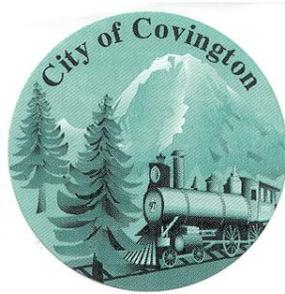


# Comprehensive Stormwater Plan Update

---



February 2010

**Parametrix**

# Comprehensive Stormwater Plan Update

*Prepared for*

**City of Covington**  
16720 SE 271st Street, Suite 100  
Covington, Washington 98042

*Prepared by*

**Parametrix**  
1231 Fryar Avenue  
Sumner, WA 98390-1516  
T. 253.863.5128 F. 253.863.0946  
[www.parametrix.com](http://www.parametrix.com)

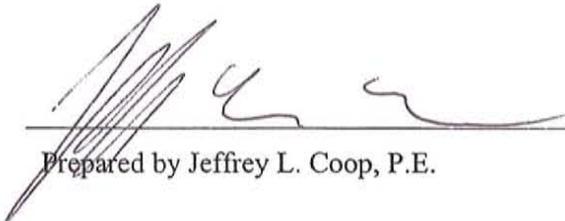
## CITATION

Parametrix. 2010. Comprehensive Stormwater Plan  
Update. Prepared by Parametrix, Sumner,  
Washington. February 2010.

## CERTIFICATION

The technical material and data contained in this document were prepared under the supervision and direction of the undersigned, whose seal, as a professional engineer licensed to practice as such, is affixed below.



  
Prepared by Jeffrey L. Coop, P.E.

  
Checked by Julie G. Brandt, P.E.

  
Approved by David B. Roberts, P.E.

## TABLE OF CONTENTS

<b>1. INTRODUCTION .....</b>	<b>1-1</b>
1.1 STORMWATER MANAGEMENT GOALS .....	1-1
1.2 PREVIOUS REPORTS .....	1-1
1.3 PURPOSE.....	1-2
1.4 STORMWATER PLAN UPDATE .....	1-5
<b>2. REGULATORY CONSIDERATIONS.....</b>	<b>2-1</b>
2.1 INTRODUCTION .....	2-1
2.2 FEDERAL REGULATIONS .....	2-1
2.2.1 Clean Water Act (CWA) Phase II NPDES Stormwater Permits .....	2-1
2.2.2 Safe Drinking Water Act .....	2-1
2.2.3 Endangered Species Act (ESA) .....	2-5
2.2.4 Federal Emergency Management Agency .....	2-10
2.3 STATE REGULATIONS .....	2-12
2.3.1 Puget Sound Water Quality Management Plan .....	2-12
2.3.2 Watershed Planning .....	2-13
2.3.3 PSP Action Agenda .....	2-13
2.3.4 Hydraulic Project Approval .....	2-14
2.3.5 Shoreline Management Act .....	2-15
2.4 LOCAL STORMWATER REGULATIONS .....	2-18
2.4.1 Surface Water Design .....	2-18
2.4.2 City of Covington Comprehensive Plan .....	2-18
2.4.3 Critical Areas .....	2-18
2.4.4 Development Regulation .....	2-19
<b>3. DRAINAGE AREA CHARACTERISTICS.....</b>	<b>3-1</b>
3.1 INTRODUCTION .....	3-1
3.1.1 Geology.....	3-1
3.1.2 Soils .....	3-1
3.1.3 Climate.....	3-2
3.1.4 Surface Waters.....	3-2
3.1.5 Land Cover .....	3-3
3.2 WATER QUALITY .....	3-4
<b>4. STORMWATER CONVEYANCE SYSTEM .....</b>	<b>4-1</b>
<b>5. STRUCTURAL AND NON-STRUCTURAL PROJECTS .....</b>	<b>5-1</b>
5.1 INTRODUCTION .....	5-1
5.2 CAPITAL IMPROVEMENT PROJECTS .....	5-1
5.3 OPERATION AND MAINTENANCE IMPROVEMENTS PROJECTS .....	5-2

## TABLE OF CONTENTS (CONTINUED)

5.4	COST OPINIONS .....	5-7
5.5	PRIORITIZATION.....	5-7
5.6	REGIONAL TREATMENT/DETENTION/INFILTRATION FACILITIES .....	5-8

### LIST OF FIGURES

1-1	City of Covington Vicinity Map.....	1-3
2-1	Potential Infiltration Indicator Map .....	2-3
5-1	20-Year Stormwater Comprehensive Plan.....	5-3

### LIST OF TABLES

2-1	Summary of ESA Listed Species.....	2-6
2-2	Summary of Applicable Salmon Habitat Plan Policies .....	2-7
2-3	Comparison of the Puget Sound Water Quality Management Plan Stormwater Program and the USEPA NPDES Phase II Program .....	2-12
2-4	Summary of Critical Areas and City Code Sections.....	2-18
3-1	Summary of Zoning Classification and Maximum Impervious Cover.....	3-3
3-2	Current Water Quality Data From Ecology .....	3-4
4-1	Storm Drainage System Inventory.....	4-1
5-1	Summary of Capital Improvement Projects.....	5-5
5-2	Summary of Operation and Maintenance Improvement Projects.....	5-6

### APPENDICES

A	Letter from USEPA Regarding UIC Wells
B	Excerpt from Puget Sound Partnership Action Agenda
C	Mapping of Areas Regulated Under the Shoreline Management Act
D	Ecology 303(d) Listings
E	CIP Implementation Schedule and Summary of Costs
F	CIP Opinions of Probable Construction Costs
G	Review for Little Soos Creek Regional Flow Control

## KEY TERMS

2002 Plan	City of Covington's Comprehensive Stormwater Plan, 2002
BiOp	biological opinion
BMPs	Best Management Practices
CARA	Critical Aquifer Recharge Area
CIPs	Capital Improvement Projects
City	City of Covington, Washington
CMC	Covington Municipal Code
CWA	Clean Water Act
Ecology	Washington State Department of Ecology
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FIRMS	Flood Insurance Rate Maps
FP	Fish Passage
HPA	Hydraulic Project Approval
IN	Innovation
LID	Low Impact Development
LU	Land Use
Manual	Stormwater Management Manual for Western Washington
MS4s	municipal separated storm sewer systems
NFIP	National Flood Insurance Program
NMFS	National Marine Fisheries Services
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
O&M	Operations and Maintenance
Plan Update	Comprehensive Stormwater Plan Update
PSP	Puget Sound Partnership
RCW	Revised Code of Washington
RPAs	Reasonable and Prudent Alternatives
SDWA	Safe Drinking Water Act
SMA	Shoreline Management Act
SWMPs	Stormwater Management Plans
TMDL	Total Maximum Daily Load
UIC	Underground Injection Control
USEPA	United States Environmental Protection Agency

## KEY TERMS (CONTINUED)

USFWS	United States Fish and Wildlife Service
WAC	Washington Administrative Code
WDFW	Washington State Department of Fish and Wildlife
WQ	Water Quality/Quantity
WRIA	Watershed Resource Inventory Area
WSDOT	Washington State Department of Transportation
WW	Watershed-Wide

# 1. INTRODUCTION

The City of Covington, Washington (City) is located in the southerly portion of King County in the Puget Sound Region west of the Cascade Foothills. See Figure 1-1 for a vicinity map of the City's location relative to adjacent municipalities. After incorporating in 1997, the City contracted with Gray and Osborne, Inc. to prepare a stormwater comprehensive plan. The results of that plan are documented in the City of Covington's Comprehensive Stormwater Plan, issued in 2002 (2002 Plan). This Comprehensive Stormwater Plan Update (Plan Update) has been developed to complement and amend the information presented in the 2002 plan. This Plan Update has been prepared in conjunction with the City's update to its Comprehensive Plan prepared as required under the Growth Management Act.

## 1.1 STORMWATER MANAGEMENT GOALS

The goals of stormwater management have developed over time. Historically, stormwater has been viewed as an incidental impact associated with a project and something that must be conveyed away from a site as quickly and inexpensively as possible. However, in the Puget Sound Region, there are a variety of factors that require stormwater to be considered in greater detail. Due to topography, geology, and soils, there are many areas that are subject to flooding, especially areas located in depressions and relatively flat reaches of streams and rivers. In addition, stormwater management in the Puget Sound Region is subject to regulation from the federal level through the National Pollutant Discharge Elimination System (NPDES) Phase I and II Permits and the listing of salmon species under the Endangered Species Act. With the increasing application of Low Impact Development (LID) Best Management Practices (BMPs) such as bioretention facilities, or "rain gardens," stormwater has become a resource that, if managed properly, can enhance the landscaping of properties and assist with groundwater recharge. Consequently, the goals of stormwater management include:

- Reduction of the risk of flooding to adjacent or downstream properties;
- Compliance with federal and state regulations; and
- Incorporation of stormwater management into the project in such a way as to increase property values by increasing the aesthetics.

The City, located within the Puget Sound Region, is also impacted by these stormwater-related issues. This Plan Update has been prepared to assist the City in meeting stormwater management goals associated with stormwater infrastructure improvements or modifications.

## 1.2 PREVIOUS REPORTS

Prior to incorporation, stormwater management within the City was regulated by King County. After incorporation, the following stormwater related documents were prepared for the City. Background information in the following documents was referred to in preparing this Plan Update.

- Comprehensive Stormwater Plan, 2002, Gray and Osborne, Inc.
- Jenkins Creek Basin Study, 2006, Gray and Osborne, Inc.
- Little Soos Creek Basin Study, 2006, Gray and Osborne, Inc.

In 2007, the NPDES Phase II permit was issued by the Washington State Department of Ecology (Ecology) and modified in 2009. The following stormwater-related codes and documents were reviewed and updated, where needed, as required by the NPDES Phase II permit. These updated codes and standards and the Stormwater Management Plans (SWMPs) reflect current stormwater analysis, design, construction, operation, and maintenance criteria applicable to projects under jurisdiction of the City. The SWMPs also reflect the programmatic practices of the City required for compliance with the NPDES Phase II Permit that are part of the overall stormwater management program of the City.

- Chapter 13.20 Covington Municipal Code (CMC) – General Provisions – Applicable portions have been updated and moved into other chapters; the remainder of this chapter has been repealed.
- Chapter 13.25 CMC – Surface Water and Stormwater.
- Chapter 13.30 CMC – Surface Water Management.
- Chapter 13.35 CMC – Water Quality – Applicable portions have been updated and moved into other chapters; the remainder of this chapter has been repealed.
- Chapter 13.37 CMC – Critical Aquifer Recharge Areas.
- Chapter 13.39 CMC – Basin Plans – Applicable portions have been updated and moved into other chapters; the remainder of this chapter has been repealed.
- Chapter 15.05 CMC – International Codes Adoption.
- Chapter 16.15 CMC – Flood Damage Prevention.
- Chapter 18.65 CMC – Critical Areas.
- Chapter 18.75 CMC – Development Standards – Adequacy of Public Facilities and Services.
- Stormwater Management Plan, First Draft, March 31, 2008.
- Stormwater Management Plan, Second Draft, March 31, 2009.
- Design and Construction Standards and Specifications.

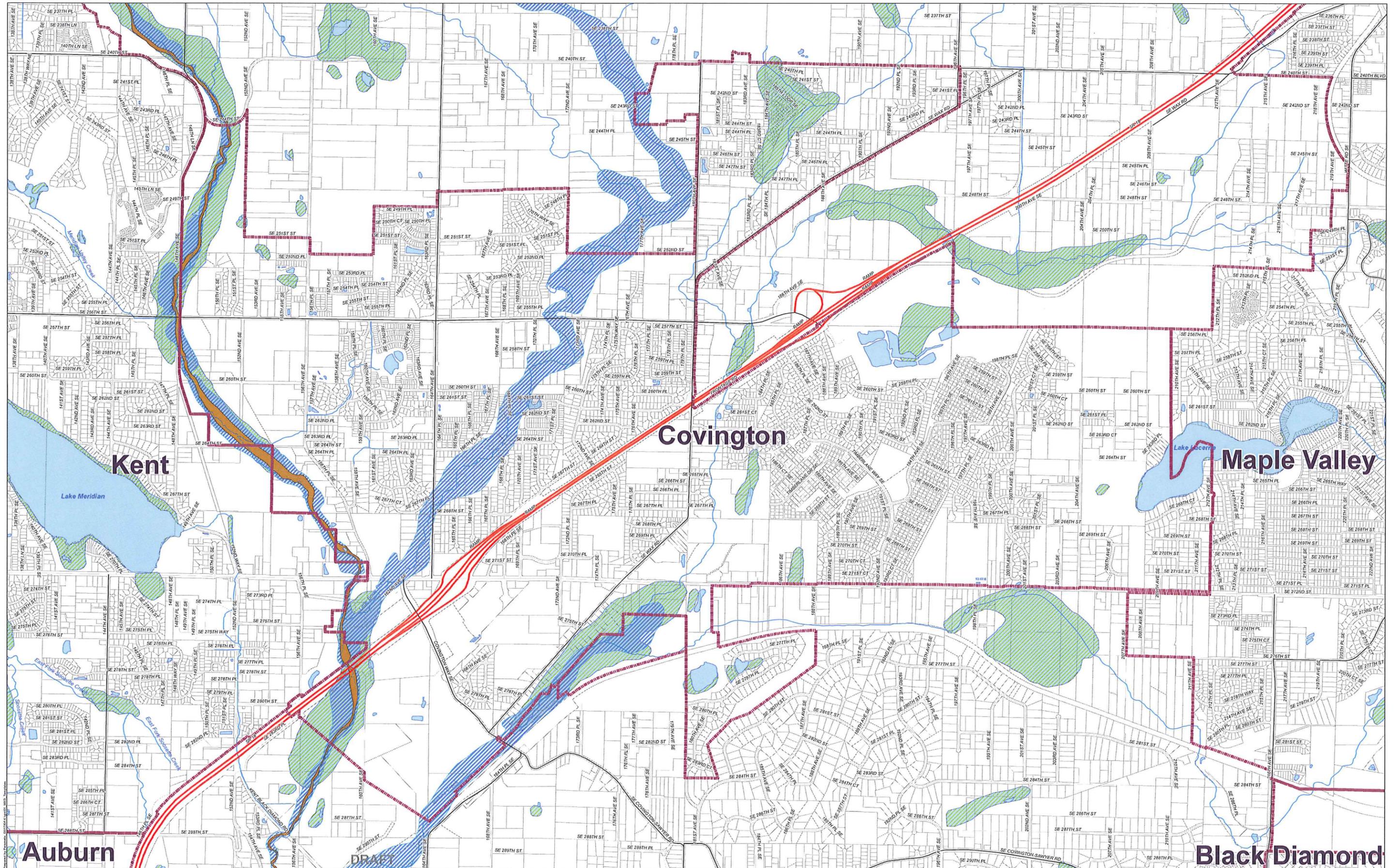
### 1.3 PURPOSE

The purpose of this Plan Update is to assist the City in meeting stormwater management goals associated with stormwater infrastructure improvements or modifications. The major elements of this Plan Update include the following:

- Identify Capital Improvement Projects (CIPs) and Operations and Maintenance (O&M) Improvement Projects that relate to major improvements to and maintenance of the City's storm water management infrastructure;
- Prepare opinions of cost for the identified projects; and
- Identify regulations related to stormwater management.

The results of this Plan Update have been summarized for inclusion in Chapter 8.0, Surface Water Resource Element and Chapter 10.0, Capital Facilities Plan Element, of the City's overall Comprehensive Plan required under the Growth Management Act.

This Plan Update is specifically related to stormwater infrastructure. Plans and reports for compliance with the NPDES Phase II Permit will be prepared separately by others.



- Legend
- Municipal Boundary
  - Water Body
  - Regulatory Floodways
  - Wetland
  - Parcel Boundary
  - Water Course
  - Regulatory 100 Year Floodplain

Figure 1-1  
City of Covington  
Vicinity Map

## 1.4 STORMWATER PLAN UPDATE

This Plan Update has been prepared based upon the following:

- The 2002 plan;
- The Jenkins Creek Basin Study;
- The Little Soos Creek Basin Study;
- Coordination with City staff;
- Review of information available through the City; and
- Field observations.

In addition, websites of the following agencies were reviewed:

- City of Covington;
- Code Publishing Company;
- United States Fish and Wildlife Service (USFWS);
- National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Services (NMFS);
- United States Environmental Protection Agency (USEPA);
- Washington State Department of Transportation (WSDOT);
- Washington State Department of Ecology (Ecology);
- Washington State Department of Fish and Wildlife (WDFW);
- Puget Sound Partnership (PSP);
- Covington Water District;
- Water District 111;
- King County Geographical Information System Center;
- Soos Creek Water and Sewer District; and
- City of Kent.

This Plan Update does not supersede information contained in previous reports except for the identification of projects to be implemented by the City and stormwater regulations. For example, hydrologic and hydraulic modeling was performed for the 2002 plan, the Jenkins Creek Basin Study, and the Little Soos Creek Basin Study. These models were not updated for this Plan Update; however, model descriptions, the parameters used, and the results are available through these previous reports. These previous reports will need to be reviewed by the design engineer prior to beginning the final design of any regional facilities that are carried forward in this Plan Update.

This Plan Update identifies stormwater infrastructure projects to be carried forward and new projects based on needs identified by the City. Where detailed breakdown is available in previous documents, the project costs have been updated by applying current unit cost estimates. Where detailed breakdown is not available in previous reports, a cost index factor was applied to account for cost increases since the previous reports were prepared.

This Plan Update has been prepared based on a 20-year implementation schedule with the highest priority projects identified for completion within the first six years. See Chapter 5 for a list of projects, project type, scheduled year of completion, and opinions of probable construction costs.

## **2. REGULATORY CONSIDERATIONS**

### **2.1 INTRODUCTION**

The City is impacted by stormwater regulations and policies from a variety of sources. Prior to incorporation, stormwater regulations and policies were developed and implemented by King County through its NPDES Phase I permit, its Surface Water Design Manual, and through basin plans. After incorporation, stormwater regulations and policies were developed by the City based on prior King County requirements adapted to the City's specific needs. After incorporation, stormwater regulations and policies were impacted by requirements established at the federal level.

Regulations in effect at the time of the 2002 plan are discussed in the 2002 plan. This Plan Update focuses on regulations that have changed since the 2002 plan was issued. See the 2002 plan for historical background.

### **2.2 FEDERAL REGULATIONS**

#### **2.2.1 Clean Water Act (CWA) Phase II NPDES Stormwater Permits**

The federal government regulates stormwater through several different programs. The CWA requires all operators of municipal separated storm sewer systems (MS4s) with a population of 10,000 to 100,000 or those located in a federally designated urban area to obtain and comply with the NPDES Phase II stormwater regulations that became effective March 10, 2003. The City of Covington is within a federally designated urban area and has a population greater than 10,000 and therefore is subject to the requirements of the Phase II permit. Ecology, under authority from the USEPA, issued the NPDES Phase II Permit on January 17, 2007, and updated the NPDES Phase II Permit in 2009. One of the requirements of the NPDES Phase II Permit is for the City to prepare a SWMP. The SWMP is a plan that documents how the City plans to implement the requirements of the NPDES Phase II Permit. The City has prepared the initial SWMP and will need to update the SWMP annually as required by the NPDES Phase II Permit.

Costs to develop and implement the SWMP and meet the other requirements of the NPDES Phase II Permit are part of the City's overall stormwater management costs. These costs need to be reflected in the rates and fees established by the City. The costs to develop and implement the SWMP and meet the other requirements of the NPDES Phase II Permit are being addressed by others in separate documentation.

The following Ecology website with NPDES Phase II Permit information was in effect at the time this Plan Update was prepared:

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

#### **2.2.2 Safe Drinking Water Act**

The Safe Drinking Water Act (SDWA) is the main federal law that protects the quality of drinking water. Under the SDWA, the USEPA sets standards for drinking water quality and oversees the states, localities, and water suppliers who implement those standards. In Washington State, Ecology has received authority from the USEPA to administer the requirements of the SDWA. The SDWA requires many actions to protect drinking water and its sources, including rivers, lakes, reservoirs, springs, and groundwater wells.

There are two aspects of the SDWA related to stormwater management: wellhead protection and underground injection control. These are discussed further in the following two sections. Figure 2-1 shows the general locations of soils with the potential for higher infiltration rates where wellhead protection and underground injection control would need to be addressed as part of a project's stormwater management approach.

The following USEPA website with SDWA information was in effect at the time this Plan Update was prepared:

- <http://www.epa.gov/safewater/sdwa/index.html>

### 2.2.2.1 Wellhead Protection Areas

As reported in the 2002 plan, much of the City is a recharge area for public water supply wells. Three water districts provide water to the City: Covington Water District, Water District 111, and Han Water Company. In addition, the City of Kent has a supply source located near the City but does not provide water to the City.

Based on mapping provided by the Covington Water District, the wells that are owned and maintained by the Covington Water District and their associated capture zone/time of travel boundaries are located outside the City.

King County Water District 111 has a well located at the Gary Grant Soos Creek Park on the westerly side of the City and additional wells in the vicinity of the park. Although wellhead times of travel mapping was not available from Water District 111, it is likely that portions of the City are located in such wellhead protection zones based on well location descriptions provided by Water District 111.

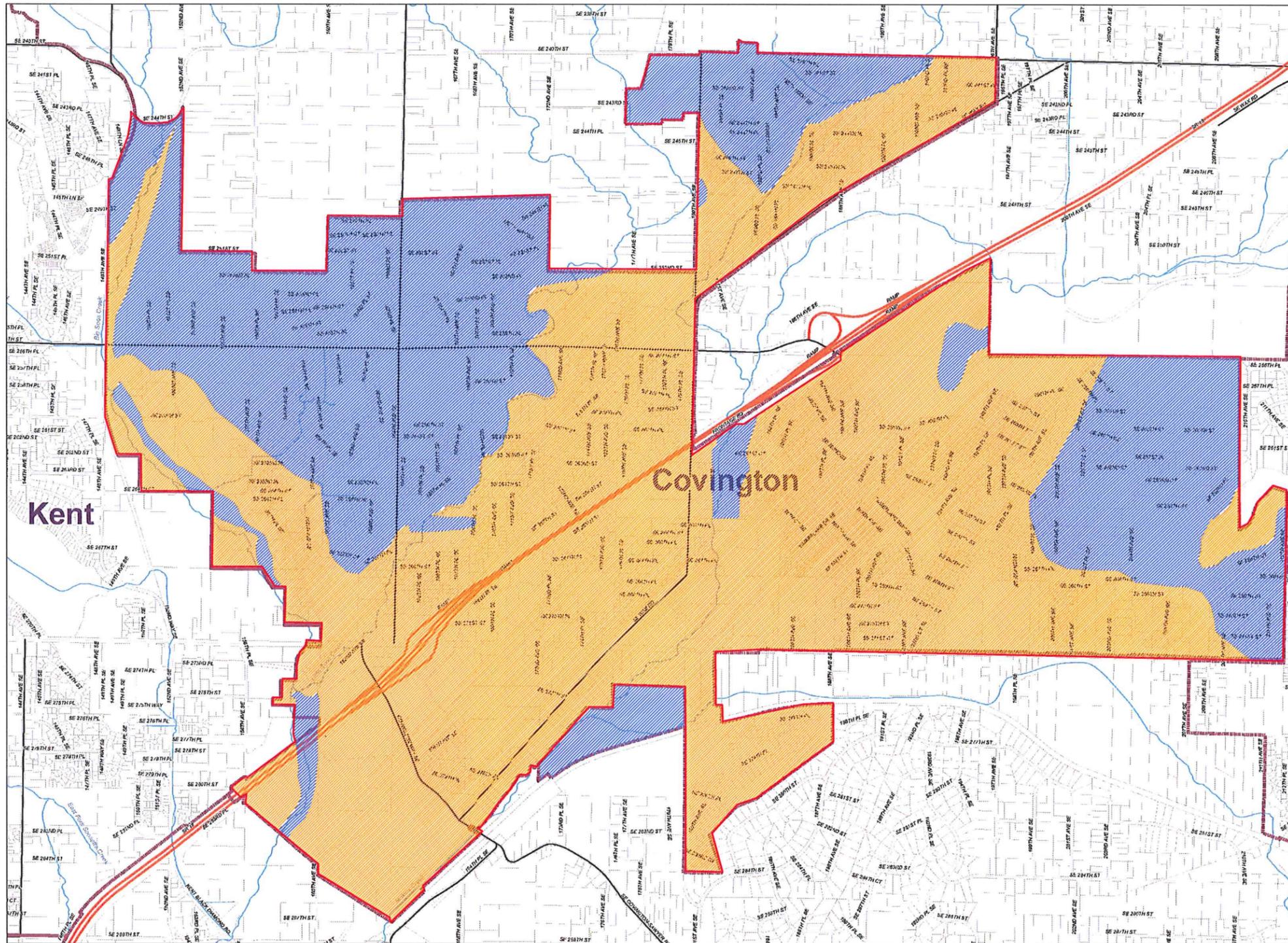
The Han Water Company has a well located on 164th Avenue SE near the northern corporate boundary. There is only a small portion of service area that is within the City.

