

Fact Sheet for the

Phase I Municipal Stormwater Permit

National Pollutant Discharge Elimination System and  
State Waste Discharge General Permit  
For discharges from  
Large and Medium Municipal Separate Storm Sewer Systems

November 4, 2011

STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY  
OLYMPIA, WASHINGTON 98504-7600

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## 1.0 Introduction

This Fact Sheet accompanies the final draft *National Pollutant Discharge Elimination System (NPDES) and State Waste Discharge Permit for Discharges from Large and Medium Municipal Separate Storm Sewers* (the Phase I Permit). The Fact Sheet serves as the documentation of the legal, technical, and administrative decisions Ecology has made in the process of reissuing the permit.

The Washington Department of Ecology (Ecology) issued the Phase I permit on January 17, 2007, and modified it on June 17, 2009 and September 1, 2010. The Phase I permit authorizes the discharge of stormwater to waters of the State of Washington from municipal separate storm sewers that are owned and operated by the permittees.

As required by RCW 90.48.260 through 2011 legislation, Ecology will issue two of each Eastern and Western Washington Phase II permits by July 31, 2012. RCW 90.48.260 directs:

*By July 31, 2012, the department shall:*

- (a) Reissue without modification and for a term of one year any national pollutant discharge elimination system municipal storm water general permit first issued on January 17, 2007; and*
- (b) Issue an updated national pollutant discharge elimination system municipal storm water general permit for any permit first issued on January 17, 2007. An updated permit issued under this subsection shall become effective beginning August 1, 2013.”*

While not required to do so, Ecology is proposing a similar two-permit process for the Phase I permit. Ecology is proposing to re-issue the current Phase I permit with minimal changes for a period of one year. At the same time, Ecology proposes to issue the revised/updated Phase I permit which would be effective starting August 1, 2013 through August 1, 2018. This Fact Sheet addresses the revised/updated Phase I permit.

As required by paragraph 402(p)(3) of the Clean Water Act, discharges covered under this permit must effectively prohibit non-stormwater discharges into municipal separate storm sewers that discharge to surface waters and must apply controls to reduce the discharge of pollutants to the Maximum Extent Practicable (MEP). As authorized by RCW 90.48.030 and RCW 90.48.162, Ecology also takes action through this permit to control impacts of stormwater discharges to all waters of Washington State, including ground waters, unless the discharges are authorized by another regulatory program.

Discharges from agricultural runoff, irrigation return flows, process and non-process wastewaters from industrial activities, and stormwater runoff from areas served by combined sewer systems are not regulated directly by this permit. These types of discharges may be regulated by local or other state requirements if they discharge to municipal separate storm sewers. This permit authorizes the municipal separate storm sewer to discharge stormwater that comes from construction sites or industrial activities under certain conditions.

You may download copies of the draft permit documents at:

<http://www.ecy.wa.gov/programs/wq/stormwater/municipal/2012draftMUNIPermits.html>

## 2.0 Public Involvement Opportunities

### 2.1 Public Comment Period

Ecology invites public comment on the proposed draft permit and fact sheet until 5:00 p.m. on Thursday, February 3, 2012. Ecology welcomes all comments that address the permit requirements in these formal draft documents.

Ecology will issue the final permit after it considers all public comments and makes final changes to the draft permit. Ecology will publish a *Response to Comments* document with the final permit to address comments submitted during the public comment period.

### 2.2 Information to Include with Each Comment

In order for Ecology to adequately address comments, please include the following information with each comment:

- The permit(s) subject to your comment.
- The specific permit language used in the requirement subject to your comment. Include the page number(s) and, where indicated, section reference (i.e., S8.D.2.b).
- A brief, concise comment including the basis for the comment, and in particular the legal, technical, administrative, or other basis for the concern.
- Suggested permit language or a conceptual alternative to address your concern.

### 2.3 How to Submit a Comment

#### Written Comments

Send written comments to Ecology by one of the methods below:

- Send permit comments by e-mail to: [SWPermitComments@ecy.wa.gov](mailto:SWPermitComments@ecy.wa.gov)
- Send permit comments in hard copy by mail to:

Carrie Graul  
WA Department of Ecology  
Water Quality Program  
PO Box 47696  
Olympia, WA 98504-7696

#### Oral Comments

Submit oral comments by attending and testifying at the public hearings. (See Section 2.4 *Public Hearing and Workshop Schedule* for more information).

## 2.4 Public Hearing and Workshop Schedule

The public hearings will provide an opportunity for the public to give formal comments on the draft permit or fact sheet. Each hearing will immediately follow a short workshop with a question and answer session.

Before each public hearing listed below and on one other date (also listed below), Ecology will host a general public workshop on the proposed changes in the draft permit during the public comment period. The workshops provide Ecology an opportunity to explain the proposed changes to the permit, and to answer questions. Ecology will not accept formal oral testimony or comments on the draft permit or fact sheet during the public workshops, but will during the public hearings. Each workshop will address all the proposed permit changes.

January 9, 2012 10am	Lacey workshop and public hearing WA Dept of Ecology 300 Desmond Drive SE Lacey, WA 98503 <a href="http://www.ecy.wa.gov">www.ecy.wa.gov</a>
January 10, 2012 10am	Vancouver workshop and public hearing WA State School for the Blind Fries Auditorium 2214 East 13 <sup>th</sup> Street Vancouver, WA 98661 <a href="http://www.wssb.wa.gov">www.wssb.wa.gov</a>
January 17, 2012 10am	Mount Vernon workshop and public hearing Skagit Transit Station 105 East Kincaid Mt. Vernon, WA 98273 <a href="http://www.skagittransit.org">www.skagittransit.org</a>
January 24, 2012 9am	Renton workshop and public hearing Renton Community Center 1715 Maple Valley Highway Renton, WA 98057 <a href="http://www.renton.wa.gov">www.renton.wa.gov</a>

Ecology will hold an informational public workshop without a public hearing on the final draft permit at the following date, time and location in western Washington:

January 19, 2012      Poulsbo workshop  
10am- 2pm            City Council Chambers  
                             200 NE Moe Street  
                             Poulsbo, WA 98370

Please direct questions about the public hearings/workshops and requests for printed copies of the Draft Permit, Fact Sheet, and Notice of Intent to Jocelyn Jones, [jocelyn.jones@ecy.wa.gov](mailto:jocelyn.jones@ecy.wa.gov) or 360-407-7529.

Please direct questions about the Notice of Intent, the Phase II Draft Permits, or Fact Sheet for the Phase II permits to Harriet Beale, [harriet.beale@ecy.wa.gov](mailto:harriet.beale@ecy.wa.gov) or 360-407-6457.

Please direct questions about the Phase I Draft Permits, or Fact Sheet for the Phase I Permit to Carrie Graul, [carrie.graul@ecy.wa.gov](mailto:carrie.graul@ecy.wa.gov) or 360-407-7221.

## **2.5 Issuance of the Final Permit**

Recent state legislation affected the reissuance dates of the Phase II Municipal Stormwater General Permits. To maintain an alignment of Phase I permit issuance dates with the Phase II permits, by July 31, 2012, Ecology will reissue the existing Phase I permit unchanged for a period of one year (effective August 1, 2012 through July 31, 2013). At the same time, Ecology will issue the revised/updated Phase I permit (effective starting August 1, 2013 through August 1, 2018).

Ecology will issue the final permits after reviewing and considering all public comments. Ecology expects to issue the final permits in June of 2012. Ecology will send a copy of the Notice of Issuance to all persons who submitted written comment or gave public testimony at the public hearings.

Ecology will append the final fact sheets for the permits with a summary of a response to comments. Parties submitting comments will receive a notice on how to obtain copies of the final permit and Ecology's response to comments.

## **2.6 Public Involvement Opportunities Prior to October 19, 2011**

Ecology conducted a number of public involvement processes in preparation for reissuance of the municipal stormwater general permits, including the Phase I permit.

### **Puget Sound Monitoring Consortium**

In October, 2007 the Puget Sound Monitoring Consortium began a stakeholder process funded by the Washington State Legislature to develop monitoring recommendations for the 2013-2018 permit cycle. This group became the Stormwater Work Group (SWG) in October 2008, with Ecology providing staff support. Permittees, representatives of federal, state, and local



governments, environmental groups, and businesses participated. Additional seats were designated for tribes, ports, and agriculture. The SWG met over several years, and in 2010 delivered to Ecology recommendations for monitoring requirements for Puget Sound. The SWG continues to advise Ecology and will contribute members to an oversight committee for the monitoring program. (See SWG materials on Ecology's website at <http://www.ecy.wa.gov/programs/wq/psmonitoring/swworkgroup.html> )

### **Low Impact Development (LID) Advisory Process**

A Pollution Control Hearings Board ruling in August 2008 mandated that Ecology modify the Phase I permit to require permittees to require low impact development (LID) where feasible in new development and re-development. A February 2009 ruling on the Western Washington Phase II permit appeal directed Ecology to bring the Western Washington Phase II permittees to a similar level of implementation on a timeline to be determined by Ecology. In May 2009, Ecology received funding from the Environmental Protection Agency (EPA) to conduct a stakeholder advisory process from a broad range of interested parties to discuss LID requirements for the Phase I and Western Washington Phase II permits.

Ecology formed two advisory committees comprised of representatives from local government permittees, state government, ports, environmental groups, scientists, consultants, and the development industry. The advisory groups met eleven times between October 2009 and August 2010. The committees provided input to Ecology on the definition of LID, a performance standard, feasibility criteria, and a number of implementation issues. In August 2010, Ecology presented an outline of the proposed LID requirements and took comments from the committee members and the broader interested public. Meeting materials, summaries, references, and comments on Ecology's proposal are available on Ecology's website. The committees met jointly again in May 2011 to provide input on Ecology's preliminary draft LID proposed language. (See LID advisory process materials at: <http://www.ecy.wa.gov/programs/wq/stormwater/municipal/LIDstandards.html>).

### **Listening Sessions**

In August and September 2010, Ecology hosted listening sessions statewide to announce the reissuance schedule and gather input for preparing to reissue the 2012 permits. More than 200 people attended the listening sessions statewide. The agency provided information regarding Ecology's proposed priorities for revisions to the permits. Nine listening sessions were held:

- Tacoma, August 4, 2010
- Ellensburg, August 10, 2010
- Spokane, August 11, 2010
- Kennewick, August 13, 2010
- Lacey, August 19, 2010
- Vancouver, August 24, 2010
- Mount Vernon, August 27, 2010

- Renton, September 8, 2010
- Poulsbo, September 27, 2010

During the listening sessions, Ecology accepted email and online comments from August 2010 to October 2010. Ecology posted the listening session notes and online comments on its website and considered these comments as it developed the permit revisions. (See listening session materials at <http://www.ecy.wa.gov/programs/wq/forms/listeningsessionscomments.html>)

### Spring 2011 Informal Public Comment Period

Ecology provided an additional public review opportunity for the permit reissuance process in the spring of 2011. From May 16, 2011 to June 17, 2011 Ecology invited informal public comment on preliminary draft permit language on LID and monitoring. The Phase I preliminary draft permit language included revisions to Appendix 1, as well as explanatory notes documenting Ecology's rationale for the proposed draft requirements.

The preliminary draft documents generated a broad response. Ecology received comments from over 85 individuals or entities via email, letters, and an online comment form. This extra step in the public process provided valuable input from a wide range of interested parties. Ecology considered those comments as it developed these proposed draft permit requirements for LID and monitoring. The preliminary draft language, explanatory notes, associated documents, and all the comments are available on Ecology's website at: <http://www.ecy.wa.gov/programs/wq/stormwater/municipal/LIDmonitorCOMMENTS/informalcomments.html>

## 3.0 Background

### 3.1 The Stormwater Problem

Stormwater runoff is the leading pollution threat to lakes, rivers, streams and marine water bodies in urbanized areas of Washington State. The large impervious surfaces in urban areas increase the quantity and peak flows of runoff, which in turn cause hydrologic impacts such as scoured streambed channels, in-stream sedimentation and loss of habitat. Impacts from stormwater are highly site-specific and vary geographically due to differences in local land use conditions, hydrologic conditions, and the type of receiving water.

The following is a list of typical impacts caused by stormwater discharges:

- **Human Health:** In general, untreated stormwater is unsafe. It contains toxic metals, organic compounds, and bacteria. Untreated stormwater is not safe for people to drink, and is not recommended for swimming.
- **Drinking Water:** In some areas of Washington, notably Spokane County and parts of Pierce and Clark counties, gravelly soils allow rapid infiltration of stormwater. Untreated

stormwater discharging to the ground could contaminate aquifers that are used for drinking water.

- **Salmon Habitat:** Urban stormwater degrades salmon habitat in streams through effects on hydrologic flows and toxicity. Paved surfaces cause greater winter stormwater flows that erode stream channels, destroying spawning beds. Also, since stormwater does not infiltrate during the wet season, streams can lose summertime base flows, drying out habitat needed for salmon rearing. Toxic chemicals in stormwater harm the immature fish and the adults returning to spawn. Two studies have identified concerns:
  - Ecology and Pierce County recently conducted *in situ* trout toxicity testing studies. Pierce County found no significant toxicity in four urban streams in 2008.<sup>1</sup> However, Ecology identified the following chemical stressors that were capable of causing adverse effects that were detected on the native trout embryos and pre-swim-up fry: copper, lead, nickel, zinc, polycyclic aromatic hydrocarbons, and the agricultural fungicide Captan.<sup>2</sup>
  - During the past decade, surveys of spawning adult Coho salmon in Seattle found that very high percentages of adult females (up to 90 percent) were dying before they could spawn. Although the precise causes of these acute die-offs are not yet known, stormwater pollution is likely involved. The problem appears to be widespread throughout urban streams in Puget Sound and is under active scientific investigation.<sup>3</sup>
- **Shellfish Industry:** Washington State's multimillion dollar shellfish industry is increasingly threatened by closures due to stormwater contamination.
- **Degraded Water Bodies:** In urban and urbanizing areas across Washington State, residential, commercial, and industrial land development has changed land cover and drastically altered stream channels. The impacts of urban land development have severely degraded, and will in many cases permanently destroy, fish resources and other beneficial uses of Washington's waters.

### Stormwater Pollution Sources

Many pollution sources may contaminate stormwater, including land use activities, illicit discharges and spills, atmospheric deposition, and vehicular traffic. Many of these sources are not under the direct control of the Permittees that own or operate the municipal storm sewer systems.

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<sup>1</sup> Nautilus Environmental, 2009. Pierce County Public Works and Utilities – Countywide Water Quality Monitoring Plan. *Pilot Test: Rainbow Trout Early Life Stages In-situ Bioassay*, Final Report submitted to Brown and Caldwell.

<sup>2</sup> Randall Marshall and Brandee Era-Miller. 2011, in preparation. *Integrated Ambient Monitoring Pilot Report, Potential Causes for the Impairment of Rainbow Trout Early Lifestages Exposed in Indian Creek for 34 Days and Loss of Diversity in the Instream Benthic Communities*, Washington State Department of Ecology.

<sup>3</sup> McCarthy, Sarah G, John P. Incardona, and Nathaniel L. Scholz. 2008, *Coastal Storms, Toxic Runoff, and the Sustainable Conservation of Fish and Fisheries*, American Fisheries Society Symposium 64:000-000.

An evaluation of stormwater monitoring data from the National Stormwater Quality Database (NSQD)<sup>4</sup> compares the results for a range of pollutants in urban runoff from areas of different land uses. The NSQD contains data from a representative number of municipal stormwater permit holders. To date, it is the largest urban stormwater database developed. Much of the data may be used to characterize stormwater produced from specific land uses, such as industrial, commercial, low density residential, high density residential, and undeveloped open space. Preliminary statistical analysis of the NSQD found significant differences among land use categories for all pollutants, as shown in Table 1.

**Table 1: Event Mean Concentrations of Pollutants Discharged via Stormwater Complied from the National Stormwater Quality Database, Version 1.0**

Pollutant	Units	Land Use					Overall
		Residential	Commercial	Industrial	Freeways	Open Space	
Ammonia	mg/L	0.31	0.5	0.5	1.07	0.3	0.44
Biochemical Oxygen Demand	mg/L	9	11.9	9	8	4.2	8.6
Cadmium, Total	ug/L	0.5	0.9	2	1	0.5	1
Cadmium, Filtered	ug/L	ND	0.3	0.6	0.68	ND	0.5
Chemical Oxygen Demand	mg/L	55.	63.	60	100	21.	53.
Copper, Total	ug/L	12.	17.	22.	35.	5.3	16.
Copper, Filtered	ug/L	7	7.6	8	10.9	ND	8
Fecal Coliform	MPN/100 mL	7,750	4,500	2,500	1,700	3,100	5,081
Lead, Total	ug/L	12.	18.	25.	25.	5	16.
Lead, Filtered	ug/L	3	5	5	1.8	ND	3
Nickel, Total	ug/L	5.4	7	16.	9	ND	8
Nickel, Filtered	ug/L	2	3	5	4	ND	4
Nitrogen, NO <sub>2</sub> +NO <sub>3</sub>	mg/L	0.6	0.6	0.7	0.3	0.6	0.6
Nitrogen, Total Kjeldahl	mg/L	1.4	1.6	1.4	2	0.6	1.4
Phosphorus, Total	mg/L	0.3	0.22	0.26	0.25	0.25	0.27
Phosphorus, Filtered	mg/L	0.17	0.11	0.11	0.2	0.08	0.12
Suspended Solids, Total	mg/L	48.	43.	77.	99.	51.	58.
Zinc, Total	ug/L	73.	150	210	200	39.	116.
Zinc, Filtered	ug/L	33.	59.	112.	51.	ND	52.

ND = Not detected, or insufficient data to determine a value.

mg/L = Milligrams per liter.

ug/L = Micrograms per liter.

MPN = Most probable number.

### 3.2 Recent Regional Efforts

Over time, Ecology intends to inform and improve the stormwater management programs required in the permits by evaluating regional data to better understand the sources and pathways of pollutants and target effective management approaches. In recent years, four major regional

<sup>4</sup> Pitt, Robert, Alex Maestre, and Renee Morquecho. 2004, *The National Stormwater Quality Database (NSQD, version 1.1)*, <http://rpitt.eng.ua.edu/Research/ms4/Paper/Mainms4paper.html>

efforts briefly discussed in this section have contributed to an understanding of stormwater impacts on the beneficial uses of Washington waters:

- A Stormwater Monitoring Work Group worked for several years to develop recommendations for a comprehensive stormwater monitoring program in Puget Sound. Information on the work group is at:  
<http://www.ecy.wa.gov/programs/wq/psmonitoring/swworkgroup.html>
- Ecology and others issued a 2010 report, *Toxics in Surface Runoff to Puget Sound*<sup>5</sup>, Phase 3 of a study to estimate toxic chemical loadings from surface runoff in the Puget Sound Basin. The studies began in 2006 and included a multi-partner steering committee of federal, state, and local government agencies, consultants, and reviewers. The report and additional information are at: <http://www.ecy.wa.gov/programs/wq/pstoxics/index.html>
- Phase I cities and counties and the ports of Tacoma and Seattle conducted stormwater outfall monitoring as required by the Phase I Municipal Stormwater General Permit and submitted the preliminary data to Ecology. Information on the monitoring program is at: <http://www.ecy.wa.gov/programs/wq/stormwater/municipal/strmH2Omonitoring.html>
- A Sediment Phthalates Work Group evaluated information to better understand how phthalates are reaching Puget Sound. The work group identified data gaps and made recommendations in a 2007 report, *Sediment Phthalates Work Group: Summary of Findings and Recommendations*, prepared by the City of Tacoma, the City of Seattle, King County, EPA, and Ecology. More information is at:  
[http://www.ecy.wa.gov/programs/tcp/smu/phthalates/phthalates\\_hp.htm](http://www.ecy.wa.gov/programs/tcp/smu/phthalates/phthalates_hp.htm)

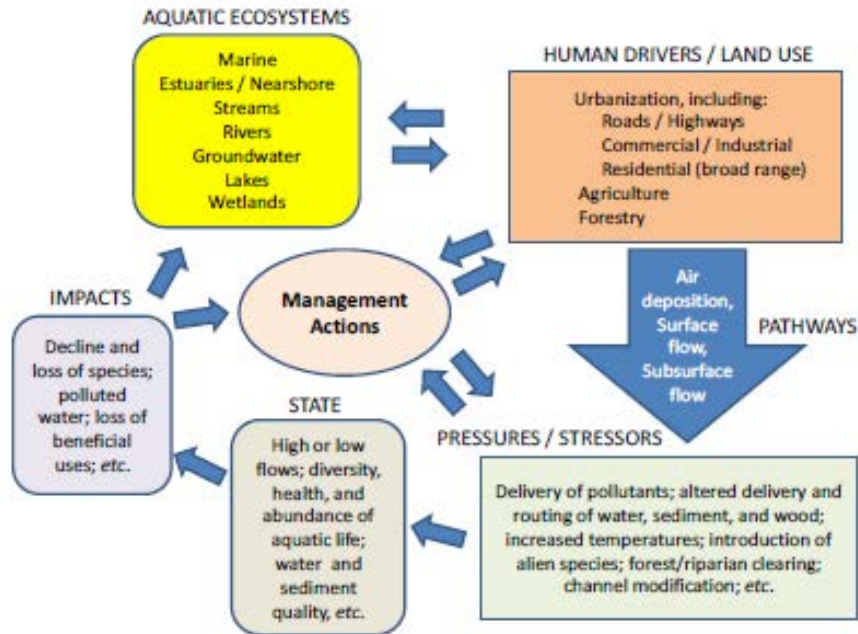
### Stormwater Monitoring Work Group

The Stormwater Monitoring Work Group brought together many of the region's stormwater experts to review previous work and evaluate the direct and indirect effects of stormwater on the Puget Sound ecosystem, and the various pathways by which those effects are transmitted. The primary task of the Stormwater Monitoring Work Group was to develop the monitoring approach proposed in the Phase I and Western Washington Phase II draft permits for the Puget Sound region. However, in the process of coming to a consensus on monitoring from a broad range of expertise and technical backgrounds, the work group members formulated a conceptual model of the factors driving the stormwater-related impairment of water quality and habitat in our region. Figure 1, below, shows the types of stressors that should be considered, the pathways by which those stressors are transmitted, and how the outcomes of our management efforts should be assessed, using a Driver-Pressure-State Impact-Response (DPSIR) conceptual model approach.<sup>6</sup>

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<sup>5</sup> Herrera Environmental Consultants, Inc. 2011. *Toxics in Surface Runoff to Puget Sound, Phase 3 Data and Load Estimates*, Washington State Department of Ecology, Olympia, WA.

<sup>6</sup> Puget Sound Stormwater Work Group. 2010. *Stormwater Monitoring and Assessment Strategy for the Puget Sound Region, Volume 1: Scientific Framework*, Washington State Department of Ecology, Olympia, WA.



**Figure 1: Stormwater Stressors and Pathways**

The conceptual model identifies land use as the driver for impacts to aquatic systems. Ecology is applying the DPSIR approach illustrated in this conceptual model to organize ecosystem recovery efforts and use monitoring information for adaptive management.

### Toxic Loading Study for Puget Sound

As part of Phase 3 of its toxics loading study, Ecology collected water quality samples of surface runoff during eight storm or baseflow events from 16 distinct sub-basins, each representative of one of four land covers (Commercial/Industrial, Residential, Agricultural, and undeveloped Forest/Field/Other). Analyses of the samples employed much lower detection limits than typically used to produce pollutant concentration and loading data. No other study in Washington has quantified pollutant loads for so many constituents at this scale. Although this data represents surface runoff in the sampled sub-basins and is not directly representative of regulated stormwater discharges, some of the findings are generally in agreement with those from the 2005 analysis of the National Stormwater Quality Database. The pollutant loading estimates were based on data collected from small streams, where pollutant concentrations had likely been reduced by attenuation, degradation, deposition, and/or dilution. Therefore, the loading estimates might have been greater if they had been based on outfalls from stormwater conveyance systems. The study found the following:

- Surface water runoff, particularly from commercial and industrial areas, did not meet water quality or human health criteria for the following parameters: dissolved copper, lead, and zinc; total mercury; total polychlorinated biphenyls (PCBs); several carcinogenic polycyclic aromatic hydrocarbons (PAHs); and DDT-related compounds.

- Organic pollutants and metals were generally detected more frequently and at greater concentrations in surface runoff from commercial and industrial areas than from other land uses. Runoff from residential and agricultural land had higher frequency of detection for most parameters than runoff from undeveloped/forested land, but generally less than runoff from commercial land. Greater detection frequencies occurred during storm events than during baseflow across all land cover types.
- During storm events, surface runoff from areas of Forested and Commercial land covers were chemically distinct from each other and from the other land cover types. Forested lands produced runoff with smaller concentrations of nitrate+nitrite nitrogen, total phosphorus, and total arsenic, copper, mercury, and suspended solids. Commercial land areas produced runoff with relatively greater concentrations of total lead, zinc, PBDEs, and PCBs.
- At the local scale, pollutant loading rates via small streams were substantially greater during storm events than during baseflow. The rain-induced surface runoff during storm events caused higher streamflow rates. These higher flow rates coupled with increased pollutant concentrations to produce substantially greater loading rates for storm events than for baseflow. This result suggested that the greatest opportunity for transport of toxic chemicals occurs during storm events.

