FINAL

Surface/Storm Water Management Plan

PREPARED FOR

CENTRALIA
WASHINGTON

PREPARED BY

CH2MHILL

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Final

Surface/Storm Water Management Plan City of Centralia, Washington

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Acronyms

AKART	All known available and reasonable treatment
°F	degrees Fahrenheit
BOD	Biochemical Oxygen Demand
BMPs	best management practices
cfs	cubic feet per second
CBP	Chehalis Basin Partnership
CIP	Capital Improvement Projects
CMC	Centralia Municipal Code
DCE	dichloroethylene
DIP	Detailed Implementation Plan
DNR	Department of Natural Resources
DO	dissolved oxygen
EA	each
Ecology	Washington State Department of Ecology
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FTE	full-time equivalent
GBA	George Butler Associates Master Series Infrastructure & Asset Management
GIS	geographic information system
GMA	Growth Management Act
GPS	Global Positioning System
HPA	Hydraulic Project Approval
LF	linear foot
LID	low-impact development
MEP	maximum extent practicable
mg/L	milligram per liter
MS4	Municipal Separate Storm Sewer System

NGVD	National Geodetic Vertical Datum
NPDES	National Pollutant Discharge Elimination System
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NWI	National Wetland Inventory
O&M	operation and maintenance
PCBs	polychlorinated biphenyls
POC	Point of Compliance
PRPs	potential responsible parties
RCW	Revised Code of Washington
r.m.	river mile
SEPA	State Environmental Protection Act
SMP	Shoreline Master Program
SWMP	Storm Water Management Program
SWPPP	Storm Water Pollution Prevention Plan
TCE	trichloroethylene
TMDL	total maximum daily load
TSS	total suspended solids
UGA	urban growth area
UIC	underground injection control
USGS	United States Geological Survey
WSDFW	Washington State Department of Fish and Wildlife
WSDOH	Washington State Department of Health
WWHM	Western Washington Hydrology Model
WWTP	waste water treatment plant

Executive Summary

This Surface/Storm Water Management Plan has been developed to meet the regulatory requirements of the NPDES Phase II Stormwater Permit, Endangered Species Act (ESA), City of Centralia Municipal Code, and other federal, state, and local regulations that apply to surface and storm water management. This Plan is also an important tool that the City can use for day-to-day operations and as a public reference document. In addition to addressing regulatory issues, the plan identifies necessary capital improvements to the City's storm water infrastructure that will address drainage problems, reduce negative water quality impacts, and address public health and safety concerns. The document includes recommendations for the preservation of environmental and aesthetic amenities within the community and a proposed 6-year capital improvement plan.

This Executive Summary provides an overview of each section of the Plan.

Section 1: City of Centralia Watershed Characteristics and Conditions Assessment

The watershed characteristics in the City of Centralia are described in detail in this section, with a map and a listing of the 26 sub-basins in the watershed, including the predominant features and the total area of each sub-basin. The City of Centralia is approximately 4,830 acres in size, and when the total Urban Growth Area (UGA) is included, that area becomes about 10,550 acres.

A condition assessment of natural resources, the developed areas, and the existing regulatory environment in the City is also presented in Section 1. Currently, there are no known fish from the endangered species list that use Centralia-area streams, creeks, and rivers; however, it is possible that bull trout may be present in the vicinity of Centralia on a seasonal basis. Bald eagles, listed as threatened in the ESA, are found within the Centralia area. Since the health of bald eagle populations is largely dependent on the health of salmonid populations, and there is a possibility that bull trout use Centralia's waters, it is recommended that the City voluntarily comply with the ESA program by being proactive in developing a strategy to prepare for and respond to the ESA should a species of fish using Centralia's waterways move onto the threatened or endangered species list. Information on ESA compliance is provided in several sections of the Surface/Storm Water Management Plan.

Salzer, China, Coffee, Scammon, and Cook creeks, the Skookumchuck and Chehalis rivers, and multiple wetlands in the City comprise the freshwater ecosystem, although certain areas have documented water quality and fish-passage issues. For instance, Salzer Creek has low dissolved oxygen levels at Airport Road (Pickett, 1994) and historical problems with leachate from the Centralia Landfill near the confluence with the Chehalis River and with discharges from pipes at the Southwest Washington Fairgrounds (Washington State Department of Ecology [Ecology], 1987). The landfill issue was addressed under a State Consent Decree by installing a protective cover (i.e., cap) over the landfill. Coffee Creek has

approximately nine culverts that are considered impassible fish barriers (Lewis County Conservation District, 2005). Scammon Creek has a history of low dissolved oxygen levels (Pickett, 1994), and there are approximately six culverts in this creek system that are considered impassable to salmonids (Lewis County Conservation District, 2005). The Skookumchuck Dam is located on Skookumchuck River approximately 10 miles upstream from Centralia. Modification to the river and the dam were proposed under a 2004 Flood Damage Reduction Project, and proposed renovations to the dam are not expected to have a major impact on wetlands or stream geomorphology downstream of the dam. It is proposed that renovations be made to the Skookumchuck Fish Hatchery to bring it up to current regulatory standards (Washington State Department of Fish and Wildlife, 2006). It is also noteworthy that the Skookumchuck River sub-basins have high levels of bank erosion. The Chehalis River passes through the City of Centralia, and each of the tributaries mentioned above connect to the Chehalis River. In 1994, Ecology conducted a total maximum daily load study of the upper Chehalis River during the dry season. Low dissolved oxygen, high temperatures, and high fecal coliform bacteria levels were identified as beyond water quality standard limits. Excess sediment delivery to water bodies is a major problem throughout most of the Chehalis River sub-basins.

In July 2004, the population of the City of Centralia was approximately 15,250, and it is projected to grow to over 18,000 by 2024. Residential zoning accounts for 76.7 percent of the City's UGA; while commercial zoning accounts for 9.4 percent and industrial zoning accounts for 10.4 percent. The remaining 3.5 percent is for health services, business district, and the port master plan. With these land-use activities can come a variety of pollutants to the watershed's storm water runoff.

Section 2: Regulatory Requirements and Planning Documents

Section 2 identifies compliance requirements that the City of Centralia must implement under the National Pollutant Discharge Elimination System (NPDES) Phase II regulations, as well as other regulatory compliance measures currently implemented in and around the City of Centralia.

In January 2007, Ecology issued Washington State's *Western Washington Phase II Municipal Stormwater Permit* for small, municipal separate storm sewer systems (the Phase II Permit, or the permit), which became effective in February 2007. The City of Centralia has filed a Notice of Intent to begin compliance with the permit requirements.

This section discusses how the City of Centralia surface/storm water management program addresses the NPDES Phase II requirements. It describes deficiencies in the City's approach under the new NPDES storm water requirements and makes recommendations on how to correct them.

The Phase II Permit gap analysis is documented in Table 2-1. It is based on the five minimum components of the mandated Storm Water Management Program (SWMP):

1. Public Education and Outreach
2. Public Involvement and Participation
3. Illicit Discharge Detection and Elimination
4. Controlling Runoff from New Development, Redevelopment, and Construction Sites

5. Pollution Prevention and Operations and Maintenance for Municipal Operations

Each of these five NPDES Phase II requirements is described by a set of minimum performance measures outlined in the permit. Each of the performance measures is addressed individually in this gap analysis for the City of Centralia. Table 2-1 contains additional detail on these requirements.

Other requirements of the permit include the following:

- Report to Ecology any monitoring studies and any known data that indicate violations of state water quality standards.
- Assess effectiveness of best management practices (BMPs) and any changes needed.
- Prepare a plan for a future comprehensive long-term monitoring program.
- Submit a detailed annual report on the status of SWMP implementation.

Another regulatory consideration for the City is compliance with the ESA. Bald Eagles, listed as threatened in the ESA, are present in the Centralia area, and there are various measures prescribed by the U.S. Fish and Wildlife Service to protect them, including maintaining an ample food supply. Measures taken to protect or enhance salmon also help protect eagles. Another ESA-listed species possibly present, at least on a seasonal basis, is bull trout (threatened), and measures that protect salmon also protect bull trout.

An earlier surface water program assessment (RW Beck, 2002) summarized most of the federal, local, and state requirements; therefore, the information is not repeated in this Surface/Storm Water Management Plan. In addition to new regulatory requirements prescribed in the Phase II Permit and updates relative to the ESA, the following regulatory updates are discussed in Section 2.

- Updates to City of Centralia Policies and Ordinances
  - CMC Chapter 16.08 – Shoreline Management Master Program
  - CMC Chapter 16.16 – Natural Resource Lands and Critical Areas
  - CMC Chapter 18.10 – Design and Development Guidelines
  - CMC Chapter 18.15 – Storm Water Management
  - Comprehensive Plan
- Updates to State Regulations and Programs
  - Washington State Department of Ecology Stormwater Management Manual for Western Washington
  - Underground Injection Control Wells
- Updates to Federal Regulations and Programs
  - Chehalis River Total Maximum Daily Loads (TMDL)

Section 3: Surface Water Issues Identified in the City of Centralia

Section 3 describes the drainage, water quality, and aquatic habitat issues identified in the City of Centralia. This Surface/Storm Water Management Plan does not address flooding issues; rather, it concentrates on storm water issues within the City (as opposed to surrounding rivers flooding Centralia). Surface water issues were identified by collecting information from a variety of sources, including the following:

- City of Centralia Citizens Advisory Board
- City of Centralia Staff
- Field visits conducted by CH2M HILL during the preparation of this plan

There were three categories of storm water management issues considered during the development of this Plan: surface runoff and ponding, water quality, and aquatic habitat. No problems specifically related to water quality and habitat were identified for inclusion in the list of surface water issues and problems; however, the Plan provides recommendations in Section 6 that the City survey, manage, and monitor potential/future water quality and habitat issues to develop a better database of issues.

A total of 52 surface water problem locations in the City of Centralia were identified, and they can be categorized into two groups:

1. Maintenance: issues with the potential to be addressed by routine or special operations and maintenance practices.
2. Structural: issues related to the storm water system being disconnected from the sewer system, broken pipes, and/or obstruction of storm drains and pipes.

Section 4: Operations and Maintenance

Storm water facilities include the storm water conveyance system (i.e., storm water pipe, ditches, catch basins, and other structures) and retention/detention facilities. Concurrent with the development of this Plan, the City of Centralia is completing an inventory of the drainage system to develop an updated map and database of the City's storm water system. The inventory should be completed and kept current by the City upon completion of this Plan. The City's storm water facilities consist of the following elements:

- 153,300 linear feet of storm water conveyance pipe*
- Unknown linear feet of open ditch
- 1,533 catch basins*
- 71 drywells
- 511 manholes
- 16 retention/detention storm water facilities
- 31 outlets

* Estimate based on the assumption that there are three catch basins and 300 linear feet of storm water conveyance pipe per manhole.

The preliminary information provided above is to be verified against the completed inventory performed by the City, as it differs slightly from the information presented in the RW Beck 2002 O&M Section 4, Table 4-1 (see Appendix A of this Surface/Storm Water Management Plan).

The NPDES Phase II Permit requires the City to implement an effective storm water facilities maintenance program. Furthermore, this Surface/Storm Water Management Plan recommends that the City voluntarily comply with ESA regulations for bull trout and salmonids, and there are operations and maintenance (O&M) implications to this recommended ESA compliance. Section 4 of the Plan addresses the NPDES and ESA requirements and details a methodology proposed to help the City of Centralia meet the regulatory guidelines. The methodology developed is a three-staged approach, intended to facilitate the City's future efforts to determine optimum staffing (in terms of full-time equivalent employees or FTEs) to meet NPDES Phase II Permit requirements.

A main feature of Section 4 is a table showing regulatory requirements and the compliance dates (in two-year increments, ending in 2012) that the City should work towards. These compliance dates are based on the intermediate regulatory guidelines of the Phase II Permit; however, an effort was made to spread out compliance activities wherever possible to present a realistic approach to meeting the final goals. A very brief overview of the main features of the staged approach to NPDES Phase II Permit compliance is presented below.

- Pre-Permit: Centralia 2006 Storm Water Program – The City currently has two different departments that contribute to inspection and maintenance of the City's storm water facilities: the Street Department and the Waste Water Department. The City relies on citizen complaints to initiate surface/storm water maintenance service; therefore, the program is mostly reactionary.
- Stage 1: 2008 – The O&M team, still working in mainly a reactive manner, would complete the City's surface/storm water database, perform some inspection of new development sites, and incorporate new action items necessary to satisfy the NPDES Phase II permit requirements. Additional FTEs would not be required to perform the work. The cost of the O&M program is not expected to increase (in comparison to the pre-permit level of service), as efficiencies and coordination would offset the cost of completion of additional service items.
- Stage 2: 2010 – Stage 2 would not require additional FTEs to perform the work; however, the O&M program would be delivered by only one department. Housing the surface/storm water operations and maintenance program under one department would help simplify coordination by decreasing the number of supervisors for the program to one, eliminating coordination issues and focusing accountability and authority. The O&M program would become more proactive, using the database to determine and administer a maintenance schedule. The O&M team would continue to perform new action items necessary to satisfy the NPDES Phase II Permit requirements, but staff would receive additional training to improve their efficiency and their ability to use the database. A more cost-effective maintenance route would also be determined, with a centralized dispatching mechanism (i.e., one department) to implement and oversee this new route. The City would continue to assume responsibility for the City surface/storm water system elements and begin taking responsibility for private

developers' additions to the system. The City would develop a semiannual inspection program of new development and recently developed sites. In addition, the City would prepare for and respond to the ESA. The cost to deliver Stage 2 is expected to increase by 10 to 20 percent over the pre-permit level of service.

- Stage 3: 2012 – Stage 3 is in many ways similar to Stage 2, though it differs in the understanding that to achieve all the NPDES Phase II Permit requirements, an increase in FTEs assigned to manage storm water will be needed. Stage 3 also involves an organizational change in how the surface/storm water O&M function is provided. Under Stage 3, the City would create a Surface/Storm Water Department that would be able to concentrate on efficiency, coordination, and management of the City's Surface/Storm Water Management Program. The City may further address the organizational and efficiency issues by providing cross-training of maintenance needs and activities and formal communication systems. Under Stage 3, the City would apply the strategy developed for ESA compliance, be mostly proactive, be responsible for the City's surface/storm water system, perform construction inspections of developers' additions during new development, and provide quarterly inspections of recently developed sites. The cost is expected to increase by 40 to 50 percent over pre-permit levels to implement all of these activities.

To meet all of the NPDES Phase II Permit requirements, it is recommended that the City move at a progressive pace towards meeting Stage 3 compliance.

To help determine the financial implications, a budget for each stage should be prepared when the City has O&M cost information for its 2006 program year. Section 4 presents a tool that can be used to evaluate financial implications. By using the tool as a template, the City can determine costs by adding new service items as required to achieve each stage of permit compliance. The departments providing the surface/storm water O&M should determine the actual daily production, crew size, and equipment needed to perform new action items.

If the recommended schedule is not financially feasible for the City, an incremental approach is recommended, and alternative funding options should be considered.

Additional recommendations to improve O&M of the surface/storm water system include the following:

- In an effort to define the storm water system in Centralia, the City should endeavor to delineate what is the City's responsibility and what is the responsibility of private owners, including homeowners associations.
- An updated map of the storm water system is needed to help private developers better design and build their storm water systems.
- Updated and accurate lists and databases of storm water facilities, maintenance needs, and maintenance schedules should be kept.
- The City should inspect all new development sites and recently developed sites for compliance with the O&M plan for storm water management submitted by the developer during permit application (i.e., site development plan).

- A system should be set up to manage the documentation of inspections and maintenance activities (database management).
- As the City of Centralia's population continues to grow, maintenance demands will increase. The City should use its repair and replacement budget to replace and/or upgrade its equipment as needed to meet these increasing demands.

Section 5: Alternatives

A 6-Year Capital Improvement Project (CIP) Plan is presented in this section, along with funding alternatives and their relative benefits. Solutions for the surface runoff and ponding issues that were listed in Section 3, as well as general water quality and aquatic habitat issues, are also discussed in Section 5. Some problems have structural (capital project) solutions, while others have programmatic solutions, and some problems can be addressed by both types of solutions. Funding and timing of programmatic and CIP changes to the City's current storm water management system will require a phased approach.

Programmatic alternatives were identified as those solutions that would not involve construction or land acquisition. These alternatives have the benefit of often being strategic rather than reactionary; that is, instead of fixing a single problem with a structural solution, programmatic alternatives often address a series of existing problems and are effective at preventing future problems.

Ecology's Phase II NPDES municipal storm water permit lists programmatic requirements for permittees. Recommendations to address these requirements are included in Section 5, and cover the categories detailed in the permit:

- Public Education and Outreach
- Public Involvement and Participation
- Illicit Discharge Detection and Elimination
- Controlling Runoff from New Development, Redevelopment, and Construction Sites
- Pollution Prevention and Operations and Maintenance for Municipal Operations

Other requirements of the NPDES Phase II permit stipulate that the permittee should achieve the following:

- Develop and implement a storm water management program
- Report any monitoring studies
- Assess effectiveness of best management practices and any changes needed
- Prepare a plan for a future comprehensive, long-term monitoring program
- Submit a detailed annual report of the status of storm water management program implementation to Ecology

While water quality and aquatic habitat issues were not identified individually as issues by a review of the citizen complaints database and the City's Surface/Storm Water Citizen's Advisory Board, there are some known (i.e., historical) issues, such as low dissolved oxygen levels and fish passage barriers that were discussed in Section 1. Recommendations are made to use BMPs to reduce water quality impacts in the watershed. Examples of these BMPs include educating citizens about the need to pick up their outdoor dog and cat waste, managing manure properly, and limiting livestock access to streams. With at least 27 culverts in the City identified as impassable to fish at certain life-stages (Lewis County Conservation District, 2005), it is recommended that the City perform its own survey to refine this information within the UGA and then replace any culverts that are impassable to salmonids. Programs to protect and restore aquatic habitat along the major creeks should be supported by the City.

Many of the City of Centralia's storm water management programmatic needs could be addressed by having a storm water specialist on staff. As detailed in the Plan, approximately one half of this person's work time would be allocated to education and coordination in the watershed, approximately 20 percent of his or her time would be dedicated to conducting or coordinating surface water monitoring, and additional administrative duties would increase this role to approximately a full-time position.

The City's database of storm water complaints includes more than 50 issues, several of them related, others requiring only maintenance, and a few clearly outside the definition of a storm water CIP, thus requiring no CIP action. Thirteen necessary operations and maintenance actions were identified, and seven high-priority CIPs resulted from the classification and prioritization efforts of this plan. The capital projects are as follows:

- Sixth Street CIP
- Center Street CIP
- Jefferson Street CIP
- Cherry Street CIP
- Summa East CIP
- Summa West CIP
- Tower Street CIP

A prioritization system was developed based on the severity of several criteria, as determined by the Centralia Citizens Advisory Board and updated by CH2M HILL. Thirteen specific criteria were used, each with a condition weight that allowed it to be scored in terms of its relative importance to other criteria. The CIPs were also evaluated using a criterion referred to as an "early opportunity"; that is, a problem that can be solved with minimal analysis or design, minimal regulatory impact, and would have high visibility by the City's citizens and Council. To be classified as an early opportunity, the project cannot exceed a predetermined minor capital projects cost ceiling, and the solution must not pose a substantial risk to downstream property or resources.

The appendix of this Surface/Storm Water Management Plan contains project summary sheets for each project (complete with problem description, Class IV opinion of cost for the proposed solution, and a figure of the proposed CIP).

In addition to the capital and O&M projects listed in the CIP plan, there are some related program items that should be completed. Two of the proposed CIPs are located on systems that flow to China Creek. These project solutions should not be implemented until flow capacity modeling of China Creek is performed. For accuracy and calibration of the model, a survey of channel geometry and the installation of a stream flow gage are recommended. It is also recommended that the City allocate a nominal amount of funding for a feasibility study to determine the cost of providing a surface/storm water system in areas currently served by drywells. This study is recommended to address concerns about an estimate of $1 million to repair drywells that have been inundated with fine materials.

This planning effort determined that the 6-year CIP plan costs exceed available surface water revenue that is normally used to fund surface water CIPs. Several potential solutions, including the following, are presented with some detail in Section 5.

- Transfer street maintenance costs to the street fund
- Defer all of the CIP (i.e., don't do it)
- Bill the street fund for impervious surface
- Measure all commercial and industrial properties and adjust storm water utility bills for actual impervious area
- Substantially reduce costs of operations and CIP
- Increase storm water rates overall
- Use other City funds
- Apply for grants
- Borrow for the CIP

As resolution of the funding shortfall is beyond the scope of the present effort, further City and Citizens Advisory Board discussion is recommended to address the shortfall and develop solutions.

Section 6: Recommendations

Section 6 presents recommendations for the City to consider in developing and implementing a surface/storm water management program. General water quality, surface runoff and ponding, and aquatic habitat protection goals presented earlier in the report are recommended, ranging from actions such as the implementation of a monitoring program to the completion of capital projects in the CIP plan. Recommendations to address regulatory requirements identified in the gap analyses of Section 2 are also summarized.

To meet all of the NPDES Phase II Permit requirements, a staged approach to improvements in the City's operations and maintenance program is recommended. This approach is described in detail in Section 4, and the reader is referred to Table 4-2 and to the funding options included in Section 5.4.

Programmatic solutions, ranging from a complaint response telephone number for citizen calls to the hiring of a storm water specialist dedicated to the surface runoff program, are presented in Section 6.

Seven prioritized CIPs, a related modeling effort on China Creek, and a feasibility study to provide surface/storm water system expansion within the area currently served by drywells are presented in a 6-Year CIP Program.

A revenue and cost budget forecast performed during this planning effort determined that costs of the 6-year CIP plan exceed available surface water revenue. It is recommended that the City and Citizens Advisory Board discuss options presented in Section 5 to address the shortfall and develop solutions to move the program forward.

SECTION 1

City of Centralia Watershed Characteristics and Conditions Assessment

1.1 Watershed Characteristics

This section includes a basic description of the watershed, aquatic resources, and land use of the City of Centralia, a growing community that is experiencing increasing flooding and erosion, declining water quality, and loss of aquatic habitat. This section also provides recommendations to reduce surface water impacts in the City's watershed.

1.1.1 Watershed Description

Centralia, Washington, is located on I-5 midway between Seattle and Portland, in Lewis County. The City of Centralia is located at the confluences of Salzer Creek, China Creek, the Skookumchuck River, and the Chehalis River. Additional secondary creeks, such as Coffee Creek and Scammon Creek, and a relatively flat topography make Centralia a unique city with a watershed that is not easily delineated; however, the watershed and its sub-basins were delineated using available documentation, hand-held GPS in some locations, and historic knowledge from City staff. This delineation is shown in Figure 1-1. Twenty-six sub-basins were defined in the City limits and up to the limits of the Urban Growth Area (UGA). The City of Centralia is approximately 4,830 acres, and together with its UGA is about 10,550 acres.

Dominant natural features of the City of Centralia area are the rolling hills on the east; the Chehalis River crossing the City on its west side, flowing from south to north; and the Skookumchuck River flowing from its reservoir, located northeast of the City, to its confluence with the Chehalis River in the City of Centralia, about 15 miles away. Other creek drainages exist in the watershed, though the Chehalis River is by far the largest.

The Centralia daily average temperatures, as recorded by the National Oceanic and Atmospheric Administration (NOAA) from 1971 to 2000, vary from 63°F in July to 38°F in January. The area receives on average of less than 1.8 inches of precipitation per month in July and just over 7.5 inches of precipitation in January. The area receives approximately 35 inches of precipitation annually. Measurable rainfall is recorded on 150 days each year. In December and January, the wettest months, precipitation is frequently recorded on 20 to 25 days or more per month. The NOAA meteorological station closest to Centralia is in Olympia, where, on November 19, 1962, the highest daily precipitation of 4.33 inches was recorded.

The Pleistocene-age glaciations (1.8 million years ago to 10,000 years ago), and subsequent Holoceneage (last 10,000 years) alluvial processes that shaped the Chehalis lowlands, left behind significant accumulations of glacial outwash, till, glacio-lacustrine deposits, and alluvium. Arranged youngest to oldest, these deposits comprise six geologic units: recent

alluvium, landslide debris, Vashon drift (which includes glacio-lacustrine deposits), Penultimate drift, Hayden Creek drift, and the Logan Hill Formation. These Quaternary deposits rest on older, Tertiary-age rocks and sediments and form the area's major water-supply aquifers (Washington State Department of Ecology, 2005). Groundwater is shallow in the Centralia area, ranging from 1 to 25 feet below ground surface depending upon location and season.

The Chehalis River is still largely unconstrained through the Middle Chehalis Basin, with limited amounts of rip-rapping, channelization, or other flow-control measures. The only impoundment of consequence upstream from the Middle Chehalis Basin is located on the Skookumchuck River. During floods, a large proportion of the Chehalis River valley in this stretch of the river is inundated, producing a channel often up to a mile wide, as shown on the 100-year flood map produced by the United States Geological Survey (USGS).

1.1.2 Watershed Drainage Basins

The Upper Chehalis Basin has nine watersheds, per Lewis County Conservation District (Figure 1-2):

- Centralia and Chehalis Area
- Lincoln and Scammon Creeks
- Scatter and Prairie Creeks
- Independence and Garrard Creeks
- Middle Chehalis River
- South Fork Chehalis River
- Skookumchuck River
- Upper Chehalis River
- Newaukum River

Four of the nine main watersheds converge in the vicinity of Centralia, as shown in Figure 1-2. These four watersheds are Skookumchuck River on the northeast, Centralia and Chehalis Area on the southeast, Lincoln and Scammon Creeks on the west, and Scatter and Prairie Creeks on the northwest. The regional watersheds that converge in the Centralia area are further divided in sub-basins.

Several sub-basins discharge through the City of Centralia. Figure 1-1 shows the locations and sizes of the 26 drainage sub-basins delineated as part of this Plan. Figure 1-3 presents the land use of the City of Centralia. Table 1-1 lists the names of these 26 sub-basins and their contributing areas. The contributing areas of the sub-basins were summed up per drainage system. Table 1-2 (see Section 1.2.2.2) presents the land use per sub-basin.

TABLE 1-1
City of Centralia Drainage Sub-basins

Sub-basin	Watershed	Area (acres)
South Salzer Creek	Centralia and Chehalis Area	974
North Salzer Creek	Centralia and Chehalis Area	664
Total Salzer Creek		**1,638**
Northeast China Creek	Centralia and Chehalis Area	112
Northwest China Creek	Centralia and Chehalis Area	150
Center China Creek	Centralia and Chehalis Area	506
East China Creek	Centralia and Chehalis Area	494
Southeast China Creek	Centralia and Chehalis Area	269
Total China Creek		**1,531**
North Chehalis River & East Dry Creek	Skookumchuck River / Scatter and Prairie Creek	869
Northeast Chehalis River	Skookumchuck River / Lincoln and Scammon Creek	279
Center East Chehalis River	Skookumchuck River / Lincoln and Scammon Creek	1,835
Center West Chehalis River	Lincoln and Scammon Creek	822
Center Southwest Chehalis River	Skookumchuck River / Lincoln and Scammon Creek / Centralia & Chehalis Area	237
Center Southeast Chehalis River	Skookumchuck River / Centralia & Chehalis Area	60
South Chehalis River	Lincoln and Scammon Creek / Centralia & Chehalis Area	78
Total Chehalis River		**4,180**
East Scammon Creek	Lincoln and Scammon Creek	104
North Scammon Creek	Lincoln and Scammon Creek	129
Total Scammon Creek		**233**
Cook Creek	Lincoln and Scammon Creek	254
Total Cook Creek		**254**
Southeast Dry Creek	Scatter and Prairie Creek	629
Total Dry Creek		**629**
Northwest Skookumchuck River	Skookumchuck River	230
Northeast Skookumchuck River	Skookumchuck River	123
East Skookumchuck River	Skookumchuck River	107
Center East Skookumchuck River	Skookumchuck River	151
Southwest Skookumchuck River	Skookumchuck River	293
South Skookumchuck River	Skookumchuck River	189
Total Skookumchuck River		**1,093**
East Coffee Creek	Skookumchuck River	711
West Coffee Creek	Skookumchuck River	285
Total Coffee Creek		**996**
TOTAL		**10,553**

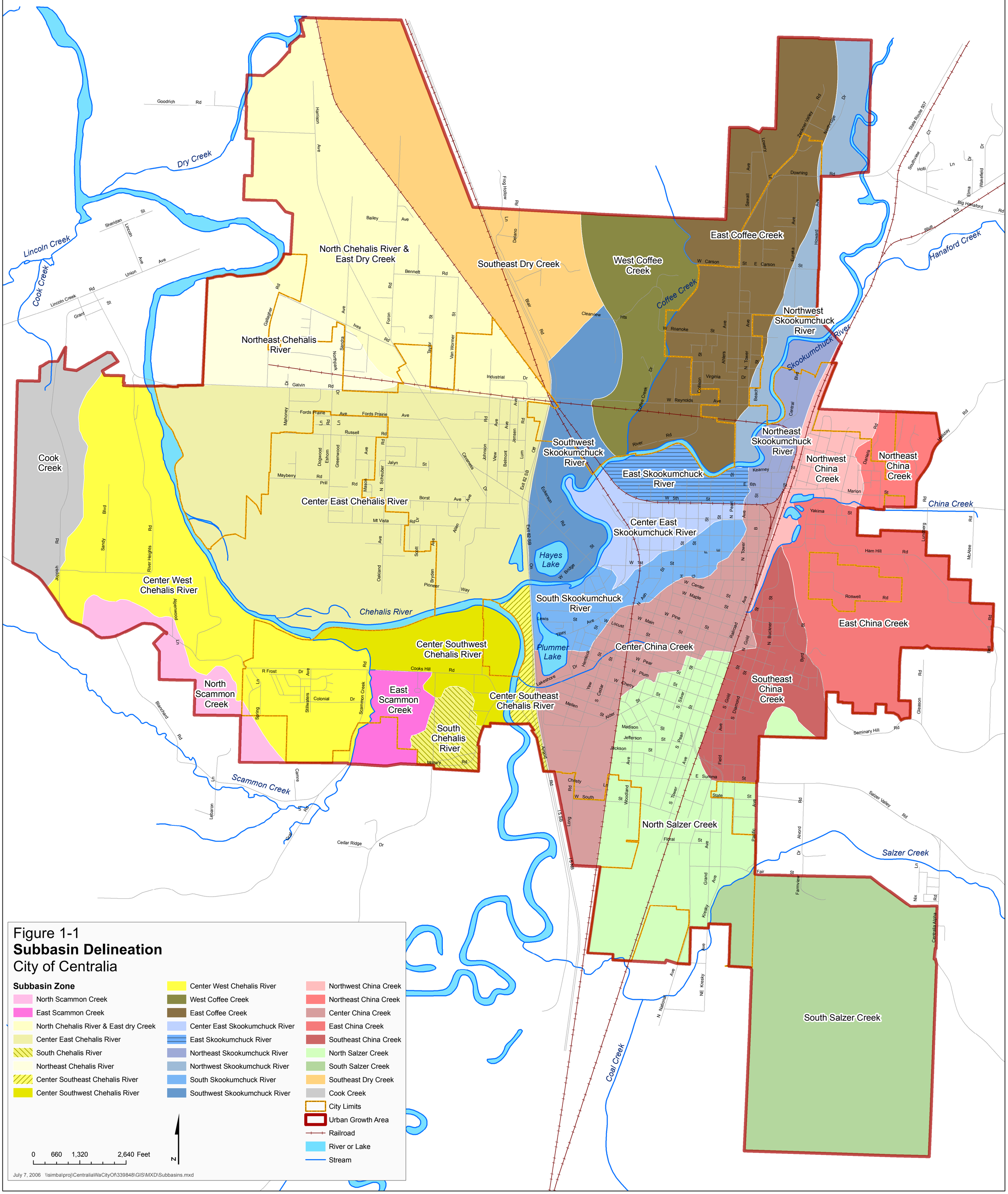
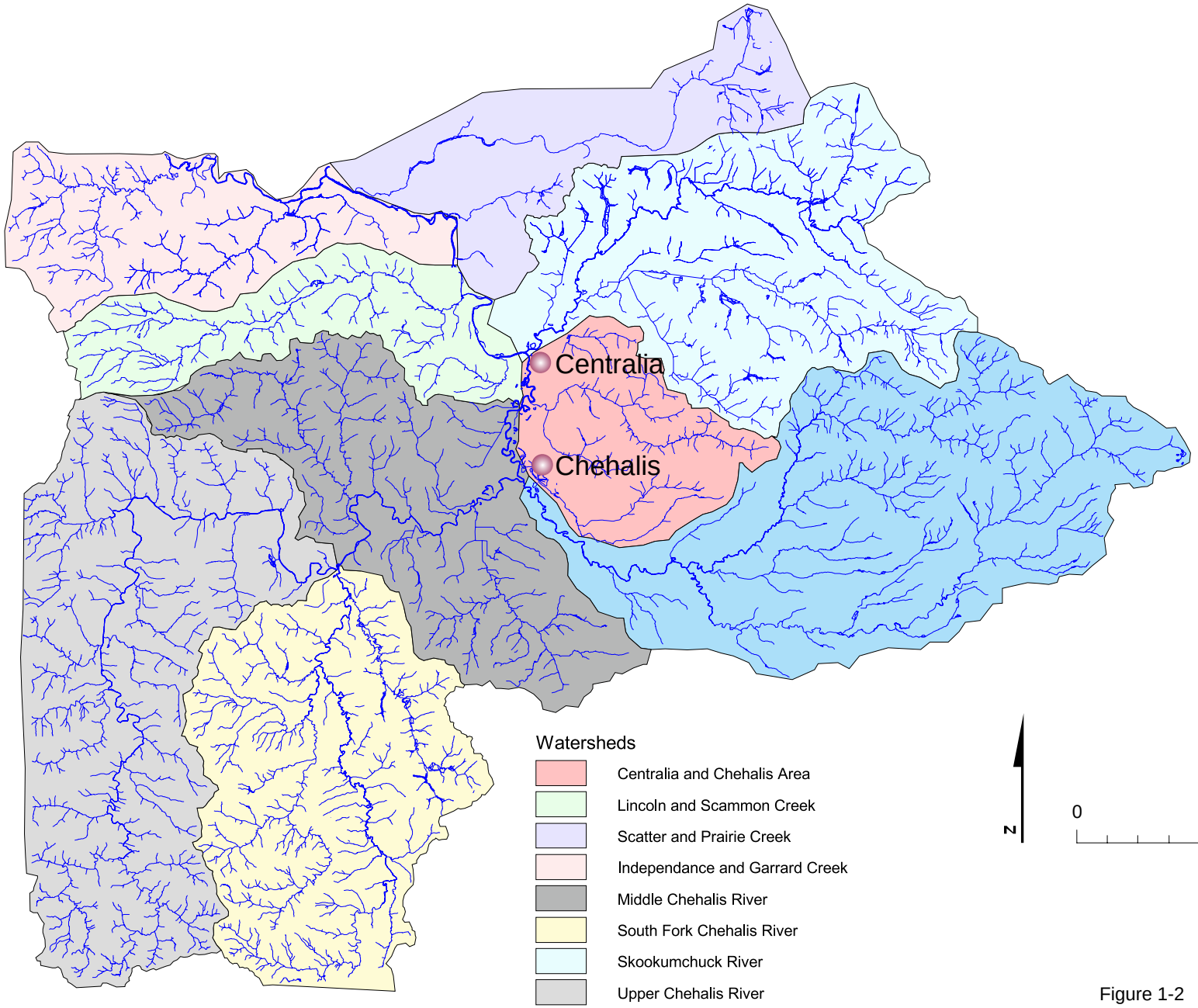
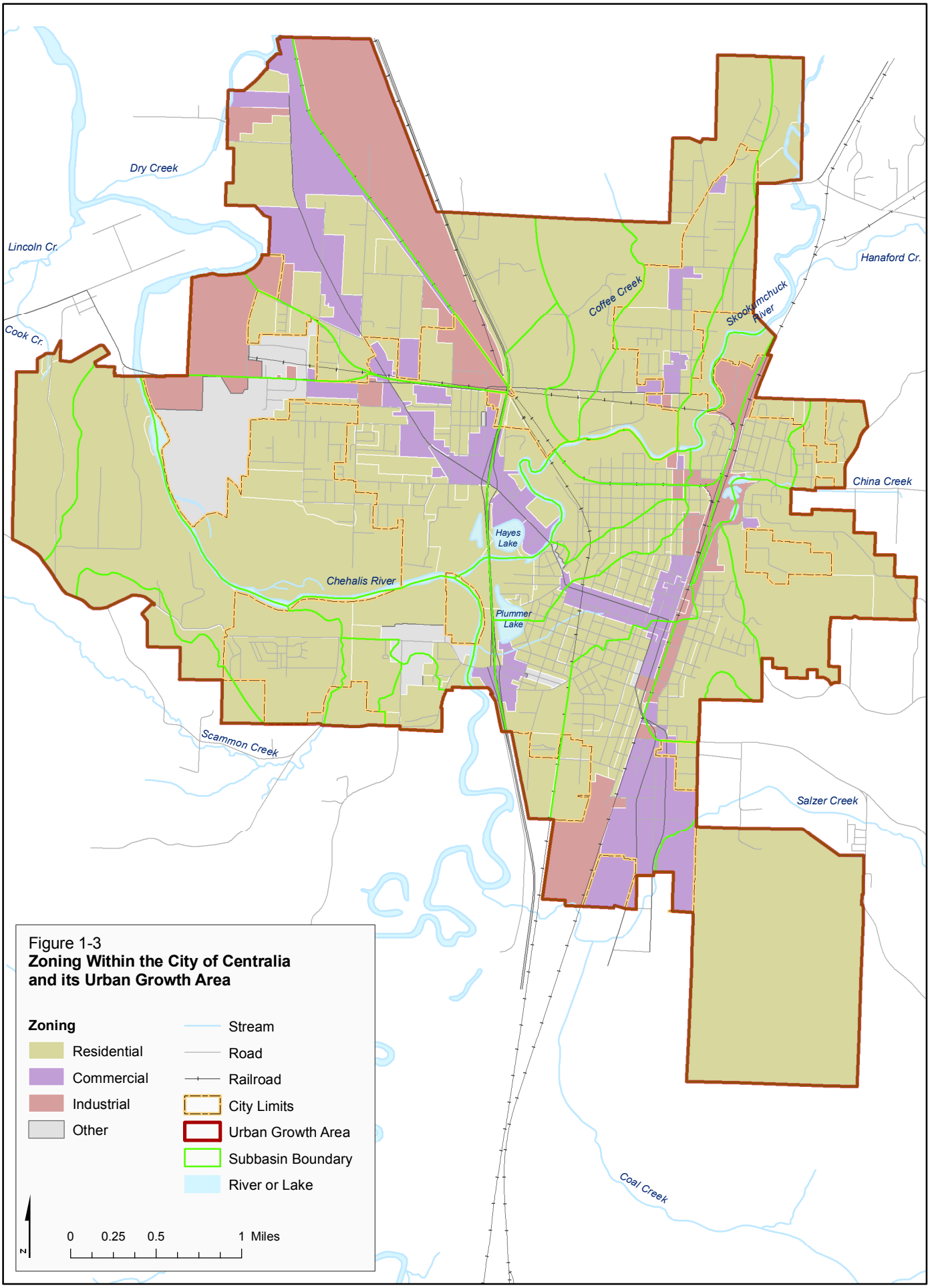


Figure 1-1
Subbasin Delineation
City of Centralia



Source: Adapted from Lewis County Conservation District, May 2005.

Figure 1-2
Upper Chehalis Watersheds
City of Centralia



July 7, 2006 \\simba\proj\CentraliaWaCityOf\339848\GIS\MXD\Fig.2-3_UGA_Zoning.mxd

The sub-basins shown in Figure 1-1 are briefly described below. Sub-basins are within city limits unless specified otherwise.

1. **South Salzer Creek Sub-basin** consists of an area that drains to Salzer Creek. Most of this sub-basin is beyond the City limits but within the UGA. Most of the sub-basin area is used as residential area.

2. **North Salzer Creek Sub-basin** consists of an area that drains to Salzer Creek. Parts of the sub-basin are within the UGA. The Centralia Landfill is located in this sub-basin. The sub-basin is covered mostly by residential and commercial area, with some industrial area.

3. **Northeast China Creek Sub-basin** consists of an area that drains to China Creek. Parts of the sub-basin are within the UGA. The sub-basin is covered by residential area.

4. **Northwest China Creek Sub-basin** consists of an area that drains to China Creek. Parts of the sub-basin are within the UGA. The railway creates the west boundary of the Northwest China Creek Sub-basin. The sub-basin is covered mainly by residential area and some industrial area.

5. **East China Creek Sub-basin** consists of an area that drains to China Creek. A portion of this sub-basin is neither part of the City nor its UGA; however, surface water flowing from this portion will also drain to China Creek. Most of the sub-basin is covered by residential area.
6. **Center China Creek Sub-basin** consists of an area that drains to China Creek but also to Plummer Lake. The town center sits mostly in this sub-basin. A small portion, on the extreme south of the sub-basin, is part of the UGA. Most of the sub-basin is covered by residential area.

7. **Southeast China Creek Sub-basin** consists of an area that drains to China Creek. The railway creates the west boundary of the Southeast China Creek sub-basin. Most of the sub-basin is covered by residential area.

8. **North Chehalis River & East Dry Creek Sub-basin** consists of an area that drains to the Chehalis River. Most of this sub-basin is beyond the City limits but within the UGA. Residential and commercial areas cover most of this sub-basin, with a small amount of industrial area.

9. **Northeast Chehalis River Sub-basin** consists of an area that drains to the Chehalis River. Parts of the sub-basin are within the UGA. Most of the sub-basin is covered by industrial area.

10. **Center East Chehalis River Sub-basin** consists of an area that drains to the Chehalis River. About half the sub-basin area is part of the UGA. The Center East Chehalis River Sub-basin is the largest sub-basin in the Centralia area; most of it is residential.

11. **Center West Chehalis River Sub-basin** consists of an area that drains to the Chehalis River. Most of the sub-basin area is part of the UGA. The southeastern part of the Center West Chehalis River Sub-basin flows to Scammon Creek. The sub-basin is only covered by residential area.

12. **Center Southwest Chehalis River Sub-basin** consists of an area that drains to the Chehalis River. A portion of this sub-basin is neither part of the City nor of the UGA; however, surface water flowing from this area also drains to the Chehalis River. The sub-basin is only covered by residential area.

13. **Center Southeast Chehalis River Sub-basin** consists of an area that drains to the Chehalis River. This sub-basin is bounded on the east by Interstate 5 (I-5), the Skookumchuck River on the north, the Chehalis River on the west, and the UGA on the south. The China creek outfall to the Chehalis River is also located on the Center Southeast Chehalis River sub-basin. All of the sub-basin is within the UGA. Most of this sub-basin is covered by residential area.

14. **South Chehalis River Sub-basin** consists of an area that drains to the Chehalis River; however, the City limit is the southeastern boundary of the sub-basin, and thus the South Chehalis River sub-basin flows indirectly to the Chehalis River. All of the sub-basin is within the UGA. The sub-basin is only covered by residential area.

15. **East Scammon Creek Sub-basin** consists of an area that drains to Scammon Creek. About half the sub-basin area is part of the UGA. The sub-basin is only covered by residential area.

16. **North Scammon Creek Sub-basin** consists of an area that drains to Scammon Creek. However, as with the South Chehalis River sub-basin, the North Scammon Creek sub-basin flows indirectly to Scammon Creek. The sub-basin is limited by the UGA limits and not by topographic features. Most of this sub-basin area is part of the UGA. The sub-basin is only covered by residential area.

17. **Southeast Dry Creek Sub-basin** consists of an area that drains to Dry Creek. All the sub-basin is part of the UGA. This sub-basin is mostly covered by industrial area and some residential area.

18. **Cook Creek Sub-basin** consists of an area that drains to Cook Creek, which is a tributary of Lincoln Creek. All the sub-basin is part of the UGA. The sub-basin is only covered by residential area.

19. **Northwest Skookumchuck River Sub-basin** consists of an area that drains to the Skookumchuck River. The central section of the sub-basin does not flow directly to the Skookumchuck River. The central section of the sub-basin is limited by the City limits and UGA limits and not by topographic features. Parts of the sub-basin are part of the UGA. The sub-basin is only covered by residential area.

20. **Northeast Skookumchuck River Sub-basin** consists of an area that drains to the Skookumchuck River. The railway forms the east boundary of the sub-basin. Only a

small portion of this sub-basin is part of the UGA. The sub-basin is mostly covered by residential area, and some industrial area.

21. **East Skookumchuck River Sub-basin** consists of an area that drains to the Skookumchuck River. All of the sub-basin is within the City limits. The Skookumchuck River is the northern boundary of the sub-basin, and the railway is the southern boundary of the sub-basin. North Tower Street is the eastern boundary of the sub-basin. This sub-basin is mostly covered by residential area.

22. **Center East Skookumchuck River Sub-basin** consists of an area that drains to the Skookumchuck River. All of the sub-basin is within the City limits. This sub-basin is mostly covered by residential area.

23. **Southwest Skookumchuck River Sub-basin** consists of an area that drains to the Skookumchuck River. About half the sub-basin is part of the UGA. This sub-basin is mostly covered by residential area.

24. **South Skookumchuck River Sub-basin** consists of an area that drains to the Skookumchuck River and to Plummer Lake. All of the sub-basin is within the City limits. This sub-basin is mostly covered by residential area.

25. **East Coffee Creek Sub-basin** consists of an area that drains mostly to Coffee Creek but also to the Skookumchuck River. About half the sub-basin is part of the UGA. This sub-basin is mostly covered by residential area.

26. **West Coffee Creek Sub-basin** consists of an area that drains mostly to Coffee Creek but also to the Skookumchuck River. This area is mostly part of the UGA. The sub-basin is only covered by residential area.

1.2 Condition Assessment

A condition assessment of natural resources, developed areas, and the existing regulatory environment in the City of Centralia is presented in this section. The existing condition of natural resources in the City of Centralia area is a product of the natural processes, historical and current land use, patterns of development, and regulatory environment in the area. The existing condition of the developed areas is also a product of the natural processes, historical and current land use, regulatory environment, and the history of investment in and maintenance of infrastructure such as roads, sewers, water systems, pipes, ditches, and ponds. These factors together have affected the current conditions within the City of Centralia and its UGA.

1.2.1 Natural Resources

Fish, birds, and other wildlife use the wetlands, creeks, and terrestrial areas of the City of Centralia for refuge and rearing purposes. The City's multiple-creek watersheds provide habitat for fish and wildlife. Several species of waterfowl and raptors find habitat opportunities in or around the City of Centralia. The northern bald eagle and the great blue heron are present, as well as pheasants and about 150 other species of birds.

