



CITY OF SHORELINE 2016 STORMWATER MANAGEMENT PROGRAM (SWMP) PLAN

Prepared March 2016



Figure 1 32nd Ave NE and NE 147th St Greenworks Bioretention Project, Before and After

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CITY OF SHORELINE

2016 STORMWATER MANAGEMENT PROGRAM (SWMP) PLAN

Prepared March 2016

Introduction

Purpose of the Stormwater Management Program Plan

This document is the City of Shoreline's 2016 Stormwater Management Program (SWMP) Plan. The purpose of the document is to comply with requirements of the *Western Washington Phase II Municipal Stormwater Permit* (NPDES Permit). Specifically, under Section 5.C of the NPDES Permit (the Permit), the City of Shoreline must prepare the SWMP Plan to inform the public of the planned SWMP activities for the upcoming calendar year. This SWMP Plan covers the period between January 1, 2016 and December 31, 2016. It must be posted on the City's website by May 31, 2016.

The NPDES Program

The National Pollutant Discharge Elimination System (NPDES) is a program created under the Federal Clean Water Act, with authority over the Permit given to Washington State Department of Ecology (Ecology). Ecology issues Permits to governmental and private entities. The intent of the NPDES is to protect and restore water quality in lakes and streams so that they can support "beneficial uses" such as fishing and swimming. Governmental and private entities wishing to discharge water or wastewater to surface waters regulated by the Federal Government ("waters of the state") must obtain permits and comply with conditions of the permit.

The Western Washington Phase II Municipal Stormwater Permit

The City of Shoreline has been operating under an NPDES Permit since 2007. The current Permit covers the period from August 1, 2013 to July 31, 2018. The Permit allows municipalities to discharge stormwater from municipal systems into "waters of the state," as long as they implement programs to reduce pollutants in stormwater to the maximum extent practicable (MEP), apply all known and reasonable technologies (AKART) to address stormwater pollutants, and protect receiving waters from degradation.

This SWMP Plan follows the organization of Section 5.C of the Permit, and is broken into the five elements of the Permit:

- S5.C.1, Public Education and Outreach

- S5.C.2, Public Involvement and Participation
- S5.C.3, Illicit Discharge Detection and Elimination
- S5.C.4, Controlling Runoff from New Development, Redevelopment and Construction Sites
- S5.C.5, Municipal Operations and Maintenance

Coverage of Section 7, Compliance with Total Maximum Daily Load Requirements, and Section 8, Monitoring, is also included in this document.

In addition, the Permit requires the City to submit an Annual Report by March 31st of each year that details actions taken in the previous year to achieve compliance.

The full text of the Permit is available at: www.shorelinewa.gov/stormwaterpermit.

City Coordination and Responsibilities

Permit conditions require internal coordination and documentation of activities across several City departments. The Public Works Department Surface Water Utility staff will coordinate City efforts, and will meet with staff from other departments regularly to ensure that on-going and planned activities meet Permit requirements. It is anticipated that activities required for Permit compliance will be carried out largely by the Public Works, Information Technology, Planning and Community Development, Parks, City Manager's Office (City Attorney), and Administrative Services departments. The Fire/Building and Police departments will be involved to a lesser extent.

The Surface Water Management Utility – Other Activities

This SWMP Plan details planned activities and that fall under the purview of the Permit. Stormwater management is one part of the City's overall surface water management strategy. The Surface Water Utility conducts a suite of programs that reduce flooding, protect and improve water quality, and protect and restore aquatic habitat in the City's streams and lakes. Although not directly required, flood reduction and aquatic habitat restoration efforts can often further stormwater management goals. For details on Surface Water Utility activities beyond this SWMP Plan, see the City website at <http://www.shorelinewa.gov/surfacewater> or contact the Surface Water Division of the Public Works Department at (206) 801-2450.

Permit Implementation Timing

The Permit allows for phased implementation of stormwater management programs and actions. Table 1 provides a Permit implementation schedule and due dates. Shoreline will continue to implement ongoing activities throughout the remainder of the permit term.

Table 1 Timeline for Implementation of Stormwater Management Program

Western Washington Phase II Municipal Stormwater NPDES Permit Overview – 2013 to 2018

The timelines below provide an overview of major program components deadlines (**By Date** means "...no later than...") for implementing permit requirements of S5 Stormwater Management Program (SWMP) for Continuing City, Town and County Permittees. Other permit elements are listed on the next page. This is guidance only; please see the permit for additional detail and related requirements.

S5 Program Component	August 1, 2013 Ongoing program implementation	2014	2015	2016	2017	Jan-July 31, 2018
A. Stormwater Management Plan	Continue to track costs, actions and activities. Continue required internal and suggested external coordination and SWMP Plan submittal w/annual report. Update SWMP Plan annually.		By March 31: annual rpt includes description of internal coordination			
C.1 Public Education and Outreach	Continue public education and outreach program. Measure changes in behavior for 1 audience & 1 topic.	Create or partner w/others to create stewardship.		By February 2: use measures of behavior changes to improve program.		
C.2 Public Involvement	Continue to provide ongoing opportunities for the public to participate in SWMP decision-making. Post online annual reports and SWMP Plan for previous calendar year by 5/31 of each year.					
C.3 Illicit Discharge Detection and Elimination (IDDE)	Continue implementing the enforceable mechanism to prohibit illicit discharges, compliance strategy, IDDE and municipal staff training, citizen hotline and IDDE response, and maintain map of MS4.				By Dec 31: Field screen at least 40% of MS4 & on average 12% each year thereafter.*	By Feb 2: Update ordinance if needed.
C.4.a-f Control Runoff from New Develop't, Redevelop't Construction Sites	Continue to implement ordinance addressing construction/post-construx runoff controls; make NOIs for construction, industrial stormwater permits available; site plan review & permitting, requiring long-term maintenance; inspections; training; and enforcement.			By Dec 31: Update SW code to revised Appx 1 standards; review, revise, make effective developmt codes to make LID preferred approach.**	By March 31: Submit summary of review & revision of codes to reduce impervious surface, protect vegetation, minimize SW.	Achieve at least 80% of scheduled inspections.
C.4.g Watershed scale stormwater planning (selected permittees)	(By Oct. 31, 2013 Phase I permittee notifies Ecology of selected basin and affected Phase II permittees; convenes planning process.)	(By April 1: Scope of work submitted to Ecology by Phase I watershed plan lead.)	Participate in planning process, if located within selected basin.	By Oct 1: Phase I lead submits final watershed scale stormwater plan to Ecology.		
C.5 Municipal Pollution Prevention, Operation and Maintenance	Continue implementation of MS4 maintenance; annually inspect SW trmt & flow control BMPs/facilities; spot checks; O&M & SWPPPs for municipal lands & facilities; staff training			By Dec 31: Update maintenance standards to revised manual/ code standards.**	By August 1: Inspect all catch basins or document alternatives if used. Plan to complete inspections every 2 years thereafter.*	Achieve 95% of inspections for municipal stormwater treatment/flow control BMPs/facilities and catch basins.

S8 Monitoring and Assessment

S8 Monitoring	August 1, 2013	2014	2015	2016	2017	July 31, 2018
S8.A	Continue to provide description in each annual report of stormwater monitoring or stormwater- related studies conducted by permittee or others (except if related to S8.B or S8.C).					
S8.B Status and Trends Option #1	<i>PS Permittees ONLY:</i> By Dec 31: Notify Ecology which option selected for status and trends monitoring.	<i>PS Permittees ONLY :</i> By Aug 15: First annual payment to RSMP.				
S8.B Status and Trends Option #2		By July 31: Begin monitoring Wadeable streams.	Oct 1: Begin monitoring nearshore marine (if applicable).	Annual reporting as per Ecology-approved QAPP.		
C. Effectiveness Option #1	By Dec 31: Notify Ecology which option selected for effectiveness monitoring.	By Aug 15: Option #1 first annual payment to RSMP.				
C. Effectiveness Option #2		By Feb 2: Submit QAPP to Ecology. By Oct 1: Begin flow monitoring.	Oct 1: Stormwater monitoring program fully implemented.	Annual reporting as per Appendix 9.		
S8.D Source ID & Diagnostic Monitoring		By Aug 15: First annual payment to RSMP.				

Other significant elements of the permit

This is guidance only: see the permit for additional detail and related requirements.

S1 Application for coverage	Co-Permittees can end or amend agreements at any time.
S4.F Response to violations of Water Quality Standards	Notification and possible adaptive management may occur at any time.
S7 Compliance with Total Maximum Daily Load (TMDL) Requirements	Comply with applicable TMDL requirements listed in Appendix 2 per individual timelines.
S9 Reporting	Keep all records related to the permit for at least five years. Beginning March 31, 2015, submit a report for the previous calendar year using WAWebDMR or form provided by Ecology.
G3 Notification of Discharge Including Spills	Report to Ecology within 24 hours any discharge into or from the MS4 which could constitute a threat to human health, welfare or the environment.
G.18 Duty to Reapply	Apply for permit renewal no later than Feb. 2, 2018 (180 days before permit expiration).
G20 Non-compliance Notification	Notify Ecology within 30 days of becoming aware of permit non-compliance.

1 Public Education and Outreach

(S5.C.1)

The Permit requires the SWMP Plan to include a stormwater education and outreach program that will:

- Provide education and outreach to the public, including: school age children, businesses, residents, landscapers, property manager/owners, engineers, contractors, developers, and land-use planners.
- Create stewardship opportunities and/or partner with existing organizations to encourage residents to participate in activities such as stream teams, storm drain marking, volunteer monitoring, riparian planting, and education activities.
- Measure the understanding and adoption of behaviors for a target audience, and use this information to evaluate past programs and direct future programs.

The City of Shoreline’s Surface Water and Environmental Services Division of Public Works has several programs in place to help residents and businesses understand stormwater pollution as a significant water quality concern. The City provides outreach to residents, schools, businesses, and government on ways to reduce actions that negatively impact our environment.

The City tracks education and outreach efforts, and informally tracks costs versus benefits of the efforts. Formal tracking information can be found in Appendix B of the Annual Report.

In addition to local programs and events, Shoreline is an active participant in regional education and outreach activities through Stormwater Outreach for Regional Municipalities (STORM) and Stormwater Outreach Group (SOG). Efforts of these groups include developing regional stormwater education campaigns and evaluation.

S5.C.1.a Targeted Stormwater Outreach

Table 2 (below) lists target audiences and behaviors that are currently being addressed by the City’s education and outreach programs. These programs fulfill the Permit requirement to build general awareness. For the 2016 period, the City will continue its work in building general awareness about the stormwater problem.

Table 2 Education and Outreach Programs Planned Activities

Item	Target Audience	Goal and/or Behaviors Promoted
Surface Water and Environmental Services Website	General Public	Reduce contaminants entering the storm drain system through educational information accessible on the City’s website.

Item	Target Audience	Goal and/or Behaviors Promoted
Earth Day Every Day/ Natural Yard Care Event	General Public and Homeowners	Promotion of natural yard care tools that help maintain lawns and gardens without chemical application and car washing techniques that minimize the amount of pollutants washed down storm drains.
Soak It Up Program	General Public; Land Owners	Continue rebate program for rain garden retrofits and native vegetation landscaping to community residents and businesses.
Storm Drain Marking Program	General Public	Awareness; prevention of discharge of non-stormwater materials into the stormwater system; resident participation by involvement of citizen organizations and residents in the storm drain labeling process.
Adopt-A-Drain Program	Homeowners; General Public	Raise awareness of stormwater impacts and ways that citizens can reduce these impacts.
Local Source Control/ Pollution Prevention Program	Businesses	Work with businesses to develop practical methods of reducing or eliminating discharge of non-stormwater materials into the stormwater system.
Clean and Green Car Wash Program	General Public	Awareness; Reduction of vehicle wash water entering the storm drain system.
"Did You Know" factoid in the City's monthly Currents news publication	General Public	Raise awareness of stormwater impacts and ways that citizens can reduce these impacts.
Park signage and pet waste stations encouraging people to pick up their pet waste (park rule or ordinance cited)	General Public; Dog Owners	Increase awareness of the importance of picking up pet waste.
Workshops and presentations on rain gardens and native vegetation landscaping	General Public; Land Owners	Raise awareness of low impact development and incentives for these retrofits.

Item	Target Audience	Goal and/or Behaviors Promoted
Booths and displays at various special and on-going events on Basic Stormwater Education	General Public	Raise awareness of stormwater impacts and ways that citizens can reduce these impacts.
Environmental Mini Grant Program	General Public; Homeowners; Schools	Provides funding source for the general public to implement projects that increase awareness about the importance of using natural yard care, water conservation practices, keeping litter out of our waterways, and the importance of environmental stewardship.

S5.C.1.b Creating Stewardship Opportunities

The City will continue to offer its Storm Drain Marking and Adopt-A-Drain programs in 2016. Citizens, community groups, and school groups can volunteer to mark storm drains with “Dump No Waste” medallions. The City of Shoreline’s Adopt-A-Drain Program is a volunteer-based opportunity for residents to help care for Shoreline’s utility infrastructure of 7,000+ storm drains. Volunteers are provided with instructions and tools, by request, to care for a storm drain or multiple drains on their street or walking route. Tasks include monitoring and removing debris from the storm drain(s) approximately once a week during the storm season and tracking hours performed. The commitment term is for six months, October through March. The City also offers Environmental Mini-Grants to provide management and stewardship of our natural resources and environmental assets, in order to preserve, restore, and enhance their value for present and future generations.

S5.C.1.c Measuring Outreach Effectiveness

The City measured the understanding and adoption of the Soak It Up Low Impact Development (LID) Rebate Program through a survey conducted in 2015. A summary of the survey results is provided in the Technical Memorandum “City of Shoreline Stormwater Public Education and Outreach Survey Evaluation” dated January 20, 2016 (Appendix A). This document is being used to guide the City’s education and outreach efforts for the Soak It Up LID Rebate Program.

The Soak It Up LID Rebate Program was created to promote LID best management practices and adhere to permit requirements. This opportunity became available to property owners in fall 2013, giving incentive to stormwater retrofits such as disconnecting downspouts into rain gardens and/or converting hard surfaces to native vegetation landscaping. Behavior change is measured by the number of projects that are installed each year, and more specifically, the square footage of contributing area treated (i.e. rooftop) and/or hard surface removed.

2 Public Involvement and Participation (S5.C.2)

The Permit requires the City to create opportunities for the public to participate in the decision-making processes involving the development, implementation and update of the City's Stormwater Management Program (SWMP) and to post the SWMP Plan and annual report on the City's website.

The City of Shoreline values public input on its stormwater programs. The City will provide ongoing opportunities for public involvement and participation through a variety of avenues.

S5.c.2.a-b Involving the Public in the SWMP

The City encourages the public to participate in the decision-making processes and updates related to the City's SWMP through open houses, public meetings, surveys, public review and comment periods, and City Council meetings. This SWMP Plan and the annual report will be posted on the City's website no later than May 31st of each year. Public comments can be made directly at www.shorelinewa.gov/stormwaterpermit.

Table 3 Public Involvement and Participation Planned Activities

Item	Description	Schedule
Post SWMP Plan on City website	The SWMP Plan outlines actions to be taken within the year to comply with the NPDES Permit. The SWMP Plan is open for public comment.	Annually, by May 31 st
Post Annual Report on City website	Annual Report is submitted to Department of Ecology by March each year. The final Report is posted on the City's website.	Annually, by May 31 st
Accept public feedback on the City's SWMP Plan via website, email, or any other written form	The City encourages public comment on the SWMP Plan.	Ongoing

Other avenues for public input include:

- Updates of the City's Surface Water Master Plan. The first plan was developed in 2005 and updated in 2011. The Plan will be updated again in 2016. During the plan update process, the public can participate through several avenues, including open houses, public meetings, surveys, public review and comment periods and/or City Council meetings. In 2011, the public provided extensive comments on the City's Surface Water Master Plan, which helped shape its development.
- The public can give input each year to the capital improvement plan and budget that details programs outlined in the current Surface Water Master Plan.

3 Illicit Discharge Detection and Elimination (S5.C.3)

The Permit requires the City to have an ongoing program designed to prevent, detect, characterize, trace and eliminate illicit connections and illicit discharges into the City's stormwater drainage system.

One of the largest threats to the City's freshwater is illicit discharge. The City of Shoreline has an ongoing illicit discharge detection and elimination (IDDE) program to fulfill this requirement. The IDDE program has grown over the years and includes a variety of techniques and methods.

S5.C.3.a Municipal Stormwater Drainage System Map

The City maintains and updates a GIS database that contains all known outfalls, receiving water, stormwater facilities, and all known connections. Field staff are constantly verifying the mapped drainage system through the City's inspection programs and basin planning efforts.

S5.C.3.b IDDE Ordinance/Regulatory Mechanism

The City adopted and implemented an illicit discharge ordinance (SMC 13.10) that provides a list of prohibited and allowable discharges and enforcement procedures. In the vast majority of cases, the City seeks voluntary compliance through education and outreach to the general public and technical assistance to business owners through the Local Source Control/Pollution Prevention program.

S5.C.3.c-d Ongoing IDDE Program

The City currently has an ongoing IDDE program through the adoption of the *Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments*, Center for Watershed Protection, 2004 manual. The City responds to and investigates reports of illegal dumping, spills, illicit discharges, and illicit connections. The City also maintains a spill response hotline (206.801.2700) for citizens to call and report illicit discharges or spill complaints. The hotline is advertised on the City's website at www.shorelinewa.gov/stormwaterpermit. In 2016, the City will develop an Illicit Discharge Policies and Procedures Manual specific to the City, consistent with the *Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments*, Center for Watershed Protection, 2004.

The City is required to screen 40% of its stormwater system by December 31, 2017, and on average 12% each year thereafter. The City will continue to fulfill this requirement through its inspection programs (commercial, right of way, regional/residential, and hot spots) and basin planning efforts.

S5.C.3.e Staff Training

The City will coordinate training in May 2016 for City staff positions may encounter water quality threats and/or respond to spills that may threaten water quality in the course of their routine work. The City will then update its IDDE and spill training materials for annual in-house refresher training to be conducted annually in May.

S5.C.3.f IDDE Program Recordkeeping

The City uses Cityworks – a Work Order software – to track efforts made in identifying, reducing, and eliminating spills, illicit discharges, and illicit connections.

4 Controlling Runoff from New Development, Redevelopment, and Construction Sites (S5.C.4)

S5.C.4 of the Permit requires that Shoreline implement and enforce a program to reduce pollutants in stormwater runoff from new development, redevelopment, and construction site activities. This area of the permit has some of the most significant changes from the 2007 permit term to the current permit term. Among other items addressed below, the Permit intends to make low impact development (LID) the preferred and commonly-used approach to site development.

Controlling pollutant loads and reducing peak flows from developed sites is a long term goal of S5.C.4 of the Permit. Ongoing maintenance of permanent stormwater facilities is critical in meeting this goal. To this end, under the NPDES Permit, stormwater facilities permitted since 2007 require proof of ongoing maintenance. To assure maintenance is completed, the City inspects several hundred stormwater facilities on a rotating inspection cycle. Through this inspection program, the City strives to assure that stormwater facilities are functioning as designed.

S5.C.4.a Controlling Runoff from New Development, Redevelopment, and Construction Sites Ordinance/Regulatory Mechanism

Shoreline Municipal Code (SMC) 13.10.200 adopts the *2012 Stormwater Management Manual for Western Washington (SWMMWW)* and the Minimum Requirements found in Appendix 1 of the NPDES Phase II Permit. The City of Shoreline *Engineering Development Manual (EDM)* also addresses stormwater management as follows:

- Chapter 19 – Stormwater Manual Modifications: Modifies sections of Ecology’s 2012 SWMMWW for the City.
- Chapter 21 – Low Impact Development (LID): Specifies LID principles and guideline recommended for site planning.
- Chapter 22 – Infiltration: Provide information on subsurface investigation, prohibition, setbacks, and verification testing.
- Chapter 23 – Surface Water Project Classifications: Defines the minimum submittal requirements for the following project classifications:
 - Small Impact Projects (MR #2 only)
 - Medium Impact Projects (MR #1 through #5)
 - Large Impact Projects (MR #1 through #9)
- Chapter 24 – Site Development Plan: Specifies criteria for project layout and site design.
- Chapter 25 – Stormwater Pollution Prevention Plan (SWPPP): Defines the requirement for MR #2.

S5.C.4.b Review and Inspect Development/Redevelopment Projects

The current permitting process includes site plan review, inspections, and enforcement mechanisms for compliance. The Site Development Permit Checklist currently includes the following stormwater requirements:

- Plan, details, and profile of drainage system
- Erosion control
- Downstream analysis

- Drainage calculations
- Soils information
- Geotechnical or soils report
- Drainage system maintenance information or manual

Additionally, construction SWPPPs are included as part of the approved Civil Engineering Plan (not currently called out on the Site Development Permit Checklist). In-field pre-construction and pre-demolition conference is required as part of the Demolition Permit submittal process before any ground-disturbing activity takes place.

S5.C.4.c Post Construction Operation and Maintenance

The City of Shoreline requires covenants for inspection and maintenance on all new stormwater facilities, following the *2012 Stormwater Management Manual for Western Washington*. Inspections in the City are divided into two main groups: erosion control inspections (includes Right-of-Way [ROW] and Building inspectors) and private facility inspections. Erosion control inspections are conducted for public projects in the ROW, CIP projects, and private building projects. Private stormwater facility inspections require covenants to inspect private stormwater facilities, per the 2012 SWMMWW and the City Surface Water Code and EDM (the City acquired facilities from King County upon incorporation that do not have covenants but inspection access was included in the King County code).

S5.C.4.d Notice of Intent (NOI)

The City will continue to make copies of “Notice of Intent for Construction Activity” and “Notice of Intent for Industrial Activity” as required.

S5.C.4.e Staff Training

Training will be kept up to date for employees involved in any aspect of planning, development, inspection, or enforcement of stormwater runoff controls.

S5.C.4.f LID Code-Related Requirements

The City has completed a review and Gap Analysis of the existing codes and standards – including the existing Shoreline Municipal Code, Engineering Development Manual, the Comprehensive land use plan, and the Critical Areas Ordinance – for consistency with the requirement of LID principles and Best management Practices. A summary of the review and Gap Analysis is provided in the Technical Memorandum “City of Shoreline Code, Standard, and Document Review” dated January 20, 2016 (Appendix B). The document is being used to guide the City in the code revisions and policy updates for making LID the preferred and commonly used approach in the City. The City is using a process similar to the one outlined in *Integrating LID into Local Codes: a Guidebook for Local Governments* (Puget Sound Partnership, 2012).

5 Municipal Operations and Maintenance

(S5.C.5)

The Permit requires the City to implement an operations and maintenance (O&M) program that includes a training component and has an ultimate goal of preventing or reducing pollutant runoff from municipal operations. The City of Shoreline currently operates its O&M programs with the goal of reducing potential impacts to water quality. These programs use a variety of methods to meet that goal. The Roads Division follows guidance from the ESA Regional Road Maintenance Program Guidelines. The Surface Water Division implements a rigorous stormwater system inspection, maintenance, and cleaning program. The Parks Department adopted an Integrated Pest Management Program. Additionally, all City Maintenance Yards operate under a Surface Water Pollution Prevention Plan and are regularly inspected to assure compliance with the SWPPP.

S5.C.5.a Maintenance Standards

The City continues to use the *2012 Stormwater Management Manual for Western Washington* (SWMMWW) for maintenance standards as well as following the ESA Regional Roads Maintenance Program Guidelines.

S5.C.5.b Annual Inspection of Stormwater Treatment and Flow Control BMPs/Facilities

The City inspects and maintains all flow control and runoff treatment facilities owned and operated by the City to ensure they are maintained according to the standards per the Ecology 2012 SWMMWW through the City's Regional and Residential Inspection Programs. New stormwater treatment and flow control facilities are added to the inspection program once the City takes over ownership. In some cases, maintenance issues are sent to the City Surface Water Engineer to assess if the issue can be addressed for less than \$25,000. If the repair exceeds \$25,000, it is then considered a capital improvement project and is placed on a list of prioritized capital stormwater repair needs.

S5.C.5.c Major Storm Event Inspections

The City continues to perform spot checks of known "hot spots" after major storm events.

S5.C.5.d Catch Basin Inspections

The City continues to inspect all municipally operated catch basins through its Right-of-Way inspection program, its Regional inspection program, and its Residential inspection program. The frequency of catch basin inspections for each program is detailed in Table 4 below, in order to achieve the permit requirement to inspect all municipally owned catch basins at least once by August 1, 2017.

S5.C.5.e Established Stormwater Inspection Program

The City has an established stormwater inspection program designed to inspect all sites (see Table 4) and achieving at least 95% of inspections through the following programs:

- Right-of-Way Inspections: includes catch basins and pipe networks that transfer surface water runoff from right-of-way pavement.
- Commercial Facility Inspections: involves visual checks of all stormwater infrastructure on site.

- Regional/Residential Facility Inspections: involves visual checks of all stormwater infrastructure on site.

City owned and operated pipes with a diameter of 12 inches or larger are assessed through the City’s basin planning efforts.

Table 4 Stormwater Assets and Inspection Frequency

Inspection Program	Asset	Frequency of Inspection
Right-of-Way	Catch Basins	Every 3 years (1/3 annually) <i>Note: Aurora ROW CBs are inspected annually for the first 3 years</i>
Regional	Catch Basins	Annually
	Facilities (ponds, tanks, wetlands, pump stations)	
	Culverts	
	Contech Filters	
	Aquafilter Vault	
	Vortechs	
Residential	Catch Basins	Biennially
	Facilities (ponds, tanks, wetlands, pump stations)	
Commercial	Catch Basins	Annually or Biennially, depending on inspection history
	Facilities (ponds, tanks, ditches, swales, filters)	

S5.C.5.f Reduction of Municipal Operations Stormwater Impacts

The City of Shoreline is committed to using applicable BMPs associated with runoff control during routine maintenance. The City continues to follow the ESA Regional Roads Maintenance Program Guidelines and an Integrated Pest Management Program.

S5.C.5.g Staff Training

City staff will be trained as needed, with a Certified Erosion and Sediment Control Lead (CESCL) training offered in-house in March 2016.

S5.C.5.h Stormwater Pollution Prevention Plans (SWPPPs)

The City has SWPPPs on file for all maintenance and storage yards. The Hamlin Maintenance Yard SWPPP will be updated in 2016.

S5.C.5.i Maintenance Records

The City uses Cityworks (a Work Order software) to track inspections and maintenance/repair activities.

6 Compliance with Total Maximum Daily Load (TMDL) Requirements (Permit Section 7)

There are no TMDLs in the City of Shoreline.

7 Monitoring and Assessment (Permit Section 8)

The Monitoring portion of the Permit has seen several significant changes for the new Permit term. Section 8 of the Permit covers Status and Trends Monitoring, Effectiveness Studies, and Source Identification and Diagnostic Monitoring (SIDM). In the first two categories, the City was given the option to either conduct its own qualifying Status and Trends Monitoring and/or Effectiveness Studies OR opt in to a regional collective fund. This fund will then be used to complete studies of regional significance. In the case of the SIDM, the City is required to pay into a collective fund.

One City staff is acting as an alternate on the Stormwater Work Group, a subgroup of the Puget Sound Ecosystem Monitoring Program. This group works to identify objectives for monitoring stormwater, to develop an approach to provide needed information about stormwater impacts and the effectiveness of stormwater management actions, and to share results in a way that helps the region make better decisions. See their webpage at www.ecy.wa.gov/programs/wq/psmonitoring/swworkgroup.html.

Opt In Decisions

In 2013, the City of Shoreline opted to contribute to the Regional fund for the Status and Trends Monitoring and Effectiveness Studies for the Permit term. The City will also contribute to the SIDM for the Permit term.

The Stormwater Work Group will be overseeing the work conducted with the regional collective funds. We expect to receive updates on this work periodically.

Attachment A. Technical Memorandum: City of
Shoreline Stormwater Public Education and
Outreach Survey Evaluation



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Technical Memorandum

Prepared for: City of Shoreline

Project Title: NPDES Permit Code Support

Project No.: 148124

Technical Memorandum

Subject: City of Shoreline Stormwater Public Education and Outreach Survey Evaluation

Date: January 20, 2016

To: Uki Dele, Surface Water and Environmental Services Manager

From: Patrick Weber, P.E.

Prepared by: Margaret Ales

Damon Diessner

Reviewed by: Patrick Weber, P.E.

Limitations:

This document was prepared solely for City of Shoreline in accordance with professional standards at the time the services were performed and in accordance with the contract between City of Shoreline and Brown and Caldwell dated July 2, 2015. This document is governed by the specific scope of work authorized by City of Shoreline; 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 City of Shoreline and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.

Section 1: Introduction

As a requirement of its National Pollutant Discharge Elimination System (NPDES) Phase II Municipal Stormwater Permit issued by the Washington State Department of Ecology, the City of Shoreline (City) is required to evaluate the public education and outreach components of its Stormwater Management Program (S5.C.1). Specifically, the City must measure understanding and adoption of a targeted behavior for at least one target audience in at least one subject area. To meet this requirement, the City has chosen to evaluate (as the targeted behavior) conversion of hard surfaces to native vegetation landscaping, and (as the targeted audience) Shoreline homeowners. In order to measure understanding and adoption, the City conducted public surveys regarding general stormwater requirements and the City's Soak It Up Low-Impact Development Rebate Program (Soak It Up program). The City requested that Brown and Caldwell (BC) complete a review of survey results to evaluate results and provide recommendations on potential program changes.

This technical memorandum (TM) includes review and summary of information from two surveys conducted by the City. The first was a telephone survey of 400 randomly selected Shoreline homeowners (with a yard) performed in November 2015 by Elway Research (City 2015a). The telephone survey repeated key questions about general stormwater knowledge and awareness from a 2012 survey administered to Shoreline homeowners and also included new questions about the Soak It Up program.

The Web-based survey was administered to recent Soak It Up program participants who had either completed a project or scheduled a site visit with City staff. It was conducted in December 2015 using the Web-based survey tool, SurveyMonkey, and had 25 responses out of 54 recent program participants, resulting in a 46 percent response rate (City 2015b).

Section 2 of this TM summarizes the results of the surveys. Section 3 provides recommendations for improvements to the City's public education and outreach programs. Responses to both surveys are included in Attachment A.

Section 2: Results Summary

Key findings from the 2015 telephone and Web-based surveys are summarized below. Both surveys asked participants about the following topics:

- General stormwater understanding
- Rain gardens and native vegetation landscaping (in general)
- The City's Soak It Up program (in particular)

2.1 General Stormwater Understanding

The telephone survey asked respondents about the importance of stormwater and water pollution relative to other environmental threats, the significance of water pollution, the respondents' impact on water quality, and the respondents' understanding of stormwater dynamics. Key findings are summarized below:

- Stormwater runoff and water pollution were named by 10 percent each to be the single most important threat to the environment facing Shoreline today. Compared to a 2012 survey, water pollution is down 5 percent and stormwater runoff is up 4 percent. This shift may indicate an increased awareness of the relationship between runoff and overall water quality. The three top environmental issues facing Shoreline were listed as traffic (20 percent), climate change (15 percent), and land use/development (15 percent).

- In both the 2012 and 2015 survey, approximately 80 percent of the respondents indicated that their actions had an impact on local water quality. The number of respondents who believed they had a significant impact decreased from 42 percent in 2012 to 27 percent in 2015.
- In both 2012 and 2015 surveys, two thirds responded that runoff has a significant impact on local water quality.
- In both 2012 and 2015 surveys, when asked where the stormwater ends up eventually, nearly all understood that it ends up in local streams or the Puget Sound.
- The understanding that stormwater is not treated doubled from 2012 to 2015, from 25 percent to 50 percent.
- Those who said that there is a local water pollution problem were more likely to install a rain garden, consider/install native vegetation landscaping, or replace pavement with porous pavement.

The Web-based survey asked similar questions on general stormwater understanding, but many were open-ended questions, and were directed to a targeted group that had already expressed knowledge and interest in the rain garden and native vegetation landscaping principles of the Soak It Up program. Key findings are summarized below:

- Similar to the telephone survey, when asked about the single most important threat to the environment facing Shoreline today, the issues with the highest response were development/loss of vegetation (nearly 50 percent) with climate change and soil/water quality being about 25 percent each.
- The great majority of respondents believed that water pollution is a significant problem and that their actions have a significant impact on local water quality.
- Nearly all respondents understood that runoff drains to local waterways and eventually to Puget Sound.
- None of the Web-based survey respondents believed that all runoff is treated before entering local waterways. Twenty percent believed that some stormwater is treated and some is not; most believed that runoff is not treated.

2.2 Soak It Up Program Understanding

The telephone survey also asked participants about the concepts of native vegetation landscaping and rain gardens, and about the City's Soak It Up program. The survey looked at three key areas: (1) residents' familiarity with the Soak It Up program, (2) their willingness to participate in the program, and (3) motivations and barriers to installing rain gardens or native vegetation. The results are presented below:

- Half of the respondents reported that they were familiar with the concept of rain gardens. Another 19 percent had heard the term, but were not familiar with the concept. Just under half would consider installing a rain garden. Those most likely to install had also perceived that there is a water pollution problem and that they contributed to it.
- Two thirds were familiar with native vegetation landscaping. Another 15 percent had heard of it but were not familiar with it. Nearly 6 in 10 would consider installing native vegetation. Similar to rain gardens, those most likely to install were those familiar with it and those who perceived a significant water pollution problem that they contributed to.
- More than half of the respondents indicated that cost was the chief barrier (55 percent) to rain gardens and native vegetation landscaping, with maintenance and aesthetics also considered to be a barrier by 28 percent, each. Half would be more likely to install a rain garden or native vegetation with the opportunity for a rebate.
- Fewer than 20 percent of the respondents had heard of the Soak It Up program. For those who had heard about the program, about 80 percent recalled hearing about it from a City-sponsored event or through City-published materials.

- About 50 percent of the respondents would be interested in replacing existing pavement on their property with porous pavement if they were offered a rebate to do so.

The Web-based survey questions focused on the Soak It Up program specifically, rather than the general concepts and understanding of rain garden and native vegetation landscaping. Key findings are summarized below:

- More than two thirds of the participants heard about the program through City-sponsored publishing or a City-sponsored event.
- Most participants would recommend the program to a friend or colleague.
- Cost and opportunity for rebate were significant issues for program participants. Benefit to the environment, aesthetics, and effort to install and maintain were also important considerations.
- Nearly 80 percent of the respondents would be interested in replacing existing pavement on their property with porous pavement if they would be offered a rebate to do so.