### Phase I Stormwater Outfall Monitoring Data

Phase I Municipal Stormwater permittees, including Clark, King, Pierce, and Snohomish Counties, the Cities of Seattle and Tacoma, and the Ports of Seattle and Tacoma, collected chemical monitoring data representing municipal stormwater discharge quality during the past several years. The 2007 Phase I permit required each city and county permittee to select three (one for each of the two Ports) municipal stormwater basins representing different land uses and conduct stormwater characterization monitoring. This monitoring includes the collection of flow-weighted composite samples of 11 storm events each water year, annual sediment sampling, and one-time toxicity testing of seasonal first-flush discharges. No other stormwater monitoring effort in Washington has generated comparable water quality data on municipal stormwater discharges for such a large parameter suite from different land uses across Western Washington.

Attachment A to this Fact Sheet includes a Table of Event Mean Concentrations in Stormwater from Various Land Uses. The data is from Phase I permittees and was collected during water years 2009 and 2010. The table presents only average concentration data where analytes were detected. This preliminary data needs further statistical evaluation when more data has been submitted. Ecology staff who compiled the data made the following preliminary observations as general statements that should be verified in the future, when more data are available:

- Fecal coliform averages appear to be higher in industrial land use compared to the other land uses.
- For nutrients, there does not appear to be any significant difference between land uses.

- Metals concentrations appear to be higher in industrial and commercial land uses than in residential areas.
- Based on a sample set of 60 or more samples, pyrene, fluoranthene, phenanthrene, Benzo(g,h,i)perylene, Naphthalene and Benzo(a)pyrene appear to be the more abundant PAHs detected.
- Based on a sample set of 60 or more samples, Bis(2-ethylhexyl) phthalate, Di-N-Butyl Phthalate, Diethylphthalate, and Butyl benzyl phthalate appear to be the more abundant phthalates detected.
- Based on a sample set of 20 or more samples, dichlobenil and 2,4-D were the more commonly detected herbicides.
- For the conventional parameters, total suspended solids appears to be higher in commercial basins while turbidity tends to be higher in industrial basins
- Diesel and motor oil concentrations appear to be higher in residential basins

As the Phase I permittees complete the monitoring programs required by the 2007 Phase I permit, Ecology will seek funding to analyze the data and apply the results to managing stormwater in both regulatory and non-regulatory programs.

### **Sediment Phthalates Work Group**

The Sediment Phthalates Work Group was convened in 2006 to address the re-contamination of cleaned up sites in urban bays of Puget Sound. The Duwamish and Foss Waterways are Superfund sites in which sediment samples showed contamination by phthalates after costly sediment cleanups. Phthalates were not among the original contaminants of concern that led to the cleanup, and are pollutants of more contemporary origin than those addressed by the cleanup. The work group was charged with identifying the sources and pathways for the phthalates and making recommendations regarding the newly contaminated sediments. The work group's 2007 comprehensive problem statement included the following findings:

- Billions of pounds of plasticized polyvinyl chloride (PVC) products are currently in use in urban environments, and these materials off-gas phthalates into the surrounding atmosphere for many years.
- Volatilized phthalates adhere to fine particulates in the air and eventually settle onto impervious surfaces and soil.
- Stormwater washes the phthalate-contaminated particulates into storm drains and subsequently into natural water bodies and sediments, where the concentrations and loadings of phthalates can build up over time.
- Although phthalates do not readily bioaccumulate, large amounts loaded into sediments are toxic to benthic organisms.

Phthalates are an example of a pollutant that exists throughout the urban environment. The work group report acknowledged that it may not be feasible to remove some pollutants such as



phthalates from stormwater once they are in the environment. Source control solutions to reducing these pollutants may include finding alternatives to use in manufacturing the products that contain them. Their widespread uses make them somewhat ubiquitous in the contemporary urban setting. Phthalates and some other pollutants will require broader societal efforts to address the contaminants resulting from the manufacturing processes for many products widely used in contemporary society.

### 3.3 Laws and Regulations

#### Federal Clean Water Act

This permit implements sections of the Federal Clean Water Act (CWA), the U.S. Environmental Protection Agency rules, and the Washington State Water Pollution Control Act (RCW 90.48).

The federal Clean Water Act (CWA, 1972, and later modifications in 1977, 1981, and 1987) established water quality goals for the surface waters of the United States. One of the mechanisms for achieving goals of the CWA is the National Pollutant Discharge Elimination System (NPDES) permitting program. In Washington State, Ecology has been delegated authority to administer the NPDES program for most dischargers, including most municipal stormwater dischargers. Chapter 90.48 RCW defines Ecology's authority and obligations in administering the NPDES permit program.

As part of the 1987 CWA amendments, Congress added section 402(p) to cover stormwater discharges to waters of the United States. Under the Federal Clean Water Act (33.U.S.C. Section 1342 (p)(3)(b)) permit requirements for discharges from municipal separate storm sewer systems include:

- Municipal Discharge. – Permits for discharges from municipal storm sewers –
- (i) May be issued on a system-or jurisdiction-wide basis;
  - (ii) Shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewers; and
  - (iii) Shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques, and system design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants. (33 U.S.C. Section 1342 (p)(3)(B))

Congress phased in NPDES requirements for municipal stormwater discharges in two phases. Phase I includes medium and large municipalities. Populations of over 250,000 are defined as “large,” while those with populations between 100,000 and 250,000 are defined as “medium” municipalities.

In the 1987 CWA amendments, Congress directed EPA to study remaining sources of stormwater discharges and, based on the study, to propose regulations to designate and control other stormwater sources. These regulations, which are commonly known as the Phase II rules, were adopted by the EPA in December, 1999. The Phase II rules extend coverage of the (NPDES) program to certain “small” municipal separate storm sewer systems.

### **EPA Rules**

U.S. EPA implementing regulations define the term “municipality” to mean incorporated cities and unincorporated counties that have sufficient population in a Census Bureau designated urbanized area to meet the population thresholds. In addition, the EPA rule requires permit coverage for other public entities (excluding incorporated cities), regardless of their size, that own and operate storm sewer systems located within the municipalities that meet the population thresholds. Examples of other publicly-owned storm sewer systems include state highways, ports, drainage districts, school districts, colleges and universities, and flood control districts located within permitted municipalities. Ecology uses the term “Secondary Permittees” for these permittees in the Phase I and Phase II municipal stormwater permits.

Recognizing the complexity of controlling stormwater, Congress and EPA established a regulatory framework for municipal stormwater discharges that is different from traditional NPDES permit programs. Some of the key provisions of the stormwater rules that reflect these differences are:

- Permits require the implementation of stormwater management programs rather than establishing numeric effluent standards for stormwater discharges (40 CFR 122.26(d)(2)(iv)).
- Permits cover a large geographic area rather than individual “facilities.” Within a permit coverage area there may be hundreds or thousands of individual outfalls discharging to surface water (40 CFR 122.26(a)(3)).
- Flexibility that allows permittees to first focus their resources on the highest priority problems (40 CFR 122.26(d)(2)(iv)).
- Pollution prevention is emphasized with some provisions requiring eliminating or controlling pollutants at their source and by requiring permittees to assess potential future impacts due to population growth and other factors (40 CFR 122.26(d)(2)(iv)(B) & (d)(1) (iii)).

EPA rules for discharges from large and medium MS4s did not establish actual permit requirements. EPA allowed the permitting authority flexibility to establish permit requirements that are appropriate for the local area under Phase I regulation.

EPA is currently conducting a process to update the federal stormwater rules. On December 29, 2009, EPA issued a notice in the Federal Register opening a public input period and announcing

listening sessions to inform a rulemaking “...to strengthen national stormwater regulations and to establish a comprehensive program to reduce stormwater discharges from new development and redevelopment.” EPA also conducted a comprehensive survey of delegated state authorities and permittees to solicit input on the range of stormwater management requirements and practices across the nation. The proposed national rulemaking is considering the following key rulemaking actions:

- Develop performance standards from newly developed and redeveloped sites to better address stormwater management as projects are built.
- Explore options for expanding the protections of the municipal separate storm sewer systems (MS4) program.
- Evaluate options for establishing and implementing a municipal program to reduce discharges from existing development.
- Evaluate establishing a single set of minimum measures requirements for regulated MS4s. However, industrial requirements may only apply to regulated MS4s serving populations of 100,000 or more.
- Explore options for establishing specific requirements for transportation facilities.
- Evaluating additional provisions specific to the Chesapeake Bay watershed.

EPA announced its intent to propose a rule in December 2011 and to take final action by November 2012. More information on EPA’s rulemaking is available at:

<http://cfpub.epa.gov/npdes/stormwater/rulemaking.cfm>.

### **The State Water Pollution Control Act and Implementing Regulations**

In addition to requirements in federal law, there are state law requirements for the control of pollution in Chapter 90.48 RCW, known as the Water Pollution Control Act. RCW 90.48.010 establishes

...the public policy of the state of Washington (is) to maintain the highest possible standards to insure the purity of all waters of the state consistent with public health and public enjoyment thereof, the propagation and protection of wild life, birds, game, fish and other aquatic life, and the industrial development of the state, and to that end require the use of all known available and reasonable methods by industries and others to prevent and control the pollution of the waters of the state of Washington.

The terms “pollution” and “waters of the state” are defined in RCW 90.48.020. Waters of the state “...shall be construed to include lakes, rivers, ponds, streams, inland waters, underground waters, salt waters and all other surface waters and watercourses within the jurisdiction of the state of Washington.” This definition differs from the federal definition of “waters of the United States” which is limited to surface waters. State law requires a permit to regulate discharge of

pollutants or waste materials to waters of the state (RCW 90.48.162). In 1987 the State Legislature passed into law RCW 90.48.520. When issuing or renewing state and federal wastewater discharge permits, Ecology must review the applicant's operations and incorporate permit conditions which require all known, available, and reasonable methods to control toxicants in the applicant's wastewater. The law prohibits the discharge of toxicants which would violate any water quality standard, including toxicant standards, sediment criteria, and dilution zone criteria (RCW 90.48.520).

RCW 90.48.035 grants Ecology authority to adopt standards for the quality of waters of the state. Ecology has adopted the following standards:

- Chapter 173-200 WAC Ground Water Quality Standards;
- Chapter 173-201A WAC Water Quality Standards for Surface Waters; and
- Chapter 173-204 WAC Sediment Management Standards.

These standards generally require that permits that Ecology issues ensure that discharges will not violate standards, or that a compliance schedule be in place to bring discharges into compliance.

The Waste Discharge General Permit Program regulation, Chapter 173-226 WAC, establishes a general permit program for the discharge of pollutants, wastes, and other materials to waters of the state. One of the requirements (WAC 173-226-110) for issuing a general permit under the NPDES permit program is the preparation of a draft permit and an accompanying fact sheet.

## **4.0 Relationship to Other Stormwater Permits**

EPA stormwater regulations establish NPDES permit requirements for stormwater discharges from industrial facilities, construction sites, small municipal storm sewer systems (Phase II), and the Washington State Department of Transportation.

### **4.1 Industrial Stormwater General Permit**

The federal stormwater regulations envision a cooperative relationship between industrial stormwater permittees that discharge to municipal separate storm sewer systems (MS4s) and those municipal permittees. A wide range of industrial facilities listed at 40 CFR 122.26(b)(14) must obtain NPDES permits from Ecology to authorize discharges to surface waters or to MS4s that discharge to surface waters. In Washington State, Ecology has also issued several industry-specific permits that authorize stormwater discharges from those facilities, including the Sand and Gravel General Permit and the General Permit for Boat Building and Repair Facilities.

Under 40 CFR 122.26(d)(2)(iv)(C), Phase I municipal permittees must establish a program to address stormwater discharges from industrial facilities that the Permittees determine are contributing a substantial pollutant loading to the MS4. EPA describes this dual responsibility in the preamble to the Phase I stormwater regulations:

Although today's rule will require industrial discharges through municipal separate storm sewers to be covered by separate permit, EPA still believes the municipal operators of large and medium municipal systems have an important role in source identification, and the development of pollution controls for industries that discharge stormwater through the municipal separate storm sewer systems is appropriate. Under the CWA [*Clean Water Act*] large and medium municipalities are responsible for reducing pollutants in discharges from municipal separate storm sewers to the maximum extent practicable. Because stormwater from industrial facilities may be a major contributor of pollutants to municipal separate storm sewer systems, municipalities are obligated to develop controls for stormwater discharges associated with industrial activity through their system in their stormwater management program. (EPA, Federal Register, Vol. 55, No. 222; November 16, 1990, p.48090).

#### **4.2 Construction Stormwater General Permit**

Under this permit, Permittees must adopt and implement measures to control discharges into the MS4 system from construction sites, including sites regulated by Ecology's Construction Stormwater General Permit. The construction stormwater permit is issued to individual construction site operators for projects of one acre or more or for projects of less than one acre that are part of a larger, common plan of development or sale. Construction site operators that are covered under and operating in compliance with the construction stormwater general permit issued by Ecology will be in compliance with the construction site runoff control requirements of the municipal stormwater permit. Local jurisdictions may add additional requirements for construction site operators to address local conditions or concerns. Local jurisdictions also coordinate with and complement Ecology's regulation of construction sites to prevent pollutants from those sites from entering the MS4.

#### **4.3 Western and Eastern Washington Phase II Municipal Stormwater General Permits**

Ecology is issuing the Eastern and Western Washington Phase II Municipal Stormwater General Permits at the same time as this Phase I permit to cover small municipal storm sewer systems. Small MS4s are part of EPA's NPDES regulatory program for stormwater discharges to surface waters. EPA issued the federal rule for Phase II of the stormwater permit program in 1999. In 2007, Ecology issued the first Phase II Municipal Stormwater General Permits. Ecology issued the Phase II Municipal Stormwater Permit for Western Washington and a second permit for Eastern Washington.

Many of the Phase II Permittees in western Washington are located in counties regulated by this permit, including many adjacent to the cities of Seattle and Tacoma. They share basins with permittees covered by the permit, have interconnected conveyance systems, and discharge into many of the same water bodies. During the Phase II permit cycle beginning in 2007, Phase I and

Phase II communities in western Washington cooperated in a number of permit programs and grant projects, and worked together through coordination groups.

Wherever possible, Ecology coordinated the requirements of the Phase I permit with the requirements of the Phase II permits. All permits include similar approaches to compliance with standards, TMDL implementation, and the use of a regional stormwater manual. Programs for illicit discharge detection and elimination and controlling stormwater from construction sites are also similar. In areas where conveyance systems are interconnected or discharges go to the same water body, successful implementation of stormwater management programs requires coordination between local jurisdictions. Ecology has established expectations in this permit for coordination in monitoring efforts and in proposed requirements for watershed-based stormwater planning. Ecology expects to bring Phase I and Western Washington Phase II requirements for municipal stormwater management closer together in future permit cycles.

#### **4.4 Washington Department of Transportation Municipal Stormwater General Permit**

The Washington Department of Transportation (WSDOT) is a statewide agency that owns and operates municipal separate stormwater systems that carry discharges from highways, maintenance and storage facilities, ferry docks, and other WSDOT facilities. Discharges from WSDOT MS4s are authorized under a single statewide permit for MS4s in Phase I and Phase II coverage areas, and in areas with applicable TMDLs. The WSDOT MS4 permit was issued in 2009.

The WSDOT municipal stormwater permit includes requirements similar to the municipal stormwater general permit to conduct public education and involvement, prevent and address polluting illicit discharges, and for operations and maintenance. Requirements for WSDOT construction sites and for managing stormwater discharges from new and re-development projects are consistent with the requirements in the Phase I permit, except they are tailored to highway construction. WSDOT's permit also includes monitoring program to evaluate the effectiveness of its stormwater management program.

WSDOT stormwater conveyances frequently interconnect with municipal MS4s covered under this permit. This requires WSDOT and municipal permittees to work together to control illicit discharges, respond to spills and dumping, and, where they discharge to shared water bodies, to implement TMDLs.

## 5.0 Antidegradation

### 5.1 Background

Federal regulations (40 CFR 131.12) and the Water Quality Standards for Surface Waters of the State of Washington (WAC 173-201A-300, 310, 320, 330) establish a water quality antidegradation program. The purpose of the antidegradation program is to:

- Restore and maintain the highest possible quality of the surface waters of Washington.
- Describe situations under which water quality may be lowered from its current condition.
- Apply to human activities that are likely to have an impact on the water quality of surface water.
- Ensure that all human activities likely to contribute to a lowering of water quality, at a minimum, apply all known, available, and reasonable methods of prevention, control, and treatment (AKART).
- Apply three Tiers of protection (described below) for surface waters of the state.

The federally mandated program establishes three tiers of protection for water quality. Tier I ensures the maintenance and protection of existing and designated uses. Tier I applies to all waters and all sources of pollution. Tier II prevents the degradation of waters that are of a higher quality than the criteria assigned, except where such lowering of water quality is shown to be necessary and in the overriding public interest. Tier II applies only to a specific list of polluting activities. Tier III prevents the degradation of waters formally listed as “outstanding resource waters,” and applies to all sources of pollution.

This permit addresses antidegradation of Tier I and Tier II waters. Ecology has determined that there are no coverages under this permit to Tier III waters.

### 5.2 Formal Adaptive Process to comply with WAC 173-201A-320(6)

Washington’s Tier II requirements for general permits are outlined in WAC 173-201a-320(6):

- a) Individual activities covered under these general permits or programs will not require a Tier II analysis.*
- b) The department will describe in writing how the general permit or control program meets the antidegradation requirements of this section.*
- c) The department recognizes that many water quality protection programs and their associated control technologies are in a continual state of improvement and development. As a result, information regarding the existence, effectiveness, or costs of control practices for reducing pollution and meeting the water quality standards may be incomplete. In these instances, the antidegradation requirements of this section can be considered met for general permits and programs that have a formal process to select,*

*develop, adopt, and refine control practices for protecting water quality and meeting the intent of this section. This adaptive process must:*

- (i) Ensure that information is developed and used expeditiously to revise permit or program requirements;*
  - (ii) Review and refine management and control programs in cycles not to exceed five years or the period of permit reissuance; and*
  - (iii) Include a plan that describes how the information will be obtained and used to ensure full compliance with this chapter. The plan must be developed and documented in advance of the permit or program approved under this section.*
- d) All authorizations under this section must still comply with the provisions of Tier I (WAC 173-210A-310).*

### **5.3 How the Municipal Stormwater Permits meet the Antidegradation Requirement**

Ecology's process for reissuance of the municipal stormwater general permits includes a formal process to select, develop, adopt, and refine control practices for protecting water quality and meeting the intent of WAC 173-201A-310. All permits are issued for fixed terms of five years. Each time Ecology reissues the municipal stormwater general permits, it evaluates the permit conditions to determine if additional or more stringent requirements should be incorporated.

Ecology's evaluation of the municipal stormwater permits includes an ongoing review of information on new pollution prevention and treatment practices for storm water discharges. Sources of such information include:

1. Comments on draft permits. Ecology's public process for developing the 2012 proposed permit includes the following:
  - a. During the 2009 permit modification to incorporate the results of permit appeals, Ecology asked for input on opportunities to improve and simplify requirements without compromising environmental protection. Staff used comments from that process to revise and improve the permits.
  - b. Committees on LID and monitoring comprised of scientists, practitioners, and resource managers advised Ecology on permit requirements.
  - c. In 2010, Ecology staff held nine listening sessions statewide and used the feedback to inform permit revisions for all sections of the permit.
  - d. A May-June 2011 informal comment period for preliminary draft language on LID and monitoring generated comments from over 85 entities or individuals.
  - e. Ecology will review and use public comment and testimony from public hearings during the public comment period on the draft permit (2011-2012) to develop the final permits.



2. Ecology's Stormwater Management Manuals. Ecology periodically updates the stormwater management manuals based on new information and science. The update process includes a public involvement element. Since the municipal stormwater permits require permittees to select BMPs from the most recent edition of the stormwater manuals (or a program approved as functionally equivalent) the BMPs contained in updated stormwater manuals are adopted by permittees. This improves the effectiveness of stormwater controls for protecting water quality and meeting the intent of the antidegradation provisions of the water quality standards. Ecology is providing an updated draft of the *Stormwater Management Manual for Western Washington* for public comment concurrent with the draft municipal stormwater general permits.
3. Technology Assessment Protocol – Ecology (TAPE) process. This formal process reviews and tests emerging treatment technologies for eventual adoption in Ecology's stormwater management manuals. The TAPE review process stimulates the development and use of innovative stormwater technologies used at construction sites and in new and redevelopment projects. Ecology recently funded the Washington Stormwater Center to revise the protocols and the TAPE guidance manual and re-opened the revised program in 2010 after a two-year suspension.
4. Washington Stormwater Center research. Ecology helped establish and fund the Stormwater Center and affiliated Low Impact Development research program to conduct stormwater technical research. The Center works in partnership with state academic institutions partners including Washington State University Puyallup Campus and the University of Washington Urban Waters Program in Tacoma. The Center also disseminates information on current research and training opportunities to municipalities and businesses, and is compiling an interactive stormwater BMP toolbox.
5. Permittee compliance reports. Each permittee submits to Ecology an annual report, monitoring results, and special submittals by permittees for alternative approaches to maintenance or detection of illicit discharges. Ecology staff review and act on annual reports to address compliance issues and provide technical assistance. A statewide Ecology municipal stormwater permit team produces written guidance and permittee training opportunities to disseminate information on improved BMPs.

The low impact development requirements proposed in the draft municipal stormwater permits are part of the adaptive process to improve stormwater management and protect surface waters from degradation. Low impact development stormwater management for new and redevelopment projects is a nationally-recognized innovative land use and stormwater management approach. Ecology's draft permits introduce the LID requirements at levels appropriate to the experience and physical conditions of permittees in each region. Ecology is funding an update to the Western Washington Hydrologic Model to address LID BMPs, as well as a project to develop guidance and training on maintenance of LID BMPs. In Eastern Washington, where permittees have less experience with LID, Ecology proposes incremental steps toward eventual broad

implementation of LID as appropriate to the climate, soils, and geology of that region. These statewide requirements will support a fundamental shift to LID stormwater design and management in new and redevelopment that help meet the antidegradation requirements of WAC 172-203A-320(6).

The monitoring proposal in the draft permit also helps satisfy the anti-degradation requirements for adaptive management. The draft permit would require effectiveness monitoring programs to evaluate individual BMPs and/or elements of stormwater programs. A repository of information for Source Identification and Diagnostic Monitoring proposed for Western Washington would benefit permittees statewide in improving programs to eliminate pollution sources. The proposal for monitoring status and trends in Puget Sound receiving waters would provide information to evaluate water quality changes in urban areas where programs are being implemented.

## **6.0 Explanation of Phase I Permit Revisions**

### **6.1 S1 – Permit Coverage and Permittees**

This section defines the area covered under this permit, defines entities that are to be covered under the permit, and explains how to obtain permit coverage.

The permit authorizes discharges from large and medium Municipal Separate Storm Sewer Systems (MS4s), as defined by EPA at 40 CFR 122.26(b)(4) and (7). Large MS4s are defined as all municipal separate storm sewers located in either: an incorporated city with a population over 250,000 in the 1990 census; or a county with a population over 250,000 in the unincorporated portion of the county that falls within an urbanized area, as defined in the 1990 census. The definition of a Medium MS4 is basically the same, with a population threshold of more than 100,000 and up to 250,000 people.

Ecology proposes removing the references to municipal separate storm sewers (MS3s) in this section and throughout this permit to be more consistent with the definitions for Large and Medium MS4s in 40CFR 122.26(b)(4) and (7).

All MS4s of any size that are owned or operated by Washington State Department of Transportation (WSDOT) are not covered under this permit because they will be covered under a separate stormwater permit. More information is available at

<http://www.ecy.wa.gov/programs/wq/stormwater/municipal/wsdot.html>

The permittees listed in Special Condition S1.B are required to obtain a permit in accordance with 40 CFR 122.26(b)(4) and (b)(7). In accordance with general condition G10 of the current (2007) Municipal Stormwater permits, all permittees named in S1.B reapplied by submitting a *Duty to Reapply – Notice of Intent (NOI)* prior to August 19, 2011 and therefore have continuing coverage under this permit.

Ecology has removed listing King County as a Co-permittee with the City of Seattle, and all associated references. Refer to section *S6.F Stormwater Management Program for King County as a Co-Permittee* of this Fact Sheet for additional information.

The Secondary Permittees listed in Special Condition S1.C.1-3 are required to obtain a permit in accordance with 40CFR122.26(a). In accordance with general condition G10 of the current (2007) Municipal Stormwater permits, all permittees named in S1.C.1-3 reapplied by submitting a *Duty to Reapply – Notice of Intent (NOI)* prior to August 19, 2011 and therefore have continuing coverage under this permit as Secondary Permittees.

Special Condition S1.E applies to discharges from publicly owned or operated MS4s, located within the cities and counties that were not covered by the permit prior to August 1, 2013. This requirement applies to special districts such as ports, universities, drainage districts and flood control districts. These permittees are now classified as New Secondary Permittees (see permit definitions). This term is used in order to distinguish the different requirements and deadlines for New Secondary Permittees.

Special Condition S1.E.2 establishes an application process for New Secondary Permittees. The Notice of Intent (NOI) is the official permit application document required to request coverage under these general permits and is included in this permit in Appendix 5. Language that is already included in Appendix 5 has been removed from this section and Ecology has clarified the language describing the application process for applying as a Co-Permittee. Each Co-Permittee must submit an individual NOI that includes information regarding the Co-Permittee relationship.

## **6.2 S2 – Authorized Discharges**

This section of the permit authorizes the discharge of stormwater from MS4s owned or operated by the permittees to waters of the State, subject to certain limitations. The permit does not authorize discharges that are authorized under other state permits or programs, such as the Underground Injection Control program.

