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City of Puyallup City Future
Stormwater Monitoring Plan

Prepared for
City of Puyallup, WA
December, 2010

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Section 1

Monitoring Overview

This section provides a brief overview of the monitoring requirements that are set forth in the Washington State Phase II Municipal Stormwater Permit for Western Washington (Phase II Permit).

1.1 Current Permit Monitoring Requirements

The Phase II Permit regulates stormwater discharges for small municipal separate storm sewer systems (MS4s) as established in Title 40 CFR, part 122.26. The Phase II Permit, issued in 2007 and modified in 2009, includes requirements for permittees to prepare to conduct a monitoring program in future permits.

The Phase II Monitoring Program described in Section S8.C includes two types of monitoring:

1. Stormwater Monitoring (S8.C.1.a)
2. Stormwater Management Program (SWMP) Effectiveness Monitoring/Targeted SWMP Effectiveness Monitoring (S8.C.1.b)

Stormwater Monitoring (S8.C.1.a) requires permittees to identify sites suitable for monitoring stormwater discharges based on jurisdictional size and land use types, and on known water quality problems and/or targeted areas of interest for future monitoring.

SWMP Effectiveness Monitoring (S8.C.1.b) requires permittees to identify questions that monitoring may answer to determine the effectiveness of specific components of their Stormwater Management Program (SWMP). The permittee must identify sites for monitoring and create monitoring plans to answer at least two effectiveness questions.

This document covers stormwater monitoring for Phase II Permit condition S8.C.1.a; effectiveness monitoring (S8.C.1.b) is described in a separate plan.

1.2 Future Phase II Permit Monitoring Requirements

This monitoring plan was prepared to meet the requirements of the current (2007) Phase II Permit. However, the next Phase II Permit, which is scheduled to be issued in 2012, may contain monitoring requirements substantially different from those envisioned in the current Permit. In 2008, Ecology convened the Puget Sound Stormwater Workgroup (SWG) to develop a comprehensive, sustainable, stormwater monitoring strategy for Puget Sound, as well as monitoring requirements for the next Phase I and Phase II permits. The SWG members represent caucuses of local, state, and federal agencies, environmental and business organizations, tribes and agriculture. The SWG submitted the comprehensive strategy in July 2010 to Ecology (in a document titled *2010 Stormwater Monitoring and Assessment Strategy for the Puget Sound Region*). Based on this strategy, the SWG submitted monitoring recommendations for the next NPDES Phase I and II permits on October 29, 2010, in a document titled *Recommendations for Municipal Stormwater Permit Monitoring*.

The SWG recommends that Ecology designate an independent entity to administer the stormwater-related monitoring and assessment activities in the next municipal stormwater permits. This recommendation is called the “pay-in” option. The SWG recommended receiving water monitoring rather than the outfall monitoring described in the current Phase II Permit. Moreover, the SWG recommended

that the regional entity (rather than by each permittee) administer the program effectiveness monitoring and focus on questions of regional significance.

More information on the SWG is available at

<http://www.ecy.wa.gov/programs/wq/psmonitoring/swworkgroup.html>.

If the next Phase II Permit incorporates the SWG recommendations, the monitoring requirements will be substantially different from those envisioned in the current Permit. Thus, this monitoring plan should be regarded as tentative and subject to change based on the next Phase II Permit.

Section 2

Monitoring Site Selection Process

2.1 Land Use Requirements

Puyallup has a population of 38,690 according to the April 1, 2009 value used for allocation of selected state revenues. Based on the thresholds set in Permit section S8.C.1.a, the City must select two outfalls where stormwater characterization monitoring could be conducted. One site should represent commercial land uses and the other should represent high-density residential land uses.

In addition to the selecting outfalls which the land uses noted above, Ecology guidance recommends selecting locations where municipalities already have an interest in the receiving water quality.

2.2 Sampling Sites Selection

The Phase II permit states that Permittees shall select outfalls or conveyances based on known water quality problems and/or targeted areas of interest for future monitoring. The City would like to highly consider locations where monitoring has been or is being conducted. This will allow monitoring collected as part of this proposal to build upon past or current monitoring information and to be used to identify trends and/or statistically significant changes. It also increases likelihood that the monitoring sites will be accessible and that power and other monitoring station needs are met. The City has been collecting monitoring data at many sites over the past 20 years and so it could be informative for the City if they could build on this existing data.