Section 3: Summary and Recommendations

The telephone survey results indicate that general awareness of stormwater and water quality issues is quite high; however, many of the respondents do not understand that urban runoff is not treated for pollutant removal prior to discharge. A comparison between the 2012 and 2015 survey results show that the public awareness gap for this is narrowing. The telephone survey also indicates that respondents who perceived local water quality as a significant issue or believe that they have an impact on water quality are more likely to participate in activities such as the Soak It Up program. The Web-based survey demonstrated that the participants are willing to recommend the program to friends and colleagues, but have concerns about cost, maintenance, and aesthetics.

One recommendation for general public awareness is for the City to work with regional partners to help focus efforts to address the public misconception that all stormwater is treated.

Specific recommendations for the Soak It Up program include enhancement of the existing program and addressing cost and aesthetics concerns, as identified below.

Program enhancements include:

- With significant percentages of telephone survey respondents willing to pursue both native vegetation planting/restoration and rain garden installation, it appears that there could be benefits to enhancing Soak It Up program funding. Staffing levels needed for program expansion should be understood before proceeding with increased project funding.
- The program could be modified to allow for plantings/improvements by contractors rather than by program participants for those physically unable to perform the work themselves. Such a program modification could be emphasized in future public outreach efforts.
- The program could be expanded to include porous pavement installations. Participants in both surveys indicated that they would be interested in a porous pavement rebate, especially those who said that local water pollution is a problem.

Efforts to address cost and aesthetics concerns include:

- Some potential native vegetation planting program participants see aesthetics as a problem. The City could explore ways to make it clearer that native planting areas can be attractive, perhaps through visual examples (e.g., photographs) or access to more successful demonstration project examples in the field.

- Securing endorsements for native plants as desirable landscaping from well-known regional experts such as Ciscoe Morris or Ed Hume could enhance the aesthetic acceptability of native plantings.
- Another potential way to address the aesthetics concerns could be to expand the allowable plants list to include some additional desirable plant materials for both native vegetation plantings and rain gardens. Following up with specific individuals having expressed opinions on this subject as well as consulting with regional experts could prove effective.
- As cost is a significant consideration for both telephone and Web-based survey respondents with respect to all potential Soak It Up program projects, it may be helpful to develop typical unit costs for native planting and rain garden installations, or suggest approaches for implementing projects in a cost-effective manner.
- Cost considerations could also be addressed by providing estimates of long-term maintenance cost reductions resulting from conversion from turf to native vegetation through the reduced use of chemicals, irrigation, mowing, etc.

Section 4: References

City of Shoreline (City). 2015a. *Stormwater Awareness, Attitudes and Behavior*, Elway Research, November.

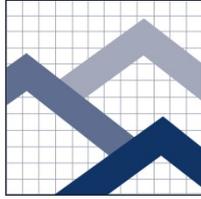
City. 2015b. *2015 Soak It Up Program Survey*, SurveyMonkey administered by City of Shoreline, December.

Attachment A: Survey Reports

City of Shoreline, *Stormwater Awareness, Attitudes and Behavior*, Elway Research
November 2015

City of Shoreline, *2015 Soak It Up Program Survey*, SurveyMonkey administered by
City of Shoreline, December 2015





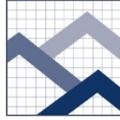
CITY OF SHORELINE

STORMWATER AWARENESS, ATTITUDES & BEHAVIOR

DECEMBER 2015



ELWAY RESEARCH, INC.



CITY OF SHORELINE

STORMWATER AWARENESS, ATTITUDES & BEHAVIOR

DECEMBER 2015

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CITY OF SHORELINE

STORMWATER AWARENESS, ATTITUDES & BEHAVIOR

DECEMBER 2015

INTRODUCTION

This report summarizes the results of a telephone survey, conducted on behalf of the City of Shoreline to assess homeowners' awareness of, and attitudes about issues related to stormwater. It also sought to gauge willingness to participate in city programs designed to ameliorate stormwater runoff into nearby creeks.

A total of 400 homeowners, selected at random from lists of addresses in Shoreline, were interviewed by telephone November 23-30, 2015. Respondents were screened to ensure that they were homeowners and that they have a yard at their home.

Specifically, the survey was designed to assess:

- Where water pollution and stormwater rank among respondents' list of important threats to the environment in Shoreline;
- Respondents' evaluation of the significance of local water pollution;
- Perceived impacts of their own activity on water quality;
- Understanding of stormwater dynamics – where it goes, the extent of harm caused by runoff;
- Familiarity with the city's Soak It Up Program and sources of information about it;
- Familiarity with and willingness to install rain gardens, native vegetation landscaping, and porous pavement to mitigate runoff problems;
- Motivations and barriers to installing rain gardens and native vegetation landscaping.

Demographic information was collected so as to compare and contrast answers.

The survey was administered by Elway Research, Inc. The questionnaire was designed to repeat key questions from a survey conducted in 2012 as well as to ask about the new city programs.

The report includes Key Findings, followed by annotated graphs summarizing the results to each question. The full questionnaire and a complete set of crosstabulation tables are presented under separate cover.



METHODS

SAMPLE:	400 Shoreline homeowners with a yard.
TECHNIQUE:	Telephone Survey with live interviewers. 23% were interviewed via cell phone.
FIELD DATES:	November 23-30, 2015.
MARGIN OF ERROR:	±5% at the 95% level of confidence. That is, in theory, had all similarly qualified homeowners been interviewed, there is a 95% chance the results would be within ±5% of the results in this survey.
DATA COLLECTION:	Calls were made during weekday evenings and weekend days. Trained, professional interviewers under supervision conducted all interviews. Up to six attempts were made to contact a voter at each number in the sample before a substitute number was called. Questionnaires were edited for completeness, and a percentage of each interviewer's calls were re-called for verification.

It must be kept in mind that survey research cannot predict the future. Although great care and the most rigorous methods available were employed in the design, execution and analysis of this survey, these results can be interpreted only as representing the answers given by these respondents to these questions at the time they were interviewed.



RESPONDENT PROFILE

In interpreting these findings, it is important to keep in mind the characteristics of the people actually interviewed. This table presents a profile of the respondents in the survey.

NOTE: Here and throughout this report, percentages may not add to 100%, due to rounding.

GENDER:	48%	Male
	52%	Female
AGE:	5%	18-35
	24%	36-50
	33%	51-64
	36%	65+
	2%	No Answer
INCOME:	17%	\$50,000 or less
	18%	\$50 to \$75,000
	18%	\$75-100,000
	11%	\$100-125,000
	16%	\$125,000+
	20%	No Answer



KEY FINDINGS

- ◆ **Traffic, climate change and development were cited as the top "threats to the environment" in Shoreline.**
 - Stormwater and water pollution were named by 10% each to rank tied for #4.
- ◆ **Half (50%) said that local water pollution is a "significant problem."**
- ◆ **1 in 5 (22%) said their household has a "significant impact" on local water quality.**
- ◆ **Nearly all were aware that stormwater ends up in local waters (46%) and/or Puget Sound (41%).**
 - 67% said that runoff has a "significant harmful effect" on local water quality.
 - 50% were aware that stormwater runoff is not treated.

RAIN GARDENS & NATIVE VEGETATION LANDSCAPING

- ◆ **Half (51%) said they are familiar with the concept of rain gardens.**
 - Another 19% had heard the term, but were not familiar with the concept.
- ◆ **Just under half (46%) would consider installing a rain garden.**
 - Most likely to install a rain garden were those who were familiar with them and those who perceived a significant water pollution problem that they contributed to.
- ◆ **Two-thirds (68%) were familiar with native vegetation landscaping.**
 - Another 15% had heard of it but were not "familiar" with it.



- ◆ **Nearly 6 in 10 (57%) would consider installing native vegetation landscaping.**
 - As with rain gardens, those most likely to install native vegetation landscaping were those who were familiar with it and those who perceived a significant water pollution problem that they contributed to.

- ◆ **Cost was the chief barrier – by far – to rain gardens and native vegetation landscaping.**
 - 55% named cost as the most important consideration for them
28% each cited the amount of work required to maintain it and how attractive it would be on their property.
 - Half (51%) said that rebates would make them more likely to install a rain garden or native vegetation landscaping on their property.

- ◆ **Perception of water quality problems was related to willingness to consider mitigating installments.**
 - Respondents 1) who said the local water problem was significant, 2) who said their household contributed to the problem, and 3) who said runoff was doing significant harm to local water quality were in each case more willing than those who did not see those problems to install rain gardens, native vegetation landscaping, and porous pavement.

SOAK IT UP

- ◆ **Nearly 1 in 5 (18%) had heard of the Soak It Up Rebate Program.**
 - Top sources named for having heard about the program were the *Currents* newsletter (34%), Neighborhood Associations (20%), and city-sponsored events (14%).

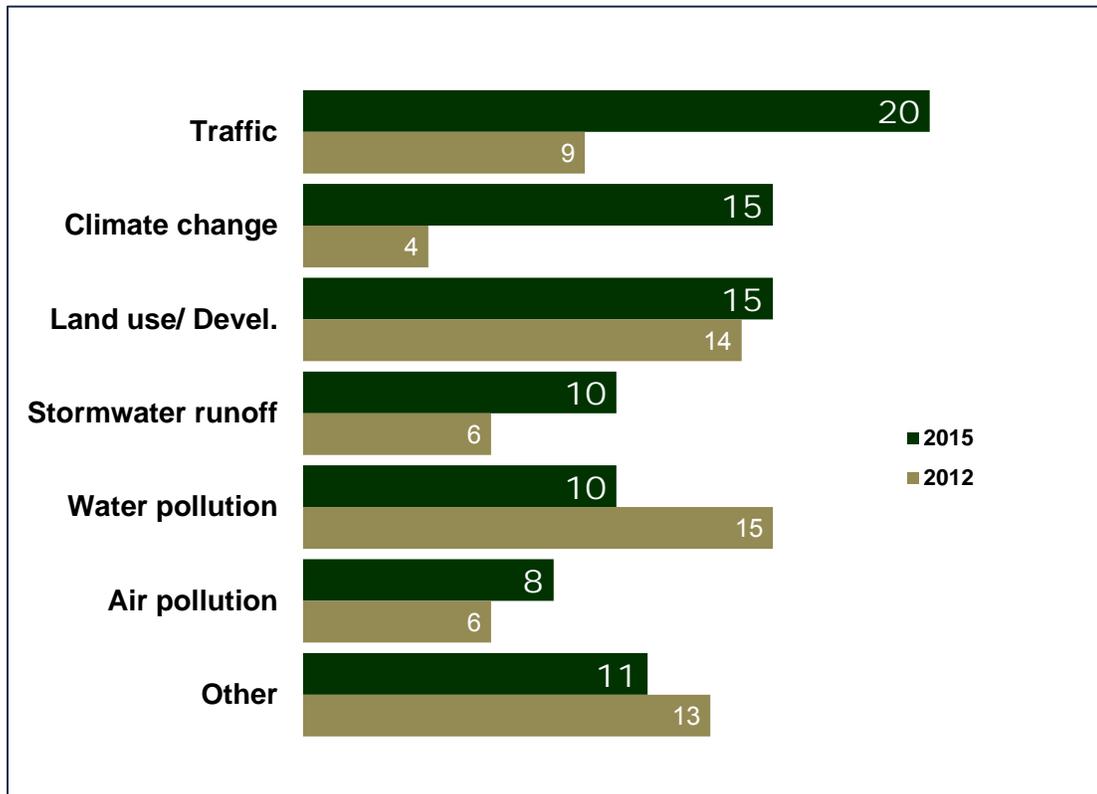


FINDINGS

- This section presents the survey findings in the form of annotated graphs.
- Bullet points indicate significant or noteworthy differences among population subgroups.



Traffic, Climate Change & Development Named as Top Environmental Issues

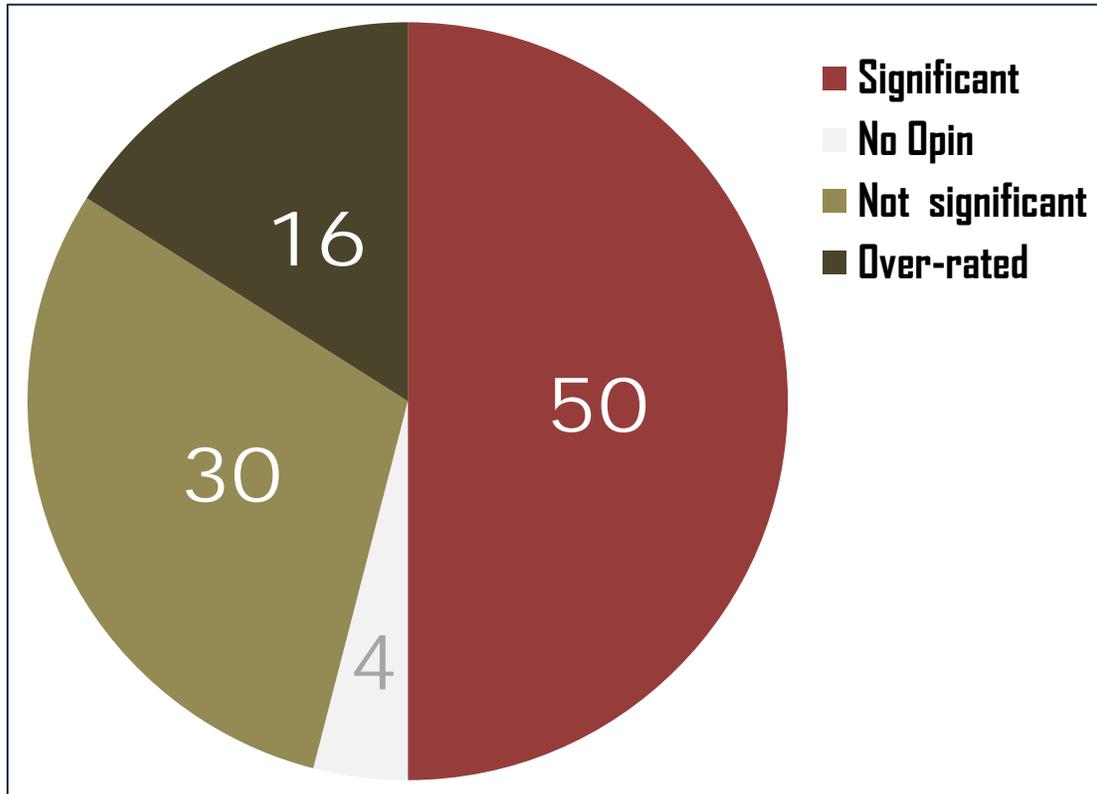


Q1 What do you think is the single most important threat to the environment facing Shoreline today? [OPEN]

- **20% of respondents volunteered traffic as the "most important threat to the environment facing Shoreline today."**
 - This is more than twice as many as mentioned traffic in 2012.
- **Stormwater and water pollution were named by 15% each.**
 - Stormwater mentions were up 4 points over the 2012 survey;
 - Water pollution mentions were down 5 points.
 - This shift may indicate a growing awareness of the relationship of runoff to overall water quality.



Half Said Local Water Pollution is a "Significant Problem"



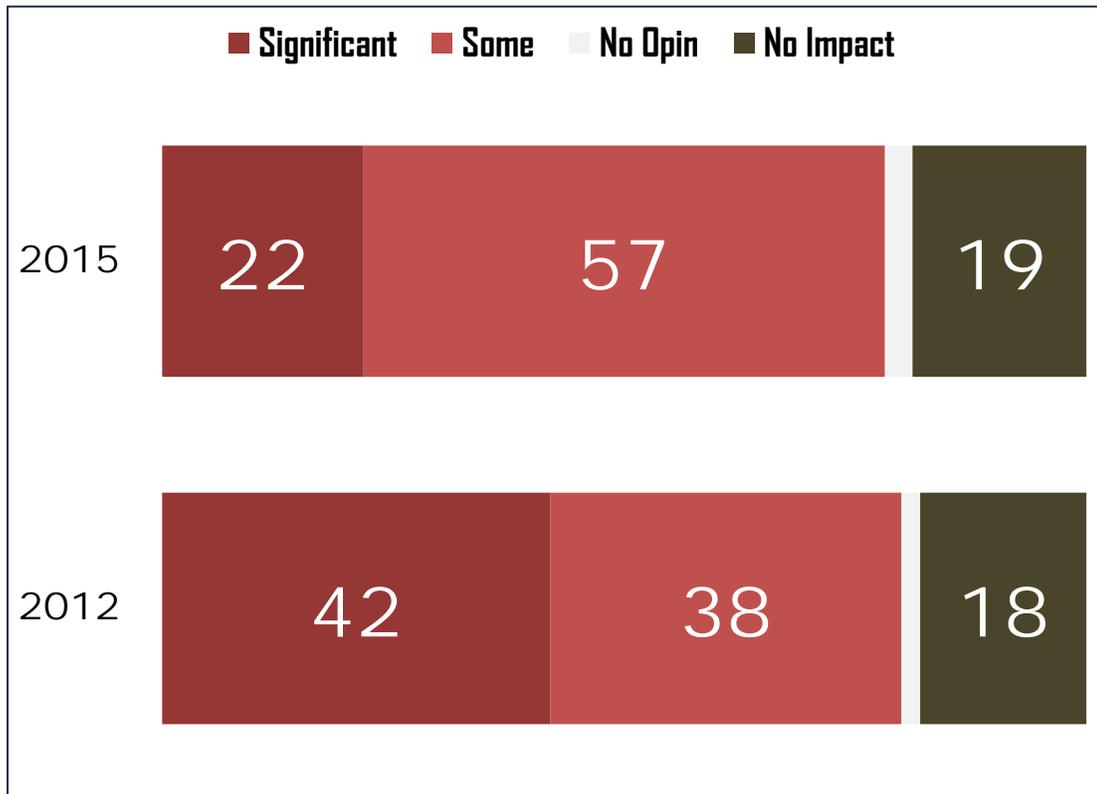
Q2 In your opinion, is pollution in local waterways – like streams, rivers, lakes, and Puget sound ...

1) A significant problem; 2) A problem, but not that significant; 3) Over-rated as a problem

- **Respondents were generally split over the significance of pollution in local waterways:**
50% said it was a "significant problem," while 46% said it was either "not that significant" (30%) or "over-rated as a problem" (16%).
- **Belief that local water pollution was significant went up with a sense of personal reasonability for water quality:**
67% of those who believed their actions had a significant impact on local water quality said that water pollution was a significant problem, compared to 50% of those who thought their actions as only an insignificant impact on water quality, and 30% of those who said they had no impact on local water quality.
- **Those who thought that runoff does significant harm to water quality were almost 3 times as likely to rate local water pollution as significant (61% v. 23%).**



1 in 5 Said They Have a "Significant Impact" on Local Water Quality

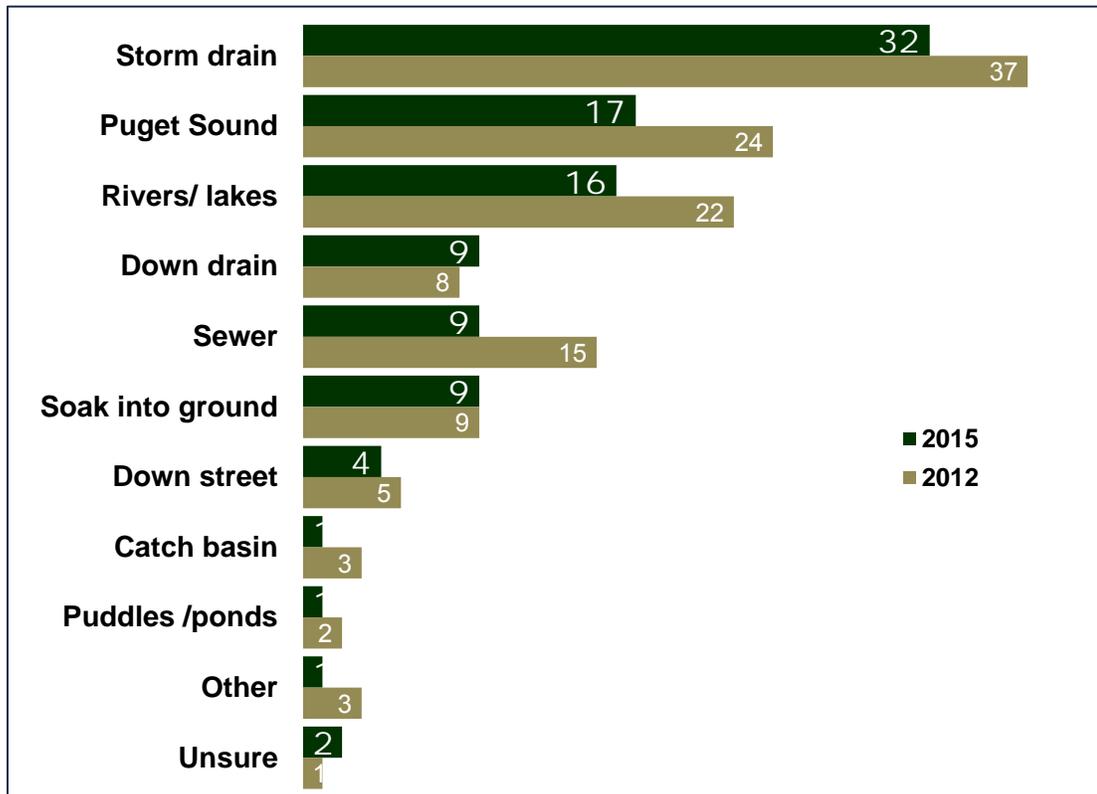


- Q3 To what degree do you believe that actions you and your family take affect the health of local streams, rivers, lakes, and Puget Sound? Would you say your household has...
- 1) A significant impact on the water quality in local waterways
 - 2) Some impact but not significant
 - 3) No impact on the water quality in local waterways

- Overall, 79% of respondents believed that their actions have an impact on the health of local waters, including 22% who said their impact was "significant."
- The overall result is almost identical to the results when the same question was asked in 2012 (80% then, 79% now), however
 - The proportion who said their impact is "significant" was just half of what it was in 2012 (22% v. 42%).



Most Aware that Stormwater Goes into Storm Drain and into Local Waters

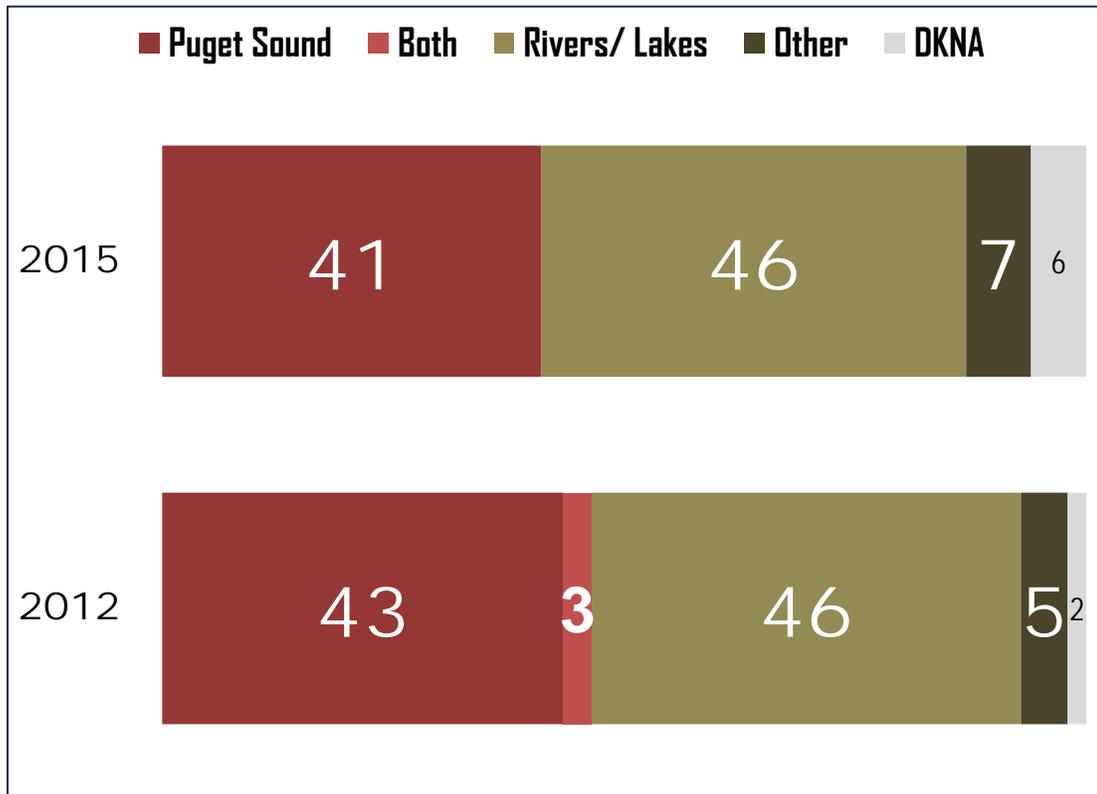


Q4 When it rains, a lot of water runs off of roofs, driveways, parking lots, and streets. As you understand it, where does that water go?

- When asked in an open-ended question where runoff water goes, the top three answers volunteered were
 - Storm drain (32%)
 - Puget Sound (17%)
 - Creeks, rivers and lakes (16%)
- The apparent decline in the proportion citing each category is a result of coding, not changes in respondents' awareness. Respondents in 2012 were allowed multiple answers. This year, only one answer was recorded and coded, resulting in lower percentages for each answer.
 - The main finding here is that the categories are cited in the same order as in 2012, with the exception that relatively fewer people thought that runoff goes down the sewer.



Nearly All Understood that Stormwater Ends Up in Local Waters and Puget Sound

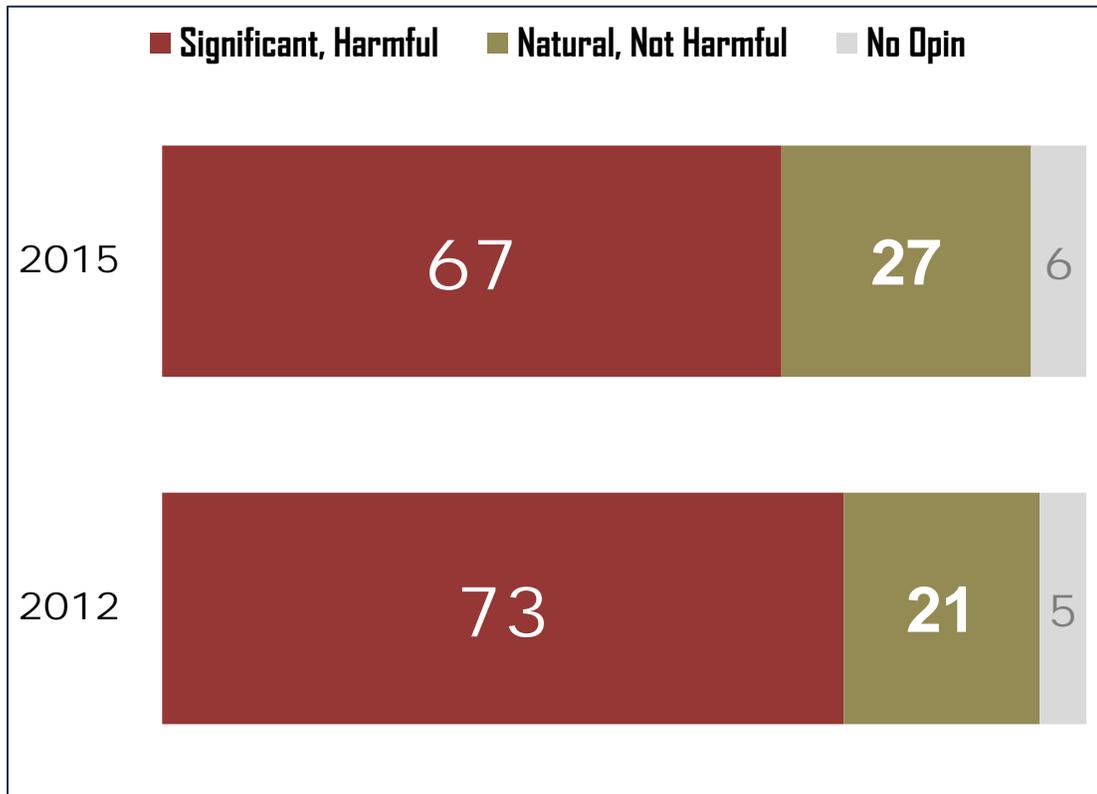


Q4.1 Where does it end up eventually?

- Respondents who had not named local rivers or Puget Sound in the previous question, but gave answers like "down the storm drain" or "soaks into the ground" were asked where the water ends up eventually.
- 9 in 10 respondents were aware that stormwater runoff eventually finds its way to local creeks and lakes (46%), and/or to Puget Sound (43%).
 - These numbers are essentially unchanged since 2012.



2 in 3 Said That Runoff has "Significant Harmful Effect" on Local Water Quality



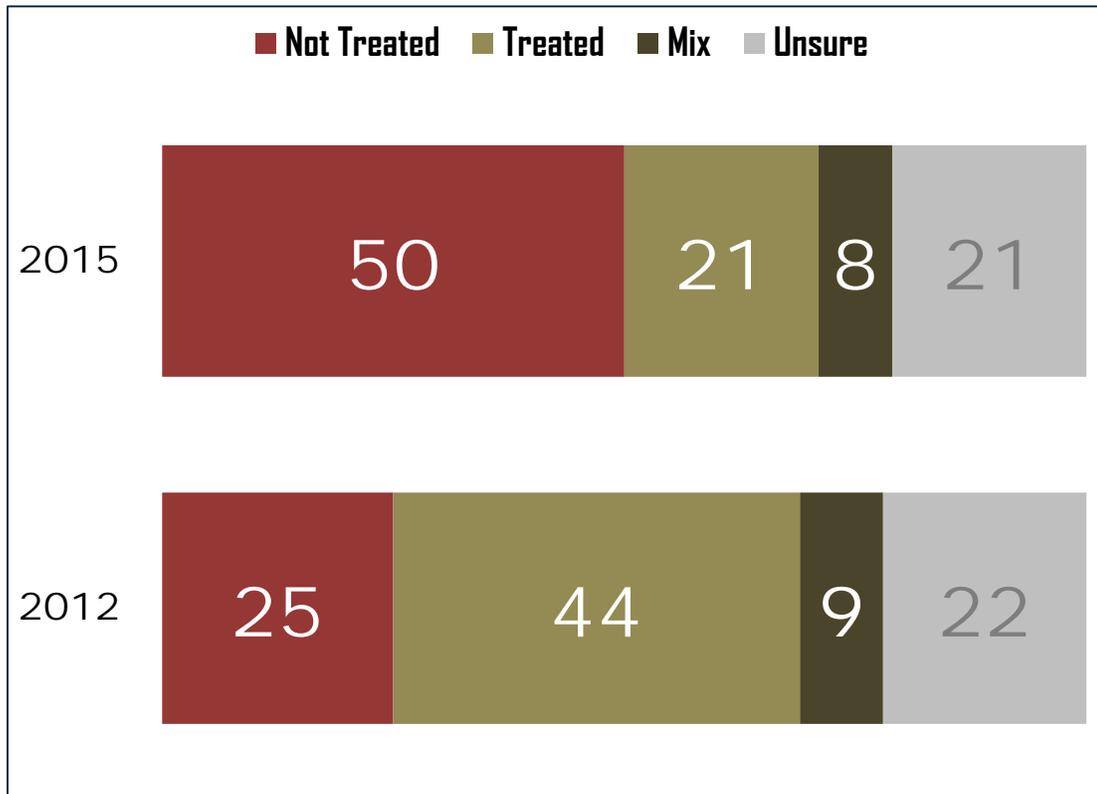
Q5 Which of the following views is closest to your opinion about the impact of runoff or stormwater?

- A) Stormwater runoff has a significant harmful effect on water quality in local streams, lakes, and rivers.
- B) Stormwater runoff is part of the natural way of things. Any harm to water quality from stormwater is not enough to worry about.

- There was a slight drop compared to 2012 in the proportion of respondents who said that "stormwater has a significant harmful effect" on local water quality (67% v. 73%).
 - The difference is not statistically significant ($p > .05$).
- Belief that there was a significant harmful effect went down with age, from 80% among those under age 35, to 59% among those over 65.



Half Aware that Stormwater Runoff is Not Treated

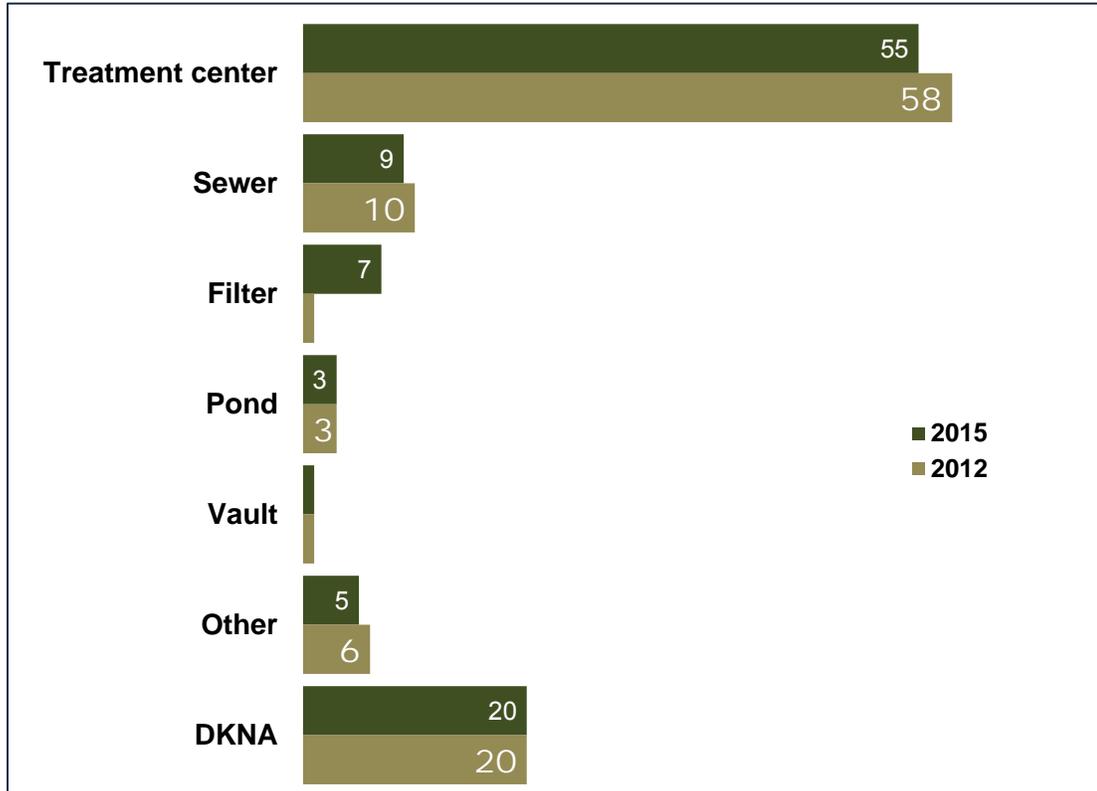


Q6 To the best of your knowledge, is runoff water in Shoreline treated before it goes back into local waters? Or is runoff water not treated?