The Soos Creek Water and Sewer District does not have any supply sources located within the City. The Soos Creek Water and Sewer District purchases its water from the City of Seattle. The Soos Creek Water and Sewer District provides sanitary sewer service to the City but does not provide water service.

The City of Kent also maintains water sources near the easterly portion of the City. The source relevant to the City is the Armstrong Springs property south of SR 516 and east of SE Wax Road, just outside of Covington's corporate boundary. The designated wellhead protection area for these wells covers much of the City on the easterly side of SR 18. The Armstrong Springs source is referred to by the City of Kent as a Phase 1 Supply Source. The City of Kent's wellhead protection plan discusses how the CMC regulates development within a Critical Aquifer Recharge Area (CARA) and reports that the City has adopted the King County Surface Water Design Manual. The City should inform the City of Kent that the Ecology Manual has been recently adopted.

It is important that infiltration facilities located in wellhead protection areas be designed, constructed, and maintained in accordance with the Ecology Manual, adopted by the City, to minimize the potential for ground water contamination from stormwater runoff. It is also important for land uses within wellhead protection areas be consistent with the wellhead protection plans and agreements between the City and the water suppliers.

Prior to changing any regulations regarding development in a CARA, the City should coordinate with the water suppliers to make sure that such changes are consistent with their wellhead protection programs.



**NOTES**

1. MAP BASED ON FIGURE 3-5 SOIL CLASSIFICATION MAP, IN THE 2002 COMPREHENSIVE STORMWATER PLAN PREPARED BY GRAY AND OSBORNE, INC.
2. SOILS WITH POTENTIAL FOR HIGHER INFILTRATION CAPACITY BASED ON EVERETT SERIES SOILS.
3. SOILS WITH LOWER OR NO INFILTRATION CAPACITY BASED ON ALDERWOOD SERIES, BELLINGHAM SILT LOAM, NORMA SAND LOAM, AND MUCK SOILS.
4. APPLICATION OF INFILTRATION CONTINGENT UPON SPECIFIC SITE CHARACTERISTICS, PROJECT PROPOSAL, AND STORMWATER MANAGEMENT REQUIREMENTS. THESE ELEMENTS TO BE ADDRESSED AS PART OF THE PROJECT'S STORMWATER REPORT AS REQUIRED BY THE CITY.

**LEGEND**

-  COVINGTON CITY LIMITS
-  STREAMS
-  SOILS WITH LOW OR NO INFILTRATION CAPACITY
-  SOILS WITH POTENTIAL FOR HIGHER INFILTRATION CAPACITY



**Figure 2-1  
Potential Infiltration  
Indicator Map**

### 2.2.2.2 Underground Injection Control (UIC)

The UIC program was developed as one of the key programs to protect drinking water sources. Ecology received authority from USEPA in 1984 to regulate UIC wells in Washington State. The UIC rule is found in Chapter 173-218 Washington Administrative Code (WAC).

A UIC well is a constructed facility used to discharge fluids into the subsurface. Examples of UIC wells are drywells, infiltration trenches with perforated pipe, and any structure deeper than the widest surface dimension. The majority of UIC wells in Washington are used to manage storm water, sanitary waste, return water to the ground, and help clean up contaminated sites. A dry well is an example of a stormwater UIC well. A large on-site septic system is an example of a sanitary sewer UIC well. The potential for groundwater contamination from UIC wells depends upon well construction, well location, quality of the fluids injected, and the geographic and hydrologic settings in which the injection occurs.

Stormwater-related elements of the UIC program include the following:

- An understanding of whether the proposed facility meets the definition of a Class V injection well. The USEPA has issued clarification on what types of stormwater management facilities may be classified as a UIC well. The clarification letter and its attachment are included in Appendix A.
- An understanding of whether the UIC well meets the nonendangerment standard of Chapter 173-218-080 WAC. If the UIC well provides the required treatment and discharges will be in compliance with water quality standards for groundwater, the UIC well can be rule authorized. Otherwise, the UIC well must go through the demonstrative approach to document that groundwater quality standards will be maintained.
- Registering the UIC well with Ecology.

Based on CMC 13.05.505, the City requires that stormwater systems meeting the definition of a UIC well be registered by the project proponent. In accordance with the CMC, the City does not anticipate taking responsibility for registering the UIC wells.

The following Ecology website with UIC information was in effect at the time this Plan Update was prepared: <http://www.ecy.wa.gov/programs/wq/grndwtr/uic/index.html>.

### 2.2.3 Endangered Species Act (ESA)

The purpose of the ESA is to “provide a means whereby the ecosystems upon which endangered species depend may be conserved, to provide a program for the conservation of such endangered species and threatened species, and to take such steps as may be appropriate to achieve the purposes of treaties.” The ultimate goal of the ESA is to return endangered and threatened species to the point where they no longer need the statute’s protection. The ESA is administered through the USFWS and the NOAA NMFS. Table 2-1 lists threatened or endangered species that live in waterbodies of the Puget Sound Region.

**Table 2-1. Summary of ESA Listed Species**

Listed Species	Listed As	Federal Agency	Date of Listing
Bull Trout	Threatened	USFWS	11/1/07
Dolly Varden Trout	Proposed Similarity of Appearance (threatened)	USFWS	5/11/05
Chinook Salmon	Threatened	NOAA NMFS	3/24/99
Steelhead Salmon	Threatened	NOAA NMFS	5/11/07
Southern Resident Killer Whale	Endangered	NOAA NMFS	11/18/05

Big Soos Creek supports and provides spawning habitat for Chinook and Coho while Little Soos Creek and Jenkins Creek support salmonids and provide spawning habitat for Coho.

Policies and regulations that are implemented as part of recovery plans of listed species can impact water quality treatment requirements for stormwater BMPs, maintenance procedures, and wastewater treatment plant effluent criteria. Major policy and regulatory documents related to ESA listed species that are being developed or implemented for the Puget Sound Region include:

- The NPDES Phase II Permit.
- The Tri-County Model 4(d) proposal developed through a partnership between King, Pierce, and Snohomish Counties; local cities; utilities; Native American tribes; business interests; environmental groups.
- The Puget Sound Recovery Plan being developed by the Puget Sound Partnership. The City will need to remain aware of stormwater and surface water requirements as policies and regulations develop.

The following WSDOT website with ESA listing information was in effect at the time this Plan Update was prepared: <http://www.wsdot.wa.gov/Environment/Biology/BA/default.htm>.

The City is located within the boundaries of Watershed Resource Inventory Area (WRIA) 9. Specifically, the City is located within the Middle Green River Subwatershed. In 2005, the WRIA 9 Steering Committee issued its Salmon Habitat Plan: Making Our Watershed Fit for a King (Salmon Habitat Plan). The Salmon Habitat Plan was prepared as part of the overall Puget Sound Salmon Recovery Plan. The Salmon Habitat Plan was developed after completing the Near-Term Action Agenda in 2002. The City is one of the participating agencies in the Salmon Habitat Plan. Amendments to the Salmon Habitat Plan were issued in 2007. Neither the Salmon Habitat Plan nor its Amendments identifies any capital construction-type projects, such as levee removal or habitat restoration, for the Middle Green River Subwatershed specifically related to the City.

Although there are no specific capital projects identified for the City in the Salmon Habitat Plan or its Amendments, there are some ongoing requirements for the City. One of the requirements will be to contribute financially in implementation of the Salmon Habitat Plan as agreed to by the City in interlocal agreements. Because there are no capital projects identified for the City, most of the City's financial commitments might have already been met through the development and publishing of the Salmon Habitat Plan.

There are also a number of policies identified in the Salmon Habitat Plan that the City will need to continue to implement unless the Salmon Habitat Plan is otherwise amended. Table 2-2 summarizes the policies in the Salmon Habitat Plan applicable to the City.

**Table 2-2. Summary of Applicable Salmon Habitat Plan Policies**

<b>Policy</b>	<b>Description</b>	<b>Focus (Comments)</b>
WW-1	Conduct shoreline stewardship workshops and outreach.	Public workshops for shoreline property owners to improve property stewardship. (This also relates to NPDES Phase II Permit.)
WW-2	Increase/expand water conservation incentive programs.	Water conservation to maintain necessary base flows.
WW-3	Increase/expand natural yard care programs for landscapers.	Educational programs for landscape designers, contractors, groundskeepers, and property managers about benefits and practices of natural yard care and use of native/riparian vegetation. (This also relates to NPDES Phase II Permit.)
WW-4	Increase/expand the natural yard care program for single family homeowners.	Natural yard care program to promote the value of native riparian vegetation and native drought-tolerant vegetation in upland areas. (This also relates to NPDES Phase II Permit.)
WW-5	Promote planting of native trees.	Outreach regarding the benefits of trees, increased forest cover, and planting of native trees. (This also relates to NPDES Phase II Permit.)
WW-6	Promote better volunteer car wash practices.	Promote or encourage car wash kits and/or car wash coupons to remove car wash runoff from storm system. (This also relates to the NPDES Phase II Permit.)
WW-7	Increase public awareness about what healthy streams and rivers look like and how to enjoy recreating on them.	Public outreach to explain important natural functions found on healthy streams and identify practices to be avoided.
WW-8	Increase involvement of volunteers in habitat stewardship.	Increase citizen participation in stewardship programs in restoring, maintaining, and monitoring habitat protection and restoration projects. (This also relates to NPDES Phase II Permit.)
WW-9	Green/Duwamish volunteer revegetation program.	Riparian planting projects along the mainstem Green River and its tributaries. (May include some areas within the City.)
WW-10	Support/expand the natural resource/basin steward programs.	Support and expand steward program to work with private landowners to protect and restore salmon habitat and rural resource lands.
WW-11	Expand/improve incentive programs.	Expand existing and develop new incentives for property owners to protect salmon habitat.
WW-12	Improve enforcement of existing land use and other regulations	Improve enforcement of existing regulations that protect salmon and salmon habitat.
WW-13	Increase use of low impact development and porous concrete.	Promote infiltration and low impact development to improve water quality generally and reduce the volume of stormwater runoff. (This also relates to NPDES Phase II Permit.)
WW-14	Provide incentives for developers to follow Built Green™ checklist sections benefiting salmon.	Provide incentives to developers to use the Built Green™ building program. (In developing incentives, the City should confirm that such incentives do not impact the funding levels necessary to support the surface water utility or be contrary to the policies and goals of the Shoreline Master Plan.)

(Table Continues)

**Table 2-2. Summary of Applicable Salmon Habitat Plan Policies (Continued)**

Policy	Description	Focus (Comments)
WW-15	Develop a coordinated acquisition program for natural areas.	Develop and implement a coordinated natural areas/open space identification and protection program. (City has previously included open space requirements in plat requirements.)
WW-16	Develop salmon restoration tools consistent with agricultural land uses.	Develop tools that allow and encourage voluntary projects by farmers to protect and restore habitat while preserving agriculture. (Identified primarily for larger farms within King County but might also be applicable to small hobby farms, if any, in the City.)
IN-1	Encourage activities that maintain, restore and rehabilitate natural watershed and ecological process, expand refugia, and enhance connections between refugia.	Refugia are geographic locations or a collection of habitat units that support a persistent population during normal environmental disturbances. Refugia are important for long-term survival of fish populations.
IN-2	Support a shorelines exemption for properties affected by salmon habitat restoration projects that would relocate the location of the ordinary high water mark.	
IN-3	Support bioengineering alternatives for shoreline bank stabilization and flood control facilities where feasible.	
IN-4	Support new and existing incentives to protect salmon habitat.	
IN-5	Review parks and grounds maintenance procedures and adopt written best management practices that protect salmon and salmon habitat.	(This also relates to the Stormwater Management Program and Stormwater Pollution Prevention Plan for City facilities required under the NPDES Phase II Permit.)
IN-6	Evaluate shorelines and critical areas under public ownership prior to sale or exchange.	
WQ-1	Reduce impervious surfaces and increase forest cover to the extent possible.	(This also relates to the City's Shoreline Master Plan and the use of low impact development. See WW-13 above.)
WQ-2	Use low-impact development to reduce the volume of stormwater runoff.	(City has updated its codes and standards to allow for low-impact development. See WW-14 above and LU-3 below. This also relates to the NPDES Phase II Permit.)
WQ-3	Manage groundwater in conjunction with surface water.	(This is contingent upon water and sewer agencies that provide service within the City. There are large portions of the City where stormwater can likely be readily infiltrated.)
WQ-4	Assess and improve where necessary current stormwater management standards, facilities, and programs.	(City has updated its codes and standards based on the NPDES Phase II Permit.)
WQ-5	Use reclaimed wastewater.	(This is contingent upon water and sewer agencies that provide service within the City.)
FP-1	Evaluate fish passage barriers to assess the most important to remove in order to increase the amount of salmon habitat.	
FP-2	Replace culverts with bridges or arched-culverts with natural streambed material in the course of planned maintenance and/or improvements.	

(Table Continues)

**Table 2-2. Summary of Applicable Salmon Habitat Plan Policies (Continued)**

Policy	Description	Focus (Comments)
LU-1	Uphold growth management requirements and urban growth boundaries.	(City is updating its Comprehensive Plan prepared as required under the Growth Management Act.)
LU-2	Encourage use of Built Green™ building program.	(See WW-14 above.)
LU-3	Critically evaluate new roads and infrastructure for salmon habitat impacts. Avoid or minimize road building, clearing and grading within landslide hazard areas except where necessary for public health and safety.	(This also relates to the City's Shoreline Master Plan and the use of low impact development. See WW-13 above.)
LU-4	Adopt the Tri-County Regional Road Maintenance ESA Program Guidelines for maintenance of existing infrastructure or an equivalent set of practices.	(City is using these guidelines.)

Source: 2005 Salmon Habitat Plan: Making Our Watershed Fit for a King. King County.

Notes:

- WW = Watershed-Wide
- IN = Innovation
- WQ = Water Quality/Quantity
- FP = Fish Passage
- LU = Land Use

The following King County websites with the WRIA 9 information were in effect at the time this Plan Update was prepared:

- <http://www.govlink.org/watersheds/9/plan-implementation/HabitatPlan.aspx#download>
- <http://www.kingcounty.gov/environment/watersheds/green-river.aspx>

Another element of ESA-related planning that is applicable to the City is the road maintenance standards developed by the Tri-County Road Maintenance ESA Technical Working Group (Tri-County Group). The Tri-County Group was formed “to develop a road maintenance program that would contribute to the conservation of salmonids and other fish species and would meet federal agencies’ requirements under Section 4(d) of the ESA. Agencies that participated in the Tri-County Group include King County, Snohomish County, Pierce County, and WSDOT. The Tri-County Group developed the Regional Road Maintenance Endangered Species Act Program Guidelines (ESA Program Guidelines) to provide a consistent program that can be used by any agency in the region that wanted to limit, reduce or eliminate the prohibition on take of threatened species under the 4(d) rule for species regulated by NOAA NMFS, the special 4(d) rule and/or a Section 7 take exemption for species regulated by the USFWS. The City has applied for a take limit under the provisions of the ESA Program Guidelines. The City will need to continue complying with the ESA Program Guidelines as maintenance actions are provided.

The following King County website with the ESA Program Guidelines was in effect at the time this Plan Update was prepared.

- <http://www.kingcounty.gov/transportation/kcdot/Roads/environment/RegionalRoadMaintenanceESAGuidelines/ESAProgramGuidelines.aspx>

## 2.2.4 Federal Emergency Management Agency

The Federal Emergency Management Agency (FEMA) originated in 1979 by executive order to consolidate federal responses to disasters. Prior to 1979, many of the federal responses to emergencies and disasters were fragmented. Although federal response to disasters can be traced back to the Congressional Act of 1803, it was not until 1974 when the Disaster Relief Act was enacted. The Disaster Relief Act, enacted after multiple hurricanes and earthquakes in the 1960s and 1970s, broadened the scope of existing disaster relief programs and provided federal assistance programs for both public and private losses sustained in disasters. The Disaster Relief Act was amended by the Robert T. Stafford Disaster Relief and Emergency Assistance Act in 1988. In 2003, FEMA was incorporated into the Department of Homeland Security.

Floodplains are regulated through FEMA through the National Flood Insurance Program (NFIP). To obtain flood insurance and participate in the NFIP, local agencies must adopt a floodplain management ordinance. Typically such ordinances are based on Chapter 173-158 WAC and Section 44 of the Code of Federal Regulations (CFR) Parts 59 and 60. The City regulates development within floodplains through the following chapters of the CMC:

- Chapter 16.15, Flood Damage Prevention;
- Chapter 18.65.230, Flood hazard areas – Components;
- Chapter 18.65.240, Flood fringe development standards and alterations;
- Chapter 18.65.250, Zero-rise floodway development standards and alterations;
- Chapter 18.65.260, FEMA floodway development standards and alterations;
- Chapter 18.65.270, Flood hazard areas certification by engineer or surveyor; and
- Chapter 18.65.275, Channel migration zones – Development standards and alterations.

Floodplains are shown on Flood Insurance Rate Maps (FIRMS) published by FEMA. Mapped floodplains can reflect a variety of conditions such as:

- Flooding associated with closed depressions, such as lakes;
- Flooding associated with rivers for which a hydraulic model has been created; or
- Areas subject to frequent flooding but for which a hydraulic model has not been created.

Waterbodies regulated as floodplains are not necessarily regulated through the state's Shoreline Management Act, which is discussed below.

There are two major aspects in regulating development within floodplains: maintaining channel hydraulics and conveyance volume capacity, and minimizing the risk of water quality impacts. Maintaining channel hydraulics and conveyance volume capacity can be accomplished through a variety of ways as presented in Chapter 16.15 CMC. However, even in such cases where these factors are mitigated, development sites can still pose a risk to water quality especially during a flood event because materials can be stored on-site that enter into the floodway during a flood event. The City's efforts to reduce the risk of water quality impacts to floodplains can be found in Chapters 18.65.240(11) and (12), which regulate new or expansion of existing livestock flood sanctuaries and livestock manure storage facilities, respectively, and by including "storage of equipment or materials located within the area of special flood hazard" in the definition of "development" in Chapter 16.15.030(6) CMC.

In September 2008, NOAA released a biological opinion (BiOp) regarding FEMA's ongoing administration of the NFIP. NOAA determined that the NFIP adversely affects or destroys critical habitat of several marine species listed under the ESA. FEMA is required to provide guidance to local governments on how to avoid violating ESA when authorizing development within a floodplain. Until such guidance is provided, local agencies must be able to demonstrate compliance with ESA. This Plan Update has been prepared assuming that compliance with the BiOp and its Reasonable and Prudent Alternatives (RPAs) will be addressed as the City regulates development in floodplains within its jurisdiction.

Some of the more significant impacts of the BiOp RPAs to the City are:

- FEMA is to “notify all NFIP participating Puget Sound communities of [NOAA’s] fundamental conclusion in the FEMA BiOp: that development under the current NFIP jeopardizes listed species and destroys or adversely modifies their critical habitat. This includes notification that current floodplain management ordinances, without modification, will violate the ESA.”
- FEMA is to change the mapping program by prioritizing mapping based upon the presence of sensitive salmon populations.
- FEMA is to modify the implementation of minimum criteria “in order to prevent and/or minimize the degradation of channel and floodplain habitat” by not allowing any development in the floodway, riparian buffer zone and other areas, unless the local permitting authority can demonstrate that development in such areas “does not adversely affect water quality, water quantity, flood volumes, flood velocities, spawning substrate, and/or floodplain refuge for listed salmonids” and either:
  - Prohibits development in the 100-year floodplain; or
  - Only allows development if floodplain storage loss can be “avoided, rectified or compensated for.”
- FEMA is to update the Community Rating System to create incentives for the use of LID to decrease the need for added stormwater treatment. This can reduce the potential risk of water quality impacts and potentially help the City meet its goals under its shoreline management program.

One of the RPAs, related specifically to levees, is not likely to be applicable to the City since there are currently no known levees within the City. The levee-related RPA requires FEMA to address levee vegetation maintenance standards to meet some or all of NOAA NMFS habitat-based objectives.

Addressing the RPAs could potentially result in development density changes, land use changes in floodplain areas and/or requiring low impact development.

The following FEMA, Ecology, and King County websites with floodplain management, NFIP, FIRMS and flood insurance studies were in effect at the time this Plan Update was prepared:

- <http://www.fema.gov/hazard/flood/index.shtm>
- <http://www.fema.gov/business/nfip/>
- <http://www.ecy.wa.gov/programs/sea/floods/index.html>
- <http://www.kingcounty.gov/environment/waterandland/flooding/maps/flood-insurance-rate-maps/rate-map-panels.aspx>
- <http://www.kingcounty.gov/environment/waterandland/flooding/maps/flood-insurance-rate-maps/flood-insurance-study.aspx>

## 2.3 STATE REGULATIONS

### 2.3.1 Puget Sound Water Quality Management Plan

The Puget Sound Water Quality Management Plan is discussed in detail in the 2002 plan. The Puget Sound Water Quality Management Plan, issued in 1988, was developed under the authority of the Puget Sound Water Quality Authority. However, the Puget Sound Water Quality Authority has developed into the Puget Sound Partnership (PSP). The PSP has been tasked by the Governor and state Legislature to “create a real Action Agenda that turns things around and leads to a healthy Puget Sound.” The Action Agenda “will prioritize cleanup and improvement projects, coordinate federal, state, local, tribal, and private resources, and make sure that we are all working cooperatively.”

The City has adopted Ecology’s 2005 *Stormwater Management Manual for Western Washington* (Manual), with modifications, as the basis for the analysis, design, operation, and maintenance of stormwater facilities. Based on Section 1.6.4 of the Manual:

The [Puget Sound Water Quality Management] Plan states that ‘A single technical stormwater manual for the region provides uniform standards and a central repository for BMPs’. The Plan directs Ecology to maintain the region’s technical stormwater manual for new development and redevelopment. Publication of this manual partially fulfills Ecology’s responsibilities under the Puget Sound Water Quality Management Plan.

Based on the standards established in the Manual, the requirements of the NPDES Phase II Permit, the Tri-County Model 4(d) proposal, and the PSP Action Agenda, the requirements of the Puget Sound Water Quality Management Plan are no longer at the forefront of establishing stormwater management requirements for local agencies.

Table 2-3 compares the requirements of the Puget Sound Water Quality Management Plan and the NPDES Phase II requirements.

**Table 2-3. Comparison of the Puget Sound Water Quality Management Plan Stormwater Program and the USEPA NPDES Phase II Program**

Puget Sound Plan Element Reference	Puget Sound Management Plan Stormwater Program Elements	EPA NPDES Phase II Program
SW-1.1	Growth Management Planning/Land Use Planning	
SW-1.2(a)	Standards for New Development and Redevelopment	X
SW-1.2(b)	Stormwater Site Plan Review	X
SW-1.2(c)	Inspections of Construction Sites	X
SW-1.2(d)	Maintenance of Permanent Facilities	X
SW-1.2(e)	Source Control	X
SW-1.2(f)	Illicit Discharge Elimination and Water Quality Response	X
SW-1.2(g)	Identification and Ranking of Problems	X
SW-1.2(h)	Public Education & Involvement	X
SW-1.2 (i)	Low Impact Development Practices	X
SW-1.2(j)	Watershed or Basin Planning	X
SW-1.2 (k)	Local Funding Capacity	Permittees are required to track permit compliance costs
SW-1.2 (l)	Programmatic and Environmental Monitoring	X
SW-1.2 (m)	Schedule for Implementation	X

Source: Puget Sound Water Quality Action Team

### 2.3.2 Watershed Planning

The Watershed Management Act, found in Chapter 90.82 Revised Code of Washington (RCW), sets a framework for the State's water quality issues as well as establishing instream flows and addressing salmon habitat needs. The Watershed Management Act uses WRAs as the organizing geographic unit for watershed planning.