Ecology's May 2010 Monitoring and Reporting Guidance for Phase II Municipal Stormwater Permits (Publication 10-10-030) was also used to select outfalls or conveyances.

The NPDES permit requires Permittees to document:

1. Why sites were selected;
2. Possible site constraints for installation of and access to monitoring equipment;
3. A brief description of the contributing drainage basin including size in acreage, dominant land use, and other contributing land uses;
4. Any water quality concerns (or interests) in the receiving water of each selected outfall or conveyance.

The two potential monitoring sites are described below.

Site 1 (Commercial): Puyallup River Outfall #14

Brief Description- The monitoring site is located at City outfall #14 near the skate park (see Figure 1). It is a concrete pipe in line with 4th St NW and the Puyallup River.

Reason for Selection- This site was selected due to its high concentration of commercial land use.

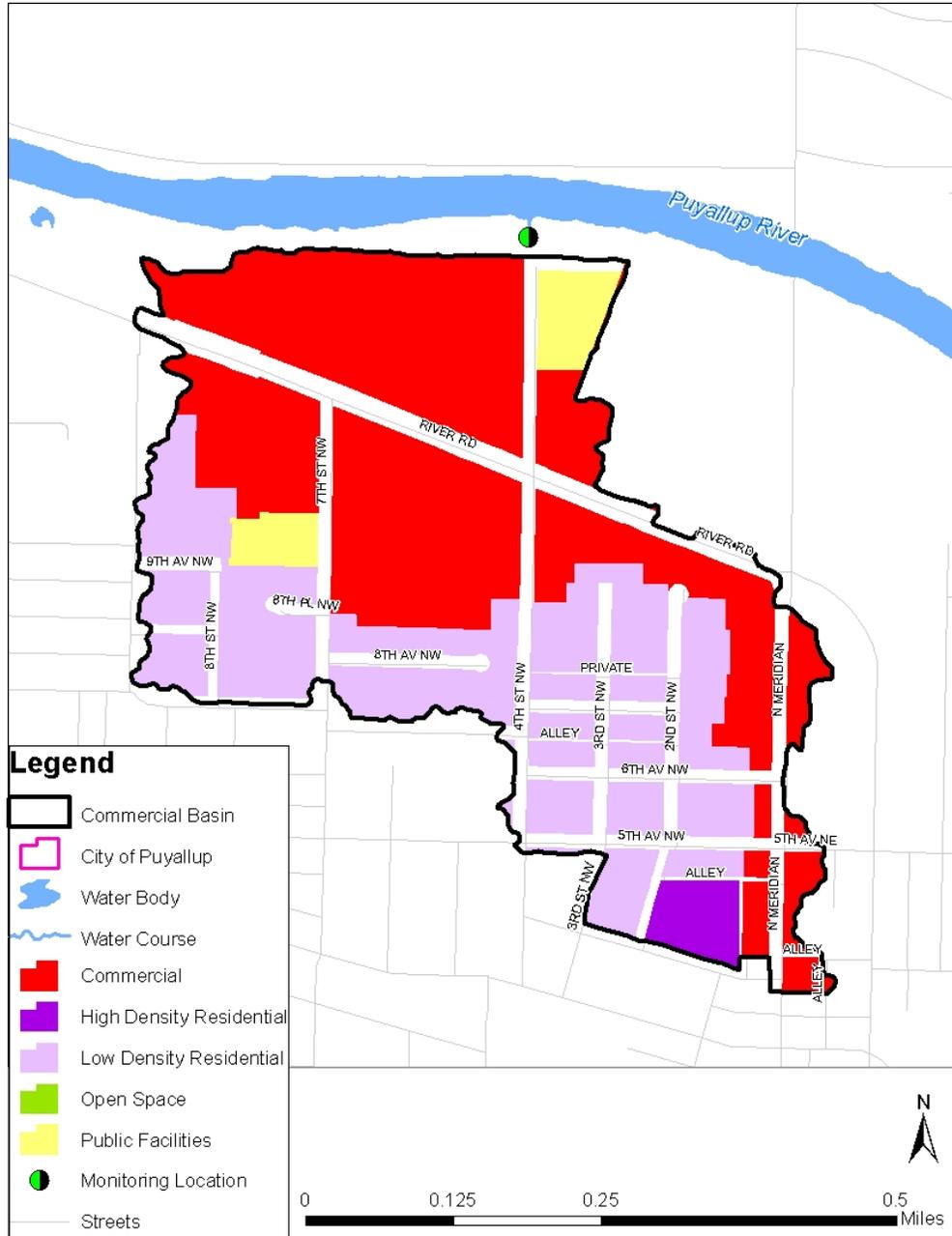
Constraints- Flow from this outfall may be affected by backwater conditions during storm runoff events that coincide with Puyallup River flows above 17,000 cfs. However, this combination of conditions is