The following sections describe the freshwater ecosystems of wetlands, Salzer Creek, China Creek, Coffee Creek, Scammon Creek, Cook Creek, Skookumchuck River, and Chehalis River.

1.2.1.1 Wetlands

Wetlands are an invaluable part of the water cycle as they contribute to aquifer recharge, groundwater storage, and flood water detention, and they act as large-scale biofilters for pollutant removal. Wetlands provide key fish and wildlife habitat.

Figure 1-4 presents the wetland delineation based on the National Wetland Inventory (NWI) and provided by the Lewis County Geographic Information System (GIS). It is noteworthy that NWI did not intend to produce maps that show exact wetland boundaries comparable to boundaries derived from ground surveys. The data were collected by NWI to meet the U.S. Fish and Wildlife Service's mandate to map the wetland and deepwater habitats of the United States, using techniques such as photo-interpretation. The objective was to provide better geospatial information on wetlands than that found on the USGS topographic maps. Boundaries are therefore generalized in most cases, and additional ground survey is needed to complete the survey and increase accuracy. After further wetland study and survey, the City should be able to use this information to classify the wetlands using the Cowardin Scientific Classification System. With this system, each wetland category is defined based on connection to other water bodies, type and density of vegetation present, and other physical factors.

1.2.1.2 Salzer Creek

Salzer Creek has a discharge area of 17.3 square miles and is about 11.7 miles long. The change in elevation between the headwaters and the confluence with the Chehalis River is about 300 feet. From the origin to river mile (r.m.) 2.0, the drainage is primarily rural and agricultural. From r.m. 2.0 to 0.3, the drainage is characterized as commercial. The remaining portion between r.m. 0.3 and the confluence with the Chehalis River is agricultural.

Salzer Creek dissolved oxygen (DO) levels at Airport Road were very poor (<1 – 6.4 milligram per liter [mg/L]) (Pickett, 1994). Organic and nutrient loading from farming activities could be reducing the DO levels in the slower flowing portions of the lower drainage, and lack of shade could be increasing the temperature, reducing DO carrying capacity.

In 1986, leachate from the Centralia Landfill was the most serious pollution problem identified between r.m. 1.2 and the confluence with the Chehalis River. Discharges from pipes at the Southwest Washington Fairgrounds and the access of farm animals to the creek near r.m. 0.3 pose potential problems during rain events (Washington State Department of Ecology, 1987).

The 55-acre landfill located in Centralia, Washington, operated from 1958 until 1994 and accepted both municipal and industrial waste, including soil containing polychlorinated biphenyls (PCBs), paint waste, and pesticide waste. Groundwater in this area contains elevated levels of chloride, conductivity, and heavy metals such as manganese, arsenic, and iron, some of which may be from natural sources.

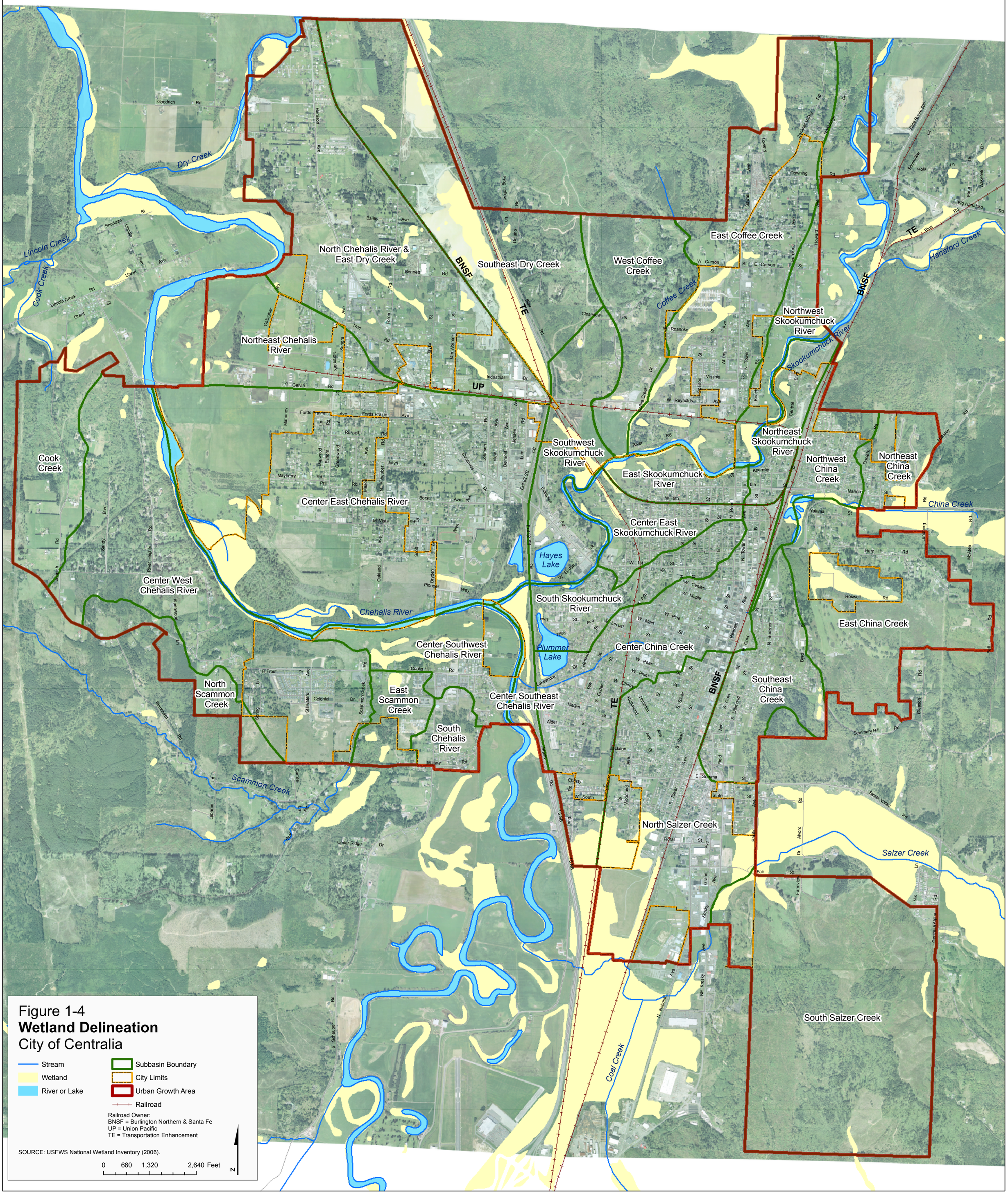


Figure 1-4
Wetland Delineation
City of Centralia

- Stream
- Wetland
- River or Lake
- Subbasin Boundary
- City Limits
- Urban Growth Area
- Railroad

Railroad Owner:
BNSF = Burlington Northern & Santa Fe
UP = Union Pacific
TE = Transportation Enhancement

SOURCE: USFWS National Wetland Inventory (2006).

0 660 1,320 2,640 Feet

N

July 7, 2006 \\simba\proj\CentraliaWaCityOf\339848\GIS\MXD\Fig.2-4_Wetland_Delineation.mxd

Leachate emanating from the landfill contains heavy metals. Before closure of the landfill, leachate drained from the landfill into Salzer Creek, a spawning area, smolt nursery, and migration route for coho salmon. Salzer Creek empties into the Chehalis River, which is a habitat for Chinook, coho, and chum salmon, and steelhead and cutthroat trout. In 1991, the site's potential responsible parties (PRPs), under a State Consent Decree, installed a temporary protective cover over the landfill and secured the site. In 1994, under a State Consent Decree, the landfill was closed and the PRPs installed a 46-acre cap over the landfill. The final cover system has greatly reduced the quantity of leachate generated by nearly eliminating the infiltration of precipitation through refuse. Additional groundwater monitoring was done to determine if additional actions were needed. The remedial investigation/feasibility study was finalized in June 1998.

The proposed final remedy for the landfill consists of long-term groundwater and surface water monitoring and long-term operation and maintenance of the final cover system. No further remedial activities are planned (Environmental Protection Agency [EPA], 2005).

1.2.1.3 China Creek

China Creek is about 5 miles long and is located west of Centralia, running through the town center. China Creek is covered (or piped) for about 3,000 feet from roughly the intersection of West Maple Street and North Railroad Avenue, to approximately the intersection of Locust Street and South Washington Avenue. The change in elevation between the headwaters and the confluence with the Chehalis River is about 150 feet. The drainage is primarily rural upstream of the City limits, where the drainage is mostly urban.

Available information pertaining to China Creek is limited. Flooding is known to occur periodically on China Creek. In 1994, Pickett noted that China Creek DO levels were good (10.3 mg/L).

1.2.1.4 Coffee Creek

Coffee Creek is about 5 miles long and is located just north of Centralia. The change in elevation between the headwaters and the confluence with the Skookumchuck River is about 130 feet. The drainage is primarily rural and agricultural.

In 2004, as part of Washington State's salmon recovery planning efforts, Coffee Creek was evaluated for the need to remove fish barriers. Two culverts in close proximity, both impassable, and both constructed of 1.6-foot-diameter corrugated steel, were replaced with a round, 50-foot-long, 6-foot-diameter steel pipe, and a 30-foot-long, 6-foot-diameter squash pipe, opening up 1.5 miles of habitat for cutthroat trout, coho, and other salmonids. However, there are approximately nine culverts remaining that are considered impassable (Lewis County Conservation District, 2005).

During a May 2006 reconnaissance-level survey conducted by CH2M HILL, it was noted that the Coffee Creek levee at the intersection of Coffee Creek and West Reynolds Avenue needs maintenance, as approximately 60 feet of the levee seems to be nonexistent at the intersection on the east side of the creek. However, this is a flood control issue, not a storm water issue.

1.2.1.5 Scammon Creek

Scammon Creek is about 5 miles long and is located just west of Centralia. The change in elevation between the headwaters and the confluence with the Chehalis River is about 310 feet. The drainage is primarily rural and agricultural.

Pickett (1994) measured low DO levels in Scammon Creek (5.6 mg/L) and concluded that the water quality was of poor quality. The low DO could be a result of agricultural runoff entering the creek and could also be related to lack of stock and high water temperatures. Approximately six culverts on Scammon Creek are considered impassable to salmonids (Lewis County Conservation District, 2005).

1.2.1.6 Dry and Cook Creeks

Cook Creek is a tributary of Lincoln Creek. Lincoln Creek discharges to the Chehalis River. Cook Creek is located on the extreme west of the Centralia UGA. The change in elevation between the headwaters and the confluence with Lincoln Creek is about 50 feet. The drainage is primarily rural.

Dry Creek is located outside of the City UGA. Little is known about the creek other than that it appears to be an old side channel of the Chehalis River.

1.2.1.7 Skookumchuck River

The Skookumchuck River is about 45 miles long, flows generally west, through Skookumchuck Reservoir, before entering the Chehalis River at Centralia. The change in elevation between the Skookumchuck reservoir and the confluence with the Chehalis River is about 330 feet.

The Skookumchuck Dam is located in Thurston County, approximately 10 miles upstream from Centralia and supplies about 54 cubic feet per second (cfs) of water for cooling to the Centralia Power Plant and additional flow to protect fish habitat. The dam was constructed in 1970 to supply water for the Centralia steam generating plant. The dam is an earthfill structure approximately 190 feet high and 1,340 feet long. In 1990, a small powerhouse was constructed to produce hydropower from the site. The dam has a multi-level intake system that allows water temperature below the dam to be discharged and maintained at less than 60°F.

Washington State Department of Fish and Wildlife (WSDFW) proposed to renovate the existing Skookumchuck Fish Hatchery to current standards (WSDFW, 2006). Some of the updates proposed are listed below:

- New concrete adult fish holding ponds and concrete juvenile fish rearing ponds will be constructed in the footprint of the demolished earthen pond.
- A trailer parking pad is proposed to house the fish pumping station that will transport fish from the existing fish sorting pond to the proposed concrete adult fish holding pond.
- The existing fish ladder will be demolished and replaced with an 11-tier fish ladder housed within a replaced culvert under Skookumchuck Road.

- A new hatchery building is proposed to house fish egg incubation facilities.
- A storm water pond is proposed to detain and treat on-site storm water runoff.
- A pollution abatement pond will be constructed that will treat water from the fish ponds and from the egg incubation facility.

Additional modification to the Skookumchuck River was proposed under a 2004 flood damage reduction project. Modification to the Skookumchuck Dam and levees along a portion of the Skookumchuck River would provide 100-year flood protection to Centralia. At the Skookumchuck Dam, water can be stored for no longer than a 5-day period for the 50- to 100-year flood event. During the 2- to 50-year period of frequency, retention greater than elevation 477 feet (NGVD 1929) should not occur more than every other year; storage should be no longer than 5 days for these events.

The Skookumchuck Dam modification will not have a major impact on wetlands or stream geomorphology downstream of the dam. The Skookumchuck Dam only controls a portion of the total watershed in the study area. A number of tributaries along the Skookumchuck River have an extremely large influence on river flow and the environment associated with, in, and along the mainstem of the Skookumchuck River.

DO levels in the Skookumchuck River, both above Hanaford Creek and at the mouth, were good (8.9 – 11.0 mg/L) (Pickett, 1994).

1.2.1.8 Chehalis River

The Chehalis River drains an area of over 2,000 square miles in western Washington, discharging to Grays Harbor near the City of Aberdeen. The river is roughly 108.2 miles in total length, not counting tributaries. The change in elevation between its start and Grays Harbor is about 670 feet.

The Chehalis River passes through Centralia, and each of the tributaries discussed above connect to the Chehalis River.

In 1994, the Washington State Department of Ecology (Ecology) conducted a total maximum daily load study of the upper Chehalis River during the dry season. Sampling of the mainstem Chehalis River and its tributaries revealed that many areas are impaired by low DO, high temperatures, and high fecal coliform bacteria levels that were outside the water quality standard limits for those parameters. The Centralia Waste Water Treatment Plant (WWTP) discharges treated wastewater directly to the mainstem Chehalis River; however, the discharge is monitored and met regulation limits at the time this report was prepared. Livestock could be the primary non-point source of fecal coliform bacteria and pollutants that cause low DO. The Chehalis River in the Centralia area is characterized by stratified areas during the summer months in locations with deep pools. Temperatures at the surface were documented to be very high during the July and August monitoring period, near lethal levels for adult salmonids. The deep waters of the stratified areas at this time were cooler, but oxygen levels were too low to support fish.

Excess sediment delivery to water bodies is a major problem throughout most of the sub-basins, and it has resulted in loss of riparian vegetation along the mainstem. Due to increases in channel scouring, channel incision, and decreased width-to-depth ratios, there

is less habitat complexity. Local bank erosion is common and occurs naturally throughout the Chehalis Basin. Bank erosion can also be exacerbated by human activities. Sub-basins with high levels of bank erosion also include the Skookumchuck River.

Many fish species rely on river/floodplain features beyond the main channel. These features include mature, healthy, diverse vegetation, organic debris of various sizes, and side- and off-channel submerged areas. For example, the Chehalis Basin is the second greatest coho salmon producer in western Washington (Seiler, 2000), and coho salmon depend heavily on side-channel and off-channel rearing habitat. Other floodplain impacts such as channel incision or loss of refuge habitat have been identified in parts of the Chehalis River and the Skookumchuck River basins.

1.2.2 Developed Areas

1.2.2.1 Population

The population of the City of Centralia community was approximately 15,250 people in July 2004, up from 14,742 people during the 2000 census, reflecting a 1.034 percent growth rate over 4 years. By 2024, the City of Centralia is expected to grow to more than 18,000 people.

1.2.2.2 Land Use

Figure 1-3 presents the City limits of Centralia, its UGA, and its current land use zoning designations. The City-limit area is approximately 4,830 acres. The UGA is approximately 10,550 acres. The City of Centralia UGA is further divided into different zoning districts that can be summarized into four groups: residential, commercial, industrial, and others. The residential area accounts for 76.7 percent, the commercial area accounts for 9.4 percent, and the industrial area accounts for 10.4 percent of the total UGA. The remaining 3.5 percent is for health services, business district, and the port master plan (Table 1-2). The City of Centralia has the most capability to expand outside its northern limits (2,485 acres), then outside its western limits (2,011 acres), and finally outside its southern city limits (1,106 acres).

There are a variety of land use activities that can contribute pollutants to the storm water runoff. In this section, run-off water quality associated with different land uses is discussed for residential, commercial, and industrial land use, demonstrating that contamination can be expected to vary according to land use. Better water quality management and monitoring then can be planned considering this information.

Farming can contribute phosphorus, ammonia and nitrogen due to crop fertilizer use. Pesticides and herbicides used to protect crops often find their way into local streams. Livestock can contribute high levels of potentially harmful micro-organisms, such as enterococci, in their fecal matter. This is particularly true where livestock is allowed direct access to streams. The prevalence of fecal bacteria is indicated by a common water quality monitoring parameter, fecal coliform.

Residential areas contribute the same types of pollutants. Although the planted areas for residences generally take up a considerably smaller fraction of total area than in agricultural areas, homeowners often intensively manage their landscaped areas. Over-use of fertilizers and pesticides/herbicides commonly occurs, and levels of these pollutants in runoff from

TABLE 1-2
Land Use by Sub-basin

Sub-basin	Sub-basin Area	Commercial	Industrial	Residential	Others
South Salzer Creek	973.6	50.7	0.0	922.9	0.0
North Salzer Creek	663.7	244.6	131.3	284.5	3.3
Northeast China Creek	112.1	0.0	0.0	112.1	0.0
Northwest China Creek	149.6	0.0	45.1	104.6	0.0
Center China Creek	505.9	109.7	44.3	344.0	7.8
East China Creek	493.9	4.1	11.9	477.9	0.0
Southeast China Creek	269.4	10.4	43.9	215.2	0.0
North Chehalis River & East Dry Creek	869.1	305.4	132.1	431.1	0.5
Northeast Chehalis River	278.9	3.0	143.1	82.3	50.4
Center East Chehalis River	1,834.7	135.2	69.0	1,387.2	243.3
Center West Chehalis River	822.3	0.0	0.0	822.3	0.0
Center Southwest Chehalis River	236.8	0.0	0.0	193.6	43.2
Center Southeast Chehalis River	59.6	10.1	0.0	49.5	0.0
South Chehalis River	78.1	0.0	0.0	61.7	16.4
East Scammon Creek	104.0	0.0	0.0	102.1	1.9
North Scammon Creek	129.3	0.0	0.0	129.3	0.0
Southeast Dry Creek	628.7	2.8	411.6	214.3	0.0
Cook Creek	254.4	0.0	0.0	254.4	0.0
Northwest Skookumchuck River	230.2	0.0	0.0	230.2	0.0
Northeast Skookumchuck River	123.2	0.0	48.0	75.1	0.0
East Skookumchuck River	107.2	2.1	9.1	96.0	0.0
Center East Skookumchuck River	151.0	0.0	3.5	147.3	0.1
Southwest Skookumchuck River	292.5	63.6	1.0	228.0	0.0
South Skookumchuck River	188.9	3.5	0.4	182.7	2.3
East Coffee Creek	711.0	48.9	3.4	658.6	0.0
West Coffee Creek	285.3	0.0	0.0	285.3	0.0
Total	**10,553.3**	**994.0**	**1,097.8**	**8,092.4**	**369.1**

Note: Areas are in acres

residential areas can be seasonally high. Instead of livestock, dogs and cats are frequently sources of microbial contamination in residential runoff. Poorly operating septic systems are another frequent contributor of pollutants in un-sewered areas.

Parking areas are a primary source of sediment and associated pollutants in commercial and industrial areas. Materials deposited on large, paved surfaces tend to be readily flushed away into the storm drain. Oils and related petroleum hydrocarbons are also common pollutants in runoff. If not roofed and/or carefully managed, dumpsters and other trash storage areas are sources of pollutants. Food scraps and paper lying on the ground can contribute biochemical oxygen demand (BOD) that, in turn, can lower DO levels in the receiving streams. Trash accumulations in business areas can result in a significant increase in general trash and floatables carried to the storm water system, which can hinder the performance of the drainage system due to clogging and can degrade the aesthetics of the receiving streams where the trash ultimately deposits. Floor drains, sumps and other illicit connections to the storm water system can introduce a wide variety of pollutants directly into the storm water system. Floor washing, grease traps, photo-chemicals, and dry cleaning solvents are examples of discharges that can find their way into the storm water system. This problem can be addressed by storm system monitoring, followed up by aggressive investigation where warranted by the detection of elevated pollutant concentrations.

Industrial areas can generate a wide variety of pollutants depending upon the type of industry. Minton (2005, Table 2.6) lists 30 pollutants commonly associated with runoff from industrial areas. Electro-plating businesses have been frequently implicated in the discharge of heavy metals such as cadmium, chromium, zinc, and nickel. Organic solvents such as dichloroethylene (DCE) and trichloroethylene (TCE) frequently show up in both the groundwater and surface runoff. Diesel, gasoline, and other fuels can be discharged from petroleum transfer facilities, such as pump stations. Sediment can be mobilized from unpaved areas that are frequently disturbed. The pollutants associated with parking lots and trash storage areas, discussed above, are also typical of industrial areas.

Highways and urban arterials are major contributors of pollutants to storm water runoff. Sediment often accumulates along curbs and is periodically washed into the storm water system during rain storms. Oil and grease can build up, particularly at signal-controlled intersections where vehicles frequently sit idling. Copper, nickel, zinc, and chromium concentrations in runoff are often found at elevated levels due to wear from brake pads and engines.

1.2.2.3 Sedimentation and Bank Erosion

Natural sedimentation and bank erosion processes have been accelerated by increased runoff velocities and volume due to removal of vegetation and by the construction of impervious surfaces and channelized ditches. The high levels of sedimentation result in high sediment transport rates. This can increase the impact of scour, channel incision, and width-to-depth ratios, resulting in less habitat complexity.

SECTION 2

Regulatory Requirements and Planning Documents

This section identifies compliance requirements for the City of Centralia under the National Pollutant Discharge Elimination System (NPDES) and other regulatory requirements currently implemented in and around the City of Centralia.

With respect to NPDES requirements, the City of Centralia is a required permittee under the 2007 Washington State Department of Ecology NPDES Phase II Permit. This section discusses how the City of Centralia storm water management program addresses the NPDES Phase II requirements. It describes deficiencies in the City's approach under the new NPDES storm water requirements and makes recommendations on how to correct them.

Another regulatory consideration for the City is compliance with the Endangered Species Act (ESA). Bald Eagles, listed as threatened in the ESA, are present in the Centralia area. There are various measures prescribed by the U.S. Fish and Wildlife Service to protect them. Among those measures is maintaining an ample food supply. Measures taken to protect or enhance salmon also help protect eagles. Another ESA-listed species possibly present, at least on a seasonal basis, is bull trout (threatened). Measures that protect salmon also protect bull trout.

Note that the scope of this analysis was limited largely to the use of the existing NPDES Phase II Municipal Stormwater Permit and related materials. This analysis has been expanded beyond those materials, but the analysis is still somewhat limited. The City of Centralia is officially required to demonstrate compliance with Phase II permitting requirements.

2.1 NPDES Phase II Regulatory Requirements and Gap Analysis

This sub-section describes the regulatory requirements of the 2007 NPDES Phase II Stormwater Permit, analyzes the gaps between current Centralia programs and the NPDES requirements, identifies State of Washington requirements, and makes recommendations for revising the City of Centralia regulations, ordinances, programs, or plans to address the requirements identified in the gap analysis.

2.1.1 NPDES Phase II Requirements

In January 2007, the Department of Ecology issued Washington State's Western Washington Phase II Municipal Stormwater Permit for small, municipal separate storm sewer systems (the Phase II Permit). The permit became effective in February 2007. The City of Centralia has filed a Notice of Intent (NOI) to begin compliance with the permit requirements.

The Phase II Permit will regulate discharge of storm water to waters of the State of Washington by municipal separate storm sewer systems (MS4s) falling under the guidelines defining Phase II jurisdiction. While outside the census-urbanized areas as defined by Ecology, the City of Centralia falls under the Phase II NPDES Permit due to its population. The Clean Water Act states that discharges covered under this Permit must effectively prohibit non-storm water discharges into storm sewers with outfalls to surface waters. They must also reduce the discharge of pollutants to the Maximum Extent Practicable (MEP). Ecology is also taking action through this Permit (under authorization by Revised Code of Washington [RCW] 90.48.030 and RCW 90.48.162) to control impacts of storm water discharges to groundwater.

The Phase II Permit was used for the regulatory gap analysis in this section of the City's Surface/Storm Water Management Plan. Under Section S5 of the Phase II Permit, permittees will be required to develop and implement a Storm Water Management Program (SWMP) or set of actions and activities to guide storm water management within their jurisdiction. The SWMP must be fully developed and implemented no later than 180 days prior to the expiration date of the Permit. Further, permittees are expected to prepare written documentation of their SWMP and update it annually. The SWMP is to include an ongoing program for gathering, maintaining, and using information to track implementation, evaluate permit compliance, and determine the effectiveness of the SWMP implementation. The Phase II Permit gap analysis is documented in Table 2-1. It is based on the five minimum components of the mandated SWMP:

1. Public Education and Outreach
2. Public Involvement and Participation
3. Illicit Discharge Detection and Elimination
4. Controlling Runoff from New Development, Redevelopment, and Construction Sites
5. Pollution Prevention and Operations and Maintenance for Municipal Operations

Each of these five NPDES Phase II requirements is described by a set of minimum performance measures outlined in the Permit. Each of the performance measures is addressed individually in this gap analysis for the City of Centralia. Table 2-1 contains additional detail on these requirements.

Other requirements of the Permit include the following:

- Report any monitoring studies and any known data that indicate violations of state water quality standards to Ecology.
- Assess effectiveness of best management practices (BMPs) and any changes needed
- Prepare a plan for a future comprehensive long-term monitoring program
- Submit a detailed annual report on the status of SWMP implementation

The Clean Water Act requires storm water treatment by permittees to the MEP. Washington State law requires all known, available and reasonable treatment (AKART). Ecology has determined that MEP is equivalent to AKART and that compliance with the Ecology Stormwater Management Manual is AKART.

2.1.2 NPDES Phase II Gap Analysis

Table 2-1 contains an outline of the NPDES Phase II requirements and corresponding performance measures along with City regulations, ordinances, programs, or plans and any City of Centralia programs or plans that address each performance measure.

2.2 Gap Analysis for Other Regulatory Requirements

The City of Centralia has numerous storm water management policies, ordinances, and regulations to consider for overall compliance. They are generally as follows:

City of Centralia Policies and Ordinances

- Centralia Municipal Code (CMC), including:
  - Environmental Policy (CMC Chapter 16.04)
  - Shoreline Management Master Program (CMC Chapter 16.06)
  - Floodplain Management (CMC Chapter 16.12)
  - Natural Resource Lands and Critical Areas (CMC Chapter 16.16)
  - Design and Development Guidelines (CMC Chapter 18.10)
  - Stormwater Management (CMC Chapters 15.30, 15.35, 15.40, 18.15 and 20)
- Comprehensive Plan

State Regulations and Programs

- Growth Management Act for concurrent provision of services in newly developing areas
- State Environmental Protection Agency (SEPA) review of City actions
- Ecology Stormwater Manual for Western Washington
- Fish and Wildlife Hydraulic Project Approval (HPA)
- Floodplain regulations
- Department of Natural Resources (DNR) Aquatic Land Use Authorization
- Water Quality Standards for discharges (WAC 200, Chapter 90.28 RCW)
- Underground Injection Control Program (WAC 173-218)

Federal Regulations and Programs

- Clean Water Act (CWA), including:
  - Compliance with state water quality standards for discharges of storm water
  - NPDES permits
  - Implementation of the Total Maximum Daily Load (TMDL) for the Chehalis River
  - Section 404 filling of wetlands
- Endangered Species Act

The *2002 RW Beck Surface Water Management Program Assessment Draft Report* (The RW Beck Report) has summarized most of these requirements; therefore, the information is not repeated here. A few updates and comments on the RW Beck Report follow below. Section 2.2.1 through 2.2.4 of this Surface/Storm Water Management Plan supersede the RW Beck Report and should be referred to for additional compliance information.

2.2.1 Updates to City of Centralia Policies and Ordinances

CMC Chapter 16.08 – Shoreline Management Master Program

In 1997, the "Lewis County Shoreline Management Master Program" prepared by the Lewis County regional planning commission was adopted into CMC Chapter 16.08. This program satisfies the requirements of the Shoreline Management Act of 1971.

The RW Beck Report indicated that Ecology was in the process of updating its Shoreline Master Program (SMP) Guidelines, but that these guidelines were invalidated by the Shoreline Hearings Board in August 2001. Subsequently, in July 2002, a third draft of the revised guidelines was issued for public comment. The final version of the guidelines was adopted December 17, 2003 and codified January 17, 2004.

RCW Chapter 90.58.080 established a timetable for local governments to develop or amend SMPs. This update has been synchronized with the Growth Management Act (GMA) update to which local jurisdictions must adhere. Lewis County, including cities within the County, is scheduled to update its SMP by 2012. When this occurs, the City of Centralia will either need to adopt the revised Lewis County SMP or make revisions.

CMC Chapter 16.16 – Natural Resource Lands and Critical Areas

As indicated in the RW Beck Report, the City is still considering proposed changes to its critical areas ordinance that addresses critical areas such as wetlands, critical aquifer recharge areas, landslide hazard areas, wildlife habitat areas, and flood hazard areas.

CMC Chapter 18.10 – Design and Development Guidelines

The Design and Development Guidelines (Development Guidelines), originally adopted in 1998, was updated in January 2004. The City has adopted the 2005 Stormwater Management Manual for Western Washington in its stormwater ordinance, and the Development Guidelines need to be updated to reflect that change.

CMC Chapter 18.15 – Storm Water Management

In 2005, the City modified its municipal code to include adoption of Ecology's 2005 Revised Stormwater Management Manual for Western Washington. Additional discussion of this manual is included in Section 2.2.2.

Comprehensive Plan

The City is currently updating its Comprehensive Plan to be consistent with the Growth Management Act. The City is required to amend the Plan by the end of 2006. Once the Plan is updated, the City should review its current design and development guidelines to ensure that they continue to be consistent with the goals and policies set forth under the new plan.

2.2.2 Updates to State Regulations and Programs

Washington State Department of Ecology Stormwater Management Manual for Western Washington

In 2005, Ecology updated the 2001 Stormwater Management Manual for Western Washington to correct errors, clarify statements, update design criteria and procedures, and

apply recent research. The City has adopted the revised manual under Chapter 18.15, Section .010 of the Centralia Municipal Code.

The following are key changes in the 2005 manual that could affect the way the City considers storm water:

- It deleted the instructions for development of single event hydrographs and deleted single-event, hydrograph-based approaches for sizing flow control and most treatment facilities.
- It updated the design procedures for sizing infiltration and filtration systems with references to use of the Western Washington Hydrology Model (WWHM) and to newly developed design criteria and steps.
- It corrected design criteria for biofiltration swales.
- It restricted the enhanced treatment required of arterials to those which exceed a certain average daily traffic threshold.
- It revised a BMP for a "Certified Erosion and Sediment Control Lead." The BMP now applies to sites that disturb 1 acre or more and discharge storm water runoff to surface waters.
- It inserted guidance concerning how to represent certain low-impact development techniques within the WWHM so that it predicts flow reduction benefits from use of those techniques.

Underground Injection Control (UIC) Wells

A UIC well is a manmade subsurface fluid distribution system consisting of an assemblage of perforated pipes, drain tiles, or other similar mechanisms intended to infiltrate fluids into the ground or a dug hole that is deeper than the largest surface dimension. Subsurface infiltration systems include drywells, pipe or French drains, drain fields, and other similar devices that are designed to discharge storm water directly into the ground.

Congress passed the Safe Drinking Water Act in 1974 and required the Environmental Protection Agency (EPA) to create the Underground Injection Control Program as one of the key programs for protecting drinking water sources by regulating discharges to the wells. In 1984, Ecology received the authority from EPA to regulate UIC wells and adopted the UIC rule, Chapter 173-218 of the WAC. On January 3, 2006, and effective February 3, 2006, Ecology adopted a revision to the rule.

Since the City relies on drywells for infiltration of storm water, the City may need to assess the adequacy of its design and development guidelines to ensure that designs are in conformance with the new rule.

2.2.3 Updates to Federal Regulations and Programs

Chehalis River TMDL

The RW Beck Report outlined the water quality issues affecting the Chehalis River and the status of developing plans aimed at addressing impaired water quality. Since that report, a

Detailed Implementation (Cleanup) Plan (DIP) for the Chehalis/Grays Harbor Watershed Dissolved Oxygen, Temperature, and Fecal Coliform Bacteria TMDL was published in November 2004. The plan was developed in collaboration with the Water Quality Committee of the Chehalis Basin Partnership (CBP).

The DIP for TMDLs in the Chehalis/Grays Harbor Watershed is intended to complement and build on work already done to document conditions in the watershed. Ecology began TMDL studies in the basin in 1990 to understand and begin responding to pollution concerns. The studies assessed water quality conditions, identified the sources and relative amounts of pollution being contributed to the impaired areas, determined loading capacities for oxygen-demanding materials, fecal coliform bacteria, and temperature, and then recommended specific pollution reductions and strategies to restore water quality to state standards. The TMDL reports provided waste-load allocations for facilities regulated by NPDES permits and load allocations for particular stretches of the rivers and streams impaired by human non-point source pollution.

The DIP describes a strategic approach to achieve the pollution reductions that were identified in previous studies. It does not, however, modify waste-load or load allocations previously determined in the TMDLs and approved by EPA.

2.2.4 Recommendations Based on Gap Analysis

In addition to the specific recommendations regarding NPDES Phase II Permit Compliance in Table 2-1, the following general recommendations are made to meet requirements identified by the gap analysis. Additional detail regarding specific actions needed to achieve regulatory compliance can be found in Sections 4 through 6 of this report.

- Recognizing that new houses and driveways are much larger now than in past decades, impervious surfaces have also increased on the typical lot development. Most engineers still use an assumed size for a house based on estimates made decades ago. This can result in the design of undersized facilities for the actual development's impervious surface coverage. For this reason, the City should conduct a survey of the average amount of impervious surface on new construction projects in the last 1 to 3 years. The results of this survey should support a requirement that new development applications use the results as an estimate for calculating storm water hydrographs and sizing facilities, or limit impervious surface on individual lots through building permits to the amount of impervious surface identified in the original permit application for a subdivision.

- In an effort to reduce the amount of impervious surface generated by new development (which in turn can reduce the amount of storm water runoff from a site), the City should encourage developers to achieve the maximum potential infiltration on development sites. This can be done by encouraging the use of amended soils that increase infiltration and detention of storm water. Developers should also be encouraged to use pervious pavement with suitable base materials for infiltration for walkways, patios, driveways, and residential streets.

- To further reduce impervious surface and the resultant storm water runoff from infrastructure improvements, the City should amend street design standards to reduce pavement widths on residential streets.

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TABLE 2-1
NPDES Phase II Stormwater Management Program (SWMP) Requirements and Corresponding City of Centralia Regulations, Plans, and Programs
Note: This table also identifies improvements to ESA Compliance in coordination with Phase II Compliance recommendations

NPDES Phase II Requirements	Minimum Performance Measures Associated with NPDES Phase II Requirements (Unless otherwise noted, the main performance measure shall be implemented no later than 180 days prior to the expiration date of this Permit. See Permit for subcategory implementation schedule.)	Applicable Regulation or Program	Potential Improvement to City of Centralia Programs, Plans, or Policies	Sections in This Plan with Recommendations to Address This Requirement	ESA Compliance
1. Public Education and Outreach [Education programs aimed at residents, businesses, industry, elected officials, policy makers, planning staff and other employees of the Permittee to reduce or eliminate behaviors and practices that cause or contribute to adverse storm water impacts.]	a) Implement or participate in an education and outreach program targeting the following audiences, within 2 years after the effective date of this Permit: i. Awareness by the general public of the need to improve water quality, reduce impervious surfaces, and protect the existing and designated uses of waters of the state and the potential impacts caused by storm water discharges. Awareness of source control BMPs and environmental stewardship actions. ii. Awareness of the general public and businesses of the need to improve water quality, protect the existing and designated uses of Waters of the State and the potential impacts caused by storm water discharges, particularly car washing and business chemical releases, as well as the impacts of illicit discharges and how to report illicit discharges. iii. Awareness by homeowners, general public, landscape professionals and property managers of the need to protect water quality by reducing purchase of and properly storing, using and disposing of pesticides, fertilizers, and other chemicals. Awareness of low-impact development (LID) techniques and storm water pond maintenance requirements. iv. Awareness by engineers, contractors, developers, review staff, and land use planners of technical standards for storm water site and erosion control plans, LID techniques, and storm water treatment and flow control BMPs.	City of Centralia Municipal Code: Title 15, 16, 18, 19, and 20 Lewis County Health Department (http://www.doh.wa.gov/concon/LHJMenu/Lewis.htm) Washington State Department of Health (http://www3.doh.wa.gov/here/materials/CRA_Detail.aspx?ID=358) WSU Cooperative Extension (http://pubs.wsu.edu/cgi-bin/pubs/index.html): the Ecosystems and Environmental sidebar offers the following publication with guidance relevant to hobby farms and rangelands: *Taking Care of Streams in Washington, Oregon, and Idaho: A guide to Riparian Areas in Rangelands Pacific Northwest Cooperative Extension Publications*	Additional education on natural yard care techniques and reducing purchase of and properly storing, using, and disposing of automotive chemicals, hazardous cleaning supplies, and other hazardous materials. Education on spill prevention efforts. Increase involvement in environmental stewardship activities; reach out to children, students, adults, and visitors.	5.2.2.5 Education	• In public educational outreach programs, include discussion of ESA-protected species. Bull trout are present in downstream waters. Recovery of salmon populations is important to the recovery of bald eagle populations. Salmon require clean water. • During local permitting processes, developers and contractors should be made aware of ESA considerations. To help implement this, the City planning staff should know where all of the bald eagle nests and territories are in the vicinity. • An information pamphlet regarding threatened and endangered species and their requirements for protection would be useful. It could be available to the public, handed out at public meetings, and given to all private and commercial development applicants. It would cover water quality, riparian zone protection, and behavioral disturbance to eagles.
	b) Measure understanding and adoption of the targeted behaviors among the targeted audiences. The resulting measurements shall be used to direct education and outreach resources most effectively, as well as to evaluate changes in adoption of the targeted behaviors.		Develop ongoing program action.	4.2.2.5 Education	

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	c) Track and maintain records of public education and outreach activities.		Develop ongoing program action.	5.2.2.8 Record-Keeping and Annual Reporting	
2. Public Involvement and Participation [Ongoing opportunities for public involvement through advisory councils, watershed committees, etc.]	a) Create opportunities for the public to participate in the decision-making process involving the development, implementation, and updating of the Permittee's entire SWMP no later than 1 year from the effective date of this Permit. Each Permittee shall develop and implement a process for consideration of public comments on their SWMP.	The Citizens Advisory Board of City of Centralia. The City of Centralia Management Storm Water Plan adoption process will include public notification, public workshops, and hearings.	Implement public participation plan.	5.2.2.5 Education	• Include ESA awareness in the SWMP development process.
	b) Make SWMP, the annual report required under the Draft NPDES Permit Reporting Requirements Section (S9.A), and all other submittals required by this Permit, available to the public. Post material on web site.		Complete and post required information on City web site. Create opportunities for ongoing public involvement.	5.2.2.9 Watershed Specialist	
3. Illicit Discharge Detection and Elimination [Ongoing program to detect, remove, and prevent illicit connections, discharges, and improper disposal, including spills, into the MS4. Full implementation of an illicit discharge and elimination program.]	a) A storm sewer system map shall be developed no later than 4 years from the effective date of this Permit. These maps should be updated periodically.	The City is currently inventorying all drainage structures, such as culverts, catch basins, and manholes, using the Global Positioning System (GPS).	Complete inventory for City of Centralia.	5.2.2.2 Inspections and Illicit Connections	• Standards should prohibit discharge of pollutants, such as soil, toxic chemicals, radioactive material, carcinogens, mutagens, or organic nutrients, including sewage, into habitats used by listed species. • Standards should prohibit release of non-indigenous or artificially propagated species into a listed species' habitat, or allow them to gain access to that habitat.
	b) Develop and implement an ordinance or other regulatory mechanism to effectively prohibit non-storm water, illegal discharges, and/or dumping into the Permittee's municipal separate storm sewer system to the maximum extent allowable under state and federal law. Ordinance or other regulatory mechanism shall be adopted within 30 months from the effective date of this Permit.		Develop and implement.	5.2.2.7 Regulations	
	c) Develop and implement an ongoing program to detect and address non-storm water discharges, spills, illicit connections, and illegal dumping into the Permittee's municipal separate storm sewer system.		Develop and implement.	5.2.2.2 Inspections and Illicit Connections	
	d) Inform public employees, businesses, and the general public of hazards associated with illegal discharges and improper disposal of waste.		Develop and disseminate.	5.2.2.5 Education	

TABLE 2-1
NPDES Phase II Stormwater Management Program (SWMP) Requirements and Corresponding City of Centralia Regulations, Plans, and Programs
Note: This table also identifies improvements to ESA Compliance in coordination with Phase II Compliance recommendations

NPDES Phase II Requirements	Minimum Performance Measures Associated with NPDES Phase II Requirements (Unless otherwise noted, the main performance measure shall be implemented no later than 180 days prior to the expiration date of this Permit. See Permit for subcategory implementation schedule.)	Applicable Regulation or Program	Potential Improvement to City of Centralia Programs, Plans, or Policies	Sections in This Plan with Recommendations to Address This Requirement	ESA Compliance
	e) Adopt and implement procedures for program evaluation and assessment, including the tracking number and type of spills or illicit discharges identified; inspections made; and any feedback received from public education efforts.		Develop and implement.	5.2.2.8 Record-Keeping and Annual Reporting	
	f) Provide appropriate training for municipal field staff on the identification and reporting of illicit discharges into MS4s.		Develop and implement.	5.2.2.5 Education	
4. Controlling Runoff from New Development, Redevelopment, and Construction Sites [Develop, implement, and enforce a program to reduce pollutants in storm water runoff to MS4 from new development, redevelopment, and construction site activities. This applies to all sites of 1 acre or more, including those projects of less than 1 acre that are part of a larger project. The program applies to private and public development, including roads.]	a) Include an ordinance or other enforceable mechanism that addresses the runoff from new development, redevelopment, and construction site projects.	City of Centralia Municipal Code Chapters 15, 18, and 20 2005 Ecology Manual and any subsequent updates (City of Centralia Municipal Code 18.15.010)		5.2.2.7 Regulations	• The following list includes activities that are likely to result in harm to ESA-protected species or harm species that are used as forage for protected species. Design standards should prohibit: – Removal, addition, or alteration of rocks, gravel, vegetation, or other physical structures that are essential to the integrity and function of a listed species' habitat, – Construction of inadequate bridges, roads, or trails on stream banks or unstable hill slopes adjacent to, above, or upstream of a listed species' habitat. – Operations that substantially disturb soil and increase the amount of sediment entering streams.
	b) Include a permitting process with plan review, inspection, and enforcement capability to meet the standards listed for both private and public projects, using qualified personnel, within 30 months from the effective date of this Permit. At a minimum, this program shall be applied to all sites that disturb a land area of 1 acre or greater, including projects of less than 1 acre that are part of a larger common plan of the development or sale.	The City has a process for reviewing permit applications, with single family residential applications reviewed by Community Development (building inspectors) and subdivisions or commercial/industrial applications reviewed by Engineering. Ecology has authority to take action in cases of water quality violations; however, no regular inspections are conducted.	Develop a City inspection program with adequate staffing and enforcement authority (perhaps better utilizing Ecology's authority) to reduce noncompliance with BMP requirements and water quality violations.	5.2.2.7 Regulations	
	c) Include provisions to ensure adequate long-term operation and maintenance (O&M) of post-construction storm water facilities and BMPs that are permitted and constructed pursuant to item b above, within 30 months from the effective date of this Permit.	City of Centralia Municipal Code Chapters 15, 18, and 20 Site owners are required to inspect annually and maintain as appropriate. The City has no routine inspection program for maintenance. Residential facilities are unlikely to be maintained without formal City inspection program, and there are no apparent penalties for failing to maintain.	Determine whether the City is willing to focus on developing an education and inspection program and enforcing required maintenance by site owners, or if the City would rather develop its own inspection and maintenance program (i.e. take over the responsibility from site owners). Implement decision.	5.2.2.4 Operations and Maintenance	

TABLE 2-1
NPDES Phase II Stormwater Management Program (SWMP) Requirements and Corresponding City of Centralia Regulations, Plans, and Programs
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NPDES Phase II Requirements	Minimum Performance Measures Associated with NPDES Phase II Requirements (Unless otherwise noted, the main performance measure shall be implemented no later than 180 days prior to the expiration date of this Permit. See Permit for subcategory implementation schedule.)	Applicable Regulation or Program	Potential Improvement to City of Centralia Programs, Plans, or Policies	Sections in This Plan with Recommendations to Address This Requirement	ESA Compliance
	d) Include a procedure for keeping records of inspections and enforcement actions by staff, including inspection reports, warning letters, notices of violations, and other enforcement records. Records of maintenance inspections and maintenance activities shall be maintained. Permittees shall keep records of all projects disturbing more than 1 acre and all projects of any size that are part of a common plan of development or sale that is greater than 1 acre that are approved after the effective date of this Permit.	George Butler Associates Master Series Infrastructure & Asset Management Database (GBA database)	Evaluate GBA database tool to determine if it has the necessary capability to bring the City into compliance with this minimum performance measure. If GBA is not acceptable for this measure, then find or develop a suitable system for tracking and reporting.	5.2.2.8 Record-Keeping and Annual Reporting	
	e) Make available copies of the "Notice of Intent for Construction Activity" and/or copies of the "Notice of Intent for Industrial Activity" to representatives of proposed new development and redevelopment. Permittees will continue to enforce local ordinances controlling runoff from sites that are also covered by storm water permits issued by Ecology.	The City has a process for notifying representatives of new development and redevelopment. There is no enforcement capability at this time.	Develop a City inspection program with adequate staffing and enforcement authority to reduce noncompliance with local ordinances controlling runoff from sites that are also covered by storm water permits issued by Ecology.	Covered in SWPPP. This is implemented by the Planning and Development Services Department.	
	f) Within 30 months from the effective date of this Permit, ensure that all staff responsible for implementing the program to Control Stormwater Runoff from new development, redevelopment, and construction sites, including permitting, plan review, construction site inspections, and enforcement, are trained to conduct these activities. Follow-up training shall be provided as needed to address changes in procedures, techniques or staffing. Permittees shall document and maintain records of the training provided and the staff trained.		Develop and fund program.	5.2.2.5 Education	

TABLE 2-1
NPDES Phase II Stormwater Management Program (SWMP) Requirements and Corresponding City of Centralia Regulations, Plans, and Programs
Note: This table also identifies improvements to ESA Compliance in coordination with Phase II Compliance recommendations

NPDES Phase II Requirements	Minimum Performance Measures Associated with NPDES Phase II Requirements (Unless otherwise noted, the main performance measure shall be implemented no later than 180 days prior to the expiration date of this Permit. See Permit for subcategory implementation schedule.)	Applicable Regulation or Program	Potential Improvement to City of Centralia Programs, Plans, or Policies	Sections in This Plan with Recommendations to Address This Requirement	ESA Compliance
5. Pollution Prevention and Operation and Maintenance for Municipal Operations [Develop and implement an O&M program that includes training and has the ultimate goal of preventing or reducing pollutant runoff from municipal operations, within 3 years of the effective date of this permit.]	a) Establish maintenance standards that are as protective, or more protective, of facility function as those specified in Chapter 4 of Volume V of the 2005 *Stormwater Management Manual for Western Washington.*		Develop and fund program.	5.2.2.7 Regulations	• The following should be included in a maintenance plan to comply with ESA. The maintenance plan should prohibit: – Maintenance of structures like culverts, berms, or dams in ways that eliminate or impede a listed species' ability to migrate past or gain access to habitat. – Removing, poisoning, or contaminating plants, fish, wildlife, or other biota that the listed species requires for feeding, shelter, or other essential activities. – Removal, addition, or alteration of rocks, gravel, vegetation, or other physical structures that are essential to the integrity and function of a listed species' habitat. – Removal of water or otherwise altering stream flow in a manner that significantly impairs spawning, migration, feeding, or other essential behavior patterns. – Operation of dams or water diversion structures with inadequate fish screens or passage facilities. – Maintenance or operation of inadequate bridges, roads, or trails on stream banks, or upstream of a listed species' habitat.
	b) Inspect annually all municipally owned or operated permanent storm water treatment and flow control facilities (other than catch basins), and take appropriate maintenance actions in accordance with the adopted maintenance standards.		Expand program to include annual maintenance. Activities include checking drainage structures (i.e. ditches, culverts, catch basins, and manholes) to make sure that they are in good working condition. Culverts may require cleaning, repairs, or replacement (replacement usually requires an upgrade in order to meet the standards of the WSDFW fish passage program). Catch basins can also require replacement because of failure or being undersized (restricting flow), and many need annual maintenance for debris removal and cleaning.	5.2.2.4 Operations and Maintenance	
	c) Perform spot checks of potentially damaged permanent treatment and flow control facilities (other than catch basins) after major storm events. If spot checks indicate widespread damage/maintenance needs, inspect all such facilities that may be affected. Take appropriate maintenance actions in accordance with the adopted maintenance standards.		Fund and train appropriate staff to make inspections. Develop and fund program to take appropriate maintenance actions as indicated by inspections.	5.2.2.4 Operations and Maintenance	
	d) Inspect catch basins and inlets owned or operated by the Permittee at least once before the end of the Permit term. Clean catch basins if the inspection indicates cleaning is needed to comply with maintenance standards established in the 2005 *Stormwater Management Manual for Western Washington*. Decant water shall be disposed of in accordance with Appendix 5 *Street Waste Disposal*.		Fund and train staff to inspect all facilities.	5.2.2.4 Operations and Maintenance	

TABLE 2-1
NPDES Phase II Stormwater Management Program (SWMP) Requirements and Corresponding City of Centralia Regulations, Plans, and Programs
Note: This table also identifies improvements to ESA Compliance in coordination with Phase II Compliance recommendations

NPDES Phase II Requirements	Minimum Performance Measures Associated with NPDES Phase II Requirements (Unless otherwise noted, the main performance measure shall be implemented no later than 180 days prior to the expiration date of this Permit. See Permit for subcategory implementation schedule.)	Applicable Regulation or Program	Potential Improvement to City of Centralia Programs, Plans, or Policies	Sections in This Plan with Recommendations to Address This Requirement	ESA Compliance
	e) Compliance with the inspection requirements in items a, b, c, and d above shall be determined by the presence of an established inspection program designed to inspect all sites. Compliance requires inspection of 95 percent of all sites.			-	
	f) Establish and implement practices to reduce storm water impacts associated with runoff from streets, parking lots, roads, or highways owned or maintained by the Permittee, and road maintenance activities conducted by the Permittee.	City of Centralia Municipal Code Chapters 15 and 18.	Develop and fund program.	5.2.2.4 Operations and Maintenance	
	g) Establish and implement policies and procedures to reduce pollutants in discharges from all lands owned or maintained by the Permittee and subject to this Permit, including but not limited to parks, open spaces, road rights-of-way, maintenance yards, and storm water treatment and flow control facilities.	City of Centralia Municipal Code Chapters 15 and 18.	Develop and fund program.	5.2.2.4 Operations and Maintenance	
	h) Develop and implement an ongoing training program for appropriate employees of the Permittee whose construction, operations, or maintenance job functions may impact storm water quality.	City of Centralia Municipal Code Chapters 15 and 18.	Develop and fund program.	5.2.2.5 Education	
	i) Develop and implement a SWPPP for all heavy equipment maintenance or storage yards, and material storage facilities owned or operated by the Permittee in areas subject to this Permit that are not required to have coverage under the Industrial Stormwater General Permit.	City of Centralia Municipal Code Chapters 15 and 18.	Develop a plan on either an individual basis for each facility, or on a city-wide basis.	None in watershed.	
	j) Records of inspections and maintenance or repair activities conducted by the Permittee shall be maintained in accordance with S9 *Reporting Requirements*.		Develop and fund program.	5.2.2.8 Record-Keeping and Annual Reporting	

SECTION 3

Surface Water Issues Identified in the City of Centralia

3.1 Introduction

This section describes the drainage, water quality, and aquatic habitat issues identified in the City of Centralia. This Surface/Storm Water Management Plan does not cover the City's flooding issue but concentrates on the City's storm water issues. The difference between flooding and storm water is the intensity, the sheer volume of water, and the direction of the water. Flooding for this Plan is considered a phenomenon related to the rivers feeding into Centralia.