The City is located within the boundaries of WRIA 9 within the Middle Green River Subwatershed. The Salmon Habitat Plan for WRIA 9 was issued in July 2005. The Salmon Habitat Plan was developed after completing the Near-Term Action Agenda in 2002. See Section 2.2.3 of this Plan Update for a discussion of WRIA 9 watershed planning related to the City.

### 2.3.3 PSP Action Agenda

The PSP published the Action Agenda on December 1, 2008. The Action Agenda "outlines how to solve the problems that threaten Puget Sound – which include pollutants in stormwater that washes off our city streets, suburban, and rural areas into the Sound, to the more than 21 species that have been listed as threatened or endangered, to massive fish kills in Hood Canal, to continued discharges of toxic substances into the Sound, to loss of habitat for living things throughout the region – whether on land or in fresh and marine waters."

The Action Agenda includes several stormwater-related elements. A brief overview of the stormwater-related elements includes:

- Control and manage stormwater runoff in an integrated way with protection of vegetated land cover and reduction of pollutants before they reach water.
- Use a watershed approach for protection and restoration efforts.
- Use Action Agenda-based watershed assessments to define areas that should be protected and those that are best suited for growth using low impact development (LID) technologies, and to prioritize restoration opportunities including stormwater retrofits.
- Use development incentives to increase and improve redevelopment within urban growth areas, including those for stormwater management upgrades and restoration. Example incentives could include: flexible design standards such as setbacks, building height restrictions, parking lot and road design; use of transfer of development rights; and property tax incentives such as the Public Benefit Rating System program.
- Fix current barriers to the use and reuse of rainwater, gray water, stormwater, and wastewater.
- Ongoing analysis of potential benefits and impacts of alternative approaches for managing stormwater and land use collectively to understand better how to reduce impacts of runoff. This analysis would provide a key scientific basis for integrated land use and water resources planning.
- Use a comprehensive, integrated approach to managing urban stormwater and rural surface water runoff to reduce stormwater volumes and pollutant loadings.
- Conduct a focused outreach campaign for the public and businesses to reduce pollutants identified in toxic loading and other studies that are priority threats to Puget Sound. This effort will be focused on pharmaceuticals, personal care products, and pollutants in stormwater runoff.

- Integrate efforts to manage stormwater discharges with work to protect land cover and reduce pollutants at the watershed scale and across Puget Sound.
- Integrate stormwater management efforts into integrated watershed planning, such as the development of Watershed Management Plans and Water Quality Improvement Plans.
- Investigate, and if appropriate and feasible, establish watershed-scale stormwater permits through Section 208 of the Clean Water Act. Focus permits on the multitude of discharges that occur in logical geographic areas, rather than discharge-specific inputs or jurisdictional boundaries.

The City will need to track the Action Agenda as it is developed and implemented to determine if there are changes to how stormwater management facilities are designed, analyzed, constructed, operated and maintained, and if there are changes that impact land use regulations, such as critical area setbacks, buffers, management of shorelines, clearing restrictions, or requirements to use Low Impact Development (LID) practices.

Most of the elements related specifically to stormwater management in the Action Agenda are identified in Priority C.2, Use a Comprehensive, Integrated Approach to Managing Urban Stormwater and Rural Surface Water Runoff to Reduce Stormwater Volumes and Pollutant Loadings. An excerpt from the Action Agenda containing the elements of Priority C2 is included in Appendix B.

The following PSP website with Action Agenda information was in effect at the time this Plan Update was prepared:

- [http://www.psp.wa.gov/aa\\_action\\_agenda.php](http://www.psp.wa.gov/aa_action_agenda.php)

### 2.3.4 Hydraulic Project Approval

The state Legislature gave the Washington Department of Fish and Wildlife (WDFW) the responsibility of preserving, protecting, and perpetuating all fish and shellfish resources of the state. To assist in this goal, the state Legislature enacted the Hydraulic Code, Chapter 77.55 RCW, in 1943. State waters include all marine waters and fresh waters but do not include watercourses that are entirely artificial, such as irrigation ditches, canals, and stormwater run-off devices. Projects that conduct any construction activity that will use, divert, obstruct, or change the natural flow or bed of state waters are regulated under the state's Hydraulic Code. Such projects must obtain a Hydraulic Project Approval (HPA) from WDFW.

There are many streams located within the City; however, large segments of the streams are located on private property outside of City right-of-way. Consequently, work might occur in or near a stream that could impact the water quality or flow regime that could go unnoticed by the City. Such projects could exacerbate existing water quality problems, create damage to adjacent or downstream properties, or violate Ecology water rights regulations. For projects in or near a stream where the project proponent submits an application to the City, permit review staff has the opportunity to provide notification to project proponents that they contact WDFW to determine if their project must obtain an HPA. The City could require the project proponent to provide documentation of contact with WDFW and/or a copy of the HPA prior to issuing the permit. For projects where permit applications are not submitted to or required by the City, the City may become aware of actions in or near a stream based on reports from neighbors or incidental observations by City staff. The City would then have an opportunity to provide notification to the property owners that they contact WDFW to determine if their project must obtain an HPA.

The City could also inform citizens and business about the requirements to obtain an HPA through the public education and outreach component of the SWMP plan developed under the NPDES Phase II Permit. Although an HPA is not specifically related to the NPDES Phase II Permit, nonauthorized activities that impact the water quality and/or flow regime of the stream could result in a violation of the NPDES Phase II Permit.

The City will need to obtain an HPA for any CIP located in a regulated stream during the design of the project.

Typical freshwater activities that may occur within the City that are required to obtain an HPA include:

- Stream bank protection;
- Construction or repair of bridges, piers, and docks;
- Pile driving;
- Channel change or realignment; conduit (pipeline) crossing;
- Culvert installation;
- Dredging;
- Gravel removal;
- Pond construction;
- Placement of outfall structures;
- Log, log jam, or debris removal;
- Installation or maintenance of water diversions; and
- Mineral prospecting.

The following WDFW website with HPA information was in effect at the time this Plan Update was prepared:

<http://wdfw.wa.gov/hab/hpapage.htm>

### **2.3.5 Shoreline Management Act**

The Shoreline Management Act (SMA) was enacted by the state Legislature in 1971. The SMA is found in Chapter 90.58 RCW. The policy of Washington State as documented in the SMA is to “provide for the management of the shorelines of the state by planning for and fostering all reasonable and appropriate uses. This policy is designed to insure the development of these shorelines in a manner which, while allowing for limited reduction of rights of the public in the navigable waters, will promote and enhance the public interest.” The SMA further states:

In the implementation of this policy the public’s opportunity to enjoy the physical and aesthetic qualities of natural shorelines of the state shall be preserved to the greatest extent feasible consistent with the overall best interest of the state and the people generally. To this end uses shall be preferred which are consistent with control of pollution and prevention of damage to the natural environment, or are unique to or dependent upon use of the state’s shoreline.

Under the SMA, local government is to have the primary responsibility of initiating the planning required by the SMA and administering the regulatory program consistent with the policy and provisions of the SMA. Generally, the shorelines of freshwater rivers and lakes are regulated under the SMA except for the following:

- Shorelines on segments of streams upstream of a point where the mean annual flow is twenty cubic feet per second or less and the wetlands associated with such upstream segments; and
- Shorelines on lakes less than 20 acres in size and wetlands associated with such small lakes.

Waterbodies within the City that are subject to regulation under the SMA include:

- Pipe Lake;
- The lower reaches of Jenkins Creek; and
- The lower reaches of Big Soos Creek.

Mapping of the areas regulated by the City under the SMA are included in Appendix C.

The City's requirements for shoreline management as related to stormwater management have not been finalized; updates to the Shoreline Master Program were being developed as this Plan Update was being prepared. The Draft Shoreline Master Program, issued on July 14, 2009, summarizes the policies and regulations. It is anticipated that the Shoreline Master Program will be finalized in 2010. The Shoreline Master Program may be finalized based on the following:

- The City's consideration of comments provided by individuals or agencies, such as Ecology, during the public review process.
- Based on monitoring results where Low Impact Development (LID) is used, it appears that the pollutant loading to surface water is less than if conventional BMPs are used. The mechanisms for this appear to be increased efficiency and reduced volume of water discharged to surface waters.
- Implementing LID structural practices, land use practices, and clearing restrictions will likely be applicable to (1) policies that require shoreline uses and activities to be located, designed, constructed, and maintained to minimize adverse impacts to water quality and fish and wildlife resources; and (2) policies intended to result in no net loss of shoreline ecological functions through setbacks, buffers, and stormwater treatment and flow control facilities.
- The use of in-line stream control works for controlling erosion, reducing stream flow rates, or controlling floodwaters may require a Hydraulic Project Approval (HPA) and may not be practicable as a long-term sustainable solution due to the need for ongoing maintenance and access to the stream. In-line stream control works may impact fish habitat and migration. In-line stream control works, if used, should be considered by the City only on a case-by-case basis when evaluating measures for controlling erosion, reducing stream flow rates, or controlling floodwaters.
- Requiring stormwater treatment BMPs to be implemented at the source of contamination rather than relying on regional treatment facilities is consistent with the approach of many NPDES Phase II permittees.

- Pipe Lake is on the 303(d) list for total phosphorous impairment. The Environmental Protection Agency is compiling data on the treatment effectiveness of stormwater BMPs to remove phosphorous. In Washington State, any proprietary BMP would need to be approved through Ecology's TAPE protocol when that is reinstated. Addressing phosphorous concerns in the near future may avoid establishment of a Total Maximum Daily Load (TMDL) which could be implemented through the NPDES Phase II Permit. Treatment will need to be in accordance with the City's adopted stormwater management manual and a TMDL plan. Any site restoration plans that involve importing compost materials need to specify the use of matured compost. Compost that has not matured sufficiently can be a nutrient source until it stabilizes in the field. Compost suppliers should be required to meet WSDOT and Ecology criteria for compost.
- Big Soos Creek is on the 303(d) list for total fecal coliform and dissolved oxygen impairments. The causes of these parameters should be confirmed. Often, it is related to uncontrolled access to streams in areas of animal grazing. If this is the case, the City should consider implementing a fencing program. If the cause is related to septic drainfields, then the City and local sewer service providers should consider implementing sanitary sewer system extensions. Addressing fecal coliform and dissolved oxygen in the near future may avoid establishment of a TMDL, which could be implemented through the NPDES Phase II Permit.
- The implementation of LID may preclude clearing and grading activities adjacent to shoreline. This will likely be applicable to policies related to designing and conducting clearing and grading activities to minimize impacts to wildlife habitat, to minimize sedimentation of water bodies, and to minimize degradation of water quality. Such LID practices may include specifying allowable land uses, retention of native vegetation areas, site planning, limiting clearing and grading activities to the minimum necessary for the construction of access and improvements, appropriate planning of construction timing and practices, bank stabilization, soil bioengineering, the use of erosion and drainage control methods, and maintenance of temporary erosion and sediment control BMPs.

The implementation of LID, including practices related to land use and retention of native vegetation, will likely be applicable to (1) policies related to reducing or limiting the extensive use of lawns, and (2) policies that require clearing and grading activities to be designed to maintain natural diversity in vegetation species, age, and cover density.

- Technical design requirements for projects regulated under the Shoreline Master Program should be in accordance with the standards adopted in Chapter 13.25.020 of the CMC.
- Surfaces that are cleared and not developed are subject to erosion control measures in the Ecology Manual. Policies in the Shoreline Master Program should clarify that revegetation cannot be deferred.

## 2.4 LOCAL STORMWATER REGULATIONS

### 2.4.1 Surface Water Design

In 2009, the City adopted several changes to its municipal code related to stormwater requirements. Sections that have changed are listed in Section 1.2 of this Plan Update. In 2009, the City adopted the following manuals for analysis, design, operation, and maintenance of stormwater facilities:

- Ecology’s Manual;
- PSP LID Technical Guidance Manual for Puget Sound;
- WSDOT Hydraulics Manual; and
- City of Covington Design and Construction Standards.

The Ecology Manual and the PSP LID Technical Guidance Manual for Puget Sound will be used for the analysis, design, operation, and maintenance of temporary and permanent treatment and flow control BMPs. The WSDOT Hydraulics Manual and the City’s Design and Construction Standards will be used for the analysis and design of conveyance components.

The following Code Publishing Company website with the CMC was in effect at the time this Plan Update was prepared:

- <http://www.codepublishing.com/wa/covington/>

### 2.4.2 City of Covington Comprehensive Plan

In accordance with the Growth Management Act, Chapter 36.70A RCW, the City developed its comprehensive plan. The City adopted its 2001 comprehensive plan in CMC Chapter 14.15. Amendments to the comprehensive plan are regulated under CMC Chapter 14.25. The GMA Comprehensive Plan was updated in 2003. The City is currently undergoing an update to its comprehensive plan. This stormwater Plan Update has been prepared specifically for Chapter 8, Surface Water Resource, and Chapter 10, Capital Facilities Plan, of the comprehensive plan.

### 2.4.3 Critical Areas

There are several types of critical areas within the City. Codes for development within or adjacent to these critical areas were developed after the City incorporated. Table 2-4 lists the type of critical area and the related CMC section.

**Table 2-4. Summary of Critical Areas and City Code Sections**

Type of Critical Area	CMC Section
Aquatic Areas	18.65.355 – 18.65.380
Shorelines	16.05
Wetlands	18.65.319 – 18.65.350
Erosion Hazard Areas	18.65.220
Landslide Hazard Areas	18.65.280
Steep Slope Hazard Areas	18.65.310
Seismic Hazard Areas	18.20.1045
Critical Aquifer Recharge Areas	13.37, 18.65.311 – 18.65.316
Flood Hazard Areas	16.15, 18.65.230 – 18.65.275
Wildlife habitat areas	18.65.381 – 18.65.385

#### **2.4.4 Development Regulation**

Regulation of development within the City, in addition to the above sections of the CMC, is regulated through the following code provisions:

- Title 12 – Streets, Sidewalks, and Bridges
- Title 13 – Public Utilities
- Title 14 – Planning and Development
- Title 15 – Buildings and Construction
- Title 16 – Environment
- Title 17 – Subdivisions
- Title 18 – Zoning
- Chapter 18.45 – Tree Preservation and Protection

## 3. DRAINAGE AREA CHARACTERISTICS

### 3.1 INTRODUCTION

Stormwater CIPs are typically developed for the purpose of managing stormwater runoff to avoid water quality impacts or property damage associated with hydrologic responses to precipitation events. Many factors impact the amount, duration, and timing of stormwater runoff and hydrologic responses to precipitation events. Such factors include the geologic setting, area soils, climate, local surface waters, and land cover. These factors are discussed in the following sections. In addition, constructed stormwater systems such as ditches, pipes, and flow control facilities can affect the timing of flows reaching receiving waters. This is discussed further in Chapter 4.

#### 3.1.1 Geology

The following, as presented in the City's 2003 Comprehensive Plan, discusses the geologic setting for the City as it relates to stormwater runoff and hydrologic responses associated with a precipitation event:

Covington lies within the southern half of the Puget Sound Lowland between the central Cascade Range to the east and the southern Olympic Mountains to the west. The Puget Lowland is part of a large glacial drift plain formed by multiple glaciations that occurred in the region. A complex sequence of unconsolidated and partially consolidated sediments beneath the study area was created by a series of glacial advances and recessions and fluvial and lacustrine deposition during long interglacial periods. The thickness of the glacial and interglacial deposits is not known, but is estimated to be at least 2,000 feet.

Essentially all of Covington is underlain by one of three major surficial geological units: till, recessional outwash, and floodplain deposits. The recessional materials are generally suitable for infiltration of stormwater if they are of sufficient thickness and the depth to the seasonal high groundwater table allows for infiltration.

Due to the high infiltration rates of the soils, much of Covington is a recharge area for public and private water supply wells located down gradient. Care must be taken to provide adequate stormwater treatment prior to infiltration systems at all times, however, it is especially important in aquifer recharge areas.

#### 3.1.2 Soils

The following, as presented in the City's 2003 Comprehensive Plan, discusses the soils in the vicinity of the City as they relate to stormwater runoff and hydrologic responses associated with a precipitation event:

Soils within the City of Covington consist primarily of Alderwood and Everett gravelly sandy loam. These soils are moderately deep, moderately well drained, and were formed in sandy materials deposited by glaciers. Typically, the surface layer and subsurface layers, to a depth of approximately 31 inches, consists of gravelly sandy loam. Between depths of approximately 31 inches and 60 inches, the substratum is comprised of compact glacial till that is weakly cemented in places. The soils transmit water quickly leaving little water available for plant growth. Generally, within the City the Everett soils are conducive to infiltration of stormwater, whereas, the Alderwood soils are not due to the near surface presence of till.

### 3.1.3 Climate

The following, as presented in the City's 2003 Comprehensive Plan, discusses the climate in the vicinity of the City as it relates to stormwater runoff and hydrologic responses associated with a precipitation event:

The Covington area is characterized by a moist, cool maritime climate. The area receives approximately 42 inches of precipitation per year, mostly in the form of rain. Approximately 70 percent of the precipitation falls between October and May. Estimated evapotranspiration rates for the area are between 18- 24 inches per year, leaving 24 to 18 inches of rainfall to discharge into surface waters as runoff or recharge to groundwater by means of percolation.

### 3.1.4 Surface Waters

Six major surface water bodies are located wholly or in part within the City. These surface waters are Big Soos Creek, Little Soos Creek, Jenkins Creek, an Unnamed Tributary to Jenkins Creek, Cranmar Creek, and Pipe Lake. These water bodies are briefly described below.

Big Soos Creek lies adjacent to the western limits of the City. Big Soos Creek crosses in and out of the City's corporate limits from the northwesterly end of the City at Southeast 240th Street to the City's southwesterly end, south of SR 18. Based on general soil mapping reflected in Figure 2-1, there may be limited potential for infiltration in the northerly portion of the Big Soos Creek basin due to the presence of till soils. However, there may be a higher potential for infiltration in the southerly portion of the Big Soos Creek basin due to the presence of outwash soils. Based on information provided in the City's 2003 Comprehensive Plan, the Big Soos Creek stream valley bottom within the City is generally comprised of post glacial valley alluvium overlying outwash material. Till is found in the uplands on both sides of the creek.

Little Soos Creek flows south from Lake Youngs through the center of the City to the point of confluence with Big Soos Creek south of SR 516 and west of SR 18. Generally the Little Soos Creek basin within the City is typified by rolling topography. Till soils are generally located north and west of Little Soos Creek. Outwash soils are generally located south and east of Little Soos Creek.

Jenkins Creek flows west from Lake Wilderness, which is east of the City. Jenkins Creek is north of the City's corporate limit until it enters the City at Jenkins Creek Trail on the south side of SR 18 east of 180th Avenue Southeast. Jenkins Creek then flows south and southeast crossing in and out of the City's southwesterly corporate limit. Most of the areas in the City within the Jenkins Creek basin are underlain by Outwash soils.

There is an Unnamed Tributary to Jenkins Creek located in the northerly triangular area of the City. Based on anecdotal information provided by the City, this Unnamed Tributary is referred to as Tributary 0089A. The Unnamed Tributary originates in unincorporated King County and likely receives outflows from Shadow Lake during high lake level events. Areas north and west of the Unnamed Tributary are generally underlain by till soils. Areas south and east of the Unnamed Tributary are generally underlain by outwash soils.

Cranmar Creek flows through a small portion of the City near the Burlington Northern Santa Fe railroad south of South 272nd Street. Cranmar Creek is a tributary to Jenkins Creek. Cranmar Creek originates east of the City within the City of Maple Valley near the intersection of Witte Road Southeast and Southeast 268th Street. Based on mapping available through King County's website, Cranmar Creek does not appear to receive surface flow from Lake Lucerne. Cranmar Creek flows south and east towards the City and through a large wetland located between South 272nd Street and the Burlington Northern Santa Fe railroad, and south

of the intersection of 201st Avenue Southeast with South 272nd Street. Cranmar Creek then flows west between South 272nd Street and the Burlington Northern Santa Fe railroad and discharges into Jenkins Creek near the City of Kent's Armstrong Springs property. Cranmar Creek flows through large areas of wetland and riparian forest.

Pipe Lake is located in the eastern portion of the City. Outflows from Pipe Lake enter the City of Maple Valley to the east of the City of Covington. Outflows continue north to Jenkins Creek. The outflows from Pipe Lake enter Jenkins Creek west of Witte Road Southeast and south of Southeast 249th Place near the boundary between the City of Covington and the City of Maple Valley. Most of the parcels around Pipe Lake are privately-owned single-family residences. Public access to Pipe Lake is limited to privately-owned camps or tracts. The City does not own any parks or open spaces adjacent to Pipe Lake.

### 3.1.5 Land Cover

Land cover impacts the hydrologic response to a precipitation event in a variety of ways. Historically, much of Western Washington was covered with forests. In a forested condition, stormwater runoff, if any, from a precipitation event is limited. It is estimated that the trees in a mature forest can prevent up to 40 percent of precipitation from occurring as stormwater runoff. This is accomplished through several mechanisms, such as interception of water on the leaves, needles, and branches of trees which is subsequently evaporated, and through uptake of the water by the trees. The relatively thick layer of organic materials typically found on the floor of a mature forest can also provide a large volume for water storage. Water can also infiltrate into underlying soils as it travels along the roots that penetrate the underlying soils.

As the forest cover is removed, there is less opportunity for the land cover to manage the precipitation which in turn results in higher volumes and rates of stormwater runoff. For example, grass does not provide the evapotranspiration capacity of a mature forest. Also, impervious surfaces reduce the infiltration capacity of the soils because of compaction of soils during construction and because impervious surfaces block the vertical flow path of water through the soils.

Allowing for changes in land cover without providing adequate on-site mitigation results in higher demand for the City to implement stormwater CIPs to address problems adjacent to or downstream of developments or other projects with land cover changes.

Table 3-1 illustrates how land cover can change based on the zoning designation. Table 3-1 summarizes the zoning classifications within the City for Residential and Commercial zones and the maximum impervious cover. The actual amount of impervious cover would depend on any future changes to the zoning code and the proposed land use.

**Table 3-1. Summary of Zoning Classification and Maximum Impervious Cover**

Type of Zoning	Designation	Base Density (units per acre)	Maximum Density (units per acre)	Maximum Impervious Surface Percentage, except through an approved Conditional Use Permit
Residential	R-1, Urban Separator	1	1	30%
	R-4	4	6	55%
	R-6	6	9	70%
	R-8	8	12	75%
Commercial	CC	8	12	Not Applicable
	CN	8	12	85%
	I	Not Applicable	Not Applicable	90%

Notes: Data from Chapter 18.30 CMC.

### 3.2 WATER QUALITY

Water quality in surface waters within the City is discussed in the previous reports. Ecology maintains water quality data for waterbodies in Washington State. The data is compiled as part of the 303(d) listings as required under the CWA. Maps of waters monitored in the City and information from Ecology's website are included in Appendix D. Current water quality information from Ecology is summarized in Table 3-2.