expected to occur very infrequently.

Brief Description of Contributing Drainage Basin (size, dominant land use, other contributing land uses)- The drainage basin is 138 acres. As shown in Table 1, over half of the basin is commercial. The rest of the basin is a combination of High Density Residential, Low Density Residential, Open Space, and Public Facilities.

Table 1. Commercial Drainage Basin Characteristics			
Land Use		Area (acres)	Percent
Commercial	Auto Commercial	58.6	55%
	Pedestrian Oriented Commercial	3.8	
High Density Residential		3.0	3%
Low Density Residential		42.0	37%
Open Space		0.0	0%
Public Facilities		5.1	5%

Water Quality Concerns or Interests- The Puyallup River downstream of the city limits (approximately two miles downstream of outfall #14) is listed as “polluted” by fecal coliform bacteria. The fecal coliform listing is based on samples collected in 1998; however, samples collected in 2006 and 2008 did not exceed the state standards for fecal coliform. The same reach is listed as a “water body of concern” for dissolved oxygen. The reach about a third of a mile upstream h is listed as “polluted” due to elevated mercury concentrations. The City is unaware of any potential mercury source(s) in the outfall #14.



drainage area.

Figure 1. Commercial Land Use Basin

Site 2 (High Density Residential): Clarks Creek Outfall #24

Brief Description- The monitoring site is located at the outfall pipe just downstream of the Pioneer Ave bridge crossing over Clarks Creek. This 48-inch diameter concrete pipe receives stormwater runoff from an area that contains a mix of High Density Residential, Commercial, and Low Density Residential land uses (see Figure 2).

Reason for Selection- Using the City's original land use data no basins were found to be dominated by

High Density Residential land use. The City land use descriptions in the tax parcel data do not define the definition for Low Density Residential; however, using GIS analysis the average density of the Low Density Residential properties in this basin is 4-5 units per acre, which by the Ecology guidance would be defined as High Density Residential. The Pioneer Avenue drainage area was selected because it is an area of high importance due to planned economic redevelopment in the City’s downtown core.

The selected sampling site will allow characterization of stormwater discharges into Clarks Creek, which has a TMDL for fecal coliform bacteria as well as sediment and dissolved oxygen concerns.

Constraints- No known constraints.

Brief Description of Contributing Drainage Basin (size, dominant land use, other contributing land uses)- The drainage basin encompasses 431 acres, including the right-of-way. Table 2 lists the current land use composition. As noted above, the area of High Density Residential is expected to increase as a result of the City’s economic redevelopment plan for the downtown area. The tables and figures are updated to use the Ecology, rather than City definition.

Table 2. High Density Residential Drainage Basin Characteristics			
Land Use		Area (acres)	Percent
Commercial	Auto Commercial	3.5	17%
	Limited Commercial	2.2	
	Pedestrian Oriented Commercial	56.4	
High Density Residential		198.8	56%
Low Density Residential		27.5	8%
Open Space		3.8	1%
Public Facilities		62.8	18%

Water Quality Concerns or Interests- Clarks Creek has a TMDL in place for fecal coliform. The Puyallup Tribe is developing a TMDL for dissolved oxygen in the creek. Excessive fine sediment and elodea growth are also key concerns for Clarks Creek.