3.2 Sources of Data

Surface water issues were identified by collecting information from a variety of sources, including the following:

- City of Centralia Citizens Advisory Board
- City of Centralia Staff
- Field visits conducted by CH2M HILL during the preparation of this Plan

Issues identified from the three different sources were combined into a master list presented in Table 3-1.

3.3 Description of Issue Types

For this Surface/Storm Water Management Plan, storm water management concerns have been classified in three different categories: surface runoff and ponding, water quality, and aquatic habitat.

Surface runoff and ponding issues may include erosion and poor drainage. Levee erosion and slope stability concerns are often created by increased volumes and velocities of runoff. However, flood issues are not discussed in this Plan.

Water quality issues may include point source pollution, such as storm water runoff containing a large concentration of suspended sediment discharging from a construction site, or non-point source pollution, such as fecal contamination from domestic animals, birds, and/or wildlife that collects and runs off streets.

Aquatic habitat in local streams and wetlands is often physically altered by new development. These physical alterations may include decreased access to upstream habitat due to road culverts or channelized sections of creeks. Habitat can also be physically altered

by changes in stream flow as a result of increased runoff due to land clearing and an increase in impervious surfaces from the addition of buildings and pavement.

No problems specifically related to water quality and habitat were identified for inclusion in Table 3-1; however, this Surface/Storm Water Management Plan provides recommendations in Section 6 to survey, manage, and monitor potential/future water quality and habitat issues.

3.4 Identified Surface Water Issues

A total of 52 surface water issue locations in the City of Centralia were identified by the City, the Citizens Advisory Board, and/or by field investigations. Six of these locations were identified in areas where the storm water containment and conveyance system is undeveloped. Forty-six were identified in areas with developed storm water systems. The 52 concerns are presented in Table 3-1 and Figure 3-1.

Water quantity concerns in Centralia sub-basins can be categorized in two groups:

- Maintenance: issues with the potential to be addressed by routine or special operations and maintenance practices.
- Structural: issues related to the storm water system being disconnected from the sewer system, broken pipes, and/or obstruction of storm drains and pipes. These issues will be discussed as surface runoff and ponding issues.

TABLE 3-1
Drainage Issue Database

Number	Location Description	Northing	Easting	Surface Water Problem Description	Drainage System	Source
STORM DRAINAGE CONCERN IN UNDEVELOPED AREA						
1	Delaware Ave	46°43'54.91"	122°56'45.50"	No drainage system. Ponding on each side of the road.	Northwest China Creek	Client
2	Windsor Ave	46°43'51.15"	122°56'42.27"	No drainage system. Ponding on each side of the road.	Northwest China Creek	Field Notes
3	Oxford Ave	46°43'47.06"	122°56'38.92"	No drainage system. Ponding on each side of the road.	Northwest China Creek	Client
4	Intersection btwn E Summa St and S Buckner St	46°42'21.77"	122°57'06.25"	West side of the road ponds, ditch not deep enough, needs sump and pipe.	Southeast China Creek	Citizens Advisory Board
5	Intersection btwn E Summa St and Pacific St	46°42'20.70"	122°57'00.06"	Ditches are working correctly.	Out of the UGA and City limits	Field Notes
6	Intersection btwn Little Hanaford and Halliday Rd	46°43'39.69"	122°55'58.59"	Ditches are full with no apparent water movement. Vegetation growth in ditches.	Out of the UGA and City limits	Field Notes
STORM DRAINAGE CONCERN IN DEVELOPED AREA						
7	Intersection btwn Elm and Ash St	46°42'40.88"	122°58'01.69"	Roots. Street deteriorating due to no storm drain and water collecting on street during rains, which helps vegetation growth.	Center China Creek	Client
8	Intersection btwn W. Cherry and Ash	46°42'47.82"	122°57'58.13"	Roots. The curbs are vegetated, which promotes drain plugging.	Center China Creek	Client
9	Intersection btwn W. Cherry and S. Rock	46°42'43.71"	122°57'40.06"	The drain in the south east corner is plugged.	North Salzer Creek	Client
10	Intersection btwn Jefferson and S. Pearl	46°42'31.71"	122°57'32.03"	Plugged northwest and southeast drain.	North Salzer Creek	Client
11	Intersection bwtn Summa St and Gold St	46°42'21.39"	122°57'19.08"	Drain line is a winding snake.	Southeast China Creek	Client
12	NE corner of Sunnyside	46°43'52.34"	122°59'28.79"	Water collects from rain.	Center East Chehalis River	Citizens Advisory Board
13	Intersection btwn E Cherry and S Diamond	46°42'38.67"	122°57'10.39"	Capacity problems. Drain is possibly plugged (vegetation and mud in the curb).	Southeast China Creek	Client
14	Intersection btwn W Center St and N Iron St	46°43'14.30"	122°57'22.06"	Plugged drain on the northwest side of the intersection.	Center China Creek	Citizens Advisory Board
15	Between N Iron St and N Rock St, on W Center St	46°43'14.60"	122°57'24.25"	The north drain is located just at an intersection with a dirt road. Ponding, possible plugged drain.	Center China Creek	Citizens Advisory Board
16	Intersection btwn W Hanson St and N Rock St	46°43'18.18"	122°57'25.50"	Plugged drain.	Center China Creek	Citizens Advisory Board
17	Between W Center St and W Hanson St, on N Rock St	46°43'15.73"	122°57'26.12"	Drainage problem.	Center China Creek	Citizens Advisory Board

TABLE 3-1
Drainage Issue Database

Number	Location Description	Northing	Easting	Surface Water Problem Description	Drainage System	Source
18	Intersection between W chestnut St and S Cedar St	46°42'45.06"	122°58'04.84"	Street deteriorating due to no storm drain, and water collects on street during rains, promoting vegetation growth.	Center China Creek	Citizens Advisory Board
19	Between S Washington St and S Oak St on W Plum St	46°42'49.15"	122°57'45.51"	1st United Methodist parking lot floods drains into Oak.	North Salzer Creek	Citizens Advisory Board
20	Intersection E Carson St and Howard Ave	46°44'45.82"	122°56'42.81"	Standing water during rain. No drainage system.	Northwest Skookumchuck River	Citizens Advisory Board
21	Intersection of N Pearl and W 5th	46°43'38.85"	122°57'12.97"	Drainage problem. Some standing water and organic debris.	Center East Skookumchuck River	Citizens Advisory Board
22	Intersection of N Pearl and W Center	46°43'12.40"	122°57'14.87"	Drainage problem.	Center China Creek	Citizens Advisory Board
23	Intersection of N Oak and W Maple	46°43'13.25"	122°57'32.50"	Ponding on the west of the intersection due to undersize or blocked drainage system.	Center China Creek	Citizens Advisory Board
24	Between S Pearl St and S Tower St, on E Plum St	46°42'44.96"	122°57'23.40"	Drainage problem.	North Salzer Creek	Citizens Advisory Board
25	Intersection between S Tower St and E Plum St	46°42'44.33"	122°57'21.15"	No catch basins on the southwest corner of the intersection.	North Salzer Creek	Citizens Advisory Board
26	Intersection between S Pearl St and E Plum St	46°42'45.21"	122°55'25.68"	Noted some sheen in the northwest corner of the intersection. Some periodic ponding.	North Salzer Creek	Citizens Advisory Board
27	Intersection between S Pearl and W Cherry	46°42'41.90"	122°57'28.05"	Some periodic ponding.	North Salzer Creek	Citizens Advisory Board
28	Intersection between S Tower and W Cherry	46°42'41.03"	122°57'23.60"	Some periodic ponding.	North Salzer Creek	Citizens Advisory Board
29	Intersection between Jackson and S Pearl	46°42'26.41"	122°57'34.30"	Drain on the southeast corner is plugged.	North Salzer Creek	Client
30	Madrona Ave	46°43'32.63"	122°56'39.99"	Receives water runoff from Ham Hill roads and streets.	East China Creek	Citizens Advisory Board
31	Intersection between 3rd and Gold	46°43'30.45"	122°56'42.32"	Truck-damaged ditches; poor drainage at corner of 3rd and Gold.	East China Creek	Citizens Advisory Board
32	China Creek (west of Ham Hill), wetland	46°43'34.70"	122°56'51.69"	1990 flooded (flood issue).	Northwest China Creek	Citizens Advisory Board
33	China Creek flooding area (see Figure 3-1).	46°43'34.70"	122°56'51.69"	China Creek flood containment (flood issue).	Northwest China Creek	Citizens Advisory Board
34	Skookumchuck River and 507	46°43'54.14"	122°57'49.58"	Levee maintenance. The northeast levee seems to be nonexistent (flood issue).	East Coffee Creek	Citizens Advisory Board

TABLE 3-1
Drainage Issue Database

Number	Location Description	Northing	Easting	Surface Water Problem Description	Drainage System	Source
35	Intersection btwn 2nd and F St	46°43'26.03"	122°57'22.97"	Roots. The large tree (about 3 feet in diameter) might have broken the drainage line.	South Skookumchuck River	Client
36	600 block of N Tower and east alley	46°43'20.15"	122°57'4.77"	Large debris. The single drain on 5/5/6 seemed okay; however, moss growing on side of the building was noticed up to 1 foot.	Center China Creek	Client
37	Jefferson Street	46°42'32.19"	122°57'46.98"	Pipe failure.	North Salzer Creek	Client
38	Between S Pearl St and S Tower St, on Cherry St and Jefferson St	46°42'31.71"	122°57'32.03"	Drainage problem.	North Salzer Creek	Citizens Advisory Board
39	Coffee Creek and Reynolds Road	46°43'44.31"	122°57'51.28"	East field get flooded (flood issue).	West Coffee Creek and East Coffee Creek	Field notes - Vincent Autier
42	Between Yew and Cedar, on Chestnut	46°42'44.26"	122°58'2.50"	2000. See Chestnut and Cedar intersection comments. No drainage on Chestnut between Yew and Cedar. It seems to pond on the side of the road.	Center China Creek	Collection System Supervisor
STORM DRAINAGE DISCONNECTED FROM SANITARY SEWER						
40	On Chestnut between Rock and Silver	46°42'39.21"	122°57'37.70"	Disconnected in1987. No sign of ponding water. Water flow direction could not be identified. Possible capacity issue.	North Salzer Creek	Collection System Supervisor
41	Intersection of E Chestnut and Gold	46°42'34.97"	122°57'18.74"	Disconnected in 1989. Southwest drain seems to experience some ponding.	Southeast China Creek	Collection System Supervisor
43	Between Hamilton and Silver, on Jackson	46°42'27.54"	122°57'40.44"	Disconnected in 1990. No obvious problem, no ponding. Intersection of Jackson and Silver could use some maintenance.	North Salzer Creek	Collection System Supervisor
44	Between Ward and Prospect, on May	46°43'41.75"	122°56'59.19"	Disconnected in 1994. The drain is plugged.	Northeast Skookumchuck River	Collection System Supervisor
45	Between Richmond and Woodland, on Adler	46°42'40.58"	122°57'54.95"	Disconnected in 1998. Storm drain between Woodland and Richmond Street, on Alder street are ineffective. Fully plugged.	North Salzer Creek	Collection System Supervisor
46	Intersection of 6th and E	46°43'44.21"	122°57'18.29"	Disconnected in 1999. Storm drain clearly disconnected from the sewer system.	East Skookumchuck River	Collection System Supervisor
47	Intersection of 6th and F	46°43'44.21"	122°57'23.32"	Disconnected in 1999. Seems okay. Possible capacity issue.	East Skookumchuck River	Collection System Supervisor
48	Intersection of 6th and G	46°43'44.21"	122°57'28.20"	Disconnected in 1999. Ponding on the north side of the intersection.	East Skookumchuck River	Collection System Supervisor
49	Intersection of Oak and Center	46°42'15.91"	122°57'31.01"	Disconnected in1999. Storm drain disconnected from sewer.	Center China Creek	Collection System Supervisor

TABLE 3-1
Drainage Issue Database

Number	Location Description	Northing	Easting	Surface Water Problem Description	Drainage System	Source
50	Intersection of Mellen and Marsh	46°42'40.09"	122°58'18.39"	Disconnected in 1999. Ponding on the north side of the intersection.	Center China Creek	Collection System Supervisor
51	Intersection of Vienna and Logan	46°43'53.97"	122°56'26.63"	Disconnected in 1999. At the intersection of Vienna and Logan streets, flow was observed at a rate of about 2 gallons per minute from the northeast storm drain of the intersection to, it seems, the sewer manhole located about 6 feet south. Further inspection suggests that the flow might be related to groundwater seepage and not sewer, as no odor was noticed, and no rain event has been recorded for the past 10 days.	Northwest China Creek	Collection System Supervisor
52	On Locust Between N. tower and railroad tracks, on Locust	46°42'54.77"	122°57'15.51"	Disconnected in 2000. Drains close to the railroad seem okay. No drains at the Tower/Locust intersection.	North Salzer Creek	Collection System Supervisor

Note:
Coordinates were measured with a hand-held GPS. The coordinates relate to a point. In the case of an intersection, the whole intersection should be considered. In the case of a street, GPS coordinates correspond to the mid-distance between intersections.

Figure 3-1
Stormwater Management Concern Areas
City of Centralia

Drainage Problem Point
Drainage Problem Line
Subbasin Boundary
City Limits
Urban Growth Area
Railroad
Stream
River or Lake

0 0.125 0.25 0.5 Miles

N

File Path: \\simba\Proj\CentraliaWaCityOf\339848\GIS\MXD\ConcernAreas.mxd, Date: March 21, 2007

SECTION 4

Operations and Maintenance

4.1 Storm/Surface Water Operations and Maintenance Program Purpose

The NPDES Phase II Permit for municipalities such as Centralia requires the City to implement an effective storm water facilities maintenance program. Furthermore, this Surface/Storm Water Management Plan ultimately recommends that the City voluntarily comply with ESA regulations for bull trout and salmonids (as discussed below), and there are O&M implications to this recommended ESA compliance. This section of the Surface/Storm Water Management Plan addresses the NPDES and ESA requirements using the following sources as guidelines:

- Washington State Department of Ecology Stormwater Management Manual for Western Washington (February 2005)
- Washington State Department of Ecology, NPDES and State Waste Discharge General Permit of Discharges from Small Municipal Separate Storm Sewers in Western Washington (Phase II Permit) (February 2007)

While addressing the regulatory requirements, this section details a methodology developed to help the City of Centralia meet the regulatory guidelines. The methodology developed is intended to facilitate the City's future efforts to determine optimum staffing (in terms of full-time equivalent employees or FTEs) to meet NPDES Phase II Permit requirements.

4.2 Staged Approach to NPDES Phase II Compliance

While the City has a reasonably effective program to provide surface/storm water management O&M services throughout its service area, the current program can be characterized as mainly reactive, rather than proactive. Enhancements to the program would increase efficiency and overall effectiveness in meeting the City's goals of NPDES Phase II compliance, which would in turn increase operational efficiency and decrease potential risk. It is recommended that the City follow a staged approach to comply with the NPDES Phase II Permit, which would allow for the appropriate cash flow and other resources to become available as the program becomes more involved and resource intensive. The methodology for this staged approach is broken into two main components:

1. Determine the City's current storm water program.

The City of Centralia is currently operating in a reactionary manner. CH2M HILL suggests considering three different stages (i.e., Stage 1 through 3). Pre-permit corresponds to the 2006 Centralia Storm Water Program, while Stage 3 yields to full compliance with the NPDES Phase II Permit. As the City moves through these phases, the operational

effectiveness increases and the risk decreases. The City can consider the trade-offs of expecting the schedule to meet the City's goals within its financial constraints.

2. Improve the O&M processes to progress between the three different stages.

Opportunities to fine-tune the current O&M program to achieve each stage include but are not limited to the following suggestions:

- Purchase new equipment to increase productivity and decrease FTEs.
- Increase FTEs to perform additional tasks.
- Increase the efficiency and coordination of the staff through planning, scheduling, and training.
- Determine points of measurement to check efficiency and make improvements through an iterative measurement and improvement process.
- Change inefficient maintenance methodologies to provide better coordination and use of limited resources.

Table 4-1 defines the different stages of compliance with NPDES Phase II and provides an estimate of the FTE level each would require.

TABLE 4-1
Stages to Reach Full Compliance with NPDES Phase II Permit

Stage	Definition	FTE
Pre-permit	Centralia 2006 Storm Water Program	3
1	Pre-permit level of service with enhanced efficiency and training	3
2	Focused (single-department) provider	3
3	Storm Water Department creation with FTE additions; full compliance with the NPDES Phase II Permit	4

4.3 Published Guidelines for Operations and Maintenance

As mentioned in the introduction, this O&M section was created using two sources as guidelines: the *Ecology Storm Water Management Manual for Western Washington*, and the Ecology Phase II Permit. Table 4-2 presents the individual components of these regulatory guidelines, including a schedule for compliance with each component. The schedule begins with pre-permit, which represents the current state of O&M compliance as of the end of 2006.

TABLE 4-2
Staged Approach to Compliance with Regulations

Regulations	Pre-Permit (2006)	Stage 1 (2008)	Stage 2 (2010)	Stage 3 (2012)
NPDES Phase II Storm Water Permit (Section 5.5 page 20 through 23 of the Western Washington Phase II Municipal Stormwater Permit, National Pollutant Discharge Elimination System and State Waste Discharge General Permit for Discharges from Small Municipal Separate Storm Sewers in Western Washington, issued by the Department of Ecology in January 2007)).				
a) Adoption of maintenance standards that are as protective, or more protective, of facility function as those specified in Chapter 4 of Volume V of the 2005 *Stormwater Management Manual for Western Washington*. The facility-specific maintenance standards are conditions for determining if maintenance actions related to facility function are required as identified through inspection. They are not a measure of the facility's required condition at all times between inspections. Exceeding the maintenance standards between inspections and/or maintenance does not automatically constitute a violation of these standards. However, based upon inspection observations, the inspection and maintenance schedules shall be adjusted to minimize the length of time that a facility is in a condition that requires a maintenance action. These standards are violated when an inspection identifies a required maintenance action related to facility function, and that action is not performed within 6 months for typical maintenance, within 9 months for re-vegetation, within 1 year for water quality or storage ponds, and within 2 years for maintenance that requires capital construction of less than $25,000.				
b) Annual inspection of all municipally owned or operated permanent storm water treatment and flow control facilities and taking appropriate maintenance actions in accordance with the adopted maintenance standards. Changing the inspection frequency to less regularly than annually shall be based on maintenance records of double the length of time of the proposed inspection frequency. In the absence of maintenance records for permanent storm water treatment and flow control facilities, the Permittee may substitute written statements, including the certification in General Condition G19 *Certification and Signature*, proposing a specific less frequent inspection schedule, based on inspection and maintenance experience.				
c) Spot checks of potentially damaged permanent treatment and flow control facilities (other than catch basins) after major (greater than 24-hour. 10-year recurrence interval rainfall) storm events. If spot checks indicate widespread damage/maintenance needs, inspect all storm water treatment and flow control facilities that may be affected. Conduct repairs or take appropriate maintenance action in accordance with maintenance standards established above, based on the results of the inspections.				
d) Inspection of all catch basins and inlets owned or operated by the Permittee at least once before the end of the Permit term. Clean catch basins if the inspection indicates cleaning is needed to comply with maintenance standards established in the 2005 *Stormwater Management Manual for Western Washington*. Decant water shall be disposed of in accordance with Appendix 6 *Street Waste Disposal*.				

TABLE 4-2
Staged Approach to Compliance with Regulations

Regulations	Pre-Permit (2006)	Stage 1 (2008)	Stage 2 (2010)	Stage 3 (2012)
e) Compliance with the inspection requirements in a, b, c, and d above shall be determined by the presence of an established inspection program designed to inspect all sites and achieving inspection of 95 percent of all sites.				
f) Establishment and implementation of practices to reduce storm water impacts associated with runoff from streets, parking lots, roads or highways owned or maintained by the Permittee, and road maintenance activities conducted by the Permittee. The following activities must be addressed: • Pipe cleaning • Cleaning of culverts that convey storm water in ditch systems • Ditch maintenance • Street cleaning • Road repair and resurfacing, including pavement grinding • Snow and ice control • Utility installation • Pavement striping maintenance • Maintaining roadside areas, including vegetation management • Dust control				
g) Establishment and implementation of policies and procedures to reduce pollutants in discharges from all lands owned or maintained by the Permittee and subject to this Permit, including but not limited to: parks, open space, road right-of-way, maintenance yards, and storm water treatment and flow control facilities. These policies and procedures must address, but are not limited to, the following: • Application of fertilizer, pesticides, and herbicides, including the development of nutrient management and integrated pest management plans • Sediment and erosion control • Landscape maintenance and vegetation disposal • Trash management • Building exterior cleaning and maintenance				

TABLE 4-2
Staged Approach to Compliance with Regulations

Regulations	Pre-Permit (2006)	Stage 1 (2008)	Stage 2 (2010)	Stage 3 (2012)
h) Develop and implement an ongoing training program for appropriate employees of the Permittee whose construction, operations, or maintenance job functions may impact storm water quality. The training program shall address the importance of protecting water quality, the requirements of this Permit, operation and maintenance standards, inspection procedures, selecting appropriate BMPs, ways to perform their job activities to prevent or minimize impacts to water quality, and procedures for reporting water quality concerns, including potential illicit discharges. Follow-up training shall be provided as needed to address changes in procedures, techniques, or requirements. Permittees shall document and maintain records of training provided.				
i) Develop and implement an SWPPP for all heavy equipment maintenance or storage yards, and material storage facilities owned or operated by the Permittee in areas subject to this Permit that are not required to have coverage under the Industrial Stormwater General Permit. Implementation of non-structural BMPs shall begin immediately after the pollution prevention plan is developed. A schedule for implementation of structural BMPs shall be included in the SWPPP. Generic SWPPPs that can be applied at multiple sites may be used to comply with this requirement. The SWPPP shall include periodic visual observation of discharges from the facility to evaluate the effectiveness of the BMPs.				
j) Records of inspections and maintenance or repair activities conducted by the Permittee shall be maintained in accordance with S9 *Reporting Requirements* of the NPDES Phase II Permit.				
Storm Water Management Manual for Western Washington (Volume IV – Source Control BMPs) Items 1 through 8 below: Pages 2-40 to 2-41, BMPs for Maintenance of Stormwater Drainage and Treatment Systems Items 9 through 17 below: Pages 2-38 to 2-39; BMPs for Maintenance of Roadside Ditches				
1. Inspect and clean treatment BMPs, conveyance systems, and catch basins as needed, and determine whether improvements in O&M are needed.				

TABLE 4-2
Staged Approach to Compliance with Regulations

Regulations	Pre-Permit (2006)	Stage 1 (2008)	Stage 2 (2010)	Stage 3 (2012)
2. Promptly repair any deterioration threatening the structural integrity of storm water facilities. These include replacement of clean-out gates, catch basin lids, and rock in emergency spillways.				
3. Ensure that storm sewer capacities are not exceeded and that heavy sediment discharges to the storm sewer are prevented.				
4. Regularly remove debris and sludge from BMPs used for peak-rate control, treatment, etc.; discharge to a sanitary sewer if approved by the sewer authority, or truck to a local or state government-approved disposal site.				
5. Clean catch basins when the depth of deposit reaches 60 percent of the sump depth as measured from the bottom of the basin to the invert of the lowest pipe into or out of the basin. However, in no case should there be less than 6 inches of clearance from the debris surface to the invert of the lowest pipe. Where these catch basins are part of a storm water collection and treatment system, the system owner/operator may choose to concentrate maintenance efforts on downstream control devices as part of a systems approach.				
6. Clean woody debris in a catch basin as frequently as needed to ensure proper operation of the catch basin.				

TABLE 4-2
Staged Approach to Compliance with Regulations

Regulations	Pre-Permit (2006)	Stage 1 (2008)	Stage 2 (2010)	Stage 3 (2012)
7. Post warning signs – "Dump no waste – drains to groundwater," "Streams," "Lakes" – or emboss on or adjacent to all storm drain inlets where practical.				
8. Disposal of sediments and liquids from the catch basins must comply with "Recommendations for Management of Street Wastes" described in Appendix IV-G of the Ecology Manual.				
9. Inspect roadside ditches regularly, as needed, to identify sediment accumulation and localized erosion.				
10. Clean ditches on a regular basis, as needed. Ditches should be kept free of rubbish and debris.				
11. Vegetation in ditches often prevents erosion and cleanses runoff waters. Remove vegetation only when flow is blocked or excess sediments have accumulated. Conduct ditch maintenance (e.g., seeding in late spring and/or early fall, where possible, which allows vegetative cover to re-establish by the next wet season, thereby minimizing erosion of the ditch and making the ditch effective as a biofilter).				

TABLE 4-2
Staged Approach to Compliance with Regulations

Regulations	Pre-Permit (2006)	Stage 1 (2008)	Stage 2 (2010)	Stage 3 (2012)
12. In the area between the edge of the pavement and the bottom of the ditch, commonly known as the "bare earth zone," use grass vegetation wherever possible. Vegetation should be established from the edge of the pavement, if possible, or at least from the top of the slope of the ditch.				
13. Diversion ditches on top of cut slopes that are constructed to prevent slope erosion by intercepting surface drainage must be maintained to retain their diversion shape and capacity.				
14. Ditch cleanings are not to be left on the roadway surfaces. Sweep dirt and debris remaining on the pavement at the completion of ditch cleaning operations.				
15. Roadside ditch cleanings not contaminated by spills or other releases and not associated with a storm water treatment system, such as bioswale, may be screened to remove litter, and separated into soil and vegetative matter. The soil fraction may be handled as "clean soils," and the vegetative matter can be composted or disposed of in a municipal waste landfill.				
16. Roadside ditch cleanings contaminated by spills or other releases known or suspected to contain dangerous waste must be handled following Dangerous Waste Regulations unless testing determines it is not a dangerous waste.				

TABLE 4-2
Staged Approach to Compliance with Regulations

Regulations	Pre-Permit (2006)	Stage 1 (2008)	Stage 2 (2010)	Stage 3 (2012)
17. Examine culverts on a regular basis for scour and sedimentation at the inlet and outlet, and repair as necessary. Give priority to culverts conveying perennial and/or salmon bearing streams, and culverts near streams in areas of high sediment load, such as those near subdivisions during construction.				
ESA Compliance See Section 4.3.1				

Notes:
Pre-permit corresponds to the 2006 Centralia Storm Water Program
Stage 3 is the full compliance with the NPDES Phase II Permit issued in January 2007

4.3.1 Implement Program for ESA Compliance

The ESA is designed to protect individual plant or animal species that are federally listed as "endangered" or "threatened." Protection is defined in terms of "take," which means to harass, harm, pursue, shoot, wound, kill, capture, or collect or attempt to engage in any such conduct. If the City inadvertently violates "take" prohibitions, it could be subject to criminal or civil prosecution. The ESA also includes provisions for citizen lawsuits.

Any action that alters patterns of runoff or water quality or that directly changes the physical habitat of the stream or riparian corridors could harm fish. Maintenance activities could potentially harm a listed species by modifying or degrading the species habitat.

Currently, there are no known fish from the endangered species list that use Centralia Area streams, creeks, and rivers, and no specific maintenance guidelines addressing ESA compliance have been developed for the City. However, it is possible that bull trout may be present in the vicinity of Centralia on a seasonal basis. Bald eagles, listed as threatened in the ESA, are found within the Centralia area. As bald eagle population health is largely dependent on salmonid population health, and there is a possibility that bull trout use Centralia's waters, it is recommended that the City voluntarily comply with the ESA program. This section provides information on ESA compliance, and Section 2 of this Plan should also be referenced to address the topic.

It is recommended that the City be proactive in developing a strategy to prepare for and respond to the ESA should a species of fish using Centralia's waterways move onto the threatened or endangered species list. Furthermore, to be prepared for a potential listing, the City should evaluate maintenance activities to determine the effects on endangered species habitat, including water quality and compliance with the ESA. Additionally, it is recommended that the maintenance providers of storm water facilities implement BMPs when performing work. Two reference documents can be used for this effort: the Tri-County ESA Response program and the Oregon Department of Transportation's *Transportation Maintenance Management System Water Quality and Habitat Guide* (July 1999). Between 1998 and 2002, the National Marine Fisheries Service approved the Tri-County ESA Response program for road maintenance. The Tri-County ESA Response program covers Snohomish, King, and Pierce counties.

While none of the species confirmed to use the streams, creeks, and rivers in the City are currently listed as endangered species (see 70-FR 37160; 71 FR 834; 70 FR 52488; and 70 FR 52630 for the complete listing), the list should be reviewed regularly to determine if a species has moved to the threatened or endangered list.

Table 4-3 lists the species that use Centralia area creeks and rivers.

TABLE 4-3
Centralia Area Creek/River Fish Species

Creek/River	Fish
Salzer Creek	Coho and cutthroat
Chehalis River	Chinook, coho, chum, steelhead, and cutthroat
China Creek	Coho and cutthroat
Coffee Creek	Coho and cutthroat
Scammon Creek	Unknown
Cook Creek	Unknown
Skookumchuck	Steelhead, Chinook, coho, and cutthroat

4.3.2 Other Requirements

4.3.2.1 Responsibility for Maintenance

In an effort to define the storm water system in Centralia, the City should endeavor to delineate what is the City's responsibility and what is the responsibility of private owners, including homeowners associations. For instance, Lewis County might be responsible for part of the system, notably on the Skookumchuck River.

An updated map of the storm water system is needed to help private developers better design and build their storm water systems. For a period of at least 2 years after construction, the private developer is responsible for the maintenance of facilities. After this time, however, the City of Centralia can choose whether or not to accept responsibility for the O&M on the property. The City of Centralia should review this practice to determine its effectiveness at maintaining these structures, particularly those structures that serve single-family residential subdivisions. In addition, the storm water O&M crews should be made aware of which facilities are and are not the specific maintenance responsibility of the City.

Updated and accurate lists and databases of storm water facilities, maintenance needs, and maintenance schedules should be kept. It is the responsibility of the City to assure that storm water facilities are maintained. The City must have a regular inspection and maintenance plan for both public and private facilities, as well as properly allocated resources, to be effective. This must include inspection of private facilities. In this way, the City can better manage and plan inspection, repair, and maintenance, thereby being proactive and not reactive. The City must have a program to work with private property owners to assure that maintenance of the private facilities is occurring.

The City should inspect all new development sites and recently developed sites for compliance with the O&M plan for storm water management submitted by the developer during permit application (i.e., site development plan). These inspections and any corresponding enforcement actions may help alleviate drainage and water quality issues potentially caused by lack of maintenance of private facilities. These inspections could be scheduled quarterly or at some reasonable interval to ensure compliance. The Ecology Stormwater Manual outlines maintenance needs for specific types of storm water treatment

facilities (Section 4.6 of Volume V of the Ecology Manual). The standards in Section 4.6 of Volume V should be used as a reference for determining maintenance needs for private storm water facilities. The facility-specific standards outline types of potential deficiencies, conditions of those deficiencies that indicate maintenance is needed, and the results that are expected once maintenance is performed. Current staffing levels may not be adequate for this pursuit. The City should adjust crew size according to the different implementation stages.

4.3.2.2 Documentation of Inspections and Maintenance Activities/Database Management

Each facility or individual component of the surface water drainage system should be documented and given a unique name or code (an ID). Often, a series of numbers is used with a letter identifier indicating the type of facility or asset (such as CB for catch basin or P for pipe). This database of surface drainage assets and facilities can be tied to the GIS for graphical interfacing.

All inspections and maintenance activities on surface water facilities should be documented. Information such as time, date, location, type of facility, team, reason for visit, and weather conditions should be recorded. This information will be helpful for assessing the long-term maintenance needs of an individual storm water facility and for formulating a proactive and preventive maintenance plan rather than a reactive one.

A centralized database should be created that allows for information associated with any one facility or asset to be pulled up with little effort. Maintenance history, age, condition, material, and size of this asset would all be tied to the unique ID of the asset. Any work performed on the asset could be tracked in this manner.

A comprehensive recording and database management system can be used as a tool for scheduling O&M activities. Keeping track of resources and assets will allow for the prioritization of O&M activities based on information for each asset in the database, such as maintenance history and complaint log. The use of resources can then be optimized.

4.3.2.3 Frequency of Maintenance

Maintenance frequency describes how often a maintenance function must be performed. Conducting systematic preventive maintenance is important to ensure that storm water facilities function as designed. Preventive maintenance has the potential to reduce reactive-type emergency work orders. The City should begin to prepare for NPDES Phase II compliance by instituting preventive maintenance in the form of inspections and cleaning as outlined and scheduled in the NPDES Phase II Permit requirements and the Ecology Manual. The NPDES Phase II Permit outlines the following performance measures related to frequency of maintenance:

- Perform annual inspection of all municipally owned or operated permanent storm water treatment and flow control facilities; take appropriate maintenance actions in accordance with the adopted maintenance standards.
- Establish an inspection (and enforcement) program for privately owned facilities on an annual, semi-annual, or even on a quarterly basis.

- Conduct spot checks of potentially damaged permanent treatment and flow control facilities (other than catch basins) after major storm events (10-year, 24-hour, for example).

4.3.2.4 Costs of Drainage Maintenance and Operation Activities

Limited information is available on the costs per unit to maintain and operate drainage infrastructure elements in the Centralia area. Table 4-4 includes costs for O&M activities from different jurisdictions (Seattle Public Utilities and King County). These data represent costs per unit for various O&M activities conducted in large jurisdictions with relatively short distances between structures; therefore, these cost estimates may underestimate the true cost to perform these activities in Centralia, where much of the land use is of low density. However, these numbers provide an order-of-magnitude estimate for the cost associated with several O&M activities that are performed within the City of Centralia.

TABLE 4-4
Drainage O&M Activities

Type of Structure	Activity	Cost per Unit[a]
Drainage Pipes	Jet Rod (for debris)	$2.07/linear foot (LF)
	Machine Rod (roots)	$0.90/LF
	Hydrocut (debris and roots)	$1.07/LF
Culverts	Clean Culvert	$15.00 each (EA)
	Hand Clean Culvert	$50.00 EA
Catch Basins	Inspect Catch Basin	$7.00 EA
	Clean Catch Basin	$45.10 EA
Drainage Ditches	Inspect Ditch	$0.25/LF
	Perform Ditch Maintenance	$1.50/LF
Facilities (ponds, tanks, vaults)	Inspect Retention/Detention Pond	$300.00 EA

[a] Costs were derived from both Seattle Public Utilities and King County data. Unit costs for Seattle Public Utilities were based on activities conducted during 2004 and the first three quarters of 2005. Unit costs for King County were based on budget and performance for the years 1999 and 2000 with adjustments to 2005 dollars. Stated costs are estimates and do not include costs of transportation/disposal of waste materials from catch basins, ditches, and other facilities.

4.3.2.5 Additional Resources

As the drainage infrastructure ages, more resources should be dedicated to its upkeep. Existing facilities that may be at or beyond design life should be inspected to determine whether repair, replacement, or upgrade is necessary. Many assets that are currently part of the drainage infrastructure system may be undersized or otherwise not able to convey current demands because they were originally sized for pre-development or less developed conditions. This may become more of a problem as the City of Centralia continues to grow and the infrastructure continues to age.

The City of Centralia owns an electronic database (GBA) that can be used as a tool to help the City become more proactive in its O&M program. Using a completed database that is regularly updated with new data, a planned inspection program can be used to target aging

infrastructure and other portions of the drainage system that are often problematic. Repair and rehabilitation activities can be prioritized based on age and risk of failure of any asset in the system.

As the City of Centralia's population continues to grow, maintenance demands will increase. The City should use its repair and replacement budget to replace and/or upgrade its equipment as needed to meet these increasing demands. New technologies should be implemented as they become available to increase effectiveness.

4.4 Implementation Stages

Three implementation stages are presented in this Plan (i.e., Stages 1, 2, 3). Achieving each stage will provide greater compliance with the NPDES Phase II Permit over time. Successfully achieving all stages will bring the City to complete compliance.

Each stage was given a deadline (i.e., Stage 1, end of 2008; Stage 2, end of 2010; and Stage 3, end of 2012). The pre-permit corresponds to the conditions as of the end of the 2006 O&M cycle. These deadlines are guidelines for the City, so that the City of Centralia can reach compliance with the Phase II NPDES Permit in 2012. The deadlines for Stages 1 and 2 are not requirements of the NPDES Permit. Although the City has the possibility to modify this guideline, it is recommended that the City follow it as the guideline paces compliance measures into 2-year stages to better meet the realities of available budget.

A cornerstone of this Plan is the assumption that until the final stage of compliance (Stage 3), additional work can be done with the same level of FTEs, by increasing the efficiencies and coordination of the workforce (Section 4.2). All of the stages are described in greater detail below and summarized in Tables 4-2 and 4-5.

4.4.1 Centralia 2006 Storm Water Program: Stage 1

According to 2005 City records, the pre-permit level of service for O&M costs the City approximately $411,000 per year for both labor and equipment (Table 4-5). The City of Centralia's current O&M program requires three FTEs to perform the work. The service items provided under the current O&M program are listed in Table 4-5, and it should be noted that the City relies on citizen complaints to initiate service and is therefore mostly reactionary in performing these service items.

4.4.1.1 Existing Storm Water Facilities Maintenance Program

The City currently has two different departments that contribute to inspection and maintenance of the City's storm water facilities: the Street Department and the Waste Water Department. The Street Department handles surface-related elements, such as ditch maintenance, shoulder grading, and catch basin grate repairs. The Waste Water Department provides support on an as-needed basis for underground elements, including storm line cleaning/vactoring. The Street Department Operation Manager is responsible for scheduling work and coordinating resources.

TABLE 4-5
City of Centralia Current Surface/Storm Water Maintenance Program

Item No.	Maintenance Activity	Units to be Maintained	Production Unit	Frequency (times/yr)	Daily Production	Crew Size	Equipment	Annual Crew Days	Annual Person Days	Full-time Labor Equivalent	Annual Labor Cost ($)	Annual Equipment Cost ($)	Annual Other Cost ($)	Total Annual Cost	% of Program
1	Clean Catch Basins	1,100	Each	0.05	15	2	1 Jet Vac Truck	4	12	0.05	$3,137	$5,331	$0	$3,137	1
2	Clean Roadside Ditches (remove sediments)	1,500	LF	0.1	1,500	3	1 Backhoe 2 Dump Trucks	0.1	0.3	0	$78	$450	$0	$78	0
3	Clean Roadside Ditches (vegetation control)	1,500	LF	1	1,500	5	1 Mower	0.5	2.5	0.01	$654	$0	$500	$1,154	0
4	Street Sweeping	3,840	Mile	0.083	16	1	1 Street Sweeper	225	225	1.02	$88,236	$43,614	$0	$131,850	32
5	Shoulder Grading for Storm Drainage	72,336	LF	0.18	220	4	1 Grader	60	240	1.09	$62,746	$44,947	$0	$62,746	15
6	Leaf Pick-up	230	Hours	1	32	4	1 Truck 1 Dump Truck	7	28	0.13	$7,320	$24,452	$0	$7,320	2
7	Clean Strom Drains	2,800	LF	0.02	3	2	1 Jet Vac Truck	2.4	4.8	0.02	$1,255	$2,132	$0	$1,255	0
8	Inspect/Clean Manholes	492	Each	0.05	15	2	1 Jet Vac Truck	1.6	4.8	0.02	$1,255	$2,132	$0	$1,255	0
9	Manhole Maintenance	492	Each	0.0125	0.5	2	1 Backhoe 1 Dump Truck	12.3	36.9	0.17	$9,647	$31,250	$0	$9,647	2
10	Maintain Drywells	86	Each	0.07	0.5	2	1 Backhoe 1 Dump Truck	12	36	0.16	$9,412	$15,993	$0	$9,412	2
11	Clean Culverts	22	Each	0.1	4	2	1 Jet Vac Truck 1 Truck	0.6	1.2	0.01	$314	$757	$0	$314	0
12	Mow Levees	1	Each	1	0.2	1	1 Mower	5	5	0.02	$1,307	$0	$0	$1,307	0
13	Additional Fall Maintenance	N/A	N/A	N/A	N/A	5	1 1.5-ton Flatbed	10	50	0.23	$13,072	$18,248	$0	$13,072	3
14	Disposal Costs (catch basin cleaning)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$1,500	$1,500	0
15	Disposal Costs (street sweeping)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$35,000	$35,000	9
16	Disposal Costs (leaf pick-up)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$5,000	$5,000	1
17	Other supplies and Services	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$66,000	$66,000	16
18	Equipment Rental Fund	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$15,000	$15,000	4
19	Amortized Vactor Truck Purchase	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$3,800	$3,800	1
20	Amortized Street Sweeper Purchase	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$24,700	$24,700	6
21	Administrative Expenses	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$17,000	$17,000	4
								Total	646.5	**2.93**	$198,433	$189,306	$168,500	**$410,547**	100

Reference: R.W. Beck 2002 Operation and Maintenance, Section 4

4.4.1.2 Drainage Complaints and Other Citizen Inquiries

The majority of citizen's complaints about drainage are referred to the City Utilities Department. Currently, the City maintains a central database of complaints and then routes the complaints to the street department for attention. When appropriate the City personnel meet with the property owner to investigate the complaint.