**Table 3-2. Current Water Quality Data From Ecology**

Category	Description	Waterbodies	Parameters	Possible Sources	Possible Solutions
5	Polluted waters that require a TMDL.	Little Soos Creek, Big Soos Creek, Jenkins Creek.	Fecal Coliform, temperature.	Areas are not served by sewer systems. Fecal coliform could be associated with septic tank drainfields. For Big Soos Creek, domesticated animals are allowed near the stream, and the stream backs up into pasture areas.	Prohibit access to streams by domesticated animals. Restrict domesticated animals to fenced off-leash areas at parks; provide fenced areas as needed. Provide public education and outreach to inform citizens on water quality impacts from uncollected waste from domesticated animals. Confirm if there are permitted or unpermitted domesticated animal farms within the City in areas adjacent to streams; coordinate with property owners to make sure that farms are in conformance with the CMC. Sewer service agencies should review feasibility of extending sewer service.
4C	Is impaired by a non-pollutant.	Pipe Lake, Lake Lucerne.	Invasive exotic species: hydrilla and Eurasian water-milfoil.	Typically transported by boats that have been in other similarly impaired waterbodies.	Continue participating in King County's Regional Eurasian Milfoil Control Plan.
4B	Has a pollution control program.	None listed.	None listed.	Not applicable.	Not applicable.
4A	Has a TMDL.	None listed.	None listed.	Not applicable.	Not applicable.
2	Waters of concern.	Little Soos Creek, Big Soos Creek.	Dissolved oxygen, pH.	Low dissolved oxygen could be impacted by fecal coliform levels. pH could be impacted to nearby construction projects with discharges from uncured concrete surfaces.	See Category 5 for discussion regarding fecal coliform. Inspect construction sites to determine that TESC measures are implemented during concrete placement and curing.
1	Meets tested standards is for clean waters.	Little Soos Creek, Big Soos Creek, Jenkins Creek, Pipe Lake, Lake Lucerne.	pH, Ammonia-N, total phosphorus.	Not applicable.	Not applicable.

Based on Table 3-2, a Total Maximum Daily Load (TMDL) plan must be prepared for Little Soos Creek, Big Soos Creek, and Jenkins Creek for fecal coliform and temperature. However, a TMDL has not been prepared nor are these waterbodies currently identified as a high priority by Ecology for developing and implementing a TMDL. Typically, Ecology is the lead agency that prepares the TMDL. Additional monitoring may be performed as the TMDL is prepared to obtain current data to determine the problem severity and the possible sources. The City will need to be involved as the TMDL plan is developed. The City may want to discuss these waterbodies with Ecology to determine if there are changes the City could implement in the near future to improve water quality and avoid establishment of a TMDL.

The following Ecology website with water quality and TMDL information was in effect at the time this Plan Update was prepared:

- <http://www.ecy.wa.gov/programs/wq/303d/index.html>

## 4. STORMWATER CONVEYANCE SYSTEM

The City's existing stormwater conveyance system consists of several components such as curb inlets, catch basins, piping, open ditches, natural streams, wetlands, detention ponds, infiltration facilities and water quality ponds. Table 4-1 shows an inventory of the stormwater conveyance system as of 2007 based on information available through the City's website.

**Table 4-1. Storm Drainage System Inventory**

Type of Stormwater Facility	Quantity
Drainage structures, such as catch basins or manholes	2,114 each
Conveyance pipe, all diameters and all materials	34.7 miles
Roadside Curb and Gutter	66.1 miles
Open conveyance ditch, all sizes	15.4 miles
Public drainage facilities, such as flow control and/or water quality treatment BMPs	77 each

Areas of inadequate stormwater conveyance systems were identified from discussions with the City, site observations, and projects identified by the City to carry forward from the 2002 Plan.

Typical problems associated with conveyance systems or stormwater management BMPs include:

- Excessive vegetation in open channel systems or open detention, infiltration, or water quality treatment facilities. Excessive vegetation reduces the available conveyance or storage capacity, allows for damage to fences, allows for root growth to damage the structural integrity of retaining walls, and/or damage liners below water quality treatment facilities.
- Accumulated sediment or other debris at the entrance to or within enclosed systems. Accumulated sediment or debris can prevent stormwater from entering the conveyance system which would create bypass flow conditions. Uncontrolled bypass conditions can result in flooding, erosion, loss of treatment, or other problems. Accumulated sediment can also reduce the available conveyance or storage volume which can cause bypass conditions, overflows, or loss of treatment. Accumulated debris can also cause damage to downstream conveyance elements if the debris is conveyed through the system.
- Loss of habitat in salmon-bearing streams.
- Lack of a defined conveyance system for roadways that do not have curb, gutters, or ditches to collect and convey stormwater flows to an appropriate location. This can result in flooding, erosion, loss of treatment, or other problems.

Some of the problems associated with stormwater management BMPs include:

- Inadequate access for maintenance. Because some of the stormwater management BMPs were not historically maintained and/or because of adjacent development, the stormwater management BMPs are less able to be maintained now than after original construction. This has resulted in failure of the BMPs to provide the intended function and in the need for a new stormwater management BMP to be constructed.

- Inadequate access rights for the City. One stormwater management BMP did not have easements granted for access and maintenance. The adjacent property owners have filled in the existing treatment BMP. This has resulted in failure of the BMP to provide the intended function and in the need for a new stormwater management BMP to be constructed.
- Multiple factors. Even when stormwater management facilities have been designed and constructed according to local codes, drainage problems can still occur. For one facility in particular, the pond has downstream nuisance flooding problems. These problems may be due to multiple, compounding factors, such as an inadequate flow control standard at the time of project permitting, lack of adequate downstream conveyance capacity, insufficient hydraulic grade differential between the pond and the receiving water body, and changes in the flow regime of the receiving water body. This has resulted in the need to expand the existing pond to increase the storage capacity to potentially reduce the frequency of downstream nuisance flooding during smaller precipitation events.

In some locations, there are no existing stormwater management BMPs. For such areas, regional facilities are identified to provide flow control and water quality treatment. The design and construction of regional facilities are generally on a low priority due to cost and timing of adjacent development. Regional facilities may be reprioritized if nearby projects develop that would facilitate the need for and ability to construct the facility.

The CIPs included in Chapter 5 of this Plan Update identify the recommended projects to address these problem areas.

## 5. STRUCTURAL AND NON-STRUCTURAL PROJECTS

### 5.1 INTRODUCTION

As has been discussed in the preceding chapters of this Plan Update and in previous stormwater plans prepared for the City, management of stormwater and surface water is important for a variety of reasons. Problems associated with lack of stormwater and surface water management include flooding, erosion, habitat impacts, and water quality degradation. Further, the City is required to manage stormwater in accordance with the NPDES Phase II permit.

To address the problems identified in this Plan Update, the following projects are proposed. The projects have been categorized as Capital Improvement Projects or Operation and Maintenance (O&M) Improvements. The basis of these two categories and the projects included are discussed in further detail below.

This Plan Update identifies stormwater infrastructure projects to be carried forward and new projects based on needs identified by the City. Where detailed breakdown is available in previous documents, the project costs have been updated by applying current unit cost estimates. Where detailed breakdown is not available in previous reports, a cost index factor was applied to account for cost increases since the previous reports were prepared.

The locations and priority of the CIP and O&M improvement projects are shown in Figure 5-1. The implementation schedule with summary of costs can be found in Appendix E. The cost opinions can be found in Appendix F.

### 5.2 CAPITAL IMPROVEMENT PROJECTS

CIPs include design and construction of the following types of projects:

- Reconfiguring existing ponds to function as bioretention facilities. These projects include removal of existing vegetation, soil, and liners; installing compost-amended soils; and revegetation of the facilities. These types of projects are located in areas likely to have suitable infiltration rates based on soil mapping in the 2002 plan.
- Construction of slope stabilization measures along City-owned facilities to protect slopes and adjacent properties from potential damage due to groundwater seepage.
- Replacement of existing treatment BMPs with new BMPs. The opinions of probable construction costs for these types of projects include the use of Contech Stormwater Solutions StormFilter® systems, new drainage structures, and bypass piping.
- Replacement of existing major stormwater components, such as control structures and inlet pipes, damaged by tree growth.
- Addition of overflow structures where existing structures have been damaged or blocked on a frequent basis due to debris accumulation.
- Replacement of existing major stormwater components damaged by debris conveyed through the system.
- Restoration of stream channels.
- Expansion of existing stormwater management ponds to increase treatment and/or flow control capacity.

- Construction of conveyance systems in areas that lack an adequately defined conveyance system.
- Conveyance channel improvements.
- Regional flow control facilities.

Depending on the type of project, the following elements may also be needed during design of the CIPs:

- Field investigation, such as television inspection, of existing enclosed stormwater piping systems;
- Topographical survey and mapping;
- Acquisition of temporary construction and/or permanent easements;
- Geotechnical investigation to determine groundwater elevations and/or infiltration rates;
- Permitting; and/or
- Detailed hydrologic/hydraulic analyses.

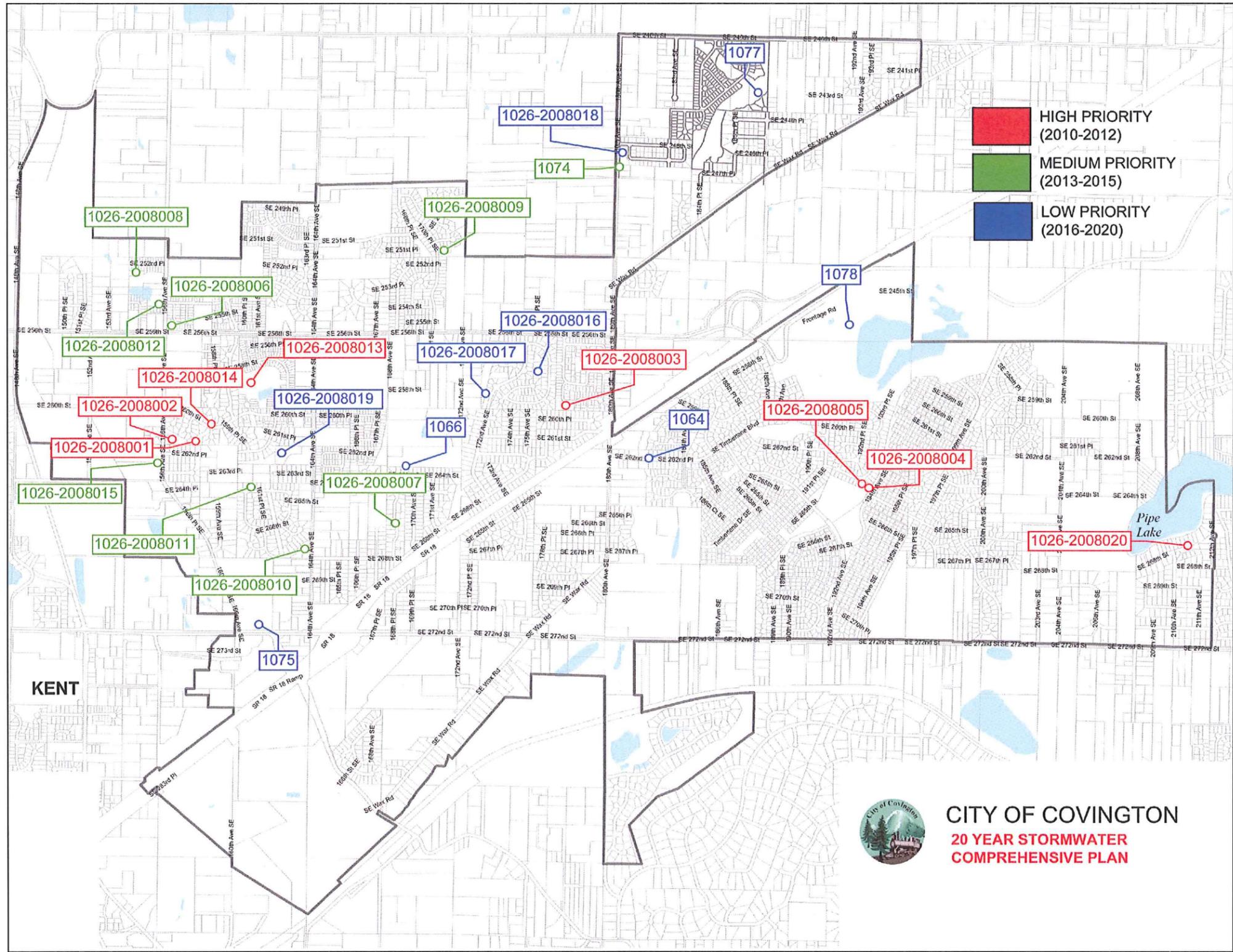
CIPs and their prioritization are identified in Table 5-1 (on page 5-5). The opinions of probable construction cost reflect the costs in 2009 and the projected cost at the time of construction. The implementation schedule and summary of costs are included in Appendix E. A breakdown of the opinion of probable construction cost for each CIP is included in Appendix F.

### **5.3 OPERATION AND MAINTENANCE IMPROVEMENTS PROJECTS**

O&M Improvement Projects include the following types of projects:

- Restoration of existing ditches to original design cross sections. These projects include removal of existing vegetation, and accumulated soil and revegetation.
- Restoration of existing ponds to original design cross sections. These projects include removal of existing vegetation, soil, and liners; replacement of the failed liner; installing topsoil; and revegetation of disturbed areas.
- Grouting the inside of drainage structures that were not grouted at the time of construction.
- Cleaning out existing storm drain pipes and/or drainage structures.
- Removal of vegetation. For some facilities, tree sizes have become substantially greater than typically associated with normal vegetation removal from stormwater facilities.
- Replacement of damaged fencing.

Operation and Maintenance Improvement Projects and their prioritization are identified in Table 5-2 (on page 5-6). The opinions of probable construction cost reflect the costs in 2009 and the projected cost at the time of construction. The implementation schedule and summary of costs are included in Appendix E. A breakdown of the opinion of probable construction cost for each CIP is included in Appendix F.



CIP #	Project Description
1026-2008001	DP11048 Channing Park Div1
1026-2008002	DP11048 Channing Park Div1 Phase II
1026-2008003	DP21060 Woodcreek-TO BE COMPLETED IN 2009
1026-2008004	DP41036 The Woodlands
1026-2008005	DP41036 The Woodlands Phase II
1026-2008006	DP11069 Prestige Park II
1026-2008007	DP11024 Green Valley Park
1026-2008008	DP11066 Abbotsford/Cornerstone
1026-2008009	DP11010 Emerald Downs
1026-2008010	DT11045 Pioneer Ridge/High Point
1026-2008011	DT11044 Pioneer Ridge/High Point
1026-2008012	DP11073 Allyssa Lane
1026-2008013	DP11083 The Reserve
1026-2008014	DP11050 Fairfield Pond
1026-2008015	CS11070 Terrace Park
1026-2008016	DP21054 Foxwood Div 2
1026-2008017	DP21055 Foxwood
1026-2008018	DP21065 Parke Meadows
1026-2008019	DP11077 KFC pond
1026-2008020	CS41094 Autumn Bay
1064	SE 262nd Place Storm Drainage Improvement Study
1066	Little Soos Creek Channel Widening at SE 264th Ave SE
1074	180th Ave SE Regional Conveyance Study, SE 240th St. to SE 248th St.
1075	Calhoun Park Regional Pond Project
1077	Jenkins Creek North Regional Detention Pond
1078	Lakeside Regional Detention Pond



**CITY OF COVINGTON**  
**20 YEAR STORMWATER**  
**COMPREHENSIVE PLAN**

Parametrix DATE: Dec 17, 2009 FILE: 2163986004Fig5-1



THIS MAP IS FOR PLANNING PURPOSES ONLY AND IS NOT GUARANTEED TO SHOW ACCURATE MEASUREMENTS.

**Figure 5-1**  
**20 Year Stormwater**  
**Comprehensive Plan**

Table 5-1. Summary of Capital Improvement Projects

Project No. – Description	Priority	Funding Source	Cost Estimate Year 2009 (\$)	Year of Completion						Cost at Completion	
				High Priority <sup>a</sup>			Medium Priority <sup>a</sup>				Low Priority <sup>a</sup>
				2010	2011	2012	2013	2014	2015		2016 to 2029 <sup>b</sup>
Seattle ENR Construction Cost Index – Calculated CCI Values:			9075	9272	9468	9665	9862	10059	10255	11730	
<b>CAPITAL IMPROVEMENT PROJECTS</b>											
1026 - 2008003	DP21060 Woodcreek - COMPLETED IN 2009										Completed 2009
1026 - 2008004	DP41036 The Woodlands - Phase I	4	\$1,230,000		\$1,283,000						\$1,283,000
1026 - 2008010	DT11045 Pioneer Ridge/High Point	10	\$496,000				\$539,000				\$539,000
1026 - 2008013	DP11083 The Reserve	6	\$184,000	\$188,000							\$188,000
1026 - 2008014	DP11050 Fairfield Pond	7	\$167,000		\$174,000						\$174,000
1026 - 2008015	CS11070 Terrace Park	16	\$217,000							\$280,000	\$280,000
1026 - 2008016	DP21054 Foxwood Div 2	18	\$727,000							\$940,000	\$940,000
1026 - 2008018	DP21065 Parke Meadows	20	\$286,000							\$370,000	\$370,000
1026 - 2008020	CS41094 Autumn Bay	8	\$1,238,000			\$1,318,000					\$1,318,000
1074	180th Ave. SE Drainage Improvements, SE 240th St. to SE 248th St.	17	\$873,000						\$987,000		\$987,000
1066	Little Soos Creek Channel Widening at SE 264th Avenue SE	22	\$394,000							\$509,000	\$509,000
1077	Jenkins Creek North Regional Detention Pond	23	\$2,610,000							\$3,374,000	\$3,374,000
1064	SE 262nd Place Storm Drainage Improvement Study	24	\$85,000			\$91,000					\$91,000
1075	Calhoun Park Regional Pond Project	25	\$3,080,000							\$3,981,000	\$3,981,000
1078	Lakeside Regional Detention Pond	26	\$1,886,000							\$2,438,000	\$2,438,000
<b>Subtotal, Capital Improvement Projects:</b>			<b>\$13,473,000</b>	<b>\$188,000</b>	<b>\$1,457,000</b>	<b>\$1,409,000</b>	<b>\$539,000</b>	<b>\$0</b>	<b>\$987,000</b>	<b>\$11,982,000</b>	<b>\$16,472,000</b>

Notes:

<sup>a</sup> Project Prioritization: High Completed Within 0 to 3 years  
Medium Completed Within 4 to 6 years  
Low Completed Within 7 to 20 years

<sup>b</sup> Inflation for 2016–2019 based on: cost factor for year 2015 \* [1.0225 \* ((2029-2016)/2)]

Table 5-2. Summary of Operation and Maintenance Improvement Projects

Project No. – Description	Priority	Funding Source	Cost Estimate Year 2009 (\$)	Year of Completion						Cost at Completion	
				High Priority <sup>a</sup>			Medium Priority <sup>a</sup>				Low Priority <sup>a</sup>
				2010	2011	2012	2013	2014	2015		2016 to 2029 <sup>b</sup>
Seattle ENR Construction Cost Index – Calculated CCI Values:			9075	9272	9468	9665	9862	10059	10255	11730	
<b>O&amp;M IMPROVEMENTS</b>											
1026 - 2008001	DP11048 Channing Park Div1 - Phase I	1	\$85,000	\$87,000							\$87,000
1026 - 2008002	DP11048 Channing Park Div1 Phase II	2	\$652,000	\$666,000							\$666,000
1026 - 2008005	DP41036 The Woodlands Phase II	5	\$147,000		\$153,000						\$153,000
1026 - 2008006	DP11069 Prestige Park II	9	\$248,000			\$269,000					\$269,000
1026 - 2008007	DP11024 Green Valley Park	11	\$380,000			\$413,000					\$413,000
1026 - 2008008	DP11066 Abbotsford/Cornerstone	12	\$384,000				\$426,000				\$426,000
1026 - 2008009	DP11010 Emerald Downs	13	\$366,000				\$406,000				\$406,000
1026 - 2008011	DT11044 Pioneer Ridge/High Point	14	\$315,000				\$349,000				\$349,000
1026 - 2008012	DP11073 Allyssa Lane	15	\$52,000					\$59,000			\$59,000
1026 - 2008017	DP21055 Foxwood	19	\$217,000							\$280,000	\$280,000
1026 - 2008019	DP11077 KFC pond	21	\$389,000					\$440,000			\$440,000
<b>Subtotal, O&amp;M Improvements:</b>			<b>\$3,235,000</b>	<b>\$753,000</b>	<b>\$153,000</b>	<b>\$0</b>	<b>\$682,000</b>	<b>\$1,181,000</b>	<b>\$499,000</b>	<b>\$280,000</b>	<b>\$3,548,000</b>

Notes:

<sup>a</sup> Project Prioritization: High Completed Within 0 to 3 years  
Medium Completed Within 4 to 6 years  
Low Completed Within 7 to 20 years

<sup>b</sup> Inflation for 2016–2019 based on: cost factor for year 2015 \* [1.0225 \* ((2029-2016)/2)]

## 5.4 COST OPINIONS

The cost opinions were prepared based on the following:

- The surface area for stormwater management facilities that are planned to be excavated and restored to original design or that will be changed to function as a bioinfiltration facility was set to match the parcel area where such information was available through the King County GIS website. If the parcel area was not documented, the area was estimated based on scaled plots from the King County GIS website.
- The depth of excavation for restoring a pond or changing a pond to function as a bioretention facility was assumed to be 18 inches.
- For typical items, such as excavation, drainage structures, or drainage pipe, unit costs were based on standard bid items listed in the Washington State Department of Transportation bid results website.
- For items that are not standard WSDOT bid items, the unit prices were based on cost information provided by manufacturers.
- Mobilization, traffic control, trench safety, and erosion/sedimentation control were based on percentages of construction cost as identified in Appendix F.

## 5.5 PRIORITIZATION

The CIPs and O&M Improvements Projects have been prioritized based on a 20-year projection. Prioritization has been established based on coordination with City staff, problem severity, cost, adjacent problem areas, and the following:

- Level of Risk. Projects that replace failed conveyance system components, such as broken pipes, damaged control structures, or inadequately functioning facilities generally have a higher ranking. There is a higher risk to the public and to property damage if these types of projects are not completed in a timely manner. Regional flow control or water quality treatment facilities are generally the lowest priority because stormwater impacts can be mitigated as part of a site specific project.
- Project location. Some drainage systems have multiple problem areas with projects identified in the upper, middle, and lower reaches of the system. Projects in the upper reaches, if constructed, may eliminate problems in the middle or downstream reaches. Consequently, projects that are in the upper reaches of a system with multiple problems generally are ranked with a higher prioritization. This will allow the City to track drainage problems and complaints in the middle and lower reaches to confirm the need to complete the remaining projects.
- Size of project. Projects have been ranked as small or large depending on the construction cost. Generally, small projects include projects with a construction cost of up to \$300,000. Small projects can be constructed by contractors through the City's roster if desired. Although it may be desirable to place a higher priority on small projects due to lower cost, small projects are not necessarily ranked higher just because of cost. Some large projects have a higher priority than small projects due to the risk and/or location of the large project.

Projects have been grouped based on potential level of risk, location, and size to develop an approximate annual cost. Generally, the project groupings and prioritization result in an annual cost of \$1.2M to \$1.7M. This includes both CIPs and O&M Improvements Projects.

These costs do not include other stormwater program elements of the City, such as NPDES Phase II Permit compliance, permit plan review, typical maintenance costs, program administration, or other stormwater program costs.

## 5.6 REGIONAL TREATMENT/DETENTION/INFILTRATION FACILITIES

Through previous plans, the City pursued the integration of open space, recreational opportunities, and environmental protection through the use of regional drainage conveyance, detention, treatment, and infiltration facilities. Regional systems are those that would be able to serve more than one plat development or public works project. Regional facilities may provide cost savings both in terms of capital costs and maintenance costs. Regional facilities may also provide an opportunity for partnership between the City and the development community, and the development of facilities that provide ancillary benefits such as recreational opportunities. In previous plans, the City integrated regional facilities into the Land Use Element and the Parks, Trails and Open Space Element of the Comprehensive Plan. The Land Use Element included policies to encourage development mitigation measures that serve several purposes, such as drainage control, groundwater recharge, stream protection, open space, cultural and historic resource protection, and landscaping. The Parks, Trails, and Open Space Element included policy to retain as open space those areas having a unique combination of open space values, including, among other things, aquifer recharge areas, floodwater or stormwater storage, and stormwater treatment.

Factors that will influence the exact location of potential regional stormwater management facilities are:

- Suitability to meet City needs, NPDES Phase II Permit requirements, and availability of O&M staff;
- Does not present undue risk on City for water quality violations – many agencies require development to provide separate water quality treatment and allowing regional facilities to function only as flow control facilities;
- Land availability;
- Topography – regional systems should be located so that stormwater pump systems are not needed; and
- Timing and location of development – it is difficult for agencies to take on the responsibility for leading a regional facility effort ahead of development because of funding the agency must have and financial risks if the development does not proceed. Consequently, regional facilities are typically not provided except in highly urbanized areas where it is highly likely that development will occur and a regional facility results in more land availability and less development cost on individual lots.