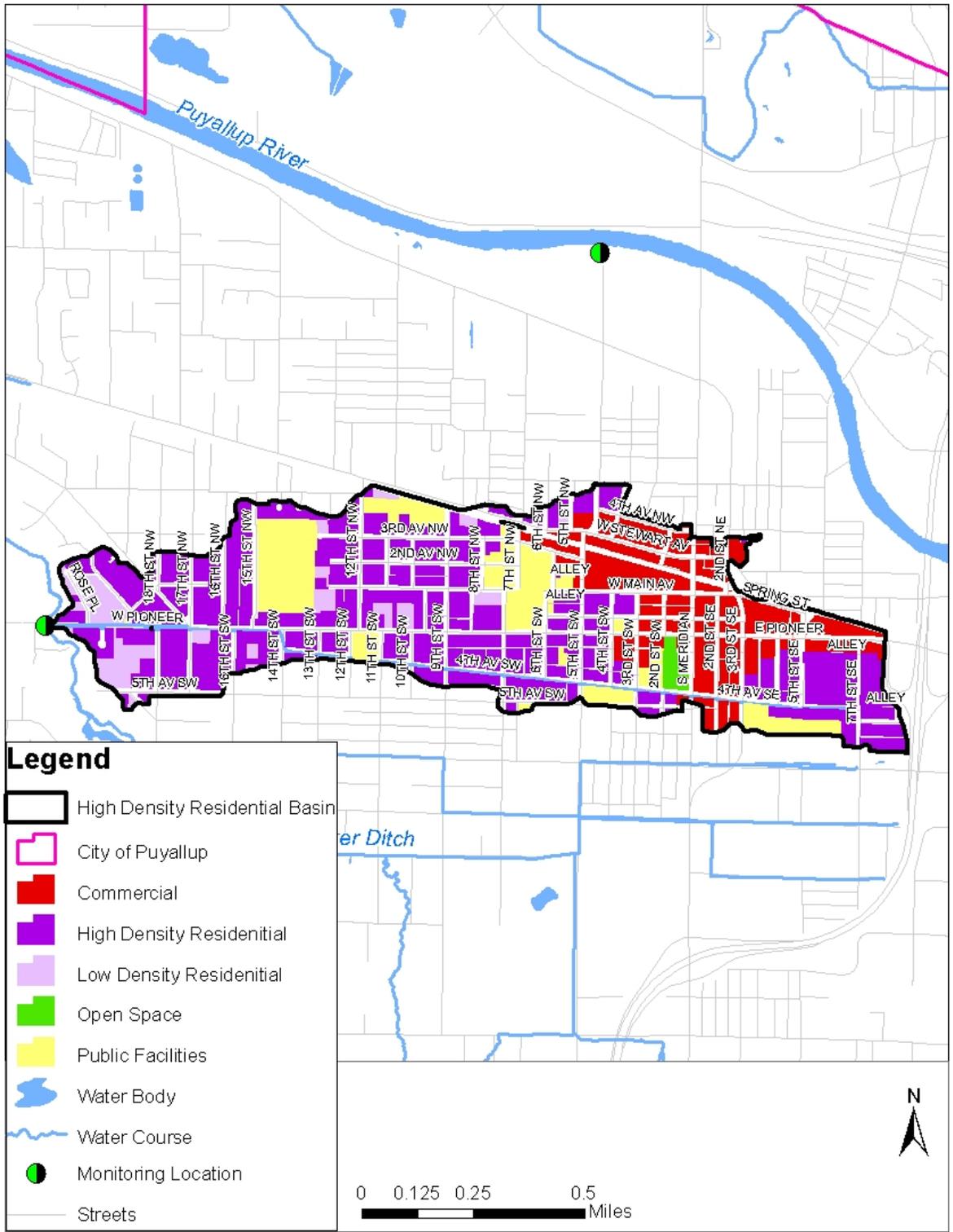


Figure 2. High Density Residential Land Use Basin

Limitations

The next version of the Phase II Permit may contain monitoring requirements that are substantially different from those envisioned in the current (2007) Permit. Therefore, the City may modify this plan after the next Phase II Permit has been issued.