The City performs the work if it is a maintenance issue. If the solution to the complaint requires construction, the City may hire a contractor.

4.4.1.3 Pre-Permit (2006) Current Surface/Storm Water System Inventory

Storm water facilities include the storm water conveyance system (i.e., storm water pipe, ditches, catch basins, and other structures) and retention/detention facilities. Concurrent with the development of this Plan, the City of Centralia is in the process of completing an inventory of the drainage system to develop an updated map and database of the City's storm water system. The inventory should be completed and kept current by the City upon completion of this Plan.

The City's storm water facilities consist of the following system elements:

- 153,300 linear feet of storm water conveyance pipe*
- Unknown linear feet of open ditch
- 1,533 catch basins*
- 71 drywells
- 511 manholes
- 16 retention/detention storm water facilities
- 31 outlets

* Estimate based on the assumption that there are three catch basins and 300 linear feet of storm water conveyance pipe per manhole.

The preliminary information provided above is to be verified against the completed inventory performed by the City, as it differs slightly from the information presented in the RW Beck 2002 O&M Section 4, Table 4-1 (see Appendix A of this Surface/Storm Water Management Plan). The City shall develop/update this database and a storm sewer system map no later than 4 years from the effective date of the City NPDES Phase II Permit.

4.4.2 Stage 1 (2008)

Stage 1 of the O&M would not require additional FTEs to perform the work. The O&M team, still working in mainly a reactive manner, would complete the City's surface/storm water database, perform some inspection of new development sites, and incorporate new action items necessary to satisfy the NPDES Phase II Permit requirements (Table 4-2). The cost of the O&M program is not expected to increase (in comparison to the pre-permit level of service), as efficiencies and coordination would offset the cost of completion of additional service items.

4.4.3 Stage 2 (2010)

Stage 2 would not require additional FTEs to perform the work; however, the O&M program would be delivered by only one department. Housing the surface/storm water operations and maintenance program under one department would help simplify coordination by decreasing the number of supervisors for the program to one, eliminating coordination issues and focusing accountability and authority. The O&M program would become more proactive, using the database to determine and administer a maintenance schedule. The O&M team would continue to perform new action items necessary to satisfy the NPDES Phase II Permit requirements, but staff would receive additional training to improve their efficiency and their ability to use the database. A more cost-effective maintenance route would also be determined, with a centralized dispatching mechanism (i.e., one department) to implement and oversee this new route. The City would continue to assume responsibility for the City surface/storm water system elements and begin taking responsibility for private developers' additions to the system. The maintenance of private systems could be completed by:

- City crews
- A private firm with whom the City could contract to perform the maintenance
- Owners of private systems, for which the City could develop a program to communicate in writing and with personal visits with these owners to require them to perform maintenance (this alternative would likely require adoption of a mechanism establishing authority for the City to require and enforce maintenance through citations and penalties for failure to do so)

The City should develop a semiannual inspection program of new development and recently developed sites. In addition, the City should prepare for and respond to the ESA. The cost to deliver Stage 2 is expected to increase by 10 to 20 percent over the pre-permit level of service.

In Stage 2, the City will have to comply with O&M regulations of the NPDES Phase II Permit presented in Items 4.b, 4.c, and 4.f of Table 2-1 in this Surface/Storm Water Management Plan. Those requirements are:

- Include a permitting process with plan review, inspection and enforcement capability to meet the standards listed for both private and public projects, using qualified personnel, within 30 months from the effective date of this Permit. At a minimum, this program shall be applied to all sites that disturb a land area of 1 acre or greater, including projects of less than 1 acre that are part of a larger common plan of the development or sale.
- Include provisions to ensure adequate long-term O&M of post-construction storm water facilities and BMPs that are permitted and constructed pursuant to Table 2-1, item 4b in this Plan, within 30 months from the effective date.
- Within 30 months from the effective date of this NPDES Permit, ensure that all staff responsible for implementing the program to control storm water runoff from new development, redevelopment, and construction sites, including permitting, plan review, construction site inspections, and enforcement, are trained to conduct these activities. Follow-up training shall be provided as needed to address changes in procedures,

techniques or staffing. Permittees shall document and maintain records of the training provided and the staff trained.

4.4.4 Stage 3 (2012)

Stage 3 is in many ways similar to Stage 2, though it differs in the understanding that to achieve all the NPDES Phase II Permit requirements, an increase in FTEs assigned to manage storm water will be needed. Stage 3 also involves an organizational change in how the surface/storm water O&M function is provided. Under Stage 3, the City should create a Surface/Storm Water Department that will be able to concentrate on efficiency, coordination, and management of the City's Surface/Storm Water Management Program. The City may further address the organizational and efficiency issues by providing cross-training of maintenance needs and activities and formal communication systems.

Under Stage 3, the City would apply the strategy developed for ESA compliance, be mostly proactive, be responsible for the City's surface/storm water system, perform construction inspections of developers' additions during new development, and provide quarterly inspections of recently developed sites. The cost is expected to increase by 40 to 50 percent to implement all of these activities.

4.5 Recommendations

To meet all of the NPDES Phase II Permit requirements, it is recommended that the City move at a progressive pace towards meeting Stage 3 compliance. Table 4-6, below, provides an overview of the compliance program status by stages from 2006 through 2012.

To help determine the financial implications, a budget for each stage should be prepared when the City has O&M cost information for its 2006 program year. Table 4-5 is a tool that can be used to evaluate financial implications. By using Table 4-5 as a template, the City can determine costs by adding new service items as required to achieve each stage of Permit compliance (see Table 4-2). The departments providing the surface/storm water O&M should determine the actual daily production, crew size, and equipment needed to perform new action items.

If the recommended schedule is not financially feasible for the City, an incremental approach is recommended, and alternative funding options (see Section 5.4) should be considered.

TABLE 4-6
Summary of Program Status by Stages

	Pre-Permit	Stage 1	Stage 2	Stage 3
Responsibility for Maintenance and Inspection Requirements	Be responsible only for the City's storm water system.	Be responsible only for the City's storm water system.	Be responsible for the City's storm water system and for the private developers' additions.	Be responsible for the City's storm water system and for the private developers' additions.
	No Inspection of new development sites and recently developed sites for compliance with O&M.	Irregular inspection of new development sites and recently developed sites for compliance with O&M.	Inspection of construction sites and semi-annual inspection of new development sites and recently developed sites for compliance with O&M.	Inspection of construction sites and quarterly inspection of new development sites and recently developed sites for compliance with O&M.
Documentation/Database Management	Database completion in progress.	Complete and well-managed database.	Complete and well-managed database.	Complete and well-managed database.
Frequency of Maintenance	Primarily reactive, proactive in some cases.	Primarily reactive, proactive in some cases.	Proactive.	Proactive.
Federal Endangered Species Act Compliance	No ESA compliance.	No ESA compliance.	Develop a strategy to prepare for and respond to the ESA.	Apply developed strategy to prepare for and respond to ESA.
Full-Time Equivalent	3	3	3	4
Utility	Street Department and Waste Water Department	Street Department and Waste Water Department	Single existing department (Streets or Waste Water)	Surface/Storm Water Department
Supervisor	1-Street Department 1-Waste Water Department	1-Street Department 1-Waste Water Department	1-single existing department	1-Surface/Storm Water Department
Cost to Deliver the Level of Service	$411,000	$411,000	Current cost is expected to increase by 10 to 20%	Current cost is expected to increase by 40 to 50%

SECTION 5

Alternatives

5.1 Introduction

A 6-year capital improvement project (CIP) plan is presented in this section, along with funding alternatives and their relative benefits. Solutions for surface runoff and ponding, water quality, and aquatic habitat issues identified in Section 3 are discussed in this section. Some problems have structural (capital project) solutions, while others have programmatic solutions, and several problems have both types of solutions. As with the recommendations for O&M in the previous section, funding and related timing of programmatic and CIP changes to the current storm water management system will require a phased approach.

5.2 Storm Water Management Program

Potential solutions to Centralia's storm water problems were divided into two categories. One category, programmatic approaches, would not involve construction or land acquisition; the other category, capital improvement projects would require land acquisition and/or construction. Together as a group, the capital improvement projects constitute the proposed CIP plan for surface/storm water for the City of Centralia.

The programmatic alternatives have the benefit of often being strategic rather than reactionary. Instead of fixing a single problem with a structural solution, programmatic alternatives often address a series of existing problems and are effective at preventing future problems. The combination of programmatic actions and capital improvements comprise the storm water management program SWMP.

5.2.1 Summary of Issues that Require a Programmatic Approach

5.2.1.1 Regulatory Requirements and Guidance

Ecology's Phase II NPDES Municipal Storm Water Permit lists programmatic requirements for permittees. These include:

- Public Education and Outreach
- Public Involvement and Participation
- Illicit Discharge Detection and Elimination (includes requirements for inventory of the drainage system)
- Controlling Runoff from New Development, Redevelopment, and Construction Sites
- Pollution Prevention and Operations and Maintenance for Municipal Operations

Each of these five NPDES Phase II requirements is implemented with a set of minimum performance measures outlined in the Permit and described in Section 2 of this Plan.

Other requirements of the NPDES Phase II Permit stipulate that the Permittee should take the following actions:

- Develop and implement a storm water management program
- Report any monitoring studies
- Assess effectiveness of BMPs and any changes needed
- Prepare a plan for a future comprehensive, long-term monitoring program
- Submit a detailed annual report of the status of storm water management program implementation to Ecology

5.2.1.2 Surface Runoff and Ponding

Some of the issues presented in Section 3 were related to maintenance—specifically catch basins plugged by trash, a condition that affects surface runoff and ponding. During field reconnaissance, a large amount of trash was noticed in catch basins, such as pillows, cans, papers, etc. The City should develop and implement a program of educating the citizens of Centralia to minimize the trash thrown onto the streets and other surfaces. Public garbage receptacles should be readily available and well maintained.

5.2.1.3 Water Quality

Urban storm water typically contains suspended solids, heavy metals, nutrients, and petroleum products at levels that exceed state water quality standards for receiving waters. Water quality is briefly discussed in Section 3.3; however; the water quality issues were not tabulated in Table 3-1, as the focus was primarily on surface runoff and ponding issues. Nevertheless, it is known that the Chehalis River in the vicinity of Centralia has some historic problems with low DO (Pickett, 1994).

Elevated fecal coliform bacteria levels have also been documented as a surface water issue in the Upper Chehalis River basin, where there are several potential sources of fecal coliform bacteria:

- The conveyance and waste water treatment system
- Dogs and cats
- Livestock
- Commercial sources
- Recreational vehicles and trailers
- Wildlife
- Waterfowl (e.g., ducks and geese)
- Septic systems
- People

Each of these potential sources is discussed below, and a BMP solution is recommended.

The conveyance and waste water treatment system

The City has an existing permit for operation of a wastewater treatment plant and collection system. The treatment plant outfall discharges to the Chehalis River and is an unlikely

source of bacteria. However, all collection systems have a potential for leaks and infiltration. The City should have an ongoing program to detect and correct leaks and infiltration.

Dogs and cats

Dogs, cats, and other outdoor pets are likely sources of fecal bacteria, particularly near streams. A program of education regarding picking up dog and cat waste is recommended. Signs and free bags and ample waste receptacles should be provided in parks and near streams and ponds.

Livestock

There are no large commercial livestock operations within the watershed, but there are a few small farms with livestock. The City should coordinate with the Lewis County Conservation District to work with these owners to develop appropriate manure management practices and to limit livestock access to streams.

Industrial sources

No potential industrial sources of bacteria have been identified within the watershed.

Recreational vehicles and trailers, commercial trailer parks

An inventory of holding tank dump sites at trailer parks should be conducted. Routine, unannounced inspections of trailer parks should be conducted to detect trailers that are not connected to sanitary sewers, and counters should be installed on pump-out stations to determine frequency of use. An educational program should be implemented for commercial and public parks.

Wildlife

Geese are particularly attracted to large areas of open grass, such as those commonly found in residential and recreational areas near water bodies. Wildlife such as geese can cause elevated fecal coliform readings in water, indicative of harmful biological contamination levels. Contamination from wildlife has the potential to pose a problem in Centralia's many wetlands and storm water ponds; therefore, the City should implement a monitoring program to determine if the presence of waterfowl is a concern. This monitoring program should begin with a simple visual inspection, such as a field survey to see if there are large concentrations of geese in open areas along the City's surface water resources. The presence of geese and/or their waste should be noted. If there are areas where geese congregate, then the second phase of monitoring should be implemented: water quality testing of fecal coliform levels. Should fecal coliform levels indicate a contamination problem, there are several control measures that can be implemented, such as replacing large, open shoreline areas with native shrubs, using trained goose-control dogs to discourage geese from congregating, and developing a signage program to explain the issue and discourage the feeding of ducks and geese.

People

Large numbers of tourist visit Centralia for its historical atmosphere and its large antique shops. Public restrooms should be readily available and well maintained.

5.2.1.4 Aquatic Habitat

Aquatic habitat is discussed in Section 3.4; however, the aquatic habitat problems were not tabulated in Table 3-1, as the citizen complaints database and feedback from the City's

Surface/Storm Water Citizens Advisory Board emphasized only surface runoff and ponding issues. Nevertheless, based on the results of a literature search, Centralia does have some impassable culverts (Lewis County Conservation District, 2005) for salmonids. Reports show that creeks were surveyed for passable and impassable culverts in the Upper Chehalis Basin. When culverts were evaluated they fell into the categories of impassable, passable, or unknown, based on the ability to pass a 6-inch trout. If a culvert is rated impassable it is not necessarily a total barrier to fish passage. It can instead cause a delay or limit a certain life stage of the salmonid. A passable culvert allows the 6-inch fish to pass the culvert at all times. Barrier status was not determined for culverts designated as unknown. Table 5-1 presents passability data for culverts on the mainstems of the five creeks in the City of Centralia.

TABLE 5-1
Passable vs. Impassable Culverts

Creek	Passable	Impassable	Unknown
Salzer	4	8	0
Scammon	7	8	2
China	7	3	3
Coffee	1	8	1
Cook	2	0	0

Note: The mainstems of the creeks were evaluated.

The City of Centralia should further refine these findings by doing its own survey within the UGA. Culverts that are determined to be impassable to salmonids should be replaced. Programs to protect and restore aquatic habitat along the creeks listed above should be supported by the City. In addition to the physical improvements, restoration programs could provide good educational and stewardship benefits.

5.2.2 Recommendations for Programmatic Solutions

5.2.2.1 Complaint Response

The public should be provided with a single phone number to call with complaints regarding drainage, erosion, water quality, or aquatic habitat issues. The City should place signs along creeks and at key locations providing the contact information to report surface water issues. Utilities staff should be trained to collect appropriate information, track calls by type and location, and notify appropriate personnel to determine response. Staff should respond to all complaints within 24 hours, even if just to acknowledge receipt of the complaint. The City's existing tracking system, George Butler Associates Master Series Infrastructure & Asset Management software (GBA), will be used to address and resolve complaints or explain why complaints are not addressed. Complaint records should be periodically reviewed to identify "hot spots" of repeated or interrelated complaints, and comprehensive solutions should be developed for them.

5.2.2.2 Inspections and Illicit Connections

An inventory of the storm drainage system in the City of Centralia should be completed. All outfalls should be identified. An inspection program to detect and eliminate illicit connections to the storm water system should be developed and implemented.

A program should be established to annually inspect public and private drainage facilities, such as storm water ponds. This program would require a significant element of education for property owners, many of whom do not understand their systems or the importance of regular maintenance.

The City should arrange for periodic inspections of RVs and trailers to ensure that there are no discharge pipes from holding tanks discharging sewage to ditches or streams.

The City of Centralia Wastewater Utility should implement an annual inspection program to detect storm water discharges to the sanitary sewer and identify areas where groundwater is leaking into the sanitary sewer or sewage is leaking out of the system. The City should implement a program to correct problems once they are identified.

The Lewis County Health Department recommends that homeowners have their septic tanks and drainfields inspected yearly and septic tanks pumped once every 3 to 5 years. Homeowners who have septic tanks should become familiar with the Lewis County Code, Title 8, Health and Safety, section 40.150 and 40.160, which codify the inspection and operation and maintenance of their septic system. The City Utilities Department should coordinate with the County Health Department to develop a program of on-site sewage-system inspections at least once every 5 years.

Some warning signs of a septic system failure include the following:

- Odors, surfacing sewage, or soggy spots with lush green grass growth in the drainfield or septic tank area
- Plumbing or septic tank backups
- Slow-draining fixtures
- Gurgling sounds in the plumbing system

Information regarding illicit discharges to the storm water system should be provided to community groups. If citizens notice suspicious pipes discharging to a ditch or stream, or if they notice odors, sheens, colors, or turbidity, they should contact the City Utilities Department. Note that this will require discussion and training in citizen complaint tracking and response for Utilities staff.

5.2.2.3 Spill Response

Supplies of absorbents and booms should be available on all maintenance trucks belonging to the Utilities, as well as on all fire trucks. Crews should be trained in recognizing and responding to spills. The City should continue to implement and update its existing spill response plan.

5.2.2.4 Education

Changing people's behavior patterns can be very effective in the implementation of programmatic solutions to improve surface water issues. The first step in changing behavior patterns is to increase the understanding of the need for the change and the specific actions that individuals can take. This requires an education program for commercial property owners, maintenance crews, homeowners associations, livestock owners, pet owners, RV owners, and visitors.

A list of recommended educational topics and actions includes the following:

- Interpretive panels and displays located at strategic locations
- Support for local, environmentally focused volunteer organizations (Funding would help to develop educational materials, execute lab tests for volunteer monitoring activities, and pursue a small grants program. Staff time would also be required to coordinate activities.)
- Support for community activities such as volunteer clean-up, native plant days, and waterfront celebrations or festivals
- Regular articles and advertisements in the local Centralia newspaper
- Display materials for festivals and other special events
- Information on surface/storm water management on the City web site
- Septic system maintenance information
- Lawn and garden care; nutrient and pesticide management
- Teaching materials and opportunities for water-quality related actions for local schools
- Pet waste
- Technical assistance to citizen organizations, developers, and commercial property owners
- Training for maintenance and permit review staff
- Display boards and fliers for campgrounds and trailer parks
- Information to homeowners associations regarding proper maintenance of drainage systems
- Manure and erosion management training for livestock owners conducted by Lewis County Conservation District (funding would be needed for one-on-one visits and technical assistance)

Refer to Table 5-2 for a list of specific needs for educational actions, and their costs.

TABLE 5-2
Proposed City Of Centralia Watershed Education Program

Issue or Potential Pollutant Source	Audience	Message	Media	Existing City/County Resource	Additional Resources Needed	One-time Cost of Additional Need ($)	Annual Cost of Additional Need ($)[a]
Dogs and cats	Pet owners	Confine pets, pick up waste	General community education media, provide signs and free "mutt mitts" in parks and near streams and ponds	none	Small grants program	15,000	x
Livestock	Owners	Keep manure out of stream, protect soil	Manure and erosion management conducted by Cooperative Extension Programs	"Taking care of streams in WA, OR, and ID," from Pacific NW Cooperative Extension "Tips Handbook for Small Farms," from Whatcom County	One-on-one contacts by Lewis County Conservation District	15,000	5,000
Commercial sources	Owners and operators	Awareness, source control	Brochures, inspections, individual contact if problems noticed	none	Storm water specialist, 0.5 FTE	5,000	35,000
Recreational vehicles and trailers	Owners and operators	Use dump station	Display boards and fliers for campgrounds and trailer parks	none	Materials and installation	25,000	x
Wildlife	General public	Focus on human-induced issues	General community education media	none	Storm water specialist	-	x
Waterfowl (ducks and geese)	Property owners and park maintenance	Modify grass areas, don't feed	If problem identified, work with park maintenance crews and land owners to develop plans and implement alternatives to large grassy areas to discourage waterfowl; signs along bodies of water and in parks	none	If problem identified, storm water specialist, materials, and installation	[b]	x
On-site septic systems	Property owners	Clean, maintain, test, and repair systems	Septic system maintenance	Health Department brochures	Storm water specialist	-	x

TABLE 5-2
Proposed City Of Centralia Watershed Education Program

Issue or Potential Pollutant Source	Audience	Message	Media	Existing City/County Resource	Additional Resources Needed	One-time Cost of Additional Need ($)	Annual Cost of Additional Need ($)[a]
People	Visitors	Use public restrooms	Signs along bodies of water and in parks	none	Materials and installation	20,000	-
Improperly maintained detention facilities	Homeowners associations	Maintain detention ponds and conveyances	Brochures, inspections, individual contact if problems noticed	none	Storm water specialist	5,000	x
New development	Developers, developer engineers, County plan reviewers, inspectors and maintenance staff	Technical issues and solutions, critical factors affecting performance	Provide technical assistance to citizen organizations, developers, and staff; formal training programs for staff and private engineers	none	Develop training materials, staff time for technical assistance, provide training; initial cost to develop materials and provide one round of training: $50,000; annual cost to provide training: storm water specialist and staff	50,000	x
Road maintenance	Road maintenance staff and managers	Awareness of issues, how to identify problems, BMPs for maintenance	Provide training to maintenance and permit review staff	none	Storm water specialist	x	x
General	Residents and visitors	Awareness of issues and specific measures that individuals can do	Support local, environmentally focused volunteer organizations	none	Storm water specialist, small grants program	x	x
			Support community activities such as volunteer clean-up and native plant days and waterfront celebrations or festivals	none	Storm water specialist, small grants program	x	x

TABLE 5-2
Proposed City Of Centralia Watershed Education Program

Issue or Potential Pollutant Source	Audience	Message	Media	Existing City/County Resource	Additional Resources Needed	One-time Cost of Additional Need ($)	Annual Cost of Additional Need ($)[a]
			Regular articles and advertisements in the local Centralia newspaper	none	Storm water specialist	5,000	x
			Display materials for festivals and other special events	none	Storm water specialist	5,000	x
			Maintain internet information	none	Storm water specialist	x	x
			Septic system maintenance	none	Storm water specialist	x	x
			Lawn and garden care, nutrient and pesticide management	none	Storm water specialist	x	x
			Work with local schools to provide teaching materials and opportunities for water-quality related actions	none	Storm water specialist, small grants program	x	x
			Provide technical assistance to citizen organizations, developers, and commercial property owners	none	Storm water specialist	x	x
TOTAL						**145,000**	**40,000**

[a] x = provided by storm water specialist staff position
[b] Total will need to be adjusted to include additional $20,000 one-time cost to address problem if one is identified.

5.2.2.5 Monitoring

In accordance with the NPDES Phase II Permit conditions, a coordinated monitoring program should be developed during this 5-year Permit term. This monitoring program will not be implemented before the next permit term (i.e., in 5 years). It is recommended that the City of Centralia contact Keith Paulson of the City of Bellevue, Washington, to join the monitoring regional approach group.

Monitoring programs should include three elements:

- Compliance monitoring: Were program actions implemented?
- Effectiveness: Did the actions achieve objectives?
- Validation: Did the objectives achieve the goals?

The first and most important question to resolve is how the monitoring information would be used to modify management actions. The monitoring program should be long-term to identify trends. A work group should be formed in the City to answer this question and plan a monitoring program accordingly. The monitoring program should be adjusted periodically to increase its value, but care should be taken to sustain a program in a consistent format so that data can be compared and trends identified.

The program should include an element for volunteer training and coordination. Much of the key monitoring may be visual indicators such as oil sheens, surveys of bird and pet concentrations, and storm water that is discolored or has high turbidity.

Following adoption of this storm water plan, the City should review implementation of the recommended actions (i.e., compliance monitoring) annually. At the same time, staff should present a list of specific potential contamination sources identified and whether or not they were reduced or eliminated (i.e., effectiveness monitoring). This could be incorporated with the annual budget review process. The annual review should include a summary of Lewis County Department of Health annual monitoring of fecal coliform bacteria in the City of Centralia and an analysis of implications for the effectiveness of the programs.

Refer to Table 5-3 for a list of specific needs for monitoring actions and their costs. It is recommended that the City identify some points of compliance to monitor storm water quality. Low-flow studies should be conducted to evaluate actual concentrations during summer months.

Metals, pesticides, and fecal coliform bacteria monitoring has been considered and is not recommended at this point. The City should first implement basic measures to clean up the storm water and perform a series of visual monitoring and volunteer activities.

In the case of pesticides, similar community testing for a broad range of pesticides using EPA's method 8270 has found that the results did not detect pesticides. Monitoring for specific pesticides is possible; however, each test for each sample costs about $200 (in 2007 dollars). Centralia would first want to establish what pesticides are being used and limit the testing to just those pesticides. Based upon the available information, pesticide monitoring is not recommended at this time.

Table 5-4 presents fecal coliform and metals monitoring information that could be used if the City decides to add these parameters to its monitoring plan.

5.2.2.7 Regulations

The City should take the following steps to meet regulatory standards:

- Perform regular inspections of all new construction sites to ensure proper erosion and sediment control and construction of the drainage system.
- Prohibit discharge of pollutants to the storm water system.
- Adopt requirements for infiltration and reduced impervious surface.

Additional recommendations for additions and modifications to regulations are discussed in Section 2.

5.2.2.8 Recordkeeping and Annual Reporting

The NPDES Permit requires that the City keep records of key activities, including the following:

- Storm Water Management Plan development and implementation
- Annual reporting of Storm Water Management Plan effectiveness
- Reporting of number of inspections
- Reporting of enforcement actions
- Reporting of educational activities

5.2.2.9 Storm Water Specialist

Many of the City of Centralia's needs could be addressed by having a staff person dedicated to the surface runoff and ponding, quality, and habitat issues. Many jurisdictions have identified these staff as storm water specialists. This is the person who residents know to call and who coordinates all of the activities of the watershed. Approximately one half-time (0.5 FTE) person is needed to provide the education and coordination of related activities in the watershed. Approximately 20 percent of a full-time person (0.2 FTE) is needed to conduct or coordinate monitoring activity in the watershed. Additional support in inspections and illicit connections and report keeping increases the storm water specialist position to 0.9 FTE (Table 5-7). For budgeting purposes in this report, it is assumed that the total annual cost of the storm water specialist would be $70,000 in 2007 dollars. A permanent and dedicated funding source should be found for this position.

TABLE 5-3
Proposed City Of Centralia Storm Water Monitoring Program

Common Pollutants of Concern and Other Issues	Typical Sources	Indicator or Parameter	Monitoring Approach				Existing City/County Resource	Additional Resources Needed	One-time Cost of Additional Need ($)	Annual Cost of Additional Need ($)[a]
			Targeting and Phasing	Frequency	Staff	Volunteers				
Total Suspended Solids (TSS) and Turbidity	Construction, stream channel erosion, landslides, roadside ditches, soil erosion from yards and fields, brake and tire wear, dust, pavement wear, road sanding	TSS and/or turbidity	Regular visual inspections to identify locations with frequent problems	Monthly, random days	Organize and train volunteers to conduct visual inspections	Available to provide visual monitoring		Storm water specialist	0	x
Nutrients	Detergents and fertilizers, failing septic systems or leaking wastewater systems	Total and dissolved phosphorus, nitrogen; visual indicators include excessive algae and vegetation growth	Regular visual inspections to identify locations with frequent problems	Annual	Organize and train volunteers to conduct visual inspections	Available to provide visual monitoring		Storm water specialist	0	x
Low Dissolved Oxygen (DO)	Organic matter decomposition, elevated temperatures	DO measurement with a hand-held unit	Regular inspections to identify locations with frequent problems	Monthly, random days	Organize and train volunteers	Available to provide visual monitoring		Storm water specialist	0	x

TABLE 5-3
Proposed City Of Centralia Storm Water Monitoring Program

Common Pollutants of Concern and Other Issues	Typical Sources	Indicator or Parameter	Monitoring Approach				Existing City/County Resource	Additional Resources Needed	One-time Cost of Additional Need ($)	Annual Cost of Additional Need ($)[a]
			Targeting and Phasing	Frequency	Staff	Volunteers				
High Water Temperature	Can be associated with low velocity, and/or lack of shade	Temperature	Regular inspections to identify locations with frequent problems	Monthly, random days	Organize and train volunteers	Available to measure temperature		Storm water specialist	0	x
Hydrocarbons	Vehicle exhaust, leaks and drips	Visual indicators include oil sheen on surface water	Regular visual inspections to identify locations with frequent problems	Monthly, random days	Organize and train volunteers to conduct visual inspections	Available to provide visual monitoring		Storm water specialist	0	x
Data Management								0.1 FTE	0	$10,000
Overall coordination								Storm water specialist	0	x
Total Cost									0	$10,000

[a] x = Provided by storm water specialist

TABLE 5-4
Additional Possible Monitoring

Common Pollutants of Concern and Other Issues	Typical Sources	Indicator or Parameter	Monitoring Approach				Existing City/County Resource	Additional Resources Needed	One-time Cost of Additional Need ($)	Annual Cost of Additional Need ($)[a]
			Targeting and Phasing	Frequency	Staff	Volunteers				
Human pathogens such as cholera and salmonella	Septic systems, boats, trailers and motor homes, leaking sewers, people outdoors	Coliform bacteria or optical brighteners	Coliform counts at storm water outfalls first, then upstream of problem areas to source. Pilot-test RNA source tracing and optical brighteners, then expand to additional locations as appropriate.	Monthly, random days	Organize and train volunteers to collect samples, manage laboratory testing and data management	Available to help collect samples	Knowledgeable staff but limited availability	Storm water specialist, 0.2 FTE; consultant and laboratory assistance to conduct pilot tests	$100,000	$20,000
Heavy metals	Heavy metals are generated from vehicle engines, body wear, and emissions	Total and dissolved zinc and copper	Evaluate the potential of heavy metals contamination to receiving water.	Annual	Organize and train volunteers to collect samples, manage laboratory testing and data management	Available to help collect samples	Knowledgeable staff but limited availability	Storm water specialist, 0.2 FTE; consultant and laboratory assistance to conduct pilot tests	$100,000	$20,000
Total Cost									$200,000	$40,000

[a] x = Provided by storm water specialist

5.2.3 Summary of Programmatic Recommendations

The programmatic action recommendations, costs, and staff requirements are summarized in Table 5-5, 5-6, and 5-7.

TABLE 5-5
Needs Addressed by Programmatic Recommendations

Program Element	Needs Addressed		
	Water Quality	Drainage and Erosion	Aquatic Habitat
Complaint Response	♦	♦	♦
Drainage Inspections and Illicit Connections	♦	♦	
Spill Response	♦		
Education	♦	♦	♦
Monitoring	♦	♦	♦
Regulatory Changes	♦	♦	♦
Recordkeeping	♦	♦	♦
Administration	♦	♦	♦

TABLE 5-6
Centralia Proposed Program Costs

Program Element	Actions	Existing City Resource	Additional City Resources Needed	One-time Cost of Additional Need ($)	Annual Cost of Additional Need ($)
Complaint Response	Develop organizational responsibility, train staff	Existing staff adequate, need direction and training	0.1 FTE time to plan and train	10,000	-
Inspections and Illicit Connections	Develop and implement inspection program	none	0.1 FTE to plan, coordinate, and implement	-	10,000
Spill Response	Provide materials, train staff	Existing staff	0.1 FTE once to provide training	10,000	5,000
Education	See Table 5-2	Knowledgeable staff but limited availability	Watershed Specialist, 0.5 FTE	165,000	5,000[a]
Monitoring	See Table 5-3	Knowledgeable staff but limited availability	Watershed Specialist, 0.2 FTE	0	10,000

TABLE 5-6
Centralia Proposed Program Costs

Program Element	Actions	Existing City Resource	Additional City Resources Needed	One-time Cost of Additional Need ($)	Annual Cost of Additional Need ($)
Regulatory	Revise existing regulations	Knowledgeable staff but limited availability	0.5 FTE, one time	50,000	-
Recordkeeping and Annual Reporting	Enhance database	Knowledgeable staff but limited availability	0.1 FTE	-	10,000
Administration	Manage overall program	Knowledgeable staff but limited availability	0.1 FTE Administrative Support	0	10,000
Total				**235,000**	**50,000**

[a] Provided by storm water specialist (0.5 FTE), see Table 5-2

TABLE 5-7
Summary of Annual FTEs for Programmatic Solutions

Program	FTE			
	Storm Water Specialist	Technical or Management	Maintenance	Office or Financial
Education	0.5			
Monitoring	0.2	0.1		
Complaint Response			0.1	
Inspection and Illicit Connections	0.1			
Spill Response			0.1	
Recordkeeping and Annual Report	0.1			
Administration and Financial		0.1		0.1
TOTAL FTEs	**0.9**	**0.2**	**0.1**	**0.1**

5.3 Storm Water Capital Improvement Program

The CIP is a list of priority projects, showing the estimated costs for each project over a 6-year period (2007 – 2013) and available funding. Capital projects were rated to determine their importance. The final rating and scheduling was based on prioritization criteria discussed below.

5.3.1 Identification and Prioritization of Proposed Projects

The database of storm water complaints includes more than 50 issues (see Table 3-1). Several of them are related to each other and could be regrouped into one CIP. Others require only maintenance, and a few are clearly outside the definition of a storm water CIP, thus requiring no action. Seven high-priority capital projects result from the classification and categorization. Table 5-8 regroups the problems identified in Table 3-1 and presents them as issues that will be solved by CIP, operation and maintenance, or policy recommendations. Figures 5-1 through 5-8 show conceptual solutions and can be found at the end of this section.

TABLE 5-8
Classified Issues per Capital Improvement Projects

ID#	Location Description	Issue Description
CAPITAL IMPROVEMENT PROJECTS PROGRAM		
Sixth Street CIP		
46	Intersection of 6th and E	Storm drain clearly disconnected from the sewer system in 1999.
47	Intersection of 6th and F	Storm drain disconnected from the sewer system in1999. Seems okay. Possible capacity issue.
48	Intersection of 6th and G	Storm drain disconnected from the sewer system in1999. Ponding on the north side of the intersection.
Center Street CIP		
14	Intersection of W Center and N Iron	Plugged drain on the northwest side of the intersection.
15	On W Center, between N Iron and N Rock	The north drain is located just at an intersection with a dirt road. Ponding, possible plugged drain.
16	Intersection of W Hanson and N Rock	Plugged drain.
17	On N Rock, between W Center and W Hanson	Drainage problem.
22	Intersection of N Pearl and W Center	Drainage problem.
23	Intersection of N Oak and W Maple	Ponding on the west of the intersection due to undersize or blocked drainage system.
49	Intersection of Oak and Center	Storm drain disconnected from the sewer system in 1999. Storm drain disconnected from sewer.
Jefferson Street CIP		
10	Intersection of Jefferson and S Pearl	Plugged northwest and southeast drain.
27	Intersection of S Pearl and W Cherry	Some periodic ponding.
29	Intersection of Jackson and S Pearl	Drain on the southeast corner is plugged.
37	Jefferson	Pipe failure.
38	Between S Pearl & S Tower St, on Cherry & Jefferson	Drainage problem.
40	On Chestnut, between Rock and Silver	Storm drain disconnected from the sewer system in 1987. No sign of ponding water. Water flow direction could not be identified. Possible capacity issue.
43	On Jackson, between Hamilton and Silver	Storm drain disconnected from the sewer system in 1990. No obvious problem, no ponding. Intersection of Jackson and Silver could use some maintenance.
45	On Adler, between Richmond and Woodland	Storm drain disconnected from the sewer system in 1998. Storm drain between Woodland and Richmond Street, on Alder street are ineffective. Fully plugged.
Cherry Street CIP		
7	Intersection of Elm and Ash	Roots. Street deteriorating due to no storm drain, and water collects on street during rains, which helps vegetation growth.
8	Intersection of W Cherry and Ash	Roots. The curbs are vegetated, which promotes drain plugging.
18	Intersection of W Chestnut and S Cedar	Street deteriorating due to no storm drain, and water collects on street during rains, promoting vegetation growth.

TABLE 5-8
Classified Issues per Capital Improvement Projects

ID#	Location Description	Issue Description
42	On Chestnut between Yew and Cedar	Storm drain disconnected from the sewer system in 2000. See Chestnut and Cedar intersection comments. No drainage on Chestnut between Yew and Cedar. It seems to pond on the side of the road.
Summa East CIP		
4	Intersection of E Summa and S Buckner	West side of the road ponds, ditch not deep enough, needs sump and pipe.
5	Intersection of E Summa and Pacific	Ditches are working correctly.
Summa West CIP		
11	Intersection of Summa St and Gold St	Drain line is a winding snake.
Tower Street CIP		
24	On E Plum St, between S Pearl and S Tower	Drainage problem.
25	Intersection of S Tower St and E Plum	No catch basins on the southwest corner of the intersection.
26	Intersection of S Pearl St and E Plum	Noted some sheen in the northwest corner of the intersection. Some periodic ponding.
28	Intersection of S Tower and W Cherry	Some periodic ponding.
OPERATIONS AND MAINTENANCE		
6	Intersection of Little Hanaford and Halliday Rd	Ditches are full with no apparent water movement. Vegetation growth in ditches.
9	Intersection of W Cherry and S Rock	The drain in the southeast corner is plugged.
12	Northeast corner of Sunnyside	Water collects from rain.
13	Intersection of E Cherry and S Diamond	Capacity problems. Drain is possibly plugged (vegetation and mud in the curb).
21	Intersection of N Pearl and W 5th	Drainage problem. Some standing water and organic debris.
31	On E 3rd, between Gold and Madrona	Truck-damaged ditches; poor drainage at corner of 3rd and Gold.
34	Skookumchuck River and 507	Levee maintenance. The northeast levee seems to be nonexistent; (flood issue).
35	Intersection of 2nd and F	Roots. The large tree (about 3 feet in diameter) might have broken the drainage line.
36	600 block N Tower and east alley	Large debris. The single drain on 5/5/6 seemed okay; however, moss growing on side of the building was noticed up to 1 foot.
39	Coffee Creek and Reynolds Road	East field get flooded (flood issue).
41	Intersection of E Chestnut and Gold	Storm drain disconnected from the sewer system in 1989. Southwest drain seem to experience some ponding.
50	Intersection of Mellen and Marsh	Storm drain disconnected from the sewer system in 1999. Ponding on the north side of the intersection.
51	Intersection of Vienna and Logan	Storm drain disconnected from the sewer system in 1999. At the intersection of Vienna and Logan streets, flow was observed at a rate of about 2 gallons per minute from the northeast storm drain of the intersection to, it seems, the sewer manhole located about 6 feet south. Further inspection suggests that the flow might be related to groundwater seepage and not sewer, as no odor was noticed and no rain event has been recorded for the past 10 days.
NO ACTION		
1	Delaware Ave	No drainage system. Ponding on each side of the road.
2	Windsor Ave	No drainage system. Ponding on each side of the road.
3	Oxford Ave	No drainage system. Ponding on each side of the road.
19	On W Plum , between S Washington and S Oak	1st United Methodist Parking lot floods drains into Oak.
20	Intersection of E Carson and Howard Ave	Standing water during rain. No drainage system.
30	Madrona Ave	Receives water runoff from Ham Hill roads and streets.
32	China Creek (west of Ham Hill), wetland	1990 flooded (flood issue).

TABLE 5-8
Classified Issues per Capital Improvement Projects

ID#	Location Description	Issue Description
33	China Creek flooding area	China Creek flood containment (flood issue).
44	On May, between Ward and Prospect	Storm drain disconnected from the sewer system in 1994. The drain is plugged.
52	On Locust, between N Tower and railroad tracks	Storm drain disconnected from the sewer system in 2000. Drains close to the railroad seem okay. No drains at the Tower/Locust intersection.

Note: See Table 3-1 for coordinates and drainage system.

Each of the CIP projects were rated against several criteria as determined by the Centralia Citizens Advisory Board and updated by CH2M HILL. Thirteen specific criteria were used. Each criterion was given a rating from 1 to 10 (with 1 being the lowest score, and therefore of low importance) and a condition weight (as a percentage) to evaluate its importance relative to other criteria. Table 5-9 presents a blank evaluation table used for the rating of the CIP. Table 5-10 presents results of the rating of the seven selected CIP projects, as evaluated by the City and CH2M HILL.

TABLE 5-9
Capital Improvement Program Blank Evaluation Table

#	Condition	Condition Score (Circle the score)										Condition Weight (%)	Item Rating ((Score x weight)/100)
1	Severity of Problem	1	2	3	4	5	6	7	8	9	10	15	
2	Economical Impact	1	2	3	4	5	6	7	8	9	10	15	
3	Visibility	1	2	3	4	5	6	7	8	9	10	5	
4	Bus Route	1	2	3	4	5	6	7	8	9	10	4	
5	Arterial	1	2	3	4	5	6	7	8	9	10	5	
6	Near School	1	2	3	4	5	6	7	8	9	10	3	
7	Human Health/Safety	1	2	3	4	5	6	7	8	9	10	10	
8	Maintenance History	1	2	3	4	5	6	7	8	9	10	9	
9	Water Quality	1	2	3	4	5	6	7	8	9	10	8	
10	Surface Runoff & Ponding	1	2	3	4	5	6	7	8	9	10	8	
11	Habitat	1	2	3	4	5	6	7	8	9	10	8	
12	Frequency of Occurrence	1	2	3	4	5	6	7	8	9	10	5	
13	Location in the System	1	2	3	4	5	6	7	8	9	10	5	
												Total =	

TABLE 5-10
Capital Improvement Program Rating

CIP Projects	Sixth Street	Center Street	Jefferson Street	Cherry Street	Tower Street	Summa West	Summa East
Severity of Problem	0.45	0.45	0.75	0.45	0.75	0.6	0.15
Economical Impact	0.3	0.45	0.9	0.45	0.9	0.75	0.15
Visibility	0.25	0.25	0.5	0.05	0.5	0.5	0.05
Bus Route	0.32	0.16	0.4	0.04	0.4	0.4	0.32
Arterial	0.25	0.05	0.5	0.05	0.5	0.5	0.25
Near School	0.03	0.03	0.03	0.03	0.03	0.12	0.24
Human Health/Safety	0.2	0.2	0.6	0.2	0.6	0.6	0.1
Maintenance History	0.36	0.63	0.9	0.18	0.9	0.72	0.09
Water Quality	0.4	0.48	0.48	0.4	0.48	0.48	0.24
Surface Runoff & Ponding	0.8	0.8	0.8	0.4	0.8	0.4	0.4
Habitat	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Frequency of Occurrence	0.25	0.25	0.25	0.05	0.25	0.25	0.05
Location in the System	0.25	0.25	0.5	0.5	0.25	0.25	0.05
Total	**3.94**	**4.08**	**6.69**	**2.88**	**6.44**	**5.65**	**2.17**

The CIPs were also evaluated using a criterion referred to as an "Early Opportunity." An early opportunity is described as an improvement that:

- Can be solved with minimal analysis or design, and no obvious substantial risk to downstream property or resources
- Does not exceed a predetermined minor capital projects cost ceiling
- Does not require resolution of any significant regulatory issues
- Would have high visibility by the City's citizens and council

A project summary sheet was created for each CIP. The project summary sheet contains three elements: a summary page, a cost estimate, and a figure of the proposed CIP. The project summary sheets for the CIP listed above can be found in Appendix D.

5.3.2 Cost Estimate

An opinion of cost was estimated for each CIP project. The cost estimate can be found together with the project summary sheets, in Appendix D. This opinion of cost is considered a "Class IV" estimate. The American Association of Cost Engineers and the American National Standards Institute both define the expected accuracy of a "Class IV" estimate to be plus or minus 30 percent. The opinions of cost (i.e., estimates) and any resulting conclusions on project financial or economic feasibility or funding requirements have been prepared for guidance in project evaluation and implementation from the information available at the time the opinion was prepared. The final costs of the project and resulting feasibility will depend on actual labor and material costs, competitive market conditions,

actual site conditions, final project scope, implementation schedule, continuity of personnel and engineering, and other variable factors. As a result, the final project costs will vary from the opinions of cost. Because of these factors, project feasibility, benefit/cost ratios, risks, and funding needs must be carefully reviewed prior to making specific financial decisions or establishing project budgets to help ensure proper project evaluation and adequate funding.

5.3.3 Conceptual Design Assumptions

Each assumption influences the estimated cost of the CIP projects. As the assumptions are being resolved during predesign and design of these structures, the accuracy of costs can be expected to improve. Below is a list of assumptions that were made for the conceptual design:

- Pipes needing replacement are generally assumed not to meeting the capacity requirements and/or are broken. Pipes that do not require replacement but need to be disconnected from the system will be abandoned in place, which would minimize repaving of the surface, excavation, and disposal cost.
- Pipes were generally increased to a minimum diameter of 12 inches and assumed to be concrete pipes. Design of the CIP will determine the actual diameter of the pipe and material type needed to meet the capacity.
- If conveyance pipes were identified as damaged, this damage was assumed to apply to the entire reach of pipe. In the event that only sections of the pipes need replacement, costs could be lowered.
- In general, manholes were reused in the conceptual design efforts and assumed to be in good condition. However, survey and continuous monitoring of the storm water system might reveal otherwise.
- Catch basins need maintenance. However, in addition to maintenance, the system is old and it is assumed that some catch basins will need replacement. Survey and design is necessary to accurately determine the costs associated with catch basin replacement.
- For CIP projects having outlets in China Creek, it is assumed that China Creek has the capacity necessary to handle the increased flows from drainage improvement projects. However, historical records show otherwise, so it is recommended that a model of China Creek be developed prior to initiation of those CIP projects discharging to China Creek. Modeling of China Creek flows was not included in the scope of work for developing this Plan.

5.3.4 Recommendation for Capital Improvement Program Solutions

5.3.4.1 Modeling China Creek

The CIP projects identified as Center Street and Cherry Street are located on systems that flow to China Creek. These project solutions should not be implemented before completion of modeling of China Creek to determine its flow capacity.

Historically, China Creek has overflowed and is a concern to the City. Modeling the creek could result in recommendations such as purchasing a floodway and adding conveyance capacity. Such recommendations could resolve much of the flood damage and create a central open space corridor through the middle of town that could become a space for trails and aesthetics. In such a case, CIP projects related to China Creek would be constructed after increasing the creek's capacity. For accuracy and calibration, a survey of channel geometry and installation of a stream flow gage are recommended. Table 5-11 presents order-of-magnitude cost estimate for the three possible modeling efforts.