- **Twice as many respondents in this survey as in 2012 were aware that stormwater is not treated (50% v. 25%).**



Most Who Said Runoff is Treated Believed it Goes to a Treatment Center

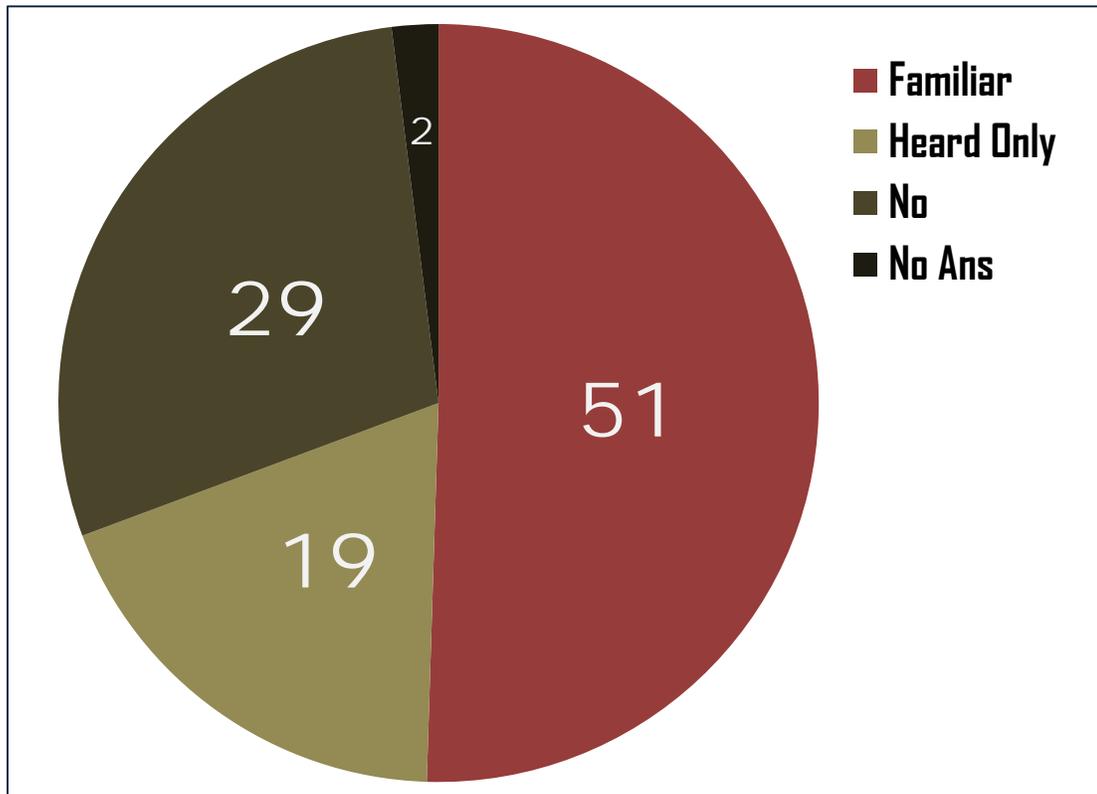


Q6.1 Where does it go for treatment?

- Those who thought that stormwater was treated were asked where the water went for treatment.
 - More than half (55%) said it went to a treatment center.
 - 20% did not know
 - These numbers are essentially the same as in 2012.



Half Report Familiarity with Rain Gardens

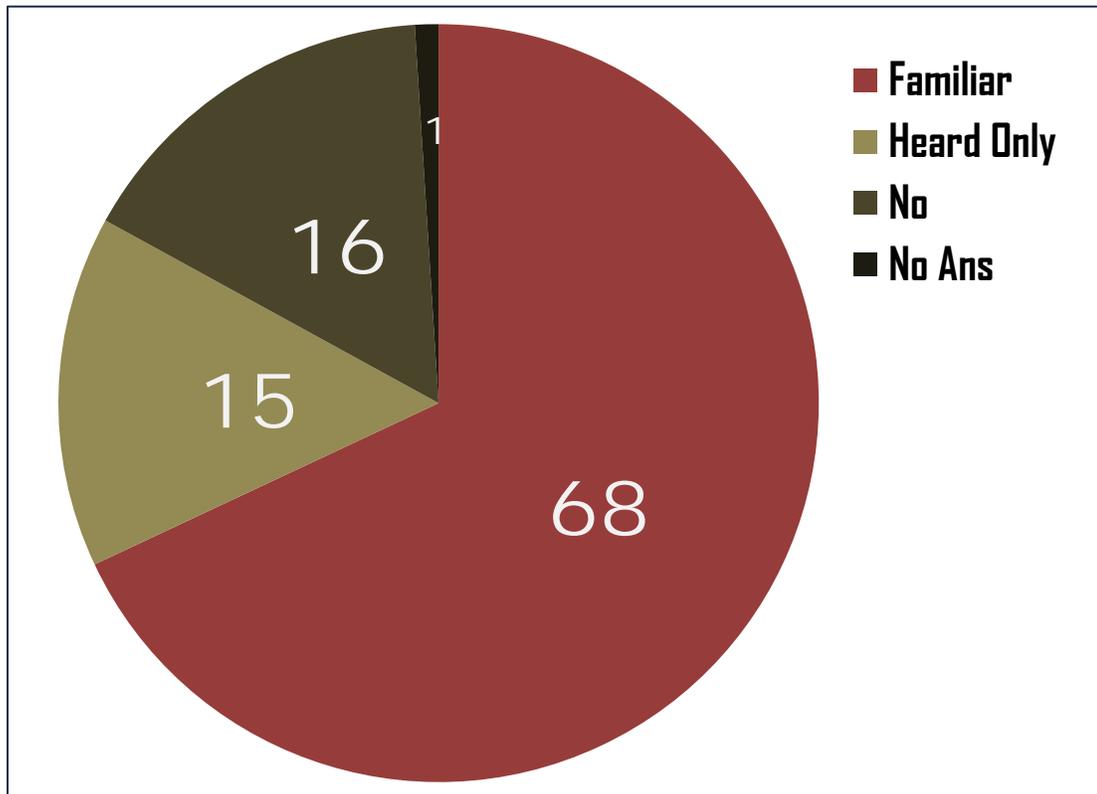


Q7 Are you familiar with the concept of rain gardens?

- **70% of respondents had heard of rain gardens and 51% said they were "familiar" with the concept.**
 - Respondents under age 35 were least likely to have heard of them: 55% had not heard of them, whereas
 - 55% of those between the ages of 36-65 were "familiar" with them as were 49% of those over 65.



2 in 3 Report Familiarity with Native Vegetation Landscaping

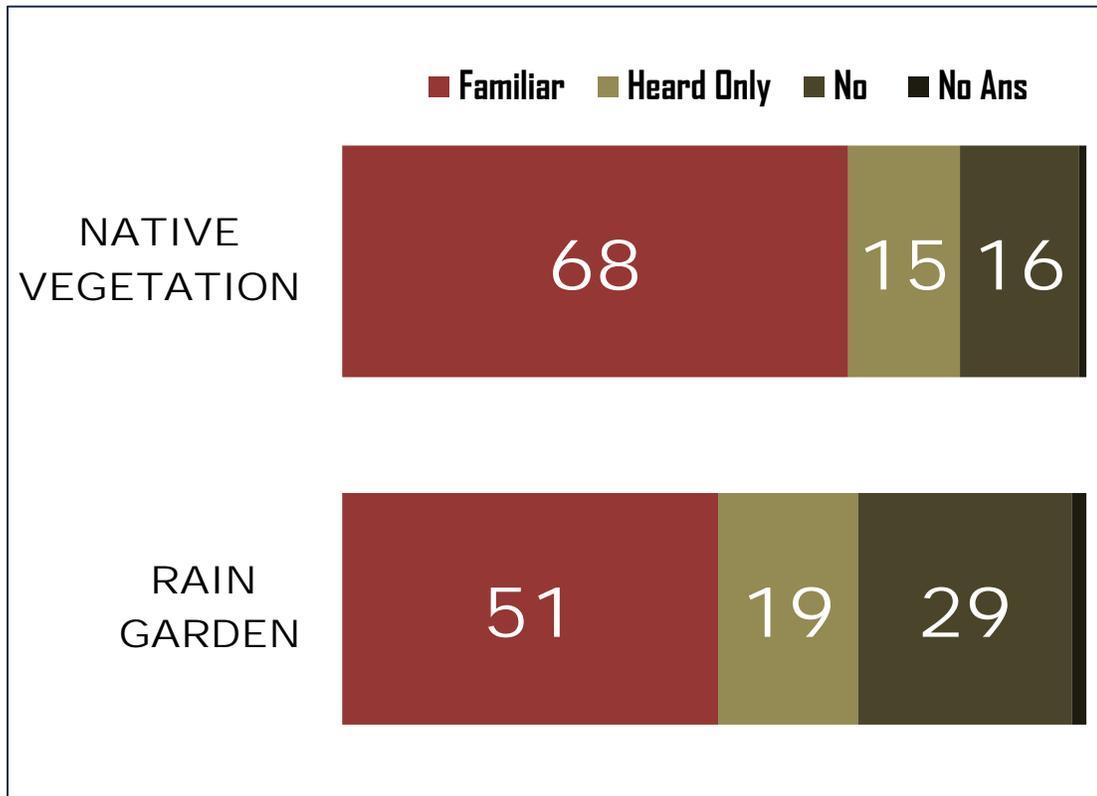


Q8 Are you familiar with the concept of native vegetation landscaping?

- **A significantly higher proportion of respondents had heard of native vegetation landscaping:**
83% had heard of that, including
68% who said they were familiar with the concept.
- **As with rain gardens, respondents between the ages of 36-64 were most likely to be familiar with this concept:**
81% of those 36-50 were familiar with it, as were
71% of those 51-64; compared to
61% of those over age 65 and
55% of those under 35.



Comparison of Familiarity with Native Vegetation Landscaping & Rain Gardens

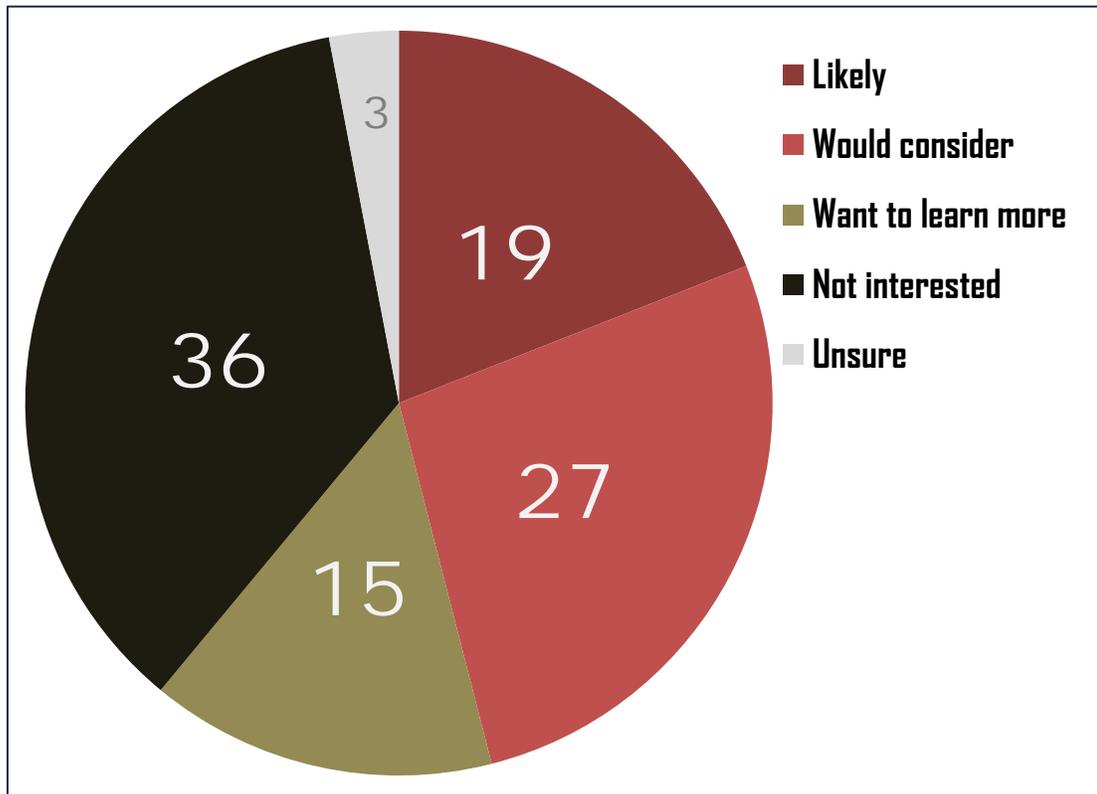


Q7 & Q8 Comparison

- In total, 89% of respondents had heard of at least one of these concepts:
 - 45% said they were "familiar" with both concepts;
 - 15% were "familiar" with one, but had not heard of the other;
 - 6% had heard of both but were not "familiar" with either;
 - 8% had heard of one, but not the other.



Just Under Half Would Consider Installing a Rain Garden

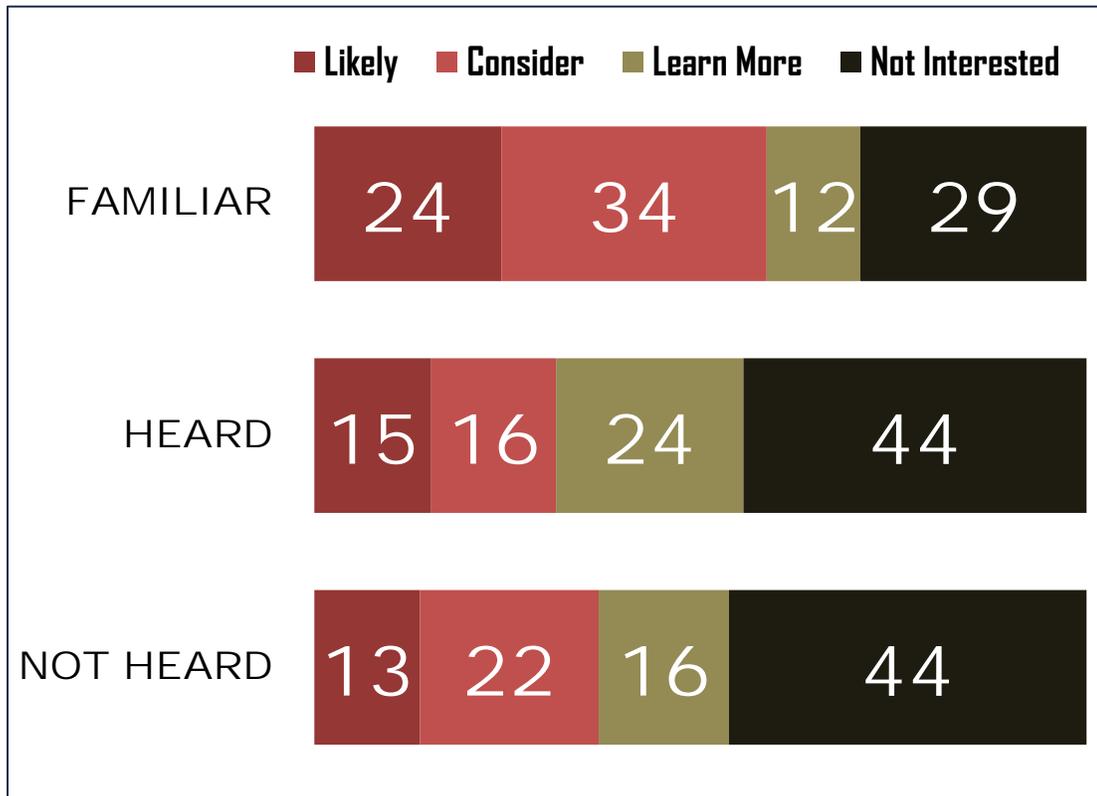


Q9 A rain garden is a planted, shallow depression that captures stormwater runoff and allows it to soak into the ground. Native vegetation landscaping means replacing lawn or pavement with native plants and compost-amended soils. Both methods filter stormwater before it gets into nearby streams and lakes. Is installing a rain garden something you would: 1) Be likely to do on your property; 2) Would consider for your property 3) Want to learn more about; 4) Not be interested in.

- **46% said they would at least consider a rain garden for their property, including 19% would be "likely" to install one.**
- **Respondents who said they have no impact on water quality were much less interested in rain gardens than those who believed they were having an impact:**
 - 62% of those who said their household had no impact on local water quality were not interested; whereas
 - 72% of those who said they had a significant impact on water quality were at least interested to learn more; as were
 - 66% of those who believed that made some impact.



Most Familiar with Rain Gardens Most Likely to Install One

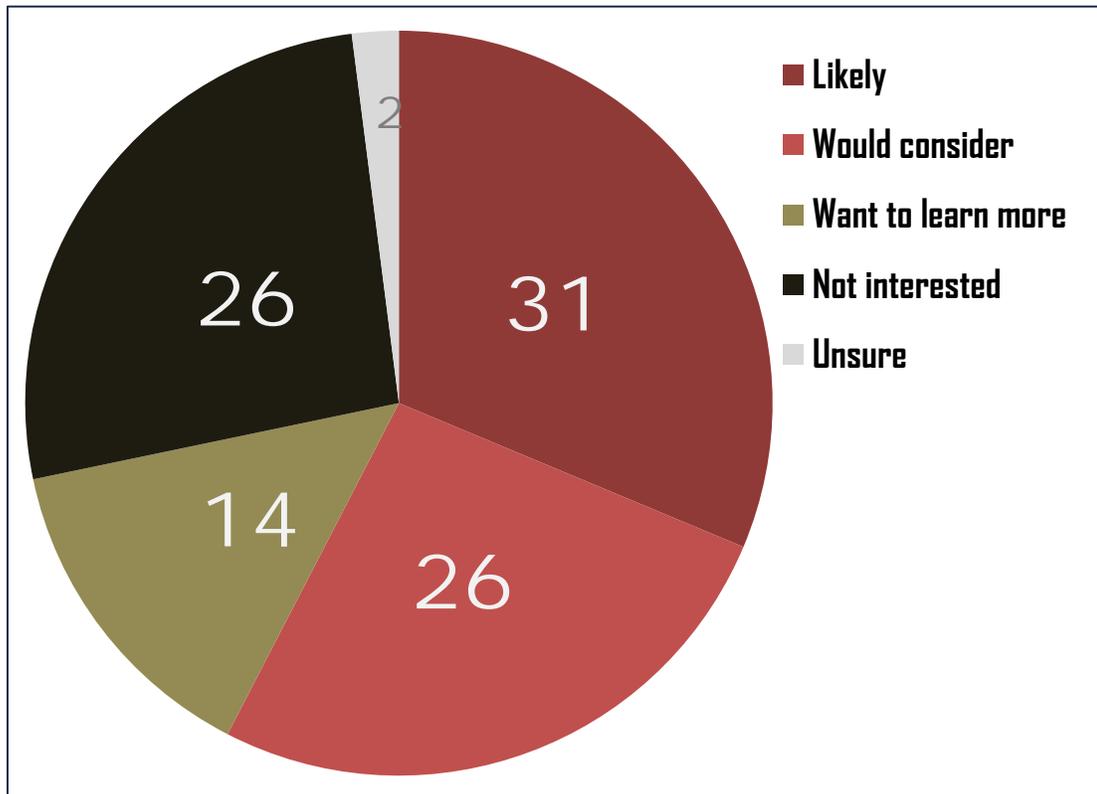


Likelihood to install by level of familiarity

- **Not surprisingly, people familiar with rain gardens were more likely to say they would install one, including:**
24% of those "familiar" with the concept; versus
15% of those who had only heard of them; and
13% of those who had not heard of them.
- **There was little difference between those who had heard of rain gardens and those who had not:**
15% of those who had only heard of them said they were likely to install versus
13% of those who had never heard of them. Meanwhile,
44% of each category said they were not interested.



Nearly 6 in 10 Would Consider Installing Native Vegetation Landscaping

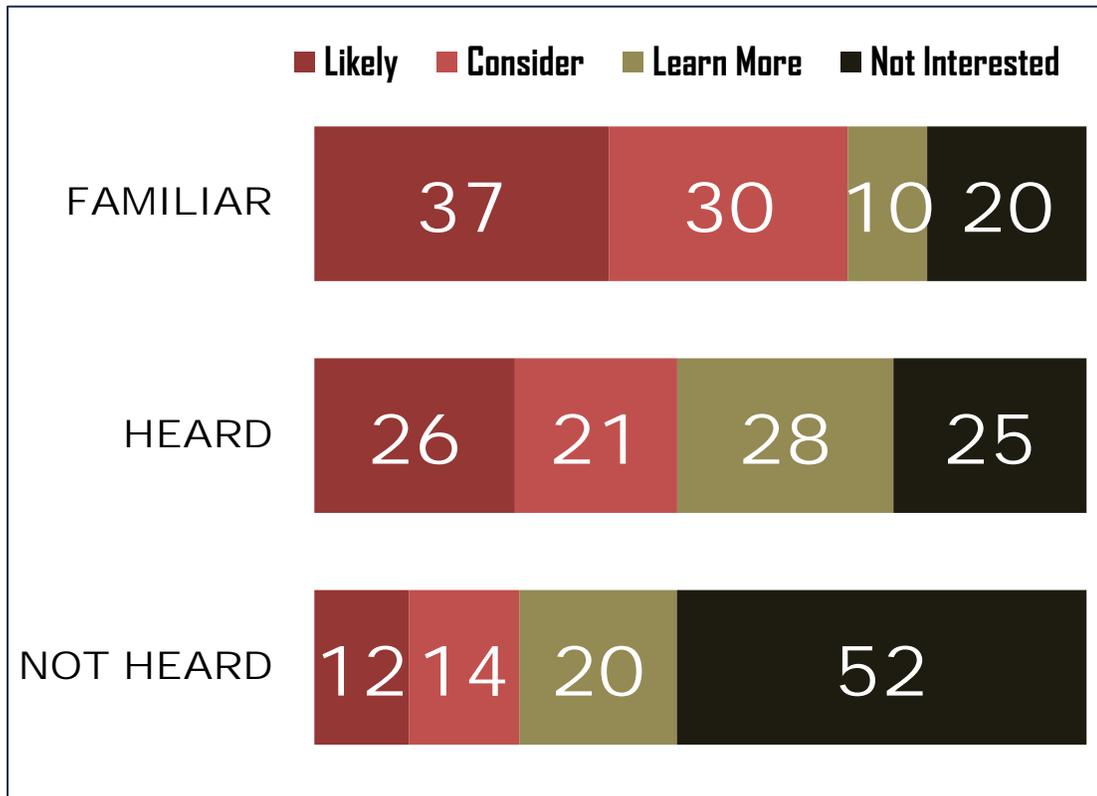


Q10 Is installing native vegetation landscaping something you would: 1) Be likely to do on your property; 2) Would consider for your property; 3) Want to learn more about; 4) Not be interested in.

- **46% said they would at least consider native vegetation landscaping for their property, including 19% would be "likely" to install it.**
- **Respondents who said they have no impact on water quality were much less interested in native vegetation landscaping than those who believed they were having an impact:**
 - 62% of those who said their household had no impact on local water quality were not interested; whereas
 - 72% of those who said they had a significant impact on water quality were at least interested to learn more; as were
 - 66% of those who believed that made some impact.



Those Who Had Heard of Native Vegetation Landscaping Wanted to Know More

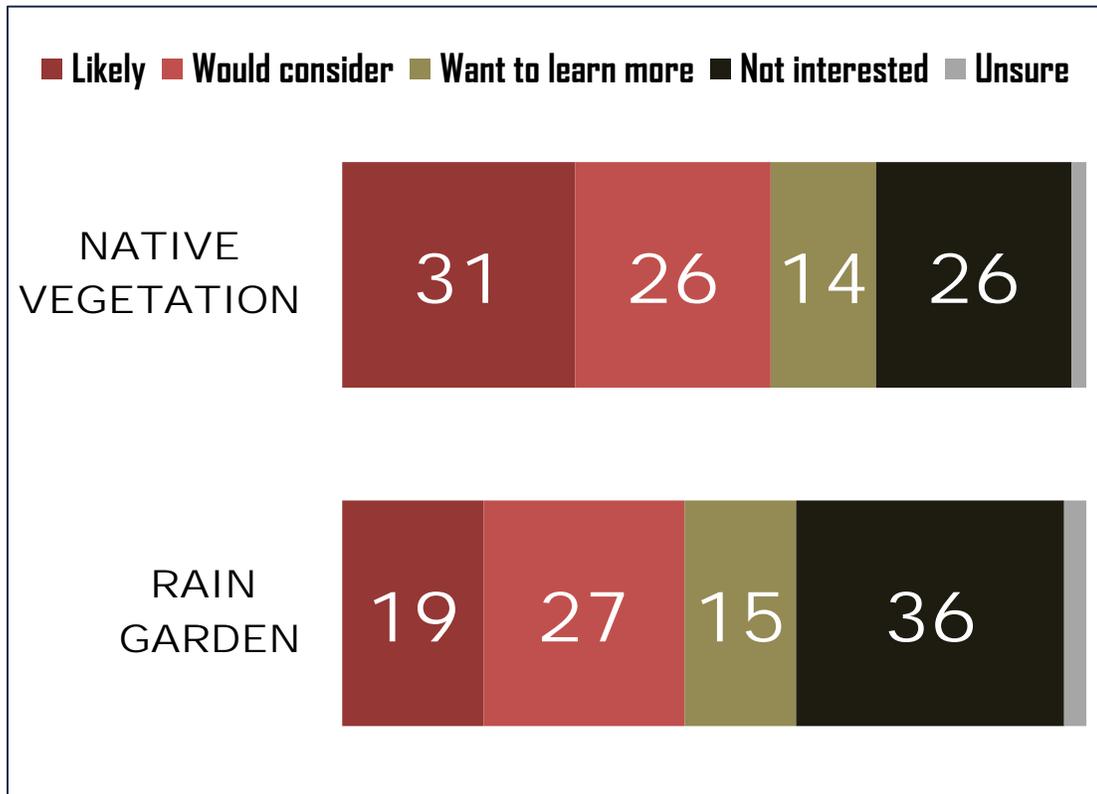


Likelihood to install by level of familiarity

- **As with rain gardens, respondents most familiar with native vegetation landscaping were most likely to say they would try it, including:**
 - 37% of those "familiar" with the concept versus
 - 26% of those who had only heard of it; and
 - 12% of those who had not heard of it.
- **Unlike the rain garden response, there was a significant difference between those who had heard of native vegetation landscaping and those who had not:**
 - Those who had not heard of the concept were twice as likely as those who had to say they were "not interested" to learn about it
 - 52% of those who had not heard of it were not interested, compared to 25% of those who had heard about it, but were not familiar with the concept.



Comparison of Likelihood to Install Native Vegetation Landscaping & Rain Garden

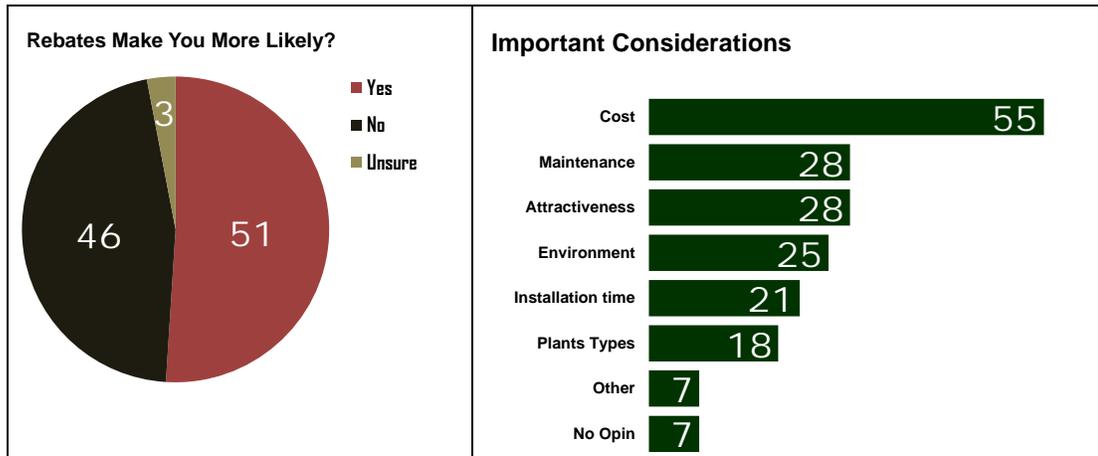


Q9 & Q10 Comparison

- **Overall, respondents were more receptive to native vegetation landscaping than to rain gardens.**
 - 71% were at least interested in native vegetation landscaping versus 61% for rain gardens.
 - 57% would at least consider native vegetation landscaping, including 31% who said they were likely to install it.
 - 46% would at least consider a rain garden, including 19% who said they were likely to install it.
- **40% said they would at least consider both, including 15% who said they were likely to install both. Only 22% were not interested in either.**



Cost Concerns Were the Chief Barrier to Considering Rain Gardens & Native Vegetation Landscaping



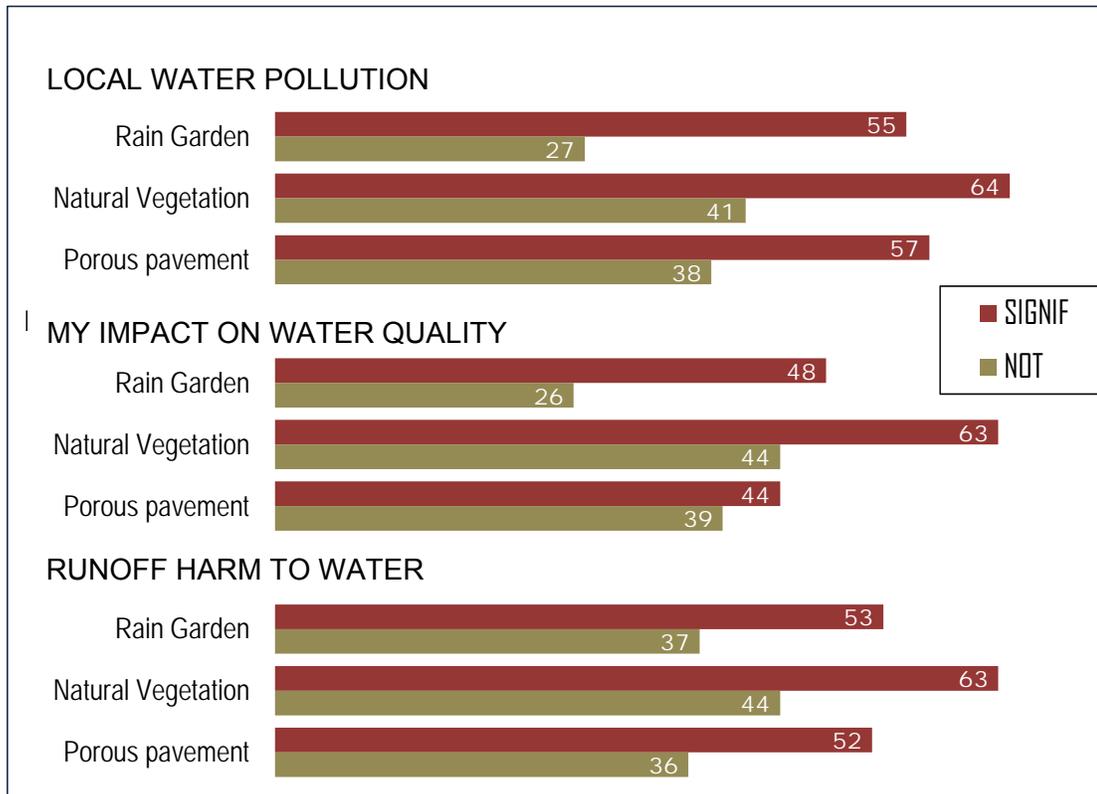
Q12 The Soak it Up Program provides rebates to property owners for installation of rain gardens and native vegetation landscaping. Would getting a rebate from the city make you more likely to install a rain garden or native vegetation landscaping? Or would a rebate not make any difference?

Q13 Which of the following would be important considerations for you in deciding whether or not to install a rain garden or native vegetation landscaping?

- **Cost concerns were the #1 consideration in deciding whether or not to install a rain garden or native vegetation landscaping.**
 - Cost was named by more than half of respondents (55%) and nearly twice as many as the next highest-ranked consideration: maintenance (28%) and attractiveness (28%).
- **Given that, it is not surprising that half (51%) said rebates would make them more likely to install native vegetation landscaping or a rain garden.**
 - For rain gardens, a rebate would make installation more likely for:
 - 69% of those who would consider one;
 - 62% of those who wanted to learn more; and
 - 23% of those who initially that they were not interested.
 - For native vegetation landscaping, a rebate would make installation more likely for:
 - 70% of those who would consider it;
 - 53% of those who wanted to learn more; and
 - 19% of those who initially that they were not interested.
- **Rebates were potentially more effective for people at higher incomes:**
 - 62% of those with incomes over \$100,000 said a rebate would make them more likely to install, compared to
 - 39% of those with incomes under \$50,000.