Previously identified regional facilities include CIP 1075, 1077, and 1078. The locations of these CIPs are shown on Figure 5-1.

For this Plan Update, there was one specific area that was reviewed to determine if a regional facility would be a reasonable solution to assist with stormwater management. This regional facility would be in addition to the regional facilities identified in previous plans. The regional facility was considered because of flooding and erosion problems that occur on Little Soos Creek downstream of Kentwood High School and south of SE 256th Street. Potential causes for the flooding and erosion problems could include an insufficient flow control standard and encroachment into the floodplain. Parametrix reviewed several sites to determine if such sites would be reasonable locations for a regional flow control facility. However, it was determined that none of the sites would be a suitable location for a regional

flow control facility to address the existing flooding and erosion problems. The existing flooding and erosion problems may be alleviated somewhat in the future as sites develop or redevelop since the City has adopted the Ecology Manual with a more stringent flow control standard, and as FEMA implements floodplain management changes associated with the NOAA NMFS BiOp. See Appendix G for further information regarding a regional facility for this portion of Little Soos Creek.

As part of the field review for this regional flow control facility, pebble counts were taken for Little Soos Creek and data to approximate the stream geometry. This field information was obtained to determine the potential for ongoing stream bank erosion and to identify level of flow control and stream velocities to be considered in future analyses and design of a regional facility. However, these parameters were not evaluated because a regional flow control facility is not recommended. The field information is included in Appendix G.

**APPENDIX A**

**Letter from USEPA Regarding UIC Wells**



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

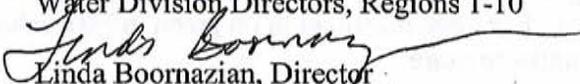
JUN 13 2008

OFFICE OF  
WATER

MEMORANDUM

**SUBJECT:** Clarification on which stormwater infiltration practices/technologies have the potential to be regulated as "Class V" wells by the Underground Injection Control Program

**TO:** Water Division Directors, Regions 1-10

**FROM:**   
Linda Boornazian, Director  
Water Permits Division (MC 4203M)

  
Steve Heate, Director  
Drinking Water Protection Division (MC 4606M)

Over the past several years stormwater infiltration has become an increasingly effective tool in the management of stormwater runoff. Although primary stormwater management responsibilities within EPA fall under the Clean Water Act (CWA), the infiltration of stormwater is, in some cases, regulated under the Safe Drinking Water Act (SDWA) with the goal of protecting underground sources of drinking water (USDWs). Surface and ground water protection requires effective integration between the overlapping programs. This memorandum is a step forward in that effort and is meant to provide clarification on stormwater implementation and green infrastructure, in particular under the CWA, which is consistent with the requirements of the SDWA's Underground Injection Control (UIC) Program.

In April 2007, EPA entered into a collaborative partnership with four national groups (the Association of State and Interstate Water Pollution Control Administrators, the Low Impact Development Center, the National Association of Clean Water Agencies, and the Natural Resources Defense Council) to promote green infrastructure as a cost-effective, sustainable, and environmentally friendly approach to stormwater management. The primary goals of this collaborative effort are to reduce runoff volumes and sewer overflow events through the use of green infrastructure wet weather management practices.

Within the context of this collaborative partnership, green infrastructure includes a suite of management practices that use soils and vegetation for infiltration, treatment, and evapotranspiration of stormwater. Rain gardens, vegetated swales, riparian buffers and porous pavements are all common examples of green infrastructure techniques that capture and treat stormwater runoff close to its source. Green infrastructure management practices typically do not include commercially manufactured or proprietary infiltration

devices or other infiltration practices such as simple drywells, which do not provide for pre-treatment prior to infiltration.

The partnership is promoting green infrastructure as an effective approach to stormwater management because these practices are associated with a number of environmental benefits. In addition to reducing and delaying runoff volumes, green infrastructure approaches can also reduce pollutant levels in stormwater, enhance ground water recharge, protect surface water from stormwater runoff, increase carbon sequestration, mitigate urban heat islands, and increase wildlife habitat.

Given the multiple benefits that green infrastructure can provide, EPA and its partners have increased efforts to incorporate green infrastructure techniques into stormwater management strategies nationwide. In recent years, public support for these practices has gradually increased. For more information on green infrastructure, please visit [www.epa.gov/npdes/greeninfrastructure](http://www.epa.gov/npdes/greeninfrastructure).

There are cases where stormwater infiltration practices are regulated as Class V wells under the UIC program, and State and local stormwater managers report that some developers are hesitant to incorporate green infrastructure practices because they fear regulatory approvals will slow the process and increase costs. EPA believes those fears are unfounded and notes that most green infrastructure practices do not meet the Class V well definition and can be installed without regulatory oversight by the UIC Program. However, EPA remains committed to the protection of USDWs and emphasizes the need for UIC program compliance (per 40 CFR 144).

To provide clarification on which stormwater infiltration techniques meet EPA's UIC Class V well definition, EPA's Office of Water has developed the attached "Class V Well Identification Guide." State or Regional stormwater and nonpoint source control programs, developers, and other interested parties are requested to contact the State or Regional UIC Program Director with primary authority for the UIC Class V program when considering the use of practices that have been identified, or potentially identified, as Class V wells. UIC program managers should consider the proximity to sensitive ground water areas when looking at the suitability of stormwater infiltration practices. Depending on local conditions, infiltration without pretreatment may not be appropriate in areas where ground waters are a source of drinking water or other areas identified by federal, state, or local governments as sensitive ground water areas, such as aquifers overlain with thin, porous soils.

Please share this memo and the attached guide with your State and Regional stormwater, nonpoint source control, UIC and other ground water managers, as well as with appropriate green infrastructure contacts. These programs are encouraged to coordinate on stormwater management efforts when sensitive ground water issues arise.

Attachment

## Underground Injection Control (UIC) Program Class V Well Identification Guide

This reference guide can be used to determine which stormwater infiltration practices/technologies have the potential to be regulated as "Class V" wells. Class V wells are wells that are not included in Classes I through IV. Typically, Class V wells are shallow wells used to place a variety of fluids directly below the land surface. By definition, a well is "any bored, drilled, driven shaft, or dug hole that is deeper than its widest surface dimension, or an improved sinkhole, or a subsurface fluid distribution system" and an "injection well" is a "well" into which "fluids" are being injected (40 CFR §144.3). Federal regulations (40 CFR §144.83) require all owners/operators of Class V wells to submit information to the appropriate regulatory authorities including the following:

1. Facility name and location
2. Name and address of legal contact
3. Ownership of property
4. Nature and type of injection well(s)
5. Operating status of injection well(s)

For more information on Class V well requirements, please visit [http://www.epa.gov/safewater/uic/class5/comply\\_minrequirements.html](http://www.epa.gov/safewater/uic/class5/comply_minrequirements.html). For more information on green infrastructure, please visit <http://www.epa.gov/npdes/greeninfrastructure>.

The stormwater infiltration practices/technologies in rows A through I below are generally not considered to be wells as defined in 40 CFR §144.3 because typically they are not subsurface fluid distribution systems or holes deeper than their widest surface dimensions. If these practices/technologies are designed in an atypical manner to include subsurface fluid distribution systems and/or holes deeper than their widest surface dimensions, then they may be subject to the Class V UIC regulations. The stormwater infiltration practices/technologies in rows J through K however, depending upon their design and construction probably would be subject to UIC regulations.

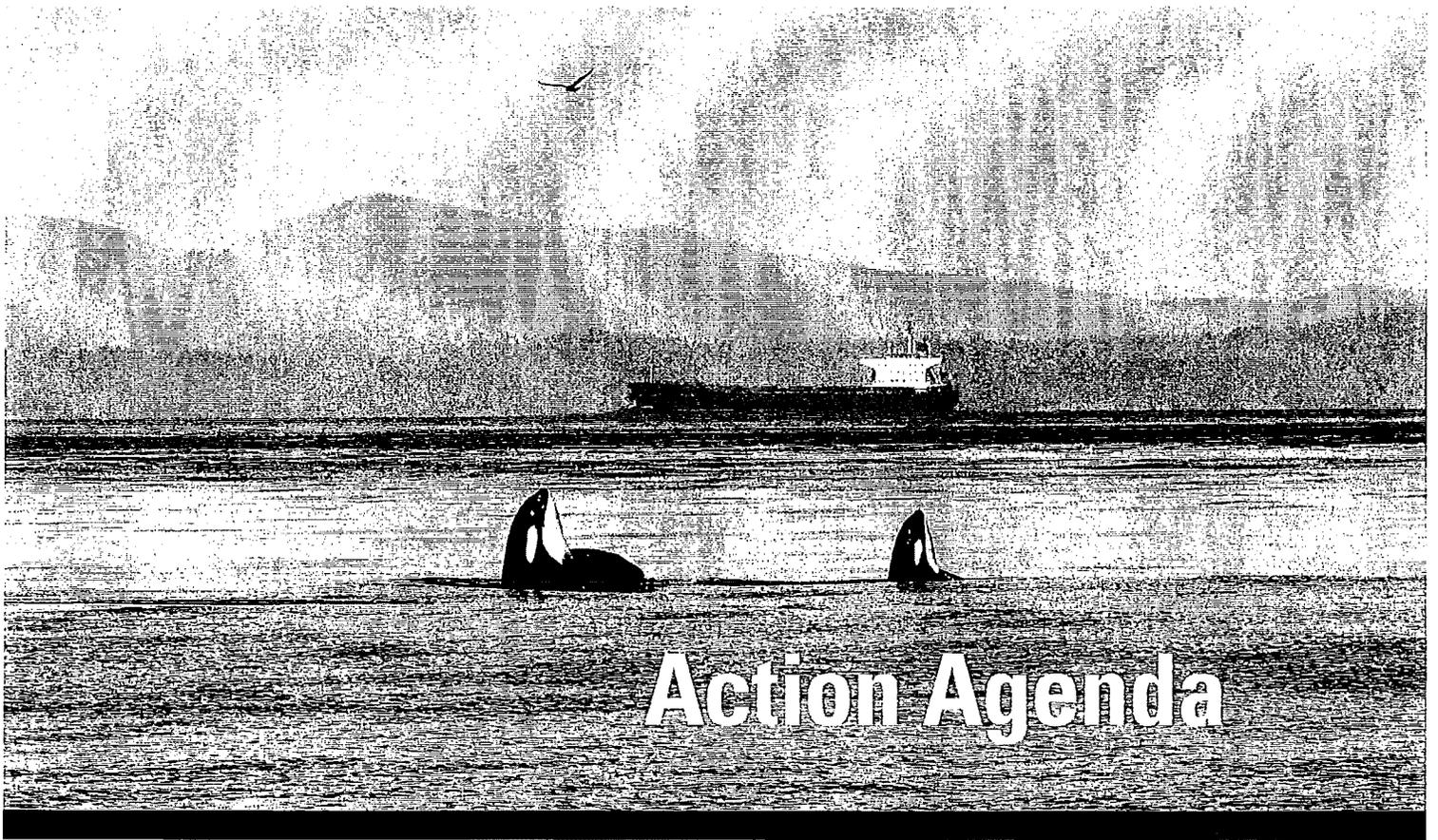
	<b>Infiltration Practice/Technology</b>	<b>Description</b>	<b>Is this Practice/Technology Generally Considered a Class V Well?</b>
A	Rain Gardens & Bioretention Areas	Rain gardens and bioretention areas are landscaping features adapted to provide on-site infiltration and treatment of stormwater runoff using soils and vegetation. They are commonly located within small pockets of residential land where surface runoff is directed into shallow, landscaped depressions; or in landscaped areas around buildings; or, in more urbanized settings, to parking lot islands and green street applications.	No.
B	Vegetated Swales	Swales (e.g., grassed channels, dry swales, wet swales, or bioswales) are vegetated, open-channel management practices designed specifically to treat and attenuate stormwater runoff. As stormwater runoff flows along these channels, vegetation slows the water to allow sedimentation, filtering through a subsoil matrix, and/or infiltration into the underlying soils.	No.
C	Pocket Wetlands & Stormwater Wetlands	Pocket/Stormwater wetlands are structural practices similar to wet ponds that incorporate wetland plants into the design. As stormwater runoff flows through the wetland, pollutant removal is achieved through settling and biological uptake. Several design variations of the stormwater wetland exist, each design differing in the relative amounts of shallow and deep water, and dry storage above the wetland.	No.
D	Vegetated Landscaping	Self-Explanatory.	No.
E	Vegetated Buffers	Vegetated buffers are areas of natural or established vegetation maintained to protect the water quality of neighboring areas. Buffer zones slow stormwater runoff, provide an area where runoff can infiltrate the soil, contribute to ground water recharge, and filter sediment. Slowing runoff also helps to prevent soil and stream bank erosion.	No

	<b>Infiltration Practice/Technology</b>	<b>Description</b>	<b>Is this Practice/Technology Generally Considered a Class V Well?</b>
F	Tree Boxes & Planter Boxes	Tree boxes and planter boxes are generally found in the right-of-ways alongside city streets. These areas provide permeable areas where stormwater can infiltrate. The sizes of these boxes can vary considerably.	No.
G	Permeable Pavement	Permeable pavement is a porous or pervious pavement surface, often built with an underlying stone reservoir that temporarily stores surface runoff before it infiltrates into the subsoil. Permeable pavement is an environmentally preferable alternative to traditional pavement that allows stormwater to infiltrate into the subsoil. There are various types of permeable surfaces, including permeable asphalt, permeable concrete and even grass or permeable pavers.	No.
H	Reforestation	Reforestation can be used throughout a community to reestablish forested cover on a cleared site, establish a forested buffer to filter pollutants and reduce flood hazards along stream corridors, provide shade and improve aesthetics in neighborhoods or parks, and improve the appearance and pedestrian comfort along roadsides and in parking lots.	No.
I	Downspout Disconnection	A practice where downspouts are redirected from sewer inlets to permeable surfaces where runoff can infiltrate.	In certain circumstances, for example, when downspout runoff is directed towards vegetated/pervious areas or is captured in cisterns or rain-barrels for reuse, these practices generally would not be considered Class V wells.
J	Infiltration Trenches	An infiltration trench is a rock-filled trench designed to receive and infiltrate stormwater runoff. Runoff may or may not pass through one or more pretreatment measures, such as a swale, prior to entering the trench. Within the trench, runoff is stored in the void space between the stones and gradually infiltrates into the soil matrix. There are a number of different design variations.	In certain circumstances, for example, if an infiltration trench is "deeper than its widest surface dimension," or includes an assemblage of perforated pipes, drain tiles, or other similar mechanisms intended to distribute fluids below the surface of the ground, it would probably be considered a Class V injection well.

	<b>Infiltration Practice/Technology</b>	<b>Description</b>	<b>Is this Practice/Technology Generally Considered a Class V Well?</b>
K	Commercially Manufactured Stormwater Infiltration Devices	Includes a variety of pre-cast or pre-built proprietary subsurface detention vaults, chambers or other devices designed to capture and infiltrate stormwater runoff.	These devices are generally considered Class V wells since their designs often meet the Class V definition of subsurface fluid distribution system.
L	Drywells, Seepage Pits, Improved Sinkholes.	Includes any bored, drilled, driven, or dug shaft or naturally occurring hole where stormwater is infiltrated.	These devices are generally considered Class V wells if stormwater is directed to any bored, drilled, driven shaft, or dug hole that is deeper than its widest surface dimension, or has a subsurface fluid distribution system.

**APPENDIX B**

**Excerpt from Puget Sound  
Partnership Action Agenda**



# Action Agenda

*The Puget Sound Action Agenda is a strategy for cleaning up,  
restoring, and protecting Puget Sound by 2020*

**PugetSoundPartnership**  
our sound, our community, our chance

passed, seek and support one-year funding for fiscal year 2010 and pursue a dedicated state funding option.

4. Obtain delegated authority from the Coast Guard to expand and enhance the scope of authority of the Department of Ecology's vessel and facility inspections, marine incident investigations, and the agency's ability to augment Coast Guard prevention activities and review spill prevention and response plans on behalf of the Coast Guard. Delegated authority will streamline and strengthen spill prevention plans and operations manuals required by both agencies as well as stronger state enforcement.
5. Petition EPA to establish Puget Sound as a No Discharge Zone for commercial and/or recreational vessels to eliminate bacteria, nutrients, and pathogens from being discharged into Puget Sound. Prioritize areas of the Sound that have nutrient and/or pathogen problems, have high vessel use, are significant for shellfish production, and/or that are otherwise especially vulnerable.
6. Implement existing air management plans consistent with the Action Agenda.
7. Implement Shellfish Protection District plans, on-site sewage treatment plans in marine recovery areas, and related projects to restore water quality at tribal, commercial, and recreational shellfish areas that are degraded or threatened.
8. Implement immediate remediation actions to address Hood Canal's low dissolved oxygen concentrations through the Hood Canal Dissolved Oxygen Program.
9. Implement priority strategies and actions to address low dissolved oxygen in South Sound, targeted areas in the Whidbey Basin, and other vulnerable areas. This includes the Ecology-led South Sound Dissolved Oxygen Study.

**C.2 Use a comprehensive, integrated approach to managing urban stormwater and rural surface water runoff to reduce stormwater volumes and pollutant loadings.**

Surface water and stormwater runoff in urban and rural areas are the primary transporters of toxic, nutrient, and pathogen pollutants to surface and groundwater resources throughout the Puget Sound basin. Comprehensive approaches to reduce stormwater runoff volumes and pollutant loadings differ in urban and rural areas, but include maintaining and restoring natural hydrologic systems of forests and wetlands for infiltration, and managing surface water closer to its source when possible. The region needs to better implement the current programs and regulations now, as well as strengthen efforts moving forward. This work is particularly important as stormwater flows will likely become larger and more frequent with climate change.

*C.2.1 Integrate efforts to manage stormwater discharges with work to protect land cover and reduce pollutants at the watershed scale and across Puget Sound.* This means implementing the land use protection and restoration actions described in Priorities A, B, and D, as well as the loadings reduction strategy in C.1.

C.2.1.1 Integrate stormwater management efforts into integrated watershed planning. This would include actions identified in Sections A and D, as well as Watershed Management Plans and Water Quality Improvement Plans.

C.2.1.2 Investigate, and if appropriate and feasible, establish watershed-scale stormwater permits through Section 208 of the Clean Water Act. Focus permits on the multitude of discharges that occur in logical geographic areas, rather than discharge-specific inputs or jurisdictional boundaries.

- C.2.1.3 Establish priorities and resource needs for creating a coordinated water quality monitoring program under National Pollutant Discharge Elimination System (NPDES). This program would need to be coordinated with the overall regional monitoring program identified in E.3.
- C.2.2 *Manage stormwater runoff in urban and urbanizing areas to reduce stormwater related impacts.*
  - C.2.2.1 Implement the municipal stormwater NPDES Phase I and II permits so that the discharges from municipal stormwater systems are reduced. Achieve overall water quality standards. Provide financial and technical assistance to permitted cities and counties.
  - C.2.2.2 Implement other NPDES permits including those for industrial discharges and the Washington State Department of Transportation.
  - C.2.2.3 Improve stormwater management in communities not currently covered by NPDES permits by providing financial and technical assistance to local governments to create local comprehensive stormwater control programs. Investigate expansion of NPDES permit coverage to include additional jurisdictions with municipal separated storm sewer systems (MS4). Initiate work in areas with documented stormwater-related problems and intact resources that are threatened by surface runoff.
  - C.2.2.4 Provide cities and counties with comprehensive guidance and standards regarding LID practices to incorporate into stormwater codes for development and redevelopment. Assist local governments with revisions to regulations so that all jurisdictions in Puget Sound require the use of LID where feasible, as soon as possible.
  - C.2.2.5 Advance the use of LID approaches to stormwater management. This includes, but is not limited to: a) resolve institutional barriers that limit use of LID for new development and redevelopment and road construction, including an update of stormwater flow control standards; b) implement, assess, and promote successful examples of LID techniques; c) develop incentives for using LID; d) develop focused training for contractors and developers and other stormwater professionals; and e) develop focused training for local government staff on areas best suited for LID and assist them in revising their regulations to allow LID.
  - C.2.2.6 Evaluate the technical and programmatic solutions for Combined Sewer Overflows (CSOs) in the context of improving water quality in fresh and marine water and preserving and recovering the health of Puget Sound. Continue efforts to eliminate discharge of raw sewage.
  - C.2.2.7 Prioritize and implement stormwater retrofits in urbanized areas, including roads. In the near term, develop high-level prioritization criteria for the selection of new projects. Over the long term, link retrofit priorities to coordinated watershed restoration and pollution prevention strategies.
  - C.2.2.8 Improve future, new, and updated NPDES permits by requiring sub-basin planning to better identify specific actions for water bodies, improving collaboration of effort for shared water bodies, incorporating climate change

projections related to stormwater runoff volumes, and meeting other requirements that will need to be identified.

**C.2.3 *Manage surface water runoff in rural areas and on working resource lands to reduce pollutant loadings.***

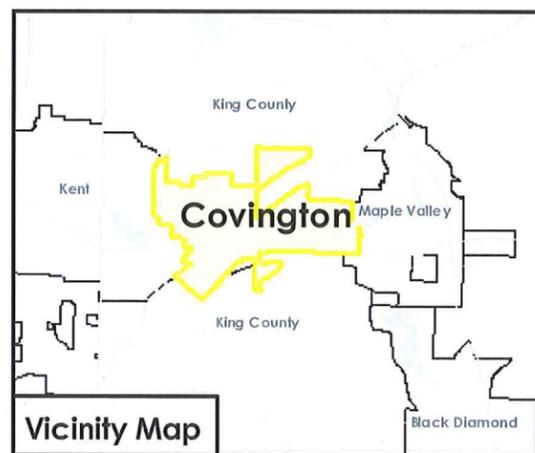
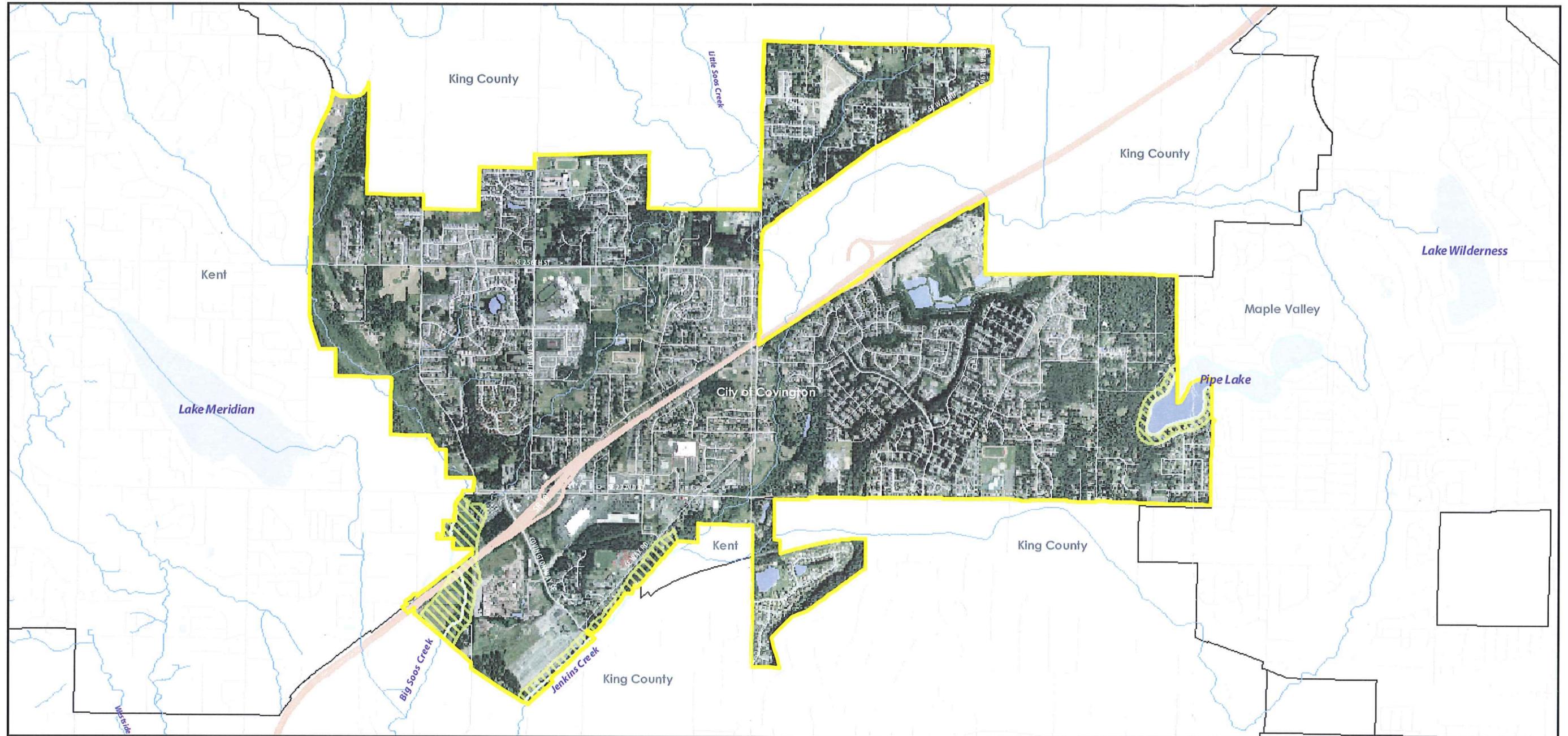
- C.2.3.1 Implement the Forest and Fish agreement, including road maintenance and abandonment plans on public and privately held working forests.
- C.2.3.2 Fund and implement voluntary incentive, stewardship and technical assistance programs for rural unincorporated landowners, hobby farms, working farms, and nurseries.
- C.2.3.3 Implement and ensure compliance with Concentrated Animal Feeding Operations permits.