TABLE 5-11
Modeling Scenarios and Costs

Capability	Flood Elevation Dike Height	One-Event Test Alternatives[a] for One Event	Unsteady State Test Alternatives for Multiple River Levels
Modeling Cost	$15,000-$20,000	$25,000-$30,000	$40,000-$50,000
Hydrology Cost	$15,000-$20,000	$15,000-$20,000	$15,000-$20,000
Survey Cost	$20,000-$30,000	$20,000-$30,000	$20,000-$30,000
Stream Flow Gage Cost	$15,000-$20,000	$15,000-$20,000	$15,000-$20,000
Total Cost	**$65,000-$90,000**	**$75,000-$100,000**	**$90,000-$120,000**

[a] Alternatives proposed are dikes, clean channel, dredge, store, buy out, second channel, pump, diversion, and reasonable precautions.

5.3.4.2 Additional Study

Although the City limits of Centralia have expanded over time, its surface/storm water system has not necessarily done the same. This has resulted, for the most part, in areas located within the existing City limits that are not serviced by a storm water collection and conveyance system. Parts of these areas were equipped with drywells, which are used to collect and disperse the storm water into the surrounding soil. Drywells are usually lined with 0.5-inch to 1.5-inch crushed rock and geotextile fabric. In cases when geotextile fabric was not used, fine materials enter the drywell, fill in the pores, and decrease the effectiveness of the system. Prior to this comprehensive planning effort, the City of Centralia received an estimate of approximately $1 million to repair the drywells. In addition, for the same infiltration characteristics, drywells located in a smaller basin work better than those located in a larger basin, due to volume of water. While drywells work for small catchment areas, drywells might not be the best option for the City of Centralia. During the CIP meeting on August 10, 2006, additional study to determine the feasibility and cost to provide a surface/storm water system in these areas was discussed. It is recommended that the City allocate a nominal amount of funding for a study, with an estimated cost of about $50,000.

5.3.5 CIP Cost Summary

Table 5-12 provides a summary of the CIP and costs.

TABLE 5-12
Drainage CIP Plan: Annual Expenditures[a]

CIP#	CIP Project	2007	2008	2009	2010	2011	2012
1	Sixth	$230,000					
2	Summa (West)		$240,000				
3	Jefferson	$790,000	$790,000	$790,000			
4	Tower				$550,000		
5	Center					$730,000	
6	Summa (East)						$40,000
7	Cherry						$630,000
8	China Creek Modeling	$70,000					
9	Additional Study						$50,000
CIP Total :		**$1,090,000**	**$1,030,000**	**$790,000**	**$550,000**	**$730,000**	**$720,000**

[a] All values are estimates and can be expected to change after detailed scopes and fees are developed.

5.4 Revenue and Cost Budget Forecast and Recommended Funding Program

Table 5-12 above is a summary of the costs of the storm water program, annual revenues, and fund balance for the next 6 years. The costs are summarized from the previous sections. Costs are adjusted by 3 percent per year to account for inflation.

Surface water capital improvement projects are funded primarily by residential and commercial/multi-family utility fees. Streets are not billed. A formal surface/storm water utility does not exist within the Utilities Department, and there is no separate budget allocated for storm water programs. The projected surface water revenue for 2007 is $541,100; $319,000 is from residential utility fees, and $222,000 is from commercial/multifamily utility fees.

As shown in Table 5-13 on the next page, annual costs substantially exceed available funds; therefore, the City cannot fund the proposed program with available funds. There are several potential solutions, including the following:

- Defer all of the CIP (i.e., don't do it)
- Measure all commercial and industrial properties and adjust storm water utility bills for actual impervious area
- Substantially reduce costs of operations and CIP
- Increase storm water rates overall

- Use other City funds
- Apply for grants
- Borrow for the CIP

These potential solutions are discussed in further detail in the following section (5.4.1).

TABLE 5-13
City of Centralia Annual Storm Water Management Budget

	2007	2008	2009	2010	2011	2012
Expenses*						
CIP	$1,090,000	$1,060,900	$838,111	$601,000	$821,621	$834,677
Operations	$551,000	$526,052	$558,142	$592,189	$628,314	$666,644
FTE	$70,000	$72,100	$74,263	$76,491	$78,786	$81,149
Programmatic Costs	$285,000	$51,500	$53,045	$54,636	$55,628	$57,964
Total Annual Costs	$1,996,000	$1,710,552	$1,523,561	$1,324,316	$1,584,349	$1,640,434
Revenues**						
Revenue from Storm Water Utility**	$541,000	$557,230	$573,947	$591,165	$608,900	$627,167
Ending Balance	$-1,455,000	$-2,608,322	$-3,557,936	$-4,291,087	$-5,266,536	$-6,279,803

* Adjusted by 3 percent for inflation.
** All future year utility revenue adjusted for 3 percent growth in impervious surface.

Note: This table does not include the optional China Creek modeling effort or the optional feasibility study for extending storm water system to areas in the UGA served by drywells.

5.4.1 Alternatives to Address Funding Shortfall

There are several potential solutions to address the funding shortfall for surface/storm water in Centralia, including alternatives to reduce costs, increase revenues by adjusting the storm water utility fees, or borrow money to fund the CIP. Each alternative is discussed below.

5.4.1.1 Defer all of the CIP

Issues

The entire surface/storm water CIP program could be delayed indefinitely or eliminated.

Pros and Cons

If the surface/storm water CIP program is delayed or eliminated, the expectations of the surface/storm water rate payers likely would not be met. In addition the NPDES Phase II compliance would be limited.

Recommendation
Do not eliminate the CIP program.

5.4.1.2 Measure all Commercial and Industrial Properties and Adjust Storm Water Utility Bills for Actual Impervious Area

Issues
Residential properties are billed at a rate based on impervious surface area. At the present time, commercial properties are billed at a reduced rate for properties that are larger than one equivalent stormwater unit. Because streets are not billed and commercial properties are billed a reduced rate, single-family home owners are carrying a disproportionate share of the current funding for surface/storm water services.

Pros and Cons
It would be far more equitable to bill all properties at an equivalent rate. The inequities in the current rate structure may create the basis for a legal challenge of the City's storm water rates.

There may be resistance from owners of large commercial properties because their bills would be higher (although more fair).

Recommendation
If not already done, all commercial areas should be measured for impervious surface and billed at the same rate as residential properties.

5.4.1.3 Substantially Reduce Costs of Operations and CIP

Issues
The recommended program and CIP could be scaled back substantially to match available revenue.

Pros and Cons
This would provide a balanced budget. By itself, it would sustain the inequitable billing system. This approach would not meet NPDES Phase II Permit requirements or meet the expectations of surface/storm water rate payers.

Recommendation
Do not substantially reduce costs of operations and CIP.

5.4.1.4 Increase Storm Water Rates Overall

Issues
It would be possible, although not popular, to raise the City's surface/storm water rates to provide additional funds.

Pros and Cons
Raising storm water rates would provide the additional funding needed. There likely would be opposition from rate payers.

Recommendation
Work with Citizens Advisory Board to examine the funding issues and needs. Develop recommendations to address the funding shortfall. Solutions may include an increase in rates. The increase(s) could be phased over several years.

5.4.1.5 Use Other City Funds

Issues
It is possible to use current City expense funds to fund surface/storm water needs.

Pros and Cons
Current expense funds are fully allocated to other critical City needs and generally not available. Funding would also be subject to annual adjustments and competition from other City needs and therefore would not be reliable. This would make it very challenging to plan for and manage a surface/storm water program.

Recommendation
Funding surface/storm water needs using other existing sources of City funding is not recommended.

5.4.1.6 Apply for Grants

Issues
The City has applied for and received grants to fund portions of its storm water activities, and the City will continue to use appropriate grant sources.

Pros and Cons
Grants are generally limited to start-up activities or specific environmental projects and are not available to fund general operating costs or to fund solutions to local drainage issues. They are highly competitive and cannot be relied upon to fund critical, ongoing needs.

Recommendation
Grants are not included as a potential revenue source for purposes of this analysis.

5.4.1.7 Borrow for the CIP

Issues
The City could issue bonds or could apply for loans to fund the CIP.

Pros and Cons
Low-interest loans are available from the state for public works projects. The City can issue bonds, but this is a complex process and carries substantial administrative and interest costs. At the present time, without other changes, the City has no way to repay the loans or bonds with surface/storm water utility revenue.

Recommendation
Debt financing is not recommended at this time. Once funding issues are resolved and City leaders are comfortable that the surface/storm water utility fund can repay debt, the City should apply for low-interest loans from the state's Public Works Trust Fund.

5.4.1.8 Further City Discussion Needed

Resolution of the funding shortfall is beyond the scope of the present effort. Further City discussion is needed, particularly regarding the potential to adjust the surface/storm water utility rates. The City should address the funding shortfall issue and develop funding solutions.

N

0 100 200 300

SCALE IN FEET

LEGEND

EXISTING:	PROPOSED:
STORM WATER	STORM WATER
MANHOLE	MANHOLE
CATCH BASIN	CATCH BASIN
STORM WATER OUTFALL	REMOVE FROM SERVICE
CITY LIMITS	

Figure 5-4

Figure 5-8

Figure 5-5

Figure 5-2

Figure 5-6

Figure 5-3

Figure 5-7

Figure 5-1
STORM WATER IMPROVEMENTS
Centralia Comprehensive Stormwater Plan
Centralia, Washington

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LEGEND

EXISTING:	PROPOSED:
STORM WATER	STORM WATER
MANHOLE	MANHOLE
CATCH BASIN	CATCH BASIN
STORM WATER OUTFALL	REMOVE FROM SERVICE
CITY LIMITS	

N

0 100 200 300
SCALE IN FEET

OUTLET INTO CHEHALIS RIVER
36" CONC.
M.H. ELEV. 146.37 D=?
36" CONC. PIPE – 0.15%
M.H. ELEV. 151.64 D=?
36" CONC. PIPE – 0.15%
48" ARCH PIPE
48" ARCH PIPE

NOTE:
THE STATUS OF THE WSDOT MELLEN INTERCHANGE PROJECT SHOULD BE CHECKED PERIODICALLY. THERE IS AN OPPORTUNITY FOR COORDINATION WITH WSDOT. THE MELLEN INTERCHANGE PROJECT IS NOT DESIGNED AT THIS POINT.

MELLEN ST.
RIM 179.7
E 169.77

CULVERT UNDER I-5
SWAIL
WSDOT C.B.'S THAT DRAIN TO SWAIL
SWAIL
36" CONC. PIPE – 0.15%
M.H. ELEV. 75.44 D=?
36" CONC. – 0.15%
M.H. ELEV. 76.00 D=?
M.H. FLOOD KEY GATE IN MANHOLE ELEV. 76.32 D=?
36" CONC. – 0.15%
M.H. ELEV. 159.32 D=?
36" CONC. – 0.15%
M.H. ELEV. 160.01 D=?
36" CONC. PIPE – 0.15%
36" CONC. PIPE – 0.15%

ELLSBURY ST.
LAKESHORE DR.
PIPE DAYLIGHTS AT CREEK
MARSH ST.
CHESTNUT ST.
BORTHWICK ST.
ALDER ST.
ELM ST.
YEW ST.
MARSH ST.
DOLEZAL
8"PERF
8"PERF
6" CONC.
8" PVC
MELLEN ST.
ALDER ST.

OUTLET INTO CHINA CREEK
8" CONC. PIPE – 0.50%
42 L.F.
M.H. ELEV. 165.50 D=?
DRYWELL
S. CEDAR ST.
S. ASH ST.
M.H. ELEV. 164.00 D=?
OUTLET INTO CHINA CREEK
40' OF 15" CONC PIPE
15" CONC PIPE – 0.3%
8" CLAY PIPE
8" CLAY PIPE
CHERRY ST.
M.H. ELEV. D=?
M.H. ELEV. D=?
12" CONC PIPE – 0.30%
M.H. ELEV. 165.23 D=?
CHESTNUT ST.
8" CONC PIPE – 1.00%
M.H. ELEV. 168.45 D=?
S. CEDAR ST.
S. ASH ST.
DRYWELL
M.H. ELEV. D=?
36" CONC. PIPE – 0.15%

Figure 5-2
STORM WATER IMPROVEMENTS
Centralia Comprehensive Stormwater Plan
Centralia, Washington

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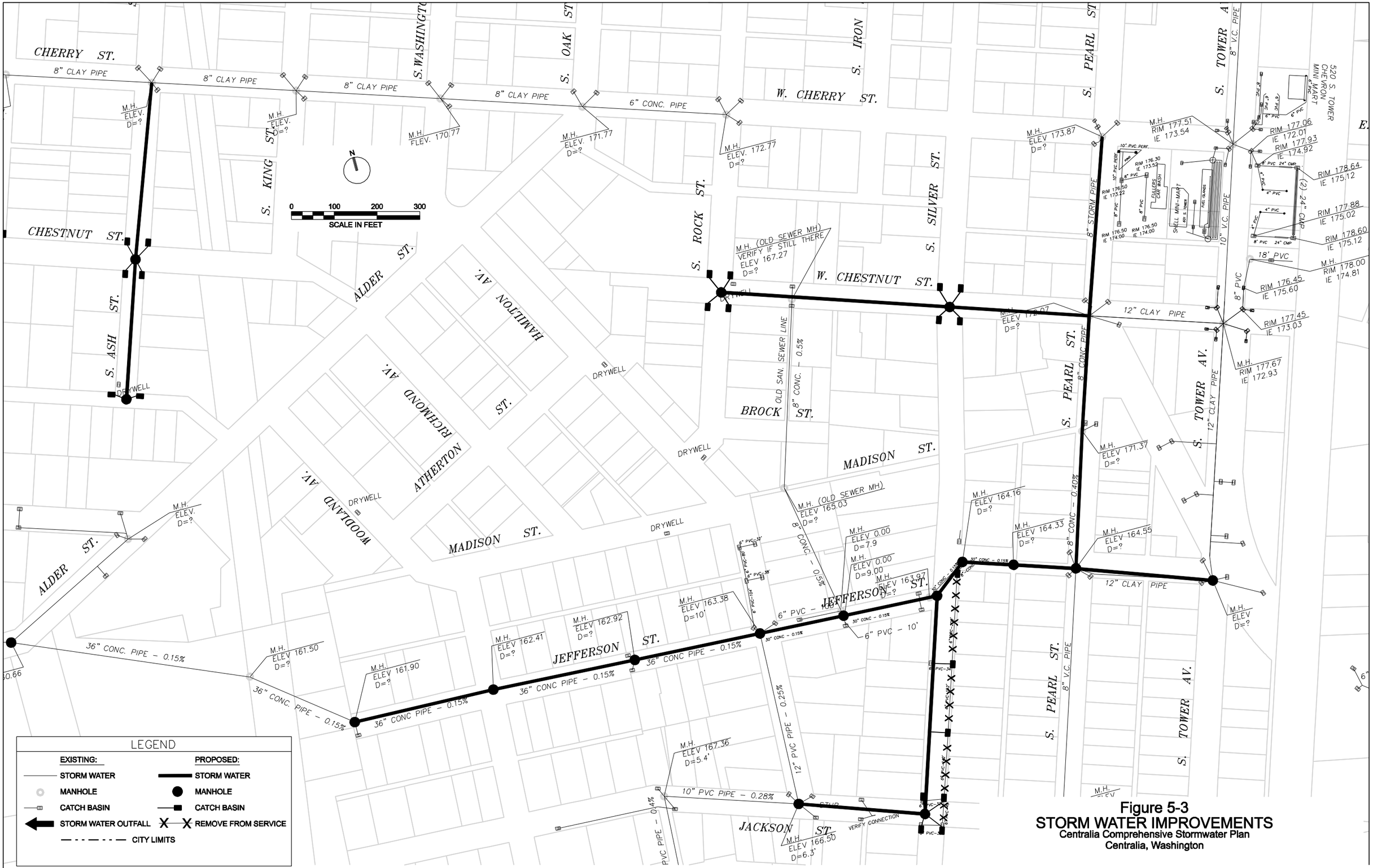

Figure 5-3
STORM WATER IMPROVEMENTS
Centralia Comprehensive Stormwater Plan
Centralia, Washington

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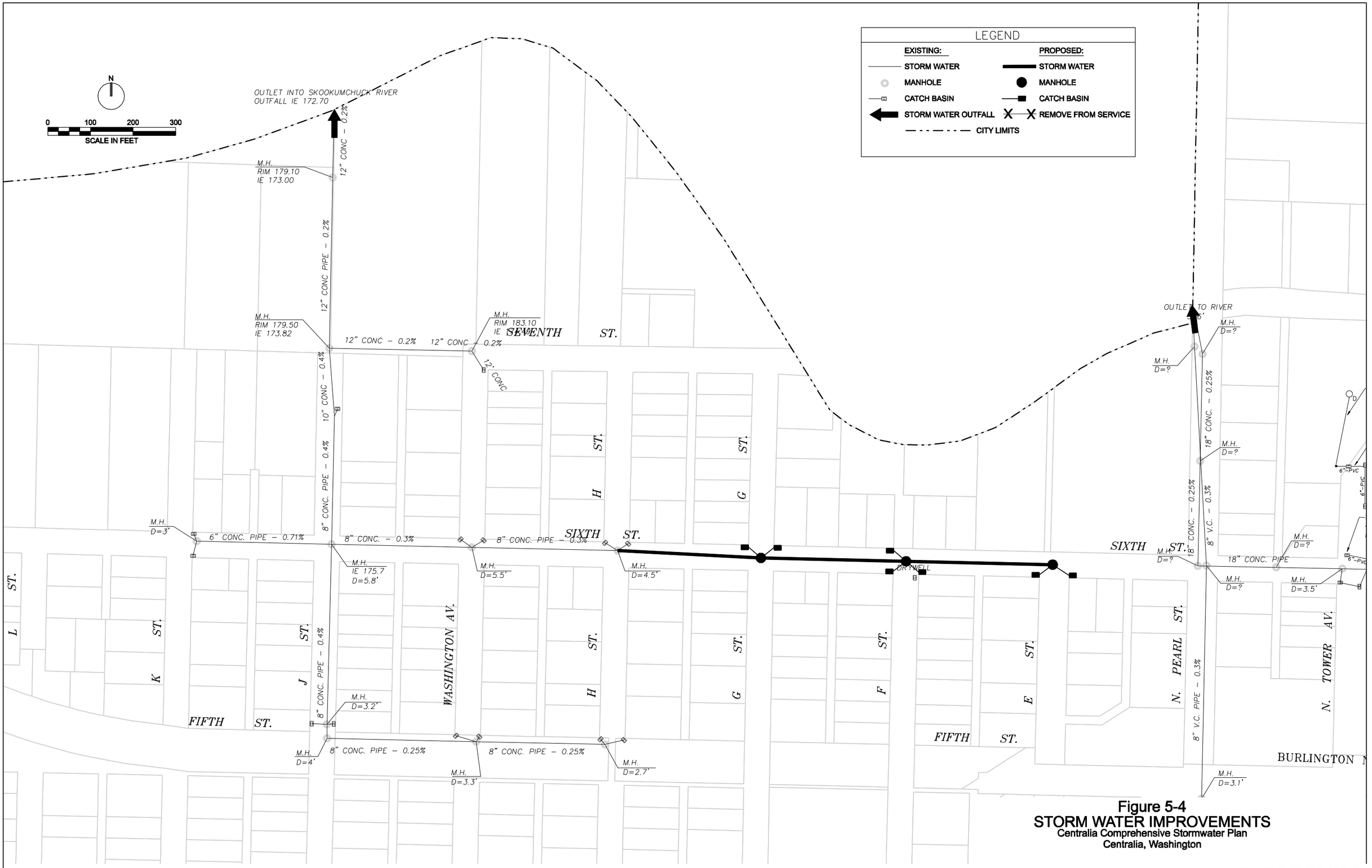

Figure 5-4
STORM WATER IMPROVEMENTS
Centralia Comprehensive Stormwater Plan
Centralia, Washington

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LEGEND

EXISTING:	PROPOSED:
STORM WATER	STORM WATER
MANHOLE	MANHOLE
CATCH BASIN	CATCH BASIN
STORM WATER OUTFALL	REMOVE FROM SERVICE
CITY LIMITS	

0 100 200 300
SCALE IN FEET

N. OAK ST.
N. ROCK ST.
N. IRON ST.
W. MAIN ST.
W. PINE ST.
W. MAGNOLIA ST.
W. MAPLE ST.
CENTER ST.
HANSON ST.
F ST.
E ST.
N. PEARL st.
N. TOWER AV.
HILKREST AV.
BURLINGTON–NORTHERN RAILROAD

Figure 5-5
STORM WATER IMPROVEMENTS
Centralia Comprehensive Stormwater Plan
Centralia, Washington

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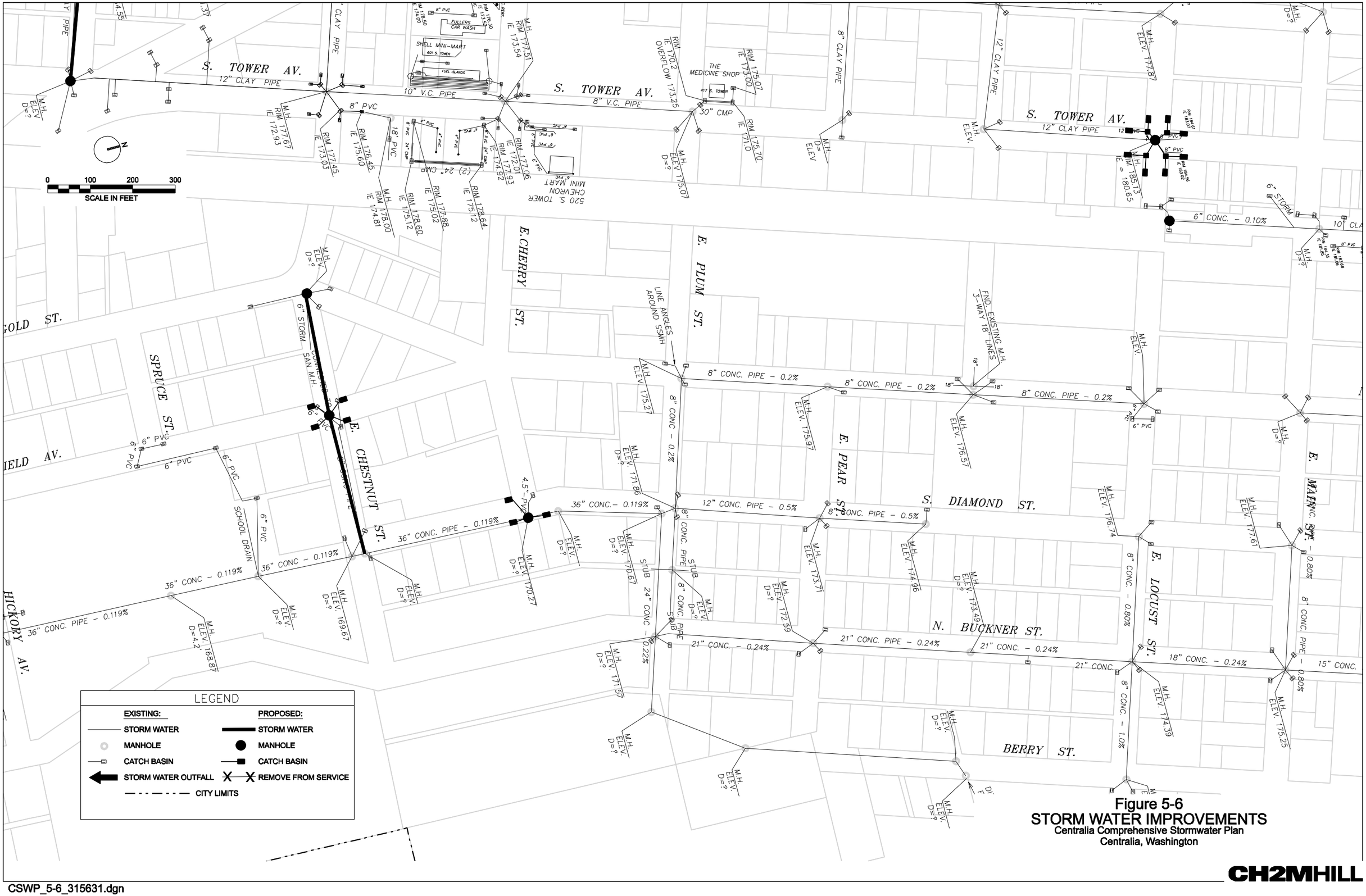

Figure 5-6
STORM WATER IMPROVEMENTS
Centralia Comprehensive Stormwater Plan
Centralia, Washington

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N

0 100 200 300
SCALE IN FEET

LEGEND

EXISTING:	PROPOSED:
STORM WATER	STORM WATER
MANHOLE	MANHOLE
CATCH BASIN	CATCH BASIN
STORM WATER OUTFALL	REMOVE FROM SERVICE
CITY LIMITS	

ST.
EARL ST.
ROOSEVELT AV.
VAN BUREN ST.
SOUTH ST.
BURLINGTON NORTHERN RR
S. TOWER AV.
S. GOLD ST.
GRAND AV.
KRESKY AV.
CENTRALIA AV.
PACIFIC AV.
S. BUCKNER ST.
SUMMA ST.
STATE ST.
UNION ST.
GROVE ST.

2- CATCH BASINS
115 LF / 6" PVC
INSTALLED BY ST.DEPT.
/09/03
CH
6"- PVC
6"- PVC
6"- PVC
6"- PVC

8" PIPE
8" PIPE
8" PIPE
12" CONC PIPE
12" CONC PIPE
M.H. ELEV. 173.86 D=6.7'
M.H. ELEV. 173.60 D=6.4'
M.H. ELEV. D=?
LINE CAPPED
M.H. ELEV. 85.60 D=6.4'
36" CONC. - 0.119%
M.H. ELEV. 85.18 D=?
STUB
36" CONC. PIPE - 0.11
M.H. ELEV. 168.06 D=?
M.H. ELEV. 175.59 D=4.2'
10" CONC PIPE
10" CONC PIPE
M.H. ELEV. 174.78 D=5.0'
M.H. ELEV. 169.43 D=
36" CONC. PIPE - 0.0882%
CB IE 169.82
12"
12" CONC - 0.6426%
M.H. ELEV. 167.60 D=?
M.H. ELEV. 174.78 D=5.0'
10" CONC PIPE
M.H. ELEV. 174.03 D=5.2'
8" PVC
8" PVC
10" PVC
6" PVC
6" PVC
GOLD ST PLAZA 1200
M.H. ELEV. 173.12 D=?
12" PVC
12" PVC - 0.22%
M.H. RIM 179.46 IE 173.12
M.H. RIM 179.5 IE 173.72
12" CONC - 0.24%
12" CONC - 0.24%
CB IE 170.60
36" CONC. PIPE - 0.10%
36" CONC. - 0.10%
M.H. ELEV. 167.10 D=?
M.H. ELEV. 173.35 D=5.5'
M.H. ELEV. 172.67 D=6.0'
THE TACK SHOP
1211 S. GOLD
12" CONC
12" CONC PIPE
M.H. ELEV. 171.77 D=6.75'
M.H. ELEV. 170.26 (15" IE) IE 8" (S) 170.84 D=7.24'
M.H. ELEV. 169.47 D=4.5'
M.H. ELEV. D=?
15" CONC - 0.36%
15" CONC
15" CONC - 0.3571%
M.H. ELEV. 171.37 D=7.0'
30" CMP
METERING M.H. RIM 177.69 IE 172.00
M.H. ELEV. 169.26 D=?
M.H. ELEV. 167.65 D=?
TOWARDS OUTLET AT SALZER CREEK
M.H. ELEV. 171.88 D=6.0'
M.H. RIM 174.50 15" IE (S) 171.50
M.H. RIM 178.21 10" IE (E) 173.06 10" IE (W) 173.14
IE 173.90
IE 174.00
DRYWELL
30" CMP
6" PVC
DRIVE UP BANKING
TWIN COUNTY CREDIT UNION 1320 S. GOLD
50' OF 30" CMP
30" CMP
CONC

Figure 5-7
STORM WATER IMPROVEMENTS
Centralia Comprehensive Stormwater Plan
Centralia, Washington

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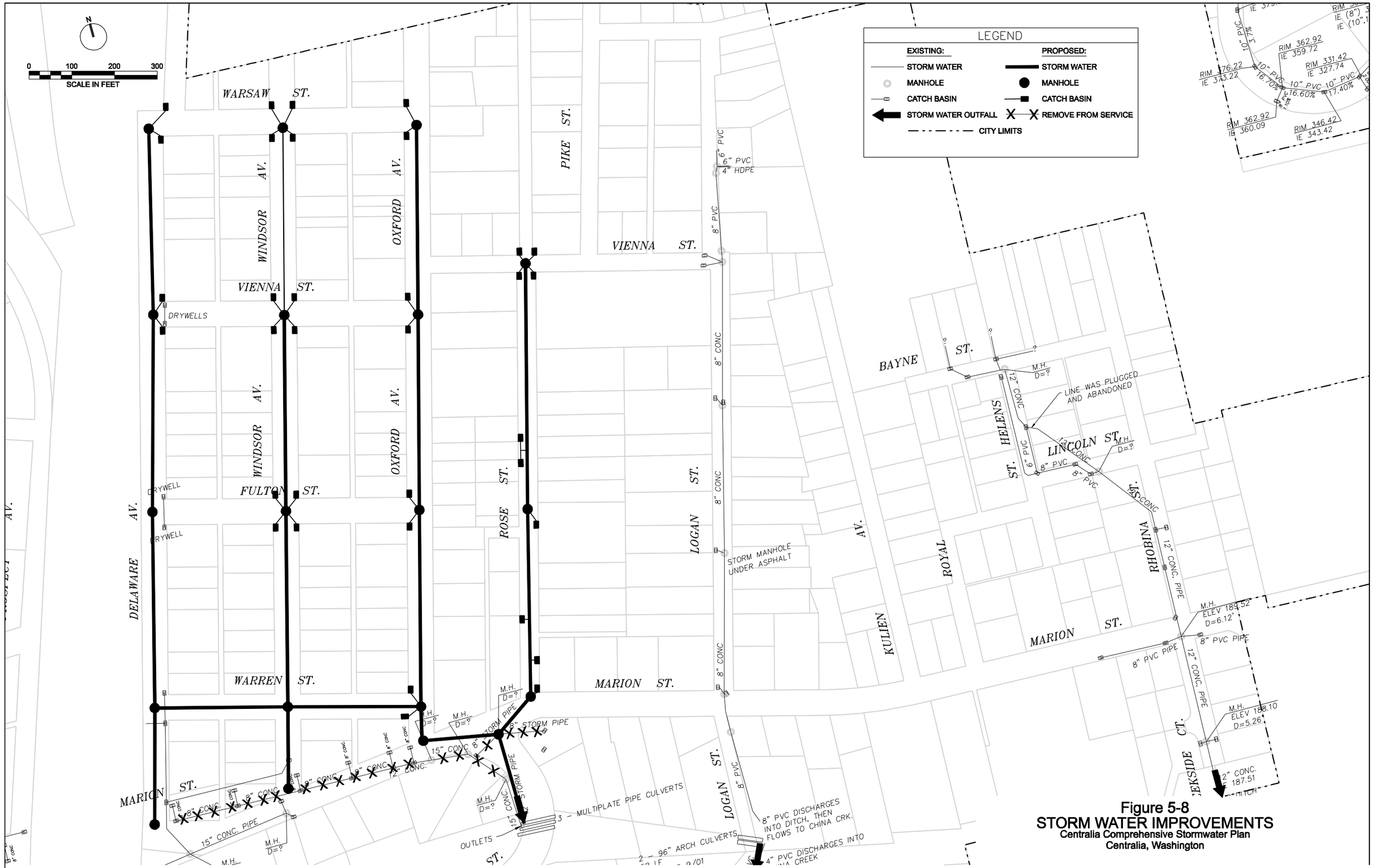

Figure 5-8
STORM WATER IMPROVEMENTS
Centralia Comprehensive Stormwater Plan
Centralia, Washington

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SECTION 6

Recommendations

6.1 Summary

General water quality, surface runoff and ponding, and aquatic habitat protection goals and action items for the City of Centralia should include the following:

- Protect water resources, aquatic habitat, and natural drainage systems by controlling the quality and quantity of storm water runoff.
- Complete a wetland survey.
- Implement storm water management policies and strategies that recognize the value of wetland areas in solving storm water problems.
- Implement a monitoring program to determine if the presence of waterfowl is a concern.
- Implement monitoring of storm water so that water quality problems can be identified in a timely manner.
- Protect and enhance water quality and aquatic habitat by promoting the sustainable and efficient use of water resources.
- Implement programmatic solutions along with capital projects to optimize success.
- Begin completion of capital projects to address surface runoff and ponding, water quality, and habitat issues.

6.2 Gap Analysis

In addition to the specific recommendations regarding NPDES Phase II Permit compliance in Section 2, Table 2-1, the following general recommendations are made to meet requirements identified by the gap analysis.

- The City should conduct a survey of the average amount of impervious surface on new construction projects in the last 1 to 3 years. The results of this survey should support a requirement that new development applications use the results as an estimate for calculating storm water hydrographs and sizing facilities, or limit impervious surface on individual lots through building permits to the amount of impervious surface identified in the original permit application for a subdivision.
- In an effort to reduce the amount of impervious surface generated by new development the City should encourage developers to achieve the maximum potential infiltration on development sites. This can be done by encouraging the use of amended soils that increase infiltration and detention of storm water. Developers should also be

encouraged to use pervious pavement with suitable base materials for infiltration for walkways, patios, driveways, and residential streets.

- To further reduce impervious surface and the resultant storm water runoff from infrastructure improvements, the City should amend street design standards to reduce pavement widths on residential streets.
- Continue to require compliance with the 2005 version of the Ecology Stormwater Management Manual, and any subsequent updates.
- Begin planning efforts to meet the minimum performance measures associated with NDPES Phase II Municipal Permit requirements for Small MS4s in Western Washington.

6.3 Operations and Maintenance

To meet all of the NPDES Phase II Permit requirements, it is recommended that the City move at a progressive pace towards Stage 3: compliance with the NPDES Permit.

To help determine the financial implications, a budget for each stage should be prepared when the City has O&M cost information summarizing its 2006 program year. Table 4-5 is a tool that can be used to evaluate financial implications. By using Table 4-5 as a template, the City can determine costs by adding new service items as required to achieve each stage (see Table 4-2). The departments providing the surface/storm water O&M should determine the actual daily production, crew size, and equipment needed to perform new action items.

If the recommended schedule is not financially feasible for the City, an incremental approach is recommended and alternative funding options (see Section 5.4) should be considered.

6.4 Programmatic Solutions

A Surface/Storm Water Management Plan should include the following programmatic elements:

- **Complaint Response:** The public should be provided with a single number to call with complaints regarding drainage, erosion, or water quality issues.
- **Inspections and Identification of Illicit Connections:** An inspection program to detect and eliminate illicit connections should be developed and implemented.
- **Spill Response:** Spill kits should be placed on service vehicles and staff should be trained in how to identify spills.
- **Regulatory and Policy:**
  - Update City of Centralia Design Standards to meet requirements in the 2005 Ecology Storm Water Manual for Western Washington. Conduct thorough design review to ensure minimal impacts. Adopt requirements for infiltration and reduced impervious surface and remove regulatory barriers to achieving these goals.
  - Implement programs and policies to gain compliance with NPDES Phase II Permit.

  - Prohibit discharge of pollutants to the surface/storm water system.
- **Education:** Educate City residents and staff on proper practices to reduce discharge of pollutants to the surface/storm water system with the goal of changing behavior patterns by increasing understanding of cause and effect of actions taken.
- **Public Involvement**: Involve residents in City storm water activities to promote water quality, source control, etc.
- **Monitoring**: In accordance with the NPDES Permit conditions, develop a coordinated monitoring program. It is recommended that the City of Centralia contact Keith Paulson of the City of Bellevue to join the monitoring regional approach group.
- **Record-Keeping and Annual Reporting**: The NPDES Phase II Permit requires keeping records of all activities, including Surface/Storm Water Management Plan development and implementation, number of inspections and enforcement actions, and educational activities.
- **Storm Water Specialist:** Hire staff dedicated to correcting the surface runoff and ponding, water quality, and habitat issues identified in this Plan.

6.5 Capital Improvement Program Solutions

The recommendations for the CIP are listed below.

- The City should evaluate the potential solutions listed below and detailed in section 5.4.1 to fund the program. As shown in Table 5-13, annual costs substantially exceed available funds; therefore, the City cannot fund the proposed program. The potential solutions are:
  - Defer all of the CIP
  - Measure all commercial and industrial properties and adjust storm water utility bills for actual impervious area
  - Substantially reduce costs of operations and CIP
  - Increase storm water rates overall
  - Use other City funds
  - Apply for grants
  - Borrow for the CIP
- As the City moves forward to implement a storm water CIP program, it should address CIPs in the following order:
  1. Sixth Street
  2. Summa West
  3. Jefferson Street
  4. Tower Street

5. Center Street
6. Summa East
7. Cherry Street

- The Center Street and Cherry Street projects should not be undertaken before completion of China Creek modeling. China Creek modeling is necessary to determine its flow capacity. Both CIPs (i.e., Center Street and Cherry Street systems) flow to China Creek and should be implemented only if China Creek has sufficient capacity. It is recommended that the City run a single-event model run for each scenario presented in Table 5-11. A survey of channel cross-sections is needed to determine channel geometry, and the installation of one or two stream flow gages is needed to calibrate the model.
- The Centralia city limits have expanded over time and will continue to grow into the City's UGA; however, the surface/storm water system has not necessarily matched this expansion. This has resulted, for the most part, in undeveloped area located within the existing city limits. A study to determine the feasibility and cost to provide surface/storm water system expansion in so-called undeveloped area is recommended.

SECTION 7

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APPENDIX A

RW Beck Operation and Maintenance 2002

Section 4
OPERATION AND MAINTENANCE

Introduction

The objective of a stormwater operation and maintenance program, as developed using a stormwater maintenance management system, is to assure the reliability and dependability of the stormwater infrastructure. Such a program is designed to minimize life-cycle costs, protect the lives and property of the City's residents and businesses, reduce local flooding and enhance water quality. Maintenance management systems include an analysis of the frequencies and levels of maintenance required to achieve water quality objectives, ensure reliability, and achieve the lowest life-cycle cost.

As part of this study, the current maintenance program was reviewed with City staff and recommended changes to the program were identified. A summary of the current maintenance program is provided in this section, as well as a proposed operation and maintenance program. The proposed stormwater program described in this section uses generally accepted maintenance practices and planning standards.

This section focuses on maintenance activities. Program management, public education, and engineering activities are described in Section 5.

Current Stormwater Maintenance Program

Table 4-1 describes current stormwater maintenance activities. This list of stormwater maintenance activities was developed from a system inventory provided by the City, additional interviews with City staff and review of the City's 2002 budget.

Table 4-1
Current Stormwater Maintenance Program

Item No.	Maintenance Activity	Units to be Maintained	Production Unit	Freq. (times/yr)	Daily Production	Crew Size	Annual Crew Days	Annual Person Days	Full-time Labor Equiv.	Annual Labor Cost ($)	Annual Other Cost ($)	Total Annual Cost	Percent of Program
1	Clean Catch Basins	1,100	Each	0.05	15	3	4	12	0.05	$2,849	$0	$2,849	1%
2	Clean Roadside Ditches (remove sediments)	1,500	LF	0.1	1,500	3	0.1	0.3	0.00	$71	$0	$71	0%
3	Clean Roadside Ditches (vegetation control)	1,500	LF	0.5	1,500	5	0.5	3	0.01	$594	$0	$594	0%
4	Street Sweeping	33.7	Mile	80	12	1	225	225	1.02	$53,345	$0	$53,345	16%
5	Shoulder Grading for Storm Drainage	72,336	LF	0.180	220	4	60	240	1.09	$56,986	$5,000	$61,986	18%
6	Leaf Pick-Up	230	Hours	1	32	4	7	29	0.13	$6,826	$0	$6,826	2%
7	Clean Storm Drains	120,840	LF	0.02	1,000	2	2.4	4.8	0.02	$1,140	$0	$1,140	0%
8	Inspect/Clean Manholes	492	Each	0.05	15	3	1.6	4.8	0.02	$1,140	$0	$1,140	0%
9	Manhole Maintenance	492	Each	0.0125	0.5	3	12.3	36.9	0.17	$8,762	$0	$8,762	3%
10	Maintain Drywells	86	Each	0.07	0.5	3	12.0	36.0	0.16	$8,548	$0	$8,548	3%
11	Clean Culverts	22	Each	0.1	4	2	0.6	1.2	0.01	$285	$0	$285	0%
12	Mow Levees	1	Each	1	0.2	1	5	5	0.02	$1,187	$0	$1,187	0%
13	Additional Fall Maintenance	LS	LS	LS	LS	5	10	50	0.23	$11,872	$0	$11,872	3%
14	Disposal Costs (catch basin cleaning)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0	$0	0%
15	Disposal Costs (street sweeping)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$55,000	$55,000	16%
16	Disposal Costs (leaf pick-up)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$5,000	$5,000	1%
17	Other Supplies and Services	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$66,000	$66,000	19%
18	Equipment Rental Fund	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$15,000	$15,000	4%
19	Amortized Vactor Truck Purchase	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$4,000	$4,000	1%
20	Amortized Street Sweeper Purchase	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$20,000	$20,000	6%
21	Administrative Expenses	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$17,000	$17,000	5%
Total								647	2.94	$153,604	$187,000	$340,604	100%

Table 4-2
Supporting Information: Current Stormwater Maintenance Program Labor

Table 4-1 Item No.	Maintenance Activity	Notes Regarding the Units to be Maintained	Notes Regarding the Frequency	Notes Regarding the Daily Production
1	Clean Catch Basins	Source: City staff; excludes 86 drywell catch basins.	Source: calculated based on the average reported number of cleaned storm drains between 1997 - 2001 (0.05 = 54 cleaned / 1,100)	Estimated based on data from City staff and other jurisdictions. Generally, this production rate is lower than in other jurisdictions because catch basins are cleaned less often.
2	Clean Roadside Ditches (remove sediments)	Source: visual inspection of City maintained ditches along Fair Street, Pacific Avenue, and in the Waunch Prairie area.	Estimated by R. W. Beck based on conversations with City staff.	Estimated by R. W. Beck based on conversations with City staff.
3	Clean Roadside Ditches (vegetation control)	Source: visual inspection of City maintained ditches along Fair Street, Pacific Avenue, and in the Waunch Prairie area.	Estimated by R. W. Beck based on conversations with City staff.	Estimated by R. W. Beck based on conversations with City staff.
4	Street Sweeping	Source: based on curb-mile inventory provided by the City.	Calculated value based on an average of 2,690 miles per year. This is the average of street miles swept between 1996 - 2001 as reported by the City, excluding the 1997 value. The 1997 value was over twice the average of other years. (80 = 2,690 / 33.7)	Data provided by City includes: 1.6 - 1.7 mph speed of the street sweeper; 6.5 - 7 hours required to complete the designated sweeping routes; current program is once/week sweeping of residential curb/gutter areas and twice/week sweeping of downtown curb/gutter areas. Other roads are swept on a work order basis.
5	Shoulder Grading for Storm Drainage	Source: City staff	Calculated value based on 13,000 LF graded in 2001 (0.180 = 13,000 / 72,336)	Source: City staff. Staff requirements are an estimated 7.5 days per month for 8 months, for a 4-man crew.
6	Leaf Pick-Up	Source: Reported 1998 - 2001 annual average.	Leaf pickup is done once per year in the fall.	Production is based on an eight hour day, with the total amount of leaf pickup measured in hours spent on the task.
7	Clean Storm Drains	Source: City staff	Calculated value based on average 1997 - 2001 value provided by the City (0.02 = 2,600 / 120,840).	Estimated based on data from City staff and other jurisdictions. Generally, this production rate is lower than in other jurisdictions because pipes are cleaned less often.
8	Inspect/Clean Manholes	Source: City staff	Cleaning and inspection are done when problems arise and is not done on a regular basis. Estimated that 5% of manholes are inspected each year.	Estimated based on data from City staff and other jurisdictions. Generally, this production rate is lower than in other jurisdictions because manholes are cleaned less often.
9	Manhole Maintenance	Source: City staff	Maintenance includes replacing and installling manhole risers.	Estimated by City staff to require a three-man crew two days each to maintain six manholes per year.
10	Maintain Drywells	Source: City staff	Calculated value based on maintenance of six drywells per year estimated by City staff.	Source: City staff
11	Clean Culverts	Source: City staff	Calculated value based on cleaning of two culverts per year estimated by City staff. (0.1 = 2 / 22)	Source: City staff
12	Mow Levees	Source: City staff	The Skookumchuck levee is mowed once per year.	City staff indicate it takes approximately five days to mow the levee.
13	Additional Fall Maintenance	Source: City staff	This maintenance is done during the fall as required.	Typically, this task occupies the five-member crew for ten working days.

Table 4-3
Supporting Information: Current Stormwater Maintenance Program Costs

Table 4-1 Item No.	Maintenance Activity	Notes Regarding the Program Cost
1 - 13	Various	Labor costs are based on a fully burdened labor rate of $29.68 per hour and 200 working days per year.
14	Disposal Costs (catch basin cleaning)	Disposal costs are assumed to be merged with other expense items because of relatively infrequent cleaning schedule.
15	Disposal Costs (street sweeping)	Source: City staff, 2002 Street Fund budget.
16	Disposal Costs (leaf pick-up)	Source: City staff, 2002 Street Fund budget.
17	Other Supplies and Services	Source: 2002 Street Fund budget. Includes items such as office supplies, vehicle fuel, small tools, computer equipment, training, electricity, general liability insurance, and telephone expenses.
18	Equipment Rental Fund	Placeholder estimate. Excludes vactor truck and street sweeper.
19	Amortized Vactor Truck Purchase	Amortized over a five-year period, based on purchase cost of $20,000 of a used vactor truck from the City wastewater utility.
20	Amortized Street Sweeper Purchase	Amortized over a six-year life, based on a purchase price of $120,000.
21	Administrative Expenses	Source: 2002 Street Fund budget. Represents pension expenses, split between street and stormwater functions.

In addition to the 21 stormwater maintenance items shown in Table 4-1, several other City maintenance functions are described below. While these efforts may be interpreted as being related to a stormwater system, it may also be reasonable to consider these items as components of flood response and/or street maintenance programs.

- Flood Fight Expenditures. Although staff overtime expenses during floods are covered be the Federal Emergency Management Agency (FEMA), the City must cover regular personnel costs (eight hours per day). The City estimates that during an average flood, 15 FTEs work full time for two weeks. At a fully burdened labor rate of $29.68 per hour, this equates to approximately $35,000 in labor costs per flood event.
- Pothole Repair. City staff indicate that drainage problems can result in the creation of potholes in City streets. The estimated staff labor requirement for pothole filling is 640 hours per year. At a fully burdened labor rate of $29.68 per hour, and this equates to approximately $20,000 in labor costs per year.