Willingness to Consider Mitigations by Perception of Water Quality Problem



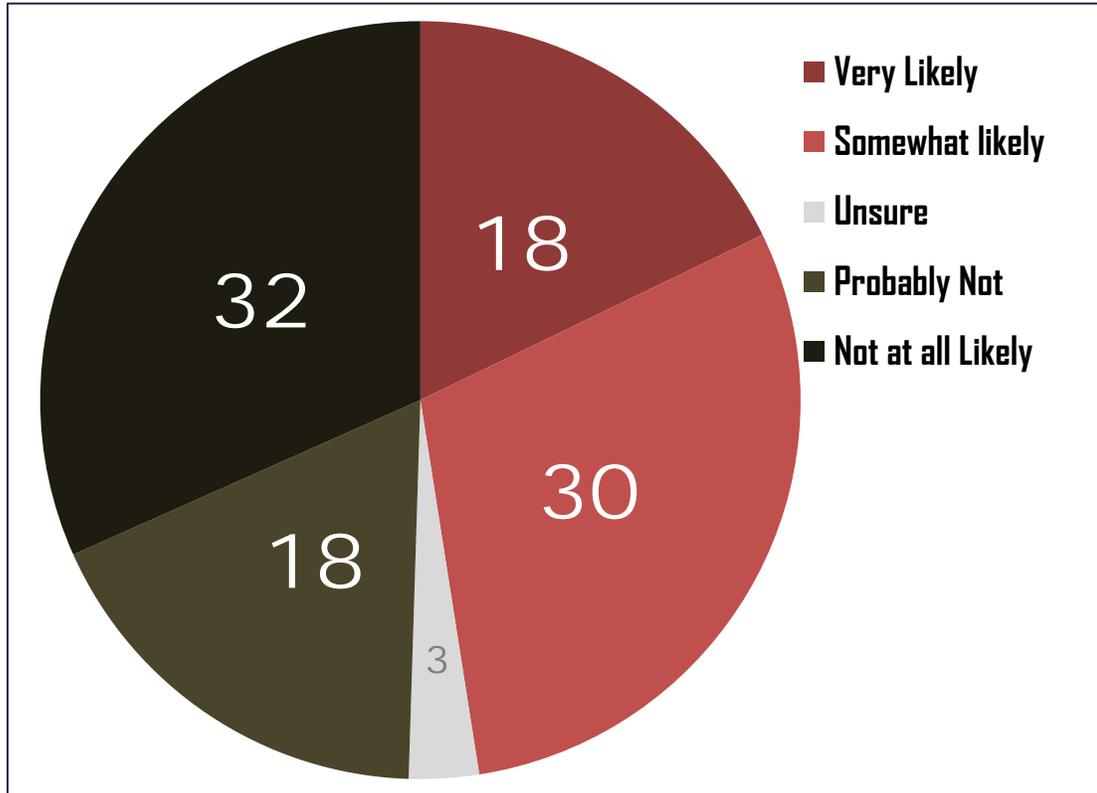
- 1) Is local water pollution significant?
- 2) Does my household significantly impact water quality?
- 3) Does runoff cause significant harm to local water quality?

This graph shows the difference in willingness to consider the potential mitigations discussed in this survey between those who perceive a problem with water quality and those who do not.

- For every potential mitigation, respondents who perceived a significant problem were more willing than those who did not to consider or install the mitigation.
- For example, those who said that local water pollution is a significant problem were more likely than those who did not see it as a problem to:
 - Consider or install a rain garden (55% v. 27% of those who did not consider water pollution to be a problem);
 - Consider or install native vegetation landscaping (64% v. 41%);
 - Replace pavement with porous pavement (57% v. 38%).



Nearly Half at Least Somewhat Likely to Install Porous Pavement

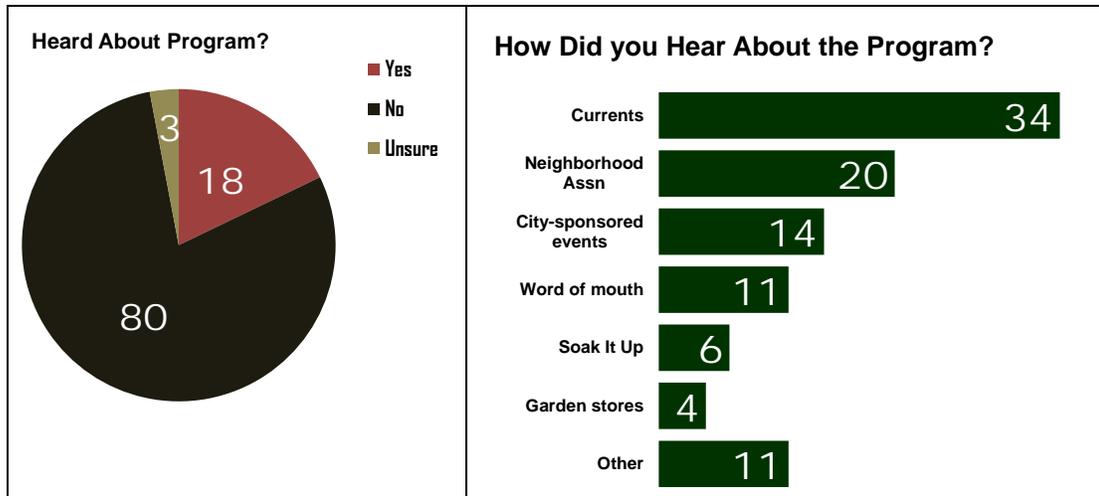


Q14 Another thing homeowners can do to manage stormwater is to replace driveways, patios, or other paved areas with porous pavement, which allows stormwater to pass through and soak into the ground. If the Soak It Up Program offered rebates for porous pavement replacement of on your property, how likely would you be to replace pavement on your property. Would you be...

- **48% said they were "very likely" (18%) or "somewhat likely" (30%) to replace pavement on their property with porous pavement "if the Soak It Up Program offered rebates" to do so.**
 - Respondents who said that local water pollution is a significant problem
 - Respondents who thought their household had an impact on local water quality were more likely than those who did not to replace their pavement (52% v. 29%).
 - Interestingly, those who said they have "some impact, but not significant" were more likely than those who thought they have a "significant impact" (55% v. 44%).



Nearly 1 in 5 had Heard About the Soak It Up Rebate Program



Q11 Have you heard about a City of Shoreline program called Soak It Up Rebate Program for rain gardens and native vegetation landscaping? How did you hear about the program?

- **18% of respondents said they had heard about the Soak It Up Rebate Program.**
- **Those who had heard about the program named a variety of sources of information about it, topped by**
 - *Currents* newsletter (34%);
 - Their Neighborhood Association (20%); and
 - City-sponsored events (14%).
 - 6% had seen Soak It Up program materials.

QUESTIONNAIRE

with Data


ELWAY RESEARCH, INC.

STORMWATER AWARENESS, ATTITUDES & BEHAVIOR

City of Shoreline 2015

TOPLINE DATA

SAMPLE: 400 Homeowners with a yard in Shoreline
MARGIN OF SAMPLING ERROR: ±4.5% at the 95% level of confidence
DATA COLLECTION: Telephone survey with live interviewers 23% via cell phone
FIELD DATES: November 23-30, 2015
GENDER: MALE... 48% FEMALE... 52%
<ul style="list-style-type: none">• The questions are presented here as they were asked in the interview• The figures in bold type are percentages of respondents who gave each answer.• Percentages may not add to 100% due to rounding.

1. These first questions are about the environment. What do you think is the single most important threat to the environment facing Shoreline today?
[OPEN ENDED]
 - 20** Traffic
 - 15** Climate change
 - 15** Land use
 - 11** Other
 - 10** Stormwater runoff
 - 10** Water pollution
 - 8** Air pollution
 - 12** No Opin
2. In your opinion, is pollution in local waterways – like streams rivers, lakes and Puget sound ...
 - 50** A significant problem
 - 30** A problem, but not that significant
 - 16** Over-rated as a problem
 - 4** No Opin
3. To what degree do you believe that actions you and your family take affect the health of local streams, rivers, lakes, and Puget Sound? Would you say your household has...
 - 22** A significant impact on the water quality in local waterways
 - 57** Some, impact but not significant
 - 19** No impact on the water quality in local waterways
 - 3** No Opin

4. When it rains, a lot of water runs off of roofs, driveways, parking lots, and streets. As you understand it, where does that water go?

[OPEN ENDED]

32 Goes down storm drain / or storm sewer

9 Down drain (Not "storm drain")

9 Sewer [NOT storm sewer]

9 Soaks into ground

4 Down the street

1 Catch basin / trough

1 Sits in puddles / ponds RESPONDENTS WHO DID NOT MENTION PUGET SOUND OR LOCAL WATERS WERE ASKED Q4.1

17 Puget Sound

16 Creeks / streams / rivers / lakes

1 Other

2 DK/NA

- 4.1 Where does it end up eventually? [OPEN ENDED] % IS TOTAL OF Q4 + FOLLOW UP Q4.1

41 Puget Sound

46 Nearest water / creeks / streams / rivers / lakes

7 Other

6 DK/NA

5. Which of the following views is closest to your opinion about the impact of runoff or stormwater.

67 Stormwater runoff has a significant harmful effect on water quality in local streams, lakes and rivers.

27 Stormwater runoff is part of the natural way of things. Any harm to water quality from stormwater is not enough to worry about.

6 No Opin

6. To the best of your knowledge, is runoff water in Shoreline treated before it goes back into local waters? Or is runoff water not treated?

50 Not Treated

21 Treated

8 Mix / both / some is some is not

21 DK/NA

- 6.1. IF TREATED [n=115]: Where does it go for treatment?

DO NOT READ

55 Treatment center

9 Sewer

7 Filter

3 Pond / holding pond

1 Vault (held in)

5 Other

20 DK/NA

7. Are you familiar with the concept of rain gardens?
- 51** Familiar With it
 - 19** Heard of it, but not Familiar
 - 29** No
 - 2** DK/NA
8. Are you familiar with the concept of native vegetation landscaping?
- 68** Familiar With it
 - 15** Heard of it, but not Familiar
 - 16** No
 - 1** DK/NA
9. A rain garden is a planted, shallow depression that captures stormwater runoff and allows it to soak into the ground. Native vegetation landscaping means replacing lawn or pavement with native plants and compost amended soils. Both methods filter stormwater before it gets into nearby streams and lakes. Is installing a rain garden something you would:
- 19** Be likely to do on your property
 - 27** Would consider for your property
 - 15** Want to learn more about
 - 36** Not be interested in
 - 3** DK/NA
10. Is installing native vegetation landscaping something you would:
- 31** Be likely to do on your property
 - 26** Would consider for your property
 - 14** Want to learn more about
 - 26** Not be interested in
 - 2** DK/NA
11. Have you heard about a City of Shoreline program called Soak It Up Rebate Program for rain gardens and native vegetation landscaping?
- 18** Yes
 - 80** No
 - 3** Unsure
- 11.1. IF YES How did you hear about the program?
- MULTIPLE ANSWERS ALLOWED
- 34** Currents Newsletter
 - 20** Neighborhood Association
 - 14** City-sponsored events
 - 11** Word of mouth/ Friends, Neighbors, Relatives
 - 4** Garden stores / nurseries
 - 6** Soak It Up program materials
 - 11** Other

12. The Soak it Up program provides rebates to property owners for installation of rain gardens and native vegetation landscaping. Would getting a rebate from the city make you more likely to install a rain garden or native vegetation landscaping? Or would a rebate not make any difference?
- 51 YES
 - 46 NO
 - 3 DK
13. Which of the following would be important considerations for you, in deciding whether or not to install a rain garden or native vegetation landscaping .
- MULTIPLE ANSWERS ALLOWED
- 55 The cost
 - 28 The amount of work it takes to maintain
 - 28 How attractive it would be on my property
 - 25 How it helps the environment
 - 21 The time it takes to install
 - 18 The kinds of plants that would be acceptable
 - 7 OTHER
 - 7 DK/NA
14. Another thing homeowners can do to manage stormwater is to replace driveways, patios, or other paved areas with porous pavement, which allows stormwater to pass through and soak into the ground. If the Soak it Up program offered rebates for porous pavement replacement of on your property, how likely would you be to replace pavement on your property? Would you be...
- 18 Very Likely
 - 30 Somewhat likely
 - 18 Probably Not
 - 32 Not at all Likely
 - 3 DK/NA
15. I have just a few last questions for our statistical analysis. I want to remind you that all your answers are confidential. How old are you?
- 5 18-35
 - 24 36-50
 - 33 51-64
 - 36 65+
16. Finally, I am going to list five broad categories. Just stop me when I get to the category that best describes your approximate household income – before taxes – for this year.
- 17 \$50,000 or less
 - 18 \$50 to \$75,000
 - 18 \$75 to \$100,000
 - 11 \$100-\$125,000
 - 16 Over \$125,000
 - 20 NO ANSWER

DATA TABLES

READING THE CROSSTABULATION TABLES

The crosstabulations found in this report are presented in a "banner table" format. Categories of respondents (e.g. "35-54 years old," or "Female") are listed across the top of each page (the "banner"). The questions asked in the survey are listed down the left margin. The figures in the cells are percentages based on the number of respondents in the category at the head of each



SHORELINE STORMWATER SURVEY NOV 2015

ENVIRONMENTAL ISSUES	TOTAL (n=)	WATER POLLUTION			PERSONAL IMPACT			RUNOFF HARMFUL?		
		Significant	Not Significant	Over-rated	None	Insignificant	Significant	Significant Harm	Not Significant	DK
TOTAL (n=)	400	200	121	63	74	228	87	269	107	24
1. IMPACT THREAT TO ENVIRONMENT										
Climate Change	59	37	16	4	5	41	12	47	9	3
Stormwater	41	21	10	8	5	23	12	31	7	3
Water Pollution	38	24	9	3	8	20	8	28	7	3
Air Pollution	32	17	9	6	5	19	7	22	10	0
Traffic	79	30	28	19	20	39	17	44	29	6
Land use	61	32	23	4	2	44	14	48	9	4
Other	43	20	12	9	16	16	10	22	17	4
No Opinion	47	19	14	10	13	26	7	27	19	1
2. LOCAL WATERWAYS POLLUTION										
Significant	200	200	0	0	22	114	58	165	25	10
Not Significant	121	0	121	0	23	76	19	66	43	12
Over-rated	63	0	0	63	25	28	9	28	34	1
No Opinion	16	0	0	0	4	10	1	10	5	1
3. PERSONAL IMPACT ON POLLUTION										
No impact	74	22	23	25	74	0	0	32	38	4
Insignificant impact	228	114	76	28	0	228	0	162	55	11
Significant impact	87	58	19	9	0	0	87	69	11	7
DK/NA	11	6	3	1	0	0	0	6	3	2

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ENVIRONMENTAL ISSUES	TOTAL (n=)	SEX		AGE			
		Male	Female	18-35	36-50	51-64	65+
TOTAL (n=)	400	192	208	20	95	131	142
1. IMPT THREAT TO ENVIRONMENT							
Climate Change	59 15%	24 13%	35 17%	5 25%	15 16%	24 18%	14 10%
Stormwater	41 10%	17 9%	24 12%	2 10%	8 8%	18 14%	12 8%
Water Pollution	38 10%	18 9%	20 10%	1 5%	12 13%	14 11%	8 6%
Air Pollution	32 8%	19 10%	13 6%	2 10%	7 7%	9 7%	14 10%
Traffic	79 20%	38 20%	41 20%	3 15%	17 18%	22 17%	37 26%
Land use	61 15%	27 14%	34 16%	2 10%	18 19%	23 18%	16 11%
Other	43 11%	22 11%	21 10%	2 10%	9 9%	13 10%	19 13%
No Opin	47 12%	27 14%	20 10%	3 15%	9 9%	8 6%	22 15%
2. LOCAL WATERWAYS POLLUTION							
Significant	200 50%	91 47%	109 52%	11 55%	49 52%	72 55%	64 45%
Not Significant	121 30%	56 29%	65 31%	7 35%	31 33%	32 24%	47 33%
Over-rated	63 16%	38 20%	25 12%	1 5%	8 8%	24 18%	28 20%
No Opin	16 4%	7 4%	9 4%	1 5%	7 7%	3 2%	3 2%
3. PERSONAL IMPACT ON POLLUTION							
No impact	74 19%	37 19%	37 18%	1 5%	7 7%	21 16%	41 29%
Insignificant impact	228 57%	114 59%	114 55%	16 80%	68 72%	77 59%	64 45%
Significant impact	87 22%	36 19%	51 25%	3 15%	20 21%	28 21%	33 23%
DKNA	11 3%	5 3%	6 3%	0 0%	0 0%	5 4%	4 3%

ELWAY RESEARCH, INC.

ENVIRONMENTAL ISSUES	TOTAL	INCOME				
	(n=)	>50k	50-75k	75-100	100-125	125k+
TOTAL (n=)	400	69	70	73	44	64
1. IMPACT THREAT TO ENVIRONMENT						
Climate Change	59 15%	5 7%	15 21%	13 18%	8 18%	12 19%
Stormwater	41 10%	8 12%	8 11%	6 8%	3 7%	9 14%
Water Pollution	38 10%	9 13%	6 9%	5 7%	7 16%	1 2%
Air Pollution	32 8%	4 6%	9 13%	8 11%	0 0%	5 8%
Traffic	79 20%	20 29%	11 16%	14 19%	9 20%	13 20%
Land use	61 15%	6 9%	8 11%	14 19%	11 25%	9 14%
Other	43 11%	9 13%	7 10%	8 11%	4 9%	5 8%
No Opin	47 12%	8 12%	6 9%	5 7%	2 5%	10 16%
2. LOCAL WATERWAYS POLLUTION						
Significant	200 50%	35 51%	38 54%	37 51%	22 50%	34 53%
Not Significant	121 30%	17 25%	20 29%	20 27%	15 34%	17 27%
Over-rated	63 16%	14 20%	11 16%	14 19%	6 14%	10 16%
No Opin	16 4%	3 4%	1 1%	2 3%	1 2%	3 5%
3. PERSONAL IMPACT ON POLLUTION						
No impact	74 19%	23 33%	8 11%	13 18%	8 18%	6 9%
Insignificant impact	228 57%	30 43%	44 63%	44 60%	29 66%	44 69%
Significant impact	87 22%	15 22%	16 23%	15 21%	7 16%	12 19%
DKNA	11 3%	1 1%	2 3%	1 1%	0 0%	2 3%

ELWAY RESEARCH, INC.

STORMWATER	TOTAL (n=)	WATER POLLUTION			PERSONAL IMPACT			RUNOFF HARMFUL?		
		Signifi- cant	Not Signifi- f	Over- rated	None	Insig	Signifi- f	Signifi- Harm	Not Signifi- f	DK
TOTAL (n=)	400	200	121	63	74	228	87	269	107	24
4. RUNOFF DESTINATION										
Storm drain	128	66	36	20	21	70	32	90	31	7
Drain	36	17	14	5	11	18	6	22	11	3
Sewer	37	22	7	6	9	22	6	20	14	3
Down street	14	8	4	2	2	8	4	11	3	0
Catch basin	5	2	3	0	2	3	2	3	0	2
Soaks ground	35	12	12	9	11	19	4	20	13	2
Sits in puddles	5	2	2	1	0	4	1	5	0	2
Puget Sound	68	39	20	8	8	41	16	49	17	2
Waterways	63	29	17	10	8	40	15	45	14	4
Other	3	1	1	1	0	3	0	3	0	0
DKNA	6	2	1	1	2	2	1	1	4	1
ENDS UP IN...										
Sound	162	90	46	21	22	93	40	119	37	6
Stream	179	84	53	36	38	99	39	121	46	12
Other	28	12	9	4	7	15	6	16	12	0
DK	22	11	9	0	5	16	1	9	8	5
5. STORMWATER IMPACT										
Significant harmful	269	165	66	28	32	162	69	269	0	0
Natural Not Harmful	107	25	43	34	38	55	11	0	107	0
No Opin	24	10	12	1	4	11	7	0	0	24
6. RUNOFF TREATMENT										
Not Treated	201	105	66	26	36	120	43	142	48	11
Treated	83	40	22	18	17	46	18	54	26	3
Mix	32	13	8	9	5	22	4	16	15	1
DKNA	84	42	25	10	16	40	22	57	18	9
61. TREATMENT LOCATION										
Sewer	10	4	2	2	1	6	3	7	3	0
Vault	1	0	0	1	1	0	0	0	1	0
Pond	4	2	0	2	1	1	2	2	1	1
Filter	8	3	3	2	3	4	1	2	5	1
Treatment center	63	30	18	12	8	43	10	43	19	1
Other	6	1	3	2	2	3	1	4	2	0
DKNA	23	13	4	6	6	11	5	12	10	1

STORMWATER	TOTAL (n=)	SEX		AGE				
		Male	Female	18-35	36-50	51-64	65+	
TOTAL (n=)	400	192	208	20	95	131	142	100
4. RUNOFF DESTINATION								
Storm drain	128 32%	55 29%	73 35%	6 30%	31 33%	42 32%	45 32%	
Drain	36 9%	18 9%	18 9%	1 5%	7 7%	12 9%	14 10%	
Sewer	37 9%	20 10%	17 8%	0 0%	11 12%	11 8%	15 11%	
Down street	14 4%	7 4%	7 3%	1 5%	4 4%	4 3%	4 3%	
Catch basin	5 1%	4 2%	1 0%	0 0%	0 0%	3 2%	2 1%	
Soaks ground	35 9%	18 9%	17 8%	1 5%	5 5%	9 7%	19 13%	
Sits in puddles	5 1%	3 2%	2 1%	0 0%	0 0%	2 2%	3 2%	
Puget Sound	68 17%	38 20%	30 14%	5 25%	17 18%	22 17%	23 16%	
Waterways	63 16%	27 14%	36 17%	6 30%	18 19%	24 18%	15 11%	
Other	3 1%	1 1%	2 1%	0 0%	2 2%	1 1%	0 0%	
DKNA	6 2%	1 1%	5 2%	0 0%	0 0%	1 1%	2 1%	
ENDS UP IN...								
Sound	162 41%	82 43%	80 40%	9 45%	39 42%	54 42%	57 41%	
Stream	179 46%	84 44%	95 47%	6 30%	46 49%	65 50%	56 40%	
Other	28 7%	15 8%	13 6%	4 20%	3 3%	4 3%	17 12%	
DK	22 6%	9 5%	13 6%	1 5%	5 5%	6 5%	10 7%	
5. STORMWATER IMPACT								
Significant harmful effect	269 67%	122 64%	147 71%	16 80%	70 74%	93 71%	84 59%	
Natural Not Harmful	107 27%	57 30%	50 24%	3 15%	24 25%	28 21%	50 35%	
No Opin	24 6%	13 7%	11 5%	1 5%	1 1%	10 8%	8 6%	
6. RUNOFF TREATMENT								
Not Treated	201 50%	106 55%	95 46%	11 55%	48 51%	74 56%	60 42%	
Treated	83 21%	41 21%	42 20%	2 10%	16 17%	24 18%	40 28%	
Mix	32 8%	14 7%	18 9%	3 15%	8 8%	9 7%	11 8%	
DKNA	84 21%	31 16%	53 25%	4 20%	23 24%	24 18%	31 22%	
61. TREATMENT LOCATION								
Sewer	10 9%	4 7%	6 10%	1 20%	2 8%	4 12%	3 6%	
Vault	1 1%	0 0%	1 2%	0 0%	0 0%	0 0%	1 2%	
Pond	4 3%	2 4%	2 3%	0 0%	0 0%	1 3%	3 6%	
Filter	8 7%	4 7%	4 7%	1 20%	1 4%	2 6%	4 8%	
Treatment center	63 55%	30 55%	33 55%	2 40%	16 67%	19 58%	26 51%	
Other	6 5%	6 11%	0 0%	0 0%	3 13%	0 0%	3 6%	
DKNA	23 20%	9 16%	14 23%	1 20%	2 8%	7 21%	11 22%	

RAIN GARDEN NATURAL VEG	TOTAL (n=)	WATER POLLUTION			PERSONAL IMPACT			RUNOFF HARMFUL?		
		Signifi- cant	Not Signifi- f	Over- rated	None	Insig	Signifi- f	Signifi- f Harm	Not Signifi- f	DK
TOTAL (n=)	400	200	121	63	74	228	87	269	107	24
7. RAINGARDEN FAMILIARITY										
Not Heard	115	53	39	16	30	58	22	75	34	6
Heard	75	27	24	22	11	40	22	47	24	4
Familiar	204	116	57	25	31	129	41	145	47	12
DKNA	6	4	1	0	2	1	2	2	2	2
8. NATIVE VEGETATION FAMILIARITY										
Not Heard	65	23	19	17	16	28	19	36	25	4
Heard	61	29	23	8	9	35	15	40	15	6
Familiar	270	146	78	38	48	165	51	191	66	13
DKNA	4	2	1	0	1	0	2	2	1	1
9. INSTALL RAINGARDEN										
Likely	75	49	17	8	8	46	19	58	14	3
Consider	108	60	36	9	10	73	23	84	15	9
Learn more	61	38	14	8	8	32	21	45	14	2
No interested	145	45	53	38	46	70	23	76	60	9
DKNA	11	8	1	0	2	7	1	6	4	1
10. INSTALL NATIVE VEGETATION										
Likely	125	68	40	13	19	78	25	91	27	7
Consider	104	59	29	13	13	60	30	77	20	7
Learn more	58	30	16	9	6	37	14	40	15	3
No interested	104	38	34	28	36	48	16	56	43	5
DKNA	9	5	2	0	0	5	2	5	2	2
14. POROUS PAVEMENT										
Very Likely	70	47	11	10	8	41	20	52	14	4
Somewhat	119	63	36	14	13	84	18	89	25	5
Prob Not	71	33	29	8	13	37	19	46	21	4
Not at All	128	50	42	31	40	59	26	72	46	10
DKNA	12	7	3	0	0	7	4	10	1	1

RAIN GARDEN NATURAL VEG	TOTAL (n=)	SEX		AGE			
		Male	Female	18-35	36-50	51-64	65+
TOTAL (n=)	400	192	108	20	95	131	142
7. RAINGARDEN FAMILIARITY							
Not Heard	115	53	62	11	22	34	42
Heard	75	39	36	3	19	24	28
Familiar	204	95	109	6	54	70	70
DKNA	6	5	1	0	0	3	2
8. NATIVE VEGETATION FAMILIARITY							
Not Heard	65	33	32	5	6	18	31
Heard	61	34	27	4	12	20	22
Familiar	270	121	149	11	77	93	86
DKNA	4	4	0	0	0	0	3
9. INSTALL RAINGARDEN							
Likely	75	36	39	1	19	31	23
Consider	108	47	61	10	32	42	21
Learn more	61	27	34	2	14	20	22
No interested	145	75	70	6	27	36	72
DKNA	11	7	4	1	3	2	4
10. INSTALL NATIVE VEGETATION							
Likely	125	52	73	2	28	53	39
Consider	104	49	55	9	32	37	25
Learn more	58	30	28	4	13	19	19
No interested	104	58	46	5	18	21	56
DKNA	9	3	6	0	4	1	3
14. POROUS PAVEMENT							
Very Likely	70	37	33	3	15	36	16
Somewhat	119	60	59	6	40	36	33
Prob Not	71	28	43	7	13	24	25
Not at All	128	61	67	4	26	31	62
DKNA	12	6	6	0	1	4	6

RAIN GARDEN NATURAL VEG	TOTAL (n=)	INCOME								
		>50k	50-75k	75-100	100-125	125k+				
TOTAL (n=)	400	100	70	100	44	100	64	100		
7. RAIN GARDEN FAMILIARITY										
Not Heard	115	29%	21	30%	18	25%	8	18%	16	25%
Heard	75	19%	14	20%	12	16%	8	18%	13	20%
Familiar	204	51%	33	48%	41	56%	27	61%	34	53%
DKNA	6	2%	1	1%	2	3%	1	2%	1	2%
8. NATIVE VEGETATION FAMILIARITY										
Not Heard	65	16%	15	22%	10	14%	3	7%	7	11%
Heard	61	15%	10	14%	10	14%	7	16%	13	20%
Familiar	270	68%	44	64%	52	71%	33	75%	44	69%
DKNA	4	1%	0	0%	1	1%	1	2%	0	0%
9. INSTALL RAIN GARDEN										
Likely	75	19%	9	13%	16	23%	9	20%	16	25%
Consider	108	27%	11	16%	22	31%	14	32%	20	31%
Learn more	61	15%	11	16%	9	12%	7	16%	8	13%
No interested	145	36%	36	52%	19	27%	23	32%	20	31%
DKNA	11	3%	2	3%	2	3%	0	0%	0	0%
10. INSTALL NATIVE VEGETATION										
Likely	125	31%	17	25%	24	34%	19	26%	22	34%
Consider	104	26%	16	23%	20	29%	26	36%	16	25%
Learn more	58	14%	10	14%	8	11%	13	18%	9	14%
No interested	104	26%	26	38%	16	23%	15	21%	17	27%
DKNA	9	2%	0	0%	2	3%	0	0%	0	0%
14. POROUS PAVEMENT										
Very Likely	70	18%	12	17%	14	20%	15	21%	9	20%
Somewhat	119	30%	19	28%	27	39%	22	30%	14	32%
Prob Not	71	18%	12	17%	8	11%	14	19%	10	23%
Not at All	128	32%	26	38%	19	27%	22	30%	9	20%
DKNA	12	3%	0	0%	2	3%	0	0%	2	5%

INFO SOURCES	TOTAL (n=)	WATER POLLUTION			PERSONAL IMPACT			RUNOFF HARMFUL?		
		Signi f cant	Not Signi f	Over- rated	None	Insig	Signi f	Signi f Harm	Not Signi f	DK
TOTAL (n=)	400	200	121	63	74	228	87	269	107	24
11. HEARD OF SOAK IT UP										
Yes	71	36	21	10	11	42	17	51	16	4
No	318	156	98	53	62	180	68	211	89	18
Unsure	11	8	2	0	1	6	2	7	2	2
11. INFO SOURCES										
Currents	24	10	8	4	3	15	6	19	5	0
Nabe Assn	14	8	5	1	5	6	3	8	4	2
City Events	10	8	1	0	1	7	1	9	1	0
Word of Mouth	8	5	1	2	1	3	4	5	2	1
Nurseries	3	2	1	0	1	1	2	3	0	0
Soak It Up	4	1	3	0	2	3	1	3	1	0
Other	8	3	1	3	2	5	1	5	3	1
DKNA	3	1	2	0	0	3	0	2	0	0

ELWAY RESEARCH, INC.

INFO SOURCES	TOTAL		SEX		AGE			
	(n=)		Male	Female	18-35	36-50	51-64	65+
TOTAL	400	100	192	208	20	95	131	142
11. HEARD OF SOAK IT UP								
Yes	71	18%	33	38	5	22	18	24
No	318	80%	155	163	15	69	109	116
Unsure	11	3%	4	7	0	4	4	2
11. INFO SOURCES								
Currents	24	34%	12	12	2	8	6	8
Nabe Assn	14	20%	6	8	1	2	5	5
City Events	10	14%	2	8	0	2	5	3
Word of Mouth	8	11%	3	5	0	3	1	4
Nurseries	3	4%	2	1	1	1	1	0
Soak It Up	4	6%	0	4	0	2	0	2
Other	8	11%	6	2	1	3	1	3
DKNA	3	4%	3	0	0	1	0	1

ELWAY RESEARCH, INC.

INFO SOURCES	TOTAL (n=)	INCOME				
		>50k	50-75k	75-100	100-125	125k+
TOTAL (n=)	400	100	100	100	100	100
11. HEARD OF SOAK IT UP						
Yes	71	12	14	15	10	9
No	318	55	53	57	33	54
Unsure	11	2	3	1	1	1
		18%	20%	21%	23%	14%
		80%	76%	78%	75%	84%
		3%	4%	1%	2%	2%
11. INFO SOURCES						
Currents	24	4	2	7	6	2
Nabe Assn	14	4	3	3	1	2
City Events	10	3	4	3	3	2
Word of Mouth	8	1	2	1	1	1
Nurseries	3	1	1	1	1	1
Soak It Up	4	1	3	1	2	2
Other	8	1	21%	7%	20%	22%
DKNA	3	4%	7%			11%

ELWAY RESEARCH, INC.

INFO SOURCES	TOTAL (n=)	WATER POLLUTION			PERSONAL IMPACT			RUNOFF HARMFUL?		
		Signifi- cant	Not Signifi- f	Over- rated	None	Insig	Signifi- f	Signifi- f Harm	Not Signifi- f	DK
TOTAL (n=)	400	200	121	63	74	228	87	269	107	24
12. REBATE MAKE DIFF										
Yes	204	115	60	21	28	117	56	154	40	10
No	183	78	59	41	46	102	28	106	65	12
Unsure	13	7	2	1		9	3	9	2	2
13. CONSIDERATIONS										
Cost	220	122	58	30	26	136	51	157	52	11
Time	84	44	24	15	8	62	10	61	19	4
Work	113	62	36	12	17	69	21	80	28	5
Appearance	111	57	32	18	14	80	15	74	33	4
Environment	98	59	28	10	11	62	21	76	17	5
Plants	72	34	26	11	9	53	8	48	23	1
Other	26	9	9	7	10	7	8	18	7	1
DKNA	29	13	9	5	9	13	6	18	9	2

ELWAY RESEARCH, INC.

INFO SOURCES	TOTAL (n=)	SEX		AGE				
		Male	Female	18-35	36-50	51-64	65+	
TOTAL (n=)	400	192	208	20	95	131	142	100
12. REBATE MAKE DIFF								
Yes	204 51%	90 47%	114 55%	10 50%	63 66%	74 56%	52 37%	
No	183 46%	96 50%	87 42%	9 45%	29 31%	52 40%	87 61%	
Unsure	13 3%	6 3%	7 3%	1 5%	3 3%	5 4%	3 2%	
13. CONSIDERATIONS								
Cost	220 55%	104 54%	116 56%	12 60%	59 62%	81 62%	61 43%	
Time	84 21%	37 19%	47 23%	7 35%	28 29%	26 20%	22 15%	
Work	113 28%	53 28%	60 29%	3 15%	28 29%	40 31%	41 29%	
Appearance	111 28%	54 28%	57 27%	6 30%	25 26%	40 31%	38 27%	
Environment	98 25%	46 24%	52 25%	3 15%	21 22%	36 27%	37 26%	
Plants	72 18%	34 18%	38 18%	3 15%	10 11%	28 21%	31 22%	
Other	26 7%	13 7%	13 6%		3 3%	9 7%	13 9%	
DKNA	29 7%	15 8%	14 7%		3 3%	4 3%	21 15%	

ELWAY RESEARCH, INC.

INFO SOURCES	TOTAL	INCOME				
	(n=)	>50k	50-75k	75-100	100-125	125k+
TOTAL (n=)	400	100	70	100	44	100
12. REBATE MAKE DIFF						
Yes	204	51%	27	39%	37	51%
No	183	46%	41	59%	32	44%
Unsure	13	3%	1	1%	4	5%
13. CONSIDERATIONS						
Cost	220	55%	33	48%	46	63%
Time	84	21%	8	12%	19	26%
Work	113	28%	23	33%	19	26%
Appearance	111	28%	13	19%	19	26%
Environment	98	25%	14	20%	20	27%
Plants	72	18%	13	19%	14	19%
Other	26	7%	3	4%	3	4%
DKNA	29	7%	10	14%	5	7%

ELWAY RESEARCH, INC.