**C.2 *Near-term Actions***

1. Establish a regional coordinated monitoring program for stormwater, working with the Monitoring Consortium of the Stormwater Work Group (see E.3).
2. Provide financial and technical assistance to cities and counties to implement NPDES Phase I and II permits, as well as Ecology for permit oversight and implementation.
3. Assist cities and counties in incorporating LID requirements for development and redevelopment into all stormwater codes.
4. Develop and implement LID incentives. Work with regional experts to develop and implement incentives and remove barriers to the use of low impact stormwater management techniques on development projects.
5. Convene a group of regulating agencies, implementers with key funding responsibilities, and other stakeholders as appropriate to evaluate the technical and programmatic solutions for CSOs to meet overall program goals of improving water quality in fresh and marine water. The integration of CSO solutions into the larger range of solutions to stormwater and other water quality problems may improve cost effectiveness of both programs in urban areas, notably Seattle and King County. This will require flexibility in implementation, timing, and scope of municipal wastewater NPDES program as applied to CSOs.
6. Retrofit existing stormwater systems by: a) developing high-level criteria that can be used in 2009 to determine the highest priority areas around the Sound for stormwater retrofits; and b) implementing stormwater retrofit projects in the highest priority areas based upon these criteria to bring areas into compliance with current stormwater regulations. Retrofits should include low impact stormwater management techniques to the greatest extent feasible. Monitor effectiveness of the techniques.
7. Continue to implement road maintenance and abandonment programs for federal, state (including trustlands), and private timber lands.
8. Implement private property stewardship, incentive, and technical assistance programs (e.g. Conservation Districts, WSU Extension, Washington Sea Grant, local government programs) that focus on reducing sources of water pollution, from commercial and non-commercial farms and other nonpoint pollution sources, particularly in priority areas.
9. Implement NPDES industrial permits and Washington State Department of Transportation permits, including Ecology for permit oversight and implementation.

## **APPENDIX C**

### **Mapping of Areas Regulated Under the Shoreline Management Act**

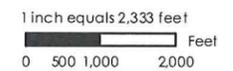


### Proposed Shoreline Management Area: City Map

-  Proposed SMA\*
-  Shoreline Approximate OHWM\*
-  Streams
-  Water Bodies
-  Roads
-  State Route 18
-  Covington City Limits
-  Adjacent City Limits

\*SMA = Shoreline Management Area OHWM = Ordinary High Water Mark

The Proposed Shoreline Management Area is drawn to include lands within two hundred feet of the ordinary high water mark or floodway of designated shorelines of the state, as well as associated wetlands.



Shoreline jurisdiction and wetland boundaries depicted on this map are approximate. They have not been formally delineated or surveyed and are intended for planning purposes only. Additional site-specific evaluation may be needed to confirm/verify information shown on this map.

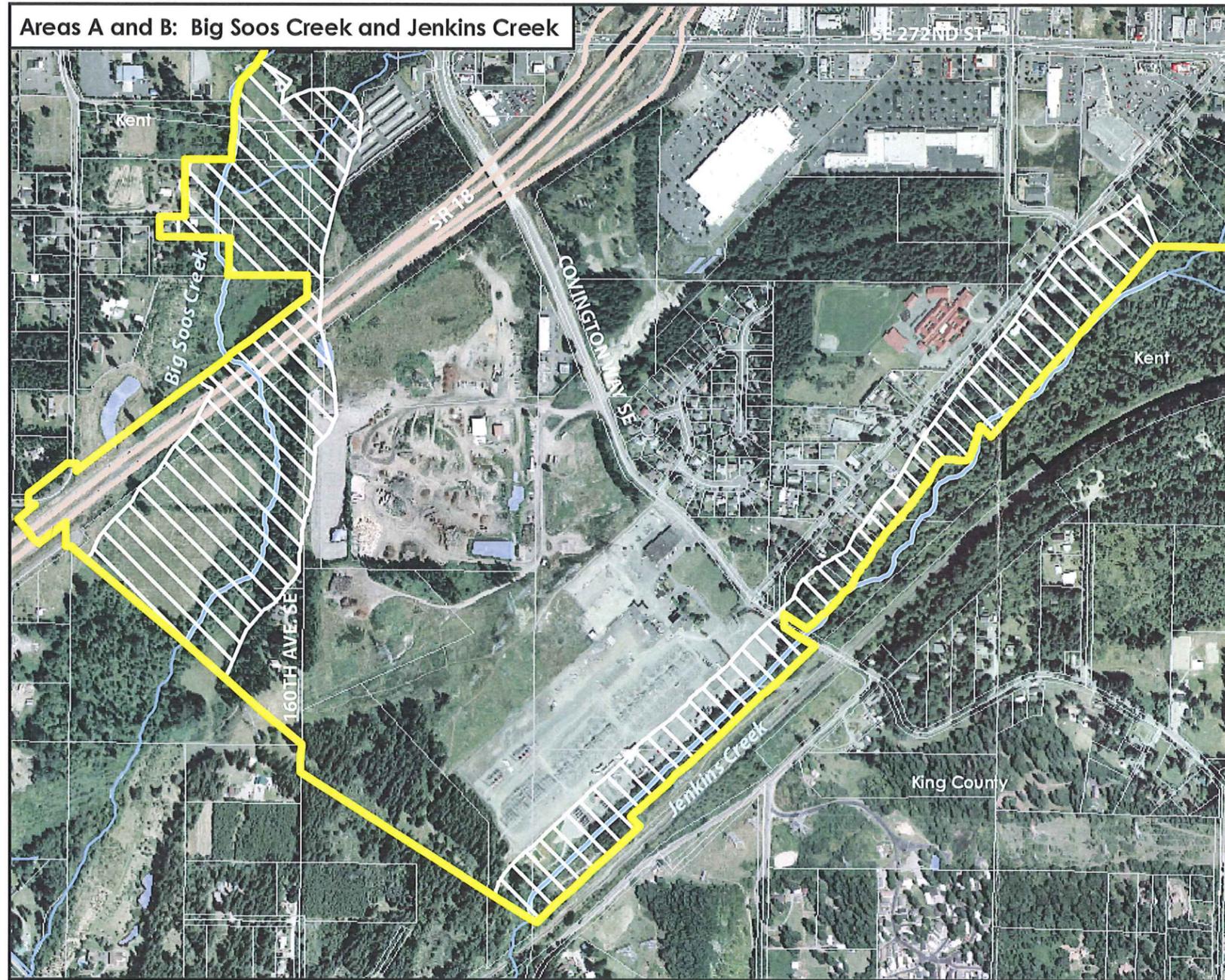
No warranties of any sort, including but not limited to accuracy, fitness or merchantability, accompany this product.

Source: King County GIS

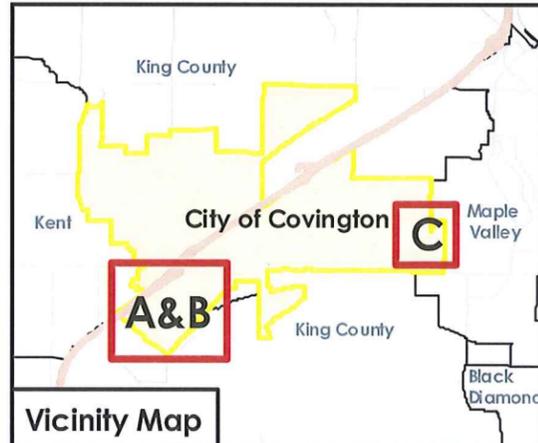
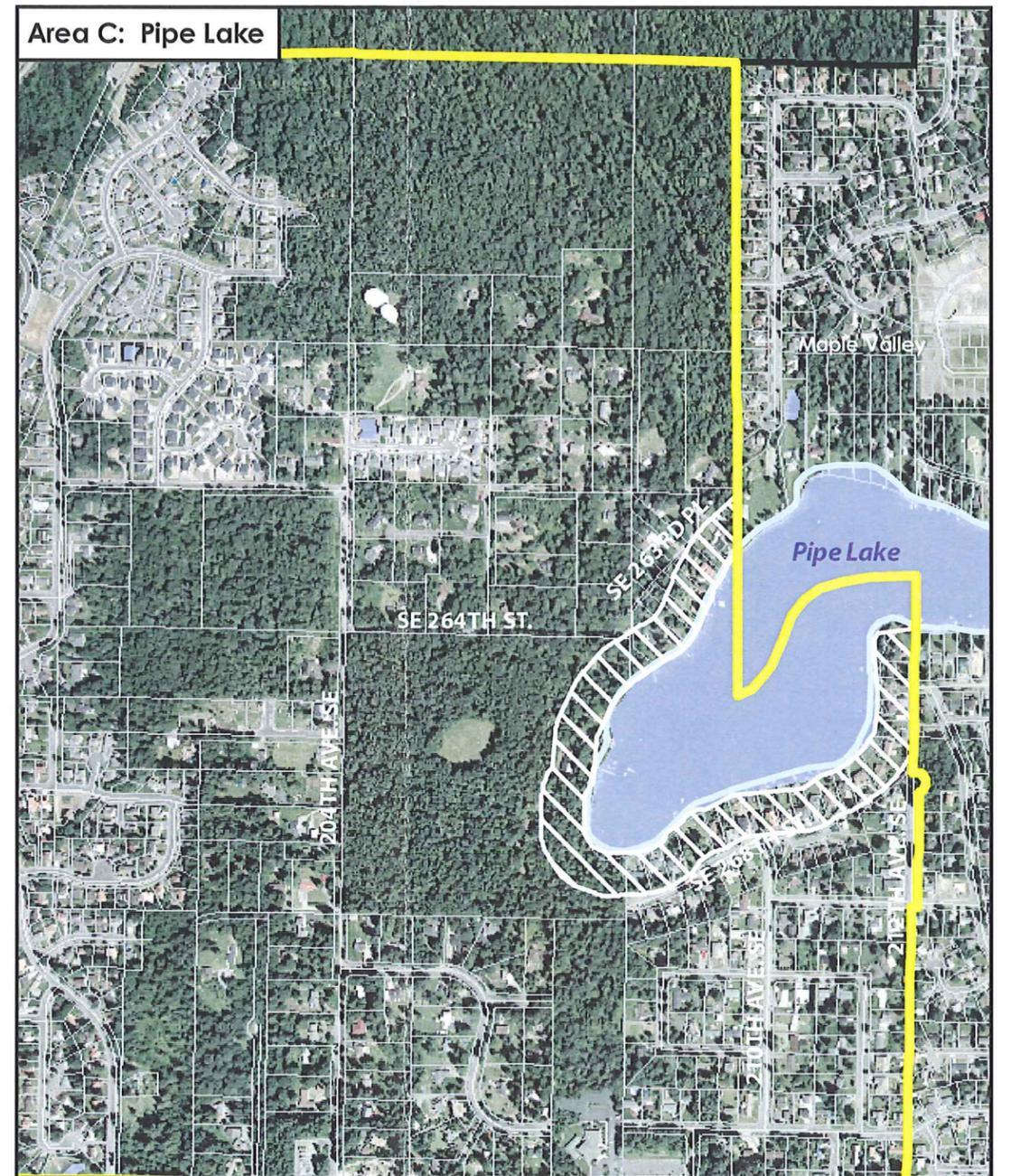
Map Date: January 2008

**Figure 1.C**

**Areas A and B: Big Soos Creek and Jenkins Creek**



**Area C: Pipe Lake**

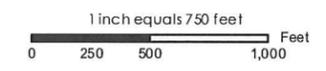


**Proposed Shoreline Management Area - Detail Map**

-  Proposed SMA\*
-  Shoreline Approximate OHWM\*
-  Streams
-  Water Bodies
-  Roads
-  State Route 18
-  Tax Parcels
-  Covington City Limits

\*SMA = Shoreline Management Area OHWM = Ordinary High Water Mark

The Proposed Shoreline Management Area is drawn to include lands within two hundred feet of the ordinary high water mark or floodway of designated shorelines of the state, as well as associated wetlands.



Shoreline jurisdiction and wetland boundaries depicted on this map are approximate. They have not been formally delineated or surveyed and are intended for planning purposes only. Additional site-specific evaluation may be needed to confirm/verify information shown on this map.

No warranties of any sort, including but not limited to accuracy, fitness or merchantability, accompany this product.

Source: King County GIS

Map Date: January 2008

**Figure 1.D**

**APPENDIX D**

**Ecology 303(d) Listings**

CITY OF COVINGTON					
2009 Stormwater Comprehensive Plan Update					
Summary Table for Report from Ecology 303(d) List					
Category	Description	Waterbodies	Parameters	Possible Sources	Possible Solutions
Category 5	Polluted waters that require a TMDL	Little Soos Creek, Big Soos Creek, Jenkins Creek	Fecal Coliform, temperature	Areas are not served by sewer systems. Fecal coliform could be associated with septic tank drainfields. For Big Soos Creek, domesticated animals are allowed near the stream, and the stream backs up into pasture areas.	Prohibit access to streams by domesticated animals. Restrict domesticated animals to fenced off-leash areas at parks; provide fenced areas as needed. Provide public education and outreach to inform citizens on water quality impacts from uncollected waste from domesticated animals. Confirm if there are permitted or unpermitted domesticated animal farms within the City in areas adjacent to streams; coordinate with property owners to make sure that farms are in conformance with the CMC.
Category 4C	Is impaired by a non-pollutant	Pipe Lake, Lake Lucerne	Invasive exotic species: hydrilla and Eurasian water-milfoil	Typically transported by boats that have been in other similarly impaired waterbodies	Continue participating in King County's Regional Eurasian Milfoil Control Plan.
Category 4B	Has a pollution control program	None listed	None listed	Not applicable	Not applicable
Category 4A	Has a TMDL	None listed	None listed	Not applicable	Not applicable
Category 2	Waters of concern	Little Soos Creek, Big Soos Creek	Dissolved oxygen, pH	Low dissolved oxygen could be impacted by fecal coliform levels. pH could be impacted to nearby construction projects with discharges from uncured concrete surfaces	See Category 5 for discussion regarding fecal coliform. Inspect construction sites to determine that TESC measures are implemented during concrete placement and curing.
Category 1	Meets tested standards is for clean waters	Little Soos Creek, Big Soos Creek, Jenkins Creek, Pipe Lake, Lake Lucerne	pH, Ammonia-N, total phosphorus	Not applicable	Not applicable

**APPENDIX E**  
**CIP Implementation Schedule**  
**and Summary of Costs**

CITY OF COVINGTON												
2009 Comprehensive Stormwater Plan Update - 20 Year Schedule												
Project No. - Description	Priority	Funding Source	Cost Estimate Year 2009 (\$)	Year of Completion							Cost at Completion	
				High Priority <sup>1</sup>			Medium Priority <sup>1</sup>			Low Priority <sup>1</sup>		
				2010	2011	2012	2013	2014	2015	2016 - 2029 <sup>2</sup>		
Seattle ENR Construction Cost Index - calculated CCI values			9075	9272	9468	9665	9862	10059	10255	11730		
<b>Capital Improvement Projects</b>												
1026 - 2008003	DP21060 Woodcreek - COMPLETED IN 2009		Completed '09								Completed '09	
1026 - 2008004	4		\$1,230,000		\$1,283,000						\$1,283,000	
1026 - 2008010	10		\$496,000				\$539,000				\$539,000	
1026 - 2008013	6		\$184,000	\$188,000							\$188,000	
1026 - 2008014	7		\$167,000		\$174,000						\$174,000	
1026 - 2008015	16		\$217,000							\$280,000	\$280,000	
1026 - 2008016	18		\$727,000							\$940,000	\$940,000	
1026 - 2008018	20		\$286,000							\$370,000	\$370,000	
1026 - 2008020	8		\$1,238,000			\$1,318,000					\$1,318,000	
1074	17		\$873,000						\$987,000		\$987,000	
1066	22		\$394,000							\$509,000	\$509,000	
1077	23		\$2,610,000							\$3,374,000	\$3,374,000	
1064	24		\$85,000			\$91,000					\$91,000	
1075	25		\$3,080,000							\$3,981,000	\$3,981,000	
1078	26		\$1,886,000							\$2,438,000	\$2,438,000	
<b>Sub-total, Capital Improvement Projects</b>			\$13,473,000	\$188,000	\$1,457,000	\$1,409,000	\$539,000	\$0	\$987,000	\$11,892,000	\$16,472,000	
<b>O&amp;M Improvements</b>												
1026 - 2008001	1		\$85,000	\$87,000							\$87,000	
1026 - 2008002	2		\$652,000	\$666,000							\$666,000	
1026 - 2008005	5		\$147,000		\$153,000						\$153,000	
1026 - 2008006	9		\$248,000				\$269,000				\$269,000	
1026 - 2008007	11		\$380,000				\$413,000				\$413,000	
1026 - 2008008	12		\$384,000					\$426,000			\$426,000	
1026 - 2008009	13		\$366,000					\$406,000			\$406,000	
1026 - 2008011	14		\$315,000					\$349,000			\$349,000	
1026 - 2008012	15		\$52,000						\$59,000		\$59,000	
1026 - 2008017	19		\$217,000							\$280,000	\$280,000	
1026 - 2008019	21		\$389,000						\$440,000		\$440,000	
<b>Sub-total, O&amp;M Improvements</b>			\$3,235,000	\$753,000	\$153,000	\$0	\$682,000	\$1,181,000	\$499,000	\$280,000	\$3,548,000	
<b>Capital O&amp;M</b>												
											\$0	
<b>Sub-total, Capital O&amp;M</b>			\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
<b>TOTAL ANNUAL COSTS (Capital and O&amp;M and Capital Maintenance)</b>					\$941,000	\$1,610,000	\$1,409,000	\$1,221,000	\$1,181,000	\$1,486,000	\$12,172,000	\$20,020,000
<b>Notes:</b>												
1. Project prioritization:												
High	Completed Within 0-3 years											
Medium	Completed Within 4-6 years											
Low	Completed Within 7-20 years											
2. Inflation for 2016 - 2019 based on: cost factor for year 2015 * [1.0225 * ((2029-2016)/2)]												

**APPENDIX F**  
**CIP Opinions of Probable  
Construction Costs**

CITY OF COVINGTON		2009 Comprehensive Stormwater Plan Update		PROJECT TYPE:		O&M		
Preliminary Opinion of Probable Cost		Checked By: J. Coop 6/23/09		PROJECT SIZE:		Small		
CIP #:	1026 - 2008001	Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount	Percent of Construction Cost
Project Name:	DP11048 Channing Park Div1 - Phase I	1	1	LS	Mobilization	\$5,100.00	\$5,100	16.53%
Prepared By:	C. Buifrago, 6/23/09	2	1	DAY	Traffic Control	\$600.00	\$600	1.95%
		3	1	LS	Restoration	\$0.00	\$0	0.00%
		4	1	LS	Trench Safety	\$1,000.00	\$1,000	3.24%
		5	0.046	ACRE	Erosion/Sedimentation Control	\$50,000.00	\$2,300	7.46%
		6	0.046	ACRE	Cleaning and Grubbing	\$10,000.00	\$460	1.49%
		7	0.046	ACRE	Seeding, Fertilizing and Mulching	\$4,000.00	\$184	0.60%
		8	0	LF	Saw Cutting	\$2.50	\$0	0.00%
		9	0	TON	Crushed Surfacing Top Course	\$25.00	\$0.00	0.00%
		10	0	TON	HMA For Pavement Repair Cl. 1/2In. P	\$150.00	\$0.00	0.00%
		11	0	TON	Asphalt Conc. Pavement CL. B	\$85.00	\$0	0.00%
		12	230	CY	Structure Excav Class B Incl Haul	\$30.00	\$6,900.00	22.37%
		13	0	TON	Select Borrow Incl. Haul	\$10.00	\$0.00	0.00%
		14	60	CY	Topsoil	\$40.00	\$2,400.00	7.78%
		15	0	LF	Corrugated PE Storm Sewer Pipe, 12-Inch Diam.	\$35.00	\$0	0.00%
		16	200	LF	Corrugated PE Storm Sewer Pipe, 18-Inch Diam.	\$50.00	\$10,000	32.42%
		17	0	LF	Corrugated PE Storm Sewer Pipe, 24-Inch Diam.	\$60.00	\$0	0.00%
		18	0	LF	Corrugated PE Storm Sewer Pipe, 30-Inch Diam.	\$70.00	\$0	0.00%
		19	0	LF	Corrugated PE Storm Sewer Pipe, 36-Inch Diam.	\$75.00	\$0	0.00%
		20	0	LF	Corrugated PE Storm Sewer Pipe, 42-Inch Diam.	\$85.00	\$0.00	0.00%
		21	0	LF	Corrugated PE Storm Sewer Pipe, 48-Inch Diam.	\$100.00	\$0	0.00%
		22	0	LF	RC Storm Sewer Pipe, 36-Inch Diam.	\$130.00	\$0	0.00%
		23	0	LF	RC Storm Sewer Pipe, 42-Inch Diam.	\$150.00	\$0.00	0.00%
		24	0	LF	RC Storm Sewer Pipe, 48-Inch Diam.	\$175.00	\$0	0.00%
		25	0	LF	12-inch SD, Cl V RCP	\$250.00	\$0.00	0.00%
		26	2	EA	Catch Basin Type I	\$950.00	\$1,900	6.16%
		27	0	EA	Catch Basin Type II	\$1,500.00	\$0	0.00%
		28	0	EA	Catch Basin Type II, 48-Inch Diam.	\$3,500.00	\$0	0.00%
		29	0	EA	Catch Basin Type II, 54-Inch Diam.	\$4,500.00	\$0.00	0.00%
		30	0	EA	Catch Basin Type II, 60-Inch Diam.	\$4,500.00	\$0	0.00%
		31	0	EA	Catch Basin Type II, 72-Inch Diam. w/Tide Flex	\$8,500.00	\$0	0.00%
		32	0	EA	Catch Basin Type II, 84-Inch Diam.	\$10,000.00	\$0	0.00%
		33	0	EA	Catch Basin Type II, 96-Inch Diam. w/Tide Flex	\$15,000.00	\$0	0.00%
		34	0	EA	F&I 12-inch Tide Flex	\$2,000.00	\$0.00	0.00%
		35	0	EA	F&I 36-inch Tide Flex	\$12,000.00	\$0.00	0.00%
		36	0	EA	Tideflex valve for 42-inch ID Conc. Pipe	\$12,000.00	\$0.00	0.00%
		37	0	EA	F&E 48-inch Tide Flex valves	\$11,000.00	\$0.00	0.00%
		38	0	TON	Riprap	\$40.00	\$0.00	0.00%
		39	0	EA	Adjust existing manhole rim	\$4,000.00	\$0.00	0.00%
		40	0	EA	Connect to existing manhole	\$2,000.00	\$0.00	0.00%
		41	0	CY	Bioretention/bioinfiltration soil mix	\$50.00	\$0.00	0.00%
		42	0	EA	Connect to Existing Storm	\$3,000.00	\$0.00	0.00%
		43	0	LS	Plantings/Landscape	\$10,000.00	\$0.00	0.00%
		44	0	LS	WQ Facility	0	\$0	0.00%
					<b>Subtotal =</b>		<b>\$30,844</b>	<b>100.00%</b>
					Contingency	30.0%	\$9,253	
					Sales Tax	8.8%	\$2,714	
					<b>Planning Level Construction Cost =</b>		<b>\$42,800</b>	
		0.046	AC		Property Acquisition	\$410,200	\$18,869.20	
					Environmental Permitting and Documentation	10.0%	\$4,280	
					Surveying	9.3%	\$3,985	
					Administration	5.0%	\$2,140	
					Preliminary Engineering, PS&E Engineering and Construction Management	30.0%	\$12,840	
					<b>TOTAL =</b>		<b>\$85,000</b>	
<b>GENERAL ASSUMPTIONS:</b>								
Mobilization including staging area, equals approximately 20-percent of Subtotal								
Trench Safety equals approximately 2-percent of Subtotal (\$1000 minimum)								
CSTC installed at minimum 6-inch compacted depth								
ACP installed at minimum 6-inch compacted depth								
ACP density equals 2 tons/cy (approx)								
ACP patch width is 4 feet								
Pipe size and length is estimated only								
Traffic control based on 2 persons @ \$35/hour plus additional \$40/day for any traffic control plan and 200 LF of piping installation per day								
Estimate does not include obtaining land or easements								
Riprap gradation:								
Dmax = 24" nominal diameter								
Dmedian = 16"								
Dmin = 4"								
Riprap includes underlying filter fabric								