Throughout the permit Ecology proposes to change the terms “authorized” and “covered” where needed for consistency. Ecology intends to use “authorized” when referring to discharges, and “covered” when referring to permittees or geographic areas, consistent with federal use of the terms. Permittees are not obligated to accept these discharges into their MS4, and may choose to refuse them. This is relevant to permit requirements such as a list of allowable discharges in S5.C.8.b.i of the IDDE program.

Ecology proposes changes in S2.B.1 to make the language and references to the National Pollutant Discharge Eliminations System and State Waste Discharge permits consistent with the language in the Western Washington Phase II Municipal Stormwater Permit.

Ecology also proposes language in this section to clarify that S2.B.2 applies to discharges to the MS4 that occur only while the emergency fire fighting activities are underway. Discharges that may occur from cleanup activities after the emergency phase of the fire is finished are not authorized. Ecology included a similar edit in special condition S5.C.8.b.i and S6 language for Secondary Permittees under the IDDE-related codes and policies for consistency.

### **6.3 S3 – Responsibilities of Permittees**

Because not all parts of the permit apply to all permittees, S3 identifies the sections of the permit that apply to each permittee, and explains the responsibilities of each type of permittee.

Revisions proposed for S3.B clarify that this section applies to relying on another entity to satisfy one or more of the permit requirements (as through a contractual arrangement for maintenance, for example). Co-Permittee status is not the same as “relying on another entity.” Ecology made these changes for consistency in language across the three municipal stormwater general permits.

### **6.4 S4 – Compliance with Standards**

Ecology proposes a clarification to special condition S4.F.2.b. A violation of water quality standards in the receiving water may have multiple contributors, and the proposed edit clarifies that it is the MS4’s contribution to the violation that is subject to this section.

### **6.5 S5 – Stormwater Management Program for City and County Permittees**

#### **S5.A**

This section of the permit establishes the requirement for the cities and counties, named in S1.B, to implement a stormwater management program (SWMP). Consistent with the objective to simplify permit language, Ecology proposes to remove language in S5.A that defines the SWMP. This language is redundant with the definition of the SWMP located in the *Definitions and Acronyms* section of the permit.

For cities and counties, the SWMP is a set of actions and activities designed to reduce the discharge of pollutants from the MS4 to the maximum extent practicable (MEP) and to protect water quality. The SWMP for cities and counties includes the components listed in S5, actions under S7 Total Maximum Daily Load requirements and Appendix 2, activities required by Special Condition S8 Monitoring, activities to meet S4.F obligations, and any additional actions necessary to meet the requirements of this Permit.

The stormwater management components in S5 form the core requirements of the SWMP. The minimum requirements for each component are established in S5. This section of the permit provides a complete written record of the local programs, planning documents, and ordinances or other regulatory documents that the permittees will implement to meet these permit requirements.

Each permittee must submit written documentation of their SWMP. In S5.A.1 Ecology proposes to refer to this written documentation of the SWMP as a SWMP Report (SWMPR) to reduce confusion between the suite of stormwater management program actions and activities, and the written document that informs the public about planned SWMP activities. The purpose of the SWMPR is revised to include a description of the activities and actions that the permittee plans for the upcoming calendar year. Ecology requires permittees to update their SWMPR annually and to submit it with each annual report.

Each permittee is required to track the cost of development and implementation of the SWMP in S5.A.2. This is based on the EPA requirements at 40 CFR 122.26 calling for a fiscal analysis of the necessary capital and operations and maintenance expenditures to implement the SWMP, and at 40 CFR 122.42(c) for reporting of annual expenditures and proposed budgets. The anticipated cost and resources available to implement the SWMP do not serve as the basis for deciding whether individual SWMPs meet the MEP standard for this permit.

The requirement in S5.A.3 to track inspections, official enforcement actions and public education activities is based on EPA regulations in 40 CFR 122.42(c). Ecology proposes to retain language in this section to remind permittees of this obligation, but removes it elsewhere in the permit where it is redundant.

#### **S5.B.**

This section is consistent with state and federal law and Special Condition S4 in requiring that the SWMP be designed to reduce the discharge of pollutants to the MEP, and meet state AKART requirements. Ecology is proposing language in this section that is consistent with the Western Washington Phase II Municipal Stormwater Permit. Permit language in this section calls for ongoing implementation of existing programs as permittees phase in the requirements in this permit. Ecology requires that permittees retain regulatory mechanisms in local codes, including the illicit discharge prohibition that cities and counties adopted under the current permit requirements.

#### **S5.C.**

This section of the permit defines many of the core components of the stormwater management program for cities and counties for the term of this permit. Each component includes a description of requirements, and minimum performance measures. Each component also includes administrative and legal elements that must be in place to ensure program implementation, as well as requirements which should directly affect pollutant reductions and reduction of impacts.

Ecology has removed language in S5.C that was redundant with section S.3.A. A number of proposed revisions throughout this section remove the implementation schedule from the current (2007) permit term for continuing Permittees and make edits to require ongoing implementation. Other edits meet Ecology's objective of simplifying language or improving consistency with other permits. Substantive changes and new requirements are discussed in more detail below.

### **S5.C.1 Legal Authority**

This section is directly from EPA regulations (40 CFR 122.26). There are only two minor changes to this section. In S5.C.1 Ecology removed the reference to the effective date of the permit because this legal authority was established previously and is ongoing in this current permit cycle. In S5.C.1.b.iv Ecology removed the obsolete term co-applicants and clarifies that interagency agreements can exist between any two agencies, not just co-applicants.

### **S5.C.2. Municipal Separate Storm Sewer System Mapping and Documentation**

This section continues, and increases, the mapping requirements. Ecology reorganized this section to clarify the ongoing mapping requirements and detail the new mapping requirements.

#### ***S5.C.2.a. Ongoing requirements for mapping***

This section lists the ongoing mapping requirements from the current (2007) permit cycle and extends them into the new permit cycle.

In S5.C.2.a Ecology has specified a map update interval of 6 months from when new features are found, modified, or constructed to minimize the likelihood of out-dated maps.

In S5.C.2.a.iii Ecology uses the new term: *stormwater treatment and flow control BMPs/facilities*. Under the current (2007) permit, Permittees were required to map structural stormwater treatment and flow control BMPs. In the proposed permit, Ecology has clarified this language to *stormwater treatment and flow control BMPs/facilities* and has defined this new term in the *Definitions and Acronyms* section of the permit. This term has been developed in part to clarify the extent to which Low Impact Development (LID) is included in various SWMP minimum performance measures, including mapping. Refer also to the discussion associated with S5.C.5 below.

LID BMPs such as bioretention, vegetated roofs, and permeable pavement are included in the definition of *stormwater treatment and flow control BMPs/facilities*, if they are installed to help meet flow control and/or treatment requirements. LID BMPs by definition are widely distributed features, often found in multiples throughout development sites (as opposed to centralized stormwater facilities). Ecology recognizes that extensively mapping each of these individual LID BMPs can be time consuming and may clutter MS4 maps beyond use. Therefore, Ecology allows permittees the option to place single points on MS4 maps that reference permanent stormwater control plans, instead of extensively mapping these BMPs (S5.C.2.a.iii).

Permanent stormwater control plans are required in Appendix 1 as part of stormwater site plans and are detailed in Volume 1, section 3.1.5 of the 2012 *Stormwater Management Manual for Western Washington*. These plans or final corrected plans, commonly referred to as “as-builts,” typically contain the information to support inspection; provided they are maintained to reflect any modifications made to the facilities.

In S5.C.2.a.v and viii where the previous cycle required specific mapping for only a portion of the MS4, Ecology has carried that forward by indicating where “this requirement applies”.

### ***S5.C.2.b – New requirements for mapping***

Ecology proposes the following three new mapping requirements for completion within four years following the permit’s effective date.

S5.C.2.b.i – Counties were required in the current 2007 permit to map existing known connections greater than 8 inches in nominal diameter to tributary conveyances to outfalls of a 24 inch nominal diameter or larger, or an equivalent cross-sectional area for non-pipe systems in half the area of the county within urban/higher density rural sub-basins. This section requires completion of the other half of these sub-basins.

S5.C.2.b.ii – Ecology proposes to extend the requirement for mapping existing, known connections to include those equal to 8 inches in nominal diameter. This requirement is only for connections to tributary conveyances to outfalls of a 24 inch nominal diameter or larger, or an equivalent cross-sectional area for non-pipe systems. Eight inches is a common diameter used for conveying stormwater in stormwater systems. Expanding mapping to include these connections is intended to aid in locating illicit discharges by expanding the knowledge base of jurisdictions on connections to their MS4.

S5.C.2.b.iii – Ecology proposes to improve the connectivity of Permittees’ MS4 maps by requiring mapping of connections between stormwater treatment and flow control BMPs/facilities owned, operated, or maintained by the Permittee and the mapped tributary conveyances. Ecology also proposes that permittees map any connections for emergency overflows from these facilities. Improving connectivity of the MS4 maps should aid in spill response and illicit discharge detection. It may also aid Permittees in understanding flow patterns within the MS4.

Although the requirements are not explicit, Ecology expects that permittees will also map structures such as catch basins and inlets to support their illicit discharge detection and elimination activities when they map tributary conveyances. This information would be particularly important for purposes of tracing illicit discharges and preventing harm from spills.

Ecology expects permittees to map the MS4 in greater detail in areas with land uses that involve storage, transfer, or use of materials where the risk of harm is greater because of factors such as the frequency of transfer or use, the potentially severe or irreversible environmental impacts associated with the illicit discharge or release of such materials, or the nature of the downstream resources at risk. Ecology intends for permittees to apply local knowledge of land uses to map the MS4 more completely in these areas to meet the intent of the illicit discharge program.

### **S5.C.2.c and S5.C.2.d**

This section provides detail on mapping availability requirements including format. A key proposed change is to require electronic format with fully described mapping standards, rather than stating this as the preferred format. All Phase I jurisdictions maintain mapping in electronic format. This website: <http://www.ecy.wa.gov/services/gis/data/standards/standards.htm> contains example mapping standards.

In S5.C.2.d Ecology clarifies that permittees must provide mapping information to other municipalities, federally recognized Indian Tribes, Ecology, and other permittees, upon request. In this section Permittees may charge those making the request a reasonable fee for providing the mapping information.

### **S5.C.3 Coordination**

This permit requirement calls for establishment of coordination mechanisms both internally and externally to aid in the implementation of the SWMP. Ecology proposes a reporting requirement for information about intra-governmental coordination that describes roles, responsibilities and organizational relationships. Permittees implementing the current (2007) permit found that problems occurred when internal communication and coordination did not happen. This reporting requirement is consistent across all municipal stormwater permits and should assist permittees with determining communication and coordination mechanisms. In the requirement for external coordination, Ecology recognizes that other entities may not choose to cooperate. It also recognizes the difficulty of defining shared water bodies and understands that such coordination may occur at a variety of scales appropriate to the activities being coordinated. Permittees in most parts of western Washington worked together in a variety of formal and informal coordination groups during the current (2007) permit term.

### **S5.C.4 Public Involvement and Participation**

For consistency across the municipal stormwater permits, Ecology proposes to specify that public involvement opportunities occur in the decision-making processes for the SWMP. The intent of this is to create an environment where the public can have an active role in shaping their local stormwater program. Because Washington State has strong requirements for public participation in local government decision-making processes, a number of SWMP activities, such as code revisions, already require public involvement under other state and local laws.

This section also requires each permittee to make the permittee's SWMPR and annual report available electronically on the permittees' website by May 31 each year to ensure timely posting of after the March 31 deadline for submission to Ecology. Ecology believes this is a reasonable requirement given the common use and proliferation of public information on the internet. Since all Phase I city and county permittees maintain a website, language was removed that allowed permittees to submit their SWMPR and annual report to Ecology for website posting. Ecology also clarifies that permittees should make other submittals related to the Municipal Stormwater General Permits available to the public upon request.



### **S5.C.5 Controlling Runoff from New Development, Redevelopment and Construction Sites**

The draft permit proposes changes to this section to reflect the following:

- Requirements for ongoing program implementation.
- Proposed requirements for low impact development (LID), including site and subdivision scale requirements found in Appendix 1, updates of broader development codes, and watershed-scale stormwater planning.
- Changes to terminology and long-term maintenance requirements associated with the draft requirements for LID.
- Proposed schedule of implementation and clarification regarding the timing of the applicability of requirements in this section.

#### ***Ongoing Program Implementation Requirements***

The draft permit would require permittees to continue to implement the ongoing programs established during the current (2007) permit term. Permittees would be required to modify the program by the deadline proposed for adoption and implementation of the draft revisions to Appendix 1, and for LID-related development codes.

#### ***S5.C.5.a.v.(3) - Long-term Maintenance Plan***

This section establishes the requirements cities and counties must apply for long-term maintenance of development and redevelopment stormwater controls. Ecology introduces a new term *stormwater treatment and flow control BMPs/facilities* (first discussed above under section S5.C.2. *Municipal Separate Storm Sewer System Mapping and Documentation*). This term has been developed in part to clarify the extent to which LID is included in various SWMP minimum performance measures. *Stormwater treatment and flow control BMPs/facilities* means detention facilities, treatment BMPs/facilities, bioretention, vegetated roofs, and permeable pavements that help meet minimum requirement 6 (treatment) and minimum requirement 7 (flow control). Ecology proposes to use the term in S5.C.5.a.v(3) to clarify that long-term maintenance and inspection requirements would not apply to smaller project sites. Ecology received a number of comments in May-June 2011 regarding the workload for inspection and maintenance of all LID BMPs, particularly those on small project sites where flow control and/or treatment requirements are not triggered.

#### ***Low Impact Development (LID)***

LID requirements proposed for Phase I permittees stem from appeals of the 2007 permit. The Pollution Controls Hearing Board (PCHB) issued a ruling on August 7, 2008 for the Phase I Municipal Stormwater Permit. The *Findings of Fact, Conclusions of Law, and Order* for the Phase I permit stated that Ecology must "...require non-structural preventive actions and source reduction approaches including Low Impact Development techniques (LID), to minimize the creation of impervious surfaces, and measures to minimize the disturbance of soils and vegetation where feasible..."

On February 3, 2009 the PCHB issued a *Findings of Fact, Conclusions of Law, and Order* for the Western Washington Phase II Municipal Stormwater Permit (WWA Phase II) which acknowledged that Ecology should convene an advisory process to develop technical guidance and a performance standard for LID for both the Phase I and WWA Phase II requirements. On June 17, 2009, Ecology modified the Phase I permit to address the PCHB's 2008 ruling and added a footnote to the requirement for LID that indicated Ecology's intention to conduct such a process and reflect the results in a future permit.

Using funding from USEPA Region 10, Ecology conducted a facilitated process from October 2009 until August 2010 to develop recommendations from two external stakeholder advisory committees on LID requirements for three interrelated levels of requirements:

- Site and subdivision-scale requirements
- Local updates of broader codes, rules, and standards to implement LID, and
- A watershed-scale stormwater planning approach.

In May 2011, Ecology released preliminary draft LID requirements for informal public comment and reconvened a meeting of the advisory committees for input on the proposal. The proposed permit reflects changes Ecology made in response to advisory committee and other informal comments submitted in May and June of 2011. A link to the preliminary draft proposal and informal comments is available at

<http://www.ecy.wa.gov/programs/wq/stormwater/municipal/2012Reissuance.html>

The LID stakeholder advisory committee meeting summaries, studies, and references are available along with Ecology's summary of the May 2011 meeting at

<http://www.ecy.wa.gov/programs/wq/stormwater/municipal/LIDstandards.html>

### ***Definition of LID***

The advisory committees agreed to the following definition of LID:

Low impact development is 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, rainwater harvest, rainwater re-use, and distributed stormwater management practices that are integrated into a project design. LID strategies can be applied to new development, redevelopment, urban retrofits, and infrastructure improvements. LID strategies can have a site, subdivision, or basin scale focus.

The current (2007) permit defines LID as “...*a 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 pre-development hydrologic functions.*” While the PCHB ruling did not provide a definition for LID, it acknowledged that commonly accepted LID principles could be adopted at a basin or watershed level. Ecology proposes the following revision of the 2007 permit definition for LID in the draft permit:

- **Low impact development** is a stormwater and land use management strategy that strives to mimic pre-development 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.

LID design is not limited to specific stormwater best management practices (BMPs) such as bioretention (rain gardens), permeable pavement, and vegetated roofs. LID requires an approach to site assessment and project design to conserve vegetation and minimize and disconnect impervious surfaces. In order to clarify that the implementation of LID includes these elements, Ecology has proposed to distinguish between *LID BMPs* and *LID principles* in the draft permit language, as follows:

- **LID Best Management Practices:** 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, vegetated roofs, minimum excavation foundations, and water re-use.
- **LID principles:** 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.

By including both terms in the draft LID requirement in special condition S5.C.5.b, Ecology intends that permittees will amend stormwater and land use codes, rules, standards, and other enforceable documents, as necessary, to apply both LID BMPs and LID principles along with Appendix 1 requirements for site and subdivision scale development (see section *Appendix 1 – Minimum Technical Requirements for New Development and Redevelopment* of this Fact Sheet) .

### ***Proposed Requirements to Update Local Codes, Rules, Standards, or other Enforceable Documents***

The proposed permit requirements for LID in special condition S.5.C.5.b would require local governments to review local codes, rules, and standards and where needed, to amend them to incorporate LID principles and LID BMPs into enforceable documents regulating stormwater and broader development standards. As described in the introduction above, LID design requires implementation that goes beyond LID BMPs to apply LID principles that conserve vegetation and minimize impervious surface in project design.

In order to provide flexibility to municipalities for implementation, Ecology does not propose to provide specific requirements such as minimum street widths, maximum impervious surface limits, or percent of native vegetation to be retained. However, in response to the May-June 2011 informal comments, Ecology places more emphasis on meeting the three specific goals of minimizing impervious surfaces, native vegetation loss, and stormwater runoff by requiring that permittees document how the amendments address them in the summary of the review and revision process (S5.C.5.b.ii). Ecology does this to emphasize those goals while allowing local governments and developers the flexibility to apply a variety of LID principles and LID BMP's to achieve those objectives. Projects would also use these code provisions to help meet the LID hydrologic performance standard described in Appendix 1.

The proposed language in S5.C.5.b.i refers to a guidance document currently in final draft by the Puget Sound Partnership (PSP) with assistance from Ecology and others. The guidebook serves as an example of an appropriate process for updating local codes to implement LID: *Integrating LID into Local Codes: A Guidebook for Local Government*. The PSP made a draft of this document available for review and comment during the May-June 2011 informal comment period. The PSP conducted workshops on the draft document which Ecology attended, and Ecology held an additional workshop in Vancouver for permittees in southwest Washington.

The PSP guidebook outlines the steps in the process and the types of codes or regulatory documents that permittees would review, and where needed, amend. By referencing this guidebook and requiring submittal of a list of participants, enforceable documents reviewed, and amendments to the documents, Ecology proposes to provide a level of structure and direction to this requirement. The requirement to structure the summary of code amendment according to how they meet the three goals is meant to clarify the importance Ecology places on achieving these goals (see the discussion of Minimum Requirement #1, in Appendix 1). This approach establishes an expectation for outcomes and still provides flexibility for local communities in applying the requirement to individual jurisdictions.

For additional guidance on this process, permittees may consult the stormwater runoff element of the EPA publication *Water Quality Scorecard: Incorporating Green Infrastructure Practices at the Municipal, Neighborhood, and Site Scales* (EPA publication 231B09001, October 2009).

The local codes process for review and amendment of codes would include opportunities for public participation, consistent with special condition S5.C.4 for public involvement.

### ***Watershed-scale Stormwater Planning***

Stormwater management is inherently related to land cover changes. Scientists recognize that it is not possible to maintain water quality and aquatic habitat in lowland streams in Washington State without considering land use and how the landscape is developed. This must occur at a watershed scale that is broader than individual site and subdivision projects. The PCHB Phase I

ruling acknowledged the need for a watershed-scale approach to stormwater management based on the testimony of stormwater experts on all sides of the appeal. The Board directed Ecology to amend the current Phase I permit to require the “permittees to identify, prior to the next permit cycle or renewal, areas for potential basin or watershed planning that can incorporate development strategies as a water quality management tool to protect aquatic resources.” That statement implies an expectation for a permit requirement in the next Phase I permit cycle in regard to basin planning.

In response to that ruling, Ecology presented a proposal in the May preliminary draft for public comment. That preliminary draft proposed planning for watersheds subject to a proposed expansion of the UGA by 80 or more acres; or a land use action causing a projected five percent increase in the total impervious area of a watershed. The required planning would have addressed only the impacts of the UGA expansion or the land use action that would trigger the impervious area increase. Ecology received quite a few comments on the proposal; virtually none were in favor of it for various reasons.

Ecology has dropped that proposal in favor of a planning requirement suggested by a number of commenters – basin planning in areas where impending growth threatens high-value habitat or water resources. The primary objective of the planning would be to identify whether and how the watershed could accommodate the planned growth and still maintain the beneficial uses of the watershed’s surface waters. Urbanization of stream basins in Western Washington has almost without exception been accompanied by a significant degradation or loss of the stream-related beneficial uses; in particular, the anadromous fish resources. The causes for the loss have been multiple and include: degradation of chemical and physical water quality; high flow-related stream channel alterations; loss of base flows; significant alteration of hydrologic patterns; and loss of critical riparian area functions. The challenge for the permittees is to explain what actions they will take that will break this historical pattern of urbanization concurrent with stream degradation and loss of beneficial uses.

The Phase I permittees, and other western Washington municipalities, have engaged in various forms of basin planning in the past. Those planning efforts traditionally suggested managing urban stormwater from planned new development by using the latest practices recommended by Ecology. Most of those practices are of limited effectiveness because they are applied at the end-of-pipe and/or only partially address the water quality and hydrologic changes of new development. They cannot address the full range of impacts caused by land development. Because the controls recommended by Ecology did not fully address the water quality, nor hydrologic impacts caused by urbanization, those plans have fallen short of protecting the aquatic resources.

The proposed watershed planning process directs the Phase I permittees to use their land use management authorities to develop plans that can more comprehensively address the impacts of urbanization.

Ecology expects the use of best available science in setting land cover, water quality, and hydrologic goals; and quantitative analyses to predict stream flows and water quality. Modeling tools such as HSPF and HEC-RAS are available to help with basin hydrologic and stream flow modeling. USEPA, Ecology, and others are working to make the SUSTAIN modeling approach a viable option for predicting water quality and the effectiveness of management measures. While the State has adopted chemical water quality standards that should be used for planning targets, it does not have multiple hydrologic standards associated with preserving beneficial uses that can be used as targets. However, there are planning efforts underway that suggest hydrologic metrics and targets for this planning effort.

Because basin planning of this rigor has not yet been completed for a number of basins, it makes sense to initially conduct this planning on a limited basis. Following the suggestion to accomplish the planning in priority basins, Ecology has identified a preliminary list of priority basins in each of the Phase I counties. No basins that meet the following characteristics were identified in Phase I cities. The priority basins were identified based on the following characteristics:

- Has a drainage area (or a significant sub-area) between 10 and 50 square miles.
- At least partially within the Phase I Permittee's MS4 service area.
- Includes a stream system that has been impacted by urban development but retains some anadromous fish resources.
- Targeted to accept significant population growth and associated land development. At least partially, if not fully, within urban growth boundaries established under the Growth Management Act.

For the final permit, Ecology will either identify a specific basin for each permittee, or will allow each permittee to pick a basin from the priority list. Comments concerning which way to proceed are welcomed. Ecology is open to suggestions for changes to the list of priority basins.

Finally, the proposed permit requires the Phase I counties to work with other municipalities, including Phase II permittees, which have jurisdiction over land regulation within the subject watershed. Each of these entities must be involved in providing information for conducting the necessary analyses, and must participate in the development of strategies to meet the planning objectives. Therefore, the Phase II permit has a requirement for participation in the planning. In future permit terms, Ecology would consider how Phase I and Phase II permittees would be responsible for implementing their parts of the identified basin management plan.

### ***Proposed Implementation Schedule***

In the draft language, Ecology proposes a deadline of December 31, 2014 to update and begin implementing local government codes, rules, and standards as required in S5.C.5.a. and Appendix I. Ecology proposed this timeline as August 1, 2014 in the May 2011 preliminary draft language, and received informal comments that permittees need more time for Ecology

review/approval and subsequent adoption processes. The proposed deadline for submitting enforceable documents for review by December 31, 2013 assumes that permittees will begin preparing for this change when the permit is reissued in July, 2012.

Most Phase I jurisdictions already have regulations, codes, and standards for LID BMPs and LID principles. The existing Phase I permit required cities and counties to “allow” LID in the S5.C.5 program to control runoff in new development, redevelopment, and construction sites. Because most Phase I jurisdictions have years of experience with LID, they are well-positioned to move quickly toward requiring LID in the 2013-2018 permit cycle. The Ecology LID advisory group recommended that the Phase I jurisdictions could achieve this in two years. The December 31, 2014 proposed deadline is two years and four months after permit reissuance.

Ecology proposes to require that Phase I permittees submit draft revised codes, rules, standards, and other enforceable documents prepared to comply with S5.C.5.a to Ecology for review and approval. Based on experience from the previous permit cycle, Ecology proposes to increase Ecology’s review time period to 90 days to better accommodate the iterative review and revision process with permittees to finalize approved language. Once approved, Ecology will list the approved manuals and codes in Appendix 10 of a modified Phase I permit. This list of approved manuals and codes can be used by Phase II permittees who choose to adopt a Phase I program that Ecology deems to provide a functionally equal or similar level of protection to the minimum requirements, thresholds, and definitions in Appendix 1.