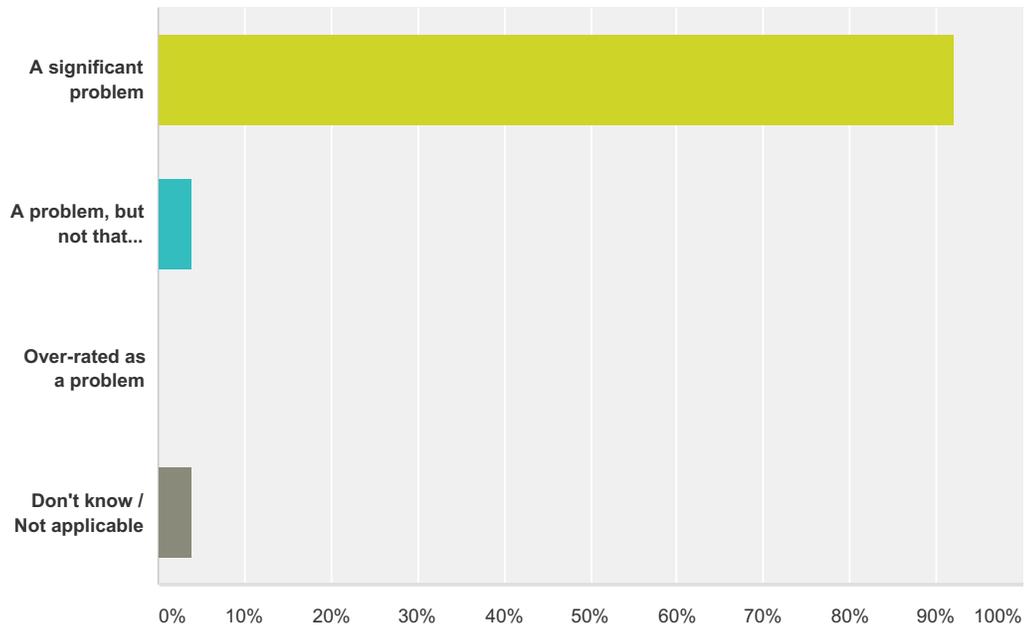
Q1 What do you think is the single most important threat to the environment facing Shoreline today?

Answered: 25 Skipped: 0

#	Responses	Date
1	toxic chemicals in some plant foods, and disguardred pesticides	12/16/2015 1:20 PM
2	Climate Change	12/11/2015 9:38 PM
3	Massive rezones that allow removal of trees and an exponential increase in hard scape	12/11/2015 6:01 PM
4	Global Warming	12/11/2015 1:38 PM
5	When the city approves new development with insufficient mitigations for water runoff.	12/11/2015 12:55 PM
6	Over development	12/11/2015 12:02 PM
7	loss of natural environment	12/11/2015 11:48 AM
8	Overuse of fertilizers and pesticides	12/11/2015 10:59 AM
9	Automobile-related pollution; exhaust and street runoff.	12/9/2015 12:55 PM
10	our toxic food system	12/9/2015 10:53 AM
11	overly aggressive plans to upzone Shoreline single family neighborhoods	12/7/2015 10:08 AM
12	water availability and costs	12/6/2015 7:16 AM
13	pollution; over development	12/6/2015 6:44 AM
14	Climate change	12/5/2015 12:14 AM
15	cars	12/4/2015 9:52 PM
16	Greenhouse gas emissions	12/4/2015 8:26 PM
17	Development	12/4/2015 6:19 PM
18	Potential loss of forest habitat (particularly with regard to the rezoned areas)	12/4/2015 3:50 PM
19	Fossil fuels	12/4/2015 3:27 PM
20	Water conservation	12/4/2015 3:03 PM
21	water pollution	12/4/2015 12:54 PM
22	carbon emmissions	12/4/2015 11:53 AM
23	Number of current and future residents	12/4/2015 11:29 AM
24	Loss of tree canopy	12/4/2015 11:16 AM
25	Traffic	12/4/2015 10:59 AM

Q2 In your opinion, is pollution in local waterways – like streams, rivers, lakes and Puget sound ...

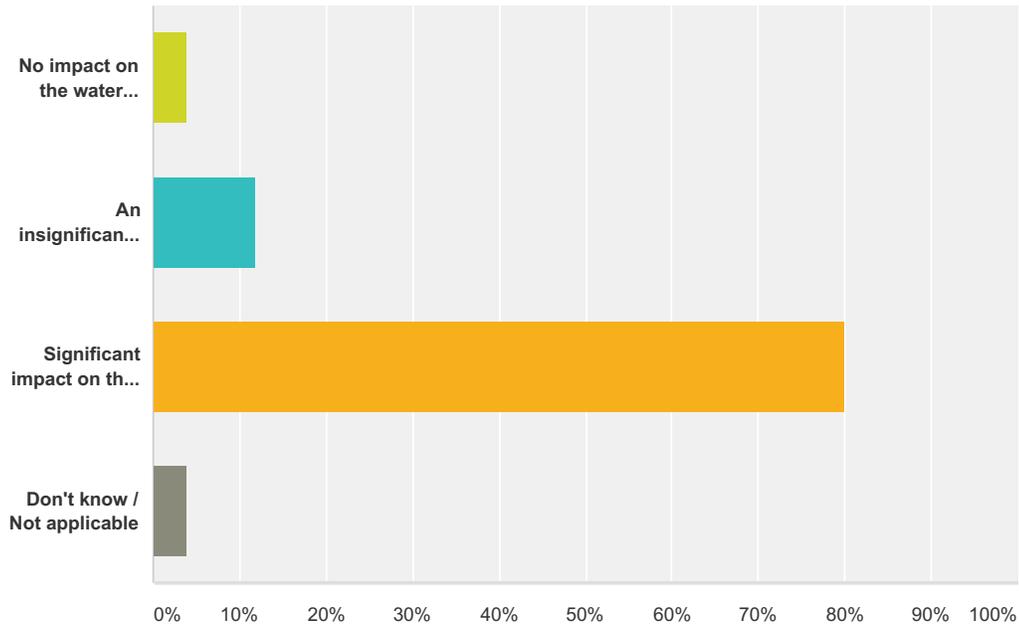
Answered: 25 Skipped: 0



Answer Choices	Responses
A significant problem	92.00% 23
A problem, but not that significant	4.00% 1
Over-rated as a problem	0.00% 0
Don't know / Not applicable	4.00% 1
Total	25

Q3 To what degree do you believe that actions you and your family take affect the health of local streams, rivers, lakes, and Puget Sound? Would you say your household has...

Answered: 25 Skipped: 0



Answer Choices	Responses
No impact on the water quality in local waterways	4.00% 1
An insignificant impact	12.00% 3
Significant impact on the water quality in local waterways	80.00% 20
Don't know / Not applicable	4.00% 1
Total	25

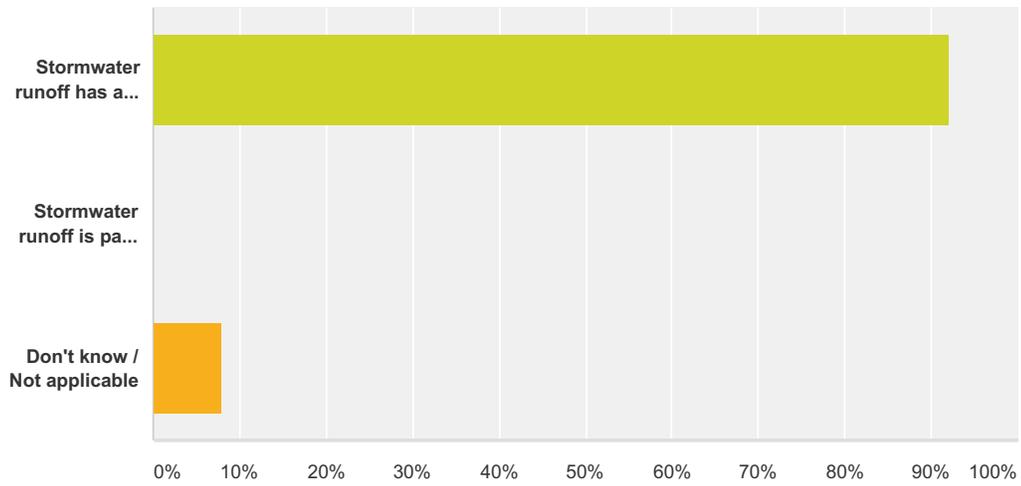
Q4 When it rains, a lot of water runs off of roofs, driveways, parking lots, and streets. As you understand it, where does that water go?

Answered: 25 Skipped: 0

#	Responses	Date
1	to plants and garden beds via catch drums	12/16/2015 1:20 PM
2	Through the sewers and into our local waterways--streams, rivers, lakes, the Sound	12/11/2015 9:38 PM
3	Into streams and Puget sound	12/11/2015 6:01 PM
4	The Puget Sounds, eventually.	12/11/2015 1:38 PM
5	Ultimately the water goes to Puget Sound.	12/11/2015 12:55 PM
6	Yes	12/11/2015 12:02 PM
7	sewer system then to Puget Sound	12/11/2015 11:48 AM
8	to the nearest body of water	12/11/2015 10:59 AM
9	Some into the ground, but most to storm drains which lead to steams, lakes and the Sound.	12/9/2015 12:55 PM
10	puget sound	12/9/2015 10:53 AM
11	via storm drains to the Sound	12/7/2015 10:08 AM
12	water tables in ground and storm drains take alot that go into P sound and L. wash.?	12/6/2015 7:16 AM
13	into the Sound	12/6/2015 6:44 AM
14	Storm drains and then streams	12/5/2015 12:14 AM
15	Into the Puget Sound	12/4/2015 9:52 PM
16	Streams and Puget Sound	12/4/2015 8:26 PM
17	I believe it all leads to the sewer and then the sound (if over capacity)	12/4/2015 6:19 PM
18	Most of it is piped directly to streams	12/4/2015 3:50 PM
19	Storm drains, then into the Sound. Probably some smaller bodies in between	12/4/2015 3:27 PM
20	In to the storm drains then into nearby lakes and stream. Untreated runoff.	12/4/2015 3:03 PM
21	Into streams and waterways.	12/4/2015 12:54 PM
22	Into our waterways	12/4/2015 11:53 AM
23	our waterways, which ultimately lead to the ocean	12/4/2015 11:29 AM
24	First, into the streams, then straight into Puget Sound	12/4/2015 11:16 AM
25	To the Sound or Lake Washington depending on watershed	12/4/2015 10:59 AM

Q5 Which of the following views is closest to your opinion about the impact of runoff or stormwater.

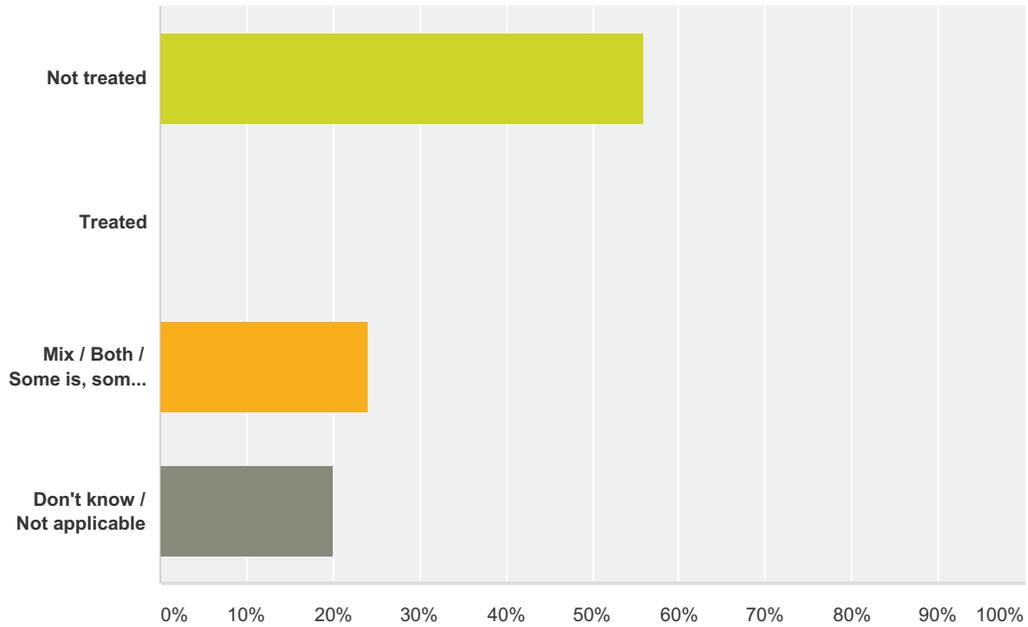
Answered: 25 Skipped: 0



Answer Choices	Responses
Stormwater runoff has a significant harmful effect on water quality in local streams, lakes, and rivers.	92.00% 23
Stormwater runoff is part of the natural way of things. Any harm to water quality from stormwater is not enough to worry about.	0.00% 0
Don't know / Not applicable	8.00% 2
Total	25

Q6 To the best of your knowledge, is runoff water in Shoreline treated before it goes back into local waters? Or is runoff water not treated?

Answered: 25 Skipped: 0



Answer Choices	Responses
Not treated	56.00% 14
Treated	0.00% 0
Mix / Both / Some is, some is not	24.00% 6
Don't know / Not applicable	20.00% 5
Total	25

Q7 If TREATED, where does it go for treatment?

Answered: 11 Skipped: 14

#	Responses	Date
1	unknown	12/16/2015 1:21 PM
2	Unsure	12/11/2015 1:38 PM
3	treatment plant	12/11/2015 12:55 PM
4	Don't know	12/11/2015 12:03 PM
5	don't know	12/11/2015 11:48 AM
6	Unknown	12/4/2015 9:52 PM
7	Puget Sound	12/4/2015 8:27 PM
8	Stormwater detention ponds	12/4/2015 3:51 PM
9	I don't know.	12/4/2015 3:27 PM
10	water treatment center (don't know name)	12/4/2015 11:29 AM
11	Westpoint or Brightwater	12/4/2015 10:59 AM

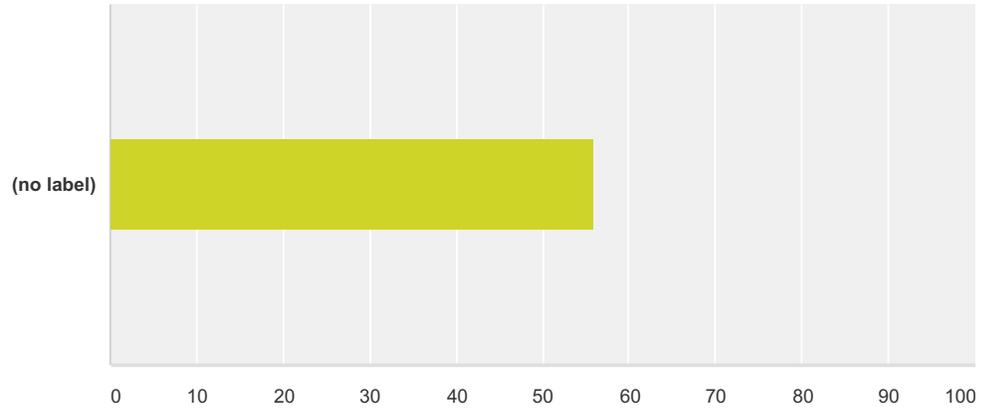
Q8 How did you hear about the City of Shoreline's Soak It Up LID Rebate Program for rain gardens and native vegetation landscaping?

Answered: 25 Skipped: 0

#	Responses	Date
1	event	12/16/2015 1:23 PM
2	Shoreline newsletter, and a neighbor	12/11/2015 9:40 PM
3	At city council meeting	12/11/2015 6:03 PM
4	Neighbors	12/11/2015 1:39 PM
5	a City of Shoreline newsletter that was mailed to my house	12/11/2015 12:58 PM
6	City of shoreline	12/11/2015 12:05 PM
7	1-2 years ago Shoreline had an event at city hall and one of the displays had information about it	12/11/2015 11:51 AM
8	shoreline newsletter	12/11/2015 11:01 AM
9	Earth Day at Central Market.	12/9/2015 12:57 PM
10	Diggin' Shoreline	12/9/2015 10:56 AM
11	from a friend	12/7/2015 10:10 AM
12	earth day 2014	12/6/2015 7:20 AM
13	Shoreline city website	12/6/2015 6:45 AM
14	City employee	12/5/2015 12:16 AM
15	UW Class	12/4/2015 9:53 PM
16	I am a former employee	12/4/2015 8:28 PM
17	Inquiry after knowing about the seattle program	12/4/2015 6:21 PM
18	Web search	12/4/2015 3:52 PM
19	Word of mouth, I think	12/4/2015 3:28 PM
20	Through city of shoreline residential newsletter	12/4/2015 3:04 PM
21	From a friend and a publication sent by Shoreline.	12/4/2015 1:01 PM
22	friend	12/4/2015 11:55 AM
23	originally by researching rain gardens after reading seattle times article about jessie bloom	12/4/2015 11:31 AM
24	Not sure, but perhaps a flyer from the city	12/4/2015 11:21 AM
25	Flyer or City Website	12/4/2015 11:02 AM

Q9 How likely is it that you would recommend the Soak It Up Program to a friend or colleague?

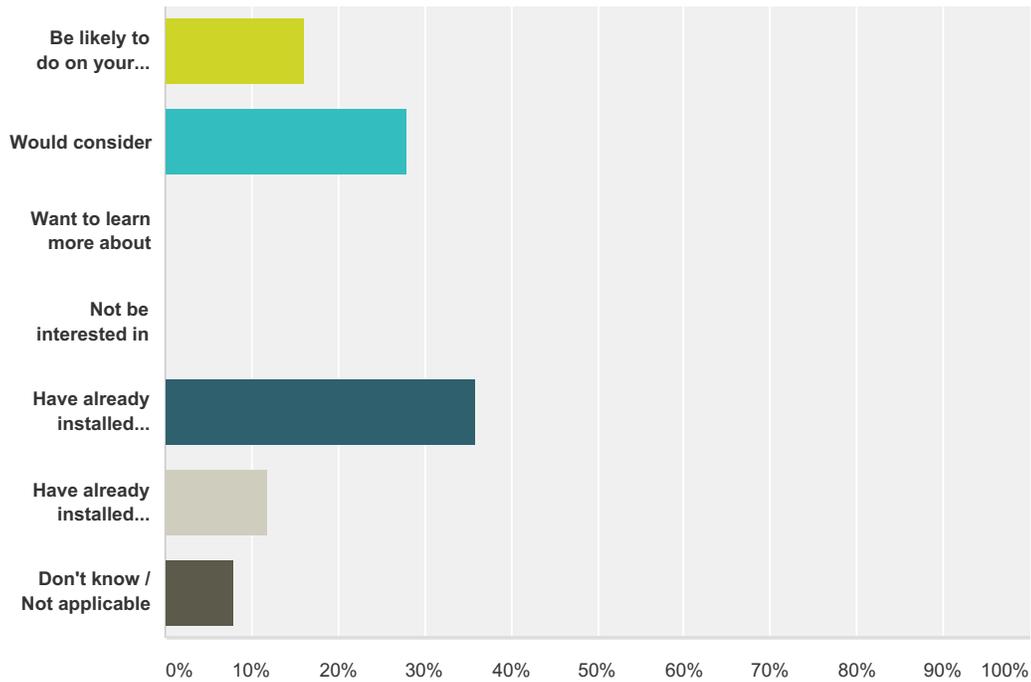
Answered: 25 Skipped: 0



	Not at all likely - 0	1	2	3	4	5	6	7	8	9	Extremely likely - 10	Total	Weighted Average
(no label)	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	12.00% 3	0.00% 0	12.00% 3	8.00% 2	0.00% 0	68.00% 17	25	56.00

Q10 A rain garden is a planted, shallow depression that captures stormwater runoff and allows it to soak into the ground. Native vegetation landscaping means replacing lawn or pavement with native plants and compost amended soils. Both methods filter stormwater before it gets into nearby streams and lakes. Is installing a rain garden something you would:

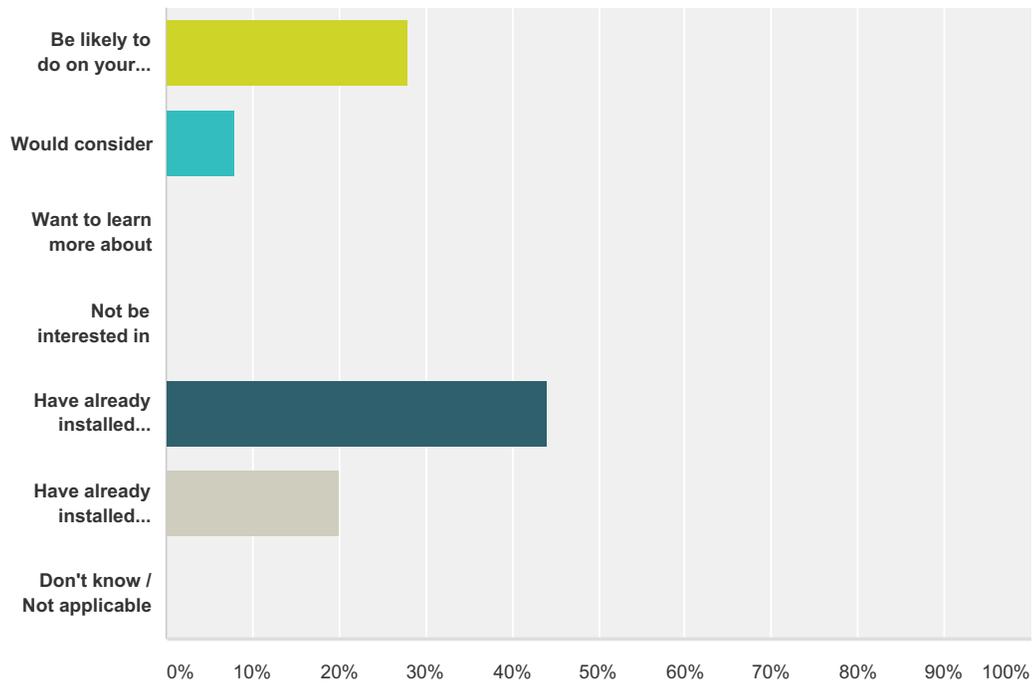
Answered: 25 Skipped: 0



Answer Choices	Responses
Be likely to do on your property	16.00% 4
Would consider	28.00% 7
Want to learn more about	0.00% 0
Not be interested in	0.00% 0
Have already installed through the Soak It Up Program	36.00% 9
Have already installed without the assistance of a rebate	12.00% 3
Don't know / Not applicable	8.00% 2
Total	25

Q11 Is installing native vegetation landscaping something you would:

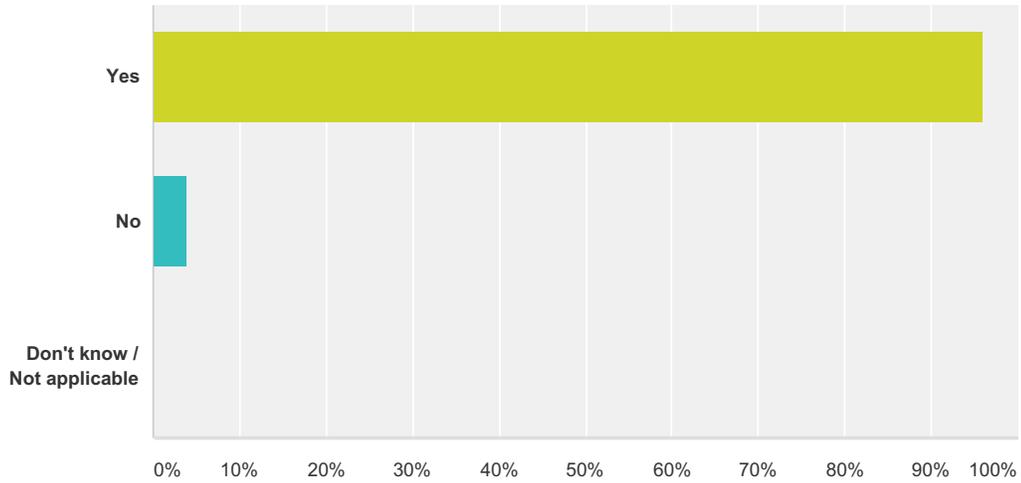
Answered: 25 Skipped: 0



Answer Choices	Responses
Be likely to do on your property	28.00% 7
Would consider	8.00% 2
Want to learn more about	0.00% 0
Not be interested in	0.00% 0
Have already installed through the Soak It Up Program	44.00% 11
Have already installed without the assistance of a rebate	20.00% 5
Don't know / Not applicable	0.00% 0
Total	25

Q12 The Soak It Up Program provides rebates to property owners for installation of rain gardens and native vegetation landscaping. Would getting a rebate from the City make you more likely to install a rain garden or native vegetation landscaping?

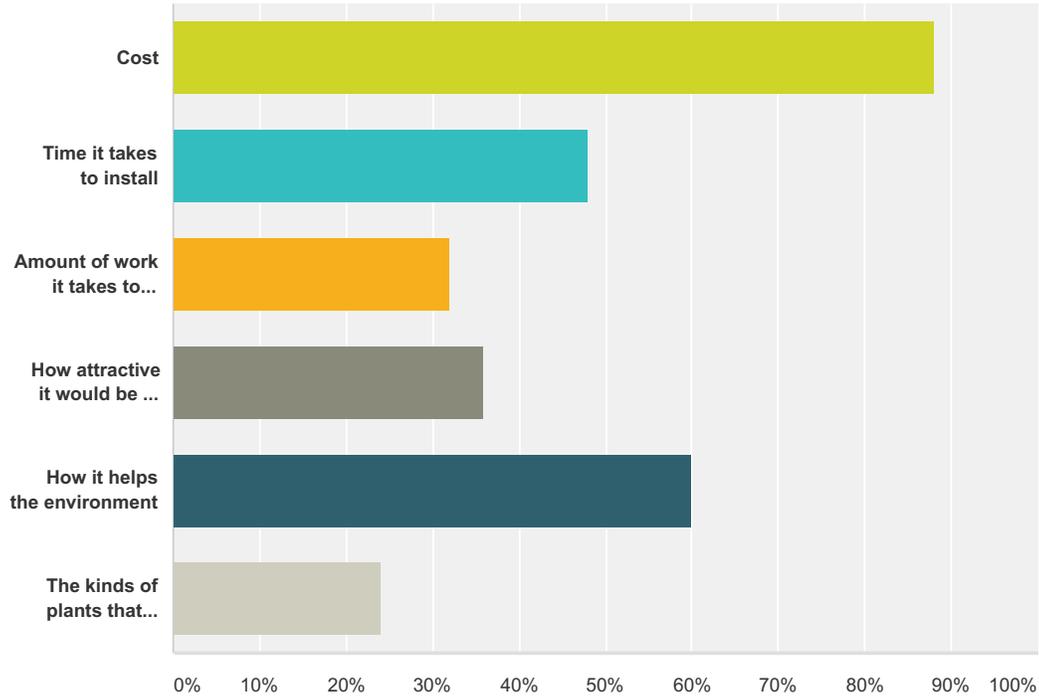
Answered: 25 Skipped: 0



Answer Choices	Responses
Yes	96.00% 24
No	4.00% 1
Don't know / Not applicable	0.00% 0
Total	25

Q13 Which of the following would be important considerations for you, in deciding whether or not to install a rain garden or native vegetation landscaping. Check all that apply.

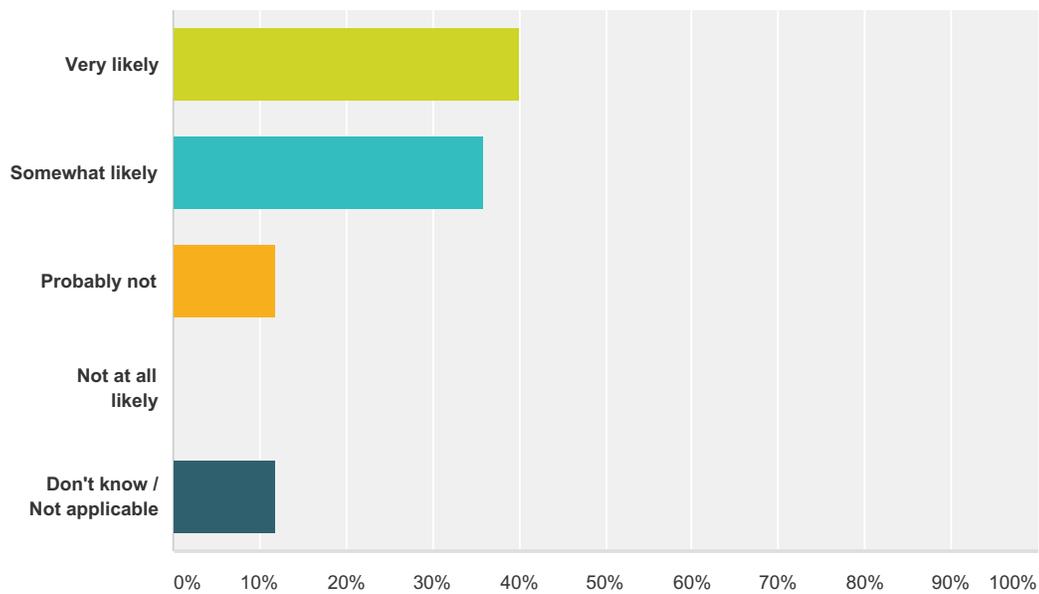
Answered: 25 Skipped: 0



Answer Choices	Responses
Cost	88.00% 22
Time it takes to install	48.00% 12
Amount of work it takes to maintain	32.00% 8
How attractive it would be on my property	36.00% 9
How it helps the environment	60.00% 15
The kinds of plants that would be acceptable	24.00% 6
Total Respondents: 25	

Q14 Another thing homeowners can do to manage stormwater is to replace driveways, patios, or other paved areas with porous pavement, which allows stormwater to pass through and soak into the ground. If the Soak It Up Program offered rebates for porous pavement replacement on your property, how likely would you be to replace pavement on your property? Would you be...

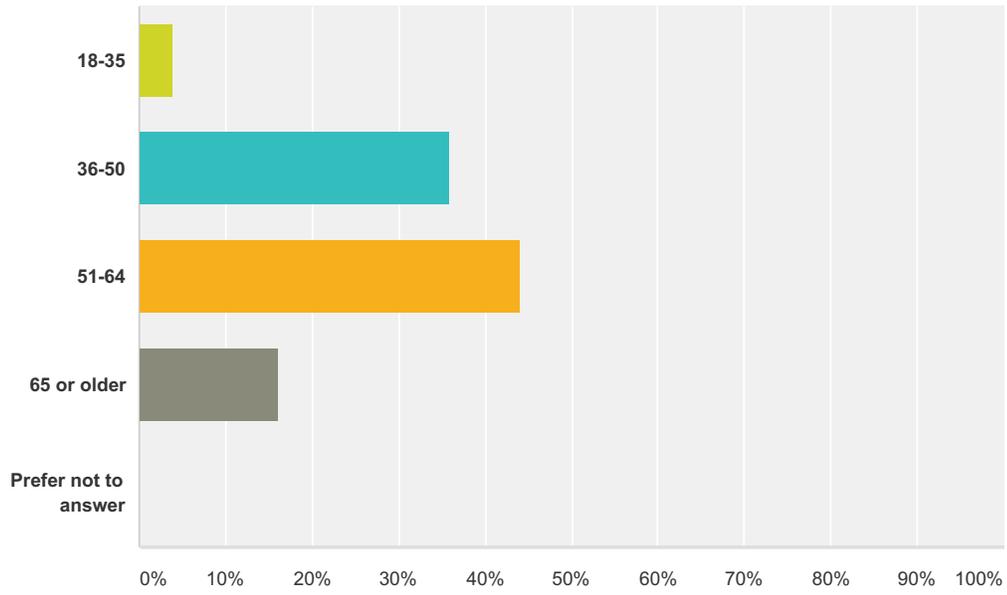
Answered: 25 Skipped: 0



Answer Choices	Responses
Very likely	40.00% 10
Somewhat likely	36.00% 9
Probably not	12.00% 3
Not at all likely	0.00% 0
Don't know / Not applicable	12.00% 3
Total	25

Q15 What is your age?

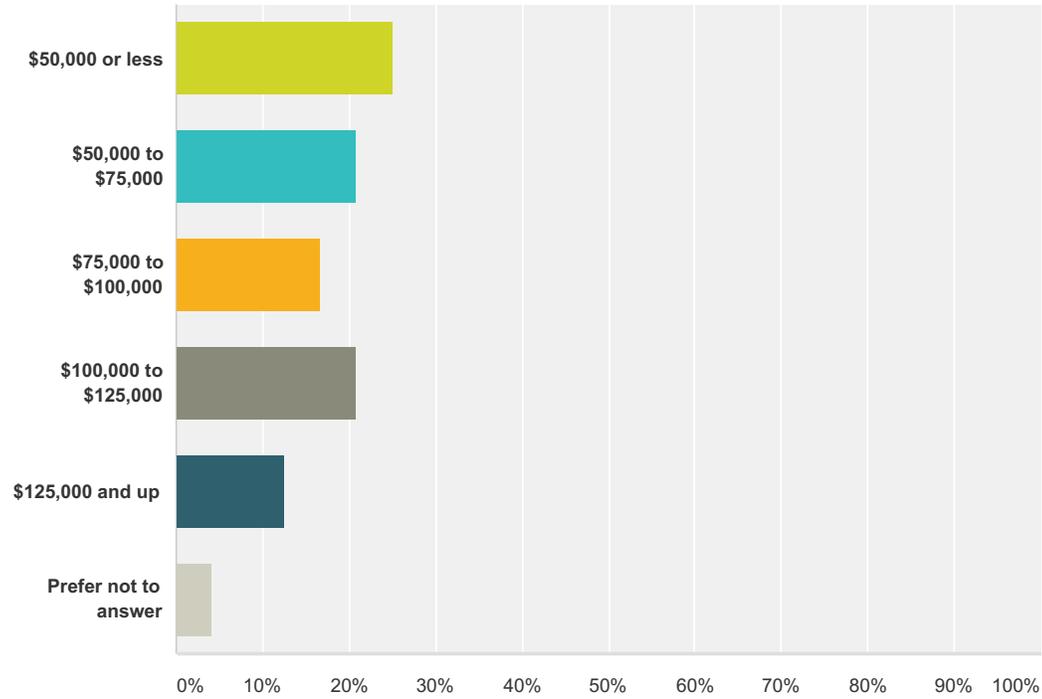
Answered: 25 Skipped: 0



Answer Choices	Responses
18-35	4.00% 1
36-50	36.00% 9
51-64	44.00% 11
65 or older	16.00% 4
Prefer not to answer	0.00% 0
Total	25

Q16 How much total combined money did all members of your HOUSEHOLD earn last year, before taxes?

Answered: 24 Skipped: 1



Answer Choices	Responses	
\$50,000 or less	25.00%	6
\$50,000 to \$75,000	20.83%	5
\$75,000 to \$100,000	16.67%	4
\$100,000 to \$125,000	20.83%	5
\$125,000 and up	12.50%	3
Prefer not to answer	4.17%	1
Total		24

Q17 Please provide us with any additional feedback or comments.