CITY OF COVINGTON		2009 Comprehensive Stormwater Plan Update		PROJECT TYPE:		O&M	
Preliminary Opinion of Probable Cost		Checked By: J. Coop 6/23/09		PROJECT SIZE:		Large	
CIP #:	1026 - 2008002	Project Name:	DP11048 Channing Park Div1 Phase II	Unit Cost	Amount	Percent of Construction Cost	
Prepared By:	C. Builtrago, 6/23/09	Description		Unit Cost	Amount	Percent of Construction Cost	
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount	Percent of Construction Cost	PROJECT DESCRIPTION:
1	1	LS	Mobilization	\$53,400.00	\$53,400	16.66%	
2	0	DAY	Traffic Control	\$600.00	\$0	0.00%	Removal of excessive vegetation and noxious weeds from pond and northern inlet swale.
3	0	LS	Restoration	\$2,700.00	\$0	0.00%	
4	1	LS	Trench Safety	\$5,200.00	\$5,200	1.62%	
5	1.7	ACRE	Erosion/Sedimentation Control	\$50,000.00	\$85,000	26.51%	Acraege of pond parcel based on King County IMAP.
6	1.7	ACRE	Cleaning and Grubbing	\$10,000.00	\$17,000	5.30%	Assumes replacement of liner, soils and vegetation.
7	1.7	ACRE	Seeding, Fertilizing and Mulching	\$4,000.00	\$6,800	2.12%	
8	0	LF	Saw Cutting	\$2.50	\$0	0.00%	
9	0	TON	Crushed Surfacing Top Course	\$25.00	\$0.00	0.00%	
10	0	TON	HMA For Pavement Repair Cl. 1/2In. P	\$150.00	\$0.00	0.00%	
11	0	TON	Asphalt Conc. Pavement CL. B	\$85.00	\$0	0.00%	
12	1,370	CY	Structure Excav Class B Incl Haul	\$30.00	\$41,100.00	12.82%	
13	0	TON	Select Borrow Incl. Haul	\$10.00	\$0.00	0.00%	
14	1,370	CY	Topsoil	\$40.00	\$54,800.00	17.09%	
15	0	LF	Corrugated PE Storm Sewer Pipe, 12-Inch Diam.	\$35.00	\$0	0.00%	
16	0	LF	Corrugated PE Storm Sewer Pipe, 18-Inch Diam.	\$50.00	\$0	0.00%	
17	0	LF	Corrugated PE Storm Sewer Pipe, 24-Inch Diam.	\$60.00	\$0	0.00%	
18	0	LF	Corrugated PE Storm Sewer Pipe, 30-Inch Diam.	\$70.00	\$0	0.00%	
19	0	LF	Corrugated PE Storm Sewer Pipe, 36-Inch Diam.	\$75.00	\$0	0.00%	
20	0	LF	Corrugated PE Storm Sewer Pipe, 42-Inch Diam.	\$85.00	\$0.00	0.00%	
21	0	LF	Corrugated PE Storm Sewer Pipe, 48-Inch Diam.	\$100.00	\$0	0.00%	
22	0	LF	RC Storm Sewer Pipe, 36-Inch Diam.	\$130.00	\$0	0.00%	
23	0	LF	RC Storm Sewer Pipe, 42-Inch Diam.	\$150.00	\$0.00	0.00%	
24	0	LF	RC Storm Sewer Pipe, 48-Inch Diam.	\$175.00	\$0	0.00%	
25	0	LF	12-inch SD. CIV RCP	\$250.00	\$0.00	0.00%	
26	0	EA	Catch Basin Type I	\$950.00	\$0	0.00%	
27	0	EA	Catch Basin Type II	\$1,500.00	\$0	0.00%	
28	0	EA	Catch Basin Type II, 48-Inch Diam.	\$3,500.00	\$0	0.00%	
29	0	EA	Catch Basin Type II, 54-Inch Diam.	\$4,500.00	\$0.00	0.00%	
30	0	EA	Catch Basin Type II, 60-Inch Diam.	\$4,500.00	\$0.00	0.00%	
31	0	EA	Catch Basin Type II, 72-Inch Diam. w/Tide Flex	\$8,500.00	\$0	0.00%	
32	0	EA	Catch Basin Type II, 84-Inch Diam.	\$10,000.00	\$0	0.00%	
33	0	EA	Catch Basin Type II, 96-Inch Diam. w/Tide Flex	\$15,000.00	\$0	0.00%	
34	8,230	SY	Geotextile	\$5.00	\$41,150.00	12.84%	
35	0	EA	F&I 36-inch Tide Flex	\$12,000.00	\$0.00	0.00%	
36	0	EA	Tideflex valve for 42-inch ID Conc. Pipe	\$12,000.00	\$0.00	0.00%	
37	0	EA	F&E 48-inch Tide Flex valves	\$11,000.00	\$0.00	0.00%	
38	0	TON	Riprap	\$40.00	\$0.00	0.00%	
39	0	EA	Adjust existing manhole rim	\$4,000.00	\$0.00	0.00%	
40	0	EA	Connect to existing manhole	\$2,000.00	\$0.00	0.00%	
41	323	CY	Bioretention/bioinfiltration soil mix	\$50.00	\$16,150.00	5.04%	
42	0	EA	Connect to Existing Storm	\$3,000.00	\$0.00	0.00%	
43	0	LS	Plantings/Landscape	\$10,000.00	\$0.00	0.00%	
44	0	LS	WQ Facility	0	\$0	0.00%	
				<b>Subtotal =</b>	<b>\$320,600</b>	<b>100.00%</b>	
				Contingency	\$96,180	30.0%	
				Sales Tax	\$28,213	8.8%	
				<b>Planning Level Construction Cost =</b>	<b>\$445,000</b>		
				Property Acquisition	\$0.00		Project Priority: High
				Environmental Permitting and Documentation	\$44,500		High: 2010 - 2012
				Surveying	\$6,820	1.5%	Medium: 2013 - 2015
				Administration	\$22,250	5.0%	Low: 2016 - 2029
				Preliminary Engineering, PS&E Engineering and Construction Management	\$133,500	30.0%	
				<b>TOTAL =</b>	<b>\$652,000</b>		
<b>GENERAL ASSUMPTIONS:</b>							
Mobilization including staging area, equals approximately 20-percent of Subtotal							
Trench Safety equals approximately 2-percent of Subtotal (\$1000 minimum)							
CSSTC installed at minimum 6-inch compacted depth							
ACP installed at minimum 6-inch compacted depth							
ACP density equals 2 tons/cy (approx)							
ACP patch width is 4 feet							
Pipe size and length is estimated only							
Traffic control based on 2 persons @ \$35/hour plus additional \$40/day for any traffic control plan and 200 LF of piping installation per day							
Estimate does not include obtaining land or easements							
Riprap gradation:							
Dmax = 24" nominal diameter							
Dmedian = 16"							
Dmin = 4"							
Riprap includes underlying filter fabric							

CITY OF COVINGTON		2009 Comprehensive Stormwater Plan Update		PROJECT TYPE:			
Preliminary Opinion of Probable Cost		Checked By: J. Coop 6/23/09		PROJECT SIZE:			
CIP #:	1026 - 2008003			Capital			
Project Name:	DP21060 Woodcreek - COMPLETED IN 2009			Small			
Prepared By:	C. Buitrago, 6/23/09						
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount	Percent of Construction Cost	PROJECT DESCRIPTION:
1	0	LS	Mobilization	\$0.00	\$0	#DIV/0!	
2	0	DAY	Traffic Control	\$600.00	\$0	#DIV/0!	Redesign and Rebuild pond using L.I.D. techniques.
3	0	LS	Restoration	\$0.00	\$0	#DIV/0!	Acraege of pond parcel based on King County IMAP.
4	0	LS	Trench Safety	\$1,000.00	\$0	#DIV/0!	Assumes pond is retrofit with compost-amended soils.
5	0	ACRE	Erosion/Sedimentation Control	\$50,000.00	\$0	#DIV/0!	Includes allowance for pipe and structures.
6	0	ACRE	Clearing and Grubbing	\$10,000.00	\$0	#DIV/0!	
7	0	ACRE	Seeding, Fertilizing and Mulching	\$4,000.00	\$0	#DIV/0!	
8	0	LF	Saw Cutting	\$2.50	\$0	#DIV/0!	
9	0	TON	Crushed Surfacing Top Course	\$25.00	\$0.00	#DIV/0!	
10	0	TON	HMA For Pavement Repair Cl. 1/2In. P	\$150.00	\$0.00	#DIV/0!	
11	0	TON	Asphalt Conc. Pavement CL. B	\$85.00	\$0.00	#DIV/0!	
12	0	CY	Structure Excav Class B Incl Haul	\$30.00	\$0.00	#DIV/0!	
13	0	TON	Select Borrow Incl. Haul	\$10.00	\$0.00	#DIV/0!	
14	0	CY	Topsoil	\$40.00	\$0.00	#DIV/0!	
15	0	LF	Corrugated PE Storm Sewer Pipe, 12-Inch Diam.	\$35.00	\$0	#DIV/0!	
16	0	LF	Corrugated PE Storm Sewer Pipe, 18-Inch Diam.	\$50.00	\$0	#DIV/0!	
17	0	LF	Corrugated PE Storm Sewer Pipe, 24-Inch Diam.	\$60.00	\$0	#DIV/0!	
18	0	LF	Corrugated PE Storm Sewer Pipe, 30-Inch Diam.	\$70.00	\$0	#DIV/0!	
19	0	LF	Corrugated PE Storm Sewer Pipe, 36-Inch Diam.	\$75.00	\$0	#DIV/0!	
20	0	LF	Corrugated PE Storm Sewer Pipe, 42-Inch Diam.	\$85.00	\$0.00	#DIV/0!	
21	0	LF	Corrugated PE Storm Sewer Pipe, 48-Inch Diam.	\$100.00	\$0	#DIV/0!	
22	0	LF	RC Storm Sewer Pipe, 36-Inch Diam.	\$130.00	\$0	#DIV/0!	
23	0	LF	RC Storm Sewer Pipe, 42-Inch Diam.	\$150.00	\$0.00	#DIV/0!	
24	0	LF	RC Storm Sewer Pipe, 48-Inch Diam.	\$175.00	\$0	#DIV/0!	
25	0	LF	12-inch SD, Cl V RCP	\$250.00	\$0.00	#DIV/0!	
26	0	EA	Catch Basin Type I	\$950.00	\$0	#DIV/0!	
27	0	EA	Catch Basin Type IL	\$1,500.00	\$0	#DIV/0!	
28	0	EA	Catch Basin Type II, 48-Inch Diam.	\$3,500.00	\$0	#DIV/0!	
29	0	EA	Catch Basin Type II, 54-Inch Diam.	\$4,500.00	\$0.00	#DIV/0!	
30	0	EA	Catch Basin Type II, 60-Inch Diam.	\$4,500.00	\$0	#DIV/0!	
31	0	EA	Catch Basin Type II, 72-Inch Diam. w/Tide Flex	\$8,500.00	\$0	#DIV/0!	
32	0	EA	Catch Basin Type II, 84-Inch Diam.	\$10,000.00	\$0	#DIV/0!	
33	0	EA	Catch Basin Type II, 96-Inch Diam. w/Tide Flex	\$15,000.00	\$0	#DIV/0!	
34	0	EA	F&I 12-inch Tide Flex	\$2,000.00	\$0.00	#DIV/0!	
35	0	EA	F&I 36-inch Tide Flex	\$12,000.00	\$0.00	#DIV/0!	
36	0	EA	Tideflex valve for 42-inch ID Conc. Pipe	\$12,000.00	\$0.00	#DIV/0!	
37	0	EA	F&E 48-inch Tide Flex valves	\$11,000.00	\$0.00	#DIV/0!	
38	0	TON	Riprap	\$40.00	\$0.00	#DIV/0!	
39	0	EA	Adjust existing manhole rim	\$4,000.00	\$0.00	#DIV/0!	
40	0	EA	Connect to existing manhole	\$2,000.00	\$0.00	#DIV/0!	
41	0	LS	Dewatering	\$500.00	\$0.00	#DIV/0!	
42	0	CY	Bioretention/bioinfiltration soil mix	\$50.00	\$0.00	#DIV/0!	
43	0	EA	Connect to Existing Storm	\$3,000.00	\$0.00	#DIV/0!	
44	0	LS	Plantings/Landscape	\$10,000.00	\$0.00	#DIV/0!	
45	0	LS	WQ Facility	0	\$0	#DIV/0!	
				<b>Subtotal =</b>	<b>\$0</b>	<b>#DIV/0!</b>	
				Contingency	30.0%		
				Sales Tax	8.8%		
				<b>Planning Level Construction Cost =</b>	<b>\$0</b>		
				Property Acquisition	\$0.00		Project Priority: Not Applicable, to be completed in 2009
				Environmental Permitting and Documentation	\$0		Priority Schedule:
				Surveying	#DIV/0!		High: 2010 - 2012
				Administration	\$0		Medium: 2013 - 2015
				Preliminary Engineering, PS&E Engineering and Construction Management	\$0		Low: 2016 - 2029
				<b>TOTAL =</b>	<b>#DIV/0!</b>		
<b>GENERAL ASSUMPTIONS:</b>							
Mobilization including staging area, equals approximately 20-percent of Subtotal							
Trench Safety equals approximately 2-percent of Subtotal (\$1000 minimum)							
CSTC installed at minimum 6-inch compacted depth							
ACP installed at minimum 6-inch compacted depth							
ACP density equals 2 tons/cy (approx)							
ACP patch width is 4 feet							
Pipe size and length is estimated only							
Traffic control based on 2 persons @ \$35/hour plus additional \$40/day for any traffic control plan and 200 LF of piping installation per day							
Estimate does not include obtaining land or easements							
Riprap gradation:							
Dmax = 24" nominal diameter							
Dmedian = 16"							
Dmin = 4"							
Riprap includes underlying filter fabric							

CITY OF COVINGTON		2009 Comprehensive Stormwater Plan Update		PROJECT TYPE:		Capital	
Preliminary Opinion of Probable Cost		Checked By: J. Coop 6/23/09		PROJECT SIZE:		Large	
CIP #:	1026 - 2008004						
Project Name:	DP41036 The Woodlands - Phase I						
Prepared By:	C. Buitrage, 6/23/09						
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount	Percent of Construction Cost	PROJECT DESCRIPTION:
1	1	LS	Mobilization	\$94,700.00	\$94,700	16.67%	
2	1	DAY	Traffic Control	\$600.00	\$600	0.11%	Control ground water issue and stabilize homeowners association hill side.
3	0	LS	Restoration	\$4,700.00	\$0	0.00%	
4	1	LS	Trench Safety	\$9,300.00	\$9,300	1.64%	Includes allowance for pipe and structures.
5	0.16	ACRE	Erosion/Sedimentation Control	\$50,000.00	\$8,000	1.41%	Includes allowance for gabion wall system and trees for hillside stabilization.
6	0.16	ACRE	Clearing and Grubbing	\$10,000.00	\$1,600	0.28%	
7	0.16	ACRE	Seeding, Fertilizing and Mulching	\$4,000.00	\$640	0.11%	
8	0	LF	Saw Cutting	\$2.50	\$0	0.00%	
9	0	TON	Crushed Surfacing Top Course	\$25.00	\$0	0.00%	
10	4	TON	HMA For Pavement Repair Cl. 1/2In. P	\$150.00	\$600.00	0.11%	
11	0	TON	Asphalt Conc. Pavement CL. B	\$85.00	\$0	0.00%	
12	516	CY	Structure Excav Class B Incl Haul	\$30.00	\$15,480.00	2.72%	
13	4,815	TON	Rock for gabions	\$75.00	\$361,125.00	63.55%	
14	0	CY	Topsoil	\$40.00	\$0	0.00%	
15	0	LF	Corrugated PE Storm Sewer Pipe, 12-inch Diam.	\$35.00	\$0	0.00%	
16	100	LF	Corrugated PE Storm Sewer Pipe, 18-inch Diam.	\$50.00	\$5,000	0.88%	
17	0	LF	Corrugated PE Storm Sewer Pipe, 24-inch Diam.	\$60.00	\$0	0.00%	
18	0	LF	Corrugated PE Storm Sewer Pipe, 30-inch Diam.	\$70.00	\$0	0.00%	
19	0	LF	Corrugated PE Storm Sewer Pipe, 36-inch Diam.	\$75.00	\$0	0.00%	
20	0	LF	Corrugated PE Storm Sewer Pipe, 42-inch Diam.	\$85.00	\$0	0.00%	
21	0	LF	Corrugated PE Storm Sewer Pipe, 48-inch Diam.	\$100.00	\$0	0.00%	
22	0	LF	RC Storm Sewer Pipe, 36-inch Diam.	\$130.00	\$0	0.00%	
23	0	LF	RC Storm Sewer Pipe, 42-inch Diam.	\$150.00	\$0	0.00%	
24	0	LF	RC Storm Sewer Pipe, 48-inch Diam.	\$175.00	\$0	0.00%	
25	0	LF	12-inch SD, CI V RCP	\$250.00	\$0	0.00%	
26	0	EA	Catch Basin Type I	\$950.00	\$0	0.00%	
27	0	EA	Catch Basin Type II	\$1,500.00	\$0	0.00%	
28	2	EA	Catch Basin Type II, 48-inch Diam.	\$3,500.00	\$7,000	1.23%	
29	0	EA	Catch Basin Type II, 54-inch Diam.	\$4,500.00	\$0	0.00%	
30	0	EA	Catch Basin Type II, 60-inch Diam.	\$4,500.00	\$0	0.00%	
31	0	EA	Catch Basin Type II, 72-inch Diam. w/Tide Flex	\$8,500.00	\$0	0.00%	
32	0	EA	Catch Basin Type II, 84-inch Diam.	\$10,000.00	\$0	0.00%	
33	0	EA	Catch Basin Type II, 96-inch Diam. w/Tide Flex	\$15,000.00	\$0	0.00%	
34	0	EA	F&I 12-inch Tide Flex	\$2,000.00	\$0	0.00%	
35	0	EA	F&I 36-inch Tide Flex	\$12,000.00	\$0	0.00%	
36	0	EA	Tidelflex valve for 42-inch ID Conc. Pipe	\$12,000.00	\$0	0.00%	
37	0	EA	F&E 48-inch Tide Flex valves	\$11,000.00	\$0	0.00%	
38	0	TON	Riprap	\$40.00	\$0	0.00%	
39	0	EA	Adjust existing manhole rim	\$4,000.00	\$0	0.00%	
40	0	EA	Connect to existing manhole	\$2,000.00	\$0	0.00%	
41	87	EA	PSIPE slope stabilization tree	\$20.00	\$1,744.00	0.31%	
42	2,485	CY	Gabion wall system, excluding rock	\$14.75	\$36,653.75	6.45%	
43	516	CY	Bioretention/bioinfiltration soil mix	\$50.00	\$25,800.00	4.54%	
44	0	EA	Connect to Existing Storm	\$3,000.00	\$0	0.00%	
45	0	LS	Plantings/Landscape	\$10,000.00	\$0	0.00%	
46	0	LS	WQI Facility	0	\$0	0.00%	
				<b>Subtotal =</b>	<b>\$568,243</b>	<b>100.00%</b>	
				Contingency	30.0%		
				Sales Tax	8.8%		
				<b>Planning Level Construction Cost =</b>	<b>\$788,700</b>		
				AC	Property Acquisition	\$0.00	Project Priority: High
				AC	Environmental Permitting and Documentation	\$78,870	Priority Schedule:
				AC	Surveying	\$7,777	High: 2010 - 2012
				AC	Administration	\$39,435	Medium: 2013 - 2015
				AC	Construction Management	\$236,610	Low: 2016 - 2029
				AC	Geotechnical engineering	\$78,870	
				<b>TOTAL =</b>	<b>\$1,230,000</b>		
<b>GENERAL ASSUMPTIONS:</b>							
Mobilization including staging area, equals approximately 20-percent of Subtotal							
Trench Safety equals approximately 2-percent of Subtotal (\$1000 minimum)							
CSTC installed at minimum 6-inch compacted depth							
ACP installed at minimum 6-inch compacted depth							
ACP density equals 2 tons/cy (approx)							
ACP patch width is 4 feet							
Pipe size and length is estimated only							
Traffic control based on 2 persons @ \$35/hour plus additional \$40/day for any traffic control plan and 200 LF of piping installation per day							
Estimate does not include obtaining land or easements							
Riprap gradation: Dmax = 24" nominal diameter							
Dmedian = 16"							
Dmin = 4"							
Riprap includes underlying filter fabric							