Proposed Stormwater Maintenance Program

Tables 4-4 and 4-5 describe the proposed stormwater maintenance program, assuming that the City is a NPDES Phase II permittee. Table 4-4 shows proposed stormwater maintenance activities and Table 4-5 is supporting documentation that highlights the difference between the current program and the proposed program. Table 4-5 shows that the major difference in the stormwater maintenance program is related to cleaning of catch basins, manholes, and culverts. This increased maintenance program will require approximately an additional 1.6 FTEs, and an additional expenditure of approximately $97,000 per year.

Table 4-4
Proposed Stormwater Maintenance Program

Item No.	Maintenance Activity	Units to be Maintained	Production Unit	Freq. (times/yr)	Daily Production	Crew Size	Annual Crew Days	Annual Person Days	Full-time Labor Equiv.	Annual Labor Cost	Annual Other Cost	Total Annual Cost	Percent of Program
1	Clean Catch Basins	~~1,100~~ 1300	Each	1	15	3	73	219	1.00	$52,000	$0	$52,000	12%
2	Clean Roadside Ditches (remove sediments)	1,500	LF	0.33	1,500	3	0.3	1.0	0.00	$235	$0	$235	0%
3	Clean Roadside Ditches (vegetation control)	1,500	LF	0.5	1,500	5	0.5	3	0.01	$594	$0	$594	0%
4	Street Sweeping	33.7	Mile	80	12	1	225	225	1.02	$53,345	$0	$53,345	12%
5	Shoulder Grading for Storm Drainage	72,336	LF	0.180	220	4	60	240	1.09	$56,986	$5,000	$61,986	14%
6	Leaf Pick-Up	230	Hours	1	32	4	7	29	0.13	$6,826	$0	$6,826	2%
7	Clean Storm Drains	120,840	LF	0.33	1,000	2	39.9	79.8	0.36	$18,948	$0	$18,948	4%
8	Inspect/Clean Manholes	492	Each	1	15	2	32.8	65.6	0.30	$15,576	$0	$15,576	4%
9	Manhole Maintenance	492	Each	0.0125	0.5	3	12.3	36.9	0.17	$8,762	$0	$8,762	2%
10	Maintain Drywells	86	Each	0.07	0.5	3	12.0	36.0	0.16	$8,548	$0	$8,548	2%
11	Clean Culverts	22	Each	0.5	4	2	2.8	5.6	0.03	$1,330	$0	$1,330	0%
12	Mow Levees	1	Each	1	0.2	1	5	5	0.02	$1,187	$0	$1,187	0%
13	Additional Fall Maintenance	LS	LS	LS	LS	5	10	50	0.23	$11,872	$0	$11,872	3%
14	Disposal Costs (catch basin cleaning)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$15,000	$15,000	3%
15	Disposal Costs (street sweeping)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$55,000	$55,000	13%
16	Disposal Costs (leaf pick-up)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$5,000	$5,000	1%
17	Other Supplies and Services	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$66,000	$66,000	15%
18	Equipment Rental Fund	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$15,000	$15,000	3%
19	Amortized Vactor Truck Purchase	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$4,000	$4,000	1%
20	Amortized Street Sweeper Purchase	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$20,000	$20,000	5%
21	Administrative Expenses	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$17,000	$17,000	4%
Total								995	4.53	$236,208	$202,000	$438,208	100%

Table 4-5
Proposed Stormwater Maintenance Program: Changes From Current Program

Table 4-4 Item No.	Maintenance Activity	Changes From Current Program
1	Clean Catch Basins	Increase frequency to annual cleaning of each catch basin, based on anticipated NPDES Phase II rule requirements.
2	Clean Roadside Ditches (remove sediments)	Increase cleaning frequency based on anticipated NPDES Phase II rule requirements.
3	Clean Roadside Ditches (vegetation control)	No change from current program.
4	Street Sweeping	No change from current program.
5	Shoulder Grading for Storm Drainage	No change from current program.
6	Leaf Pick-Up	No change from current program.
7	Clean Storm Drains	Increase cleaning frequency based on anticipated NPDES Phase II rule requirements.
8	Inspect/Clean Manholes	Increase frequency to annual inspection of each manhole, based on anticipated NPDES Phase II rule requirements.
9	Manhole Maintenance	No change from current program.
10	Maintain Drywells	No change from current program.
11	Clean Culverts	Increase frequency to biennial cleaning of each culvert, based on anticipated NPDES Phase II rule requirements.
12	Mow Levees	No change from current program.
13	Additional Fall Maintenance	No change from current program.
14	Disposal Costs (catch basin cleaning)	Additional $15,000 per year added in anticipation of more frequent catch basin cleaning.
15	Disposal Costs (street sweeping)	No change from current program.
16	Disposal Costs (leaf pick-up)	No change from current program.
17	Other Supplies and Service	No change from current program.
18	Equipment Rental Fund	No change from current program.
19	Amortized Vactor Truck Purchase	No change from current program.
20	Amortized Street Sweeper Purchase	No change from current program.
21	Administrative Expenses	No change from current program.

Required City flood fight and pothole repair expenditures are not anticipated to change for reasons related to the development of the City's stormwater program.

Ecology is expected, in the future, to publish a model stormwater ordinance that may contain operation and maintenance provisions. The City should monitor any model ordinances developed by Ecology and reassess its maintenance program accordingly.

APPENDIX B

Western Washington Phase II Municipal Stormwater Permit

Issuance Date: January 17, 2007
Effective Date: February 16, 2007
Expiration Date: February 15, 2012

WESTERN WASHINGTON PHASE II MUNICIPAL STORMWATER PERMIT

National Pollutant Discharge Elimination System and
State Waste Discharge General Permit for Discharges
from Small Municipal Separate Storm Sewers
in Western Washington

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

In compliance with the provisions of
The State of Washington Water Pollution Control Law
Chapter 90.48 Revised Code of Washington
and
The Federal Water Pollution Control Act
(The Clean Water Act)
Title 33 United States Code, Section 1251 et seq.

Until this permit expires, is modified, or revoked, permittees that have properly obtained coverage under this permit are authorized to discharge to waters of the state in accordance with the special and general conditions which follow.

David C. Peeler, Manager
Water Quality Program
Department of Ecology

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SPECIAL CONDITIONS

Notice: If legislation related to this Permit is passed into law, Ecology will, as necessary, modify, revoke and re-issue or terminate this Permit to carry out legislative requirements. Any such modification will be in accordance with G14 *General Permit Modification and Revocation* and the provisions of WAC 173-226-230.

S1. PERMIT COVERAGE AREA AND PERMITTEES

A. Geographic Area of Permit Coverage

This Permit is applicable to owners or operators of regulated small municipal separate storm sewer systems (MS4s) located west of the eastern boundaries of the following counties: Whatcom, Skagit, Snohomish, King, Pierce, Lewis and Skamania.

1. For all cities required to obtain coverage under this permit, the geographic area of coverage is the entire incorporated area of the city.
2. For all counties required to have coverage under this Permit, the geographic area of coverage is the urbanized areas and urban growth areas associated with cities under the jurisdictional control of the county. The geographic area of coverage also includes any urban growth area contiguous to urbanized areas under the jurisdictional control of the county.
3. For secondary permittees required to obtain coverage under this permit, the minimum geographic area of coverage is all areas identified under S1.A.1. and S1.A.2. At the time of permit coverage, Ecology may establish a geographic area of coverage specific to an individual secondary permittee.
4. All regulated small MS4s owned or operated by the permittees named in S1.D.2.a. and located in another city or county area requiring coverage under either the Phase I Municipal *Stormwater Permit* or the *Eastern Washington Phase II Municipal Stormwater Permit* are also covered under this permit.

B. Regulated Small Municipal Separate Storm Sewer Systems (MS4s)

All operators of regulated small municipal separate storm sewer systems (MS4s) are required to apply for and obtain coverage under this Permit or be permitted under a separate individual permit, unless waived or exempted in accordance with condition S1.C.

1. A **regulated small MS4**:
   a. Is a "Small MS4" as defined in the *Definitions and Acronyms* section at the end of this Permit; and
   b. Is located within, or partially located within, an urbanized area as defined by the latest decennial census conducted by the U.S. Bureau of Census, or designated by the Department pursuant to 40 CFR 123.35(b) or 40 CFR 122.26(f); and
   c. Discharges stormwater from the MS4 to a surface water of Washington State; and

d. Is not eligible for a waiver or exemption under S1.C. below.

2. All other operators of MS4s, including special purpose districts, which meet the criteria for a regulated small MS4 shall obtain coverage under this Permit. Other operators of municipal separate storm sewers may include, but are not limited to: flood control, or diking and drainage districts, schools including universities, and correctional facilities that own or operate a small MS4 serving non-agricultural land uses.

3. Any other operators of small MS4s may be required by the Department to obtain coverage under this permit or an alternative NPDES permit if the Department determines the small MS4 is a significant source of pollution to surface waters of the state. Notification of the Department's determination that permit coverage is required will be through the issuance of an Administrative Order issued in accordance with RCW 90.48.

4. The owner or operator of a regulated small MS4 may obtain coverage under this Permit as a permittee, co-permittee, or secondary permittee as defined in S1.D.1. below.

5. Pursuant to 40 CFR 122.26(f), any person or organization may petition Ecology to require that additional municipal separate storm sewers obtain coverage under this permit. The process for petitioning Ecology is:

   a. The person or organization shall submit a complete petition in writing to Ecology. A complete petition shall address each of the relevant factors for petitions outlined on Ecology's website.

   b. In making its determination on the petition, Ecology may request additional information from either the petitioner or the jurisdiction.

   c. Ecology will make a final determination on a complete petition within 180 days of receipt of the petition and inform both the petitioner and the municipal separate storm sewer of the decision, in writing.

   d. If Ecology's final determination is that the candidate municipal separate storm sewer will be regulated, Ecology will issue an order to the municipal separate storm sewer requiring them to obtain coverage under this Permit. The order will specify:

      i. The geographic area of permit coverage for the municipal separate storm sewer system;

      ii. Any modified dates or deadlines for developing and implementing the Stormwater Management Program in S5. or S6., as appropriate to the municipal separate storm sewer system, and for submitting their first annual report; and

      iii. A deadline for the operator of the municipal separate storm sewer system to submit a complete Notice of Intent (see Appendix 5) to Ecology.

C. Owners and operators of an otherwise regulated small MS4 are not required to obtain coverage under this Permit if:

1. The small MS4 is operated by:

   a. The federal government on military bases or other federal lands; or by the United States Military, the Bureau of Land Management, the United States Park Service or other federal agencies;

   b. Federally recognized Indian Tribes located within Indian Country Lands; or

   c. The Washington State Department of Transportation.

   or:

2. The portions of the small MS4 located within the census defined urban area(s) serve a total population of less than 1000 people and a, b, and c, below all apply:

   a. The small MS4 is not contributing substantially to the pollutant loadings of a physically interconnected MS4 that is regulated by the NPDES stormwater program.

   b. The discharge of pollutants from the small MS4 have not been identified as a cause of impairment of any water body to which the MS4 discharges.

   c. In areas where an EPA approved TMDL has been completed, stormwater controls on the MS4 have not been identified as being necessary.

   In determining the total population served both resident and commuter populations shall be included. For example:

   - For publicly operated school complexes including universities and colleges the total population served would include the sum of the average annual student enrollment plus staff.
   - For flood control, diking, and drainage districts the total population served would include residential population and any non-residents regularly employed in the areas served by the small MS4.

D. Obtaining coverage under this Permit

All operators of **regulated small MS4s** are required to apply for and obtain coverage in accordance with this section, unless waived or exempted in accordance with section S1.C.

1. Permittees: unless otherwise noted, the term "Permittee" shall include Permittee, Co-Permittee, and Secondary Permittee, as defined below:

   a. "Permittee" is a city, town, or county owning or operating a regulated small MS4 applying and receiving a permit as a single entity.

   b. "Co-Permittee" is any operator of a regulated small MS4 that is applying jointly with another applicant for coverage under this Permit. Co-Permittees own or operate a regulated small MS4 located within or adjacent to another regulated small MS4.

c. A "Secondary Permittee" is an operator of regulated small MS4 that is not a city, town or county. Secondary Permittees include special purpose districts and other MS4s that meet the criteria for a regulated small MS4 in S1.B. above.

2. Operators of **regulated small MS4s** shall submit either an individual application to the Department or a Notice of Intent (NOI). Applications submitted after January 17, 2007 must be made using the NOI provided in Appendix 5. The NOI is also available on Ecology's website.

   a. All cities, towns and counties listed in i and ii below and operating regulated small MS4s shall apply as either a Permittee or Co-Permittee.

      i. Cities of: Aberdeen, Algona, Anacortes, Arlington, Auburn, Bainbridge Island, Battle Ground, Bellevue, Bellingham, Black Diamond, Bonney Lake, Bothell, Bremerton, Brier, Buckley, Burien, Burlington, Camas, Centralia, Clyde Hill, Covington, Des Moines, DuPont, Duvall, Edgewood, Edmonds, Enumclaw, Everett, Federal Way, Ferndale, Fife, Fircrest, Gig Harbor, Granite Falls, Issaquah, Kelso, Kenmore, Kent, Kirkland, Lacey, Lake Forest Park, Lake Stevens, Lakewood, Longview, Lynnwood, Maple Valley, Marysville, Medina, Mercer Island, Mill Creek, Milton, Monroe, Mountlake Terrace, Mount Vernon, Mukilteo, Newcastle, Normandy Park, Oak Harbor, Olympia, Orting, Pacific, Port Orchard, Port Angeles, Poulsbo, Puyallup, Redmond, Renton, Sammamish, SeaTac, Sedro-Woolley, Shoreline, Snohomish, Steilacoom, Sumner, Tukwila, Tumwater, University Place, Vancouver, Washougal, Woodinville, and Yarrow Point.

      ii. Counties: Cowlitz, Kitsap, Thurston, Skagit, and Whatcom.

   b. All other **regulated small MS4s** shall apply as a Secondary Permittee or as a Co-Permittee.

   c. The following cities, towns and counties submitted either an application or a NOI for coverage to Ecology prior to January 17, 2007:

      i. Cities and towns: Aberdeen, Algona, Arlington, Auburn, Bainbridge Island, Battle Ground, Bellevue, Bellingham, Black Diamond, Bonney Lake, Bothell, Bremerton, Brier, Buckley, Burien, Burlington, Camas, Centralia, Clyde Hill, Covington, Des Moines, DuPont, Duvall, Edgewood, Edmonds, Enumclaw, Everett, Federal Way, Ferndale Fife, Fircrest, Gig Harbor, Granite Falls, Issaquah, Kelso, Kenmore, Kent, Kirkland, Lacey, Lake Forest Park, Lake Stevens, Lakewood, Longview, Lynnwood, Maple Valley, Marysville, Medina, Mercer Island, Mill Creek, Milton, Monroe, Mountlake Terrace, Mount Vernon, Mukilteo, Newcastle, Normandy Park, Oak Harbor, Olympia, Orting, Pacific, Port Orchard, Poulsbo, Puyallup, Redmond, Renton, Sammamish, SeaTac, Sedro-Woolley, Shoreline, Snohomish, Steilacoom, Sumner, Tukwila, Tumwater, University Place, Vancouver, Washougal, Woodinville, and Yarrow Point

ii. Counties: Cowlitz, Kitsap, Thurston, Skagit, and Whatcom.

d. All operators of regulated small MS4s located in jurisdictions listed in S1.D.2.a. shall submit to Ecology a NOI or individual permit application before the effective date of this permit, with the following exceptions:

i. Operators of regulated small MS4s located in the Cities of Aberdeen, Anacortes, Centralia, Oak Harbor, and Port Angeles shall submit a NOI or application to Ecology no later than 30 days after the effective date of this permit.

ii. Operators of regulated small MS4s listed in S1.D.2.c. do not need to submit a new application to be covered under this permit.

e. For operators of regulated small MS4s listed in S1.D.2.c., coverage under this permit is automatic and begins on the effective date of this permit, unless:

i. The operator chooses to reapply before the effective date of this permit; or

ii. The operator will be relying on another entity to satisfy one or more of their permit obligations in accordance with S1.D.2.g. and S1.D.3.d. below; or

iii. The operator chooses be a Co-Permittee in accordance with S1.D.2.f. and S1.D.3.c. below; or

iv. The operator chooses to opt out of this General Permit. Any operator of a regulated small MS4 that is opting out of this permit shall submit an application for an individual MS4 permit in accordance with 40 CFR 122.33(b)(2)(ii) no later than the effective date of this permit.

f. Operators of regulated small MS4s which want to be covered under this permit as Co-Permittees shall submit to Ecology a joint NOI.

g. Operators of regulated small MS4s which are relying on another entity to satisfy one or more of their permit obligations shall submit a NOI to Ecology.

h. Operators of small MS4s designated by Ecology pursuant to S1.B.3. of this permit shall submit a NOI to Ecology within 120 days of receiving notification from Ecology that permit coverage is required.

3. Application Requirements

a. NOIs shall be submitted to:

Department of Ecology
Water Quality Program
Municipal Stormwater Permits
P.O. Box 47696
Olympia, WA 98504-7696

b. For NOIs submitted after January 17, 2007, the permit applicant shall provide public notice of the application in accordance with WAC 173-226-130(5). The applicant or co-applicant shall include a certification that the public notification

requirements of WAC 173-226-130(5) have been satisfied. Unless Ecology responds in writing, coverage under this Permit will be effective 60 days after receipt of a complete NOI. A complete NOI shall include the certification of public notice.

c. Permittees applying as co-applicants shall submit a joint NOI. The joint NOI shall clearly identify the areas of the MS4 for which each of the co-applicants are responsible.

d. Permittees relying on another entity or entities to satisfy one or more of their permit obligations shall notify Ecology in writing. The notification shall include a summary of the permit obligations that will be carried out by another entity. The summary shall identify the other entity or entities and shall be signed by the other entity or entities. During the term of the permit, permittees may terminate or amend shared responsibility arrangements by notifying Ecology, provided this does not alter implementation deadlines.

e. Secondary permittees required to have coverage under this Permit, and the NPDES and State Waste Discharge Permit for Discharges from Small Municipal Separate Storm Sewers in Eastern Washington or the NPDES and State Waste Discharge Permit for Discharges from Large and Medium Municipal *Separate Storm Sewers*, may obtain coverage by submitting a single NOI.

S2. AUTHORIZED DISCHARGES

A. This Permit authorizes the discharge of stormwater to surface waters and to ground waters of the state from municipal separate storm sewer systems owned or operated by each Permittee covered under this permit, in the geographic area covered pursuant to S1.A. These discharges are subject to the following limitations:

1. Discharges to ground waters of the state through facilities regulated under the Underground Injection Control (UIC) program, Chapter 173-218 WAC, are not covered under this Permit.

2. Discharges to ground waters not subject to regulation under the federal Clean Water Act are covered in this permit only under state authorities, Chapter 90.48 RCW, the Water Pollution Control Act.

B. This Permit authorizes discharges of non-stormwater flows to surface waters and to ground waters of the state from municipal separate storm sewer systems owned or operated by each Permittee covered under this permit, in the geographic area covered pursuant to S1.A, only under the following conditions:

1. The discharge is authorized by a separate National Pollutant Discharge Elimination System (NPDES) or State Waste Discharge permit.

2. The discharge is from emergency fire fighting activities.

3. The discharge is from another illicit or non-stormwater discharge that is managed by the Permittee as provided in Special Condition S5.C.3.b. or S6.C.3.b.

These discharges are also subject to the limitations in S2.A.1. and S.2.A.2. above.

C. This Permit does not relieve entities that cause illicit discharges, including spills, of oil or hazardous substances, from responsibilities and liabilities under state and federal laws and regulations pertaining to those discharges.

D. Discharges from municipal separate storm sewers constructed after the effective date of this permit shall receive all applicable state and local permits and use authorizations, including compliance with Chapter 43.21C RCW (the State Environmental Policy Act).

E. This Permit does not authorize discharges of stormwater to waters within Indian Reservations except where authority has been specifically delegated to Ecology by the U.S. Environmental Protection Agency. The exclusion of such discharges from this Permit does not waive any rights the State may have with respect to the regulation of the discharges.

S3. RESPONSIBILITIES OF PERMITTEES

A. Each Permittee covered under this Permit is responsible for compliance with the terms of this Permit for the regulated small MS4s that they own or operate. Compliance with (1) or (2) below is required as applicable to each permittee, whether the permittee has applied for coverage as a permittee, co-permittee, or secondary permittee.

1. All city, town and county permittees are required to comply with all conditions of this Permit, including any appendices referenced therein, except for Special Condition S6 *Stormwater Management Program for Secondary Permittees.*

2. All secondary permittees are required to comply with all conditions of this Permit, including any appendices referenced therein, except for Special Conditions S8.C. *Monitoring* and S5 *Stormwater Management Program for Cities, Towns and Counties.*

B. Permittees may rely on another entity to satisfy one or more of the requirements of this Permit. Permittees that are relying on another entity to satisfy one or more of their permit obligations remain responsible for permit compliance if the other entity fails to implement permit conditions. Permittees may rely on another entity provided all the requirements of 40 CFR 122.35(a) are satisfied, including but not limited to:

1. The other entity, in fact, implements the Permit requirements.

2. The other entity agrees to take on responsibility for implementation of the Permit requirement(s) as indicated on the NOI.

S4. COMPLIANCE WITH STANDARDS

A. In accordance with RCW 90.48.520, the discharge of toxicants to waters of the state of Washington which would violate any water quality standard, including toxicant standards, sediment criteria, and dilution zone criteria is prohibited. The required response to such violations is defined in section S4.F., below.

B. This Permit does not authorize a violation of Washington State Surface Water Quality Standards (Chapter 173-201A WAC), Ground Water Quality Standards (Chapter 173-200 WAC), Sediment Management Standards (chapter 173-204 WAC), or human health-based criteria in the national Toxics Rule (Federal Register, Vol. 57, NO. 246, Dec. 22,

1992, pages 60848-60923). The required response to such violations is defined in section S4.F., below.

C. The Permittee shall reduce the discharge of pollutants to the maximum extent practicable (MEP).

D. The Permittee shall use all known, available, and reasonable methods of prevention, control and treatment (AKART) to prevent and control pollution of waters of the state of Washington.

E. In order to meet the goals of the Clean Water Act, and comply with S4.A., S4.B., S4.C., and S4.D. each Permittee shall comply with all of the applicable requirements of this Permit as identified in S3 Responsibilities of Permittees.

F. Required response to violations of Water Quality Standards pursuant to sections S4.A. and/or S4.B:

1. Pursuant to G20 *Non-Compliance Notification*, the Permittee shall notify Ecology in writing within 30 days of becoming aware that a discharge from the municipal separate storm sewer is causing or contributing to a violation of Water Quality Standards. For ongoing or continuing violations, a single written notification to Ecology will fulfill this requirement.

2. In the event that Ecology determines that a discharge from a municipal separate storm sewer is causing or contributing to a violation of Water Quality Standards in a receiving water, and the violation is not already addressed by a Total Maximum Daily Load or other water quality cleanup plan, Ecology will notify the Permittee in writing that:

   a. Within 60 days of receiving the notification, or by an alternative date established by Ecology, the Permittee shall review their Stormwater Management Program and submit a report to Ecology. The report shall include:

      i. A description of the operational and/or structural BMPs that are currently being implemented to prevent or reduce any pollutants that are causing or contributing to the violation of Water Quality Standards, including a qualitative assessment of the effectiveness of each BMP.

      ii. A description of additional operational and/or structural BMPs that will be implemented to prevent or reduce any pollutants that are causing or contributing to the violation of Water Quality Standards.

      iii. A schedule for implementing the additional BMPs including, as appropriate: funding, training, purchasing, construction, monitoring, and other assessment and evaluation components of implementation.

   b. Ecology will, in writing, either approve the additional BMPs and implementation schedule or require the Permittee to modify the report. If modifications are required, the Permittee shall submit a revised report to Ecology.

   c. The Permittee shall implement the additional BMPs, pursuant to the schedule approved by Ecology, beginning immediately upon receipt of written notification of approval.

d. The Permittee shall include with each subsequent annual report a summary of the status of implementation and any information from assessment and evaluation procedures collected during the reporting period.

e. Provided the Permittee is implementing the approved BMPs, pursuant to the approved schedule, the Permittee is not required to further modify the BMPs or implementation schedule unless directed to do so by Ecology.

G. Ecology may modify or revoke and reissue this General Permit in accordance with G14 General *Permit Modification and Revocation*, if Ecology becomes aware of additional control measures, management practices or other actions beyond what is required in this Permit that are necessary to:

1. Reduce the discharge of pollutants to the MEP,
2. Comply with the state AKART requirements, or
3. Control the discharge of toxicants to waters of the State of Washington.

S5. STORMWATER MANAGEMENT PROGRAM FOR CITIES, TOWNS AND COUNTIES

A. Each Permittee shall develop and implement a Stormwater Management Program (SWMP). A SWMP is a set of actions and activities comprising the components listed in S5.B. and S5.C.1. through S5.C.5., and any additional actions necessary to meet the requirements of applicable TMDLs (see S7). The SWMP shall be designed to reduce the discharge of pollutants from the regulated small MS4 to the maximum extent practicable and to protect water quality. This section applies to all cities, towns and counties covered under this Permit, including cities, towns and counties that are co-permittees. Where the term "Permittee" is used in this section the requirements apply to all cities, towns and counties covered under this Permit.

1. The SWMP shall be developed and implemented in accordance with the schedules contained in this section and shall be fully developed and implemented no later than 180 days prior to the expiration date of this Permit. At a minimum the Permittee's SWMP shall be implemented throughout the geographic area subject to this Permit as described in S1.A.
2. Each Permittee shall prepare written documentation of the SWMP. The SWMP documentation shall be organized according to the program components in S5.C. and shall be updated at least annually for submittal with the Permittee's annual reports to Ecology (see S9 *Reporting and Record Keeping*). The SWMP documentation shall include:

   a. A description of each of the program components included in S5.C., and

   b. Any additional actions implemented by the Permittee pursuant to S5.C., and

   c. Any additional actions necessary to meet the requirements of applicable TMDLs pursuant to S7 *Compliance with Total Maximum Daily Load Requirements*.

3. The SWMP shall include an ongoing program for gathering, tracking, maintaining, and using information to evaluate SWMP development, implementation and permit compliance and to set priorities.

   a. Beginning no later than January 1, 2009, each Permittee shall track the cost or estimated cost of development and implementation of each component of the SWMP. This information shall be provided to Ecology upon request.

   b. Each Permittee shall track the number of inspections, official enforcement actions and types of public education activities as stipulated by the respective program component. This information shall be included in the annual report.

4. The SWMP described herein supersedes SWMP descriptions provided by permit applicants in individual applications submitted to the Department prior to the effective date of this permit.

   Notwithstanding the schedules for implementation of SWMP components contained in this permit, Permittees that are already implementing some or all of the SWMP components in this section shall continue implementation of those components of their SWMP. Permittees shall not repeal existing local requirements to control stormwater that go beyond the requirements of this permit for new development and redevelopment sites.

5. Coordination among permittees

   a. Coordination among entities covered under municipal stormwater NPDES permits may be necessary to comply with certain conditions of the SWMP. The SWMP should include, when needed, coordination mechanisms among entities covered under a municipal stormwater NPDES permit to encourage coordinated stormwater-related policies, programs and projects within adjoining or shared areas.

      i. Coordination mechanisms shall clarify roles and responsibilities for the control of pollutants between physically interconnected MS4s permittees covered by a municipal stormwater permit.

      ii. Coordination mechanisms shall coordinate stormwater management activities for shared water bodies among permittees to avoid conflicting plans, policies and regulations.

   b. The SWMP should include coordination mechanisms among departments within each jurisdiction to eliminate barriers to compliance with the terms of this permit.

B. The SWMP shall be designed to reduce the discharge of pollutants from regulated small MS4s to the maximum extent practicable (MEP), meet state AKART requirements, and protect water quality. Notwithstanding the schedules for implementation of SWMP components contained in this Permit, permittees who are implementing some or all of the SWMP components in this section shall continue implementation of those components of their SWMP.

C. The SWMP shall include the components listed below. To the extent allowable under state or federal law, all components are mandatory for city, town or county permittees covered under this Permit. In accordance with 40 CFR 122.35(a) and Special Condition S3, a city, town or county may rely on another entity to implement one or more of the components in this section.

1. Public Education and Outreach

The SWMP shall include an education program aimed at residents, businesses, industries, elected officials, policy makers, planning staff and other employees of the Permittee. The goal of the education program is to reduce or eliminate behaviors and practices that cause or contribute to adverse stormwater impacts. An education program may be developed locally or regionally.

The minimum measures are:

a. No later than two years after the effective date of this Permit, the Permittee shall provide an education and outreach program for the area served by the MS4. The outreach program shall be designed to achieve measurable improvements in the target audience's understanding of the problem and what they can do to solve it.

Education and outreach efforts shall be prioritized to target the following audiences and subject areas:

i. General public

- General impacts of stormwater flows into surface waters.
- Impacts from impervious surfaces.
- Source control BMPs and environmental stewardship actions and opportunities in the areas of pet waste, vehicle maintenance, landscaping and buffers.

ii. General public, businesses, including home-based and mobile businesses

- BMPs for use and storage of automotive chemicals, hazardous cleaning supplies, carwash soaps and other hazardous materials.
- Impacts of illicit discharges and how to report them.

iii. Homeowners, landscapers and property managers

- Yard care techniques protective of water quality.
- BMPs for use and storage of pesticides and fertilizers.
- BMPs for carpet cleaning and auto repair and maintenance.
- Low Impact Development techniques, including site design, pervious paving, retention of forests and mature trees.
- Stormwater pond maintenance.

iv. Engineers, contractors, developers, review staff and land use planners

- Technical standards for stormwater site and erosion control plans.
- Low Impact Development techniques, including site design, pervious paving, retention of forests and mature trees.

- Stormwater treatment and flow control BMPs.

b. Each Permittee shall measure the understanding and adoption of the targeted behaviors among the targeted audiences. The resulting measurements shall be used to direct education and outreach resources most effectively, as well as to evaluate changes in adoption of the targeted behaviors.

c. Each Permittee shall track and maintain records of public education and outreach activities.

2. Public Involvement and Participation

The SWMP shall include ongoing opportunities for public involvement through advisory councils, watershed committees, participation in developing rate-structures, stewardship programs, environmental activities or other similar activities. Each Permittee shall comply with applicable State and local public notice requirements when developing their SWMP.

The minimum performance measures are:

a. No later than one year from the effective date of this Permit, all permittees shall create opportunities for the public to participate in the decision-making processes involving the development, implementation and update of the Permittee's entire SWMP. Each Permittee shall develop and implement a process for consideration of public comments on their SWMP.

b. Each Permittee shall make their SWMP, the annual report required under S9.A and all other submittals required by this Permit, available to the public. The annual report, and SWMP that was submitted with the latest annual report, shall be posted on the permittee's website. To comply with the posting requirement, a permittee that does not maintain a website may submit the updated SWMP in electronic format to the Department for posting on the Department's website.

3. Illicit Discharge Detection and Elimination

The SWMP shall include an ongoing program to detect and remove illicit connections, discharges as defined in 40 CFR 122.26(b)(2), and improper disposal, including any spills not under the purview of another responding authority, into the municipal separate storm sewers owned or operated by the Permittee. Permittees shall fully implement an ongoing illicit discharge detection and elimination program no later than 180 days prior to the expiration date of this Permit.

The minimum performance measures are:

a. A municipal storm sewer system map shall be developed no later than four years from the effective date of this permit. Municipal storm sewer system maps shall be periodically updated and shall include the following information:

i. The location of all known municipal separate storm sewer outfalls and receiving waters and structural stormwater BMPs owned, operated, or maintained by the Permittee. Each Permittee shall map the attributes listed

below for all storm sewer outfalls with a 24 inch nominal diameter or larger, or an equivalent cross-sectional area for non-pipe systems:

- Tributary conveyances (indicate type, material, and size where known).
- Associated drainage areas.
- Land use.

ii. Each Permittee shall initiate a program to develop and maintain a map of all connections to the municipal separate storm sewer authorized or allowed by the Permittee after the effective date of this Permit.

iii. Geographic areas served by the Permittee's MS4 that do not discharge stormwater to surface waters.

iv. Each Permittee shall make available to Ecology, upon request, municipal storm sewer system map(s) depicting the information required in S5.C.3.a.i. through iv above. The preferred format of submission will be an electronic format with fully described mapping standards. An example description is provided on Ecology WebPages under Core Services, GIS Data.

vi. Upon request, and to the extent appropriate, permittees shall provide mapping information to co-permittees and secondary permittees.

b. Each Permittee shall develop and implement an ordinance or other regulatory mechanism to effectively prohibit non-stormwater, illegal discharges, and/or dumping into the Permittee's municipal separate storm sewer system to the maximum extent allowable under State and Federal law. The ordinance or other regulatory mechanism shall be adopted no later than 30 months from the effective date of this Permit.

i. The regulatory mechanism does <u>not</u> need to prohibit the following categories of non-stormwater discharges:

- Diverted stream flows.
- Rising ground waters.
- Uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20)).
- Uncontaminated pumped ground water.
- Foundation drains.
- Air conditioning condensation.
- Irrigation water from agricultural sources that is commingled with urban stormwater.
- Springs.
- Water from crawl space pumps.
- Footing drains.
- Flows from riparian habitats and wetlands.
- Non-stormwater discharges covered by another NPDES permit.
- Discharges from emergency fire fighting activities in accordance with S2 *Authorized Discharges*.

ii. The regulatory mechanism shall prohibit the following categories of non-stormwater discharges unless the stated conditions are met:

- Discharges from potable water sources, including water line flushing, hyperchlorinated water line flushing, fire hydrant system flushing, and pipeline hydrostatic test water. Planned discharges shall be de-chlorinated to a concentration of 0.1 ppm or less, pH-adjusted, if necessary, and volumetrically and velocity controlled to prevent re-suspension of sediments in the MS4.
- Discharges from lawn watering and other irrigation runoff. These shall be minimized through, at a minimum, public education activities (see section S5.C.1) and water conservation efforts.
- Dechlorinated swimming pool discharges. The discharges shall be dechlorinated to a concentration of 0.1 ppm or less, pH-adjusted and reoxygenized if necessary, volumetrically and velocity controlled to prevent re-suspension of sediments in the MS4. Swimming pool cleaning wastewater and filter backwash shall not be discharged to the MS4.
- Street and sidewalk wash water, water used to control dust, and routine external building wash down that does not use detergents. The Permittee shall reduce these discharges through, at a minimum, public education activities (see section S5.C.1.) and/or water conservation efforts. To avoid washing pollutants into the MS4, Permittees must minimize the amount of street wash and dust control water used. At active construction sites, street sweeping must be performed prior to washing the street.
- Other non-stormwater discharges. The discharges shall be in compliance with the requirements of the stormwater pollution prevention plan reviewed by the Permittee, which addresses control of construction site de-watering discharges.

iii. The Permittee's SWMP shall, at a minimum, address each category in ii above in accordance with the conditions stated therein.

iv. The SWMP shall further address any category of discharges in i or ii above if the discharges are identified as significant sources of pollutants to waters of the State.

v. The ordinance or other regulatory mechanism shall include escalating enforcement procedures and actions.

vi. The Permittee shall develop an enforcement strategy and implement the enforcement provisions of the ordinance or other regulatory mechanism.

c. Each Permittee shall develop and implement an ongoing program to detect and address non-stormwater discharges, spills, illicit connections and illegal dumping into the Permittee's municipal separate storm sewer system. The

program shall be fully implemented no later than 180 days prior to the expiration date of this Permit and shall include:

i. Procedures for locating priority areas likely to have illicit discharges, including at a minimum: evaluating land uses and associated business/industrial activities present; areas where complaints have been registered in the past; and areas with storage of large quantities of materials that could result in spills.

ii. Field assessment activities, including visual inspection of priority outfalls identified in i, above, during dry weather and for the purposes of verifying outfall locations, identifying previously unknown outfalls, and detecting illicit discharges.

- Receiving waters shall be prioritized for visual inspection no later than three years from the effective date of this Permit, with field assessments of three high priority water bodies made no later than four years from the effective date of this Permit. Field assessments on at least one high priority water body shall be made each year thereafter.
- Screening for illicit connections shall be conducted using: Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments, Center for Watershed Protection, October 2004, or another methodology of comparable effectiveness.

iii. Procedures for characterizing the nature of, and potential public or environmental threat posed by, any illicit discharges found by or reported to the Permittee. Procedures shall include detailed instructions for evaluating whether the discharge must be immediately contained and steps to be taken for containment of the discharge.

Compliance with this provision shall be achieved by investigating (or referring to the appropriate agency) within 7 days, on average, any complaints, reports or monitoring information that indicates a potential illicit discharge, spill, or illegal dumping; and immediately investigating (or referring) problems and violations determined to be emergencies or otherwise judged to be urgent or severe.

iv. Procedures for tracing the source of an illicit discharge; including visual inspections, and when necessary, opening manholes, using mobile cameras, collecting and analyzing water samples, and/or other detailed inspection procedures.

v. Procedures for removing the source of the discharge; including notification of appropriate authorities; notification of the property owner; technical assistance for eliminating the discharge; follow-up inspections; and escalating enforcement and legal actions if the discharge is not eliminated.

Compliance with this provision shall be achieved by initiating an investigation within 21 days of a report or discovery of a suspected illicit

connection to determine the source of the connection, the nature and volume of discharge through the connection, and the party responsible for the connection. Upon confirmation of the illicit nature of a storm drain connection, termination of the connection shall be verified within 180 days, using enforcement authority as needed.

d. Permittees shall inform public employees, businesses, and the general public of hazards associated with illegal discharges and improper disposal of waste.

   i. No later than 180 days prior to the expiration date of this Permit, distribute appropriate information to target audiences identified pursuant to S5.C.1.

   ii. No later than two years from the effective date of this Permit, publicly list and publicize a hotline or other local telephone number for public reporting of spills and other illicit discharges. Keep a record of calls received and follow-up actions taken in accordance with S5.C.3.c.ii. through v. above; include a summary in the annual report (see section S9 Reporting and Record Keeping Requirements).

e. Permittees shall adopt and implement procedures for program evaluation and assessment, including tracking the number and type of spills or illicit discharges identified; inspections made; and any feedback received from public education efforts. A summary of this information shall be included in the Permittee's annual report (see section S9 Reporting and Recordkeeping Requirements).

f. Each Permittee will provide appropriate training for municipal field staff on the identification and reporting of illicit discharges into MS4s.

   i. No later than thirty months after the effective date of this Permit, each Permittee shall ensure that all municipal field staff who are responsible for identification, investigation, termination, cleanup, and reporting illicit discharges, including spills, improper disposal and illicit connections are trained to conduct these activities. Follow-up training shall be provided as needed to address changes in procedures, techniques or requirements. Permittees shall document and maintain records of the training provided and the staff trained.

   ii. No later than three years after the effective date of this Permit, an ongoing training program shall be developed and implemented for all municipal field staff, which, as part of their normal job responsibilities, might come into contact with or otherwise observe an illicit discharge or illicit connection to the storm sewer system shall be trained on the identification of an illicit discharge/connection, and on the proper procedures for reporting and responding to the illicit discharge/connection. Follow-up training shall be provided as needed to address changes in procedures, techniques or requirements. Permittees shall document and maintain records of the training provided and the staff trained.

4. Controlling Runoff from New Development, Redevelopment and Construction Sites

Each Permittee shall develop, implement, and enforce a program to reduce pollutants in stormwater runoff to a regulated small MS4 from new development, redevelopment and construction site activities. This program shall be applied to all sites that disturb a land area 1 acre or greater, including projects less than one acre that are part of a larger common plan of the development or sale. The program shall apply to private and public development, including roads. The "Technical Thresholds" in Appendix 1 shall be applied to all sites 1 acre or greater, including projects less than one acre that are part of a larger common plan of the development or sale.

The minimum performance measures are:

a. The program shall include an ordinance or other enforceable mechanism that addresses runoff from new development, redevelopment, and construction site projects. Pursuant to S5.A.2., in adopting this ordinance or other regulatory mechanism, existing local requirements to apply stormwater controls at smaller sites, or at lower thresholds than required pursuant to S5.C.4., shall be retained. The ordinance or other enforceable mechanism shall be in place no later than thirty months from the effective date of this Permit. The ordinance or other enforceable mechanism shall include, at a minimum:

   i. The Minimum Requirements, technical thresholds, and definitions in Appendix 1 or an equivalent approved by Ecology under the NPDES Phase I Municipal Stormwater Permit, for new development, redevelopment, and construction sites. Adjustment and variance criteria equivalent to those in Appendix 1 shall be included. More stringent requirements may be used, and/or certain requirements may be tailored to local circumstances through the use of basin plans or other similar water quality and quantity planning efforts. Such local requirements shall provide equal protection of receiving waters and equal levels of pollutant control to those provided in Appendix 1.

   ii. A site planning process and BMP selection and design criteria that, when used to implement the minimum requirements in Appendix 1 (or equivalent approved by Ecology under the Phase I Permit) will protect water quality, reduce the discharge of pollutants to the maximum extent practicable and satisfy the State requirement under Chapter 90.48 RCW to apply all known, available and reasonable methods of prevention, control and treatment (AKART) prior to discharge. Permittees shall document how the criteria and requirements will protect water quality, reduce the discharge of pollutants to the maximum extent practicable, and satisfy State AKART requirements.

   Permittees who choose to use the site planning process and BMP selection and design criteria in the 2005 *Stormwater Management Manual for Western Washington,* or an equivalent manual approved by the Department

under the Phase I Permit, may cite this choice as their sole documentation to meet this requirement.

iii. The legal authority, through the approval process for new development, to inspect private stormwater facilities that discharge to the Permittee's MS4.

iv. Provisions to allow non-structural preventive actions and source reduction approaches such as Low Impact Development Techniques (LID), measures to minimize the creation of impervious surfaces and measures to minimize the disturbance of native soils and vegetation. Provisions for LID should take into account site conditions, access and long term maintenance.

v. If the Permittee chooses to allow construction sites to apply the "Erosivity Waiver" in Appendix 1, Minimum Requirement #2, the ordinance or regulatory mechanism shall include appropriate, escalating enforcement sanctions for construction sites that provide notice to the Permittee of their intention to apply the waiver but do not meet the requirements (including timeframe restrictions, limits on activities that result in non-stormwater discharges, and implementation of appropriate BMPs to prevent violations of water quality standards) to qualify for the waiver.

b. The program shall include a permitting process with plan review, inspection and enforcement capability to meet the standards listed in (i) through (iv) below, for both private and public projects, using qualified personnel (as defined in Definitions *and Acronyms*). At a minimum, this program shall be applied to all sites that disturb a land area 1 acre or greater, including projects less than one acre that are part of a larger common plan of the development or sale. The process shall be in place no later than thirty months from the effective date of this Permit.

i. Except as provided in S5.C.4.b.vii. below, review of all stormwater site plans for proposed development activities.

ii. Except as provided in S5.C.4.b.vii. below, inspect, prior to clearing and construction, all known development sites that have a high potential for sediment transport as determined through plan review based on definitions and requirements in Appendix 7 Identifying Construction Site Sediment Transport Potential.

iii. Except as provided in S5.C.4.b.vii. below, inspect all known permitted development sites during construction to verify proper installation and maintenance of required erosion and sediment controls. Enforce as necessary based on the inspection.

iv. Inspect all permitted development sites upon completion of construction and prior to final approval or occupancy to ensure proper installation of permanent stormwater controls such as stormwater facilities and structural BMPs. Also, verify a maintenance plan is completed and responsibility for maintenance is assigned. Enforce as necessary based on the inspection.

v. Compliance with the inspection requirements in (ii), (iii) and (iv) above shall be determined by the presence and records of an established inspection program designed to inspect all sites and achieving at least 95% of scheduled inspections.

vi. An enforcement strategy shall be developed and implemented to respond to issues of non-compliance.

vii. If the Permittee chooses to allow construction sites to apply the "Erosivity Waiver" in Appendix 1, Minimum Requirement #2, the Permittee is not required to review the construction stormwater pollution prevention plans as part of the site plan review in (i) above, and is not required to perform the construction phase inspections identified in (ii) and (iii) above related to construction sites which are eligible for the erosivity waiver.

c. The program shall include provisions to verify adequate long-term operation and maintenance (O&M) of post-construction stormwater facilities and BMPs that are permitted and constructed pursuant to (b) above. These provisions shall be in place no later than thirty months from the effective date of this Permit and shall include:

i. Adoption of an ordinance or other enforceable mechanism that clearly identifies the party responsible for maintenance, requires inspection of facilities in accordance with the requirements in (ii) through (iv) below, and establishes enforcement procedures.

ii. Each Permittee shall establish maintenance standards that are as protective or more protective of facility function than those specified in Chapter 4 of Volume V of the 2005 Stormwater Management Manual for Western Washington. For facilities which do not have maintenance standards, the Permittee shall develop a maintenance standard.

(1) The purpose of the maintenance standard is to determine if maintenance is required. The maintenance standard is not a measure of the facilities required condition at all times between inspections. Exceeding the maintenance standard between the period of inspections is not a permit violation.

(2) Unless there are circumstances beyond the Permittees control, when an inspection identifies an exceedence of the maintenance standard, maintenance shall be performed:

- Within 1 year for wet pool facilities and retention/detention ponds.
- Within 6 months for typical maintenance.
- Within 9 months for maintenance requiring re-vegetation, and
- Within 2 years for maintenance that requires capital construction of less than $25,000.

Circumstances beyond the permittees control include denial or delay of access by property owners, denial or delay of necessary permit approvals, and unexpected reallocations of maintenance staff to

perform emergency work. For each exceedence of the required timeframe, the Permittee must document the circumstances and how they were beyond their control.

iii. Annual inspections of all stormwater treatment and flow control facilities (other than catch basins) permitted by the Permittee according to S5.C.4.b. unless there are maintenance records to justify a different frequency.

Reducing the inspection frequency shall be based on maintenance records of double the length of time of the proposed inspection frequency. In the absence of maintenance records, the Permittee may substitute written statements to document a specific less frequent inspection schedule. Written statements shall be based on actual inspection and maintenance experience and shall be certified in accordance with G19 *Certification and Signature*.

iv. Inspections of all new flow control and water quality treatment facilities, including catch basins, for new residential developments that are a part of a larger common plan of development or sale, every 6 months during the period of heaviest house construction (i.e., 1 to 2 years following subdivision approval) to identify maintenance needs and enforce compliance with maintenance standards as needed.

d. The program shall include a procedure for keeping records of inspections and enforcement actions by staff, including inspection reports, warning letters, notices of violations, and other enforcement records. Records of maintenance inspections and maintenance activities shall be maintained. Permittees shall keep records of all projects disturbing more than one acre, and all projects of any size that are part of a common plan of development or sale that is greater than one acre that are approved after the effective date of this Permit.

e. The program shall make available copies of the "Notice of Intent for Construction Activity" and copies of the "Notice of Intent for Industrial Activity" to representatives of proposed new development and redevelopment. Permittees will continue to enforce local ordinances controlling runoff from sites that are also covered by stormwater permits issued by Ecology.

f. No later than thirty months from the effective date of this Permit, each Permittee shall verify that all staff responsible for implementing the program to control stormwater runoff from new development, redevelopment, and construction sites, including permitting, plan review, construction site inspections, and enforcement, are trained to conduct these activities. Follow-up training shall be provided as needed to address changes in procedures, techniques or staffing. Permittees shall document and maintain records of the training provided and the staff trained.