Answered: 16 Skipped: 9

#	Responses	Date
1	I applied for the Soak It Up program, but didn't qualify. because I had already put weed block cloth down without loosening the soil below. (Loosening the soil disturbs soil microbes.) Little by little I have been removing the grass/weeds and replacing them with the ground cloth, with wood chips on top. When the grass under the ground cloth has decayed, I cut holes in it and plant. Unfortunately that method does not qualify for a rebate. :(I already have the weed block on most of my yard, and I don't want to undo all that work in order to qualify for the rebate.	12/11/2015 9:46 PM
2	I will not be doing a rain garden unless the city is required to redo the 185th st rezone. No point in doing so when the property will be bulldozed for an apartment building	12/11/2015 6:06 PM
3	Really looking forward to partaking in the Soak-It-Up program this year if our budget can handle it. I think this is a GREAT program for Shoreline and probably the best city-based program from Shoreline that I've learned of since moving here 2 years ago.	12/11/2015 1:40 PM
4	It would help to have someone that could give a estimate range of what it would cost to do a certain area. Not knowing stops me.	12/11/2015 11:53 AM
5	Providing tours of existing rain gardens in Shoreline would help educate residents of their benefits.	12/11/2015 11:02 AM
6	I like the program, wish more money was available, as in seattle. also, rain catchment and permeable paving systems should be encouraged same way.	12/9/2015 10:57 AM
7	Considered the conservation/native plant city program but decided against it: too limiting in plant choices, too many hoops to jump through, too much money I would need to spend upfront in order to get rebate.	12/7/2015 10:15 AM
8	I love my rain garden, and appreciate the rebate I received. I would not have been able to afford the garden without it!	12/6/2015 6:46 AM
9	Soak It Up is a great program. I like Seattle's program where they do it for you which may help those that are intimidated or not physically able to do the work.	12/4/2015 9:54 PM
10	We utilized the conservation lanscaping rebate on our last house in Shoreline. We found it advantageous all around and Tina was great in fascilitating things.	12/4/2015 6:22 PM
11	We received funding from the Soak it Up program for a rain garden and conservation landscaping. Tina was great to work with.	12/4/2015 3:53 PM
12	I love the soak it up program!	12/4/2015 3:05 PM
13	Really commend you for encouraging citizens to remove their lawns and plant native plants. The idea of porous driveways is very interesting.	12/4/2015 11:56 AM
14	I have told several neighbors about the program. thank you to tina, who has personally helped me work through several details/steps of the program.	12/4/2015 11:32 AM
15	Air and water quality will continue to degrade, if we don't put a halt to over-development. Loss of trees and soil surfaces will deter the absorption of water, and affect the air that all of creation need to sustain life.	12/4/2015 11:30 AM
16	I hope you continue forward thinking programs like Soak It Up and are to be commended with coming up with it in the first place!	12/4/2015 11:04 AM

Attachment B. Technical Memorandum: City of Shoreline Code, Standard, and Document Review



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Technical Memorandum

Prepared for: City of Shoreline

Project Title: NPDES Permit Code Support

Project No.: 148124

Subject: City of Shoreline Code, Standard, and Document Review

Date: January 20, 2016

To: Uki Dele, P.E.

From: Patrick Weber, P.E.

Prepared by: Damon Diessner

Margaret Ales

Reviewed by: Patrick Weber, P.E.

Limitations:

This document was prepared solely for City of Shoreline in accordance with professional standards at the time the services were performed and in accordance with the contract between City of Shoreline and Brown and Caldwell dated July 2, 2015. This document is governed by the specific scope of work authorized by City of Shoreline; 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 City of Shoreline and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.

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List of Abbreviations

2011 Plan	2011 Stormwater Master Plan
BC	Brown and Caldwell
BMP	best management practice
CESCL	Certified Erosion and Sediment Control Lead
City	City of Shoreline
Ecology	Washington State Department of Ecology
EDM	Engineering Development Manual
IDDE	illicit discharge detection and elimination
I&I	inflow and infiltration
IPM	integrated pest management
LID	low-impact development
LIDPS	Low-Impact Development Performance Standard
LOS	levels of service
MOU	memorandum of understanding
MR	Minimum Requirement
MS4	municipal separate storm sewer system
NPDES	National Pollutant Discharge Elimination System
O&M	operations and maintenance
Permit	NPDES Phase II Municipal Stormwater Permit
PIT	pilot infiltration test
ROW	right-of-way
SMC	Shoreline Municipal Code
SOP	standard operating procedure
Stormwater Manual	<i>Stormwater Management Manual for Western Washington</i>
SWMP	Stormwater Management Program
TAPE	Technology Assessment Protocol-Ecology
TM	technical memorandum
TMDL	total maximum daily load

Introduction

The City of Shoreline (City) requested that Brown and Caldwell (BC) complete a review of certain existing City codes, standards, and documents and provide input on recommended updates. This review is needed because on August 1, 2012, the Washington State Department of Ecology (Ecology) reissued the National Pollutant Discharge Elimination System (NPDES) Phase II Municipal Stormwater Permit (Permit), effective August 1, 2013, through July 31, 2018. As a Phase II Permittee, the City must update the Shoreline Municipal Code (SMC) and stormwater-related standards and guidance documents to maintain consistency with the requirements of the updated NPDES Permit.

As a result of the review, BC developed comments and recommendations documented in this technical memorandum (TM) that include the following:

- Draft revisions to the Surface Water Utility Code (SMC 13.10)
- Review comments for SMC Titles 12 through 20
- Review comments for other standards and documents identified by the City

In addition to Permit-related updates, the City asked BC to review and provide recommendations on potential approaches and options for selected surface water utility management issues. Identified areas of interest include:

- Sufficiency of code authority for implementing and enforcing stormwater requirements
- Use of covenants for ensuring long-term maintenance of private stormwater facilities
- Potential need for a stormwater-specific construction permit, and potential options for such a permit
- Issues related to public and private property, stormwater pipes and facilities that are privately owned or cross private property, and easements for such facilities
- Other utility management topics, such as business planning and asset management

Table 1 summarizes review activities completed for NPDES and utility management-related issues.

Table 1. Summary of Review Activities

NPDES-related review of City codes, standards, and documents	
City code, standard, or document	Review outcome
SMC 13.10 Surface Water Utility	Review focused on updates to Permit requirements. Key issues are summarized in Table 3, and redline text edits to SMC 13.10 are included as Attachment A.
SMC Titles 12-20	Review focused on new Permit low-impact development (LID) principles requirements. Review comments are summarized in Table 4. This review excluded SMC 13.10, which is addressed in more detail separately in this TM, and the City's Critical Area Ordinance, which was reviewed earlier in a TM dated August 20, 2015.
Engineering Development Manual (EDM)	Review focused on updates to Permit requirements. Review comments are summarized in Table 5.
Comprehensive Land Use Plan	Review focused on policies identified in the Comprehensive Land Use Plan and their applicability relative to new LID principles requirements. Review comments are summarized in Tables 6-8.
Stormwater Management Program (SWMP) Plan	Review focused on updates to Permit requirements, content, and usability. Review comments are summarized in Table 9.
Critical Area Ordinance	The City's Critical Area Ordinance was reviewed separately in a TM dated August 20, 2015.
Utility management recommendations	
Topic area	Review outcome
Code authority and enforcement	Discussion of existing code authority and enforcement framework and potential alternatives; recommended next steps.
Covenants	Discussion of covenant approach and potential alternatives; recommended next steps.
Construction stormwater permit	Discussion of potential options for implementing a construction permit specific to stormwater requirements; recommended next steps.
Public and private stormwater system elements	Discussion of issues around public and private stormwater system elements, ownership, funding, and related challenges; recommended next steps.
Utility management framework	Discussion of other topics raised by the City pertaining to utility management; recommended next steps.

Section 1: Review of City Codes, Standards, and Documents

The following sections summarize changes to the Permit and BC reviews of selected City codes, standards, and documents relative to those changes.

1.1 Summary of NPDES Permit Changes

The updated Permit includes a number of new and revised requirements related to:

- Public education and outreach
- Illicit discharge detection and elimination (IDDE)
- Low-impact development (LID) technical requirements
- Implementation of LID principles in development planning and site design
- Facility inspections
- Stormwater monitoring

Key Permit changes are described in Table 2.



Table 2. Summary of Key Permit Changes

Key changes	Discussion of changes and potential issues
Public education and outreach requirements	Changes were made to the target audiences and education topics. A new requirement was added to provide opportunities to involve the public in stewardship activities. For most Permittees, the required updates to education and outreach programs will be fairly modest.
LID requirements for new development and redevelopment	The majority of changes to the Permit and the Ecology Stormwater Manual are related to inclusion of LID practices and implementation in stormwater management, with a variety of new requirements for new development and redevelopment. As a result, the majority of new development and redevelopment projects will have to construct new types of onsite stormwater facilities. Those facilities will have to be inspected and maintained in perpetuity.
LID principles/remove barriers to LID	The revised Permit requires that development-related codes, standards, and enforcement be revised to implement LID principles, including minimizing impervious surfaces, native vegetation loss, and stormwater runoff. The requirement to minimize impervious areas poses challenges and may have significant policy implications for Permittee interests outside of stormwater management. Examples of potential policy conflicts might include preserving areas of existing vegetation vs. meeting parking requirements or roadway width standards.
Addition of LID Performance Standard (LIDPS) (Minimum Requirement [MR] 5/LIDPS/Lists 1 and 2)	The Permit significantly revised MR 5 to include an LIDPS and alternative menus of best management practice (BMP) options (Lists 1 and 2). The new requirements apply to projects triggering MRs 1–5 (i.e., not necessarily flow control and water quality, which are under MRs 6 and 7). The revised requirements will apply to more new development and redevelopment projects than under the previous Permit, and will affect projects in new ways.
Deletion of 1-acre threshold exemption	Under the previous Permit, projects of less than 1 acre were exempt from some of the onsite stormwater facility requirements (the MRs in Appendix 1). The deletion of this exemption is a significant change for Phase II Permittees.
IDDE field screening requirements	Field screening requirements have been updated, including new thresholds for annual inspections, and new flexibility in screening approaches. The impacts of this change are dependent on the nature of existing activities, but will likely be relatively minor for most Permittees.
Stormwater facility inspection requirements	The previous Permit included requirements to conduct annual inspections for all permanent stormwater BMPs/facilities permitted in accordance with the requirements of this Permit. The requirements for inspections now include LID and facilities constructed on private property. With the deletion of the 1-acre threshold exemption, this requirement takes on new significance. Virtually all properties will have the potential, with new development and redevelopment, to have an inspection requirement over time. The scale of required inspections and the requirement to inspect on private property may pose challenges.
Operations and maintenance (O&M)	Changes include updated maintenance standards, additional inspection requirements for catch basins, and expanded runoff water quality management for Permittee-owned or -maintained lands. Updated requirements include new types and locations of ongoing maintenance inspections, and increased frequencies for some types of inspections, which will create additional effort for Permittee inspection staff.
Monitoring and assessment	New monitoring requirements are included in the Permit. Permittees must either pay a fee to participate in a statewide stormwater monitoring program implemented by Ecology, or conduct monitoring and assessment activities independently. Costs are scaled by Permittee size; it will likely be more cost-effective for most Permittees to participate in the Ecology program.

1.2 Surface Water Utility Code Review (SMC 13.10)

BC reviewed SMC 13.10 for consistency and compliance with the Permit. The City has previously adopted Ecology’s *Stormwater Management Manual for Western Washington* (Stormwater Manual) as its standard for stormwater management; by doing so, many of the technical updates required by the Permit are already included in the City standards via the Stormwater Manual.

Significant recommended revisions to SMC 13.10 are summarized in Table 3, and proposed revisions are included as redlined edits to the SMC text in Attachment A. See the redline edits for full detailing of recommended revisions. One code reference from Title 3 (Revenue and Finance) is also included in Table 3, although no edits have been made to that section. The Title 3 reference is included because it contains the rate table for the surface water utility, and is correlated to an issue of terminology in SMC 13.10 and potential revenue-related impacts.

Table 3. Summary of SMC 13.10 Revisions	
SMC section	Comment
3.01.400 Surface water management rate table	Recommending the City begin using “hard surfaces” in lieu of “impervious surfaces” in certain code instances to maintain consistency with the Permit and to avoid potential revenue decay as pervious, hard surfaces are installed in coming years (i.e., pervious pavements and green roofs).
13.10.105 Definitions	A number of definitions were revised to maintain consistency with terminology in the Permit and the Stormwater Manual, including a shift to using “hard surfaces” in some specific instances.
13.10.200.A Stormwater Manual adoption	Recommended revision to provide the City administrative control over when an updated Stormwater Manual becomes effective for City use (e.g., new Stormwater Manual published in 2012, but not required to be adopted until 2016).
13.10.200.B Low impact development	Recommended revisions intended to strengthen the language around LID consistent with the new emphasis on LID in the Permit.
13.10.245.B Operation and maintenance	Recommended revision to clarify/strengthen existing covenant-based requirements.
13.10.320 Prohibited discharges	A number of updates were made to improve consistency with the corresponding Permit text (this code section has its basis in prohibitions and allowances prescribed in detail within the Permit).
13.10.340 Operations, maintenance, and illicit discharge inspections and investigations	Recommended revision to section title and content to highlight the types of inspections authorized by the section and to explicitly call out inspections on private property.

1.3 Review of Other Potentially Affected Code Sections (SMC Titles 12–20)

BC reviewed SMC Titles 12 through 20 for consistency with new Permit requirements and for opportunities to enhance or reduce barriers to the implementation of LID principles, which include:

- Minimizing impervious surfaces
- Minimizing native vegetation loss
- Minimizing stormwater runoff



SMC Titles 12 through 20 were identified through screening as code sections potentially affected by Permit updates and the new requirement to implement LID principles. Other SMC titles do not appear to be affected.

Sections previously reviewed in other efforts, including SMC 13.10 (see previous section) and SMC 20.80 and 20.230 (BC August 2015 TM), were not included in this review.

The review noted a number of examples of existing code language that is supportive of goals similar to LID principles, as well as opportunities to consider further enhancements in support of clustered site development, vegetation retention, and minimization of impervious surfaces. Table 4 summarizes the results of the review, which are intended to provide ideas and starting points for discussion for City staff who work with the development codes.

Table 4. Summary of SMC Title 12–20 Review	
SMC section	Comments
12.05 Sidewalk Maintenance and Construction	Details of sidewalk sizing and materials are not included in this section; LID opportunities related to sidewalks will be elsewhere in the code or EDM.
12.10 Roads and Bridges	The King County roads standards are adopted by reference. Many LID principle-related issues have potential tie-in with roads standards, including right-of-way (ROW) widths, lane widths, parking, permeable pavement standards, utilities conflicts, turnaround areas, cul-de-sac radii, cul-de-sac alternatives, on-street parking, and stormwater facilities like bioretention, rain gardens, and street trees. Will LID principles be implemented indirectly for the City through King County updates to its road standards pursuant to the Permit? Could the City note modifications to the King County roads standards in the SMC in order to implement LID principles?
12.15 Use of Right-of-Way	Potential for conflict between LID/infiltration and utility franchise agreements. Consider if the City is required to protect underground utilities under any franchise agreement provisions.
12.30.020 Public Tree Management–Tree Board	Consider if LID issues need to be reviewed by the parks, recreation, and cultural services board (tree board). For example, street trees co-located with stormwater facilities (e.g., planter box systems).
13.12.400.B.2.a Floodplain Management–General Development Standards–Site Design	Recommend adding a reference to the stormwater management and LID requirements in SMC 13.10.
20.20.040 P Definitions	Recommend broadening the definition of “private stormwater management facility” to include water quality and LID facilities. Example text: “A surface water control structure installed by a project proponent to retain, detain, treat, infiltrate, or otherwise limit runoff from an individual or group of developed sites specifically served by such structure.”
20.20.040 S Definitions	Recommend updating the definition of “Stormwater Manual” consistent with the revisions to SMC 13.10, provided that those revisions are accepted by the City.
20.20.050 U Definitions	In the definition of “utility facility,” is there any need for additional stormwater facility description? “Regional stormwater facilities” are included, but that term is defined somewhat narrowly in the same chapter. Does it adequately encompass the range of potential surface water utility facilities?
20.30.410.A Preliminary Subdivision Review Procedures and Criteria–Environmental	Consider adding language to this section to further support LID principles as a criterion for evaluating subdivision proposals.

Table 4. Summary of SMC Title 12–20 Review

SMC section	Comments
20.50 General Development Standards	Overall, there are opportunities in SMC 20.50 for reducing requirements in general or specifically for LID site design. This could include introducing flexibility in a range of requirements in order to promote LID principles and clustered site layouts. Potential considerations include building locations, parking area locations (and sizing), protecting/ enhancing soils, tree preservation/screening/landscaping requirements (frontages perimeters and parking lots, impervious surface limits, driveway widths/sharing/permeable pavement/two track, building setbacks, bulk/dimensional standards/height limits/max square footage/clustering, parking ratios/permeable pavement/parking stall dimensions/parking stall mix/driving aisle dimensions, curbs/gutters/sidewalks, and open space requirements).
20.50.040.I Setbacks—Designation and Measurement	Onsite drainage systems are allowed to project into yard setbacks in the existing code language. No apparent issues with this, but calling attention to it in case the City would consider any new types of LID/onsite drainage systems inappropriate for locating in the yard setback.
20.50.290 Tree Conservation, Land Clearing and Site Grading Standards—Purpose	Good example of multi-benefit approach to reducing environmental impacts of development. This section could be built on to further promote clustered development and LID principles.
20.50.310.A.6.c Exemptions from Permit	Recommend updating out-of-date Ecology Manual reference to “Stormwater Manual” pursuant to Chapter 13.10.200.
20.50.330.A.4 Project Review and Approval	Could broaden the reference to SMC 13.10, but acceptable if left as-is.
20.50.350.C Incentives for Higher Levels of Tree Protection	Good example of LID-friendly code language (and one the City should take credit for in reporting to Ecology): “director may grant reductions to other site development standards for tree protection efforts exceeding the baseline requirement.” Also an example of an alternative approach to stormwater covenants already in use at the City: “commitment to ongoing tree protection must be recorded on the face of the plat or as a notice to title.”
20.50.380–440 Parking, Access, and Circulation	Opportunity to allow or encourage reduced requirements and/or pervious pavement surfacing for required parking, access, and circulation provisions.
20.50.400.A.8 Reductions to Minimum Parking Requirements	Good example of LID-friendly code language (and one the City should take credit for in reporting to Ecology): “projects using permeable pavement on at least 20% of the area of a parking lot are eligible for a reduction in minimum parking requirements of up to 25%.”
20.50.430 Nonmotorized Access and Circulation	Opportunity to require or encourage pervious pavement for pedestrian access and circulation paths and walkways.
20.50.450 Landscaping—Purpose	Opportunity for allowing flexibility for LID coordination with landscaping requirements (i.e., check off both requirements with a single feature) where appropriate, and where necessary functions of each are met.
20.70.330 Sidewalks, Walkways, Paths and Trails	Confirm that City wants to rely on the EDM to reference the correct sections of the Stormwater Manual for pervious materials and dimensions.

With respect to consideration and implementation of potential code changes, the City should consider tracking and documenting changes considered, changes implemented, and also determinations to retain existing requirements. This documentation will help the City to report on the required LID principles review process it is conducting; reporting is due to Ecology in March 2017.

1.4 Engineering Development Manual Review

BC reviewed the City’s draft 2014 Engineering Development Manual (EDM) (draft received July 2015) for consistency with the technical and LID principle-related requirements of the Permit. Review comments were generally related to clarifications or opportunities to implement LID principles. Review comments are summarized in Table 5.



Table 5. Engineering Development Manual Review Comments

EDM section and title	Comments
General	What is the goal for the stormwater sections of the EDM? Suggest that the stormwater discussion in the EDM rely on the Stormwater Manual and EDM include only deviations from Stormwater Manual or administrative matters specific to the City.
Chapter 11 Access Design	Consider whether any noted dimensions can be further minimized to reduce impervious surface creation.
Chapter 12 Street Design	Consider whether any noted dimensions can be further minimized to reduce impervious surface creation. Consider adding a statement in support of pervious pavement for approved applications.
Chapter 14 Nonmotorized Facilities	Consider whether any noted dimensions can be further minimized to reduce impervious surface creation. Consider adding a statement in support of pervious pavement for approved applications.
14.2, 14.3, 14.4 Sidewalks and Paths	Consider allowing or encouraging use of pervious pavement for sidewalks and paths.
15.2 Landscaping	Consider allowing LID stormwater facilities to meet roadside landscaping requirements where there is no conflict between facility function and landscaping requirements.
Chapter 16 Surface Treatment	Consider additional discussion and support of pervious pavement for approved applications.
Chapter 18 Surface Water Standards	Recommend removing LID from the list of emerging technologies; now required as the first option for stormwater management.
Chapter 18 Surface Water Standards	Once a project has Technology Assessment Protocol-Ecology (TAPE) approval, does the director automatically approve? Are there criteria for emerging technologies approval, e.g., safety, better outcome, reasonable maintenance or life-cycle cost?
Chapter 19 Stormwater Manual Modifications	
19.2.4	Consider clarifying supplemental guidelines revision regarding stop loss and fee in lieu.
19.2.5.6	Recommend providing citation or reference for “Special Drainage Areas.”
19.2.5.7	Why list soil amendment before infiltration or reducing impervious surface? Not generally a flow control BMP; could it be in parallel with other options?
19.2.5.7	Consider making it clear that where infiltration is insufficient, other BMPs must combine with infiltration to achieve performance standards.
19.2.5.9	Consider noting that direct discharge is for Puget Sound. Are there any areas that discharge to Lake Washington that may also apply?
19.2.5.10.C	Are there O&M manuals for all properties? Is following a set of standards an option?
19.2.5.10.C	Should the O&M description include a reference to covenants?
19.2.5.10.C.b	Recommend changing second sentence to “The manual shall...” instead of “The manual should”.
19.2.5.10	As a general approach, might a set of standards apply to small private systems and manuals only for larger systems and emerging technologies?
Chapter 20 General Requirements	
20.1 Licensed Professionals	Could landscape firms be considered as allowable designers for rain gardens in addition to a licensed engineer?
20.1.F	Recommend including the duties, responsibilities, and required frequency at job site of Certified Erosion and Sediment Control Lead (CESCL), or providing a reference to that information in another document.
20.3 Special Drainage Areas	Are there any Special Drainage Areas, currently? SMC 13.10 refers to the EDM for requirements, but it appears they are site specific.
20.5.B Separated Runoff	Are there any situations in which private property surface water controls on another private property might be allowed?
20.5.C	Somewhat unclear. Does this mean you can retrofit an existing developed area within the same threshold discharge area in lieu of developing surface water control for new impervious areas? Consider additional

Table 5. Engineering Development Manual Review Comments	
EDM section and title	Comments
	description or clarification.
20.7 Sump Pumps	Recommend specifying the permit that allows discharge from sump pumps to connect to surface water system.
20.14.D	Consider making roof and footing drain stubs more than 1 foot deeper than lowest existing elevation of building envelope for traffic loads.
Chapter 21 Low Impact Development	Where do these guidelines come from? Are they verbatim or modified?
21.A.1 LID Principles	Consider alternative word for “envelope” or define what it means.
21.B.7 LID Guidelines	Recommend modifying to use porous paving where it is beneficial and effective (i.e., a good idea) versus wherever possible.
22.1.A.2 Subsurface Investigations	Would it be acceptable to allow a septic designer for pilot infiltration test (PIT) testing and reporting?
22.2 Prohibitions	Consider including language about ground/surface interflow and ROW/adjacent properties with respect to certifications.
22.2.C	In addition to slope stability analysis, consider having a geotechnical engineer certify safety.
Chapter 24 Site Development Plan and Chapter 25 SWPPP	Are the requirements of these two chapters different from what is stated in the Stormwater Manual? If not, would it be better to make a reference to the Stormwater Manual instead?
27.4 Ditch Modifications	Consider adding LID discussion to section.
Chapter 28 Construction	Consider adding a reference to the Stormwater Manual in this chapter.
Appendix A Definitions	“Natural systems” are defined but not used in the EDM.

1.5 Comprehensive Land Use Plan Review

BC reviewed the Comprehensive Land Use Plan to identify goals and policies that support or represent barriers to the implementation of LID principles. The review found that City policies identified in the Comprehensive Land Use Plan are generally highly supportive of the goals of LID implementation and, where potentially limiting of LID, reflect safety and other legitimate feasibility considerations.

Table 6 lists several general review comments related to the Permit or stormwater management. Table 7 lists goals and policies that support the use of LID or encourage other practices that enhance LID-related outcomes. Table 8 lists goals and policies that may indirectly create a barrier or provide an additional opportunity for LID.

Table 6. Comprehensive Plan Review: General Comments	
Element	Comment
Essential Public Facilities	Consider including policy related to NPDES Permit requirements in the Essential Public Facilities policy section.
Capital Facilities	Some discussion of water and wastewater levels of service (LOS) is included here. Consider adding discussion for surface water LOS as well.
Utilities	It does not appear that any discussion of potential LID impacts to underground utilities is included. Should there be some discussion regarding infiltration and utilities?

Table 7. Comprehensive Plan Review: Policies Supportive of LID Principles

Policy or goal ID	Policy text
FG7	Conserve and protect our environment and natural resources, and encourage restoration, environmental education, and stewardship.
FG8	Apply innovative and environmentally sensitive development practices.
LU XI	Maintain regulations and procedures that allow for siting of essential public facilities.
LU4	Allow clustering of residential units to preserve open space and reduce surface water runoff.
LU52	Parking requirements should be designed for average need, not full capacity. Include regulatory provisions to reduce parking standards, especially for those uses located within 1/4 mile of high-capacity transit, or serving a population characterized by low rates of car ownership. Other parking reductions may be based on results of the King County Right-Sized Parking Initiative.
LU55	Explore whether “Ecodistricts” could be an appropriate means of neighborhood empowerment, and a mechanism to implement triple-bottom-line sustainability goals by having local leaders commit to ambitious targets for green building, smart infrastructure, and behavioral change at individual, household, and community levels.
LU66	Design, locate, and construct surface water facilities to: <ul style="list-style-type: none"> • Promote water quality • Enhance public safety • Preserve and enhance natural habitat • Protect critical areas • Reasonably minimize significant, individual, and cumulative adverse impacts to the environment
LU69	Protect water quality by educating citizens about proper waste disposal and eliminating pollutants that enter the stormwater system.
LU72	Where feasible, stormwater facilities, such as retention and detention ponds, should be designed to provide supplemental benefits, such as wildlife habitat, water quality treatment, and passive recreation.
CD13	Encourage the use of native plantings throughout the city.
CD16	Where feasible, preserve significant trees and mature vegetation.
CD18	Preserve, encourage, and enhance open space as a key element of the community’s character through parks, trails, water features, and other significant properties that provide public benefit.
CD28	Use the Green Street standards in the Master Street Plan to provide an enhanced streetscape, including street trees, landscaping, natural surface water management techniques, lighting, pathways, crosswalks, pedestrian and bicycle facilities, decorative paving, signs, seasonal displays, and public art.
CD32	Use low-impact development techniques or green street elements, except when determined to be infeasible. Explore opportunities to expand the use of natural surface water treatment in the right-of-way through partnerships with public and private property owners.
CD37	Minimize the removal of existing vegetation, especially mature trees, when improving streets or developing property.
Goal H I	Provide sufficient development capacity to accommodate the 20-year growth forecast and promote other goals, such as creating demand for transit and local businesses through increased residential density along arterials and improved infrastructure, such as sidewalks and stormwater treatment, through redevelopment.
T10	Use low-impact development techniques or other elements of complete or green streets, except when determined to be infeasible. Explore opportunities to expand the use of natural stormwater treatment in the right-of-way through partnerships with public and private property owners.
T11.	Site, design, and construct transportation projects and facilities to avoid or minimize negative environmental impacts to the extent feasible.
ED20	Encourage businesses to plan for shared parking when redeveloping commercial areas in order to provide adequate (but not excessive) parking. Other considerations in design of mixed-use or multi-tenant parking areas should include opportunities for interconnectivity and shared space, number and placement of curb cuts, and routes for ingress/egress.
Goal NE VI	Manage the stormwater system through the preservation of natural systems and structural solutions in order to: <ul style="list-style-type: none"> • Protect water quality

Table 7. Comprehensive Plan Review: Policies Supportive of LID Principles

Policy or goal ID	Policy text
	<ul style="list-style-type: none"> • Provide for public safety and services • Preserve and enhance fish and wildlife habitat, and critical areas • Maintain a hydrologic balance • Prevent property damage from flooding and erosion
Goal NE VII	Continue to require that natural and onsite solutions, such as infiltration and rain gardens, be proved infeasible before considering engineered solutions, such as detention.
NE6	Provide incentives for site development that minimize environmental impacts.
NE18	Develop educational materials, incentives, policies, and regulations to conserve native vegetation on public and private land for wildlife habitat, erosion control, and human enjoyment. The City should establish regulations to protect mature trees and other native vegetation from the adverse impacts of residential and commercial development, including short-plat development.
NE19	Minimize removal of healthy trees, and encourage planting of native species in appropriate locations.
NE22	Encourage the use of native and low-maintenance vegetation.
NE40	Establish policy decisions and priorities considering long-term impacts on natural and human environments.
NE45	Design natural infrastructure into projects whenever feasible to mimic ecological processes.
PR4	Maintain environmentally sustainable facilities that reduce waste, protect ecosystems, and address impacts of past practices.
CF13	Maximize onsite mitigation of development impacts to minimize the need for additional capital facility improvements in the community.

Table 8. Comprehensive Plan Review: Potential Barriers or Opportunities for LID

Policy or goal ID	Policy text	Comment
ED9	Promote land use and urban design that allows for smart growth and dense nodes of transit-supportive commercial activity to promote a self-sustaining local economy.	Consider also aligning with clustered development
Goal NE III	Regulate land disturbances and development to conserve soil resources and protect people, property, and the environment from geologic hazards such as steep slope, landslide, seismic, flood, or erosion hazard areas.	Legitimate LID feasibility barrier
NE11	Mitigate drainage, erosion, siltation, and landslide impacts, while encouraging native vegetation.	Legitimate LID feasibility barrier
NE12	Seek to minimize risks to people and property in hazardous areas through education and regulation.	Legitimate LID feasibility barrier
NE14	Inform landowners about site development, drainage, and yard maintenance practices that affect slope stability and water quality.	Legitimate LID feasibility barrier
NE17	Promote public education and encourage preparation in areas that are potentially susceptible to geological and flood hazards.	Legitimate LID feasibility barrier
NE33	Conserve and protect groundwater resources.	Potential to limit LID feasibility in vicinity of groundwater resources
CF18	Support local efforts to minimize inflow and infiltration (I&I), and reduce excessive discharge of surface water into wastewater systems.	Potential to limit LID feasibility in the vicinity of sewer I&I problems

1.6 Stormwater Management Program Plan Review

BC reviewed the City’s Stormwater Management Program (SWMP) Plan. The SWMP Plan is included in the annual report submitted to Ecology as a requirement of the Permit, and documents the City’s planned activities related to stormwater management for the year.

Generally, the Shoreline SWMP Plan does a good job of providing the “look forward” for NPDES Permit compliance activities requested by Ecology. It is well organized and outlines the actions necessary to maintaining continued compliance with the City’s stormwater Permit. As opportunities arise to revise and improve the document, consideration could be given to a number of SWMP elements. Comments and recommendations are presented in Table 9.

Table 9. Stormwater Management Plan Review	
Reference	Comment
Document organization	<p>This SWMP document provides a relatively compact description of the upcoming Permit compliance activities through the use of tables. While providing a concise program overview, the tabular approach could be clearer both as an internal tool for the various departments involved in NPDES compliance, and as a reporting/education document.</p> <p>Other Phase II Permittees have developed SWMP documents that employ descriptions of Permit requirements and planned activities in addition to the tabular information. For the sake of brevity, those descriptions are often developed as bullet points that, while brief, provide somewhat more background than allowed text within a table cell. The tables following the bullet points then include task information including an identifier, description, task lead, and time frame that provide focus on meeting specific Permit requirements. The City could consider a similar approach.</p> <p>Currently, the Shoreline tables (and the SWMP document) do not include much information regarding task leads, which can be helpful for work planning across the City organization. Additionally, the Shoreline tables sometimes include either actions or task descriptions (or both) in the “item” column, which could be clarified if the tables are revised.</p>
Page 2	Others often include program/Permit administration as a SWMP section, allowing for a clear description of the interdepartmental coordination efforts necessary for successful NPDES compliance and providing a workload planning tool/reminder for participating departments.
Page 3	The Ecology tables are useful, but at the same time are fairly large with small font. If bullet point descriptors are included in a revised document, this information could be employed in that format. The Ecology tables could be included as an appendix.
Page 5	Generally, Permit section citations include the “S” as in the Permit itself (e.g., S5.C.1); has a target audience and BMP been identified for 2015?
Page 6	Are there opportunities here to “get credit” for staff straining (if desired, e.g., IDDE/LID/IPM/spill response/etc.)? Council education?
Page 8	Have standard operating procedures (SOPs) been developed for these IDDE items/activities/tasks? Has training been completed? Refreshed? Has the municipal separate storm sewer system (MS4) screening methodology been identified? Does the Work Order software generate reports?
Page 10	Might note the December 31, 2016, Stormwater Manual adoption deadline for the permitting process. Why is the plat inspection until 90% buildout requirement (S5C.4.c.iv) called out over others? SWMP plans in other jurisdictions often include some more specificity for “controlling runoff”: enforce Ecology-issued Permits, inspect all sites during construction, inspect all sites for final/occupancy, pre-inspect all sites having high runoff/sedimentation potential, track and report permits.
Page 12	For maintenance standards, should the 25% inspection by 7/31/2015 have been called out? Was it met?

Section 2: Surface Water Utility Management Recommendations

The following sections summarize BC reviews and discussion of selected topics of interest to the City, including code authority and enforcement, covenants and alternative approaches, construction stormwater permitting, and delineations of public and private stormwater system elements and responsibilities.

2.1 Code Authority and Enforcement

This section presents potential issues, existing authority, and recommendations related to SMC authority and enforcement.