Between December 31, 2013, which is the deadline for submitting the amendment package, and the December 31, 2014 adoption deadline, permittees would be responsible for the following:

- Responding to Ecology’s comments. Based on previous experience, several iterations may be necessary before all comments are resolved.
- Finalizing documents that reflect the resolution of Ecology’s comments.
- Conducting the public process for adoption.
- If necessary following public processes, making changes and coordinating such changes with Ecology to ensure approvability.
- Adoption by elected officials.
- Make program effective.

Ecology proposes to review and approve the site and subdivision scale LID requirements. In response to informal comments, Ecology does not propose to review and approve the broader package of code amendments. Ecology proposes that Permittees conduct this broader code review and amendment process also by December 31, 2014.

The draft language proposes that permittees submit a summary of the process for updating broader codes, rules, and standards with the Second Year annual report (S5.C.5.b). The Second

Year annual report covering activities in calendar year 2014 is appropriate because the process for updating these codes, rules and standards would be completed by December 31, 2014.

In the proposed permit Ecology clarifies both when the new stormwater related ordinances must be adopted and when they must become effective. In addition, Ecology clarifies how the newly adopted ordinances apply to development projects that have previously been approved but not yet built; as well as, development projects that are in the application/approval process at the time the new codes become effective.

Ecology proposes the effective date for new stormwater codes/ordinances be the same as the adoption date for local codes. If local governments want or need a period of time between the adoption date and the effective date, the adoption date would need to be moved up accordingly.

The new stormwater requirements would apply to all projects where the application is submitted after the effective date of the new codes. In this context, Ecology defines the application to include, at a minimum a complete: project description, site plan, and, if applicable, SEPA checklist. If permittees choose, the elements of a complete application may be expanded.

The new stormwater requirements would apply to previously approved projects that have not started construction within five years of the effective date of the new stormwater requirements. Ecology defines “started construction” as the site work associated with, and directly related to the approved project. For example: grading the project site to final grade and/or utility installation. Simply clearing the project site would not constitute the start of construction.

### *Coordinating with Updates of Stormwater Manuals, Guidance, and the Hydrology Model*

Ecology is engaged in updating or developing five important tools for local governments and developers that, taken together, comprise an integrated body of design standards and guidance for implementing the LID requirements. Coordinated timelines for public review will provide interested reviewers with a comprehensive view of these interrelated tools and guidance documents:

1. *Stormwater Management Manual for Western Washington*, Department of Ecology (expected publication 2012)
  - Ecology is drafting selected edits of the Ecology stormwater manual for Western Washington to incorporate the proposed LID requirements in Appendix I, as well as several other specific edits to the manual. Ecology is releasing the edits of selected sections of the manual for public review on November 4, 2011 to coincide with the public comment period of the formal draft Phase I permit.
2. *Low Impact Development Guidance Manual for Puget Sound*, Puget Sound Action Team and WSU Pierce County Extension (expected version in late 2011 or early 2012)



- Ecology is participating in the update of the LID manual to ensure it is consistent with proposed Appendix I requirements and the edited sections of the Ecology manual. Led by WSU Puyallup Campus and the Puget Sound Partnership, the draft updated LID manual will be available for public review during the draft permit comment period, and will be useful for most areas of Western Washington.
3. *Integrating LID into Local Codes: A Guidebook for Local Governments*, Puget Sound Partnership, (final draft expected by November 10, 2011)
    - The Puget Sound Partnership's step-by-step guidebook for local governments to update stormwater and broader development codes for LID principles is referenced in (S5.C.5.b). The guidebook outlines a process to review and amend local codes, rules, and standards. The public review draft is available at [www.psp.wa.gov](http://www.psp.wa.gov) and publication of the final document is expected before the end of the draft permit comment period.
  4. *Rain Garden Handbook for Western Washington Homeowners*, WSU Pierce County Extension (2007)
    - WSU Pierce County will update the rain garden handbook during 2012 based on current research and lessons learned. Ecology preliminary draft language in Appendix I, Minimum Requirement #5 cites the updated handbook as guidance for construction of rain gardens on project sites that must comply with Minimum Requirement #5, but which do not have to comply with the Minimum Requirements for treatment or flow control (#6 and #7, respectively).

Ecology also expects to complete an update of the Western Washington Hydrologic Model (WWHM) in spring 2012. Ecology is working with a consultant to update the WWHM to better address LID BMPs. The Ecology LID advisory committees identified this as a high priority for implementing LID, and Ecology will update this tool to reflect the committee's input.

#### **S5.C.6 Structural Stormwater Controls**

Under the current (2007) permit permittees are required to develop a program for structural stormwater controls (SSC) as part of their Stormwater Management Program (SWMP). This program is aimed toward retrofitting existing developed areas; and promotes planning and prioritizing these projects to reduce impacts to watershed hydrology and pollutant discharges from MS4s. This program also address stormwater impacts which are not adequately controlled by other permit requirements.

Ecology proposes to revise this permit section based on the summer 2010 Listening Sessions, past Pollution Control Hearing Board rulings, and informal comments from permittees. Key points from these sources included:

- The Phase I permit should include a metric for implementing retrofits.
- The Phase I SSC program should allow more flexibility than the current permit requires.
- Permittees want a meaningful way to count projects, to give recognition for what they are doing, and to use the information generated by the reporting in their own management programs.

Ecology proposes that the reissued Phase I permit contain improved methods for evaluating and quantifying the performance of the Structural Stormwater Controls (SSC) program. Ecology requires permittees to include an updated list of planned individual projects scheduled for implementation during the term of the permit with their annual reports. Ecology has included a standardized listing format in *Appendix 11-Structural Stormwater Controls Project List* of the permit in order to improve project comparisons.

#### ***55.C.6.a Project Types for Consideration***

The permit generally retains all project types in the 2007 permit. The following information describes the reasons for changes and provides clarifying information for each project type that must be considered in permittees' SSC programs:

- (1) New flow control facilities—Flow control facilities need not be regional. These facilities do not have to meet the standard flow control requirement but they shall be new facilities designed to control stormwater flow from existing development.
- (2) New water quality treatment facilities—Water quality treatment facilities include facilities that provide oil control, phosphorus treatment, enhanced (dissolved metals) treatment, and basic treatment. Facilities in this category do not have to meet runoff treatment requirements but they shall be new facilities that provide a treatment benefit for existing development.
- (3) Retrofitting of existing stormwater facilities—Retrofitting is expected to occur on previously constructed stormwater facilities that, if modified, would provide additional hydrologic or water quality benefits. For example, Ecology considers the retrofit of a stormwater pond to provide a settling area and more storage a retrofit to a stormwater facility. Maintenance of existing stormwater facilities is not classified under this project type.
- (4) Property acquisition to provide additional water quality and/or flow control benefits—Purchase of a development site to permanently prevent it from being developed could qualify under this category. This may include forest protection and conservation easements. Projects that purchase “rights-of-way” property may be listed if that area will be used to provide water quality and/or flow control benefits.
- (5) New LID BMPs and the application of LID Principles—Ecology added this project type to replace the previous permit language that considered the “reduction or prevention of

hydrologic changes through use of on-site (infiltration and dispersion) stormwater management BMPs and site design techniques.”

- (6) Maintenance with capital construction costs  $\geq$  \$25,000 —Ecology added this project type and intends it to apply to repair projects that improve the hydrologic or treatment performance of stormwater facilities. These projects typically compete with the other types of retrofit projects for limited capital construction funding. Ecology expects that maintenance or repair projects identified through Operations and Maintenance requirements in S5.C.9 which fall into this category will be placed on the Permittee’s SSC Project List.

The Permit continues to allow additional project types that should be considered in the SSC Program. These potential project types are described below.

- (1) Riparian habitat acquisition—Retained from the 2007 permit.
- (2) Restoration of forest cover and/or riparian buffers—Retained from the 2007 permit.
- (3) Other projects not otherwise required in S5.C—Ecology included this project type in the SSC Program to allow permittees to count the water quality and/or hydrologic benefits of any project addressing stormwater runoff into or from the MS4 that is not otherwise required in the Stormwater Management Program requirements of S5.C.

Ecology proposes removing language that requires permittees to describe how the projects comply with AKART and MEP requirements. Ecology intends, through establishing Appendix 11, that projects will receive a larger amount of retrofit incentive points for meeting AKART or MEP requirements. For more information see section *Appendix 11 and the relationship to AKART and MEP* of this Fact Sheet.

#### ***S5.C.6.b SWMPR requirements for the SSC Program***

The required written documentation of the Permittee’s SSC program is substantially unchanged. This permit clarifies that this documentation belongs in the Permittee’s Stormwater Management Program Report (SWMPR), and is thus subject to public review and comment.

Ecology removed the items previously listed for individual and small projects. Ecology designed Appendix 11, in part, to address these items in a standardized format.

#### ***S5.C.6.c***

Ecology requires permittees to include an updated list of planned individual projects scheduled for implementation during the term of the permit with their annual reports. Ecology has created Appendix 11 as a way to standardize the information and reporting format received from permittees.

### **Appendix 11 and the relationship to AKART and MEP**

In developing this Appendix 11, Ecology considered similar retrofit program requirements in Oregon, Alaska and the District of Columbia. Oregon requires the construction of one structural stormwater control project over the permit term. The Anchorage, Alaska permit requires the retrofit of one parking lot. Washington DC's permit requires retrofits for stormwater discharges from a minimum of 18,000,000 square feet of impervious surfaces during the permit term. Ecology wants to build a SSC Program in Washington State that, over time, accomplishes objectives similar to these permits; but also allows permittees flexibility in meeting such objectives.

Ecology's attempt to do this led to the creation of the retrofit incentive, which provides a relatively standardized calculation of points for each SSC project. Ecology intends the retrofit incentive to provide more points for projects that meet an AKART or MEP standard, achieve higher standards of hydrologic or water quality benefits, and for projects that occur in degraded areas. Ecology anticipates that future permit cycles will establish a minimum performance standard based on the retrofit incentive points, water quality benefits, and hydrological benefits in Appendix 11. For more information about Appendix 11 see section *Appendix 11- Structural Stormwater Controls Project List* in this Fact Sheet.

### **S5.C.7 Source Control Program for Existing Development**

This provision is based upon EPA rules at 40 CFR 122.26(d)(2)(iv)(A) which call for a stormwater management program that includes, among other things, source control measures.

Ecology proposes to remove this clause, previously found in S5.C.7.a.iii of the permit: *“Permittees that are in compliance with the terms of this permit will not be held liable by Ecology for water quality standard violations or receiving water impacts caused by industries and other Permittees covered, or which should be covered under an NPDES permit issued by Ecology.”* Ecology will continue to use its enforcement discretion consistent with this clause and as appropriate on a case by case basis.

Ecology is editing the *Stormwater Management Manual for Western Washington* and intends to release the 2012 version of the Stormwater Management Manual in June of 2012. Permittees may need to update their ordinances and/or other enforceable documents (such as source control or pollution prevention manuals) for consistency with Ecology's 2012 Stormwater Management Manual. Ecology proposes a deadline for this of 180 days before the end of the permit cycle. Ecology expects this update to be minor in comparison to the original adoption of these documents, required under the current (2007) permit term. Therefore, Ecology will not review or approve updated ordinances or other enforceable documents to support source control. Ecology acknowledges that permittees may not need to change their local ordinances and documents to meet the requirements of this section.

In S5.C.7b.ii., the permit requires a program to identify sites which are potentially pollutant generating. Ecology has slightly modified the requirement associated with inventorying sites due to the difficulties that counties, in particular, experienced trying to generate the inventory based on business licenses and Standard Industry Classification codes. Unlike cities, counties do not have local business license programs. Permittees may use other records, such as land use maps and parcel information to generate the inventory provided the inventory represents and encompasses the business types listed in Appendix 8. The permit also now expressly requires this inventory to be updated annually. Each annual update generates a list from which the level of effort required in section S5.C.7.b.iii of the permit (20%) is derived.

S5.C.7.b.iii requires an inspection and enforcement program for identified sites. Note that while the permit calls for inspecting 20% of the identified sites each year, Ecology does not expect inspection of 100% of the sites over the 5 year term of the permit. Permittees have the flexibility to prioritize sites based on categories of land use, geographic areas, or other criteria. Ecology proposes to limit the amount of follow up compliance inspections that count as part of the 20% to two a year per site.

Ecology proposes language that explicitly requires an ongoing training program to include annual trainings for staff responsible for implementing source control programs, required under S5.C.7.b.v. Ecology expects that the annual trainings will ensure that source control staff are continually kept up to date on procedures, topics and issues related to their work.

#### ***Proposed changes to address minor clarifications, corrections, and issues of consistency:***

- *S5.C.7.a* – Ecology proposes to change the language from include a program to implement a program. Ecology also proposes to add the word facilities after treatment BMPs for clarification.
- *S5.C.7.b.iii* – Ecology removed the word audit and now just refers to an inspection program for this section. Permittees may continue existing “audit” programs if performed to meet the requirements of this section. Ecology also made minor language changes for clarification.

*S5.C.7.b.iv* – Ecology made minor language changes to clarify that permittees will continue their ongoing program. In section S5.C.7.b.iv.(4) Ecology removed redundant language that required permittees to contact Ecology upon discovering a source control violation that is a severe threat to human health or the environment. Permittees should refer to the requirements under General Condition 3 of the permit.

#### **S5.C.8 Illicit Connections and Illicit Discharges Detection and Elimination**

Permittees used the illicit discharge detection and elimination (IDDE) program during the current permit cycle to eliminate many pollution problems (see Ecology’s focus sheet describing some successes at <http://www.ecy.wa.gov/pubs/1110022.pdf> ). As they built their programs, permittees

provided valuable feedback that Ecology incorporated into the proposed permit requirements for the 2013-2018 permit term.

Ecology proposes to reorganize the IDDE section to clarify the purposes of requirements and how they are related. These proposed changes are consistent with permit reissuance themes of simplifying language where possible, and to improve consistency across the municipal stormwater permits. The proposed changes also respond to questions and comments by permittees. Most of the requirements remain unchanged, but have been reorganized. The requirements for prohibiting, identifying, investigating, responding to, and addressing/eliminating illicit discharges and connections are now in separate subsections.

#### ***S5.C.8.b Prohibiting illicit discharges***

This subsection provides for local government legal authority to prohibit non-stormwater discharges into the MS4. Ecology intends the requirements to provide an opportunity for permittees, to evaluate how well their IDDE-related codes are working, make changes, and if necessary improve their programs. Ecology has set a deadline of February 2, 2018 for this evaluation.

*S5.C.8.b.i* – Ecology proposes moving the following two provisions to the allowable discharges subsection for clarity:

- Non-stormwater discharges authorized by another NPDES or state waste discharge permit are authorized by this permit under S2.B.
- Revision regarding allowable discharges during emergency fire fighting, for consistency with S2.B.

*S5.C.8.b.ii* – Ecology proposes to add dechlorinated spa and hot tub discharges to swimming pool discharges as conditionally allowable discharges, for completeness. Conditions include dechlorination to the required levels and thermal controls to prevent elevate temperatures in receiving waters as required by WAC 173-201A-200, the designated uses and criteria for state water quality standards. Ecology expects that local governments will advise citizens to turn off the heater and let the water sit to achieve thermal control. Ecology also removes “stormwater” from the section for “Other non-stormwater discharges” to prevent confusion with the Construction SWPPP required under minimum requirement #2 in Appendix 1 and to acknowledge that the pollution prevention plan may address non-stormwater discharges. The pollution prevention plan in this section should be reviewed and conditioned to address the specific discharge under consideration.

#### ***S5.C.8.c Identifying illicit discharges***

The focus of this subsection is now on the three primary means of learning about an illicit discharge: pro-active MS4 screening, complaints from an informed public, and referrals from trained municipal field staff. In response to input at Listening Sessions and lessons from the

previous permit cycle (as summarized by Ecology's August 6, 2010 IDDE Project Report)<sup>7</sup>, Ecology provides more flexibility in the procedures for conducting field screening, and for each permittee to develop the method or methods that are most effective and efficient for their MS4. A jurisdiction may employ a method that works best in one part of the system and another method in other parts of the system. The Center for Watershed Protection guidance is still available for those permittees who find it appropriate, and for new permittees to use as a reference when establishing a program.

Under the current (2007) permit, cities were required to screen 60% of their MS4. In this permit, Ecology proposes that cities complete screening the remaining 40% in the first 4 years. Similarly, counties were required to screen 50% of their MS4 in urban/higher density sub basins under the last permit, and Ecology is proposing they complete the remaining half in this permit's first 4 years. Ecology proposes that counties maintain the level of effort for rural sub-basins that had been required under the previous permit (1 rural subbasin). For both cities and counties, Ecology proposes a clear ongoing level of effort of 20% annually (and 1 rural subbasin in the counties) to begin after the first 4 years of this permit cycle.

The general municipal field staff training requirements are in this section because this training is an important method for learning about illicit discharges. It is different from the training for employees responsible for implementing the IDDE program. The training requirement is limited to ensuring that municipal field staff know how to identify a possible illicit discharge and how to report it internally for response. Municipal field staff include permanent and temporary employees whose work includes frequent field activities during which they might observe an illicit discharge or illicit connection. Examples of municipal field staff include local government employees such as maintenance staff, law enforcement officers, building inspectors, fire fighters, health department staff, sewer and water utility staff, animal control officers, and planners. Permittee feedback on the IDDE program identified this training as one of the most effective methods for the local government to learn about illicit discharges.

S5.C.8.c.ii of the draft permit also clarifies that all hotline reports of illicit discharges must be addressed if they prove to be legitimate.

#### ***S5.C.8.d Investigating and responding to illicit discharges***

The draft permit better organizes this subsection to establish procedures and requirements for responding to illicit discharges, including characterizing the environmental threat, source tracing, and eliminating or otherwise addressing the discharge. Ecology clarifies the time frames for investigation, response, and elimination and improves the consistency with General Condition G3 for situations requiring immediate action.

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<sup>7</sup> Opalka, Alice. 2010. *IDDE Project Report*, Ecology internal report to the Northwest Regional Office Water Quality Program, submitted in completion of internship, August 16, 2010.

In permit condition (S5.C.8.d.iii) Ecology uses the term “eliminating” illicit discharges, although (S5.C.8.d) refers more broadly to an ongoing program to “address” illicit discharges. Although the program goal is to eliminate illicit discharges, Ecology recognizes that there are situations for which the term “eliminate” does not apply. Examples include situations such as when the illicit discharge has ended but requires action to identify the source and prevent recurrence, or the local government addresses it through education or technical assistance.

#### ***S5.C.3.e Training IDDE program staff***

Ecology proposes language to clarify and simplify the training requirement for staff responsible for implementing the IDDE program.

#### ***S5.C.3.f Regional emergency response program***

Ecology proposes to remove language already addressed in other areas of the permit, including G3 Notification of Discharge Including Spills.

#### ***S5.C.3.g Recordkeeping***

Ecology proposes language to simplify recordkeeping requirements that removes several undefined phrases that may or may not be relevant to a permittee’s IDDE procedures or enforcement authority.

### **S5.C.9 Operation and Maintenance Program**

The changes proposed for this section would require continuing implementation of the operation and maintenance programs developed during the current (2007) permit term. Proposed changes would also add LID related terms, reflect the 2012 edits to the *Stormwater Management Manual for Western Washington* (SWMMWW), and improve the flexibility for some activities.

S5.C.9.a – Maintenance Standards – In this section Ecology sets a deadline for cities and counties to update maintenance standards to be consistent with those in the 2012 SWMMWW. The proposed deadline is the same as the schedule for adoption of proposed site and subdivision requirements in S5.C.5. Language is added to clarify that until adoption of the updated maintenance standards, permittees would continue to implement the maintenance standards adopted under requirements of the current (2007) permit.

S5.C.9.b & c – Maintenance of Stormwater Treatment and Flow Control BMPs/Facilities – Ecology uses the term *stormwater treatment and flow control BMPs/facilities* in specific conditions where the requirement is limited to the facilities and BMPs designed and constructed to help meet treatment and/or flow control requirements in Appendix 1 (refer to previous discussions of this term associated with S5.C.2 and S5.C.5). The proposed permit would require permittees to inspect and maintain those facilities annually, except where there is documentation to support a less frequent schedule. Once permittees have submitted that documentation, they do not need to re-submit it during the permit term.



Since permittees developed annual inspection programs in the previous permit for stormwater facilities regulated by the permittee Ecology removed initial inspection requirements from S5.C.9.b.i. The clause that limits the inspection program only to facilities which the permittee can legally gain access is now located in section S5.C.9.b.ii.

Ecology has revised section S5.C.9.b.iv language from “the period of heaviest construction” to “until 90% of the lots are constructed”.

S5.C.9.c.ii – Spot Checks – Ecology proposes to remove the storm event size from this requirement to conduct spot checks after major storm events. Some permittees provided feedback that their systems are too variable to tie this to a prescriptive storm event, and that when damage may be occurring, they prefer to deploy their staff where it is most needed. Ecology recognizes the importance of this flexibility and defers this to local discretion.

S5.C.9.d – Catch Basins – This section the permit requires permittees to inspect and as, needed, clean catch basins annually.

Ecology received feedback related to the catch basin requirements during the previous permit term and proposes to modify this requirement to allow alternative approaches that permittees have found effective. Ecology proposes a definition for “circuit” in the Definitions section of the proposed permit to further clarify the circuit basis alternative for catch basin cleaning (S5.C.9.d.i.(1)). Several permittees reported that cleaning the entire conveyance and catch basins within a circuit is also effective and can be accompanied by a less frequent inspection requirement. Ecology adds this alternative as well (S5.C.9.d.i.(2)). Ecology anticipates that permittees will adapt these alternatives as best suited to their systems, and may choose to employ one alternative in one area, and another in other parts of the system.

In the current (2007) permit Ecology did not include permit language about how compliance shall be determined for the maintenance of catch basin requirements. Ecology proposes to add language for compliance for S5.C.9.d.i similar to the compliance requirements for stormwater treatment and flow control BMPs/facilities maintenance.

S5.C.9.e – Municipal Lands– Ecology proposes to combine this section with the requirement in the current (2007) permit for lands owned by the permittee (combining sections S5.C.9.b. vi and vii of the current permit). This section was previously limited to lands owned and maintained by the permittee that are primarily transportation-related. Most of the proposed changes implement this simplification of requirements. Additional requirements address snow disposal and pet waste management. Ecology proposes to remove the term “integrated pest management” (IPM) in response to permittee comments that this term may be confused with a formal IPM plan that has complex elements not applicable to this context. Ecology recognizes that the general IPM approach remains an effective one for landscaping practices.

S5.C.9.f – Employee Training – Ecology proposes to revise this section for consistency with the Western Washington Phase II Municipal Stormwater Permit.

S5.C.9.g – SWPPP Requirement – Ecology proposes to remove from this section the sentence about non-structural BMPs because it caused confusion during the current (2007) permit cycle with another use of the term “non-structural” to describe LID BMPs. This does not change the substance of this requirement.

### **S5.C.10 Education and Outreach Program**

Ecology does not propose to significantly change the public education and outreach program. Changes to S5.C.10.a simplify the language, and add several topics of public education recommended by permittees during the current (2007) permit term. Education topics for low impact development (LID) in S5.C.10.c.iv are made consistent with Ecology’s proposed LID terminology in S5.C.5. In S5.C.10.a the proposed permit adds the requirement to create stewardship opportunities for consistency with the Western Washington Phase II Municipal Stormwater Permit. Permittees have indicated that activities such as stream teams, storm drain stenciling, and volunteer monitoring are public education activities. Ecology proposes requirements that permittees continue education activities for target audiences as appropriate, and also implement a more developed educational effort to at least one new subject audience in at least one new subject area. This new educational effort would target a priority audience and subject and measure the changes in understanding and behavior for at least a year beginning by February 2, 2015. After a year, permittees would begin to use the information gathered to improve the program as described in S5.C.1.d. Ecology recognizes that a variety of types of measures may be effective. As outlined in the guidance prepared for permittees on Ecology’s website, the education program should be scaled to the size of the jurisdiction. (See <http://www.ecy.wa.gov/biblio/0710092.html>)

Ecology encourages Phase I permittees to cooperate in and/or lead regional public education efforts. During the last permit term Ecology funded efforts such as the Puget Sound Stormwater Outreach for Regional Municipalities (STORM) program and awarded other grants to groups of permittees for regional or statewide public education activities. Some permittees requested that Ecology clarify that they may meet permit requirements through a regional effort, and Ecology added such language to this section of the draft permit. Jurisdictions using a regional approach should contribute a meaningful level of effort, ensure that the education approach is implemented in their jurisdiction, and ensure that regional education activities are applicable to audiences and issues in those communities. Cooperative regional efforts are often more effective in disseminating a coordinated message and are generally more cost effective for permittees.

## **6.6 S6 Stormwater Management Program for Secondary Permittees**

Secondary Permittees are public entities such as ports, park districts, school districts, colleges and universities, state institution campuses, state military campuses, irrigation districts, and diking and drainage districts that are located in a Phase I city or county coverage area and own or

operate a regulated MS4. This section of the permit describes the requirements that apply to Secondary Permittees and makes up the core elements of their Stormwater Management Program.