5. Pollution Prevention and Operation and Maintenance for Municipal Operations

Within three years of the effective date of this Permit, each Permittee shall develop and implement an operations and maintenance (O&M) program that includes a

training component and has the ultimate goal of preventing or reducing pollutant runoff from municipal operations.

The minimum performance measures are:

a. Each Permittee shall establish maintenance standards that are as protective, or more protective, of facility function than those specified in Chapter 4 of Volume V of the 2005 Stormwater Management Manual for Western Washington. For facilities which do not have maintenance standards, the Permittee shall develop a maintenance standard.

   i. The purpose of the maintenance standard is to determine if maintenance is required. The maintenance standard is not a measure of the facilities required condition at all times between inspections. Exceeding the maintenance standard between inspections and/or maintenance is not a permit violation.

   ii. Unless there are circumstances beyond the Permittees control, when an inspection identifies an exceedence of the maintenance standard, maintenance shall be performed:

      - Within 1 year for wet pool facilities and retention/detention ponds.
      - Within 6 months for typical maintenance.
      - Within 9 months for maintenance requiring re-vegetation.
      - Within 2 years for maintenance that requires capital construction of less than $25,000.

      Circumstances beyond the permittees control include denial or delay of access by property owners, denial or delay of necessary permit approvals, and unexpected reallocations of maintenance staff to perform emergency work. For each exceedence of the required timeframe, the Permittee shall document the circumstances and how they were beyond their control.

b. Annual inspection of all municipally owned or operated permanent stormwater treatment and flow control facilities, other than catch basins, and taking appropriate maintenance actions in accordance with the adopted maintenance standards. The annual inspection requirement may be reduced based on inspection records.

   Reducing the inspection frequency shall be based on maintenance records of double the length of time of the proposed inspection frequency. In the absence of maintenance records, the Permittee may substitute written statements to document a specific less frequent inspection schedule. Written statements shall be based on actual inspection and maintenance experience and shall be certified in accordance with G19 *Certification and Signature*.

c. Spot checks of potentially damaged permanent treatment and flow control facilities (other than catch basins) after major (greater than 24-hour-10-year recurrence interval rainfall) storm events. If spot checks indicate widespread damage/maintenance needs, inspect all stormwater treatment and flow control facilities that may be affected. Conduct repairs or take appropriate maintenance

action in accordance with maintenance standards established above, based on the results of the inspections.

d. Inspection of all catch basins and inlets owned or operated by the Permittee at least once before the end of the Permit term. Clean catch basins if the inspection indicates cleaning is needed to comply with maintenance standards established in the 2005 *Stormwater Management Manual for Western Washington.* Decant water shall be disposed of in accordance with Appendix 6 *Street Waste Disposal.*

   Inspections may be conducted on a "circuit basis" whereby a sampling of catch basins and inlets within each circuit is inspected to identify maintenance needs. Include in the sampling an inspection of the catch basin immediately upstream of any system outfall. Clean all catch basins within a given circuit at one time if the inspection sampling indicates cleaning is needed to comply with maintenance standards established under S5.C.4.c., above.

   As an alternative to inspecting catch basins on a "circuit basis," the Permittee may inspect all catch basins, and clean only catch basins where cleaning is needed to comply with maintenance standards.

e. Compliance with the inspection requirements in a, b, c and d above shall be determined by the presence of an established inspection program designed to inspect all sites and achieving inspection of 95% of all sites.

f. Establishment and implementation of practices to reduce stormwater impacts associated with runoff from streets, parking lots, roads or highways owned or maintained by the Permittee, and road maintenance activities conducted by the Permittee. The following activities shall be addressed:

   - Pipe cleaning
   - Cleaning of culverts that convey stormwater in ditch systems
   - Ditch maintenance
   - Street cleaning
   - Road repair and resurfacing, including pavement grinding
   - Snow and ice control
   - Utility installation
   - Pavement striping maintenance
   - Maintaining roadside areas, including vegetation management
   - Dust control

g. Establishment and implementation of policies and procedures to reduce pollutants in discharges from all lands owned or maintained by the Permittee and subject to this Permit, including but not limited to: parks, open space, road right-of-way, maintenance yards, and stormwater treatment and flow control facilities. These policies and procedures shall address, but are not limited to:

   - Application of fertilizer, pesticides, and herbicides including the development of nutrient management and integrated pest management plans.
   - Sediment and erosion control.

- Landscape maintenance and vegetation disposal.
- Trash management.
- Building exterior cleaning and maintenance.

h. Develop and implement an on-going training program for employees of the Permittee whose construction, operations or maintenance job functions may impact stormwater quality. The training program shall address the importance of protecting water quality, the requirements of this Permit, operation and maintenance standards, inspection procedures, selecting appropriate BMPs, ways to perform their job activities to prevent or minimize impacts to water quality, and procedures for reporting water quality concerns, including potential illicit discharges. Follow-up training shall be provided as needed to address changes in procedures, techniques or requirements. Permittees shall document and maintain records of training provided.

i. Development and implementation of a Stormwater Pollution Prevention Plan (SWPPP) for all heavy equipment maintenance or storage yards, and material storage facilities owned or operated by the Permittee in areas subject to this Permit that are not required to have coverage under the Industrial Stormwater General Permit. Implementation of non-structural BMPs shall begin immediately after the pollution prevention plan is developed. A schedule for implementation of structural BMPs shall be included in the SWPPP. Generic SWPPPs that can be applied at multiple sites may be used to comply with this requirement. The SWPPP shall include periodic visual observation of discharges from the facility to evaluate the effectiveness of the BMP.

j. Records of inspections and maintenance or repair activities conducted by the Permittee shall be maintained in accordance with S9 *Reporting Requirements.*

S6. STORMWATER MANAGEMENT PROGRAM FOR SECONDARY PERMITTEES

A. This section applies to all secondary permittees, whether coverage under this Permit is obtained individually or as a co-permittee with a city, town or county or another secondary permittee.

1. To the extent allowable under state, federal or local law, all components are mandatory for each Secondary Permittee covered under this Permit, whether covered as an individual permittee or as a co-permittee.

2. Each Secondary Permittee shall develop and implement a stormwater management program (SWMP). The SWMP shall be designed to reduce the discharge of pollutants from regulated small MS4s to the maximum extent practicable and protect water quality.

3. Unless an alternate implementation schedule is established by Ecology as a condition of permit coverage, the SWMP shall be developed and implemented in accordance with the schedules contained in this section and shall be fully developed and implemented no later than180 days before the expiration date of this Permit. Notwithstanding the schedules in this Permit, secondary permittees that are already

implementing some or all of the required SWMP components shall continue implementation of those components.

4. Secondary permittees may implement parts of their SWMP in accordance with the schedule for cities, towns and counties in S5, provided they have signed a memorandum of understanding or other agreement to jointly implement the activity or activities with one or more jurisdictions listed in S1.D.2.a., and submitted a copy of the agreement to Ecology.

5. Each Secondary Permittee shall prepare written documentation of the SWMP. The SWMP documentation shall be organized according to the program components in S6.D below and shall be updated at least annually for submittal with the Permittee's annual reports to Ecology (see S9 *Reporting Requirements*). The SWMP documentation shall include:

   a. A description of each of the program components included in S6.D.1. through S6.D.6., and

   b. Any additional actions necessary to meet the requirements of applicable TMDLs pursuant to S7 *Compliance with Total Maximum Daily Load Requirements.*

B. Coordination

The SWMP shall include mechanisms to encourage coordinated stormwater-related policies, programs and projects within a watershed and interconnected MS4s. Where relevant and appropriate, the SWMP shall also include coordination among departments of the Secondary Permittee to ensure compliance with the terms of this Permit.

C. Legal Authority

To the extent allowable under state law and federal law, each Secondary Permittee shall be able to demonstrate that they can operate pursuant to legal authority which authorizes or enables the Secondary Permittee to control discharges to and from municipal separate storm sewers owned or operated by the Secondary Permittee.

This legal authority may be a combination of statutes, ordinances, permits, contracts, orders, interagency agreements, or similar instruments.

D. Stormwater Management Program for Secondary Permittees

The term "Secondary Permittees" means drainage, diking, flood control, or diking and drainage districts, ports (other than the ports of Seattle and Tacoma), public colleges and universities, and any other owners or operators of municipal separate storm sewers located within the municipalities that are listed as permittees in S1.B.

SWMP components

1. Public Education and Outreach

   Each Secondary Permittee shall implement the following stormwater education strategies:

a. Storm drain inlets owned and operated by the Secondary Permittee that are located in maintenance yards, in parking lots, along sidewalks, and at pedestrian access points shall be clearly and permanently labeled with the message "Dump no waste" and indicating the point of discharge as a river, lake, bay, or groundwater.

   i. No later than three years from the date of permit coverage, at least 50 percent of these inlets shall be labeled.

   ii. No later than 180 days prior expiration date of this Permit, or as established as a condition of coverage by the Ecology, all of these inlets shall be labeled.

   iii. As identified during visual inspection and regular maintenance of storm drain inlets per the requirements of S6.D.3.d. and S6.D.6.a.i. below, or as otherwise reported to the Secondary Permittee, any inlet having a label that is no longer clearly visible and/or easily readable shall be re-labeled within 90 days.

b. Each year beginning no later than three years from the date of permit coverage, public ports, colleges and universities shall distribute educational information to tenants and residents on the impact of stormwater discharges on receiving waters, and steps that can be taken to reduce pollutants in stormwater runoff. Different combinations of topics shall be addressed each year, and, before the expiration date of this Permit, where relevant, tenants and residents shall receive educational information about the following topics:

   i. How stormwater runoff affects local waterbodies

   ii. Proper use and application of pesticides and fertilizers

   iii. Benefits of using well-adapted vegetation

   iv. Alternative equipment washing practices including cars and trucks that minimize pollutants in stormwater

   v. Benefits of proper vehicle maintenance and alternative transportation choices; proper handling and disposal of vehicle wastes, including the location of hazardous waste collection facilities in the area

   vi. Hazards associated with illicit connections

   vii. Benefits of litter control and proper disposal of pet waste

   Compliance with this requirement can be achieved through participation in the local jurisdiction's public education and outreach programs.

2. Public Involvement and Participation

   No later than 180 days before the expiration date of this Permit, or as established as a condition of coverage by the Ecology, each Secondary Permittee shall:

   a. Publish a public notice in the local newspaper and solicit public review of their SWMP.

b. Make the latest updated version of the SWMP available to the public. If the Secondary Permittee maintains a website, the SWMP shall be posted on the Secondary Permittee's website.

3. Illicit Discharge Detection and Elimination

Each Secondary Permittee shall:

a. From the date of permit coverage, comply with all relevant ordinances, rules, and regulations of the local jurisdiction(s) in which the Secondary Permittee is located that govern non-stormwater discharges.

b. No later than one year from the date of permit coverage, develop and adopt appropriate policies prohibiting illicit discharges and illegal dumping, and identify possible enforcement mechanisms for those policies. No later than eighteen months from the date of permit coverage, develop and implement an enforcement plan using these mechanisms to ensure compliance with illicit discharge policies. These policies shall address, at a minimum: illicit connections; non-stormwater discharges as defined below; and spilling, dumping, or otherwise improperly disposing of: hazardous materials, pet waste, and litter.

i. Non-stormwater discharges covered by another NPDES permit and discharges from emergency fire fighting activities are allowed in the MS4 in accordance with S2 *Authorized Discharges*.

ii. The policies do not need to prohibit the following categories of non-stormwater discharges:

- Diverted stream flows
- Rising ground waters
- Uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20))
- Uncontaminated pumped ground water
- Foundation drains
- Air conditioning condensation
- Irrigation water from agricultural sources that is commingled with urban stormwater
- Springs
- Water from crawl space pumps
- Footing drains
- Flows from riparian habitats and wetlands

iii. The policies shall prohibit the following categories of non-stormwater discharges unless the stated conditions are met:

- Discharges from potable water sources, including water line flushing, hyperchlorinated water line flushing, fire hydrant system flushing, and pipeline hydrostatic test water. Planned discharges shall be de-chlorinated to a concentration of 0.1 ppm or less, pH-adjusted if

necessary, and volumetrically and velocity controlled to prevent resuspension of sediments in the MS4.

- Discharges from lawn watering and other irrigation runoff. These discharges shall be minimized through, at a minimum, public education activities and water conservation efforts conducted by the Secondary Permittee and/or the local jurisdiction.
- Dechlorinated swimming pool discharges. The discharges shall be dechlorinated to a concentration of 0.1 ppm or less, pH-adjusted and reoxygenated if necessary, and volumetrically and velocity controlled to prevent resuspension of sediments in the MS4. Swimming pool cleaning wastewater and filter backwash shall not be discharged to the MS4.
- Street and sidewalk wash water, water used to control dust, and routine external building wash down that does not use detergents. The Secondary Permittee shall reduce these discharges through, at a minimum, public education activities and/or water conservation efforts conducted by the Secondary Permittee and/or the local jurisdiction. To avoid washing pollutants into the MS4, the Secondary Permittee shall minimize the amount of street wash and dust control water used. At active construction sites, street sweeping shall be performed prior to washing the street.
- Other non-stormwater discharges shall be in compliance with the requirements of a stormwater pollution prevention plan reviewed by the Permittee which addresses control of such discharges.

iv. The Secondary Permittee's SWMP shall, at a minimum, address each category in iii above in accordance with the conditions stated therein.

v. The SWMP shall further address any category of discharges in ii or iii above if the discharge is identified as a significant source of pollutants to waters of the State.

c. No later than 180 days before the expiration date of this Permit, or as established as a condition of coverage by the Ecology, develop a storm sewer system map showing the locations of all known storm drain outfalls, labeled receiving waters and delineated areas contributing runoff to each outfall. Make the map (or completed portions of the map) available on request to the Department and/or to other Permittees or Secondary Permittees. The preferred, but not required, format of submission will be an electronic format with fully described mapping standards. An example description is provided on Ecology WebPages.

d. Conduct field inspections and visually inspect for illicit discharges at all known outfalls that discharge to surface waters. Visually inspect at least one third (on average) of all known outfalls each year beginning no later than two years from the date of permit coverage. Develop and implement procedures to identify and

remove any illicit discharges. Keep records of inspections and follow-up activities.

e. No later than 180 days before the expiration date of this Permit, or as established as a condition of coverage by the Ecology, develop and implement a spill response plan that includes coordination with a qualified spill responder.

f. Provide staff training or coordinate with existing training efforts to educate relevant staff on proper best management practices for preventing spills and illicit discharges. All relevant staff shall be trained.

4. Construction Site Stormwater Runoff Control

From the date of permit coverage, each Secondary Permittee shall:

a. Comply with all relevant ordinances, rules, and regulations of the local jurisdiction(s) in which the Secondary Permittee is located that govern construction phase stormwater pollution prevention measures.

b. For all construction projects under the control of the Secondary Permittee which, require a construction stormwater permit, Secondary Permittees shall obtain coverage under the NPDES General Permit for Stormwater Discharges Associated with Construction Activities or an alternative individual NPDES permit prior to discharging construction related stormwater.

c. Coordinate with the local jurisdiction regarding projects owned and operated by other entities which discharge into the Secondary Permittee's MS4, to assist the local jurisdiction with achieving compliance with all relevant ordinances, rules, and regulations of the local jurisdiction(s).

d. Provide training or coordinate with existing training efforts to educate relevant staff in erosion and sediment control BMPs and requirements, or hire trained contractors to perform the work.

e. Coordinate as requested with the Department or the local jurisdiction to provide access for inspection of construction sites or other land disturbances, which are under the control of the Secondary Permittee during the active grading and/or construction period.

5. Post-Construction Stormwater Management for New Development and Redevelopment

From the date of permit coverage, each Secondary Permittee shall:

a. Comply with all relevant ordinances, rules and regulations of the local jurisdiction(s) in which the Secondary Permittee is located that govern post-construction stormwater pollution prevention measures.

b. Coordinate with the local jurisdiction regarding projects owned and operated by other entities which discharge into the Secondary Permittee's MS4, to assist the local jurisdiction with achieving compliance with all relevant ordinances, rules, and regulations of the local jurisdiction(s).

6. Pollution Prevention and Good Housekeeping for Municipal Operations

Each Secondary Permittee shall:

a. No later than three years from the date of permit coverage, develop and implement a municipal operation and maintenance (O&M) plan to minimize stormwater pollution from activities conducted by the Secondary Permittee. The O&M Plan shall include appropriate pollution prevention and good housekeeping procedures for all of the following operations, activities, and/or types of facilities that are present within the Secondary Permittee's boundaries.

i. Stormwater collection and conveyance system, including catch basins, stormwater sewer pipes, open channels, culverts, structural stormwater controls, and structural runoff treatment and/or flow control facilities. The O&M Plan shall address, but is not limited to: scheduled inspections and maintenance activities, including cleaning and proper disposal of waste removed from the system. Secondary Permittees shall properly maintain stormwater collection and conveyance systems owned or operated by the Secondary Permittee and regularly inspect and maintain all structural post-construction stormwater BMPs to ensure facility function.

For facilities located in Western Washington, Secondary Permittees shall establish maintenance standards that are as protective or more protective of facility function than those specified in Chapter 4 Volume V of the 2005 Stormwater Management Manual for Western Washington,

For facilities located in Eastern Washington, Secondary Permittees shall establish maintenance standards that are as protective or more protective of facility function than those specified in Chapters 5, 6 and 8 of the Stormwater Management Manual for Eastern Washington (2004),

Secondary Permittees shall conduct spot checks of stormwater treatment and flow control facilities following a 24 hour storm event with a 10-year or greater recurrence interval.

ii. Roads, highways, and parking lots. The O&M Plan shall address, but is not limited to: deicing, anti-icing, and snow removal practices; snow disposal areas; material (e.g. salt, sand, or other chemical) storage areas; all-season BMPs to reduce road and parking lot debris and other pollutants from entering the MS4.

iii. Vehicle fleets. The O&M Plan shall address, but is not limited to: storage, washing, and maintenance of municipal vehicle fleets; and fueling facilities. Secondary Permittees shall conduct all vehicle and equipment washing and maintenance in a self-contained covered building or in designated wash and/or maintenance areas.

iv. External building maintenance. The O&M Plan shall address, building exterior cleaning and maintenance including cleaning, washing, painting and other maintenance activities.

v. Parks and open space. The O&M Plan shall address, but is not limited to: proper application of fertilizer, pesticides, and herbicides; sediment and erosion control; BMPs for landscape maintenance and vegetation disposal; and trash management.

vi. Material storage areas, heavy equipment storage areas, and maintenance areas. Secondary Permittees shall develop and implement a Stormwater Pollution Prevention Plan to protect water quality at each of these facilities owned or operated by the Secondary Permittee and not covered under the General NPDES Permit for Stormwater Discharges Associated with Industrial Activities or under another NPDES permit that covers stormwater discharges associated with the activity.

vii. Other facilities that would reasonably be expected to discharge contaminated runoff. The O&M Plan shall address proper stormwater pollution prevention practices for each facility.

b. From the date of coverage under this Permit, Secondary Permittees shall also have permit coverage for all facilities owned, or operated by the Secondary Permittee that are required to be covered under the General NPDES Permit for Stormwater Discharges Associated with Industrial Activities.

c. The O&M Plan shall include sufficient documentation and records as necessary to demonstrate compliance with the O&M Plan requirements in S6.D.6.a.i through vii above.

d. Train all employees whose construction, operations, or maintenance job functions may impact stormwater quality. The training shall address:

i. The importance of protecting water quality,

ii. The requirements of this Permit,

iii. Operation and maintenance requirements,

iv. Inspection procedures,

v. Ways to perform their job activities to prevent or minimize impacts to water quality, and

vi. Procedures for reporting water quality concerns, including potential illicit discharges.

S7. COMPLIANCE WITH TOTAL MAXIMUM DAILY LOAD REQUIREMENTS

The following requirements apply if an applicable Total Maximum Daily Load (TMDL) is approved for stormwater discharges from MS4s owned or operated by the Permittee. Applicable TMDLs are TMDLs which have been approved by EPA on or before the date

permit coverage is granted. All Permittees shall be in compliance with the requirements of applicable TMDLs.

A. For applicable TMDLs listed in Appendix 2, affected permittees shall comply with the specific requirements identified in Appendix 2. Each Permittee shall keep records of all actions required by this Permit that are relevant to applicable TMDLs within their jurisdiction. The status of the TMDL implementation shall be included as part of the annual report submitted to Ecology.

   Where monitoring is required in Appendix 2, the Permittee shall conduct the monitoring according to a Quality Assurance Project Plan (QAPP) approved by Ecology.

B. For applicable TMDLs not listed in Appendix 2, compliance with this Permit shall constitute compliance with those TMDLs.

C. For TMDLs that are approved by EPA after this Permit is issued, Ecology may establish TMDL related permit requirements through future permit modification if Ecology determines implementation of actions, monitoring or reporting necessary to demonstrate reasonable further progress toward achieving TMDL waste load allocations, and other targets, are not occurring and shall be implemented during the term of this Permit or when this Permit is reissued. Permittees are encouraged to participate in development of TMDLs within their jurisdiction and to begin implementation.

S8. MONITORING

A. Permittees are not required to conduct water sampling or other testing during the effective term of this Permit, with the following exceptions:

   1. Any water quality monitoring required for compliance with TMDLs, pursuant to section S7 *Compliance with Total Maximum Daily Load Requirements* and Appendix 2 of this Permit, and

   2. Any sampling or testing required for characterizing illicit discharges pursuant to section S5.C.3. or S6.D.3. of this Permit.

B. The Permittee shall provide the following information in each annual report:

   1. A description of any stormwater monitoring or studies conducted by the Permittee during the reporting period. If stormwater monitoring was conducted on behalf of the Permittee, or if studies or investigations conducted by other entities were reported to the Permittee, a brief description of the type of information gathered or received shall be included in the annual report(s) covering the time period(s) the information was received.

   2. An assessment of the appropriateness of the BMPs identified by the Permittee for each component of the SWMP; and any changes made, or anticipated to be made, to the BMPs that were previously selected to implement the SWMP, and why.

   3. Information required pursuant to S8.C.2. below.

C. Preparation for future, long-term monitoring

This section does not apply to secondary permittees. However, secondary permittees are required to provide information, maps and access for sampling efforts, as necessary. Secondary permittees are encouraged to participate in the monitoring program.

1. All cities, towns and counties shall prepare to participate in the implementation of a comprehensive long-term monitoring program. The monitoring program will include two components: stormwater monitoring and targeted Stormwater Management Program (SWMP) effectiveness monitoring. Stormwater monitoring 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 the permittees' jurisdictions. Stormwater program effectiveness monitoring is intended to improve stormwater management efforts by evaluating issues that significantly affect the success of, or confidence in, stormwater controls. The monitoring program can include long-term monitoring and short-term studies. The results of the monitoring program will be used to support the adaptive management process and lead to refinements of the SWMP.

   a. Stormwater monitoring

      Cities having a population greater than 10,000 and counties having a population greater than 25,000 shall identify sites for long-term stormwater monitoring. Adequate sites will be those completely mapped as required in S5.C.3.a. and be suitable for permanent installation and operation of flow-weighted composite sampling equipment. No later than December 31, 2010:

      i. Each county having a population greater than 100,000 shall identify three outfalls or conveyances where stormwater sampling could be conducted. One outfall or conveyance shall represent commercial land use, the second shall represent low-density residential land use and the third will represent medium-to-high density residential land use.

      ii. Each city having a population greater than 75,000 shall identify three outfalls or conveyances where stormwater sampling could be conducted. One outfall or conveyance shall represent commercial land use, the second shall represent high-density residential land use and the third will represent industrial land use.

      iii. Each county having a population between 25,000 and 100,000 shall identify two outfalls or conveyances where stormwater sampling could be conducted. One outfall shall represent commercial land use and the second one will represent low-density residential land use.

      iv. Each city having a population between 10,000 and 75,000 shall identify two outfalls or conveyances where stormwater sampling could be conducted. One outfall shall represent commercial land use and the second will represent high-density residential land use.

      v. Permittees shall document how sites are selected and justify the basin size, based on comparison of the times of concentration with rainfall durations for typical seasonal storms. Each site shall represent a discernible type of land

use, but not be a single industrial or commercial complex. Ideally, to represent a particular land use, no less than 80% of the area served by the outfall or conveyance will be classified as having that land use. Permittees may move upstream in the conveyance system to achieve the desired land use, or, if a primarily industrial or commercial area is not present, an area of mixed industrial and commercial land use may be selected.

b. SWMP effectiveness monitoring

i. Each city, town and county shall prepare to conduct monitoring to determine the effectiveness of the Permittee's SWMP at controlling stormwater-related problems that are directly addressed by actions in the SWMP. This component of the monitoring program shall be designed to answer the following types of questions:

- How effective is a targeted action or narrow suite of actions?
- Is the SWMP achieving a targeted environmental outcome?

ii. No later than December 31, 2010, each city, town and county shall identify at least two suitable questions and select sites where monitoring will be conducted. This monitoring shall include, at a minimum, plans for stormwater, sediment or receiving water monitoring of physical, chemical and/or biological characteristics. This monitoring may also include data collection and analysis of other measures of program effectiveness, problem identification and characterizing discharges for planning purposes.

iii. For each question, the Permittee shall develop a monitoring plan containing the following elements:

- A statement of the question, an explanation of how and why the issue is significant to the Permittee, and a discussion of whether and how the results of the monitoring may be significant to other MS4s.
- A specific hypothesis about the issue or management actions that will be tested.
- Specific parameters or attributes to be measured.
- Expected modifications to management actions depending on the outcome of hypothesis testing.

2. Monitoring program reporting requirements

a. The fourth annual report shall:

i. Describe the status of identification of sites for stormwater monitoring, if required for the Permittee.

ii. Include a summary of proposed questions for the SWMP effectiveness monitoring and describe the status of developing the monitoring plan, including the proposed purpose, design, and methods.

b. To comply with the requirements of all or part(s) of this section, permittees in a single Urbanized Area or WRIA may choose to submit a collaborative report or reports in lieu of separate reports.

S9. REPORTING REQUIREMENTS

A. No later than March 31 of each year beginning in 2008, each Permittee shall submit an annual report. The reporting period for the first annual report will be from the effective date of this permit through December 31, 2007. The reporting period for all subsequent annual reports will be the previous calendar year.

B. Two printed copies and an electronic (PDF) copy of each document shall be submitted to Ecology. All submittals shall be delivered to:

Department of Ecology
Water Quality Program
Municipal Stormwater Permits
P.O. Box 47696
Olympia, WA 98504-7696

C. Each Permittee is required to keep all records related to this permit and the SWMP for at least five years. Except for the requirements of the annual reports described in this permit, records shall be submitted to Ecology only upon request,

D. Each Permittee shall make all records related to this permit and the Permittee's SWMP available to the public at reasonable times during business hours. The Permittee will provide a copy of the most recent annual report to any individual or entity, upon request.

1. A reasonable charge may be assessed by the Permittee for making photocopies of records.
2. The Permittee may require reasonable advance notice of intent to review records related to this Permit.

E. The annual report for cities, towns, and counties

Each annual report shall include the following:

1. A copy of the Permittee's current Stormwater Management Program as required by S5.A.2.
2. Submittal of Appendix 3 – *Annual Report Form for Cities, Towns, and Counties,* which is intended to summarize the Permittees compliance with the conditions of this permit, including:
   a. Status of implementation of each component of the SWMP in section S5 *Stormwater Management Program for Cities, Towns and Counties.*
   b. An assessment of the Permittee's progress in meeting the minimum performance standards established for each of the minimum control measures of the SWMP.
   c. A description of activities being implemented to comply with each component of the SWMP, including the number and type of inspections, enforcement

actions, public education and involvement activities, and illicit discharges detected and eliminated.

d. The Permittee's SWMP implementation schedule and plans for meeting permit deadlines, and the status of SWMP implementation to date. If permit deadlines are not met, or may not be met in the future, include: reasons why, corrective steps taken and proposed, and expected dates that the deadlines will be met.

e. A summary of the Permittee's evaluation of their SWMP, according to sections S5.A.4. and S8.B.2.

f. If applicable, notice that the MS4 is relying on another governmental entity to satisfy any of the obligations under this permit.

g. Updated information from the prior annual report plus any new information received during the reporting period, pursuant to S8.B.2. above.

h. Certification and signature pursuant to G19.D, and notification of any changes to authorization pursuant to G19.C.

3. Permittees shall include with the annual report, notification of any annexations, incorporations or jurisdictional boundary changes resulting in an increase or decrease in the Permittee's geographic area of permit coverage during the reporting period, and implications for the SWMP.

F. Annual report for Secondary Permittees

All Secondary Permittees shall complete the *Annual Report Form for Secondary Permittees* (Appendix 4) and submit it along with any supporting documentation to Ecology.

1. The *Annual Report Form for Secondary Permittees* is intended to summarize the Permittees compliance with the conditions of this permit, including:

   a. Status of implementation of each component of the SWMP in section S6 *Stormwater Management Program for Secondary Permittees* of this permit.

   b. An assessment of the Permittee's progress in meeting the minimum performance standards established for each of the minimum control measures of the SWMP.

   c. A summary of the Permittee's evaluation of their SWMP, according to section S8.B.2.

   d. If applicable, notice that the MS4 is relying on another governmental entity to satisfy any of the obligations under this permit.

   e. Updated information from the prior annual report plus any new information received during the reporting period pursuant to S8.B.1 and S8.B.2.

   f. Certification and signature pursuant to G19.D, and notification of any changes to authorization pursuant to G19.C.

2. Secondary Permittees shall include with the annual report a notification of any jurisdictional boundary changes resulting in an increase or decrease in the

Permittee's geographic area of permit coverage during the reporting period, and implications for the SWMP.

GENERAL CONDITIONS

G1. DISCHARGE VIOLATIONS

All discharges and activities authorized by this Permit shall be consistent with the terms and conditions of this Permit.

G2. PROPER OPERATION AND MAINTENANCE

The Permittee shall at all times properly operate and maintain all facilities and systems of collection, treatment, and control (and related appurtenances) which are installed or used by the Permittee for pollution control to achieve compliance with the terms and conditions of this Permit.

G3. NOTIFICATION OF SPILL

If a Permittee has knowledge of a spill into a municipal storm sewer which could constitute a threat to human health, welfare, or the environment, the Permittee shall notify the Ecology regional office and other appropriate spill response authorities immediately but in no case later than within 24 hours of obtaining that knowledge. Spills which might cause bacterial contamination of shellfish, such as might result from broken sewer lines, shall be reported immediately to the Department of Ecology and to the Department of Health, Shellfish Program. The Department of Ecology's regional office 24-hour number is (425)649-7000 for NWRO and (360)407-6300 for SWRO and the Department of Health's shellfish 24-hour number is (360)236-3330.

G4. BYPASS PROHIBITED

The intentional bypass of stormwater from all or any portion of a stormwater treatment BMP whenever the design capacity of the treatment BMP is not exceeded, is prohibited unless the following conditions are met:

A. Bypass is: (1) unavoidable to prevent loss of life, personal injury, or severe property damage; or (2) necessary to perform construction or maintenance-related activities essential to meet the requirements of the Clean Water Act (CWA); and

B. There are no feasible alternatives to bypass, such as the use of auxiliary treatment facilities, retention of untreated stormwater, or maintenance during normal dry periods.

"Severe property damage" means substantial physical damage to property, damage to the treatment facilities which would cause them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass.

G5. RIGHT OF ENTRY

The permittee shall allow an authorized representative of Ecology, upon the presentation of credentials and such other documents as may be required by law at reasonable times:

A. To enter upon the Permittee's premises where a discharge is located or where any records must be kept under the terms and conditions of this Permit;

B. To have access to, and copy at reasonable cost and at reasonable times, any records that must be kept under the terms of the Permit;

C. To inspect at reasonable times any monitoring equipment or method of monitoring required in the Permit;

D. To inspect at reasonable times any collection, treatment, pollution management, or discharge facilities; and

E. To sample at reasonable times any discharge of pollutants.

G6. DUTY TO MITIGATE

The Permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this Permit which has a reasonable likelihood of adversely affecting human health or the environment.

G7. PROPERTY RIGHTS

This permit does not convey any property rights of any sort, or any exclusive privilege.

G8. COMPLIANCE WITH OTHER LAWS AND STATUTES

Nothing in the Permit shall be construed as excusing the Permittee from compliance with any other applicable federal, state, or local statutes, ordinances, or regulations.

G9. MONITORING

A. Representative Sampling:

Samples and measurements taken to meet the requirements of this Permit shall be representative of the volume and nature of the monitored discharge, including representative sampling of any unusual discharge or discharge condition, including bypasses, upsets, and maintenance-related conditions affecting effluent quality.

B. Records Retention:

The Permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original recordings for continuous monitoring instrumentation, copies of all reports required by this Permit, and records of all data used to complete the application for this permit, for a period of at least five years. This period of retention shall be extended during the course of any unresolved litigation regarding the discharge of pollutants by the permittee or when requested by the Ecology. On request, monitoring data and analysis shall be provided to Ecology.

C. Recording of Results:

For each measurement or sample taken, the Permittee shall record the following information: (1) the date, exact place and time of sampling; (2) the individual who

performed the sampling or measurement; (3) the dates the analyses were performed; (4) who performed the analyses; (5) the analytical techniques or methods used; and (6) the results of all analyses.

D. Test Procedures:

All sampling and analytical methods used to meet the monitoring requirements in this permit shall conform to the Guidelines Establishing Test Procedures for the Analysis of Pollutants contained in 40 CFR Part 136, unless otherwise specified in this permit or approved in writing by Ecology.

E. Flow Measurement:

Appropriate flow measurement devices and methods consistent with accepted scientific practices shall be selected and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges. The devices shall be installed, calibrated, and maintained to ensure that the accuracy of the measurements are consistent with the accepted industry standard for that type of device. Frequency of calibration shall be in conformance with manufacturer's recommendations or at a minimum frequency of at least one calibration per year. Calibration records should be maintained for a minimum of three years.

F. Lab Accreditation:

All monitoring data, except for flow, temperature, conductivity, pH, total residual chlorine, and other exceptions approved by Ecology, shall be prepared by a laboratory registered or accredited under the provisions of, Accreditation of Environmental Laboratories, Chapter 173-50 WAC. Soils and hazardous waste data are exempted from this requirement pending accreditation of laboratories for analysis of these media by Ecology.

G. Additional Monitoring:

Ecology may establish specific monitoring requirements in addition to those contained in this permit by administrative order or permit modification.

G10. REMOVED SUBSTANCES

With the exception of decant from street waste vehicles, the Permittee shall not allow collected screenings, grit, solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of stormwater to be resuspended or reintroduced to the storm sewer system or to waters of the state. Decant from street waste vehicles resulting from cleaning stormwater facilities may be reintroduced only when other practical means are not available and only in accordance with the Street Waste Disposal Guidelines in Appendix 4.

G11. SEVERABILITY

The provisions of this Permit are severable, and if any provision of this Permit, or the application of any provision of this permit to any circumstance, is held invalid, the

application of such provision to other circumstances, and the remainder of this Permit shall not be affected thereby.

G12. REVOCATION OF COVERAGE

The director may terminate coverage under this General Permit in accordance with Chapter 43.21B RCW and Chapter 173-226 WAC. Cases where coverage may be terminated include, but are not limited to the following:

A. Violation of any term or condition of this general permit;

B. Obtaining coverage under this general permit by misrepresentation or failure to disclose fully all relevant facts;

C. A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge;

D. A determination that the permitted activity endangers human health or the environment, or contributes significantly to water quality standards violations;

E. Failure or refusal of the permittee to allow entry as required in Chapter 90.48.090 RCW;

F. Nonpayment of permit fees assessed pursuant to Chapter 90.48.465 RCW;

Revocation of coverage under this general permit may be initiated by Ecology or requested by any interested person.

G13. TRANSFER OF COVERAGE

The director may require any discharger authorized by this General Permit to apply for and obtain an individual permit in accordance with Chapter 43.21B RCW and Chapter 173-226 WAC.

G14. GENERAL PERMIT MODIFICATION AND REVOCATION

This General Permit may be modified, revoked and reissued, or terminated in accordance with the provisions of WAC 173-226-230. Grounds for modification, revocation and reissuance, or termination include, but are not limited to the following:

A. A change occurs in the technology or practices for control or abatement of pollutants applicable to the category of dischargers covered under this General Permit;

B. Effluent limitation guidelines or standards are promulgated pursuant to the CWA or Chapter 90.48 RCW, for the category of dischargers covered under this General Permit;

C. A water quality management plan containing requirements applicable to the category of dischargers covered under this General Permit is approved; or

D. Information is obtained which indicates that cumulative effects on the environment from dischargers covered under this General Permit are unacceptable.

E. Changes in state law that reference this permit.

G15. REPORTING A CAUSE FOR MODIFICATION OR REVOCATION

A Permittee who knows or has reason to believe that any activity has occurred or will occur which would constitute cause for modification or revocation and reissuance under Condition G12, G14, or 40 CFR 122.62 must report such plans, or such information, to Ecology so that a decision can be made on whether action to modify, or revoke and reissue this Permit will be required. Ecology may then require submission of a new or amended application. Submission of such application does not relieve the Permittee of the duty to comply with this Permit until it is modified or reissued.

G16. APPEALS

A. The terms and conditions of this General Permit, as they apply to the appropriate class of dischargers, are subject to appeal within thirty days of issuance of this General Permit, in accordance with Chapter 43.21B RCW, and Chapter 173-226 WAC.

B. The terms and conditions of this General Permit, as they apply to an individual discharger, are appealable in accordance with chapter 43.21B RCW within thirty days of the effective date of coverage of that discharger. Consideration of an appeal of General Permit coverage of an individual discharger is limited to the General Permit's applicability or nonapplicability to that individual discharger.

C. The appeal of General Permit coverage of an individual discharger does not affect any other dischargers covered under this General Permit. If the terms and conditions of this General Permit are found to be inapplicable to any individual discharger(s), the matter shall be remanded to Ecology for consideration of issuance of an individual permit or permits.

D. Modifications of this Permit are appealable in accordance with chapter 43.21B RCW and chapter 173-226 WAC.

G17. PENALTIES

40 CFR 122.41(a)(2) and (3), 40 CFR 122.41(j)(5), and 40 CFR 122.41(k)(2) are hereby incorporated into this Permit by reference.

G18. DUTY TO REAPPLY

The Permittee must apply for permit renewal at least 180 days prior to the specified expiration date of this permit.

G19. CERTIFICATION AND SIGNATURE

All applications, reports, or information submitted to the Department shall be signed and certified.

A. All permit applications shall be signed by either a principal executive officer or ranking elected official.

B. All reports required by this Permit and other information requested by the Department shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

1. The authorization is made in writing by a person described above and submitted to the Department, and

2. The authorization specifies either an individual or a position having responsibility for the overall development and implementation of the stormwater management program. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.)

C. Changes to authorization. If an authorization under condition G19.B.2 is no longer accurate because a different individual or position has responsibility for the overall development and implementation of the stormwater management program, a new authorization satisfying the requirements of condition G19.B.2 must be submitted to the Department prior to or together with any reports, information, or applications to be signed by an authorized representative.

D. Certification. Any person signing a document under this Permit shall make the following certification:

"I certify, under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that Qualified Personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for willful violations."

G20. NON-COMPLIANCE NOTIFICATION

In the event the Permittee is unable to comply with any of the terms and conditions of this permit, including discharges from the Permittees MS4 which may cause a threat to human heath or the environment, the Permittee shall:

A. Take appropriate action to correct or minimize the threat to human health or the environment or otherwise stop or correct the condition of noncompliance.

B. Notify Ecology of the failure to comply with the permit terms and conditions within 30 days of becoming aware of the non-compliance.

C. Notify Ecology immediately in cases where the Permittee becomes aware of a discharge from the Permittee's MS4 which may cause or contribute to an imminent threat to human health or the environment.

G21. UPSETS

Permittees must meet the conditions of 40 CFR 122.41(n) regarding "Upsets." The conditions are as follows:

A. Definition. "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

B. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of paragraph (C) of this condition are met. Any determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, will not constitute final administrative action subject to judicial review.

C. Conditions necessary for demonstration of upset. A permittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed contemporaneous operating logs, or other relevant evidence that:

1. An upset occurred and that the Permittee can identify the cause(s) of the upset;

2. The permitted facility was at the time being properly operated; and

3. The Permittee submitted notice of the upset as required in 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice of noncompliance).

4. The Permittee complied with any remedial measures required under 40 CFR 122.41(d) (Duty to Mitigate).

D. Burden of proof. In any enforcement proceeding, the Permittee seeking to establish the occurrence of an upset has the burden of proof.

DEFINITIONS AND ACRONYMS

AKART means all known, available, and reasonable methods of prevention, control and treatment.

All known, available and reasonable methods of prevention, control and treatment refers to the State Water Pollution Control Act, Chapter 90.48.010 and 90.48.520 RCW.

Applicable TMDL means a TMDL which has been approved by EPA on or before the issuance date of this Permit, or prior to the date that the Permittee's application is received by Ecology, or prior to a modification of this Permit, whichever is later.

Beneficial Uses means uses of waters of the states which include but are not limited to use for domestic, stock watering, industrial, commercial, agricultural, irrigation, mining, fish and wildlife maintenance and enhancement, recreation, generation of electric power and preservation of environmental and aesthetic values, and all other uses compatible with the enjoyment of the public waters of the state.

Best Management Practices ("BMPs") are the schedules of activities, prohibitions of practices, maintenance procedures, and structural and/or managerial practices approved by the Department that, when used singly or in combination, prevent or reduce the release of pollutants and other adverse impacts to waters of Washington State.

BMP means Best Management Practice.

Bypass means the diversion of stormwater from any portion of a stormwater treatment facility.

Common plan of development or sale means a site where multiple separate and distinct construction activities may be taking place at different times on different schedules, but still under a single plan. Examples include: phased projects and projects with multiple filings or lots, even if the separate phases or filings/lots will be constructed under separate contract or by separate owners (e.g. a development where lots are sold to separate builders); a development plan that may be phased over multiple years, but is still under a consistent plan for long-term development; and projects in a contiguous area that may be unrelated but still under the same contract, such as construction of a building extension and a new parking lot at the same facility. If the project is part of a common plan of development or sale, the disturbed area of the entire plan shall be used in determining permit requirements.

Component or **Program Component** means an element of the Stormwater Management Program listed in S5 Stormwater Management Program for Cities, Towns, and Counties or S6 Stormwater Management Program for Secondary Permittees of this permit.

Co-permittee means an operator of a regulated small MS4 which is applying jointly with another applicant for coverage under this permit. A co-permittee is an owner or operator of a regulated small MS4 located within or adjacent to another regulated MS4. A co-permittee is only responsible for complying with the conditions of this permit relating to discharges from the MS4 the co-permittee owns or operates. See also 40 CFR 122.26(b)(1)

CWA means Clean Water Act (formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972) Pub.L. 92-500, as amended Pub. L. 95-217, Pub. L. 95-576, Pub. L. (6-483 and Pub. L. 97-117, 33 U.S.C. 1251 et.seq.

Detailed Implementation Plan means the formal implementation plan for a Total Maximum Daily Load (TMDL) or water quality clean-up plan.

DIP means Detailed Implementation Plan.

Director means the Director of the Washington State Department of Ecology, or an authorized representative.

Discharge for the purpose of this permit means, unless indicated otherwise, any discharge from a MS4 owned or operated by the permittee.

Entity means another governmental body, or public or private organization, such as another permittee, a conservation district, or volunteer organization.

Equivalent document means a technical stormwater management manual developed by a state agency, local government or other entity that includes the Minimum Technical Requirements in Appendix 1 of this Permit. The Department may conditionally approve manuals that do not include the Minimum Technical Requirements in Appendix 1; in general, the Best Management Practices (BMPs) included in those documents may be applied at new development and redevelopment sites, but the Minimum Technical Requirements in Appendix 1 must still be met.

40 CFR means Title 40 of the Code of Federal Regulations, which is the codification of the general and permanent rules published in the Federal Register by the executive departments and agencies of the federal government.

General Permit means a permit which covers multiple dischargers of a point source category within a designated geographical area, in lieu of individual permits being issued to each discharger.

Ground water means water in a saturated zone or stratum beneath the surface of the land or below a surface water body.

Heavy equipment maintenance or storage yard means an uncovered area where any heavy equipment, such as mowing equipment, excavators, dump trucks, backhoes, or bulldozers are washed or maintained, or where at least five pieces of heavy equipment are stored.

Hydraulically Near means runoff from the site discharges to the sensitive feature without significant natural attenuation of flows that allows for suspended solids removal. See Appendix 7 Determining Construction Site Sediment Damage Potential for a more detailed definition.

Hyperchlorinated means water that contains more than 10 mg/Liter chlorine. Disinfection of water mains and appurtenances requires a chlorine residual of 10 mg/L at the end of the disinfection period. This level is well above the Maximum Residual Disinfectant Level of an annual average of 4 mg/Liter chlorine for potable water.

Illicit connection means any man-made conveyance that is connected to a municipal separate storm sewer without a permit, excluding roof drains and other similar type connections. Examples include sanitary sewer connections, floor drains, channels, pipelines, conduits, inlets, or outlets that are connected directly to the municipal separate storm sewer system.

Illicit discharge means any discharge to a municipal separate storm sewer that is not composed entirely of storm water except discharges pursuant to a NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer) and discharges resulting from fire fighting activities.

Large Municipal Separate Storm Sewer System means all municipal separate storm sewer systems located in an incorporated place with a population of 250,000 or more, a county with unincorporated urbanized areas with a population of 250,000 or more according to the 1990 decennial census by the Bureau of Census.

Low Density Residential Land Use means, for the purpose of permit section S8 Monitoring, one unit per 1-5 acres.

Low Impact Development (LID) means 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.

Major Municipal Separate Storm Sewer Outfall means a municipal separate storm sewer outfall from a single pipe with an inside diameter of 36 inches or more, or its equivalent (discharge from a single conveyance other than circular pipe which is associated with a drainage area of more than 50 acres); or for municipal separate storm sewers that receive stormwater from lands zoned for industrial activity (based on comprehensive zoning plans or the equivalent), an outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (discharge from other than a circular pipe associated with a drainage area of 12 acres or more).