2.1.1 Issue

BC reviewed code authority and enforcement sections of the SMC and discussed authority and enforcement topics with Surface Water Utility staff regarding stormwater requirements. The City stormwater management program is in a state of change as are all municipal programs due to the new state Permit requirements. We perceived that while the code authorities needed to implement the Permit requirements are generally in place, there may be challenges in implementing and enforcing the code effectively given this climate of change. Obstacles to effective code implementation and enforcement may include the following perceived potential issues based on our conversations with the City and our experience working with other clients:

- Changing state requirements that are not clearly or fully understood
- Authorities may not be clearly or effectively designated to departments or staff that may need them
- Staff in various roles may be uncertain their roles in enforcing provisions of the code
- Some specific required practices may still be unfamiliar or not consistently applied, including requiring, reviewing, and enforcing stormwater drainage submittals, performing effective construction inspections of onsite stormwater controls, and conducting ongoing O&M inspections of stormwater facilities, including accessing facilities on private property
- A general public may be unaware of regulatory requirements, City processes, and City authorities

2.1.2 Existing Authority

In determining that code authority for implementation and enforcement is generally in place, we identified the following SMC sections that provide authority to the planning director, public works director, or both:

- **SMC 13.10.110 Utility created:** General code authority for administration, implementation (including inspections), and enforcement is established here. The definition of “director” in SMC 13.10 appears to indicate public works director authority for administration and implementation of the stormwater code, and planning director authority for enforcement of stormwater provisions.
- **SMC 13.10.235 Inspections:** Code authority for construction inspections is established in this section. Since the inspections in this section are related to administering the stormwater code, this authority would likely be interpreted as residing with the public works director.
- **SMC 13.10.245 Operation and maintenance:** Language appears to authorize covenant signing requirement, although we are recommending to strengthen/clarify the language. The authority for review, approval, and recording of the required operations and maintenance plan is specifically allocated to the planning and development services director.
- **SMC 13.10.340 Inspections and investigations:** This section establishes authority for ongoing inspection programs, including on private property. Since the provisions of this section are related to implementa-

tion of the stormwater code, the authority for them would likely be interpreted as residing with the public works director.

- **SMC 13.10.400 Violations:** Defines violations of SMC 13.10 a public nuisance, and refers to code enforcement sections SMC 20.30.720–790. Since the provisions of this section are related to enforcement of the stormwater code, the authority for them would likely be interpreted as residing with the planning director.
- **SMC 20.30.720-790 Code Enforcement:** Provides legal enforcement mechanisms to the planning director, including:
 - Declaration of public nuisance and notices of violation
 - Abatement and cost recovery
 - Various civil penalties

While these sections provide the City with the authority to conduct necessary utility activities and to enforce Permit requirements, most implementation and enforcement activities do not escalate to the point of relying on a formal legal framework. In other words, while existing authorities may be sufficient, processes for day-to-day activities and informal enforcement may need to be confirmed and strengthened.

2.1.3 Recommendations

As a starting point, we recommend leveraging existing code authorities to support required utility activities, and working with other departments to develop (or strengthen an existing) administrative memorandum of understanding (MOU) that will:

- Clearly identify existing authorities and interdepartmental delegation thereof
- Identify staff roles and responsibilities
- Identify clear processes for conducting and enforcing code requirements, including:
 - Drainage reviews and approvals
 - Construction inspections
 - O&M inspections
- Provide support for permit review, inspection, and other staff interacting with the public

Depending on identified needs, the City could also consider options that would involve revisions to the SMC, such as:

- Re-alignment of certain authorities of the planning director and the public works director along departmental business lines
- Code revisions to augment and refine authorities designated to the directors, following examples that have been effective elsewhere. Two examples containing sample code authority language are included in Attachment B; they are adapted from City of Bellevue, Washington, and excerpted from City of Davis, California, code language, respectively. If alternative code authority approach is desired, we recommend the City of Bellevue language as a starting point for the City to consider in making changes.

These options can be further considered in conjunction with the Surface Water Master Plan process together with associated strategic business plans, action plans, asset management program needs and operating procedures, or at some other time in the future.

2.2 Covenants

This section presents challenges, potential alternatives, and recommendations related to covenants.

2.2.1 Issue

The Permit requires the City to have the authority to enter private property for the purpose of ensuring that stormwater control facilities function properly. Currently, the City exercises that authority through covenants. Typically, a "covenant running with the land", imposes duties or restrictions upon the use of that land in perpetuity regardless of ownership. Like easements, covenants come with a deed or title to the property.

Some municipalities see the covenant as an individual agreement between the property owner and the local government with the covenant dependent on an administrative process to ensure that each individual property has the appropriate covenant. These municipalities often do not view that vehicle as the best method for ensuring ongoing maintenance of private stormwater facilities in part because of the potential for administrative error resulting in disparity between individual properties with respect to stormwater requirements within the jurisdiction.

The attorney for the local municipality is in the best position to assess which stormwater enforcement mechanisms are most appropriate to that jurisdiction.

2.2.2 Potential Alternatives

Municipalities in Western Washington use a number of approaches to enforce stormwater requirements, including:

- Use of covenants: This approach would maintain the status quo, but can be somewhat administratively cumbersome with associated risk of error resulting in problems with enforcement powers.
- Use of easements: This approach can also be somewhat administratively cumbersome with associated risk of error resulting in problems with enforcement powers.
- Including plat face language: Again, this process is subject to potential administrative error, and property owners may not notice the plat requirements at the time they purchase the property.
- Adopting general police powers for inspection and enforcement via ordinance to minimize risk of administrative error and ensure uniform enforcement.

The City of Bellevue code authority language provided in Attachment B could also be used as the basis for an alternative approach to covenants, should the City to move in that direction.

For reference, an additional four examples of sample code language are included in Attachment C:

- Excerpt from City of Seattle, providing an example of a Memorandum of Drainage Control (similar to a covenant approach)
- Excerpt from City of Puyallup, providing an example of a Maintenance Agreement (similar to a covenant approach)
- Excerpt from Skagit County, providing an example of use of easements to achieve stormwater maintenance objectives (similar to a covenant approach)
- Excerpt from City of Auburn, providing an example of police power for maintenance inspections

2.2.3 Recommendations

The efficacy of the covenant as a stormwater enforcement tool should be examined in consultation with the City Attorney's Office. These options can be further considered in conjunction with the Surface Water Master Plan process, or in the future.

2.3 City-Issued Stormwater Connection Permit

This section presents challenges, potential alternatives, and recommendations related to potential City-issued stormwater connection permits.

2.3.1 Issue

Currently, it is reported that Permit requirements and enforcement responsibilities can be unclear to both those performing construction within the city as well as to permitting and inspection staff. This lack of clarity in some other jurisdictions has occurred when a number of different municipally issued permits may be used to enforce various stormwater management requirements. Additional confusion may result with different departments being responsible for various stormwater requirements.

2.3.2 Potential Alternatives

To address these types of issues, a number of jurisdictions have adopted the use of a City-issued stormwater connection permit similar to those commonly issued for side sewer connection or for a water meter installation. The stormwater permit makes clear to those performing construction within the city what the requirements are for stormwater management. In cases where various departments or work groups continue to enforce the requirements of the stormwater connection permit, a common practice is to develop one or more MOU among the departments involved to clarify roles and responsibilities. Standard operating procedures (SOPs) are then developed to help staff execute their responsibilities under City code and the MOUs.

Three examples containing sample code language are included in Attachment D:

- Excerpt from City of Seattle, providing an example of its Grading Permit approach (using an existing construction permit to achieve stormwater objectives)
- Excerpt from City of Puyallup, providing an example of its permit requirement language (requiring that stormwater objectives be addressed in other existing construction permits)
- Excerpt from City of Auburn, providing an example of a stormwater connection permit approach

2.3.3 Recommendations

Work on a stormwater connection permit could begin now to provide a vehicle for stormwater requirement clarity. Development of SOPs and MOUs might be better performed at the time of the Surface Water Master Plan update. At that time, when associated strategic business plans, action plans, and asset management program needs are being considered, these procedures and agreements can be coordinated accordingly.

2.4 Public/Private System Responsibilities

This section presents issues, background, and recommendations related to public and private system responsibilities.

2.4.1 Issue

To maintain and improve the quality of surface waters and to provide effective stormwater drainage via constructed drainage facilities, the City must ensure appropriate management of both public and private stormwater systems. The SMC and stormwater management policies do not currently address the roles and responsibilities regarding ownership, operation, and maintenance for public and private stormwater systems within the regulatory climate of the latest NPDES Permit.

2.4.2 Background

The stormwater system is a complicated interplay between private and public drainage systems. Stormwater flows freely between these systems, and responsibility for management of the water shifts accordingly.

Rainfall runs off of all properties within the City, eventually entering the City stormwater system at some point, becoming public stormwater. Water from a single downspout, pipe, swale, ditch, onsite stormwater control facility, or stream may begin on private property; transfer to a system in public ownership as it

crosses a road right-of-way (ROW), drainage easement, or dedicated drainage tract; and then transfer to yet another private property owner as the water is routed downhill.

All of these stormwater system components must operate together to provide overall flood protection and preserve water quality. Federal, state, and city regulations provide this protection by requiring systems to be maintained and operated to meet established standards. Insufficient maintenance of one type of stormwater control facility or even one individual system can cause serious flooding or water quality problems for many others.

Typically, cities do not maintain or improve privately owned stormwater systems because state law requires that the revenues from stormwater management rates and charges be used only for specific purposes. Generally, municipalities may not spend public stormwater funds to maintain or improve private stormwater systems.

The City is required to manage, operate, and maintain the publicly owned stormwater system to federal and state standards. It does so in part by permitting and inspecting both new development and redevelopment to ensure that flow control and water quality treatment systems comply with these standards. New regulatory requirements also have the City indirectly managing private stormwater systems by providing ongoing inspection of systems located on private property that are owned and operated by the private property owner.

The City has historically managed public stormwater facilities by maintaining those public drainage systems on City property, road ROWs, drainage easements, and dedicated drainage tracts. It plans for new public systems and improvements, manages finances, administers the Stormwater Management Program, and designs and constructs projects for new and/or refurbished public stormwater systems to resolve problems. Various departments may be charged with the responsibility of managing elements of City-owned drainage facilities. From time to time, the City may also be asked to take on responsibilities for private drainage systems by private system owners or by those being impacted by private drainage systems.

Stormwater management staff is charged with applying limited resources in managing stormwater through a variety of programs and projects to comply with federal and state regulatory requirements. At the same time, staff must meet City goals in a manner that is affordable, within funding levels approved by the community, and equitable among customers and generations.

Given new state and federal regulatory requirements, it is appropriate to review past policy with respect to public and private stormwater system management issues to efficiently and effectively meet City stormwater management goals.

2.4.3 Key Issues

Some of the key issues affecting development of policies governing public and private stormwater management responsibilities are listed below, together with a brief discussion of each issue.

Recognizing Responsibility

Issue: Stormwater systems are complicated combinations of private and public systems that work together to convey stormwater, control flooding, and protect water quality. Many owners may not recognize that they are responsible for different segments of what appears to be a single stormwater system.

Discussion:

All types of stormwater components may be under either public or private ownership and responsibility, including roof gutters, yard drains and pipes, large storm drainage pipes, streams, and wetlands. All of these types of drainage systems may be under public ownership and responsibility if they are located within a public road ROW, on a public easement or tract of land specifically dedicated for stormwater purposes, or on property owned by the City.

As in most other jurisdictions in the region, it is likely that more than half of the stormwater systems in the city are private. In Shoreline, an additional layer of complexity in answering drainage system ownership questions is due to incomplete drainage ownership records transferred from King County in 1995.

Ownership Determines Role/Responsibility

Issue: System ownership generally determines roles and responsibilities for stormwater management actions.

Discussion: The City manages stormwater systems within public ROWs and on properties it owns or for which it has easements. Management of City systems can be complicated as various City departments may be responsible for maintenance of specific drainage system components.

Private property owners must maintain or improve their components of the stormwater system.

The City indirectly manages stormwater on private property through regulation of development and activities, maintenance inspections, and public education and outreach.

Emergency Response

Issue: It is sometimes necessary for the City to undertake activities on private property to adequately respond to an emergency.

Discussion: The revenue generated from stormwater rates and charges may generally be used only for public stormwater system management. At the same time, the City provides emergency response services for flooding and pollution events that may involve both private and public drainage systems.

Elimination of all risk from storms or pollution events for all public or private drainage systems would be unaffordable even if possible. Providing a cost-effective stormwater management service that protects the public health, safety, and welfare is a balance between avoiding risk and minimizing costs.

Mandates as Cost Drivers

Issue: Federal and state mandates are significant cost drivers for local stormwater programs, affecting both public and private systems.

Discussion: New requirements for both public and private construction projects will result in many new stormwater facilities dispersed across the city. Ensuring proper functioning of these facilities in the future through direct operation and maintenance and/or a program of inspection and enforcement will be a significant new programmatic responsibility for the City.

Attachment E includes an excerpt from the City of Bellevue draft *Storm and Surface Water System Plan*, which provides another example of discussion language on this topic.

2.4.4 Past Public/Private System Discussion

A brief review of the issues involved in defining responsibilities for public and private stormwater in Shoreline was performed with the 2011 *Stormwater Master Plan* (2011 Plan). That review identified the City as responsible for maintaining stormwater systems in the City ROW for flood control and property owners as responsible for maintaining their own systems to prevent flooding on their land. The 2011 Plan also noted that there may be certain situations where there may be an overriding public benefit to the City accepting stormwater system improvements as a public work and assuming ownership of some private systems for future maintenance.

The 2011 Plan contained draft decision guidelines for use of utility funds on private property. Elements of those guidelines included considering whether:

- Stormwater runoff conveyance is provided by the system in question for both multiple properties and public roads
- The system installation was performed by a public agency
- There is existence of an overriding public benefit such as risk of public road damage
- There is potential for failure of a trunk system resulting in neighborhood problems
- The NPDES Permit is a driver to meet water quality standards
- Stream or wetland degradation is occurring
- The problem is occurring in jointly owned properties where it is very difficult for private parties to implement solutions

The draft decision guidelines for use of utility funds on private property contained in the 2011 Plan can be found in Appendix C of that document, and are also included in Attachment E to this TM.

2.4.5 Recommendations

The 2011 draft guidelines are somewhat general in nature and the public, as well as City stormwater management staff, could benefit from additional clarity provided by more fully developed decision-making criteria. Much of the 2011 public/private system issue discussion revolved around flood control and the latest version of the NPDES Permit has placed a greater emphasis on water quality issues. The 2011 Plan anticipated additional discussion of these public versus private system responsibility issues in the future.

It is recommended that the issue of public and private drainage system responsibilities be addressed with the stormwater planning effort to be undertaken in 2016. At that time, the issues in this TM can be further considered and future needs related to water quality, aquatic ecosystem habitat, and new state and federal regulatory requirements can be addressed.

Policy discussion direction could focus on a number of different approaches, such as:

- Maintaining flexibility for case-by-case decisions using the general guidelines of the 2011 Plan
- Developing more clear ranking criteria to be applied to the 2011 guidance
- Adopting a more strict, less flexible policy of acquiring or accepting no additional new or existing system components outside of the City-owned ROW (through easements, ownership, or other property rights) except when needed for City construction projects identified in the CIP
- Fully discussing the issues in this TM in the context of related policy issues such as levels of service (LOS), asset management, private system inspections, critical infrastructure components, and stormwater rates

Until the system responsibility policies can be addressed in the context of the current regulatory environment, it is recommended that the Decision Guidelines of the 2011 Plan be followed. It is further recommended that the 2016 stormwater planning effort examine these system management issues within the context of related policy issues such as LOS, asset management, departmental stormwater responsibilities, private system inspections, critical infrastructure components, and stormwater rates. If additional clarity is needed in the SMC regarding responsibilities for private systems, code language to that end can also be developed.

2.5 Utility Management Framework

Staff also identified a potential need for additional structure around utility management practices and priorities, including:

- Business and strategic planning processes
- Asset management systems and practices

- Rate and revenue tracking and evaluation

A defined framework of tools and practices to support utility management could have a variety of benefits. We recommend pursuing these topics further, but suggest deferring and addressing these issues as part of the Surface Water Master Plan process.

Attachment A: Redline Text Edits to SMC 13.10, Surface Water Utility

Shoreline Surface Water Utility Code

Draft Revision 1/20/2016

**Chapter 13.10
SURFACE WATER UTILITY**

Sections:

- 13.10.100 Purpose.**
- 13.10.105 Definitions.**
- 13.10.110 Utility created.**
- 13.10.120 Revenue and expenditures.**
- 13.10.200 Adoption of Stormwater Management Manual.**
- 13.10.225 Minimum requirements.**
- 13.10.230 Special drainage areas.**
- 13.10.235 Inspections.**
- 13.10.240 Record drawings and certifications.**
- 13.10.245 Operation and maintenance.**
- 13.10.320 Prohibited discharges.**
- 13.10.330 General requirements.**
- 13.10.340 Inspections and investigations.**
- 13.10.400 Violations.**

13.10.100 Purpose.



A surface water utility is necessary to promote public health, safety, and welfare by:

- A. Establishing a program to comprehensively manage surface water with the intent of reducing flooding, erosion and sedimentation, preventing habitat loss, and enhancing groundwater recharge.
 - B. Protecting and enhancing the water quality of water courses, water bodies, groundwater, and wetlands in a manner pursuant to and consistent with the Federal Clean Water Act, Department of Ecology's Western Washington Phase II Municipal Stormwater Permit related to the National Pollutant Discharge Elimination System (NPDES), and Chapter [90.48](#) RCW, Water Pollution Control.
 - C. Providing design, construction, and maintenance criteria for permanent and temporary surface water drainage facilities for development and redevelopment activities.
 - D. This chapter is adopted to protect the public and not for the benefit of any particular individual or class.
- [Ord. 531 § 2 (Exh. 2), 2009

13.10.105 Definitions. 

The following terms are defined for the purpose of implementing the provisions of this chapter:

A. “Best management practices” means schedules of activities, restrictions, maintenance procedures, and structural and/or managerial practices that, when used singly or in combination, prevent or reduce the release of pollutants and other adverse impacts to waters of the state.

B. “City” means the city of Shoreline.

C. “Chlorinated” means water that contains more than 10 milligrams per liter chlorine.

D. “Comprehensive plan” means [the City’s comprehensive plan adopted pursuant to Chapter 36.70A RCW and such plan as amended, and as described in SMC Title 20,](#)

Deleted: the plan and amendments as described in Chapter SMC

E. “Critical areas” means critical areas as defined in SMC [20.20.014](#).

F. “Dangerous waste” means those solid wastes designated in WAC [173-303-070](#) through [173-303-100](#) as dangerous or extremely hazardous or mixed waste, as further defined under WAC [173-303-040](#).

G. “Development” means land disturbing activities, including class IV general forest practices that are conversions from timber land to other uses; structural development, including construction or installation of a building or other structure; [creation of hard surfaces](#); and subdivision and binding site plans, as defined and applied in Chapter [58.17](#) RCW. Projects meeting the definition of “redevelopment” shall not be considered new development.

Comment [PW1]: Recommending consistency with Ecology’s switch to using “hard surfaces” instead of “impervious surfaces” for their thresholds and requirements. However, it is not obligatory if the City would prefer not to make that change. See discussion in the January 20, 2016 TM “City of Shoreline Code, Standard, and Document Review”.

H. [“Declaration of covenant”](#) means a legal document between the city and persons holding title to the property requiring the title holder to perform required maintenance and repairs on drainage facilities necessary to meet the city’s specified standards within a reasonable time limit.

Comment [UD2]: ~~Please provide title of TM.~~ Will consider the implications of changing to Hard Surfaces to other documents and policies including those that relate to King County Billing.

I. “Director” means the public works director or designee, except that when referring to enforcement of permitting and review processes defined in Chapter [20.30](#) SMC, “director” shall mean the director of planning and development services or designee.

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Comment [PW3]: See the January 20, 2016 TM “City of Shoreline Code, Standard, and Document Review” for discussion of potential alternatives to covenant approach.

J. “Discharge” means to throw, drain, release, dump, spill, empty, emit, or pour forth any matter or to cause or allow matter to flow, run or seep from land or be thrown, drained, released, dumped, spilled, emptied, emitted or poured into water.

K. “Drainage” means collection, conveyance, containment, and/or discharge of surface water and stormwater runoff.

L. "Drainage facility" means a constructed or engineered feature that collects, conveys, stores, treats, or infiltrates stormwater runoff. "Drainage facility" includes, but is not limited to, a constructed or engineered stream, pipeline, channel, ditch, gutter, lake, wetland, closed depression, flow control or water quality treatment facility, infiltration facility, constructed low impact development facility(LID), erosion and sediment control facility and other structure and appurtenance that provides for drainage.

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M. "Emerging technologies" means treatment technologies that have not been evaluated with Department of Ecology-approved protocols, but for which preliminary data indicate that they may provide a necessary function(s) in a stormwater treatment system.

N. "Hard surface" means an impervious surface, a permeable pavement, or a vegetated roof.

Comment [PW4]: Recommending consistency with Ecology's switch to using "hard surfaces" instead of "impervious surfaces" for their thresholds and requirements. However, it is not obligatory if the City would prefer not to make that change. See discussion in the January 20, 2016 TM "City of Shoreline Code, Standard, and Document Review".

O. "Illicit connection" means any manmade conveyance that is connected to a municipal separate storm sewer without a permit, or that is not intended for collecting and conveying stormwater discharges or the non-stormwater discharges allowed by SMC 13.10.320, excluding roof drains and other similar type connections. Examples of illicit connections include sanitary sewer connections, floor drains, channels, pipelines, conduits, inlets, or outlets that are connected directly to the municipal separate storm sewer system.

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P. "Illicit discharge" means any discharge to a municipal separate storm sewer that is not composed entirely of stormwater or of the non-stormwater discharges allowed by SMC 13.10.320.

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Q. "Impervious surface" means a non-vegetated surface area that either prevents or retards the entry of water into the soil mantle as under natural conditions prior to development. A non-vegetated surface area which causes water to run off the surface in greater quantities or at an increased rate of flow from the flow present under natural conditions prior to development. Common impervious surfaces include, but are not limited to, roof tops, walkways, patios, driveways, parking lots or storage areas, concrete or asphalt paving, gravel roads, packed earthen materials, and oiled, macadam or other surfaces which similarly impede the natural infiltration of stormwater.

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R. "Land disturbing activity" means any activity that results in movement of earth, or a change in the existing soil cover (both vegetative and nonvegetative) and/or the existing soil topography. "Land disturbing activities" include, but are not limited to, clearing, grading, filling, and excavation. Compaction that is associated with stabilization of structures and road construction shall also be considered a land disturbing activity. Vegetation maintenance practices are not considered land disturbing activity. Stormwater facility maintenance is not considered land disturbing activity if conducted according to established standards and procedures.

Deleted: P

S. “Low impact development(LID)” means a stormwater and land use management strategy that strives to mimic pre-disturbance hydrologic processes of infiltration, filtration, storage, evaporation and transpiration by emphasizing conservation, use of on-site natural features, site planning, and distributed stormwater management practices that are integrated into a project design.

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T. “Low impact development best management practices(LID BMP)” means distributed stormwater management practices, integrated into a project design, that emphasize pre-disturbance hydrologic processes of infiltration, filtration, storage, evaporation and transpiration. LID BMPs include, but are not limited to, bioretention, rain gardens, permeable pavements, roof downspout controls, dispersion, soil quality and depth, minimal excavation foundations, vegetated roofs, and water re-use.

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U. “Low impact development (LID) principles” means land use management strategies that emphasize conservation, use of on-site natural features, and site planning to minimize impervious surfaces, native vegetation loss, and stormwater runoff.

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Deleted: means stormwater management and land development strategy applied at the parcel and subdivision scale that emphasizes conservation and use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely mimic predevelopment hydrologic functions.

V. “Municipal separate stormwater system (MS4)” means a conveyance, or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains):

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1. Owned or operated by the state, city, county, or special purpose district having jurisdiction over disposal of wastes, stormwater, or other wastes, or a designated and approved management agency under Section 208 of the CWA that discharges to waters of the United States;
2. Designed or used for collecting or conveying stormwater;
3. Which is not a combined sewer; and
4. Which is not part of a publicly owned treatment works (POTW) as defined at [40 CFR 122.2](#).

W. “Natural systems” means channels, swales, and other nonmanmade conveyance systems as defined by the first documented topographic contours existing for the subject property, either from maps or photographs, or such other means as appropriate. In the case of outwash soils with relatively flat terrain, no natural location of surface discharge may exist.

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X. “Operation and maintenance plan” means a set of instructions and schedules to keep drainage facilities working to meet the design performance criteria.

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Y. “Record drawings” means a submittal documenting as-built conditions of a permitted development or redevelopment project.

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Z. "Redevelopment" means, on a site that is already substantially developed (i.e., has 35 percent or more of existing hard surface coverage), the creation or addition of hard surfaces; the expansion of a building footprint or addition or replacement of a structure; structural development including construction, installation or expansion of a building or other structure; replacement of hard surface that is not part of a routine maintenance activity; and land disturbing activities.

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Comment [O5]: With hard surface edit, this matches the Permit definition (see hard surface discussion with "Development" definition). At the same time, it begs the question as whether redevelopment on sites with < 35% I.S would be considered New Development or Redevelopment. The Manual has a more straightforward definition in Volume I: "Conversion of an existing development to another land use, or addition of a material improvement to an existing development." This is noted for interest only.

AA. "Runoff" means water that travels across the land surface and discharges to water bodies either directly or through a collection and conveyance system.

AB. "Stormwater Manual" means the Stormwater Management Manual for Western Washington, published by the Washington State Department of Ecology. The version in effect is the most recent version that has been approved for City use by the director.

Comment [UD6]: Good point. I do prefer the more straight forward definition but will need input from planning and Engineering on this

AC. "Surface water" or "stormwater" means water originating from rainfall and other precipitation that is found on ground surfaces and in drainage facilities, creeks, rivers, streams, seeps, ponds, lakes, wetlands, as well as shallow ground water.

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AD. "Waters of the state" includes lakes, rivers, ponds, streams, inland waters, underground water, salt waters, estuaries, tidal flats, beaches, and lands adjoining the seacoast of the state, sewers, and all other surface waters and watercourses within the jurisdiction of the state of Washington. [Ord. 531 § 2 (Exh. 2), 2009]

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13.10.110 Utility created. 

A. There is hereby created and established the surface water utility of the city of Shoreline under which the provisions of this chapter shall be carried out.

B. The director is authorized to administer, implement, and enforce the provisions of this chapter. The director may establish inspection programs to ensure compliance with the requirements of this chapter and the Western Washington Phase II Municipal Stormwater Permit (Phase II Permit). [Ord. 531 § 2 (Exh. 2), 2009]

13.10.120 Revenue and expenditures. 

A. Fees, discounts and rebates associated with surface water management are set forth in the surface water management fee schedule in Chapter 3.01 SMC. All fees collected pursuant to this chapter shall be credited and deposited in the surface water utility enterprise fund pursuant to SMC 3.35.080.

B. Fees deposited in the surface water enterprise fund shall be expended for:

1. Administering, operating, maintaining, or improving the surface water system, including all or any part of the cost of planning, designing, acquiring, constructing, repairing, replacing, improving, regulating, educating the public, or operating drainage and stormwater facilities owned by the city;
2. Paying or securing the payment of all or any portion of any debt issued for such purpose and the related reserve and coverage requirements;

3. Providing a rebate for developed properties for the construction of approved Low Impact Development techniques including rain gardens, native vegetation, landscaping, or pervious pavement of at least 400 square feet, secured by a property covenant for repayment of the rebate if the improvement is discontinued within 10 years of payment.

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Comment [UD7]: This is referring to the LID Rebate program that may be expanded to include rebate for porous pavement. What about a broader description here... "construction of approved Low Impact Development techniques including rain gardens...."

Comment [PW8]: How about this expanded language?

C. Fees shall not be transferred to any other funds of the city except to pay for expenses attributable to the surface water system. [Ord. 659 § 1, 2013; Ord. 531 § 2 (Exh. 2), 2009]

13.10.200 Adoption of Stormwater Management Manual.

A. The city adopts by reference the Stormwater Management Manual for Western Washington published by Washington State Department of Ecology, henceforth referred to as "Stormwater Manual." The approved version shall be the most recent version that has been approved for City use by the director. All new development, redevelopment, and other activities which have the potential to impact surface water and stormwater shall comply with the standards set forth in the current effective approved version of the following unless specifically exempted by the Stormwater Manual:

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1. Stormwater Manual;
2. Western Washington Phase II Municipal Stormwater Permit, issued by the Washington Department of Ecology; and

3. City of Shoreline engineering development manual.

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B. Low Impact Development. Low impact development techniques shall be employed wherever feasible, consistent with the requirements of the Stormwater Manual. When low impact development techniques are employed, the design, construction, and ongoing maintenance shall be consistent with the Stormwater Manual, or with techniques approved by the public works director.

Deleted: , reasonable and appropriate before conventional on-site detention and infiltration methods are considered

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Low impact development principles shall also be employed wherever feasible in planning, site layout, and implementation of development and redevelopment projects. Low impact development principles include management strategies that emphasize conservation, use of on-site natural features, and site planning to minimize impervious surfaces, native vegetation loss, and stormwater runoff.

C. Emerging Technologies.

1. The use of emerging technologies is encouraged. Examples of emerging technologies include media filters, catch basin inserts, and engineered erosion control products.
2. The Washington State Department of Ecology's Technology Assessment Protocol (TAPE) or Chemical Technology Assessment Protocol (CTAPE) should be consulted by project proponents to determine which technologies may be appropriate for use on their project site.
3. The public works director has the authority to review and approve the use of emerging technologies.

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D. Deviations to the standards may be requested pursuant to SMC [20.30.290](#). [Ord. 531 § 2 (Exh. 2), 2009]

13.10.225 Minimum requirements. 

The requirements of this chapter are minimum requirements. They do not replace, repeal or supersede more stringent requirements, rules, regulations, covenants, standards, or restrictions. Where this chapter imposes requirements which are more protective of human health or the environment than those set forth elsewhere, the provisions of this chapter shall prevail. [Ord. 531 § 2 (Exh. 2), 2009]

13.10.230 Special drainage areas. 

A. The public works director may designate "special drainage areas" where it has determined that the existing flooding, drainage, and/or erosion conditions present a threat of harm to the welfare or safety of the surrounding community.

B. Activities in special drainage areas shall meet additional drainage requirements that are outlined in the engineering development manual. [Ord. 531 § 2 (Exh. 2), 2009]

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13.10.235 Construction Inspections. 

A. All development and redevelopment that could impact surface water is subject to inspection to assure consistency with the provisions of this chapter.

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B. Work for which a permit is required shall be subject to inspection by the director and such work shall remain accessible and exposed for inspection until approved. The city shall not be liable for expenses for the removal or replacement of any material required to allow inspection.

C. The standards of this code shall be enforced regardless of an inspection and approval of work.

D. Reports of approved inspection agencies may be accepted.

E. The permit holder shall notify the city when work is ready for inspection. The planning and development services director, upon notification, shall make the requested inspections and either approve that the portion of the work inspected or notify the permit holder of any portions of work that fail to comply with this code. Any portions that do not comply shall be corrected and shall not be covered until authorized by the director. [Ord. 531 § 2 (Exh. 2), 2009]

13.10.240 Record drawings and certifications. 

A. Before final approval of an engineered surface water drainage facility, the owner shall provide a record drawing that delineates the as-built conditions. The planning and development services director shall review and approve record drawings prior to final approval of the facility. Record drawings shall be prepared in accordance with the engineering development manual, and shall be stamped by a civil engineer.

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B. The record drawings shall include a certification that all facilities function in accordance with the plans, specifications, hydraulic computations, and design volumes shown on the approved plans or as approved by the director or the director's designee. [Ord. 531 § 2 (Exh. 2), 2009]

13.10.245 Operation and maintenance. 

A. Pursuant to the Stormwater Manual, the owner shall prepare an operation and maintenance plan for the constructed surface water drainage facilities. This plan is subject to review and approval by the planning and development services director.

Comment [UD9]: Since this is the operation and maintenance of a stormwater facility wouldn't it be approved by the Public Works Director or director designee?

Comment [UD10]: Shouldn't this be the PW Director?

B. When required, the planning and development services director shall prepare a declaration of covenant for signature by the owner. A covenant is required for all permanent stormwater facilities installed pursuant to the Stormwater Manual.

Comment [PW11]: We see this as an internal question for the City to determine (i.e., whether it would be appropriate to revisit allocation of certain authorities between department directors, either via code changes or a memorandum of understanding that administratively delegated authority).

C. The owner shall record the approved operation and maintenance plan and the associated declaration of covenant with King County recorder's office and provide a copy of the recorded document to the planning and development services director.

Comment [PW12]: See the January 20, 2016 TM "City of Shoreline Code, Standard, and Document Review" for discussion of alternative options to using covenants for this purpose.

D. The dedication of surface water facilities in the public right-of-way shall comply with SMC 20.70 140. [Ord. 531 § 2 (Exh. 2), 2009]

Comment [UD13]: There could be stronger language here...what are the consequences if the owner fails to provide the City with the record? How does the City enforce the OM plan?

Comment [PW14]: We see enforcement of this provision as similar to other code compliance issues, with established code enforcement authorities that could be brought to bear. If code authorities are revisited (e.g., covenants vs. alternative authority approaches) this section could be revisited.

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13.10.320 Prohibited discharges. SHARE

A. Any discharge into a municipal separate stormwater system (MS4) or waters of the state that is not composed entirely of stormwater, either directly or via an illicit connection, is considered an illicit discharge and is prohibited; provided, that the following discharges are not prohibited:

Deleted: that is not composed entirely of stormwater

1. Discharges made pursuant to the Phase II Permit or other current permit issued or approved by the Department of Ecology.
2. Discharges resulting from activities undertaken to avoid or lessen an imminent threat to public health or safety. Such public health or safety activities should minimize prohibited discharges to the maximum extent practicable. The city shall be notified of the occurrence within 24 hours.
3. Discharges not considered a significant source of contamination, as determined by the public works director, including:
 - a. Spring water;
 - b. Diverted stream flows;
 - c. Uncontaminated water from crawl space pumps, foundation drains, or footing drains;
 - d. Lawn watering or other activities using collected rainwater;
 - e. Pumped groundwater flows that are uncontaminated;
 - f. Materials placed as part of an approved restoration project;
 - g. Natural uncontaminated surface water or groundwater;
 - h. Flows from riparian habitats and wetlands;
 - i. Uncontaminated groundwater that seeps into or otherwise enters surface and groundwaters;
 - j. Air conditioning condensation.

Comment [PW15]: While awkward, this is typical permit language and similar to language used by other jurisdictions.

Comment [UD16]: Any suggestions on how to improve here?