The SWMP for Secondary Permittees is intended to apply to a wide variety of Secondary Permittees. The requirements of Special Condition S6 will apply differently depending on the type and function of the public entity, the size and nature of the coverage area, and the specifics of the entity's MS4. For example, ports covered by the permit may lease property to other entities that manage stormwater on the leased property, and in some cases that property may be covered by the *General NPDES Permit for Stormwater Discharges Associated with Industrial Activities*, or another NPDES stormwater permit. Alternatively, many colleges and universities have resident and commuter student populations. Diking and drainage districts may serve more than 1,000 residents because their service areas are now partially in urbanized areas, but they have little or no authority over activities on those properties. Some permittees may rely on the local jurisdiction to regulate discharges into their MS4, others may rely on another NPDES permit for such regulations, while others such as school districts control operations on all the lands served by their MS4 and may rely on internal policies.

Ecology's general approach to changes for Secondary Permittee requirements is to simplify language, where appropriate, to clarify requirements, and to improve consistency across permits. Several proposed revisions also clarify requirements that the Secondary Permittee may be unable to meet on leased property. Ecology proposes additions such as "...under the functional control of..." to refer to situations in which Secondary Permittees must have legal access and authority to perform the activity. Other draft revisions use the phrase "...owned and operated by the Secondary Permittee..." to refer to activities where the Secondary Permittee not only owns the property, but also operates the stormwater system. The alternative phrase, "...owned or operated by the Permittee..." may refer to situations in which a permittee owns the property but a tenant operates the stormwater system.

### **S6.A New Secondary Permittees**

Ecology drafted the revisions to requirements in S6 to apply to continuing Secondary Permittees. The term "New Secondary Permittees" refers to Secondary Permittees with coverage dates after August 1, 2013, the permit effective date. Special condition S6.A includes a statement that all the S6 requirements apply to New Secondary Permittees as modified by footnotes in S6.D. New Secondary Permittees must follow all the applicable S6 requirements, and where requirements are modified by footnotes, they must follow the modified requirements and timelines.

The implementation schedule for New Secondary Permittees presented in footnotes phases in the program requirements on the same timelines as those in the current (2007) permit cycle. The permit also refers to a schedule established as a condition of coverage by Ecology, which will be developed with the permittee applies for permit coverage. Ecology will tailor the implementation schedule to the specific entity, depending on the type of entity and the nature of the MS4.

Secondary Permittees may begin permit coverage at any time during the permit term, and the implementation schedule may extend from one permit term to the next. Secondary Permittee implementation schedules are calculated based on the date of permit coverage. For this reason, Ecology also revises Secondary Permittee deadlines to refer to the “initial” permit coverage date. This may be a date in a previous permit term. As New Secondary Permittees begin permit coverage and fully implement their requirements, they will be subject in future permit terms to deadlines for the “initial” date of permit coverage. Ecology uses this approach to direct continuing Secondary Permittees to continue implementing their programs according to their individual schedules, and to direct New Secondary Permittees to phase in their programs according to individual schedules over a four and one-half year period. Once the SWMP is fully implemented, Ecology expects all Secondary Permittees to continue full program implementation.

#### **S6.A.4 Stormwater Management Program and Report**

Consistent with Ecology’s objective to simplify permit language, Ecology proposes to remove language in S6.A.4 that outlines the SWMP documentation requirements. Instead, Ecology proposes to refer to written documentation of the SWMP as a SWMP Report (SWMPR) to reduce confusion between the suite of stormwater management program actions and activities, and the written document to inform the public about planned SWMP activities. The purpose of the SWMPR is revised to include descriptions of the activities and actions that the permittee plans for the upcoming calendar year. This is intended to reduce and streamline paperwork. The updated SWMPR is to be posted annually on the Secondary Permittee’s website, but it would no longer be required as a submittal with the annual report.

#### **S6.B. Coordination**

The draft permit proposes to change “shall” to “should” for requirements to coordinate within a watershed and with interconnected MS4s because it is not relevant to each type of permittee. Internal coordination is still required where the entity is large enough to have various departments.

Other revisions in S6.A and B are intended to reduce duplicative language and improve consistency across the three municipal stormwater permits.

#### **S6.D. Stormwater Management Program for Secondary Permittees**

##### **S6.D.1 Public Education and Outreach**

Ecology proposes edits in S6.D.1.a to the types of messages required for storm drain inlet labels, in order to recognize the variety of messages being used. The requirement for new secondary permittees combines into one four-year deadline the previous requirement that divided the deadlines for half the inlets to be labeled in three years, and the other half in four years. Feedback from some secondary permittees indicated that in many cases there are very few inlets, and this simplifies the requirement and reporting obligation.

In condition S6.D.1.b the revised language clarifies that the requirement to distribute educational information by ports, colleges and universities may be done electronically, and provides more flexibility in the topics covered. Ecology believes that public education for college and university students and for port tenants and their employees helps prevent polluting discharges and complements the city or county public education program to help strengthen awareness and change behaviors in the broader community.

Ecology removed the language that the requirement can be met by participating in the local jurisdiction's public education and outreach program only because it duplicates language in S6.A.4. Ecology continues to encourage this type of collaboration and efficiency, for cost savings as well as consistency of messaging.

### ***S6.D.2 Public Involvement and Participation***

The draft permit requires secondary permittees to post the annual report and SWMPR on the entity's website each year by May 31. This provides information for the interested public on program implementation, as well as advance notice on opportunities for public involvement.

### ***S6.D.3 Illicit Discharge Detection and Elimination***

For secondary permittees that rely on internal policies to govern non-stormwater discharges rather than the local city or county code, changes proposed in allowable and conditional discharges clarify language and improve consistency with the local government requirements. The proposed language for S6.D.3.b.ii notes that the conditional discharges are allowable only if the conditions are met and if such discharges are allowed by the local code for the jurisdiction. Ecology intends this language to clarify that in cases where a city or county has more restrictive conditional discharge requirements than those in the permit, the secondary permittee must comply with the local code.

In the requirement for field inspections (S6.D.3.d) Ecology clarifies that the visual inspection is intended to include MS4 discharge points as well as outfalls. Many secondary permittee MS4s are interconnected with those of the city or county, and where possible, the screening for illicit discharges should include these discharge points as well, to improve detection of illicit discharges.

Draft requirement S6.D.3.e includes the term "qualified spill responder." A qualified spill responder should meet the training and experience requirements of a Hazardous Team member at the Hazardous Materials Specialist level, as outlined in Labor and Industry regulations (Chapters 296-824 WAC and 296-843 WAC). Ecology's website includes lists of qualified contractors for hazardous materials (Ecology does not verify or endorse the list) and approved primary spill response contractors (as per Chapter 173-182 WAC) at [http://www.ecy.wa.gov/programs/spills/spills\\_happen/main.html](http://www.ecy.wa.gov/programs/spills/spills_happen/main.html)

The staff training requirement (S6.D.3.f) proposes that secondary permittees must offer training opportunities to the appropriate employees of tenants. This would apply primarily to ports, and is

intended to promote improved coordination and response to illicit discharges. It may also help reduce costs for training. However, compliance with this requirement is limited to offering the training opportunity and does not carry an obligation to ensure attendance at the training by tenant staff.

#### ***S6.D.4 Construction Site Stormwater Runoff Control***

The draft permit proposes no substantive changes to this section, but clarifies that certain requirements apply to activities that are under the *functional control* of the secondary permittee. Feedback from ports, in particular, informed Ecology that some secondary permittees may not have the legal authority under already executed leases to manage stormwater on leased property. Where the tenant is responsible for stormwater management on a leased property, Ecology recognizes that the secondary permittee responsibilities for construction site requirements apply to properties under the secondary permittee's functional control, whether by its own staff or through a contractor.

#### ***S6.D.5 Post-construction Stormwater Management in New Development and Redevelopment***

Secondary permittees do not have land use authority under state law, and the requirements of this and the previous section refer to the obligation to comply with local ordinances governing these activities. Where the MS4 is interconnected with the local jurisdiction MS4, secondary permittees must coordinate to assist the local jurisdiction in achieving compliance with local codes. This might occur if the local jurisdiction needed assistance in addressing a discharge from a secondary permittee's MS4 that originated from a tenant's discharge into the MS4 of the secondary permittee.

#### ***S6.D.6 Pollution Prevention and Good Housekeeping for Municipal Operations***

The draft permit requires that operation and maintenance of the secondary permittee's MS4 must include standards consistent with or more protective than those in Ecology's edited 2012 *Stormwater Management Manual for Western Washington*. Ecology proposes language to require secondary permittees to review maintenance standards to ensure they are consistent with any updates in local or Ecology standards. In the permit term beginning August 1, 2013, the draft permit sets a date of December 31, 2015 for local governments to adopt the revised manual in local codes, or an Ecology-approved Phase I manual. Secondary permittees would update their maintenance standards to be consistent with the 2012 manual update in order to include new maintenance standards for some LID BMPs.

Ecology introduces the term *stormwater treatment and flow control BMPs/facilities* in the draft permit to distinguish BMPs and facilities that help meet treatment and flow control requirements (see definition in the *Definitions and Acronyms* section of the permit). This distinction is relevant because some LID BMPs help meet these requirements for some projects but do not for other projects.

The draft requirement for S6.C.6.a.i clarifies that the secondary permittee is responsible for maintenance of the MS4 that it owns *and* operates, and may not be responsible for those operated by tenants. Requirements for spot checks after major storms are no longer tied to a specific size of storm, but can be conducted according to the priorities of the secondary permittee.

Other additions to the requirements for the Operations and Maintenance (O&M) plan include maintenance of dumpsters, management of pet waste, and clarification of the terms for facilities requiring Stormwater Pollution Prevention Plans for consistency with the *Definitions and Acronyms* section of the permit. Input from Permittees during the current (2007) permit term led to these improvements and clarifications.

### **S6.E Stormwater Management Program for the Port of Seattle and Port of Tacoma**

Ecology proposes to remove the introductory paragraphs in this section because they are redundant with section S6.A. Throughout this section Ecology has revised the permit language to refer to Permittees or the Permittee, for consistency, instead of the various terms used in the previous permit, such as Port and Secondary Permittee.

#### **S6.E.1 Education Program**

Ecology does not propose any substantial changes to this section but does require permittees to continue their education program.

#### **S6.E.2 Public Involvement and Participation**

Ecology proposes to streamline the requirements by requiring permittees to post their SWMPR and Annual Report on their website each year.

#### **S6.E.3 Illicit Discharge Detection and Elimination**

Ecology requires permittees to continue to implement their policies prohibiting illicit discharges and their enforcement plans. For permittees that rely on internal policies to govern non-stormwater discharges rather than the local city or county code, changes proposed in allowable and conditional discharges clarify language and improve consistency with the local government requirements. The proposed language for S6.E.3.b.ii notes that the conditional discharges are allowable only if the conditions are met and if such discharges are allowed by the local code for the jurisdiction. Ecology intends this language to clarify that in cases where a city or county has more restrictive conditional discharge requirements than those in the permit, the permittee must comply with the local code.

Section S6.E.3.c – Ecology proposes language that continues, and increases, the mapping requirements. Ecology also proposes that permittees maintain the maps they create under this permit section.

Section S6.E.3.c.ii – The proposed language extends the requirement for mapping tributary conveyances, and associated drainage areas, to outfalls with a 12 inch nominal diameter or

equivalent. Port MS4s typically drain smaller areas than city or county MS4s thus small diameter outfalls are more common.

S6.E.3.c.iii – A new requirement is the initiation of a program to map connections greater than or equal to 8 inches to tributary conveyances of outfalls with a 12 inch nominal diameter or equivalent by August 1, 2017. Expanding mapping to include these connections is intended to aid in locating illicit discharges by expanding the knowledge base of jurisdictions on connections to their MS4.

S6.E.3.c.iv – Ecology proposes to require electronic format with fully described mapping standards, rather than stating this as the preferred format for maps. This website: <http://www.ecy.wa.gov/services/gis/data/standards/standards.htm> contains example mapping standards.

S6.E.3.c.v – Ecology has clarified the language in this section to *stormwater treatment and flow control BMPs/facilities* and has defined this new term in the *Definitions and Acronyms* section of the permit. Ecology also clarifies that permittees include catch basins in their maintenance program under this permit section. Ecology recognizes that proper maintenance of stormwater facilities can minimize illicit discharges from the MS4.

S6.E.3.d – Ecology proposes changes to this section for consistency with changes proposed to the filed screening requirements for cities and counties (see section *S5.C.8.c Identifying illicit discharges* of this Fact Sheet). Proposed new mapping requirements will likely increase the number of known outfalls and the extent of tributary conveyances for permittees. Therefore, Ecology proposes to specify an annual field screening rate of 20% of the MS4 as a clearer and more specific benchmark. This replaces the previous permit requirement, which began in the third year of the permit, to visually inspect one third (on average) of all known outfalls. This revision also allows for screening to occur within the MS4 tributary conveyances and reflects that not all illicit discharges are observable at the outfall itself.

Draft requirement S6.E.3.e includes the term “qualified spill responder.” A qualified spill responder should meet the training and experience requirements of a Hazardous Team member at the Hazardous Materials Specialist level, as outlined in Labor and Industry regulations (Chapters 296-824 WAC and 296-843 WAC). Ecology’s website includes lists of qualified contractors for hazardous materials (Ecology does not verify or endorse the list) and approved primary spill response contractors (as per Chapter 173-182 WAC) at [http://www.ecy.wa.gov/programs/spills/spills\\_happen/main.html](http://www.ecy.wa.gov/programs/spills/spills_happen/main.html)

The staff training requirement (S6.D.3.f) proposes that permittees must offer training opportunities to the appropriate employees of tenants. This is intended to improve coordination and response to illicit discharges. It may also help reduce costs for training. However, compliance with this requirement is limited to offering the training opportunity and does not carry an obligation to ensure attendance at the training by tenant staff.



#### ***S6.E.4 Construction Site Stormwater Runoff Control***

The draft permit proposes no substantive changes to this section, but clarifies that certain requirements apply to activities that are under the *functional control* of the permittee. Feedback from ports informed Ecology that permittees may not have the legal authority under leases to manage stormwater on leased property. Where the tenant is responsible for stormwater management on a leased property, Ecology recognizes that the permittee responsibilities for construction site requirements apply to properties under the permittee's functional control, whether by its own staff or through a contractor.

#### ***S6.E.5 Post-construction Stormwater Management for New Development and Redevelopment***

Port permittees do not have land use authority under state law, and the requirements of this and the previous section refer to the obligation to comply with local ordinances governing these activities. Where the MS4 is interconnected with the local jurisdiction MS4, permittees must coordinate to assist the local jurisdiction in achieving compliance with local codes. This might occur if the local jurisdiction needed assistance in addressing a discharge from a permittee's MS4 that originated from a tenant's discharge into the MS4 of the permittee.

#### ***S6.E.6 Operations and Maintenance Program***

Ecology introduces the term *stormwater treatment and flow control BMPs/facilities* in the draft permit to distinguish BMPs and facilities that help meet treatment and flow control requirements (see definition in the *Definitions and Acronyms* section of the permit). This distinction is relevant because some LID BMPs help meet these requirements for some projects but do not for other projects.

In section S6.E.6.a Ecology clarified the language using the *stormwater treatment and flow control BMPs/facilities* term and explicitly includes catch basins in the permittees' operation and maintenance (O&M) manual; in order to remove accumulated sediment, trash, oily residue and other materials captured by catch basins.

S6.E.6.a.i—Ecology proposes that permittees update their O&M manual for any new stormwater facilities constructed or discovered, particularly during the permittees mapping process.

S6.E.6.a.ii—The draft permit requires that operation and maintenance of the permittee's MS4 must include standards consistent with or more protective than those in Ecology's *Stormwater Management Manual for Western Washington*. Ecology proposes language to require permittees to review maintenance standards to ensure they are consistent with any updates in local or Ecology standards. In the permit term beginning August 1, 2013, the draft permits set a date of December 31, 2015 for local governments to adopt the revised Ecology manual in local codes, or an Ecology-approved Phase I manual. Ecology expects permittees to update their maintenance standards to be consistent with the 2012 manual update in order to include new maintenance standards for some LID BMPs.

### ***S6.E.7 Source Control in Existing Developed Areas***

This provision of the permit calls for developing Stormwater Pollution Prevention Plans (SWPPPs) for sites that are potentially pollutant generating, and that do not already have coverage under a NPDES permit issued by Ecology. A SWPPP is a documented plan to implement measures to identify, prevent, and control the contamination of discharges of stormwater to surface or ground water.

S6.E.7—Ecology proposes to change the term “authorized” to “covered” consistent with the changes proposed in section S2 of the permit (see section S2 – *Authorized Discharges* of this Fact Sheet).

S6.E.7.a—Under the previous permit cycle permittees were required to develop SWPPP(s). In this permit cycle, Ecology proposes that permittees update these SWPPP(s), as needed, to reflect changes to stormwater facilities.

S6.E.7.b— Ecology clarified language in this section to refer only to source control BMPs. Ecology is editing the Stormwater Management Manual for Western Washington and intends to release the 2012 version on the Stormwater Management Manual in June of 2012. Ecology expects that the edits to the Source Control BMPs in the Stormwater Management Manual will be minor. Permittees may need to update their SWPPP(s) for consistency with Ecology’s 2012 Stormwater Management Manual.

S6.E.7.f—Ecology removed redundant language that required permittees to contact Ecology upon discovering a source control violation that is a severe threat to human health or the environment. Permittees should refer to the requirements under General Condition 3 of the permit. Permittees should also notify the city or county the spill or illicit discharge is located in.

### ***S6.E.8 Monitoring***

See section S8 *Monitoring* of this Fact Sheet.

### ***S6.F Stormwater Management Program for King County as a Co-Permittee***

Ecology removed the Stormwater Management Program for King County as a Co-Permittee with Seattle Special Condition S6.F and the associated references in S1, S3 and S5.A.6. Instead, Ecology defers to the provision in S1.F. This approach more thoroughly addresses King County’s permit obligations within the City of Seattle, as all King County MS4 infrastructure located within the City of Seattle is subject to S1.F and the stormwater management program requirements of the permit. This approach brings consistency to the co-permittee program by eliminating a co-permittee status where only one Permittee has co-permittee requirements and the permittees did not both apply as co-permittees. By removing this Special Condition, Ecology is not influencing the existing referenced Memorandum of Agreement (MOA) between the City and County dated September 25, 1995. Ecology has no role in implementing or overseeing the implementation of the referenced MOA

## 6.7 S7 Compliance with Total Maximum Daily Load Requirements

Under some circumstances, when the water quality of a water body is impaired, the federal Clean Water Act requires States to set limits on the amount of pollutants that the water body receives from all sources. States may also set limits on pollutant loads when water bodies are threatened. These limits are known as Total Maximum Daily Loads (TMDLs). A TMDL is developed through a defined process to identify the maximum amount of a pollutant that may be discharged from all sources to a water body without causing violations of water quality standards. Pollutant control strategies are developed in a TMDL to keep the pollutant loading below that level. TMDLs include an assignment of Waste Load Allocations (WLAs) to NPDES permitted dischargers and Load Allocations to control the load from non-point pollution sources.

Stormwater dischargers authorized by this permit are required to implement actions necessary to achieve the reduction in pollution called for in applicable TMDLs. Applicable TMDLs are TMDLs which EPA has approved prior to the date the final permit is issued or prior to the date that Ecology issues coverage under this permit, whichever is later. Information on Ecology's TMDL program is available on Ecology's website at <http://www.ecy.wa.gov/programs/wq/tmdl/>

Ecology incorporates these required actions in the permit through special condition 7. In some cases, actions are included in Appendix 2 as requirements for individual permittees. Appendix 2 lists the actions by TMDL and by permittee. The proposed Appendix 2 includes both updated actions from the current permit term and new actions proposed for TMDLs approved since the 2007 permits were issued.

The stormwater management program required by this permit can help make progress in preventing pollution and cleaning up water bodies impaired in part by stormwater discharges. These two related Clean Water Act programs are integrated through Appendix 2 actions. Ecology expects the addition of TMDL actions to help focus resources where Ecology and local communities have identified the most severe problems and the actions needed to correct them. Ecology encourages permittees to participate in the TMDLs that are currently being developed within their jurisdiction, and to begin implementation where appropriate.

In 2010, Ecology began reviewing TMDLs to identify those that EPA has approved since the 2007 permits were issued, and to identify the ones that assign a Waste Load Allocation to one or more municipal stormwater permittees.

Ecology then identified the actions for permittees and compared them to existing permit requirements. There are three types of TMDL actions for MS4s:

1. Actions already addressed by regular stormwater program implementation, such as a public education program or ongoing maintenance of the MS4. Ecology does not include these actions in Appendix 2. Special condition S7 states that for TMDLs not listed in Appendix 2, compliance with the permit constitutes compliance with those TMDLs.

2. Actions that require a permittee to target a SWMP requirement to a specific area or activity, such as focusing the illicit discharge screening program in the area draining to the impaired water or conducting a public education program that includes pet waste education. Appendix 2 lists these actions with a reference to the related program, and identifies the specific area, BMP, or timeline.
3. Actions in addition to the current SWMP that are not necessarily reflected in the existing program requirements, but that are relevant to the MS4 and its contribution of pollutants to the impaired water body. This could include special monitoring requirements or a specific stormwater facility retrofit.

Where monitoring is required, Appendix 2 requires that it be conducted according to an Ecology-approved Quality Assurance Project Plan (QAPP).

The proposed Appendix 2 actions link to and address the potential MS4 contribution to the impairment. If the list for one permittee is long, Ecology proposes priorities and schedules. In some cases, the draft actions for one permit term may include requirements to collect and evaluate monitoring data, then use the analysis to develop an action plan, and finally to begin implementing the action plan. This supports an adaptive management approach, to avoid requiring permittees to monitor a site for the entire permit term before acting on the information. The focus is on achieving the TMDL objective, which is to meet the WLA for the MS4 contribution, and ultimately improve or restore water quality in the receiving water.

The proposed permit also includes updated actions for TMDLs that are listed in the current (2007) permit's Appendix 2. Updates may include removing actions now completed, moving to the next logical action, or incorporating new actions based on lessons from the current permit term.

Before releasing the draft permits, Ecology informed affected permittees of the range and scope of actions it expected to propose in the draft Appendix 2. In some cases, Ecology staff met with affected permittees to review proposed language and ask for feedback. This "no surprises" approach reflects Ecology's recognition of permittees' local knowledge in ground-level efforts to clean up impaired waters.

In several cases Ecology lists TMDLs that are not yet approved by EPA, but are anticipated to be approved before the expected June 2012 final permit issuance. In other cases, actions are proposed for jurisdictions that Ecology is evaluating for possible permit coverage. Ecology includes this information in the draft Appendix 2 in order to afford an opportunity for input during the public review and comment period. Ecology will update Appendix 2 in the final permit to include only the TMDLs approved by EPA and actions only for jurisdictions that are covered by the final permit.

## 6.8 S8 Monitoring

This section in both the Phase I and Phase II permits defines monitoring requirements for permittees in two areas of western Washington:

- “Puget Sound permittees” are located in Clallam, Island, King, Kitsap, Pierce, Skagit, Snohomish, Thurston, and Whatcom counties.
- “Southwest Washington permittees” are located in Clark, Cowlitz, Grays Harbor, and Lewis counties.

The permits propose participation in a collaborative, regional approach to stormwater monitoring as the preferred approach in lieu of individually-conducted monitoring activities. The proposal is based on a strategy that was developed in a two-year stakeholder process focused in Puget Sound but that also included some involvement by southwest Washington permittees. The proposed structure includes a coordinated regional stormwater monitoring program (RSMP) based on shared costs among permittees, with Ecology acting during the 2013-2018 permit term as the service provider to administer contracts with permittees and others to conduct RSMP activities. Permittees would participate in a formal oversight committee.

The permit provides permittees the option of either participating in the RSMP or conducting individual monitoring designed to complement the RSMP. Permittees who choose to participate in the RSMP are not subject to individual S8 monitoring requirements in the permits. The RSMP would result in:

- Feedback on improvements in water quality in receiving waters.
- Regionally consistent methods to collect comparable and valid data.
- A repository of information on pollution sources.
- Transferable studies of the effectiveness of specific stormwater program activities.

The RSMP components include monitoring wadeable streams and nearshore areas in Puget Sound, conducting regional effectiveness studies applicable to all of western Washington, and developing a source identification information repository that will be useful across western Washington, and perhaps the entire State. In southwest Washington, Clark County is required to continue its current stormwater discharge monitoring. During the 2013-2018 permit term, Ecology will continue to work with permittees and others to define a meaningful receiving water monitoring program that benefits southwest Washington permittees.

### *Background*

The current Phase I permit requires individual permittees to conduct stormwater monitoring, treatment and flow control facility evaluation monitoring, and targeted program effectiveness monitoring. The current (2007) western Washington Phase II permit requires individual permittees to identify sites where stormwater monitoring might be conducted and to submit ideas for effectiveness studies to answer questions of importance to the jurisdiction. Ecology’s intent in developing the Phase II western Washington permit requirements was to implement some of

the current Phase I monitoring requirements in more western Washington jurisdictions in the 2013-2018 permit cycle.

The current permit monitoring requirements were formally challenged, and ultimately upheld by the Pollution Control Hearing Board (PCHB, or Board). The Board concluded that Ecology should require monitoring in future Phase II permits. The current Phase I permit monitoring requirements have produced useful information; however, at significant cost and effort. The Board endorsed the [Puget Sound Monitoring Consortium](#) (PSMC) process for framing a collaborative regional monitoring program.