Material Storage Facilities means an uncovered area where bulk materials (liquid, solid, granular, etc.) are stored in piles, barrels, tanks, bins, crates, or other means.

Maximum Extent Practicable (MEP) refers to paragraph 402(p)(3)(B)(iii) of the federal Clean Water Act which reads as follows: Permits for discharges from municipal storm sewers 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 other such provisions as the Administrator or the State determines appropriate for the control of such pollutants.

Medium Municipal Separate Storm Sewer System means municipal separate storm sewer systems located in an incorporated place with a population of more than 100,000 but less than 250,000, or a county with unincorporated urbanized areas of more than 100,000 but less than 250,000 according to the 1990 decennial census by the Bureau of Census.

MEP means Maximum Extent Practicable.

MTRs means Minimum Technical Requirements.

Municipal Separate Storm Sewer System (MS4) means a conveyance, or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains):

(i) owned or operated by a state, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State Law) having jurisdiction over

disposal of wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States.

(ii) designed or used for collecting or conveying stormwater.

(iii) which is not a combined sewer; and (iv) which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.

National Pollutant Discharge Elimination System (NPDES) means the national program for issuing, modifying, revoking, and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under sections 307, 402, 318, and 405 of the Federal Clean Water Act, for the discharge of pollutants to surface waters of the state from point sources. These permits are referred to as NPDES permits and, in Washington State, are administered by the Washington Department of Ecology.

Notice of Intent (NOI) means the application for, or a request for coverage under this General Permit pursuant to WAC 173-226-200.

Notice of Intent for Construction Activity and **Notice of Intent for Industrial Activity** mean the application forms for coverage under the *Baseline General Permit for Stormwater Discharges Associated with Industrial Activities.*

Outfall means point source as defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the State and does not include open conveyances connecting two municipal separate storm sewer systems, or pipes, tunnels, or other conveyances which connect segments of the same stream or other waters of the State and are used to convey waters of the State.

Permittee unless otherwise noted, the term "Permittee" includes Permittee, Co-Permittee, and Secondary Permittee, as defined below:

(i) A "Permittee" is a city, town, or county owning or operating a regulated small MS4 applying and receiving a permit as a single entity.

(ii) A "Co-Permittee" is any operator of a regulated small MS4 that is applying jointly with another applicant for coverage under this Permit. Co-Permittees own or operate a regulated small MS4 located within or adjacent to another regulated small MS4.

(iii) A "Secondary Permittee" is an operator of regulated small MS4 that is not a city, town or county.

Physically Interconnected means that one MS4 is connected to a second MS4 in such a way that it allows for direct discharges to the second system. For example, the roads with drainage systems and municipal streets of one entity are physically connected directly to a MS4 belonging to another entity.

Pollutant Generating Impervious Surfaces (PGIS) are surfaces considered to be significant sources of pollutants in stormwater runoff. Such surfaces include those that are subject to vehicular use, industrial activities, or storage of erodible or leachable materials that receive direct rainfall or run-on or blow-in of rainfall. Metal roofs are considered to be PGIS unless

coated with an inert, non-leachable material. Roofs that are subject to venting of indoor pollutants from manufacturing, commercial or other operations or processes are also considered PGIS. A surface, whether paved or not, shall be considered PGIS if it is regularly used by motor vehicles. The following are considered regularly-used surfaces: roads, unvegetated road shoulders, bike lanes within the traveled lane of a roadway, driveways, parking lots, unfenced fire lanes, vehicular equipment storage yards, and airport runways.

Process Wastewater means any water which, during manufacture or processing, comes into direct contact with or results form the production or use of any raw material, intermediate product, finished product, by product, or waste product.

Qualified Personnel or Consultant means someone who has had professional training in the aspects of stormwater management for which they are responsible and are under the functional control of the Permittee.

RCW means the Revised Code of Washington State.

Regulated Small Municipal Separate Storm Sewer System (MS4) means a Municipal Separate Storm Sewer System which is automatically designated for inclusion in the Phase II stormwater permitting program by its location within an Urbanized Area, or by designation by the NPDES permitting authority and is not eligible for a waiver or exemption under S1.C.

Replaced impervious surfaces means, for structures, the removal and replacement of any exterior impervious surfaces or foundation; or, for other impervious surfaces, the removal down to bare soil, or base course, and replacement. Exemptions and partial exemptions are defined in Appendix 1 of this Permit.

Runoff is water that travels across the land surface and discharges to water bodies either directly or through a collection and conveyance system. See also "Stormwater."

Shared Waterbodies means waterbodies, including downstream segments, lakes and estuaries that receive discharges from more than one permittee.

Secondary Permittee is an operator of regulated small municipal separate storm sewer system which is not a city, town or county. Secondary Permittees include special purpose districts and other MS4s that meet the criteria for a regulated small MS4 in S1.B.

Significant contributor means a discharge contributes a loading of pollutants considered to be sufficient to cause or exacerbate the deterioration of receiving water quality or instream habitat conditions.

Sediment/Erosion-Sensitive Feature means an area subject to significant degradation due to the effect of construction runoff or areas requiring special protection to prevent erosion. See Appendix 6 Determining Construction Site Sediment Transport Potential for a more detailed definition.

Small Municipal Separate Storm Sewer System or **Small MS4** is a conveyance or system of conveyances including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels and/or storm drains which is:

a. Owned or operated by a city, town, county, district, association or other public body created pursuant to State law having jurisdiction over disposal of sewage, industrial

wastes, stormwater, or other wastes, including special districts under State law such as a sewer districts, flood control districts or drainage districts, or similar entity.

b. Designed or used for collecting or conveying stormwater.

c. Not a combined sewer system,

d. Not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.

e. Not defined as "large" or "medium" pursuant to 40 CFR 122.26(b)(4) & (7) or designated under 40 CFR 122.26 (a)(1)(v).

Small MS4s include systems similar to separate storm sewer systems in municipalities such as: universities, large publicly owned hospitals, prison complexes, highways and other thoroughfares. Storm sewer systems in very discrete areas such as individual buildings do not require coverage under this Permit.

Small MS4s do *not* include storm drain systems operated by non-governmental entities such as: individual buildings, private schools, private colleges, private universities, and industrial and commercial entities.

Stormwater means runoff during and following precipitation and snowmelt events, including surface runoff and drainage.

Stormwater Associated with Industrial and Construction Activity means the discharge from any conveyance which is used for collecting and conveying stormwater, which is directly related to manufacturing, processing or raw materials storage areas at an industrial plant, or associated with clearing grading and/or excavation, and is required to have an NPDES permit in accordance with 40 CFR 122.26.

Stormwater Management Manual for Western Washington means the 5-volume technical manual (Publication Nos. 99-11 through 15 for the 2001 version and Publication Nos. 05-10-029-033 for the 2005 version (The 2005 version replaces the 2001 version) prepared by Ecology for use by local governments that contains BMPs to prevent, control, or treat pollution in storm water.

Stormwater Management Program (SWMP) means a set of actions and activities designed to reduce the discharge of pollutants from the regulated small MS4 to the maximum extent practicable and to protect water quality, and comprising the components listed in S5 or S6 of this Permit and any additional actions necessary to meet the requirements of applicable

Total Maximum Daily Load (TMDL) means a water cleanup plan. A TMDL is a calculation of the maximum amount of a pollutant that a water body can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point and nonpoint sources. The calculation must include a margin of safety to ensure that the water body can be used for the purposes the state has designated. The calculation must also account for seasonable variation in water quality. Water quality standards are set by states, territories, and tribes. They identify the uses for each water body, for example, drinking water supply, contact recreation (swimming), and aquatic life support (fishing), and the scientific criteria to support that use. The Clean Water Act, section 303, establishes the water quality standards and TMDL programs.

Urbanized Area (UA) is a land area comprising one or more places and the adjacent densely settled surrounding area that together have a residential population of at least 50,000 and an overall population density of at least 1,000 people per square mile. For the year 2000 Census, the U.S. Census Bureau classified "urban" as all territory, population, and housing units located within an Urbanized Area (UA) or an Urban Cluster (UC). It delineated UA and UC boundaries to encompass densely settled territory, which consists of: core census block groups or blocks that have a population density of at least 1,000 people per square mile and surrounding census blocks that have an overall density of at least 500 people per square mile. In addition, under certain conditions, less densely settled territory may be part of each UA or UC. The U.S. Census Bureau announced the "Census 2000 Urbanized Areas" on May 1, 2002. More information can be found at the U.S. Census Bureau website.

Urban/higher density rural subbasins means any subbasin or portion thereof that is within or proposed to be within the urban growth area (UGA), or any rural area subbasin or portion thereof fifty percent or more of which is comprised of lots smaller than 5 acres in size.

Vehicle Maintenance or Storage Facility means an uncovered area where any vehicles are regularly washed or maintained, or where at least 10 vehicles are stored.

Waters of the State includes those waters as defined as "waters of the United States" in 40 CFR Subpart 122.2 within the geographic boundaries of Washington State and "waters of the state" as defined in Chapter 90.48 RCW which includes lakes, rivers, ponds, streams, inland waters, underground waters, salt waters and all other surface waters and water courses within the jurisdiction of the State of Washington.

Water Quality Standards means Surface Water Quality Standards, Chapter 173-201A WAC, Ground Water Quality Standards, Chapter 173-200 WAC, and Sediment Management Standards, Chapter 173-204 WAC.

APPENDIX C

Notice of Intent (NOI) for Coverage Under NPDES Permit

WASHINGTON STATE DEPARTMENT OF ECOLOGY

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

Introduction

This form must be used by all entities seeking coverage under one or more of the following municipal separate storm sewer permits:

- **Phase I Permit** – "National Pollutant Discharge Elimination System and State Waste Discharge General Permit for Discharges from Large and Medium Municipal Separate Storm Sewer Systems"
- **Phase II Permit for Western Washington** – "National Pollutant Discharge Elimination System and State Waste Discharge General Permit for Discharges from Small Municipal Separate Storm Sewers in Western Washington"
- **Phase II Permit for Eastern Washington** – "National Pollutant Discharge Elimination System and State Waste Discharge General Permit for Discharges from Small Municipal Separate Storm Sewers in Eastern Washington"

The Department of Ecology (Ecology) will use the information provided to determine if coverage under one or more of the above municipal stormwater general permits is required and/or appropriate. Please answer all questions accurately and completely. If a question does not apply, answer NA to that question. See instructions at the back of the form for more information.

Operators of municipal separate storm sewer systems (MS4s) seeking permit coverage must complete this application and return it to Ecology. You may print this form and complete it by hand, or download the form from Ecology's Web site and fill it out electronically. The form is available at: http://www.ecy.wa.gov/biblio/ecy070207.html.

An authorized signature is needed to complete the application. Please reference supporting documents in the text and attach as necessary.

Mail completed NOI to:

Department of Ecology
Water Quality Program
Municipal Stormwater Permits
P.O. Box 47696
Olympia, WA 98504-7696

Ecology will send each applicant an acknowledgment of receipt. If you have questions about this application, please contact the appropriate Ecology employee listed in the instructions at the end of this form, or call Ecology's Water Quality Program at 360-407-6600.

Part 1 - Owner/Operator Information

A. Applicant Information			B. Responsible Official or Representative		
Name of city, county, or special district:			Name		
			Title		
			Phone		
			Email		
Mailing Address			Mailing Address		
PO Box (Optional)			PO Box (Optional)		
City	State	Zip	City	State	Zip

C. Billing Address, if different			D. Contact Person
Name			Name
Mailing Address			Title
PO Box (Optional)			Phone No. Business Ext.
City	State	Zip	Email
			Fax No. (Optional)

E. Ownership Status
(check appropriate box)

- ☐ City or Town
- ☐ County
- ☐ Federal
- ☐ Tribal

Special Purpose District:(secondary permittee)

- ☐ Diking/drainage district
- ☐ Flood control district
- ☐ Public school district
- ☐ State agency (give name) _____
- ☐ Other (please describe) _____
- ☐ Port
- ☐ University
- ☐ Park district

Part 2 – Geographic Area Where the applicant's MS4s are located (see instructions)

- ☐ Phase I Municipal Stormwater Permit
- ☐ Phase II Municipal Stormwater Permit for Western Washington
- ☐ Phase II Municipal Stormwater Permit for Eastern Washington

If you operate municipal separate storm sewer systems which are located in areas covered by more than one permit please list the locations of all of the municipal separate storm sewer systems for which you are requesting permit coverage.

Part 3 – Population served by the MS4

Estimated population (resident and commuter) served by the MS4 within the geographic area(s) covered by the permits: _____

Part 4 – Map(s)

A. Is part of the MS4 located on tribal lands (within a reservation or on land held in trust for a tribe)? For the Puyallup reservation only, check "yes" if MS4 is located on trust lands and "no" if any part of the MS4 is located on fee lands. ☐ Yes ☐ No

B. For special purpose districts only, attach a map or maps delineating the geographic area served by the MS4. ☐ Attach map(s) to this form
☐ Not applicable

Part 5 – Co-Permittee information

Complete this part of the NOI only if you are co-applying with another entity to meet the requirements of the permit. Permittees that co-apply are responsible for meeting permit conditions related to their discharge(s).

If you are co-applying with another entity or entities please include, as an **attachment to this NOI, a summary of the permit obligations** that will be carried out jointly among co-applicants. The summary must identify the other co-applicant(s) and must be signed by the other co-applicant(s).

☐ Attach a summary of joint permit obligations
☐ Summary is signed by all co-applicants
☐ Not Applicable

Part 6 - Relying on another entity to satisfy permit requirement(s)

Complete this part of the NOI only if you are relying on another entity to satisfy one or more of the requirements of the permit. Permittees that rely on another entity to satisfy one or more of their permit obligations remain responsible for permit compliance if the other entity fails to implement the permit conditions. Permittees may rely on another entity provided:

1. The other entity agrees to take on responsibility for implementation of the permit requirement(s),

   AND

2. The other entity implements the permit requirements.

If you are relying on another entity or entities to satisfy one or more of the permit obligations, please include as an **attachment to this NOI a summary of the permit obligations** that will be carried out by another entity. The summary must identify the other entity or entities and must be signed by the other entity or entities.

☐ Attach summary of permit obligations carried out by another entity
☐ Summary is signed by all other entities
☐ Not Applicable

Part 7 – Public Notice

A public notice must be published at least ***once each week for two consecutive weeks*** in a ***single*** newspaper of general circulation in the county or city in which the district or entity is located. See the NOI instructions for the public notice language requirements. Permit coverage will not be granted sooner than ***31 days*** after the date of the second public notice.

Submit the NOI and public notice to Ecology before the date of the first public notice. A copy of the NOI and public notice may be faxed to (360) 407-6426.

Name of the newspaper that will publish the public notices: _____

Provide the **exact** dates (mm/dd/yy) that the first and second public notices will appear in the newspaper:

Date of the first notice ____/____/____

Date of second notice ____/____/____

Part 8 - Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. The information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

_____

Print or type name of responsible official or representative **Title**

_____ / / ____

Signature of responsible official or representative **Date**

INSTRUCTIONS

These instructions will help you prepare an application, referred to as a Notice of Intent (NOI), for coverage under a National Pollutant Discharge Elimination System (NPDES) General Permit and State Waste Discharge Permit for stormwater discharges associated with municipal separate storm sewer systems in Washington State.

Questions?

If you have questions, please contact the Ecology employee who manages the permit in the county or counties in which your facility or district is located:

- Island, Skagit, and Whatcom Counties:
  contact Steve Hood at 360-738-6254
- King, Kitsap, and Snohomish Counties:
  contact Anne Dettelbach at 425-649-7093
- Clark, Cowlitz, Clallam, Grays Harbor, Lewis, Pierce, and Thurston Counties:
  contact Alison Chamberlin at 360-407-0245
- Benton, Chelan, Kittitas, Douglas, and Yakima Counties:
  contact Terry Wittmeier at 509-574-3991
- Asotin, Franklin, Grant, Spokane, Walla Walla, and Whitman Counties:
  contact Dave Duncan at 509-329-3554

Or, call Ecology's Water Quality Program office at 360-407-6600, and the receptionist will direct you to another staff member who can assist you.

Who must apply?

Federal and state law requires all operators of regulated municipal separate storm sewer systems (MS4s) to apply for and obtain coverage under this permit, or to be permitted under a separate individual permit, unless waived or exempted in accordance with conditions described below.

What is an MS4?

A municipal separate storm sewer system (MS4) is a conveyance or system of conveyances including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels and/or storm drains which is:

a. Owned or operated by a city, town, county, district, association, or other public body created pursuant to state law having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under state law such as a sewer districts, flood control districts or drainage districts, or similar entity.

b. Designed or used for collecting or conveying stormwater.

c. Not a combined sewer system.

d. Not part of a publicly owned treatment works (POTW) (see 40 CFR 122.2).

MS4s also include systems similar to separate storm sewer systems in municipalities such as: universities, prison complexes, highways and other thoroughfares, and flood control districts.

Storm sewers in very discrete areas such as individual buildings do not require coverage under this permit. Storm drain systems operated by non-governmental, private entities such as: individual buildings; private schools, colleges, and universities; and industrial and commercial entities **are not** subject to these permits.

Who needs a permit?

1. A regulated MS4 is a municipal separate storm sewer system that:

   - Is located within, or partially within, the unincorporated areas of Clark, King, Pierce or Snohomish counties; or
   - Is located within, or partially within, the cites of Seattle or Tacoma; or
   - Is located within the other areas defined in the permits. See list of cities and counties in Part 2 of the line-by-line instructions or Ecology's maps of permit coverage www.ecy.wa.gov/programs/wq/stormwater/phase_2/maps.html for more information on these locations; or
   - Is designated by Ecology

   AND

   - Discharges stormwater from the MS4 to a surface water of Washington State; and
   - Is not eligible for a waiver or exemption.

2. All operators of municipal separate storm sewers which meet the criteria listed above must obtain coverage under this permit. Operators of municipal separate storm sewer systems may also include, but are not limited to: public flood control districts, public diking, and drainage districts, public schools including universities, and correctional facilities that own or operate an MS4 serving non-agricultural land uses.
3. If Ecology determines the MS4 is a significant source of pollution to surface waters of the state, Ecology may require any other operators of small municipal separate storm sewer systems to obtain permit coverage. Ecology will notify the affected MS4 that permit coverage is required by issuing an administrative order (see RCW 90.48).

Who does not need to apply?

State and federal laws do not require a regulated MS4 to obtain permit coverage, if either of the following conditions applies:

The portions of the small MS4 located within the census defined urban area(s) serve a total population of less than 1000 people** and **all** the conditions below apply:

- The small MS4 is not contributing substantially to the pollutant loadings of a physically interconnected MS4 that is regulated by the NPDES stormwater program.
- The discharge of pollutants from the small MS4 has not been identified as a cause of impairment of any water body to which the MS4 discharges.
- In areas where an EPA approved Total Maximum Daily Load (TMDL), or water quality improvement plan for impaired waters, has been completed, stormwater controls on the MS4 have not been identified as being necessary.

***In determining the total population served, include both resident and commuter populations as follows:*

- *For publicly operated school complexes including universities and colleges, the total population served includes the sum of the average annual student enrollment plus staff.*
- *For flood control, diking, and drainage districts, the total population served includes residential population and any non-residents regularly employed in the areas served by the small MS4.*

MS4s operated by:

- The federal government on military bases or other federal lands; or by the United States Military, the Bureau of Land Management, the United States Park Service, or other federal agencies; or
- Federally recognized tribes located within tribal lands

Are not covered under this permit but may need coverage under a permit issued by the USEPA.

When to apply

Submit the NOI to the Department of Ecology on or before the date of the first public notice required in part 5 of this NOI. Ecology must have the permit application during the public comment period in order to provide the public access to the applications as required by state law (WAC 173-226-130(5)). Ecology cannot grant permit coverage until 31 days after the date of the second public notice.

Upon receipt of a complete NOI, Ecology will notify the applicant by mail of confirmation of coverage under the permit. An NOI is deemed complete only after the 30-day public comment period and all other requested information has been supplied. Permit coverage will begin on the date specified in Ecology's letter of confirmation.

Where to apply

Mail the signed NOI to: Washington Department of Ecology
Water Quality Program
Municipal Stormwater Permits
P.O. Box 47696
Olympia, WA 98504-7696

Fees

There is no application fee. Ecology will bill the applicant(s) for permit fees after permit coverage is issued. Call Bev Poston at 360-407-6425 or email bpos461@ecy.wa.gov for questions relating to fees.

If you need this publication in an alternate format, please call the Water Quality Program at 360-407-6401. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.

Line-by-line Instructions

Part 1 – Owner/Operator information

A. Applicant information - Fill out the name and mailing address of the city, county, or public entity that will receive coverage under the permit.
B. Responsible Official or Representative – Fill out the name, address and contact information for the principal executive officer or ranking elected official responsible for signing the application and all reports. See Part 8 for more information.
C. Billing information - If a separate department or office handles billing, enter the appropriate contact information. There is an annual permit fee associated with this permit.
D. Contact person - Enter the name, title, phone number, and email for the person who will be in charge of developing the stormwater management program and meeting the stormwater permit requirements.
E. Ownership status - Check the appropriate box indicating the ownership status (e.g., city, county, or special district type).

Part 2 – Permit(s) under which the applicant is requesting coverage

Check the box that corresponds to the permit(s) under which you are applying for coverage. The geographic locations covered by each permit break down as follows:

- **Phase I** – regulates entities within, or partially within the unincorporated areas of Clark, King, Pierce, or Snohomish counties; or the cities of Seattle or Tacoma.
- **Phase II Western Washington** – regulates entities in the census-defined urban areas of western Washington and some cities with populations over 10,000.
- **Phase II Eastern Washington** – regulates entities in the census-defined urban areas of eastern Washington and some cities with populations over 10,000.

Note: Applicants may submit a single NOI to request coverage of all of the regulated MS4s which they operate. For example, a single NOI may be submitted to cover the main campus and any satellite campuses of a university which may require permit coverage. Applicants requesting coverage for multiple sites/locations must list the locations for each site/location for which coverage is being requested. When more than one permit is checked, Ecology will assign the permit that will provide coverage.

Part 3 – Population served by the MS4

Provide an estimate of the population served by the MS4 within the geographic area(s) covered by the permits. The estimate must include both resident and commuter populations. For example, a university may have a resident population of students who live on campus and a commuter population of students and employees who commute to campus.

Part 4 – Map requirements

A. Is part of the MS4 located on tribal lands (within a reservation or on land held in trust for a tribe)? For the Puyallup reservation only, check "yes" if MS4 is located on trust lands and "no" if any part of the MS4 is located on fee lands. The portion of the MS4 that is located on tribal lands will not be covered under these permits.
B. For special purpose districts only, attach a map or maps delineating the geographic area served by the MS4.

Part 5 – Co-Permittee information
Complete this part of the NOI only if you are co-applying with another entity to meet the requirements of this permit. Permittees that co-apply are responsible for meeting permit conditions related to their discharge(s).

If you are co-applying with another entity or entities, please include as an attachment to this NOI a summary of the permit obligations that will be carried out jointly among co-applicants. The summary must identify the other co-applicant/s and must be signed by the other co-applicant/s.

Part 6 - Relying on another entity to satisfy permit requirement(s)
Complete this part of the NOI only if you are relying on another entity to satisfy one or more of the requirements of the permit. Permittees may rely on another entity provided the entity satisfies all of the requirements it agrees to undertake (see 40 CFR 122.35(a)).

That other entity **must agree** to take responsibility and **implement** the permit requirement(s).

Permittees that rely on another entity to satisfy one or more of their permit obligations remain responsible for permit compliance with those obligations if the other entity fails to implement the permit conditions.

If you are relying on another entity or entities to satisfy one or more of the permit obligations, please include as an attachment to this NOI a summary of the permit obligations that will be carried out by another entity. The summary must identify the other entity or entities and must be signed by the other entity or entities.

Part 7 – Public notice
You must publish a public notice in a newspaper of general circulation in the county or city in which the district or entity is located. The following sample public notice contains the required public notice elements.

Sample Public Notice

(Name and address of municipality, district or other public entity) is seeking coverage under (select one of the following):

- **Phase I Permit** – "National Pollutant Discharge Elimination System and State Waste Discharge General Permit for Discharges from Large and Medium Municipal Separate Storm Sewer Systems"
- **Phase II Permit for Western Washington** – "National Pollutant Discharge Elimination System and State Waste Discharge General Permit for Discharges from Small Municipal Separate Storm Sewers in western Washington"
- **Phase II Permit for Eastern Washington** – "National Pollutant Discharge Elimination System and State Waste Discharge General Permit for Discharges from Small Municipal Separate Storm Sewers in eastern Washington"

The proposed permit will regulate stormwater discharges from the municipal separate storm sewer system located in (*city, town or county*). The permit requires *(Name of municipality, district or other public entity)* to develop and implement a stormwater management program that:

1. Reduces the discharge of pollutants to the maximum extent practicable.
2. Protects water quality.
3. Satisfies appropriate requirements of the Clean Water Act.

Any person desiring to present views to the Department of Ecology concerning this application may notify Ecology in writing within 30 days from the last date of publication of this notice.

Submit comments to:

Washington Department of Ecology
Water Quality Program
Municipal Stormwater Permits
P.O. Box 47696
Olympia, WA 98504-7696

Fax: 360-407-6426

Part 8 - Certification

An authorized person, such as a principal executive officer or ranking elected official, must sign the certification statement.

OR

A duly authorized representative of the executive officer (or ranking elected official) may sign the certification as long as:

1. The signator receives written authorization from the executive officer or ranking elected official. This document must be submitted to Ecology.
2. The authorization specifies an individual or position that has responsibility for the overall development and implementation of the stormwater management program.

If you need this publication in an alternate format, please call the Water Quality Program at 360-407-6401. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.

APPENDIX D

Project Summary Sheets

PROJECT SUMMARY SHEET

CIP Number and Name:	Summa West
Subbasin:	North Salzer Creek
Problem Description:	Capacity issue, Intersection floods.
Project Solution:	Increase the capacity of the surface/storm water pipe west of Gold Street, and realign the pipe. The catch basins at the intersection of Summa Street and Gold Street can be reused and reconnected to the upgraded system.
Project Benefit:	Increase the capacity, eliminate flooding from storm water events (i.e., not river flooding).
Estimated Project Cost:	$240,000
Associated Projects:	11 Intersection of Summa St and Gold St

Project Cost Estimate

CITY OF CENTRALIA **DATE: 8/20/2006**
STORMWATER COMPREHENSIVE PLAN **PROJECT NO.: 315631**
Summa West **ESTIMATE BY: R Edgerton**
ORDER OF MAGNITUDE COST OPINION

DESCRIPTION	QTY	UNIT	TOTAL UNIT COST	TOTAL COST
Mobilization	1	LS	$11,396	$11,396
Earthwork for removal of a 8" pipe	425	LF	$93	$39,662
Earthwork for pipe installation	320	LF	$96	$30,689
Earthwork for catch basin	3	EA	$220	$660
Earthwork for manhole	1	EA	$521	$521
Remove 8" pipe	425	EA	$9	$3,761
Remove 2 catch basins	2	EA	$827	$1,655
Remove manhole	1	EA	$1,598	$1,598
Install manhole	1	EA	$4,581	$4,581
Install catch basin	3	EA	$2,540	$7,621
Install 12" concrete pipe	320	LS	$35	$11,044
Manhole connection	4	EA	$452	$1,807
Miscellaneous Detail Allowance	1	LS	$10,360	$10,360
SUBTOTAL				**$125,354**
CONTINGENCIES	**30.0%**			**$37,606**
CONSTRUCTION TOTAL (ROUNDED)				**$160,000**
SALES TAX	**8.0%**			**$12,800**
CONSTRUCTION TOTAL WITH SALES TAX (ROUNDED)				**$170,000**
ENGINEERING, LEGAL/ADMIN, COORDINATION	**20.0%**			**$32,000**
CONSTRUCTION ENGINEERING	**10.0%**			**$16,000**
ENVIRONMENTAL MITIGATION	**5.0%**			**$8,000**
EASEMENTS & ROW ACQUISITION	**5.0%**			**$8,000**
INDIRECT COST TOTAL (ROUNDED)				**$70,000**
PROJECT TOTAL (ROUNDED)				**$240,000**

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PROJECT SUMMARY SHEET

CIP Number and Name:	Tower
Subbasin:	North Salzer Creek
Problem Description:	Capacity issue on S. Tower Avenue, intersection ponding.
Project Solution:	Increase the size of the surface/storm water pipe on S. Tower Avenue, to increase the capacity. Also, the manhole at the intersection at S. Pearl Street and E. Plum Street will be disconnected from actual system (flowing to China Creek) and connected to the updated system on S. Pearl Street. This will decrease flows in the former system, and increase flow in the updated system. The 12-inch clay pipe on Chestnut Street between S. Pearl Street and S. Tower Avenue would be abandoned in place. Note: This project should take place after Jefferson project is completed.
Project Benefit:	Decrease/eliminate ponding and increase capacity of this system.
Estimated Project Cost:	$550,000
Associated Projects:	24 Between S Pearl St and S Tower St, on E Plum St 25 Intersection of S Tower St and E Plum St 26 Intersection of S Pearl St and E Plum St 28 Intersection of S Tower and W Cherry

Project Cost Estimate

CITY OF CENTRALIA — **DATE: 8/20/2006**
STORMWATER COMPREHENSIVE PLAN — **PROJECT NO.: 315631**
Tower — **ESTIMATE BY: R Edgerton**
ORDER OF MAGNITUDE COST OPINION

DESCRIPTION	QTY	UNIT	TOTAL UNIT COST	TOTAL COST
Mobilization	1	LS	$25,580	$25,580
Earthwork ro remove 8" PVC pipe	340	LF	$93	$31,730
Earthwork to remove 10" PVC pipe	400	LF	$95	$38,142
Earthwork to remove 12" clay pipe	550	LF	$96	$52,747
Earthwork to install 12" concrete pipe	340	LF	$96	$32,607
Remove 8" PVC pipe	340	LF	$9	$3,008
Remove 10" PVC pipe	400	LF	$9	$3,539
Remove 12" clay pipe	550	LF	$14	$7,615
Install 12" concrete pipe	1,630	LF	$35	$56,254
Connect catch basin	8	EA	$452	$3,614
Connect manhole	8	EA	$452	$3,614
Miscellaneous Detail Allowance	1	LS	$22,926	$22,926
SUBTOTAL				**$281,377**
CONTINGENCIES	**30.0%**			**$84,413**
CONSTRUCTION TOTAL (ROUNDED)				**$370,000**
SALES TAX	**8.0%**			**$29,600**
CONSTRUCTION TOTAL WITH SALES TAX (ROUNDED)				**$400,000**
ENGINEERING, LEGAL/ADMIN, COORDINATION	**20.0%**			**$74,000**
CONSTRUCTION ENGINEERING	**10.0%**			**$37,000**
ENVIRONMENTAL MITIGATION	**5.0%**			**$18,500**
EASEMENTS & ROW ACQUISITION	**5.0%**			**$18,500**
INDIRECT COST TOTAL (ROUNDED)				**$150,000**
PROJECT TOTAL (ROUNDED)				**$550,000**

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PROJECT SUMMARY SHEET

CIP Number and Name: Sixth Street

Subbasin: East Skookumchuck River

Problem Description: Ponding at the 3 intersections (i.e.: E, F, G)

Project Solution: Install catch basins and pipe to connect these intersections to the nearby 18-inch concrete pipe at the intersection of 6th Street and N. Pearl Street, which flows to Skookumchuck River.

Note: A complete survey of the existing system in this area is necessary to determine if the flow to the existing facility is possible.

Project Benefit: Reduce/eliminate the ponding at the intersections

Estimated Project Cost: $230,000

Associated Projects:

46	Intersection of 6th and E
47	Intersection of 6th and F
48	Intersection of 6th and G

Project Cost Estimate

CITY OF CENTRALIA
STORMWATER COMPREHENSIVE PLAN
CIP # 1 Sixth Street
ORDER OF MAGNITUDE COST OPINION

DATE: 8/20/2006
PROJECT NO.: 315631
ESTIMATE BY: R Edgerton

DESCRIPTION	QTY	UNIT	TOTAL UNIT COST	TOTAL COST
Mobilization	1	LS	$11,280	$11,280
Earthwork for a 12 " pipe	500	LF	$96	$47,952
Earthwork for catch basin	7	EA	$220	$1,540
Earthwork for Manhole	3	EA	$521	$1,564
Install 12"concrete pipe	500	LF	$35	$17,256
Install manhole	3	EA	$4,581	$13,742
Install catch basin	7	EA	$2,540	$17,782
Manhole connection	6	EA	$452	$2,710
Miscellaneous Detail Allowance	1	LS	$10,255	$10,255
SUBTOTAL				**$124,082**
CONTINGENCIES	**30.0%**			**$37,225**
CONSTRUCTION TOTAL (ROUNDED)				**$160,000**
SALES TAX	**8.0%**			**$12,800**
CONSTRUCTION TOTAL WITH SALES TAX (ROUNDED)				**$170,000**
ENGINEERING, LEGAL/ADMIN, COORDINATION	**20.0%**			**$32,000**
CONSTRUCTION ENGINEERING	**10.0%**			**$16,000**
ENVIRONMENTAL MITIGATION	**5.0%**			**$8,000**
EASEMENTS & ROW ACQUISITION	**5.0%**			**$8,000**
INDIRECT COST TOTAL (ROUNDED)				**$60,000**
PROJECT TOTAL (ROUNDED)				**$230,000**

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PROJECT SUMMARY SHEET

CIP Number and Name: Center Street

Subbasin: Center China Creek

Problem Description: Capacity issue, intersection ponding.

Project Solution: The 8-inch concrete pipe on Center Street would be replaced by a 12-inch concrete pipe to accommodate for additional flow. In addition, the surface/storm water system on N. Rock Street would be disconnected between W. Maple Street and Center Street. This would limit the flow into that (Rock St) system and therefore decrease the need for any resizing of the Rock system.

Note: The surface/storm water system in this area is flowing to China Creek, therefore an initial study and modeling of China Creek is recommended to determine the potential capacity of China Creek.

Project Benefit: Increase capacity.

Estimated Project Cost: $730,000

Associated Projects:

14	Intersection of W Center St and N Iron St.
15	Between N Iron St and N Rock St, on W Center St.
16	Intersection of W Hanson St and N Rock St.
17	Between W Center St and W Hanson St, on N Rock St.
22	Intersection of N Pearl and W Center
23	Intersection of N Oak and W Maple
49	Intersection of Oak and Center

Project Cost Estimate

CITY OF CENTRALIA
STORMWATER COMPREHENSIVE PLAN
CIP # Center
ORDER OF MAGNITUDE COST OPINION

DATE: 8/20/2006
PROJECT NO.: 315631
ESTIMATE BY: R Edgerton

DESCRIPTION	QTY	UNIT	TOTAL UNIT COST	TOTAL COST
Mobilization	1	LS	$34,095	$34,095
Earthwork to remove a 8" concrete pipe	1,160	LF	$93	$108,254
Earthwork to install 12" concrete pipe	640	LF	$96	$61,379
Earthwork to remove/install manhole	6	EA	$521	$3,129
Eartwork to install catchbasin	10	EA	$220	$2,200
Remove 8" conctrete pipe	1,160	LF	$9	$10,264
Remove manhole	3	EA	$1,598	$4,793
Install 12" concrete pipe	1,800	LF	$35	$62,121
Install manhole	6	EA	$4,581	$27,484
Install catch basin	10	EA	$2,540	$25,403
Manhole connection	12	EA	$452	$5,421
Miscellaneous Detail Allowance	1	LS	$30,503	$30,503
SUBTOTAL				**$375,046**
CONTINGENCIES	**30.0%**			**$112,514**
CONSTRUCTION TOTAL (ROUNDED)				**$490,000**
SALES TAX	**8.0%**			**$39,200**
CONSTRUCTION TOTAL WITH SALES TAX (ROUNDED)				**$530,000**
ENGINEERING, LEGAL/ADMIN, COORDINATION	**20.0%**			**$98,000**
CONSTRUCTION ENGINEERING	**10.0%**			**$49,000**
ENVIRONMENTAL MITIGATION	**5.0%**			**$24,500**
EASEMENTS & ROW ACQUISITION	**5.0%**			**$24,500**
INDIRECT COST TOTAL (ROUNDED)				**$200,000**
PROJECT TOTAL (ROUNDED)				**$730,000**

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PROJECT SUMMARY SHEET

CIP Number and Name: Cherry Street

Subbasin: Center China Creek

Problem Description: Ponding on Chestnut Street and S. Ash Street

Project Solution: The 8-inch clay pipe on Cherry Street will be replaced by a 15 inch concrete pipe between S. Ash Street and Yew Street. 12-inch concrete pipe will be install on S. Ash Street and connected at the intersection with Cherry Street. In addition, it is recommended to add a 12-inch concrete pipe on Chestnut Street connected to the system at Yew Street.

Note: The surface/storm water system in this area is flowing to China Creek, therefore an initial study and modeling of China Creek is recommended to determine the potential capacity of China Creek.

Project Benefit: Eliminate/decrease ponding.

Estimated Project Cost: $630,000

Associated Projects:

7	Intersection of Elm and Ash St.
8	Intersection of W. Cherry and Ash
18	Intersection of W chestnut St and S Cedar St
42	Between Yew and Cedar, on Chestnut

Project Cost Estimate

CITY OF CENTRALIA — **DATE: 8/20/2006**
STORMWATER COMPREHENSIVE PLAN — **PROJECT NO.: 315631**
Cherry — **ESTIMATE BY: R Edgerton**
ORDER OF MAGNITUDE COST OPINION

DESCRIPTION	QTY	UNIT	TOTAL UNIT COST	TOTAL COST
Mobilization	1	LS	$29,941	$29,941
Earthwork to remove 8" clay pipe	640	SF	$93	$59,726
Earthwork to install 12" concrete pipe	1,040	EA	$96	$99,740
Earthwork to install catchbasin	12	EA	$220	$2,640
Earthwork to install manhole	3	EA	$521	$1,564
Earthwork to remove drywell	1	EA	$521	$521
Remove 8" clay pipe	640	LS	$9	$5,663
Remove drywell	1	EA	$44	$44
Install 15" concrete pipe	640	LS	$35	$22,088
Install 12"concrete pipe	1,040	LS	$35	$35,892
Install catchbasin	12	EA	$2,540	$30,484
Install manhole	3	EA	$4,581	$13,742
connection to manhole	10	EA	$452	$4,517
Miscellaneous Detail Allowance	1	LS	$22,788	$22,788
SUBTOTAL				**$329,352**
CONTINGENCIES	**30.0%**			**$98,806**
CONSTRUCTION TOTAL (ROUNDED)				**$430,000**
SALES TAX	**8.0%**			**$34,400**
CONSTRUCTION TOTAL WITH SALES TAX (ROUNDED)				**$460,000**
ENGINEERING, LEGAL/ADMIN, COORDINATION	**20.0%**			**$86,000**
CONSTRUCTION ENGINEERING	**10.0%**			**$43,000**
ENVIRONMENTAL MITIGATION	**5.0%**			**$21,500**
EASEMENTS & ROW ACQUISITION	**5.0%**			**$21,500**
INDIRECT COST TOTAL (ROUNDED)				**$170,000**
PROJECT TOTAL (ROUNDED)				**$630,000**

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PROJECT SUMMARY SHEET

CIP Number and Name: Jefferson Street

Subbasin: North Salzer Creek

Problem Description: Capacity Issue, ponding at intersections.

Project Solution: Jefferson project is separated into 3 parts:

Part 1: Jefferson – 36-inch line

Jefferson 36" pipe between Alder Street and S. Tower Avenue will be replaced. Some sections will be increased from a 12-inch clay pipe and from a 30-inch concrete pipe to a 36-inch concrete pipe.

Part 2:Connect Jackson, S. Pearl and W. Chestnut

The 6-inch PVC pipe on S. Silver Street will be abandoned in place, as well as the 8-inch pipe on S. Pearl, between Jefferson Street and Jackson Street. The section between S. Pearl and Hamilton Avenue, on Jackson Street will be redirected to Jefferson through Hamilton Avenue, in a 12-inch concrete pipe.

W. Chestnut will be connected to the S. Pearl system upgraded to a 12-inch concrete pipe. The catch basins on W. Chestnut Street, which are apparently still connected to Jefferson Street, through the old 8-inch concrete sanitary sewer line, will be reconnected to the new W. Chestnut system.

Part 3: Connect Alder

Install a new 12-inch concrete pipe from Richmond Avenue to the existing Alder system.

Note: Design of Part 1 might demonstrate that only part of the 36 inch concrete pipe needs replacement. To be conservative in this conceptual design, it was assumed that the whole section would be replaced. In addition, Part 1 might be influenced by the WSDOT project and thus should be started only after having a clear understanding of the WSDOT planning.

Project Benefit: Increase capacity, eliminate ponding from storm events.

Estimated Project Cost:
Part 1 subtotal: $712,436
Part 2 subtotal: $393,878
Part 3 subtotal: $127,689
Total: $2,370,000

Associated Projects:

10	Intersection of Jefferson and S. Pearl
27	Intersection of S Pearl and W Cherry
29	Intersection of Jackson and S. Pearl
37	Jefferson Street
38	Between S Pearl St and S Tower St, on Cherry St and Jefferson St
40	On Chestnut between Rock and Silver

43 Between Hamilton and Silver, on Jackson
45 Between Richmond and Woodland, on Adler

Project Cost Estimate

CITY OF CENTRALIA — **DATE: 8/20/2006**
STORMWATER COMPREHENSIVE PLAN — **PROJECT NO.: 315631**
Jefferson — **ESTIMATE BY: R Edgerton**
ORDER OF MAGNITUDE COST OPINION

DESCRIPTION	QTY	UNIT	TOTAL UNIT COST	TOTAL COST
Mobilization	1	LS	$12,340	$12,340
Phase 1 - Jefferson 36" concrete pipe				
Earthwork to remove 12" clay pipe	300	LF	$96	$28,771
Earthwork to remove 30" concrete pipe	750	LF	$116	$86,998
Earthwork to remove 36" concrete pipe	1,700	LF	$122	$207,475
Earthwork to install catchbasin	6	EA	$220	$1,320
Remove 12" clay pipe	300	LF	$14	$4,154
Remove 30" concrete pipe	750	LF	$28	$20,768
Remove 36" concrete pipe	1,700	LF	$32	$53,622
Install 36" concrete pipe	2,750	LF	$103	$284,147
Install catchbasin	6	EA	$2,540	$15,242
Manhole connections	22	EA	$452	$9,938
Phase 2 - Connect Jackson, Pearl and Chestnut				
Earthwork to remove 8" pipe	950	LF	$93	$88,656
Earthwork to install 12" concrete pipe	1,440	LF	$96	$138,102
Earthwork to remove/install catchbasin	20	EA	$220	$4,400
Earthwork to install manhole	4	EA	$521	$2,086
Remove 8" concrete pipe	950	LF	$9	$8,406
Remove catchbasin	2	EA	$827	$1,655
Install 12" concrete pipe	2,350	LF	$35	$81,103
Install catchbasin	18	EA	$2,540	$45,726
Install manhole	4	EA	$4,581	$18,323
Manhole connections	12	EA	$452	$5,421
Phase 3 - Connect Alder				
Earthwork to install 12" concrete pipe	760	LF	$96	$72,887
Earthwork to install catchbasin	6	EA	$220	$1,320
Earthwork to install manhole	2	EA	$521	$1,043
Install 12" concrete pipe	760	LF	$35	$26,229
Install catchbasin	6	EA	$2,540	$15,242
Install manhole	2	EA	$4,581	$9,161
Manhole connections	4	EA	$452	$1,807
Miscellaneous Detail Allowance	1	LS	$123,400	$123,400
SUBTOTAL -Phase 1				**$712,436**
SUBTOTAL -Phase 2				**$393,878**
SUBTOTAL -Phase 3				**$127,689**
CONTINGENCIES	**30.0%**			**$370,201**
CONSTRUCTION TOTAL (ROUNDED)				**$1,600,000**
SALES TAX	**8.0%**			**$128,000**
CONSTRUCTION TOTAL WITH SALES TAX (ROUNDED)				**$1,730,000**

ENGINEERING, LEGAL/ADMIN, COORDINATION	**20.0%**	**$320,000**
CONSTRUCTION ENGINEERING	**10.0%**	**$160,000**
ENVIRONMENTAL MITIGATION	**5.0%**	**$80,000**
EASEMENTS & ROW ACQUISITION	**5.0%**	**$80,000**
INDIRECT COST TOTAL (ROUNDED)		**$640,000**
PROJECT TOTAL (ROUNDED)		**$2,370,000**

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PROJECT SUMMARY SHEET

CIP Number and Name: Summa East

Subbasin: North Salzer Creek

Problem Description: Ponding on the north side of Summa Street.

Project Solution: Due to the differential elevation between Summa Street and its north side, a ditch could be installed, with surface/storm water flowing east, through a culvert, to be installed below Summa Street, and toward the Pacific Avenue existing ditch. The ditches of Pacific Avenue are hydraulically connected to Salzer Creek.

Note: As the ditch proposed would direct the flow to Pacific Avenue which is out of the Centralia city limit, an interjurisdictional agreement is necessary before construction.

Project Benefit: Decrease/eliminate ponding.

Estimated Project Cost: $40,000

Associated Projects:

4	Intersection of E Summa St and S Buckner St
5	Intersection of E Summa St and Pacific St

Project Cost Estimate

CITY OF CENTRALIA — **DATE: 8/20/2006**
STORMWATER COMPREHENSIVE PLAN — **PROJECT NO.: 315631**
Summa East — **ESTIMATE BY: R Edgerton**
ORDER OF MAGNITUDE COST OPINION

DESCRIPTION	QTY	UNIT	TOTAL UNIT COST	TOTAL COST
Mobilization	1	LS	$2,074	$2,074
Earthwork to install 48" culvert	30	LF	$143	$4,286
Install 48" culvert	30	LF	$153	$4,585
Install ditches	350	LF	$29	$9,986
Miscellaneous Detail Allowance	1	LS	$1,886	$1,886
SUBTOTAL				**$22,817**
CONTINGENCIES	**30.0%**			**$6,845**
CONSTRUCTION TOTAL (ROUNDED)				**$30,000**
SALES TAX	**8.0%**			**$2,400**
CONSTRUCTION TOTAL WITH SALES TAX (ROUNDED)				**$30,000**
ENGINEERING, LEGAL/ADMIN, COORDINATION	**20.0%**			**$6,000**
CONSTRUCTION ENGINEERING	**10.0%**			**$3,000**
ENVIRONMENTAL MITIGATION	**5.0%**			**$1,500**
EASEMENTS & ROW ACQUISITION	**5.0%**			**$1,500**
INDIRECT COST TOTAL (ROUNDED)				**$10,000**
PROJECT TOTAL (ROUNDED)				**$40,000**

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