4. Conditionally allowable discharges, provided that the identified conditions are met:

a. Discharges from potable water sources, including but not limited to water line flushing, hyperchlorinated water line flushing, fire hydrant system flushing, and pipeline hydrostatic test water. Planned discharges shall be dechlorinated to a total residual chlorine concentration of

0.1 ppm or less, pH-adjusted, if necessary, and volumetrically and velocity controlled to prevent re-suspension of sediments in the MS4.

b. Discharges from lawn watering and other irrigation runoff. These discharges shall be minimized by property owners.

c. Dechlorinated swimming pool, spa and hot tub discharges. The discharges shall be dechlorinated to a total residual chlorine concentration of 0.1 ppm or less, pH-adjusted and reoxygenized if necessary, volumetrically and velocity controlled to prevent re-suspension of sediments in the MS4. Discharges shall be thermally controlled to prevent an increase in temperature of the receiving water. Swimming pool cleaning wastewater and filter backwash shall not be discharged to the MS4.

d. Street and sidewalk wash water, water used to control dust, and routine external building washdown that does not use detergents. The the amount of street wash, building wash, and dust control water used shall be minimized.

e. Other non-stormwater discharges. The discharges shall be in compliance with the requirements of a pollution prevention plan reviewed by the Permittee, which addresses control of such discharges.

5. Discharges where no additional pollutants are being discharged from the site above the background conditions of the water entering the site; provided, that any prohibited discharges through illicit connections, dumping, spills, improper maintenance of surface water facilities, or other discharges that allow pollutants to enter surface water or ground water in violation of state water quality standards is considered a violation.

Comment [PW17]: This language is not in the Permit; intended to protect a property owner downstream of a prohibited discharge? Probably okay to leave in, but could consider deleting.

Comment [UD18]: Not clear what the intent is in the code here. Need to discuss with the team.

B. Prohibited discharges include, but are not limited to, the following:

1. Domestic or sanitary sewage;
2. Trash or debris;
3. Construction materials;
4. Steam cleaning wastes;
5. Pressure washing wastes;
6. Heated water;

7. Animal carcasses;
8. Domestic animal wastes;
9. Food wastes;
10. Yard wastes;
11. Silt, sediment, or gravel;
12. Petroleum products, including but not limited to oil, gasoline, grease, fuel oil, and heating oil;
13. Soaps, detergents, or ammonia;
14. Chlorinated spa or swimming pool water;
15. Antifreeze and other automotive products;
16. Metals in excess of naturally occurring amounts, in either particulate or dissolved form;
17. Degreasers and/or solvents;
18. Commercial and household cleaning products;
19. Drain cleaners;
20. Chemicals not normally found in uncontaminated water;
21. Flammable or explosive materials;
22. Acids, alkalis, or bases;
23. Painting products;
24. Pesticides, herbicides, or fertilizers;
25. Dyes, with the following exception: Dye testing is allowable but requires verbal notification to the city at least one business day prior to the date of the test; and
26. Any chemical or dangerous waste not listed above. [Ord. 531 § 2 (Exh. 2), 2009]

13.10.330 General requirements. [SHARE](#)

A. Requirement to Implement Best Management Practices.

1. Best management practices as specified in the Stormwater Manual shall be applied to any activity that might result in a prohibited discharge. Activities that might result in prohibited discharges include, but are not limited to, the following:

- a. Land disturbing activity;
- b. Potable water line flushing;
- c. Lawn watering with potable water;
- d. Dust control with nonpotable water;
- e. Vehicle and boat washing;
- f. Pavement and building washing;
- g. Swimming pool and hot tub maintenance;
- h. Auto repair and maintenance;
- i. Building repair maintenance;
- j. Landscape maintenance;
- k. Dangerous waste handling;
- l. Solid and food waste handling; and
- m. Pesticide application.

2. The owner or operator of a commercial or industrial establishment shall provide, at their own expense, reasonable protection from accidental discharge of prohibited materials or other wastes into the stormwater drainage system or waters of the state through the use of structural and nonstructural BMPs as defined in the Stormwater Manual. The director may require any person responsible for a property or premises which is, or may be, the source of an illicit discharge to implement, at their own expense, additional structural and nonstructural BMPs to prevent the further discharge of pollutants to the stormwater drainage system.

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B. Watercourse Protection. Any person owning property through which surface water or waters of the state passes shall keep and maintain that part of the watercourse within the property free of any activities or items that would pollute or contaminate the flow of water through the watercourse.

C. Notification of Spills. Notwithstanding other requirements of law, as soon as any person responsible for a facility or operation has information of any known or suspected illegal discharge into the surface water, stormwater drainage system or water of the state, said person shall take all necessary steps to ensure the discovery, containment, and cleanup of such release. In the event of a release of hazardous materials, said person shall immediately notify emergency response agencies of the occurrence via emergency dispatch services. In the event of a release of nonhazardous materials, said person shall notify the city no later than the next business day. If the discharge of prohibited materials emanates from a commercial or industrial establishment, the owner or operator shall also retain an on-site written record of the discharge and the actions taken to prevent its recurrence. Such records shall be retained for at least three years. [Ord. 531 § 2 (Exh. 2), 2009]

13.10.340 Operations, maintenance, and illicit discharge inspections and investigations.



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A. The director is authorized to establish inspection programs. Inspection programs may include: routine inspections; random inspections; inspections based upon complaints or other notice of possible violations; inspection of drainage basins or areas identified as higher than typical sources of sediment or other pollutant or pollutants; inspections of businesses or industries of a type associated with higher than usual discharges of pollutant or pollutants; and joint inspections with other agencies inspecting under environmental or safety laws. Inspections may include, but are not limited to: reviewing maintenance and repair records; sampling discharges, surface water, groundwater, and material or water in drainage control facilities; screening for or tracking illicit discharges or illicit connections; and evaluating the condition of drainage control facilities and other BMPs, including those located on private property.

B. Property owners shall allow access to all parts of the premises for the purpose of inspection, sampling, examination, and copying of records that must be kept under the conditions of an NPDES permit to discharge stormwater, and the performance of any additional duties as defined by state and federal law.

C. The director shall have the right to set up necessary equipment to conduct monitoring or sampling of discharge from stormwater facilities.

D. The director has the right to require the property owner to install stormwater facility monitoring equipment as necessary. Sampling and monitoring equipment shall be maintained at all times in a safe and proper operating condition at the property owner's expense. All devices used to measure stormwater flow and water quality shall be calibrated to ensure their accuracy.

Comment [UD19]: And if they do not, is there authority for the city to install at the expense of the property owner?

Comment [PW20]: The City's abatement authority could perhaps be used for this purpose, but this seems like more of a question for City legal representatives. I don't have the sense that this would often come up (i.e., that the City would require a property owner to install monitoring equipment), but I could be wrong.

E. Any temporary or permanent obstruction to the facility to be inspected and/or sampled shall be promptly removed by the property owner at the written or oral request of the director. Such obstructions shall not be replaced. The costs of clearing obstructions shall be born by the property owner. [Ord. 531 § 2 (Exh. 2), 2009]

13.10.400 Violations. 

Any activity or action caused or permitted to exist in violation of this chapter is a threat to public health, safety, and welfare, and is declared and deemed a public nuisance. Such violations are subject to enforcement under [SMC 20.30.720](#) through [20.30.790](#). [Ord. 531 § 2 (Exh. 2), 2009]

Comment [O21]: Code authority to enforce SMC 13.10 is specifically called out in SMC 20.30 (Code Enforcement chapter). Includes civil infractions, misdemeanors, abatement, penalties, appeals process. See discussion of code authority and enforcement in the January 20, 2016 TM "City of Shoreline Code, Standard, and Document Review".

Attachment B: Code Authority and Enforcement Reference Examples

GENERIC CODE AUTHORITY FOR STORMWATER ON-SITE INSPECTION AND ENFORCEMENT

(Adapted from City of Bellevue, WA)

Right of entry for inspection

A. An authorized representative of the utility may enter private property at all reasonable times to conduct inspections, tests or to carry out other duties imposed by the code, provided the utility shall first notify the proper owner or person responsible for the premises. If entry is refused, the director shall have recourse to every remedy provided by law to secure entry.

B. For inspection programs authorized by [cite code section providing authority of the Utility], the utility may provide advance mailings of its intent to inspect properties consistent with such inspection programs; provided the utility receives no objection from the property owner, the city may inspect private facilities consistent with the terms provided in the advance mailings. (Ord.x.)

Authority of the utility - generic

The utility, by and through its director or his designee, including enforcement officers, shall have the authority to:

A. Develop, adopt, and carry out procedures as needed to implement this code, engineering standards and related manuals, and to carry out other responsibilities of the utility, including, but not limited to, procedures pertaining to the billing and collection of monthly drainage charges and procedures for periodic adjustment of fees and charges imposed pursuant to this code;

B. Prepare, adopt, update, administer and enforce as needed engineering standards to establish requirements for the design and construction of drainage facilities and requirements for protecting existing facilities during construction. The engineering standards shall be consistent with this code and adopted city policies;

C. Administer and enforce this code and all procedures and standards relating to the planning, acquisition, security, design, construction and inspection of new storm and surface water systems and any alterations thereof;

D. Enter into any contract pursuant to Chapter 35.91 RCW, the Municipal Water and Sewer Facilities Act, including contracts which provide for the reimbursement of owners constructing facilities (latecomer

agreements) and agreements with private property owners for the extension of the drainage system (utility developer extension agreements);

E. Prepare, adopt, update, administer and enforce as needed maintenance standards to establish requirements for the maintenance of drainage facilities so they function as intended, protect water quality and provide flood control;

F. Develop and implement programs (including the private drainage inspection program), that administer, inspect, and enforce private storm and surface water systems to ensure continued compliance with provisions of this code. This program may include a requirement that property owners obtain third party inspections and certification of private systems and/or facility conditions, required maintenance, and system and/or facility performance;

G. Advise the city council, city manager, other city departments, and commissions on matters relating to the utility;

H. Prepare, revise as needed, recommend and implement a storm and surface water comprehensive plan for adoption by the city council. Prepare other planning studies as appropriate;

I. Coordinate development of a city-wide stormwater management program, as required by state and/or federal agencies, for review [and adoption/approval] by the city council;

J. Establish and implement programs to protect and maintain water quality and to manage stormwater runoff within the storm and surface water system in order to maintain compliance [to the maximum extent practicable] with applicable water quality and other stormwater standards and requirements established by state and/or federal agencies;

K. Perform or direct the performance of financial review and analysis of the utility's revenues, expenses, indebtedness, rates and accounting and recommend budgets, rates and financial policy for adoption by the city council;

L. Carry out such other responsibilities as required by this code or other city codes, ordinances or regulations consistent with the city's comprehensive [land use] plan and the storm and surface water comprehensive plan;

M. Conduct public education programs related to protection and enhancement of the storm and surface water system;

N. Develop and implement a program that includes administration, inspection and enforcement of new provisions or modifications to this code relating to the storm and surface water system for activities listed under [cite code section regarding permits/approvals] and [cite code section containing minimum stormwater requirements for development and redevelopment] to ensure continued compliance of storm and surface water systems with the provisions of this code. [Repair and/or replacement of private drainage facilities in kind are exempt from this program unless applicable under other portions of the code];

O. Enter into, to the extent allowed by law, an agreement with property owners for said owner to voluntarily contribute funds toward the construction of one or more drainage facilities that mitigate the impacts to the same receiving waters that have been identified as a consequence of the proposed new development or redevelopment; [insert other fee-in-lieu language here?]

P. Enforce the applicable provisions of this code should the director determine that a discharge from a site, real property, or storm and surface water system has exceeded, exceeds, or will exceed water quality standards at the point of assessment, or has caused or contributed, is causing or contributing, or will cause or contribute to a prohibited discharge or a known or likely known violation of water quality standards in the receiving water or a known or likely known violation of the city's municipal stormwater NPDES permit, and cannot be adequately addressed by the required best management practices;

Q. Take enforcement action, to the extent allowed by law pursuant to [cite civil violations section here];

R. Develop and implement an illicit discharge detection and elimination system program (IDDE) for storm and surface water systems;

S. Direct authorized representatives of the utility or enforcement officers to enter private property consistent with the provisions contained in [cite right of entry authority and civil violations code sections here] for inspections, tests, or to carry out other duties imposed by this code;

T. Direct authorized representatives of the utility or enforcement officers to take necessary abatement action during an emergency situation, to conduct inspections, take remedial action, or to carry out other duties imposed or required by this code subject to the provisions of [cite civil violations code section here];

U. Develop drainage basin plans pursuant to [cite stormwater code basin planning section here];

V. Prepare and update an emergency plan as required by state law, as part of the city's emergency operation plan; and

W. Rely, reference, and condition projects during development review with compliance of other applicable chapters of the [X] city code not otherwise contained in this code, including but not limited to [cite land use code title, civil violations code section, clearing and grading code, others here].

City of Davis Stormwater Code Enforcement

Chapter 30 STORMWATER MANAGEMENT AND DISCHARGE CONTROL

Article 30.06 VIOLATIONS, ENFORCEMENT, AND PENALTIES

30.06.010 Violations.

Any action or inaction that violates any provision of this chapter and/or the requirements of a recorded stormwater maintenance agreement, may be subject to the enforcement actions set forth in this article. Any such action or inaction is deemed to be a public nuisance and may be abated by injunctive or other equitable relief. The imposition of any of the penalties set forth below shall not prevent such equitable relief. (Ord. 2391 § 1, 2012)

30.06.020 Notice of violation.

(a) Whenever the city finds that a person has violated a provision of this chapter or has failed to meet a requirement of this chapter, the city may order compliance by written notice of violation to the responsible person. Such notice may require, without limitation, all or some of the following measures:

- (1) Performance of monitoring, analysis and reporting;
- (2) Proof of the elimination of illicit connections or discharges;
- (3) Termination of violating discharges, practices or operations;
- (4) Abatement or remediation of stormwater pollution or contamination hazards and the restoration of any affected property;
- (5) Payment of a fine to cover administrative and remediation costs, if any, borne by the city;
- (6) Implementation or maintenance of source control or treatment control measures; and/or
- (7) A plan to eliminate illicit discharges.

(b) If abatement of a violation and/or restoration of affected property is required, the notice of violation shall set forth a deadline by which such remediation or restoration must be completed. The notice shall further advise that, should the violator fail to comply by the established deadline, the work may be performed by the city, or by a contractor designated by the city, and the costs for such work shall be charged to the property owner. If the property owner fails to reimburse the city, a lien upon and against the property may be imposed and shall remain in force until the amount is paid. Said lien shall be imposed and collected in accordance with the applicable provisions of state law and of this Code. (Ord. 2391 § 1, 2012)

30.06.030 Penalties.

In the event the remedial measures described in the notice of violation have not been completed by the date set forth for such completion, any one or more of the following actions or penalties may be taken or assessed against the person to whom the notice of violation was directed.

(a) **Stop work order.** The city may issue a stop work order, which shall be served on the property owner or other responsible person. The stop work order shall remain in effect until the

property owner or other responsible person has implemented the remedial measures set forth in the notice of violation or has otherwise cured the violation or violations described therein, provided the stop work order may be withdrawn or modified to enable the property owner or other responsible person to implement the necessary remedial measures to cure the violation or violations.

(b) **Withhold certificate of occupancy.** The city may refuse to issue a certificate of occupancy for the building or other improvements constructed or being constructed on the site until the property owner or other responsible person has implemented the remedial measures set forth in the notice of violation or has otherwise resolved the violations described therein.

(c) **Suspension, revocation or modification of permit.** The city may suspend, revoke or modify permits issued by the city. A suspended, revoked or modified permit may be reinstated after the property owner or other responsible person has taken the remedial measures set forth in the notice of violation or has otherwise resolved the violations described therein, provided such permit may be reinstated upon such conditions as the city may deem necessary to enable the property owner or other responsible person to take the necessary remedial measures to cure such violations.

(d) **Civil penalties.** In the event the property owner or other responsible person fails to take the remedial measures set forth in the notice of violation, the city may impose a penalty not to exceed five thousand dollars (depending on the severity of the violation) for each violation for each day the violation(s) continue(s).

Civil penalties may be imposed either on a daily basis or on a per gallon basis, but not both, for any discharge of non-stormwater to storm drains that violates any provision of this chapter. Civil penalties imposed on a daily basis shall not exceed five thousand dollars for each day or portion of a day that the discharge occurs, and civil penalties imposed on a per gallon basis shall not exceed ten dollars for each gallon of discharge. The total civil penalty imposed shall be determined by taking into consideration some or all of the following factors: the nature, circumstances, extent, and gravity of the discharge; whether the discharge is susceptible to cleanup or abatement; the degree of toxicity of the discharge, and, with respect to the violator, the ability to pay; the effect on the violator's ability to remain in business; any voluntary cleanup efforts undertaken; any prior history of violations; the degree of culpability; the economic benefit or savings, if any, resulting from the violation; and such other matters as justice may require.

(e) **Criminal penalties.** Any person who knowingly or willfully violates any provision of this chapter, or the orders, rules, regulations and permits issued hereunder, shall be guilty of a misdemeanor, punishable by a fine of not more than one thousand dollars or by six months imprisonment, or both. Each act of violation and each day on which a violation occurs or continues shall constitute a separate offense. (Ord. 2391 § 1, 2012)

30.06.040 Appeals.

(a) Any person aggrieved by an action or decision of the director may file a written notice of appeal with the city manager within ten calendar days from the date of the action or decision. If an appeal is not filed within that time, the determination of the director shall be final. The written notice of appeal shall set forth in detail all the facts supporting the appellant's request. The written notice of appeal shall be accompanied by the applicable fee to cover the costs of the appeal.

(b) The city manager shall within fifteen days of receiving the written notice of appeal designate an impartial hearing officer to hear the appeal and mail written notice to the appellant of

the hearing date, time, and place at least ten business days before the hearing. The hearing date shall not be more than thirty days from the mailing of such notice to the appellant. Employees of the city shall not be eligible to serve as the hearing officer. A notice of the time and place for the hearing shall be published in a newspaper of general circulation in the city.

(c) If the appellant wishes to have the hearing transcribed, the appellant may request that a court reporter be present at the hearing. The appellant shall bear all costs and expenses of the transcription.

(d) At the hearing, the appellant shall have the opportunity to present information supporting his or her position with respect to the director's action or decision. After the conclusion of the hearing, the hearing officer shall submit a written report to the city manager setting forth a brief statement of facts found to be true, a determination of the issues presented, conclusions, and a recommendation whether to uphold, modify, or reverse the director's action or determination. Upon receipt of the written report, the city manager shall make a determination and shall issue a decision and order within thirty calendar days of the hearing. The city manager's written decision and order shall be sent by certified mail to the appellant or to appellant's attorney if appellant is represented by one. The decision of the city manager shall be final. (Ord. 2391 § 1, 2012)

30.06.050 Remedies not exclusive.

The remedies set forth in this article are in addition to, and do not supersede or limit any and all other available remedies, either civil or criminal. The remedies set forth in this article shall be cumulative to, and not exclusive of, each other. (Ord. 2391 § 1, 2012)

Attachment C: Covenant Alternative Approach Examples



Auburn Inspection Access Example (alternative code authority):

13.48.180 Inspection and compliance with storm drainage requirements.



A. Duly authorized personnel of the city shall have free access to private property at hours subject to the provisions of ACC [1.20.010](#) for the purpose of inspecting private storm drainage systems, the manner in which they are being used, and the satisfactory compliance with the provisions of this article.

B. Any property, where the existing storm drainage facilities were constructed per approved construction plans, found to be in nonconformance with such plans, shall be required to correct all such nonconformances as directed by the city. If, after proper notice, the property owner does not comply with set requirements as directed by the city, then the city shall have the authority to correct such nonconformances and bill the property owner for all reasonable costs. Any delinquent payments shall constitute a lien as fixed by ACC [13.06.300](#).

C. Inspections of storm water treatment and flow control facilities shall be performed by the city at a frequency to comply with the Western Washington Phase II Municipal Stormwater NPDES Permit.

D. New residential developments that are part of a larger common plan of development or sale shall be inspected every six months during the period of heaviest house construction (i.e., one to two years following subdivision approval or until 50 percent of build-out is achieved) to identify maintenance needs and enforce compliance with the maintenance standards as needed. (Ord. 6283 § 4, 2009; Ord. 5853 § 1, 2004; Ord. 5212 § 1 (Exh. J), 1999; Ord. 4492 § 4, 1991.)

22.807.020 - Drainage control review and application requirements

c. Memorandum of Drainage Control. The owner(s) of the site shall sign a "memorandum of drainage control" that has been prepared by the Director of SPU. Completion of the memorandum shall be a condition precedent to issuance of any permit or approval for which a drainage control plan is required. The applicant shall file the memorandum of drainage control with the King County Recorder's Office so as to become part of the King County real property records. The applicant shall give the Director of SPU proof of filing of the memorandum. The memorandum shall not be required when the drainage control facility will be owned and operated by the City. A memorandum of drainage control shall include:

- 1) The legal description of the site;
- 2) A summary of the terms of the drainage control plan, including any known limitations of the drainage control facilities, and an agreement by the owners to implement those terms;
- 3) An agreement that the owner(s) shall inform future purchasers and other successors and assignees of the existence of the drainage control facilities and other elements of the drainage control plan, the limitations of the drainage control facilities, and of the requirements for continued inspection and maintenance of the drainage control facilities;
- 4) The side sewer permit number and the date and name of the permit or approval for which the drainage control plan is required;
- 5) Permission for the City to enter the property for inspection, monitoring, correction, and abatement purposes;
- 6) An acknowledgment by the owner(s) that the City is not responsible for the adequacy or performance of the drainage control plan, and a waiver of any and all claims against the City for any harm, loss, or damage related to the plan, or to drainage or erosion on the property, except for claims arising from the City's sole negligence; and
- 7) The owner(s)' signatures acknowledged by a notary public.

22.807.090 - Maintenance and Inspection

- Amended by Ordinance No. 124872

A. Responsibility for Maintenance and Inspection. The owner and other responsible party shall maintain drainage control facilities, source controls, and other facilities required by this subtitle and by rules adopted hereunder to keep these facilities in continuous working order. The owner and other responsible party shall inspect permanent drainage control facilities temporary drainage

control facilities, and other temporary best management practices or facilities on a schedule consistent with this subtitle and sufficient for the facilities to function at design capacity. The Director may require the responsible party to conduct more frequent inspections and/or maintenance when necessary to ensure functioning at design capacity. The owner(s) shall inform future purchasers and other successors and assignees to the property of the existence of the drainage control facilities and the elements of the drainage control plan, the limitations of the drainage control facilities, and the requirements for continued inspection and maintenance of the drainage control facilities.

B. Inspection by City. The Director of SPU may establish inspection programs to evaluate and, when required, enforce compliance with the requirements of this subtitle and accomplishment of its purposes. Inspection programs may be established on any reasonable basis, including but not limited to: routine inspections; random inspections; inspections based upon complaints or other notice of possible violations; inspection of drainage basins or areas identified as higher than typical sources of sediment or other contaminants or pollutants; inspections of businesses or industries of a type associated with higher than usual discharges of contaminants or pollutants or with discharges of a type which are more likely than the typical discharge to cause violations of state or federal water or sediment quality standards or the City's NPDES stormwater permit; and joint inspections with other agencies inspecting under environmental or safety laws. Inspections may include, but are not limited to: reviewing maintenance and repair records; sampling discharges, surface water, groundwater, and material or water in drainage control facilities; and evaluating the condition of drainage control facilities and other best management practices.

C. Entry for Inspection and Abatement Purposes.

1. New Installations and Connections. When any new drainage control facility is installed on private property, and when any new connection is made between private property and a public drainage system, sanitary sewer or combined sewer, the property owner shall grant, per subsection 22.807.020.B.1.c (Memorandum of Drainage Control), the City the right to enter the property at reasonable times and in a reasonable manner pursuant to an inspection program established pursuant subsection 22.807.090.B, and to enter the property when the City has a reasonable basis to believe that a violation of this subtitle is occurring or has occurred, and to enter when necessary for abatement of a public nuisance or correction of a violation of this subtitle.

2. Existing Real Property and Discharges. Owners of property with existing discharges or land uses subject to this subtitle who are not installing a new drainage control facility or making a new connection between private property and a public drainage system, sanitary sewer or combined sewer, shall have the option to execute a permission form for the purposes described above when provided with the form by the Director of SPU.

(Ord. [123105](#), § 3, 2009.)

Puyallup Maintenance Agreement Example (alternative to covenant):

21.10.270 Maintenance agreement. 

(1) Prior to the issuance of any land disturbing permit, street excavation permit, clearing, filling and grading permit, building permit, or other approval or permit that triggers application of this chapter, the city shall require the developer to execute an inspection and maintenance agreement that is binding on all subsequent owners of land served by the private stormwater facility. Such agreement shall provide for access to the system at reasonable times for regular inspection by the city and for regular or special assessments of property owners to ensure that the facility is maintained in proper working condition to meet design standards and any provisions established.

(2) The agreement shall be recorded by the developer and/or owner in the land records of Pierce County.

(3) The agreement shall also provide that, if after notice by the city to correct a violation requiring maintenance work and satisfactory corrections are not made by the responsible entities within a reasonable period of time as determined by the city, the city may perform all necessary work to place the facility in proper working condition. The city may assess the cost of the work and any penalties against the entity that is responsible for, or benefits from, the operation and maintenance of the facility, and there shall be a lien on the property, which may be placed on the tax bill and collected as ordinary taxes by the city. (Ord. 2951 § 1 (Exh. A), 2010).

Skagit County Easement Approach Example (alternative to covenant):

14.32.080 Stormwater management.

(10) Easements, Tracts and Covenants.

(a) Drainage easements shall be provided in a proposed development for all stormwater and drainage conveyance systems that are not located in public rights-of-way or tracts. Said drainage easements shall be granted to the parties responsible for providing on-going maintenance of the systems. Drainage easements through non-drainage structures are not permitted.

(b) Stormwater facilities that are to be maintained by Skagit County, together with maintenance access roads to said facilities, shall be located in public right-of-way, separate tracts dedicated to Skagit County, or drainage easements located in designated open space.

(c) All runoff from impervious surfaces, roof drains, and yard drains shall be directed so as not to adversely effect adjacent properties. Wording to this effect shall appear on the face of all final plats, and shall be contained in any covenants required for a development.

Attachment D: Construction Stormwater Permit Examples



Auburn Stormwater Connection Permit (alternative stormwater permitting approach):

13.48.230 Connections.

A. Required Connections. All non-single-family residential building permits shall be subject to a mandatory connection to a public storm drainage system where the development has the potential to negatively impact public or private property or receiving waters as determined by the city or whenever an existing public system is available adjacent to the site or where the public system is required to be constructed adjacent to the property as a condition of development.

B. Existing Connections. Properties that apply for a building permit to make an addition, alteration or repairs that have 2,000 square feet or more of new or new plus replaced impervious surfaces or land disturbing activity of 7,000 square feet or more must comply with the applicable Minimum Requirements for Redevelopment as given in Volume I of the SWMM. All redevelopment shall be required to comply with Minimum Requirement No. 2 (Construction Storm Water Pollution Prevention). All redevelopment that exceeds these thresholds shall be required to comply with additional Minimum Requirements as given in Volume I of the SWMM. (Ord. 6283 § 8, 2009; Ord. 6015 § 1, 2006; Ord. 5853 § 1, 2004; Ord. 5530 § 1, 2001; Ord. 5212 § 1 (Exh. J), 1999; Ord. 4492 § 4, 1991.)

13.48.240 Connection procedures – Permit required.

A. It is unlawful for any person to construct or connect to a public or private storm drainage system without first obtaining a written permit to do so from the city.

B. It is unlawful for any person to repair or replace either a private or public storm drainage system without first obtaining a written permit to do so from the city, unless such repair or replacement constitutes an emergency. (Ord. 5853 § 1, 2004; Ord. 5212 § 1 (Exh. J), 1999; Ord. 4492 § 4, 1991.)

13.48.250 Permit – Term.

Applications for storm permits shall be valid for 365 days. All permits issued under the provisions of this chapter shall be valid for a period of 365 days after the date of permit issuance. Permits may be extended by the city, in 180-day increments, if an extension is applied for prior to the expiration of the permit. If the time extension is not requested prior to the expiration of the permit, a new permit is required and an additional fee equal to one-half the original permit shall be charged. (Ord. 6283 § 9, 2009; Ord. 5853 § 1, 2004; Ord. 5212 § 1 (Exh. J), 1999; Ord. 4492 § 4, 1991.)

Puyallup Permit Requirement Example (includes stormwater permitting requirements):

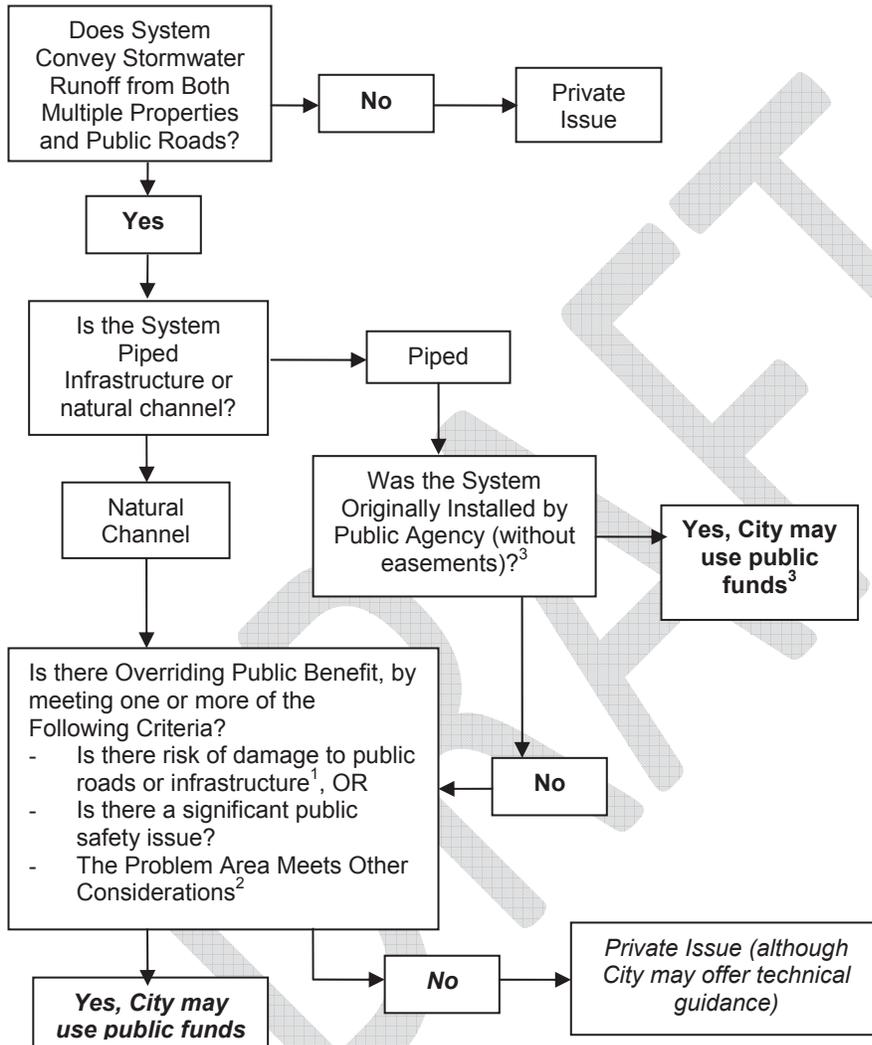
21.10.100 Permit required. 

The city shall not issue a land disturbing permit, street excavation permit, clearing, filling and grading permit, building permit, or other approval or permit that triggers application of this chapter, to a developer unless the requirements of this chapter are satisfied. (Ord. 2951 § 1 (Exh. A), 2010).

Attachment E: Public and Private System Responsibility Examples

Draft Decision Guidelines for Use of Utility Funds on Private Property.

In an effort to provide consistent guidance on use of public funds to improve and/or maintain drainage systems on private property, the following flow chart was developed to provide a framework for decision making.



Footnotes:

- ¹. Includes flooding or erosion that results in (or could result in future) damage to public roads, infrastructure or structures.
- ². There may be other considerations that provide additional justification for overriding public benefit, including: the system is a trunk system where failure of system could result in neighborhood problems; there is an NPDES permit driver to meet water quality standards; the problem is causing significant environmental degradation to a stream or wetland; the project to solve a problem provides significant benefit compared to the cost, and meets objectives stated in the City's Surface Water Master Plan; or the problem lies within jointly owned properties (e.g., native growth protection areas) where it would be very difficult for private parties to implement solutions.
- ³. In some areas, King County constructed improvements without securing easements. In these cases, there may be a legal justification for the City to secure drainage easements and assume maintenance, particularly if it is a trunk system that serves multiple properties. The City may require that the system be brought up to City standards and that the easement be provided to City at no cost.

Language Excerpt from

THE CITY OF BELLEVUE STORM AND SURFACE WATER SYSTEM PLAN DRAFT October 2015 (pp 58, 59)

Policy

The Utilities Department shall own and maintain all components of the storm and surface water system in city-owned right-of-way and in easements or tracts dedicated to, and accepted by, the Utilities Department. The Utilities Department should not acquire or accept additional new or existing System components outside the city-owned right-of-way (through easements, ownership, or other property rights) except when needed for Utilities Department construction projects identified in the Utilities Department Capital Investment Program, or when all of the following conditions are met:

- 1. There is a public benefit;*
- 2. Easement or property is offered by the property owner at no cost;*
- 3. The system meets current City standards or is brought up to current City standards by the owner;*
- 4. There is access for Utilities Department maintenance from public right-of-way;*
- 5. The Utilities Department has adequate resources to maintain the system, and for detention systems;*
- 6. The system serves a residential plat or short plat (rather than a commercial property).*

Discussion

Much of the stormwater system in Bellevue is not owned by the Utilities Department. Private drainage conveyance and detention systems are those components for which the Utilities Department does not have a property interest. Detention and conveyance systems located in City-owned right-of-way are owned and maintained by the Utilities Department. In addition, the Utilities Department has acquired easements, rights-of-way, or fee titles (through purchase or dedication) for some additional system components.

All detention systems must be maintained to ensure they function as designed for flood control. Detention system maintenance also benefits water quality when trapped pollutants are removed from the system rather than being flushed downstream during a major storm. The Utilities Department maintains its facilities through ownership and allocation of maintenance resources. The functionality of private detention facilities is sought through the City's private drainage inspection (PDI) program. Where practical, and when in the public interest, multi-purpose detention facilities should be encouraged.

The City's historical policy has been to acquire control of system components on an as-needed basis when brought up to current City standards by others or through an approved Utilities Department project. An aggressive program to acquire additional segments of the stormwater system (conveyance and detention) is not recommended because:

- Owning and maintaining the stormwater system would not address the City's water quality and flood control responsibilities because pollutants and runoff originate throughout each drainage basin. Also, most of the primary conveyance systems are streams (riparian corridors), and streams are regulated through local and state regulations.

- Acquiring all conveyance systems and bringing them up to standard would be high in cost and would also result in increased operation and maintenance costs.
- Assuming substandard systems could increase City liability.
- Continuing to work with property owners to ensure maintenance of privately owned detention systems is an objective of the Utilities Department's private maintenance and inspection program.
- Assuming ownership of private systems is not necessarily equitable to ratepayers