The PSMC was funded by the Legislature at the request of local jurisdictions and other stakeholders with a broad scope that included stormwater and other regional water quality, habitat, and biota monitoring. The PSMC was initiated in October 2007 and staffed by Ecology. Jay Manning (Ecology's director at the time) formally requested in April 2008 that the PSMC provide specific recommendations through a stakeholder process to inform the 2013-2018 cycle of municipal stormwater NPDES permits. The Stormwater Work Group (SWG) was officially launched in October 2008, with Ecology providing staff support. Official SWG members were designated as representatives by the caucuses of federal, state, and local governments (including permittees); environmental groups; and businesses. Additional seats at the table were designated for tribes, ports, and agriculture.

Through the SWG process, Phase I and Phase II permittees and other stakeholders in Puget Sound developed and proposed a different approach to permit-required monitoring. Ecology believes this alternative approach represents a better way to utilize limited monitoring resources. It is expected to reduce Phase I permittees' overall expenditures on monitoring, and to provide a lower cost alternative to individual monitoring by Phase II permittees, while providing information that is meaningful and useful to Ecology and to local jurisdictions.

In September 2009 the SWG held a formal peer review and public comment period for a draft scientific framework for the regional stormwater monitoring and assessment program. In April-May 2010 the SWG held three public workshops and accepted public comments on the revised scientific framework, accompanied by a broad implementation plan. In June 2010 the SWG delivered the [2010 Stormwater Monitoring and Assessment Strategy for the Puget Sound Region](#) (2010 Strategy). In the 2010 Strategy, the SWG recommends a regional stormwater monitoring program (RSMP) for Puget Sound.

In October 2010 the SWG delivered its [Recommendations for Municipal Stormwater Permit Monitoring](#) (October 2010 recommendations) whereby specific components of the RSMP would be funded and implemented by Phase I and II permittees through permit requirements. In May-June 2011 Ecology held an informal draft public comment period on proposed new monitoring requirements based on requiring all permittees to participate in the RSMP.

### ***Shared responsibility for stormwater monitoring***

Ecology believes that the responsibility for stormwater-related monitoring is shared among permittees, the State, and the federal government. The RSMP does not, nor is it intended to, represent the total effort to collect meaningful information about stormwater impacts on receiving waters and effectiveness of management practices. Other ongoing monitoring programs provide additional data, meaning, and context for RSMP findings.

The 2010 Strategy outlines a broad regional monitoring program that leverages existing, ongoing federal, state and local monitoring programs. Specifically, the 2010 Strategy and RSMP leverage:

- The state/federal Environmental Monitoring and Assessment Program (EMAP) and related salmon recovery monitoring efforts in coordination with local governments;
- U.S. Geological Survey and local government stream-gauging programs;
- Several key programs within the state's Puget Sound Assessment and Monitoring Program (PSAMP), including Washington Department of Health shellfish monitoring, Ecology's BEACH monitoring, and Ecology's sediment chemistry monitoring;
- The federally funded/state-implemented Mussel Watch program; and
- Existing data management structures including Ecology's Environmental Information Management (EIM) system and King County's stream benthos database.

The October 2010 recommendations outlined a specific, stand-alone effort to be funded by municipal stormwater permittees. This stand-alone effort is referred to in the permit as the RSMP; it is designed to result in useful information for permittees, Ecology, and others.

After the October 2010 recommendations were delivered to Ecology, several state and federal funding opportunities arose, as well as one local funding opportunity. Ecology directed each of these fund sources towards early implementation of a specific task outlined in the SWG recommendations. This resulted in lower overall costs to permittees to implement the RSMP. Ecology will continue to pursue opportunities to share costs, save RSMP funds, and strategically expand the regional effort to produce information that will be useful for improving stormwater management practices.

Permittees will not be asked to contribute more funding beyond the cost-share defined in the permits. Unspent permittee-contributed RSMP funds will be proportionally returned to participating permittees.

### ***Regional stormwater monitoring program (RSMP)***

The SWG recommended specific stand-alone components of the 2010 Strategy for permittees to fund, plus a means to administer and implement the new program collaboratively. Ecology has used these recommendations and priorities to develop a proposed scope of work for the RSMP collectively funded by all of the local jurisdictions covered under the Phase I and Phase II

permits. Ecology was required to make several key decisions beyond the SWG recommendations, each of which is described in the sections below.

The SWG's proposal represents a paradigm shift away from monitoring conducted by individual permittees and towards collaborative implementation of a regional monitoring program with shared protocols, data management, and analysis and interpretation. Ecology believes this approach will provide necessary, higher-quality information for improving stormwater management activities and general permit requirements.

Special conditions S8.C, S8.D, and S8.E represent Ecology's translation of the SWG's October 2010 recommendations into permit language. RSMP participation is defined in three sections:

- S8.C.1 in the Phase II permit and S8.C.1.a in the Phase I permit: Status and trends monitoring to answer basic questions as to whether conditions in receiving waters are improving or deteriorating. (Note that these sections apply only to Puget Sound permittees.)
- S8.D.1: Regional effectiveness studies that will provide direct quantitative feedback about the results of different stormwater management activities and programs.
- S8.E.1: Source identification and diagnostic monitoring information repository to allow permittees to share source identification program information and provide a regional understanding of stormwater pollutant sources to support new policy initiatives.

Detail on each RSMP component is provided in the SWG's 2010 Strategy, October 2010 recommendations, and subsequent technical committee discussions. The proposed scope of work for the RSMP is provided as Attachment A to Appendix 10 (Phase II) or Appendix 12 (Phase I), the draft boilerplate agreement between permittees and Ecology. More information on contracting arrangements is in the "Governance and administration of the RSMP" section below. A more detailed description of each RSMP component follows:

Status and trends monitoring: collecting data on the status and changing conditions in water bodies in Puget Sound, including:

- An analysis of current stream gauging activities and proposing a long-term streamflow monitoring network design to answer important questions about impacts of stormwater on small, wadeable streams in Puget Sound lowlands. Continuous streamflow monitoring is not proposed for the 2013-2018 permit term.
- At 100 sites in small, wadeable streams in Puget Sound lowlands (50 located inside Urban Growth Areas (UGAs) and 50 outside UGAs), the following sampling is proposed during the 2013-2018 permit term:
  - One year of monthly water quality and instantaneous flow monitoring to support the calculation of a Water Quality Index (WQI). (In future permits this sampling is expected to occur once every five years.)



- One round of stream benthos and habitat monitoring. (In future permits this sampling is expected to occur every other year.)
- One round of sediment and toxicity sampling. (In future permits this sampling is expected to occur once every five years.)
- One round of WQI, stream benthos, and habitat monitoring at 20 sites, or ten each inside and outside UGAs. (In future permits this sampling is expected to occur during four of every five years.)
- Ten percent quality assurance and quality control (QA/QC) sampling.

The initial sites have been selected and are shown in the maps in Attachment B to the draft cost-sharing agreement in Appendix 10 (Phase II) and Appendix 12 (Phase I).

- At 50 sites in marine nearshore areas of Puget Sound located inside UGAs, the following sampling is proposed during the 2013-2018 permit term.
  - One year of monthly bacteria monitoring. (In future permits this sampling is expected to occur every year.)
  - One round of mussel tissue sampling. (In future permits this sampling is expected to occur every other year.)
  - One round of sediment chemistry sampling. (In future permits this sampling is expected to occur once every five years.)

The sites selected for sediment chemistry sampling might be different from the sites for bacteria monitoring and mussel sampling. Sites will be selected during preparation for sampling.

Regional effectiveness studies: prioritized and collaboratively conducted studies to assess the effectiveness of stormwater management programs in western Washington.

Permittee contributions to this RSMP component will be dedicated to conducting a total of about 15 studies during the permit term at an average cost of \$450K per study. The SWG identified and recommended 29 effectiveness study topics through an open and transparent stakeholder-driven process to rank, evaluate, and determine which topics are of greatest regional interest for western Washington. The list of SWG-recommended study topics and questions is included as Attachment C to the draft cost-sharing agreement in Appendix 10 (Phase II) or Appendix 12 (Phase I). The SWG evaluated and ranked study proposals submitted by:

- Phase II jurisdictions in their annual reports due March 31, 2011, and
- Other ideas submitted by Phase I and II permittees, state and federal agencies, academics, and others in response to an open request in February through April 2011.

A request for proposals (RFP) is expected to follow the close of public comment on this formal draft permit. Proposals will be ranked and evaluated according to the oversight process established for the RSMP and in consultation with the SWG. Ecology plans to list the specific studies that will be conducted for at least the first two years using pooled funds contributed by permittees in the final permit, which is expected to be issued in July 2012.

The SWG as a whole did not recommend an amount of funding that permittees should be required to contribute to conduct effectiveness studies. Local government representatives proposed that permittees would collectively contribute \$1.5 million annually for effectiveness studies in Puget Sound. Other SWG members proposed a substantially higher investment, up to \$6 million per year to address the pressing need for this information and considering the magnitude of the overall costs of stormwater management. In the May 2011 preliminary draft, Ecology proposed that permittees collectively contribute \$1,750,000 annually for effectiveness studies for each of permit years 2 through 5, including a per-capita expansion to southwest Washington permittees. Ecology continues to believe this is a reasonable starting point for effectiveness studies in a new RSMP.

Source identification and diagnostic monitoring: Develop an information repository for western Washington. The repository will include methods, protocols, data quality objectives, report boilerplates, information on effectiveness of screening tools and enforcement procedures, and other information. Permittees will be invited to participate in designing the repository. Permittees will be able to use this repository to share information and improve their illicit discharge detection and elimination and source control programs, if applicable. Collective analysis of this information will support future regional source control initiatives and improve enforcement efforts.

### *Southwest Washington*

Southwest Washington permittees are not required to conduct receiving water monitoring in the 2013-2018 permit term unless required pursuant to S8.A.1 or S8.A.2. Clark County is required to continue monitoring stormwater discharges. Any southwest Washington permittee may choose to participate in either or both of the regional effectiveness studies and the source identification information repository or to meet other permit requirements specified in the “Options not to participate in the RSMP” section below.

The SWG recommendations were developed focused on Puget Sound with limited involvement by the ten southwest Washington permittees. Still, Ecology believes it makes sense to expand the regional effectiveness studies and source identification information repository to include all of western Washington because:

- Southwest Washington permittees have the same stormwater management program permit requirements as permittees in Puget Sound.
- Southwest Washington permittees use the same set of stormwater management tools as Puget Sound permittees including the *Stormwater Management Manual for Western Washington* and equivalent manuals.
- Many similar effectiveness study questions were proposed in the Phase II permittees’ annual reports that were due to Ecology by March 31, 2011.
- The SWG local government caucus and other SWG stakeholder caucuses have agreed to include broader western Washington members within their formal representation

structure so that southwest Washington perspectives will be considered in making recommendations that affect areas outside Puget Sound.

Southwest Washington is not included in the receiving water monitoring program for Puget Sound because that monitoring is not directly or proportionately expandable to southwest Washington. Ecology representatives met several times with permittees in southwest Washington to discuss receiving water monitoring and try to make progress toward a proposal that would work for Ecology and for the permittees. Clark County proposed that, rather than participating in a new regional monitoring program designed to answer different questions, the county instead continue and expand its current receiving water monitoring. As a group, southwest Washington permittees proposed monitoring of one small stream in each jurisdiction to fulfill permit monitoring requirements. This limited monitoring did not seem designed to provide substantially meaningful information to either Ecology or the permittees.

Ecology, permittees, and stakeholders will continue to discuss priorities and possible approaches for monitoring in receiving waters related to stormwater management questions. Ecology recommends that permittees located in Clark and Cowlitz Counties become more actively engaged in development of a salmon recovery monitoring program for the lower Columbia River. Ultimately the goal for permit-required monitoring is to collect information that is useful for local governments, Ecology, and others.

### ***Options not to participate in the RSMP***

Ecology believes that the RSMP will be more cost-effective than individual monitoring and will produce needed, high-quality information to improve stormwater management practices throughout western Washington. For these reasons, Ecology encourages all permittees to participate in the RSMP. However, Ecology recognizes that some permittees will prefer to fund collection of monitoring information only inside their jurisdictional boundaries or to collect information more specific to their local needs. For these reasons, the permit includes, for each component of the RSMP, a choice for any Phase I or Phase II local jurisdiction permittee to conduct individual monitoring that will still provide broadly-relevant information.

The permit-defined options for conducting individual monitoring in lieu of participation in the RSMP are:

- Puget Sound permittees who choose not to participate in the RSMP status and trends monitoring are required to conduct status and trends monitoring following approved RSMP Quality Assurance Project Plan (QAPP) procedures at RSMP-identified locations inside or adjacent to their jurisdictional boundaries.
  - The stream sampling locations are listed in the [revised draft RSMP QAPP](#) which is expected to be approved in advance of the permit issuance. Two tables showing latitude and longitude locations of these sites [inside UGAs](#) and [outside UGAs](#) are available for informational purposes.

- The nearshore sampling locations will be identified in the RSMP QAPP that is expected to be developed and approved during the first two years of the 2013-2018 permit.
  - The same parameters, frequency, and timing of sampling as the RSMP are required. For streams, the first 20% of sites in the permittee's jurisdiction must be sampled as "sentinel" sites.
  - Ten percent quality assurance and control sampling is required.
- Permittees who choose not to participate in the RSMP effectiveness studies are required to conduct a revised version of the stormwater discharge monitoring that Phase I permittees implemented in the 2007 permit.

The monitoring will focus on metals, polycyclic aromatic hydrocarbons (PAHs), and bis(2-ethylhexyl)phthalate to provide a broad understanding of whether stormwater management activities are effectively reducing contributions to receiving waters of constituents that are most commonly detected in stormwater and to complement priorities established for the nearshore mussel tissue and sediment chemistry status and trends monitoring.

- Appendix 9 is provided to ensure that that permittees who choose this option know what is required in order to successfully conduct this type of monitoring and provide meaningful feedback for improving stormwater management practices. Ecology developed Appendix 9 to reflect the lessons learned during the Phase I monitoring under the 2007 permit, guidance and standard operating procedures published since the 2007 permit was issued, and findings of the recently completed Puget Sound toxics loadings studies.
  - Phase I permittees are further granted an option to participate in the RSMP effectiveness studies at a reduced level (50%) and also propose a study that they will conduct independently. Permittees selecting this option are expected to invest an equivalent amount of funding into conducting the individual study, which must be approved by Ecology and should provide information that will be meaningful and applicable to other permittees.
- Permittees who choose not to participate in developing the RSMP source identification information repository are required to submit detailed Quarterly Source Identification Reports to Ecology. A standard reporting format will be provided to permittees who choose this option for S8.E requirements. This permit section adds quarterly reporting requirements for information related to illicit discharges gathered and retained under existing permit requirements.

Permittees are continually refining and updating policies, methods, and procedures for source identification based on information gained during implementation. Ecology

expects this reporting requirement will support broader dissemination of this information leading to regional improvements in source identification.

With the exception of Phase I effectiveness studies, all of the above options can be conducted based on currently-approved QAPPs or boilerplate QAPPs that are under development and are expected to be approved before the monitoring is required to begin.

Ecology remains concerned that if too many permittees elect not to participate in one or more RSMP components it would be inefficient for Ecology to implement and could potentially compromise the regional effort.

### ***Governance and administration of the RSMP***

A substantial element of the collaborative RSMP involves pooling and administering funds. The SWG recommended that all permittees contribute funds to administer and implement the RSMP. The SWG made specific recommendations to Ecology as to how to do this, including asking Ecology to:

- Write the permit in a manner that permittees may satisfy their S8 monitoring requirements solely by contributing funds to the RSMP.
- Require all permittees to contribute funds to cover administration, support, and infrastructure such as standard methods and protocols, data bases, literature reviews, and analyses.
- Implement the requirement to pay into the pooled resources fund via contractual arrangements with each permittee.
- Act as the administrative entity during the 2013-2018 permit term, understanding that another entity may serve in this capacity in future permit terms.
- Leverage existing capacities at local municipalities and other organizations to implement the RSMP.
- Convene an oversight committee to oversee the financial and technical aspects of the RSMP.

Permittees and others need assurance from Ecology that its administration of the RSMP will be technically and fiscally accountable; that all funds contributed by permittees will be committed to the RSMP; and that contracts to those conducting the monitoring will be awarded in a fair, open, and transparent process. Local governments with capacity and interest in implementing monitoring or other RSMP work will be eligible to compete for RSMP contracts for specific RSMP activities. Other qualified entities may also compete for RSMP contracts. Puget Sound and southwest Washington stakeholders will be included in the processes of reviewing proposals.

Accompanying the proposed permit language in S8.C.1/S8.C.1.a, S8.D.1, and S8.E.1 is a draft boilerplate agreement between Ecology and permittees (see Appendix 10 of the Phase II permit or Appendix 12 of the Phase I permit). The agreement is provided so that permittees and interested parties know what contractual arrangements and obligations are expected on the part

of Ecology and on the part of participating permittees. Attached to the agreement is a scope of work that describes Ecology's direct obligations and deliverables that will be produced by contracting entities.

Ecology is receptive to the SWG recommendation to convene an oversight committee that would help develop requests for proposals, evaluate and rank applications, and award contracts to implement the RSMP. The SWG is currently revising recommendations as to the composition, membership, scope, authority, and responsibilities of this committee. Ecology expects this process to result in a project management oversight process to provide accountability for Ecology's implementation of the RSMP. Ecology expects to report annually to the committee and more often as needed, particularly during the process of awarding contracts.

The proportion of each permittee's share of RSMP costs is defined in the permits. The approach for determining each permittee's share is discussed below under "Allocating RSMP costs among the permittees."

### ***Compliance with permit monitoring requirements***

All permittees must inform Ecology before the deadlines established in each section as to which option under each section S8.C, S8.D, and S8.E the permittee chooses to implement. Timely payment into the cost-share fund fully satisfies a permittee's obligations under S8.C.1/S8.C.1.a, S8.D.1, or S8.E.1; and partially satisfies a Phase I permittee's obligations under S8.D.3.

Ecology will administer the collective fund and implement the monitoring program in accordance with the arrangements between Ecology and each permittee. The status of RSMP effectiveness studies implementation and production of specified information and deliverables shall have no effect on any permittee's compliance with this permit.

### ***RSMP cost estimates***

Good cost estimates are needed for planning, preparation, and full implementation of the RSMP. The total RSMP costs used to develop the cost-share tables in the draft permit language are based on updated, revised cost estimates. See notes below. The cost estimates used in developing the cost-share amounts in the tables in S8.C.1/S8.C.1.a, S8.D.1, and S8.E.1 are summarized as follows:

<b>RSMP component and timing</b>	<b>Puget Sound only</b>	<b>All of western Washington</b>
Collective contributions for regional effectiveness studies		\$1,750,000 per year
Costs for developing a source identification information repository		\$160,000 per year
Start-up costs for small streams status and trends monitoring	\$175,000 over two years	
Start-up cost for nearshore status and trends monitoring	\$87,000 over two years	
Implementation of small streams status	\$2,174,000 over two years	

and trends monitoring		
Implementation of nearshore status and trends monitoring	\$843,000 over two years	
Additional data management needs for status and trends monitoring	\$158,000 over four years	
Project administration and contracting (Ecology's costs)	\$55,000 per year	\$95,000 per year
Total RSMP costs	\$2.97 million per year	

Notes on the cost estimates above:

Ecology has refined these cost estimates since releasing the preliminary draft permit language for public review in May 2011. Overall RSMP cost estimates are lower than the May 2011 cost estimates which were based on preliminary working draft information the SWG provided to Ecology with the October 2010 recommendations. The cost estimates have been revised pursuant to input from technical SWG subgroups and include recognition of key work being done with other funding sources.

- Costs here are rounded to the nearest thousand dollars.
- Ecology's overhead and administrative costs are provided as a separate line item in the revised cost estimates.
- Costs may appear different from those in the cost allocation spreadsheet or cost sharing agreement, where data management costs are included differently.
- For status and trends:
  - Included a new budget line item for Ecology's cost to administer the program and to cover data management needs.
  - Reduced start-up costs because several tasks to prepare for full implementation of the RSMP are being done now, with other funding sources.
    - Tasks being completed with other funding sources include:
      - ◆ [Streams QAPP](#)
      - ◆ Two literature reviews
      - ◆ Stream gauging analysis
    - Tasks that have begun with other funding sources include:
      - ◆ Mussel Watch QAPP
      - ◆ Sediment QAPP
    - Additional tasks will be implemented using approximately \$100,000 in Phase I permittees' contributions that are expected to be submitted one year in advance of the first date of Phase II permittees' contributions.
  - Full implementation costs were reduced because the technical SWG subgroups found that some monitoring was proposed (per the October 2010 recommendations) to be conducted more frequently than necessary:
    - Stream S&T monitoring costs: Pursuant to EMAP staff recommendations, reduced the sampling from annual monitoring of 100 sites to monitoring

these sites once every five years; 20 “sentinel” sites (ten each inside and outside UGA boundaries) will be monitored annually. The timing of the once per five year sampling will coincide with EMAP sampling in Puget Sound.

- Nearshore S&T monitoring costs: pursuant to technical staff of Mussel Watch, reduced the mussel sampling from every year to every other year and timed the sampling to coincide with the national program.
  - New estimates for data management include developing new data management tools, conducting a laboratory comparison, maintaining key databases, and training personnel to enter and verify data.
  - Ten percent QA/QC costs are included in the revised cost estimates.
  - The cost estimates include a 10% contingency fund for cost overruns.
- The annual amount for effectiveness monitoring includes costs for developing standard protocols and the pool of funds for conducting the effectiveness studies. The total amount for effectiveness studies reduced by the estimated costs for a literature review, which was conducted with another funding source.
- The cost estimate for developing the source identification information repository was reduced by the estimated costs for a literature review, which is being conducted with another funding source.

In the proposed allocation of costs for Puget Sound, the costs of all status and trends monitoring ramp-up, implementation, and assessment activities are spread evenly across years 2 through 5 of the 2013-2018 permit term. Total contributions by all western Washington Phase I and Phase II permittees would be about \$2.97 million per year.

- All western Washington city and county permittees covered under the current permit, plus the two Phase I ports, are included in the cost allocations.
- Only Puget Sound permittees are included in cost allocations for status and trends monitoring in receiving waters.

The Phase I permit requires contributions to the RSMP in advance of the scheduled Phase II contributions. This is Ecology’s interpretation of the specific SWG recommendation that “Existing Phase I permit requirements should evolve into the next permit term and transition from individually-conducted monitoring to regionally-conducted monitoring activities.” These funds will be dedicated to preparation for full implementation of the RSMP.

### *Allocating RSMP costs among the permittees*

The SWG recommended that Ecology require permittees to contribute funds to administer and implement the RSMP. The SWG did not propose a method for “equitably” allocating RSMP costs among all permittees. During the informal public comment period (May-June 2010) Ecology requested suggestions for an approach to dividing monitoring costs among permittees that is: simple to administer, objective, repeatable, based on readily available information



(preferably using information generated by the Office of Financial Management (OFM), not information generated by Ecology or by the permittees), related to the municipal stormwater permits, and as fair and equitable as possible.

In the May 2011 preliminary draft permit, Ecology provided example approaches including a population basis for distributing costs among permittees with and without a base-level contribution for one or more RSMP components. Many permittees' comments on the cost allocation methods reflected the reality that requiring a base-level contribution benefits the largest jurisdictions at the expense of the smallest jurisdictions. Whatever approach is chosen, it will benefit some permittees at the expense of others.

Ecology considered the following suggestions for allocating costs:

- Allocate RSMP costs based solely on population.
- Apply a base investment for all permittees.
- Allocate Phase I costs equitably across that set of permittees.
- Require all permittees to contribute a percentage of the cost of individual monitoring.
- Consider per capita income and/or overall capacity of jurisdictions to raise revenue.
- Exclude populations that are not covered under municipal stormwater permits (populations served by combined sewers, or by discharging stormwater runoff to groundwater, or the portion of a Phase II permittee's population located outside the geographic area covered under the permit).
- Allocate RSMP costs based on something related to the quantity and/or quality of stormwater generated (impervious surface or effective impervious surface, drainage basin area, number of outfalls, pollutant loads).
- Allocate RSMP costs the same way permit fees are set.
- Allocate RSMP costs the same way capacity and other grants are given out.

Ecology has revised the cost allocation spreadsheet tool and decided to spread costs evenly across permittees according to OFM population estimates. Ecology believes that allocating costs according to the best available estimate of the number of ratepayers in each jurisdiction provides for the most equitable allocation of monitoring costs. In order to evaluate the results of this approach in full, interested parties should review the tables for both the Phase I and the Phase II permittees in S8.C.1/S8.C.1.a, S8.D.1, and S8.E.1. Puget Sound permittees bear all of the costs for status and trends monitoring; southwest Washington permittees contribute only to effectiveness studies and the source identification information repository.

For the cost allocation approaches proposed in the May 2011 preliminary draft, Ecology used unincorporated populations of Phase II counties. The population numbers in the revised cost allocation tool are OFM data for the unincorporated Phase II county populations associated with Urban Growth Areas in their permit coverage areas, except for Cowlitz County which is not a UGA planning county. Cowlitz County's permit coverage area was estimated by subtracting the populations of the Cities of Longview and Kelso from the Census 2010 WA-OR Urban Area

population. Because some Census-defined Urban Areas lie outside UGA boundaries, these new population numbers slightly underestimate the populations inside permit coverage areas of these counties. However, the total unincorporated populations of these counties greatly overestimate the covered populations. Ecology believes that this new approach results in a more equitable allocation of RSMP costs among permittees.

Future annexations could potentially affect the proportional allocation of costs represented by this approach. Because permittees' cost shares will not be amended during the 2013-2018 permit term, Ecology encourages local jurisdictions to consider addressing their financial commitments to the RSMP in future annexation agreements.

Participation of the Ports of Seattle and Tacoma is included in the cost allocation. In comments submitted on the preliminary draft permit, both Ports requested that Ecology a different method to calculate their "equivalent populations" and subsequent, respective contributions to the RSMP. The new "equivalent populations" in the revised cost allocation tool were informed by multiplying the estimated area of each seaport times the adjacent jurisdiction's population density. This approach substantially reduces the RSMP contribution of the two ports.

WSDOT is covered under a separate permit and their contribution to the RSMP is not included in these calculations. An appropriate contribution would be determined as part of the reissuance of the WSDOT Municipal Stormwater NPDES Permit.

Ecology is not proposing requirements for other secondary permittees or new permittees to participate in the RSMP during the 2013-2018 permit term. Ecology believes that new permittees need ample time to prepare to implement all of the permit requirements, including monitoring.

### ***Other monitoring***

As in the previous permit, S8.A states that permittees are still required to collect samples, where appropriate, to identify illicit discharges and to comply with applicable Total Maximum Daily Load (TMDL) requirements.

The RSMP is not designed to address locally-specific monitoring driven by illicit discharges, TMDLs, and other needs and priorities. Ecology recognizes that many individual jurisdictions invest a significant level of resources in these other types of monitoring to protect local water bodies. Ecology intends that the proposed collective approach to regional monitoring in the permit will minimize the diversion of resources away from local monitoring efforts and provide a benefit to all permittees.

## **6.9 S9 Reporting Requirements**

The draft permit proposes two general changes for S9 Reporting requirements. One is the placeholder for an upcoming change to direct online reporting by permittees. The other is to simplify the reporting language and rely on the Annual Report forms and appendices to define what Ecology proposes to require in annual reporting submittals.

Ecology proposes to retain the same timing for annual reports for the 2013-2018 permit term, which is a report for the previous calendar year to be submitted by March 31. The first year annual report due by March 31, 2014 will cover the period from August 1, 2013, the effective date of the permit, through December 31, 2013. Ecology also added language to address the fact that some submittals report on activities that are not tied to the previous calendar year. Examples include annual monitoring reports which are based on the water year, and LID-related development code reviews which are expected to describe the results of a multi-year process.

Special condition S9.B provides a placeholder for final permit language that will require online annual reporting on a form to be provided by Ecology. The shift to these procedures at Ecology has not yet been completed for the municipal stormwater general permits, but is anticipated to be completed in time to include the information in the final permit. The online annual report will allow for submittal of attachments and will include instructions and the certification and signature as required by General Condition G19. Permittees may request an alternative form provided by Ecology if online reporting is not possible.

A footnote to S9.B directs reviewers to draft appendices for review and comment on the annual report questions and information on submittals to be included for each type of permittee:

- Appendix 3 – Annual Report for the Port of Seattle and the Port of Tacoma
- Appendix 4 – Annual Report for Secondary Permittees

The draft requirements in S9.E listing the components of the annual report for cities and counties are simplified compared to the list in the current (2007) permit. The key components of the submittal are the Stormwater Management Program Report (SWMPR), the annual report form to answer the questions presented in the draft appendices listed above, and any attachments required as submittals in the annual report form. Ecology intends the draft S9.E.3 requirement to be broad enough to include all the required or applicable submittals, such as documentation and summaries of S5 activities, monitoring data and reports, summaries of activities conducted under Appendix 2 TMDL requirements, reports to comply with S4 compliance with standards requirements, and any other submittals required under permit conditions for that reporting period.

Ecology also retained in this section the requirements to notify Ecology of changes to jurisdictional or coverage area boundaries and the requirement for certification and signature under G19 in order to clarify that these are required annually.

Requirements proposed for Secondary Permittees, including the Ports of Seattle and Tacoma, in S9.F follow a format similar to that for cities and counties.

### ***Annual Report Appendices***

The draft Annual Report appendices address several objectives Ecology identified in developing the draft permit, including: 1) track the compliance status of permittees; 2) gather information to

improve permits; 3) identify needs for technical assistance; 4) identify successful outcomes of program for the public; 5) help permittees coordinate internally to track and gather reporting information; and 6) gather meaningful quantitative information statewide.

The Annual Report for Secondary Permittees (Appendix 4) is intended both for continuing Secondary Permittees and for New Secondary Permittees, as the deadlines are tied to the initial permit coverage date.

The draft appendices include questions intended to address the six objectives listed above. There are fewer questions with numerical answers, although some remain as indicators of compliance and for reporting statewide outcomes. There are more questions requesting summaries of activities intended to provide information on meaningful successes and outcomes, needs for technical assistance, and opportunities to improve the permits.

### ***Reporting on the Assessment of BMPs***

The draft permit removes language in S8.B.2, S9.E.6, S9.F.2.c and e, and S9.G.7 in the current (2007) permit requiring permittees to report on an assessment of the BMPs selected to implement the SWMP. Ecology proposes to remove this requirement in the permit because it reflects language in the federal rule that does not align with Ecology's permits. Many states implement the federal rule by requiring permittees to develop and submit individual stormwater management programs for review and approval. Over time, the permittees evaluate and improve on the BMPs using this requirement. In Washington State, Ecology issued permits with specific BMPs and minimum performance measures outlined in permit requirements that comprise the SWMP.

Ecology was able to do this because of the earlier development of stormwater practices, guidance, manuals, and programs for different regions of the state. Prior to issuing the 2007 permits, Ecology worked with permittees to update the *Stormwater Management Manual for Western Washington* in 2001 and 2005, which was originally issued in 1992. Ecology also worked with eastern Washington jurisdictions to develop the *Stormwater Management Manual for Eastern Washington* in 2004, as well as the *Model Municipal Stormwater Program for Eastern Washington* (2003).

Ecology proposes to satisfy the federal requirement to assess and improve BMPs using methods more applicable to the structure of the Washington State permits. Ecology will use information from sources such as:

- National/regional technical and scientific forums;
- Studies and technology reviews of the Washington Stormwater Center;
- Effectiveness monitoring studies proposed for eastern and western Washington;
- Individual permittee requests to use alternatives;
- Suggestions from permittee coordination groups;

- Ecology compliance reviews and technical assistance; and
- Public processes to update manuals and reissue permits.

Ecology proposes alternatives to BMPs in this draft permit that originate from those sources, rather than from the annual reporting to meet S8.B.2. For these reasons, Ecology proposes to remove the requirement, recognizing the benefits of a broader approach to improving BMPs.

## 6.10 General Conditions

Ecology proposes several minor changes to the General Conditions in the draft permit.

The revision proposed for G3.C expands the circumstances for immediately reporting discharges that might cause bacterial contamination from discharges affecting shellfish to include discharges into all marine waters. For shellfish concerns, the permit provides the Department of Health shellfish number. For discharges into marine waters, permittees must call the Ecology Regional Office number listed in G3.B. Including marine waters recognizes the role of the BEACH program in monitoring, reporting, and protecting the public from contaminated swimming beaches. Ecology makes this change in recognition that such discharges to marine waters also comprise a "...threat to human health, welfare, or the environment." More information on the BEACH program, a program co-administered by Ecology and the Washington Department of Health, is available at <http://www.ecy.wa.gov/programs/eap/beach/>

Ecology proposes to change the terminology in G3.D from "hazardous materials" to "hazardous substances." *Hazardous substances* is defined in WAC 173-303-040, and Ecology prefers to use the term with a specific meaning under state law that is appropriate to this section of G3. This term is also added to the Definitions section of the permit.

Ecology proposes minor language changes in G9.D and F for consistency with the Western Washington Phase II Municipal Stormwater Permit.

Previously, G10 Removed Substances referred only to liquid street waste. Ecology recognizes that permittees also collect solid street waste and proposes language in G10 to address solid street waste. Permittees should refer to their local health departments/districts and laws/regulations that govern the disposal and reuse of solid street waste.

The changes proposed for G19, Certification and Signature, clarify when the requirement for a signature by a principal executive officer or ranking elected official is required on submittals to Ecology. The current (2007) permit indicates that all reports and information submitted must have such as signature. Ecology has administered this requirement to require the G19 signature on all formal submittals, such as annual reports. Ecology staff communicates frequently with permittees and receives information on a variety of topics. This proposed change clarifies that only formal submittals require the signature of a principal executive officer or ranking elected official.

## 6.11 Definitions and Acronyms

Ecology's objectives in revising the Definitions section of the permit include improving consistency across the municipal stormwater general permits, simplifying and clarifying language, and improving the accuracy of definitions of the terms as used in the permit. Specific edits proposed to Definitions include the following types of changes:

1. Addition of terms and definitions new to the permit.
2. Correction of a previous definition to match the use of the term in the permit.
3. Deletion of terms that are not used in the permit or that do not add helpful information.
4. Edits for consistency with other NPDES stormwater general permits.
5. Clarifications and simplifications to improve the understanding of terms.

Ecology lists the proposed revised terms below according to the type of change.

1. Addition of terms and definitions new to the permit:
  - *Low Impact Development (LID), LID principles, LID BMPs* (explained further below)
  - *Stormwater treatment and flow control BMPs/facilities* (also explained below)
  - *Circuit* is used in S5.C.9 for municipal operation and maintenance in a proposed alternative approach to catch basin inspection and cleaning requirements.
  - *New Secondary Permittee* is added to implement Ecology's approach to defining requirements for permittees that were not covered in the current (2007) permit term.
2. Correction of a previous definition to match the use of the term in the permit:
  - *SWMPR* – The Stormwater Management Program Report requirements are revised as outlined in S5.A.2. Ecology removed additional text that no longer applies.
  - *Qualified Personnel or Consultant* – Ecology clarified that this term may refer to volunteers, recognizing that in some jurisdictions volunteers are trained and qualified to conduct some activities such as stream monitoring.
  - *Physically interconnected* – The proposed edit recognizes that the other system to which the MS4 is connected need not be another MS4, but may belong to an unpermitted entity.
  - *Co-Permittee* – Proposed edits reflect Ecology's procedure for individual application for permit coverage by Co-Permittees.
  - *Notice of Intent for Construction Activity* and *Notice of Intent for Industrial Activity* have replaced the term *Industrial or Construction Activity* to accurately reflect how these terms is used in the permit.
  - *Hydraulically Near* and *Sediment/Erosion Sensitive Feature* have been added to reflect their use in Appendix 7 and for consistency with the Western Washington Phase II permit.

- *Applicable TMDL* – The revision clarifies that the applicable TMDL may be one that is approved by EPA prior to the date of permit coverage.
3. Deletion of terms that are not used in the permit or that do not add helpful information:
    - *Medium and Large Municipal Separate Storm Sewer System, Major Municipal Separate Storm Sewer Outfall, Integrated Pest Management and Pest and Detailed Implementation Plan* are not used in the permit.
    - *Discharge* is a common word with multiple uses. Different uses may have descriptors (such as “non-stormwater” or “illicit”) where appropriate.
    - *Municipal Separate Storm Sewer (MS3)* and the abbreviation *MS3* is no longer used in the permit.
  4. Edits for consistency with other NPDES stormwater general permits:
    - *Common plan of development or sale* – Ecology added this definition for consistency with the definition in the Construction Stormwater General Permit and to make it consistent across municipal stormwater permits.
    - *Heavy equipment maintenance or storage yard* includes an edit to clarify that these sites are not limited to areas that provide storage on a long-term basis. This edit makes the definition consistent across municipal stormwater permits.
    - *Runoff* – Ecology revised the definition for consistency with the Western Washington Phase II permit.
  5. Clarifications and simplifications to improve the understanding of terms
    - *Certified Erosion and Sediment Control Lead* – The draft permit removes duplicative language already in Appendix 1, Section 2.
    - *Secondary Permittee* – Ecology revises the definition for the proposed changes in S1.E.1.
    - *Stormwater Management Manual for Western Washington* – Ecology clarified the references to publication numbers.
    - *Stormwater Management Program* – Ecology clarifies that the SWMP includes all activities to meet the requirements in the permit. This meaning is also reflected in edits to the term *Component* or *Program Component*.
    - *Permittee* – The draft permit removes duplicative language already in Special Condition S1 of the permit.
    - *Illicit connection* and *illicit discharge* – Ecology received questions from permittees during the last permit term that led to improved definitions of these terms. The proposed definition of *illicit connection* is more complete. The *illicit discharge* definition clarifies that this may be a discharge into or from the MS4. The revised definition improves consistency with permit requirements, and clarifies that spills and illicit connections are a type of illicit discharge. Experience

by permittees during the current permit term indicates that illicit discharges may occur through infiltration/exfiltration of non-stormwater in pipe bedding, so Ecology also adds this clarification.

- *Outfall* - Ecology's draft definition clarifies that an outfall can be a point of discharge to both surface and ground water, consistent with Ecology's obligation under state law to regulate discharges to waters of the State, which include both surface and ground water. The draft definition also clarifies that *outfall* does not apply to connections between segments of primarily surface water streams but may include open conveyances connecting two MS4s. Ecology makes this change based on the experience of permittees in the illicit discharge detection and elimination (IDDE) program and for consistency with the proposed addition of "discharge points" to the IDDE field screening requirements for Secondary Permittees in (S6.D.3.d).
- *Hazardous substance* has been added to the permit to clarify requirements associated with General Condition G3.

Ecology also proposes the following changes to address the implementation of permit conditions:  
*Municipal Separate Storm Sewer System*

Ecology clarifies the definition of a municipal separate storm sewer system (or MS4) as it is regulated under this permit as discharging to "...waters of Washington State." This is consistent with Special Condition S2.A which states that the permit authorizes discharges under state law (chapter 90.48 RCW) to surface waters and to ground waters. Ecology uses this definition in the *Definitions and Acronyms* section of the permit for this term, for *Best Management Practices*, and in the clarified definition of *outfall*, because the permit regulates discharges to waters of the State.

A different definition of MS4 in Appendix 5, the *Notice of Intent for Coverage under a NPDES Municipal Stormwater General Permit* (NOI), includes in the definition "waters of the United States" instead of waters of the State. The NOI definition is the federal definition of an MS4 which applies to the determination of eligibility for permit coverage under the Clean Water Act. *Waters of the United States* as defined in 40 CFR 122.2 applies to surface waters, and Ecology adds this term to the *Definitions and Acronyms* section of the permit. Once a permittee is covered by the permit, however, Ecology applies its authority as required under state law to regulate discharges from the MS4 to both surface and ground water.

#### *Low Impact Development, LID Principles, LID BMPs*

Ecology edits the definition for *Low Impact Development* (LID) to be consistent with proposed LID requirements, and adds definitions for *LID Principles* and *LID BMPs*. These definitions have specific meaning as they apply to proposed LID requirements (S5.C.5.a.v.(3)) and



(S5.C.5.b) in S5.C.5 Runoff Controls for New Development, Redevelopment and Construction Sites. (See discussion of LID in S5.C.5)

### *Stormwater treatment and flow control BMPs/facilities*

The current (2007) permit applies various terms to refer to stormwater facilities and BMPs, such as stormwater controls, structural BMPs, stormwater post-construction BMPs, and permanent stormwater treatment and flow control facilities. Ecology has introduced the term *stormwater treatment and flow control BMPs/facilities* and has defined this new term in the Definitions section of the permit. Ecology describes in other sections of this Fact Sheet how the term applies in specific SWMP requirements.

Ecology's proposal addresses revisions to Appendix 1 requirements that include LID BMPs such as permeable pavements, which may or may not be used to help meet Appendix 1 treatment and flow control requirements at the site and subdivision scale. Ecology adds the term *stormwater treatment and flow control BMPs/facilities* to distinguish those BMPs and facilities that do help meet the minimum requirements for runoff treatment and / or the flow control requirements in Appendix 1. This term and definition evolved from comments on the preliminary draft LID requirements during the May-June 2011 informal comment period.

## **6.12 Appendices**

### **Appendix 1 – Minimum Technical Requirements for New Development and Redevelopment**

See discussion in section *S5.C.5 Controlling Runoff from New Development, Redevelopment and Construction Sites* of this Fact Sheet.

#### ***Introduction***

Proposed language for Appendix 1 includes those requirements, definitions, and thresholds that Ecology intends the permittees to adopt into local codes or other enforceable documents and apply to new and redevelopment projects. Most of the proposed changes in Appendix 1 are those related to implementing low impact development (LID) on the project scale. Appendix 1 also includes detailed changes to the Construction SWPPP elements of Minimum Requirement #2, and changes to the text of the guidance for the wetlands protection requirement, Minimum Requirement #8. Other changes are suggested for clarity concerning the intent of requirements.

#### ***Section 1: Exemptions***

Minor changes to clarify intent.

#### ***Section 2: Definitions***

Ecology has defined some new terms to make the regulatory structure work. These include:

**Permeable Pavements:** This includes the range of pavements that allow passage of water through the pavement or wearing course.

**Bioretention BMPs & Rain Gardens:** Ecology distinguishes “Bioretention BMPs” from “Rain Gardens.” Both refer to depressions of compost-amended soils to which stormwater is routed and passed through before discharging into the ground or re-collected in a sub-surface drainage pipe. Rain Garden designs are used on small projects that do not trigger treatment or flow control requirements. Rain gardens may use compost-amended on-site soils. Bioretention BMPs are used on projects that trigger treatment or flow control requirements. Bioretention BMPs use a specified soil mixture which ensures adequate pollutant removal capability, and a saturated hydraulic conductivity within an acceptable range.

**Hard Surfaces:** The previous thresholds that determined the applicable minimum requirements were partially based on the extent of impervious surfaces or pollution-generating impervious surfaces that were created and/or replaced as part of a project. The new proposed LID requirements make the use of permeable pavements a priority. Because permeable pavements are not impervious surfaces, Ecology proposes revised thresholds to acknowledge their use. Ecology introduces a new term, hard surfaces, to use in the thresholds. Hard surfaces are permeable pavements, impervious surfaces, or vegetated roofs. The term, *hard surfaces*, generally replaces the use of impervious surfaces in the thresholds. Though permeable pavements should result in less surface runoff, and they should increase the amount of water potentially discharged to the ground. Because Ecology is as concerned about ground water pollution as surface water; and because of the need to protect water quality, Ecology proposes to use the same square footages of “hard surfaces” as used for “impervious surfaces” to trigger the minimum requirements.

***Pollution-Generating Hard Surfaces, pervious surfaces, and converted pervious surfaces:***

These are also newly defined terms to help make the regulatory intent clear. Note the overlaps and shuffling of surfaces into new categories. Hard surfaces can be impervious or permeable. Permeable pavements are pervious surfaces, but also hard surfaces.

Ecology also proposes updated definitions for *arterials, erodible or leachable materials, pollution-generating pervious surface, receiving waters, and vehicular use*. These were updated to clarify the new LID-related requirements. Ecology modified the proposed definition of *receiving waters* to be more accurate. The emphasis here is that the LID requirements will put more stormwater into the ground. Some of that stormwater will reach ground water, making it a receiving water. This does not represent an expansion of the regulatory scope of the municipal stormwater permits. The 2007 permits were issued as “state waste discharge permits” because they authorized discharges to the ground as well as to surface waters.

There are a few other terms, used previously but not defined, for which a definition has been added. A handful of other terms have an amended definition because of the new LID requirements.

### ***Section 3: Applicability of the Minimum Requirements***

A significant change is the replacement of “impervious” surfaces with “hard” surfaces in the thresholds for determining which minimum requirements apply to a project. See the explanation for the new term, “hard surfaces,” above. Another change is the application of minimum requirements #6 - #9 to replaced hard surfaces at new development sites. Without this change, the stormwater requirements for new development sites would be less than for re-development sites because replaced hard surfaces would continue to not be addressed at new development. Ecology is also proposing to delete the word, “native,” from the land conversion threshold. Whether the existing land cover is native vegetation or non-native vegetation, the conversion to pasture or lawn/landscaping categories should trigger stormwater requirements.

### ***Section 4: Minimum Requirements***

**Minimum Requirement (M.R.) #1:** The draft includes a new statement for the site plan to use site-appropriate development principles to retain native vegetation and minimize impervious surfaces to the extent feasible.

This is consistent with draft permit condition (S5.C.5.b) that requires local governments to review their site development codes to incorporate LID principles (see related discussion below). The guidance document prepared by the Puget Sound Partnership will include an example of a site development code that sets minimum requirements for native vegetation and maximum impervious surface areas for various land development types and densities. Local governments are encouraged to adopt similar changes by the proposed permit.

Ecology will also continue to require permittees to adopt site planning procedures that are similar to those in the Western Washington Stormwater Manual. Ecology is updating those site planning procedures to be consistent with the recommendations in the *Low Impact Development Technical Guidance Manual for the Puget Sound Basin* (2005, Puget Sound Action Team and Washington State University Pierce County Extension) – which is also being updated. The updated site planning procedures are intended to encourage site layouts that will tend to minimize impervious areas and maximize native vegetation. It will also remind the site planner to meet whatever minimum requirements have been codified by the local government.

**M. R. #2:** The requirement contains a new technical Stormwater Pollution Prevention Plan element #13 that requires protection of LID Best Management Practices from sedimentation, erosion, and compaction during the construction phase. The other elements have been updated to be consistent with the updates in the most recent Construction Stormwater General Permit issued by Ecology. Because the municipal permittees must regulate sites smaller than 1 acre, Ecology

reviewed the elements for applicability for these smaller sites. Element #12 in particular has been updated to include responsibilities for an inspector or Certified Erosion and Sediment Control Lead (CESCL) depending upon the size of the project site. Element #12 includes a reference to the requirements in the Construction Stormwater General Permit for inspection and monitoring. Ecology has included those statements so that the local requirements/permit will remind their permittees of the additional obligations in the Ecology Construction Stormwater General Permit that also covers their construction site. Ecology does not mean to imply that it expects the local government to check for compliance with those state permit provisions.

**M.R. #5, On-site Stormwater Management:** The requirement has been significantly revised. The 2007 municipal stormwater permits required that projects subject to Minimum Requirement #5 implement infiltration or dispersion of roof downspouts and other impervious surfaces (depending on soil type), and meet a minimum soil quality and depth requirement (BMP T5.13) for all lawn and landscaped areas. This draft expands upon the list of practices that these projects must consider and use if feasible, unless a project chooses to implement the LID Performance Standard option. The lists now include the following practices: full dispersion, permeable pavement, bioretention or rain gardens, and vegetated roofs (only commercial sites). If choosing the Performance Standard option, the applicant must apply BMP T5.13. They can also select any other practices as long as they demonstrate achievement of the standard.

***Mandatory List Option:***

Projects that trigger only Minimum Requirements #1 - #5, are to use Mandatory List #1. Projects that trigger all the minimum requirements are to use Mandatory List #2. Within those lists, the proposal places developed land covers into three categories: lawn/landscape, roofs, and other hard surfaces.

**Lawn/landscape areas** must meet BMP T5.13 – Soil Quality and Depth, just as they were required to in the previous permit. The Washington Organic Recycling Council has developed an excellent document to help developers and local governments meet their obligations to implement this BMP. The document, “Building Soil: Guidelines and Resources for Implementing Soil Quality and Depth BMP T5.13,” is available at the Soils for Salmon website: <http://www.soilsforsalmon.org/>.

**Roof areas** are given a list of practices to evaluate. The practices must be considered in the order listed. The order is based upon the effectiveness of the practices in reducing surface runoff; with the most effective practices listed at the top, and the least effective on the bottom. Projects are to select the highest ranked practice that is feasible for their site.

**“Other Hard Surfaces”** are also given a list of practices to evaluate in the order listed. The order is once again based upon the effectiveness of the practices. Projects are to select the highest ranked practice that is feasible for their site.

Note the differences between the two mandatory lists. List #1 includes rain gardens, while list #2 replaces rain gardens with bioretention. In Appendix 1, Ecology lists bioretention as a treatment BMP and specifies design criteria in the stormwater manual. This makes it possible to reasonably predict the performance of bioretention facilities using continuous runoff modeling. That modeling is necessary for projects that must meet the treatment and/or flow control minimum requirements.

In addition to the design criteria presented in the SWMMWW, Ecology proposes a minimum size required for the bioretention facilities. The minimum size is intended to ensure that the bioretention facility is adequately sized to control flows. The size is in line with sizes recommended in the literature and used by local governments.

The following BMPs are included in the “mandatory lists” of MR #5 because they are considered available and reasonable unless site constraints, as defined in Section 8, render them infeasible.

***Permeable pavements:*** Specifications for porous asphalt, pervious concrete, and other forms of permeable pavements are readily available, but should conform to the guidance in the *Low Impact Development Technical Guidance Manual for Puget Sound*. Pervious asphalt and concrete currently cost more than the standard impervious versions. But as pervious pavements become common in construction (as these stormwater requirements will demand), the cost difference will shrink as many suppliers have batches in frequent production and contractors gain experience in placement. Pervious pavements can be used almost everywhere that impervious pavements have been used. This provision does not mandate that all walkways and driveways must be paved. But wherever they are paved, pervious pavements must be used unless infeasible according to the criteria in Section 8.

***Bioretention BMPs and rain gardens:*** Rain gardens do not have to meet a specific performance standard, so the general guidance in *Rain Gardens, A Handbook for Western Washington Homeowners*, published by Washington State University, Pierce County Extension, can be used for design, construction and maintenance. “Bioretention” specifications for design, construction, and maintenance can be found in the *Stormwater Management Manual for Western Washington*, and the *Low Impact Development Technical Guidance Manual for Puget Sound*. Bioretention facilities - not rain gardens - are to be used on project sites that have to comply with the Minimum Requirement for Treatment, or the Minimum Requirement for Flow Control. Complying with the design specifications allows for reasonable assumptions in regard to their treatment and flow reduction benefits, which must be estimated using approved continuous runoff models.

**Vegetated roofs:** This LID BMP refers to roofs designed to sustain vegetation on a soil or artificial media. Vegetated roofs are used extensively in Europe. Their use is expanding on commercial buildings in the United States. Ecology considers them a proven and accepted LID technology in commercial projects, but not in residential projects. However, their costs in comparison to standard roof construction can be substantial, and their potential benefits in stormwater runoff reduction are limited.

### ***LID Performance Standard Option***

Qualifying projects may choose to demonstrate compliance with the LID performance standard rather than employ the practices from the mandatory lists. However, if choosing the LID performance standard, they must at least implement BMP T5.13 concerning soil quality and depth. This is a practice that makes sense for flow reduction and pollution control at all sites. Removing it as a requirement would not be consistent with the provisions of the NPDES permit program that require that standards not be reduced from levels previously established.

Projects on parcels of five acres or larger outside the urban growth area must comply with the LID performance standard, which is discussed in detail in the next section. These projects have sufficient land area to utilize LID BMPs and LID principles to keep stormwater on-site and meet the standard. In addition, these are generally areas where reasonably good aquatic habitat conditions exist. Compliance with the LID performance standard is a more reliable approach to not degrading those conditions. Inside the UGA, where individual parcel sizes are much smaller, and development densities much higher, there can be complicating factors that make keeping runoff on-site more difficult, and in many cases infeasible. While Ecology would prefer all sites to meet the LID performance standard, it is not feasible in many cases without employing rainwater harvesting and reuse internal to the structure. Ecology is not prepared to mandate rainwater harvesting and reuse as a standard technique at new development sites. So Ecology proposes to allow development sites within the urban growth boundary to choose the mandatory list option described above.

**LID Performance Standard:** The proposed LID performance standard would require the project to match developed discharge durations to pre-developed durations for the range of pre-developed discharge rates from 8% of the 2-year peak flow up to 50% of the 2-year peak flow. The current (2007) permit has stream erosion protection standard in Minimum Requirement #7 controls the duration of flows in the range of ½ the 2-year flow to the 50-year flow, but that standard is only intended to prevent accelerated stream channel erosion from extreme high flows. It controls flows that are exceeded 1% of the time or less frequently in a natural land cover situation. It does not guard against other significant alterations in the natural hydrology that impact the beneficial uses. Those alterations commonly occur with land development in most watersheds in western Washington.

The proposed LID performance standard under Minimum Requirement #5 extends the lower limit of the range of flows whose duration currently must be matched under Minimum Requirement #7 to a rate that is exceeded approximately 10% of the time and less frequently. This standard requires projects to retain on-site the runoff from smaller storms. Extending the duration standard to the 10% level will have the effect of more closely approximating the natural hydrology. The proposed LID performance standard would also reduce the magnitude of deviations in the flows that are exceeded more than 10% of the time. Ecology cannot unequivocally quantify the relative benefits to the beneficial uses of this more stringent standard. Ecology can say that more closely matching the natural hydrology will reduce the impact of land development on the physical aspects of surface water habitat, and will reduce pollutant loading to surface waters through uptake of pollutants in the soils.

The potential benefits provided by this standard are indicated through analyses done by King County but not yet documented in a report. King County is trying to identify a strategy to improve stream habitat in the Juanita Creek basin, a highly urbanized area. They are using correlations between stream hydrologic metrics and Benthic Index of Biotic Integrity (B-IBI) scores, to predict the benefits of strategies that improve the urban stream's hydrology. For Juanita Creek, they have found strategies that meet the proposed LID performance standard result in hydrologic metrics that predict improving B-IBI scores from a "poor" range into a "good" range (i.e., mid- 30's). These predicted improvements are based on an average response with no other environmental conditions limiting the potential recovery as indicated with the B-IBI score, and may vary depending on the distribution of soil infiltration capacities.

Matching historic flows down to the 10% exceedance level was initially selected because it is achievable with aggressive use of LID BMPs that Ecology considers to be consistent with all known, available and reasonable methods of prevention, control, and treatment (AKART). However, the LID performance standard option allows the developer to choose a different combination of LID BMPs than those in the "mandatory list" as long as the LID performance standard is achieved.

#### **M.R. #6 – Treatment and M.R. #7 – Flow Control**

The thresholds for these requirements have been modified to acknowledge the use of permeable pavements and the related new definitions. The intent is to continue to capture the same size and types of projects as previously.

#### ***Sections 5, 6 – Adjustments and Exceptions/Variances***

No changes

#### ***Section 7 – Basin Planning***

The text is expanded to acknowledge that the new Minimum Requirement #5 can also be adjusted through a basin-specific management plan. Also, the availability of new computer software from USEPA can assist in basin planning.

### ***Section 8: Feasibility Criteria for Low Impact Development BMPs***

The Pollution Control Hearings Board directed Ecology to require the use of LID techniques where feasible. There are instances where an LID BMP is either technically infeasible or not advisable for public health and safety reasons. For the new LID BMPs – bioretention/rain gardens, permeable pavements, and vegetated roofs - that have been added to minimum requirement #5, Ecology has drafted a list of site/engineering infeasibility criteria and presents the list in Section 8 of Appendix 1. A LID BMP is considered infeasible for the criterion or condition listed. The criteria are primarily drawn from the local American Public Works Association storm water managers group; AHBL Consultants recommendations to the Puget Sound Partnership, the LID Advisory Committees formed by Ecology to provide advice on development of LID requirements in municipal stormwater permits, and public comments received on the preliminary draft of the permit.

Possibly the criteria most difficult to set is a minimum saturated hydraulic conductivity rate. Ecology sought and received significant input from a variety of sources on this issue. The recommendations were not consistent, even from well-informed parties. A confounding factor is that the ability of a site to infiltrate water isn't based solely on the saturated hydraulic conductivity of its underlying soils, but also on a number of other site-specific factors such as the depth of the soils that can sustain that rate, and the potential for inconsistencies in the soil profile across a development site, e.g., very low permeability lenses. So, it is necessary to defer to the expertise of a geotechnical professional who has considered the soil, underlying geology, slopes, and other factors in recommending for or against on-site infiltration of stormwater. But citing a saturated hydraulic conductivity rate that is in excess of 0.3 inches per hour is not acceptable as a sole reason to not employ bioretention and/or permeable pavements on a site.

The lower the estimated saturated hydraulic conductivity for a site, the more careful a designer has to be in site design layout. At sites reporting very low saturated hydraulic conductivities in field tests, it becomes difficult to know how much of the rate is actually associated with horizontal movement of water rather than vertical movement. The fate of the infiltrating water becomes more of an issue because it is unlikely that a classic cemented till layer will infiltrate at 0.3 inches per hour or greater, this would suggest that permeable pavements and bioretention may be precluded at sites underlain with till. However, in these instances, local governments may allow designs that include an underdrain. This would allow bioretention to still serve to help meet treatment requirements. And, if the underdrain is elevated within the base course below the bioretention soil or the permeable pavement, the design can be modeled to get credit for the flow reduction benefits. Designs not underlain with an impervious material may still assume losses into the underlying soil as long as the design and construction follow the guidance from the latest edition of the *Low Impact Development Technical Guidance Manual for the Puget Sound Basin*. Underdrain designs are less practical for surfaces not requiring deep base courses for load bearing reasons, e.g., sidewalks, patios, and residential driveways.



Concurrent with this permit, Ecology is drafting a 2012 edited version of the *Stormwater Management Manual for Western Washington*. The edited version will include revised guidance for estimating saturated hydraulic conductivity. The guidance will restrict the options to large-scale and small-scale Pilot Infiltration Testing at each development site. Sites underlain by recessional outwash soils will be allowed to use soil gradation testing to estimate saturated hydraulic conductivity from an equation in the manual. In order to claim that a site cannot use permeable pavement or bioretention options due to low saturated hydraulic conductivity, sites must have the results of these field tests.

In comparison to the preliminary draft language Ecology proposed in May 2011, projects subject only to Minimum Requirements #1 – #5 have more flexibility because they may choose the performance standard rather than the mandatory list. Projects of all sizes may have lower costs because areas using permeable pavements will not be required to have any overflows drain to a bioretention/rain garden.

Feasibility criteria for competing needs have been revised as follows:

1. Federal and state laws: Ecology proposes to list the federal and state laws that may conflict with implementation of LID. In the May-June 2011 informal comment period, some commenters suggested a general reference to federal and state laws was too open to interpretation, and they requested specific listings. Ecology would appreciate suggestions for relevant additional listings.
2. Special districts or zones: Ecology's revision addresses concerns over use of the term "aesthetics" in the preliminary draft language, which some commenters thought was too open to interpretation. Many jurisdictions have established design codes for a particular zone or district based on several years of community planning with extensive visioning and design processes. Changing these design codes in ways that require revisiting the community planning process is not feasible within the draft permit schedule for updating codes and standards.

Ecology reviewed a number of local design codes for areas of potential conflict. The review found that some design criteria can be changed to eliminate the conflict, such as landscaping, paving types, parking, sidewalk width/style, canopies for weather protection, but still be in line with the goals and vision of the special district or zone. Others such as zero lot line development, roof pitch, building orientation, and some sidewalk designs are not as easily changed if they conflict with the community planning vision and are already being implemented. Because there are many variables, Ecology cannot address all the types of changes in this feasibility criteria and proposes to provide local discretion to determine what is feasible. The draft permit establishes an expectation that permittees will change those design codes where possible during their review, but not those that are in conflict and are

integral to the community vision, and that are already being implemented. Ecology would expect jurisdictions to make changes as they revisit special district and zoning design codes during future permit terms.

3. Public health and safety – Most health-related issues are already addressed under the criteria of site/engineering-based conditions, such as distance from drinking water wells and onsite septic systems. The public safety criteria listed here refers to regulations to address items such as multiple pedestrian or vehicle access points, or others that may arise and are determined to be necessary to public health and safety. Safety issues related to specific road width recommendations from the American Association of State Highway and Transportation Officials (AASHTO) and the Institute of Transportation Engineers (ITE) do not qualify as competing needs by default. Road widths may be significantly reduced by determining specific traffic, parking, and emergency vehicle access needs, and designing for the narrowest width capable of meeting those requirements, consistent with public safety needs. .
4. Transportation options for future needs – Ecology added language regarding infeasibility within public rights-of-way in response to comments that locating bioretention or other LID facilities in public rights-of-way may conflict with the multiple purposes of the rights-of-way. Other purposes include future options for uses such as bike paths, transit, rapid transit, and road widening to address higher traffic volumes with growth. Most jurisdictions have identified the rights-of-way with such future needs in a transportation plan.

#### **Appendix 2 – TMDL Requirements**

See discussion of Special Condition S7 Compliance with Total Maximum Daily Load Requirements.

#### **Appendix 3 – Annual Report Questions for the Port of Seattle and the Port of Tacoma**

See discussion of Special Condition S9 Reporting Requirements.

#### **Appendix 4 – Annual Report Questions for Secondary Permittees**

See discussion of Special Condition S9 Reporting Requirements.

#### **Appendix 5 – Notice of Intent (NOI) for Coverage under a National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater General Permit**

This appendix serves as the application for permit coverage by cities, towns, and counties as well as Secondary Permittees. Proposed revisions simplify language and make it consistent with the terms as used in the permit, add a request for a staff contact address, and clarify the application of requirements consistent with the federal rule as follows:

- Commuter traffic is included in calculating the population served by the MS4 only for Secondary Permittees.

- Permittees relying on another entity submit the summary of that agreement as part of the NOI only if the other entity is taking on all the permit obligations.
- A regulated MS4 that qualifies for coverage discharges stormwater to a surface water of Washington State, consistent with federal law. As discussed in Special Condition S2, once an entity is covered by the permit, Ecology applies state law (RCW 90.48) to protect all receiving waters, including ground waters, from such discharges.

### **Appendix 6 – Street Waste Disposal**

Consistent with General Condition G10, Removed Substances, this appendix previously referred only to liquid street waste. Ecology recognizes that permittees also collect solid street waste and proposes language in Appendix 6 (and G10) to address solid street waste. Permittees should refer to their local health departments/districts and laws/regulations that govern the disposal and reuse of solid street waste.

### **Appendix 7 –Determining Construction Site Sediment Damage Potential**

Ecology clarified in a footnote that if there is no surface or ground water entering the site then zero points should be assigned. This is consistent with the Western Washington Phase II permit.

### **Appendix 8 – Urban Land Uses and Pollutant Generating Sources**

No changes proposed.

### **Appendix 9 – Stormwater Discharge Monitoring**

See discussion of S8 Monitoring.

### **Appendix 10 –Equivalent Programs for Runoff Controls for New and Redevelopment and Construction Sites**

Ecology removed language listing Clark County as an approved equivalent program based on the January 5, 2011 Pollution Control Hearings Board (PCHB) decision finding the Clark County Alternative Flow Control Program as not equivalent. The PCHB decision has subsequently been appealed. Ecology added language for Snohomish County. Once approved, Ecology will list manuals and codes approved under the 2013-2018 permit in Appendix 10 of a modified Phase I permit. For additional information about Ecology’s equivalency reviews under the 2007 permit, refer to

<http://www.ecy.wa.gov/programs/wq/stormwater/municipal/PhaseIequivalentstormwatermanualsWestern.html>.

### **Appendix 11- Structural Stormwater Controls Project List**

For general information about Appendix 11 see section *S5.C.6 Structural Stormwater Controls* of this Fact Sheet.

Ecology proposes a standardized listing format, in Appendix 11, in order to achieve the following goals:

- Allow for comparisons of water quality and hydrological benefits across jurisdictions.
- Quantify the benefits (water quality, hydrologic, and other) each project and each jurisdiction achieves.
- Count the following within the structural controls requirement:
  - Redevelopment portions of new projects (i.e. those required by the stormwater manual but also adding new treatment or flow control)
  - Projects not directly related to stormwater (i.e. not driven by stormwater capital planning) but providing stormwater benefits (ex. forest retention)
  - Operations and maintenance projects that go beyond permit O&M requirements (ex. whole system cleaning, intensive facility maintenance/upgrades)
  - Source control work that goes beyond source control permit requirements
- Provide a basis for potential future permit requirements to achieve a defined level of effort.

The following paragraphs discuss the three main aspects of the Structural Stormwater Controls Project List: the water quality benefit, the hydrological benefit, and the retrofit incentive. The location and receiving water body columns are also discussed below.

Water Quality (WQ) Benefit – Appendix 11 describes the required TSS reduction calculation method.

Ecology considered a range of potential water quality metrics and proposes to use Total Suspended Solids (TSS) because of its applicability to most, if not all, of the project types and because of its existing wide-spread use. The Puget Sound Partnership sponsored a stormwater needs assessment in 2010 that further supports the applicability of TSS to estimating water quality benefits from stormwater management activities (*Task 1: Urban Stormwater Runoff Preliminary Needs Assessment Technical Memorandum, Final Review Draft, September 2010.*)

Ecology believes that, in absence of site-specific TSS loading data, a pre-project median annual TSS loading rate should be calculated from the stormwater characterization monitoring conducted under the 2007 Phase I permit compiled from all the Phase I Permittees. Post-project TSS loading can then be calculated based on the project design specifications.

Hydrological (Hydro) Benefit – For each project there are multiple designs and methods that can provide a hydrologic benefit. For example projects can use detention ponds, infiltration, full dispersion, bioretention, weirs, orifices, or any combination of the above.

Ecology proposes a simplified Hydro Benefit calculation method that takes into account both the Standard Flow Control Requirement and the Low Impact Development Performance Standard.

Ecology took the Standard Flow Control Requirement into account through the use of the Volume Ratio Calculation which compares the provided storage of the project to that required if

the project had to meet the Standard Flow Control Requirement. Infiltration is not included in the Volume Ratio Calculation. Ecology believes that there is value to providing detention/retention storage before discharging stormwater to surface water even if the Standard Flow Control Requirement is not met; therefore, Ecology has set a minimum value of 25% for the hydrologic benefit for projects that attempt any sort of detention/retention storage.

Unfortunately, it is extremely difficult to determine a calculation similar to the Volume Ratio for projects that have an infiltration component. This is because the amount of infiltration is dependent on wetted perimeter, soil type, soil amendments, and infiltration area. Due to the complex modeling and calculations involved Ecology proposes to provide a 100% hydro benefit for projects that meet certain requirements that align with the Low Impact Development Performance Standard. A 100% hydro benefit will be given to projects that infiltrate a large portion of stormwater on site, use full dispersion, use a vegetated roof, or use permeable pavement for 50% of the project's hard surface area (other than roofs). These credits provide a simple and consistent way for projects that use infiltration to show they provide a large hydrologic benefit without requiring permittees to perform complicated calculations or modeling.

Retrofit Incentive – Projects improving water quality that discharge to a water body with known water quality problems (such as 303(d) listing or contaminated site) receive more incentive points. Projects that treat the volume of water required for new and redevelopment projects (91% of the runoff volume) receive more incentive points than projects with treatment facilities that cannot achieve the design standard.

The retrofit incentive for property acquisition projects are to be calculated as a flow control and/or a treatment project because this category implies the acquisition will provide quantifiable “additional” water quality and/or flow control benefits.

Projects that involve habitat protection or reforestation are more difficult to quantify in terms of a hydrologic and/or water quality benefit. Ecology considered different methodologies for calculating incentive points (such as how close the project will get the basin toward 65% forested) but due to the complexity and high variability of these methodologies, we selected a simple formula based on the land area protected or restored.

Ecology will refine this standardized reporting approach as necessary after evaluating how well it works during this permit cycle.

Projects can only use one incentive type. Permittees should select the one with the highest incentive value. If different acreages on the project achieve different things, Permittees should add them together as appropriate, but double-counting is not allowed.

Location – Latitude and longitude of the project can be obtained here: <http://itouchmap.com/latlong.html>. This allows for mapping of the projects.

Receiving water body – This information will help verify retrofit incentive calculations based on condition of the receiving water body. Receiving water bodies are not always apparent when only a lat/long location is provided.

**Appendix 12- Funding Agreement between Ecology and Municipal Stormwater Permittees**

See discussion of special condition S8 Monitoring.

## 7.0 Attachment A

### *Average Event Mean Concentrations Stormwater Data from Various Land Uses*

**\*The table below contains data from multiple Phase I permittees collected during water years 2009 and 2010. Data from the Ports of Seattle and Tacoma has not yet been included. As time allows and additional data is reported, this information will be revised. This information is currently under evaluation with the future intention of further statistical evaluation. The data table below only presents average concentration data where analytes were detected. This table does not include non-detect data. The number of sample points in the table indicate the number of single event mean concentrations used to determine the average event mean concentration.**

The purpose of Special Condition S8.D Stormwater Monitoring in the Phase I Municipal Stormwater Permit (effective February 2007) is intended to characterize stormwater runoff quantity and quality at a limited number of locations in a manner that allows analysis of loadings and changes in conditions over time and generalization across permittee jurisdictions. Supporting information regarding how this data was collected, storm event criteria, parameter lists etc. is provided in the 2007 Phase I permit or in permittee's quality assurance project plans (QAPPs). QAPPs are available on Ecology's website at <http://www.ecy.wa.gov/programs/wq/stormwater/municipal/s8dswmonitoring.html>. A complete parameters list can be found in the Phase I Municipal Stormwater Permit effective 2007 in Special Condition S8.D.

## Attachment A

### Average Event Mean Concentration Data from Various Land Uses Provided by Multiple Phase I Municipal Stormwater Permittees (Water Year 2009-2010)

Parameter and Units	Industrial		High Density Residential		Commercial		Low Density Residential	
	Average Concentration	Number of Sample Points	Average Concentration	Number of Sample Points	Average Concentration	Number of Sample Points	Average Concentration	Number of Sample Points
<b>Nutrients (mg/L)</b>								
Total Phosphorus	0.23	22	0.15	48	0.19	51	0.10	29
Total Kjeldahl Nitrogen	1.15	22	1.38	45	2.10	44	2.90	26
Nitrate/Nitrite	0.33	22	0.56	48	0.45	52	0.81	29
Ortho-phosphorus	0.04	22	0.03	41	0.04	40	0.04	28
<b>Conventional Parameters</b>								
Total Suspended Solids (mg/L)	64.86	22	50.99	48	75.40	60	18.98	29
Turbidity (NTU)	64.04	11	23.78	36	42.90	40	11.06	29
BOD (mg/L)	7.76	17	6.48	37	11.26	46	3.73	12
Surfactants (mg/L)	0.11	13	0.09	24	0.17	38	0.76	6
Chloride (mg/L)	21.67	19	26.05	48	6.85	50	5.72	29
Hardness (mg/L)	58.13	22	18.47	48	31.30	60	26.34	29
<b>Bacteria (CFU)</b>								
Fecal Coliform	9087	21	6866	47	4989	46	1534	15
<b>Metals (ug/L)</b>								
Total Copper	19.02	22	10.06	49	28.42	58	3.08	29
Dissolved Copper	4.83	22	4.10	48	11.06	59	2.26	29
Total Zinc	136.74	22	61.49	48	124.45	60	23.10	29
Dissolved Zinc	53.86	22	32.21	48	57.04	60	18.83	29
Total Cadmium	0.29	18	0.19	22	0.24	42	0.09	9
Dissolved Cadmium	0.10	9	0.04	20	0.06	33	0.03	13
Total Lead	9.29	22	9.01	48	32.37	60	0.99	29
Dissolved Lead	1.12	16	0.72	43	4.82	58	0.15	24
Total Mercury	0.05	4	0.17	5	0.06	12		0
Dissolved Mercury		0	0.08	1	0.06	6		0



	Industrial		High Density Residential		Commercial		Low Density Residential	
<b>TPH (mg/L)</b>								
Diesel (Dx)	0.82	11	363.75	28	68.87	35	246.00	15
Motor Oil	0.56	4	497.72	17	164.91	34	414.43	14
Gasoline (Gx)	17.82	9	17.25	8	21.00	9		0
<b>PAHs (ug/L)</b>								
1-Methylnaphthalene	0.17	1		0		0		0
2-Methylnaphthalene	0.02	16	0.01	18	0.02	20		0
Acenaphthene	0.01	15	0.00	4	0.01	10		0
Acenaphthylene	0.01	10	0.01	7	0.03	9		0
Anthracene	0.01	6	0.01	4	0.03	9		0
Benzo(a)anthracene	0.03	12	0.02	12	0.11	27	0.07	8
Benzo(a)pyrene	0.05	13	0.02	18	0.06	26	0.10	8
Benzo(b)fluoranthene		0	0.07	3	0.25	16	0.13	8
Benzo(b,k)fluoranthenes	0.02	14	0.04	19	0.05	20		0
Benzo(g,h,i)perylene	0.07	13	0.03	18	0.11	41	0.07	6
Benzo(k)fluoranthene		0	0.03	2	0.13	5	0.10	8
Chrysene	0.05	19	0.04	21	0.12	48	0.12	8
Dibenzo(a,h)anthracene	0.01	2	0.02	2	0.01	1	0.02	4
Fluoranthene	0.08	22	0.06	36	0.19	58	0.20	9
Fluorene	0.01	14	0.01	10	0.01	17		0
Indeno(1,2,3-Cd)Pyrene	0.06	8	0.03	16	0.08	21	0.06	6
Naphthalene	0.03	15	0.04	20	0.04	21	0.05	10
Phenanthrene	0.06	22	0.03	31	0.08	48	0.06	8
Pyrene	0.09	22	0.04	34	0.18	60	0.21	9
<b>Phthalates (ug/L)</b>								
Bis(2-ethylhexyl) phthalate	1.95	10	2.38	35	4.00	44	1.28	19
Butyl benzyl phthalate	0.35	16	0.25	20	0.68	33		0
Di-N-Butyl Phthalate	0.35	17	0.23	27	0.57	34	0.47	10
Diethylphthalate	0.74	21	0.29	27	0.18	20	0.08	7
Dimethyl phthalate	0.06	6	0.07	8	0.43	35	0.07	11
Di-n-octyl phthalate	0.90	7	0.17	12	0.54	10		0
<b>Pesticides/Herbicides (ug/L)</b>								
2,4-D		0	1.47	12	1.25	10	1.28	3
MCP		0	7.50	2	24.90	1	20.50	1

	Industrial		High Density Residential		Commercial		Low Density Residential	
Triclopyr		0	0.21	4		0		0
Pentachlorophenol		0	0.07	1	0.23	11	0.07	1
Diazinon		0	0.14	1	0.21	1		0
Malathion		0	0.25	1	0.59	2	1.38	1
Dichlobenil	0.02	1	0.17	16	0.25	18		0
Prometon		0	0.13	3	0.05	1	0.09	1

mg/L = milligrams per liter

ug/L= micrograms per liter

CFU = colony forming units

PAHs = polycyclic aromatic hydrocarbons

TPH = total petroleum hydrocarbons

Industrial land use data provided by:

- Cities of Tacoma and Seattle

High density residential land use data provided by:

- Counties of Clark, Pierce, Snohomish and King
- Cities of Tacoma and Seattle

Low density residential land use data provided by

- Counties of Clark, Pierce, Snohomish and King

Commercial land use data provided by

- Cities of Tacoma and Seattle
- Counties of Clark, Pierce, Snohomish and King