CITY OF COVINGTON		2009 Comprehensive Stormwater Plan Update		PROJECT TYPE:		O&M	
Preliminary Opinion of Probable Cost		Description		PROJECT SIZE:		Small	
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount	Percent of Construction Cost	PROJECT DESCRIPTION:
CIP #:	1026 - 2008005	LS	Mobilization	\$11,800.00	\$11,800	16.66%	
Project Name:	DP41036 The Woodlands Phase II	DAY	Traffic Control	\$600.00	\$0	0.00%	Rebuild pond to as-built conditions.
Prepared By:	C. Buitrago, 6/23/09	LS	Restoration	\$600.00	\$600	0.85%	Muck out pond and re-establish low flow channel and hydroseed.
		LS	Trench Safety	\$1,100.00	\$1,100	1.55%	
		ACRE	Erosion/Sedimentation Control	\$50,000.00	\$30,500	43.07%	Acreege of pond parcel based on King County IMAP.
		ACRE	Clearing and Grubbing	\$10,000.00	\$6,100	8.61%	
		ACRE	Seeding, Fertilizing and Mulching	\$4,000.00	\$2,440	3.45%	
		LF	Saw Cutting	\$2.50	\$0	0.00%	
		TON	Crushed Surfacing Top Course	\$25.00	\$0.00	0.00%	
		TON	HMA For Pavement Repair Cl. 1/2In. P	\$150.00	\$1,800.00	2.54%	
		TON	Asphalt Conc. Pavement CL. B	\$85.00	\$0	0.00%	
		CY	Structure Excav Class B Incl Haul	\$30.00	\$15,480.00	21.86%	
		TON	Select Borrow Incl. Haul	\$10.00	\$0.00	0.00%	
		CY	Topsoil	\$40.00	\$0.00	0.00%	
		LF	Corrugated PE Storm Sewer Pipe, 12-inch Diam.	\$35.00	\$0	0.00%	
		LF	Corrugated PE Storm Sewer Pipe, 18-inch Diam.	\$50.00	\$0	0.00%	
		LF	Corrugated PE Storm Sewer Pipe, 24-inch Diam.	\$60.00	\$0	0.00%	
		LF	Corrugated PE Storm Sewer Pipe, 30-inch Diam.	\$70.00	\$0	0.00%	
		LF	Corrugated PE Storm Sewer Pipe, 36-inch Diam.	\$75.00	\$0	0.00%	
		LF	Corrugated PE Storm Sewer Pipe, 42-inch Diam.	\$85.00	\$0.00	0.00%	
		LF	Corrugated PE Storm Sewer Pipe, 48-inch Diam.	\$100.00	\$0	0.00%	
		LF	RC Storm Sewer Pipe, 36-inch Diam.	\$130.00	\$0	0.00%	
		LF	RC Storm Sewer Pipe, 42-inch Diam.	\$150.00	\$0.00	0.00%	
		LF	RC Storm Sewer Pipe, 48-inch Diam.	\$175.00	\$0	0.00%	
		LF	12-inch SD, CI V RCP	\$250.00	\$0.00	0.00%	
		EA	Catch Basin Type I	\$950.00	\$0	0.00%	
		EA	Catch Basin Type II	\$1,500.00	\$0	0.00%	
		EA	Catch Basin Type II, 48-inch Diam.	\$3,500.00	\$0	0.00%	
		EA	Catch Basin Type II, 54-inch Diam.	\$4,500.00	\$0.00	0.00%	
		EA	Catch Basin Type II, 60-inch Diam.	\$4,500.00	\$0	0.00%	
		EA	Catch Basin Type II, 72-inch Diam. w/Tide Flex	\$8,500.00	\$0	0.00%	
		EA	Catch Basin Type II, 84-inch Diam.	\$10,000.00	\$0	0.00%	
		EA	Catch Basin Type II, 96-inch Diam. w/Tide Flex	\$15,000.00	\$0	0.00%	
		EA	F&I 12-inch Tide Flex	\$2,000.00	\$0.00	0.00%	
		EA	F&I 36-inch Tide Flex	\$12,000.00	\$0.00	0.00%	
		EA	Tidelflex valve for 42-inch ID Conc. Pipe	\$12,000.00	\$0.00	0.00%	
		EA	F&E 48-inch Tide Flex valves	\$11,000.00	\$0.00	0.00%	
		TON	Riprap	\$40.00	\$0.00	0.00%	
		EA	Adjust existing manhole rim	\$4,000.00	\$0.00	0.00%	
		EA	Connect to existing manhole	\$2,000.00	\$0.00	0.00%	
		LS	Dewatering	\$1,000.00	\$1,000.00	1.41%	
		CY	Biorettention/bioinfiltration soil mix	\$50.00	\$0.00	0.00%	
		EA	Connect to Existing Storm	\$3,000.00	\$0.00	0.00%	
		LS	Plantings/Landscape	\$10,000.00	\$0.00	0.00%	
		LS	W/Q Facility	0	\$0	0.00%	
			<b>Subtotal =</b>		<b>\$70,820</b>	<b>100.00%</b>	
			Contingency	30.0%	\$21,246		
			Sales Tax	8.8%	\$6,232		
			<b>Planning Level Construction Cost =</b>		<b>\$98,300</b>		
		AC	Property Acquisition		\$0.00		Project Priority: High
			Environmental Permitting and Documentation	10.0%	\$9,830		High: 2010 - 2012
			Surveying	4.9%	\$4,822		Medium: 2013 - 2015
			Administration	5.0%	\$4,915		Low: 2016 - 2029
			Preliminary Engineering, PS&E Engineering and Construction Management	30.0%	\$29,490		
			<b>TOTAL =</b>		<b>\$147,000</b>		
			<b>GENERAL ASSUMPTIONS:</b>				
			Mobilization including staging area, equals approximately 20-percent of Subtotal				
			Trench Safety equals approximately 2-percent of Subtotal (\$1000 minimum)				
			CSTC installed at minimum 6-inch compacted depth	0.50			
			ACP installed at minimum 6-inch compacted depth	0.50			
			ACP density equals 2 tons/cy (approx)				
			ACP patch width is 4 feet				
			Pipe size and length is estimated only				
			Traffic control based on 2 persons @ \$35/hour plus additional \$40/day for any traffic control plan and 200 LF of piping installation per day				
			Estimate does not include obtaining land or easements				
			Riprap gradation:	Dmax = 24" nominal diameter			
				Dmedian = 16"			
				Dmin = 4"			
			Riprap includes underlying filter fabric				

CITY OF COVINGTON		2009 Comprehensive Stormwater Plan Update		PROJECT TYPE:		O&M	
Preliminary Opinion of Probable Cost		Description		PROJECT SIZE:		Small	
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount	Percent of Construction Cost	PROJECT DESCRIPTION:
CIP #:	1026 - 2008006						
Project Name:	DP11069 Prestige Park II						
Prepared By:	C. Buitrago, 6/23/09		Checked By: J. Coop 6/23/09				
1	1	LS	Mobilization	\$20,100.00	\$20,100	16.68%	
2	0	DAY	Traffic Control	\$600.00	\$0	0.00%	Rebuild pond: Remove of excessive vegetation, strip and replace side slopes and hydroseed.
3	0	LS	Restoration	\$1,000.00	\$0	0.00%	
4	1	LS	Trench Safety	\$2,000.00	\$2,000	1.66%	
5	0.41	ACRE	Erosion/Sedimentation Control	\$50,000.00	\$20,500	17.01%	
6	0.41	ACRE	Clearing and Grubbing	\$10,000.00	\$4,100	3.40%	
7	0.41	ACRE	Seeding, Fertilizing and Mulching	\$4,000.00	\$1,640	1.36%	
8	0	LF	Saw Cutting	\$2.50	\$0	0.00%	
9	0	TON	Crushed Surfacing Top Course	\$25.00	\$0.00	0.00%	
10	0	TON	HMA For Pavement Repair Cl. 1/2In. P	\$150.00	\$0.00	0.00%	
11	0	TON	Asphalt Conc. Pavement CL. B	\$85.00	\$0	0.00%	
12	995	CY	Structure Excav Class B Incl Haul	\$30.00	\$29,850.00	24.77%	<b>PROJECT ASSUMPTIONS:</b> Structure Excavation Class B including haul and
13	0	TON	Select Borrow Incl. Haul	\$10.00	\$0.00	0.00%	Topsoil based on 1.5-ft thickness.
14	995	CY	Topsoil	\$40.00	\$39,800.00	33.03%	Three structures to have interior joints grouted based on City storm drain map book. Four hours per structure for mobilization, pump out, ventilation, ventilation, safety equipment, clean joints.
15	0	LF	Corrugated PE Storm Sewer Pipe, 12-Inch Diam.	\$35.00	\$0	0.00%	Two people per structure.
16	0	LF	Corrugated PE Storm Sewer Pipe, 18-Inch Diam.	\$50.00	\$0	0.00%	
17	0	LF	Corrugated PE Storm Sewer Pipe, 24-Inch Diam.	\$60.00	\$0	0.00%	
18	0	LF	Corrugated PE Storm Sewer Pipe, 30-Inch Diam.	\$70.00	\$0	0.00%	
19	0	LF	Corrugated PE Storm Sewer Pipe, 36-Inch Diam.	\$75.00	\$0	0.00%	
20	0	LF	Corrugated PE Storm Sewer Pipe, 42-Inch Diam.	\$85.00	\$0.00	0.00%	
21	0	LF	Corrugated PE Storm Sewer Pipe, 48-Inch Diam.	\$100.00	\$0	0.00%	
22	0	LF	RC Storm Sewer Pipe, 36-Inch Diam.	\$130.00	\$0	0.00%	
23	0	LF	RC Storm Sewer Pipe, 42-Inch Diam.	\$150.00	\$0.00	0.00%	
24	0	LF	RC Storm Sewer Pipe, 48-Inch Diam.	\$175.00	\$0	0.00%	
25	0	LF	12-inch SD, CI V RCP	\$250.00	\$0.00	0.00%	
26	0	EA	Catch Basin Type I	\$950.00	\$0	0.00%	
27	0	EA	Catch Basin Type II	\$1,500.00	\$0	0.00%	
28	0	EA	Catch Basin Type II, 48-Inch Diam.	\$3,500.00	\$0	0.00%	
29	0	EA	Catch Basin Type II, 54-Inch Diam.	\$4,500.00	\$0.00	0.00%	
30	0	EA	Catch Basin Type II, 60-Inch Diam.	\$4,500.00	\$0	0.00%	
31	0	EA	Catch Basin Type II, 72-Inch Diam. w/Tide Flex	\$8,500.00	\$0	0.00%	
32	0	EA	Catch Basin Type II, 84-Inch Diam.	\$10,000.00	\$0	0.00%	
33	0	EA	Catch Basin Type II, 96-Inch Diam. w/Tide Flex	\$15,000.00	\$0	0.00%	
34	0	EA	F&I 12-inch Tide Flex	\$2,000.00	\$0.00	0.00%	
35	0	EA	F&I 36-inch Tide Flex	\$12,000.00	\$0.00	0.00%	
36	0	EA	Tideflex valve for 42-inch ID Conc. Pipe	\$12,000.00	\$0.00	0.00%	
37	0	EA	F&E 48-inch Tide Flex valves	\$11,000.00	\$0.00	0.00%	
38	0	TON	Riprap	\$40.00	\$0.00	0.00%	
39	0	EA	Adjust existing manhole rim	\$4,000.00	\$0.00	0.00%	
40	0	EA	Connect to existing manhole	\$2,000.00	\$0.00	0.00%	
41	1	LS	Dewatering	\$1,000.00	\$1,000.00	0.83%	
42	0	CY	Bioretention/bioinfiltration soil mix	\$50.00	\$0.00	0.00%	
43	0	EA	Connect to Existing Storm	\$3,000.00	\$0.00	0.00%	
44	0	LS	Plantings/Landscape	\$10,000.00	\$0.00	0.00%	
45	3	EA	Grout Existing Structures	500	\$1,500	1.24%	
			<b>Subtotal =</b>		<b>\$120,490</b>	<b>100.00%</b>	
			Contingency	30.0%	\$36,147		
			Sales Tax	8.8%	\$10,603		
			<b>Planning Level Construction Cost =</b>		<b>\$167,200</b>		
		AC	Property Acquisition		\$0.00		Project Priority: Medium
			Environmental Permitting and Documentation	10.0%	\$16,720		Priority Schedule: High: 2010 - 2012 Medium: 2013 - 2015 Low: 2016 - 2029
			Surveying	3.3%	\$5,448		
			Administration	5.0%	\$8,360		
			Preliminary Engineering, PS&E Engineering and Construction Management	30.0%	\$50,160		
			<b>TOTAL =</b>		<b>\$248,000</b>		
			<b>GENERAL ASSUMPTIONS:</b>				
			Mobilization including staging area, equals approximately 20-percent of Subtotal				
			Trench Safety equals approximately 2-percent of Subtotal (\$1000 minimum)				
			CSTC installed at minimum 6-inch compacted depth	0.50			
			ACP installed at minimum 6-inch compacted depth	0.50			
			ACP density equals 2 tons/cy (approx)				
			ACP patch width is 4 feet				
			Pipe size and length is estimated only				
			Traffic control based on 2 persons @ \$35/hour plus additional \$40/day for any traffic control plan and 200 LF of piping installation per day				
			Estimate does not include obtaining land or easements				
			Riprap gradation:	Dmax = 24" nominal diameter			
				Dmedian = 16"			
				Dmin = 4"			
			Riprap includes underlying filter fabric				

CITY OF COVINGTON		2009 Comprehensive Stormwater Plan Update		PROJECT TYPE:		O&M	
Preliminary Opinion of Probable Cost		Checked By: J. Coop 6/23/09		PROJECT SIZE:		Small	
CIP #:	1026 - 2008007						
Project Name:	DP11024 Green Valley Park						
Prepared By:	C. Buitrago, 6/23/09						
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount	Percent of Construction Cost	PROJECT DESCRIPTION:
1	1	LS	Mobilization	\$31,000.00	\$31,000	16.69%	
2	0	DAY	Traffic Control	\$600.00	\$0	0.00%	Rebuild Pond: Muck out pond, re-establish inlet and outfall swales for culvert crossing and hydroseed.
3	1	LS	Restoration	\$1,500.00	\$1,500	0.81%	
4	1	LS	Trench Safety	\$3,000.00	\$3,000	1.62%	Acreage of pond parcel based on King County IMAF.
5	0.4	ACRE	Erosion/Sedimentation Control	\$50,000.00	\$20,000	10.77%	
6	0.4	ACRE	Clearing and Grubbing	\$10,000.00	\$4,000	2.15%	
7	0.4	ACRE	Seeding, Fertilizing and Mulching	\$4,000.00	\$1,600	0.86%	
8	0	LF	Saw Cutting	\$2.50	\$0	0.00%	
9	0	TON	Crushed Surfacing Top Course	\$25.00	\$0.00	0.00%	
10	19	TON	HMA For Pavement Repair Cl. 1/2In. P	\$150.00	\$2,850.00	1.53%	
11	0	TON	Asphalt Conc. Pavement Cl. B	\$85.00	\$0	0.00%	
12	1,615	CY	Structure Excav Class B Incl Haul	\$30.00	\$48,450.00	26.08%	
13	0	TON	Select Borrow Incl. Haul	\$10.00	\$0.00	0.00%	
14	970	CY	Topsoil	\$40.00	\$38,800.00	20.89%	
15	0	LF	Corrugated PE Storm Sewer Pipe, 12-Inch Diam.	\$35.00	\$0	0.00%	
16	0	LF	Corrugated PE Storm Sewer Pipe, 18-Inch Diam.	\$50.00	\$0	0.00%	
17	0	LF	Corrugated PE Storm Sewer Pipe, 24-Inch Diam.	\$60.00	\$0	0.00%	
18	0	LF	Corrugated PE Storm Sewer Pipe, 30-Inch Diam.	\$70.00	\$0	0.00%	
19	0	LF	Corrugated PE Storm Sewer Pipe, 36-Inch Diam.	\$75.00	\$0	0.00%	
20	0	LF	Corrugated PE Storm Sewer Pipe, 42-Inch Diam.	\$85.00	\$0.00	0.00%	
21	0	LF	Corrugated PE Storm Sewer Pipe, 48-Inch Diam.	\$100.00	\$0	0.00%	
22	0	LF	RC Storm Sewer Pipe, 36-Inch Diam.	\$130.00	\$0	0.00%	
23	0	LF	RC Storm Sewer Pipe, 42-Inch Diam.	\$150.00	\$0.00	0.00%	
24	0	LF	RC Storm Sewer Pipe, 48-Inch Diam.	\$175.00	\$0	0.00%	
25	0	LF	12-inch SD, CIV RCP	\$250.00	\$0.00	0.00%	
26	0	EA	Catch Basin Type I	\$950.00	\$0	0.00%	
27	0	EA	Catch Basin Type II	\$1,500.00	\$0	0.00%	
28	0	EA	Catch Basin Type II, 48-Inch Diam.	\$3,500.00	\$0	0.00%	
29	0	EA	Catch Basin Type II, 54-Inch Diam.	\$4,500.00	\$0.00	0.00%	
30	0	EA	Catch Basin Type II, 60-Inch Diam.	\$4,500.00	\$0	0.00%	
31	0	EA	Catch Basin Type II, 72-Inch Diam. w/Tide Flex	\$8,500.00	\$0	0.00%	
32	0	EA	Catch Basin Type II, 84-Inch Diam.	\$10,000.00	\$0	0.00%	
33	0	EA	Catch Basin Type II, 96-Inch Diam. w/Tide Flex	\$15,000.00	\$0	0.00%	
34	0	EA	F&I 12-inch Tide Flex	\$2,000.00	\$0.00	0.00%	
35	0	EA	F&I 36-inch Tide Flex	\$12,000.00	\$0.00	0.00%	
36	0	EA	Tideflex valve for 42-inch ID Conc. Pipe	\$12,000.00	\$0.00	0.00%	
37	0	EA	F&E 48-inch Tide Flex valves	\$11,000.00	\$0.00	0.00%	
38	16	TON	Riprap	\$50.00	\$800.00	0.43%	
39	0	EA	Adjust existing manhole rim	\$4,000.00	\$0.00	0.00%	
40	0	EA	Connect to existing manhole	\$2,000.00	\$0.00	0.00%	
41	645	CY	Bioretention/bioinfiltration soil mix	\$50.00	\$32,250.00	17.36%	
42	0	EA	Connect to Existing Storm	\$3,000.00	\$0.00	0.00%	
43	0	LS	Plantings/Landscape	\$10,000.00	\$0.00	0.00%	
44	1	Day	Clean storm drain	1500	\$1,500	0.81%	
				<b>Subtotal =</b>	<b>\$185,750</b>	<b>100.00%</b>	
				Contingency	30.0%		
				Sales Tax	\$55,725		
					\$16,346		
				<b>Planning Level Construction Cost =</b>	<b>\$257,800</b>		
				Property Acquisition	\$0.00		Project Priority: Medium
				Environmental Permitting and Documentation	\$25,780		Priority Schedule:
				Surveying	10.0%		High: 2010 - 2012
				Administration	2.3%		Medium: 2013 - 2015
				Engineering and Construction Management	\$12,890		Low: 2016 - 2029
					\$77,340		
				<b>TOTAL =</b>	<b>\$380,000</b>		
<b>GENERAL ASSUMPTIONS:</b>							
Mobilization including staging area, equals approximately 20-percent of Subtotal							
Trench Safety equals approximately 2-percent of Subtotal (\$1000 minimum)							
CSTC installed at minimum 6-inch compacted depth							
ACP installed at minimum 6-inch compacted depth							
ACP density equals 2 tons/cy (approx)							
ACP patch width is 4 feet							
Pipe size and length is estimated only							
Traffic control based on 2 persons @ \$35/hour plus additional \$40/day for any traffic control plan and 200 LF of piping installation per day							
Estimate does not include obtaining land or easements							
Riprap gradation:							
Dmax = 24" nominal diameter							
Dmedian = 16"							
Dmin = 4"							
Riprap includes underlying filter fabric							

CITY OF COVINGTON		2009 Comprehensive Stormwater Plan Update		PROJECT TYPE:		O&M	
Preliminary Opinion of Probable Cost		PROJECT SIZE:		Amount		Small	
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount	Percent of Construction Cost	PROJECT DESCRIPTION:
1	1	LS	Mobilization	\$31,300.00	\$31,300	16.65%	
2	1	DAY	Traffic Control	\$600.00	\$600	0.32%	Rebuild pond: Remove of excessive vegetation, strip and replace side slopes and hydroseed.
3	0	LS	Restoration	\$1,600.00	\$0	0.00%	
4	1	LS	Trench Safety	\$3,100.00	\$3,100	1.65%	Acreege of pond parcel based on King County IMAP.
5	0.58	ACRE	Erosion/Sedimentation Control	\$50,000.00	\$29,000	15.43%	Includes allowance for pipe and structures.
6	0.58	ACRE	Clearing and Grubbing - heavy vegetation	\$20,000.00	\$11,600	6.17%	
7	0.58	ACRE	Seeding, Fertilizing and Mulching	\$4,000.00	\$2,320	1.23%	
8	0	LF	Saw Cutting	\$2.50	\$0	0.00%	
9	0	TON	Crushed Surfacing Top Course	\$25.00	\$0.00	0.00%	
10	8	TON	HMA For Pavement Repair Cl. 1/2In. P	\$150.00	\$1,200.00	0.64%	
11	0	TON	Asphalt Conc. Pavement CL. B	\$85.00	\$0	0.00%	
12	1,405	CY	Structure Excav Class B Incl Haul	\$30.00	\$42,150.00	22.42%	
13	0	TON	Select Borrow Incl. Haul	\$10.00	\$0.00	0.00%	
14	1,405	CY	Topsoil	\$40.00	\$56,200.00	29.90%	
15	100	LF	Corrugated PE Storm Sewer Pipe, 12-Inch Diam.	\$35.00	\$3,500	1.86%	
16	0	LF	Corrugated PE Storm Sewer Pipe, 18-Inch Diam.	\$50.00	\$0	0.00%	
17	0	LF	Corrugated PE Storm Sewer Pipe, 24-Inch Diam.	\$60.00	\$0	0.00%	
18	0	LF	Corrugated PE Storm Sewer Pipe, 30-Inch Diam.	\$70.00	\$0	0.00%	
19	0	LF	Corrugated PE Storm Sewer Pipe, 36-Inch Diam.	\$75.00	\$0	0.00%	
20	0	LF	Corrugated PE Storm Sewer Pipe, 42-Inch Diam.	\$85.00	\$0.00	0.00%	
21	0	LF	Corrugated PE Storm Sewer Pipe, 48-Inch Diam.	\$100.00	\$0	0.00%	
22	0	LF	RC Storm Sewer Pipe, 36-Inch Diam.	\$130.00	\$0	0.00%	
23	0	LF	RC Storm Sewer Pipe, 42-Inch Diam.	\$150.00	\$0.00	0.00%	
24	0	LF	RC Storm Sewer Pipe, 48-Inch Diam.	\$175.00	\$0	0.00%	
25	0	LF	12-inch SD, CI V RCP	\$250.00	\$0.00	0.00%	
26	0	EA	Catch Basin Type I	\$950.00	\$0	0.00%	
27	0	EA	Catch Basin Type IL	\$1,500.00	\$0	0.00%	
28	2	EA	Catch Basin Type II, 48-Inch Diam.	\$3,500.00	\$7,000	3.72%	
29	0	EA	Catch Basin Type II, 54-Inch Diam.	\$4,500.00	\$0.00	0.00%	
30	0	EA	Catch Basin Type II, 60-Inch Diam.	\$4,500.00	\$0	0.00%	
31	0	EA	Catch Basin Type II, 72-Inch Diam. w/Tide Flex	\$8,500.00	\$0	0.00%	
32	0	EA	Catch Basin Type II, 84-Inch Diam.	\$10,000.00	\$0	0.00%	
33	0	EA	Catch Basin Type II, 96-Inch Diam. w/Tide Flex	\$15,000.00	\$0	0.00%	
34	0	EA	F&I 12-inch Tide Flex	\$2,000.00	\$0.00	0.00%	
35	0	EA	F&I 16-inch Tide Flex	\$12,000.00	\$0.00	0.00%	
36	0	EA	Tideflex valve for 42-inch ID Conc. Pipe	\$12,000.00	\$0.00	0.00%	
37	0	EA	F&E 48-inch Tide Flex valves	\$11,000.00	\$0.00	0.00%	
38	0	TON	Riprap	\$40.00	\$0.00	0.00%	
39	0	EA	Adjust existing manhole rim	\$4,000.00	\$0.00	0.00%	
40	0	EA	Connect to existing manhole	\$2,000.00	\$0.00	0.00%	
41	0	CY	Biotention/bioinfiltration soil mix	\$50.00	\$0.00	0.00%	
42	0	EA	Connect to Existing Storm	\$3,000.00	\$0.00	0.00%	
43	0	LS	Plantings/Landscape	\$10,000.00	\$0.00	0.00%	
44	0	LS	WQ Facility	0	\$0	0.00%	
				<b>Subtotal =</b>	<b>\$187,970</b>	<b>100.00%</b>	
				Contingency	30.0%	\$56,391	
				Sales Tax	8.8%	\$16,541	
				<b>Planning Level Construction Cost =</b>	<b>\$260,900</b>		
				Property Acquisition	\$0.00		Project Priority: Medium
				Environmental Permitting and Documentation	\$0.00		Priority Schedule:
				Surveying	10.0%	\$26,090	High: 2010 - 2012
				Administration	2.3%	\$6,033	Medium: 2013 - 2015
				Preliminary Engineering, PS&E Engineering and Construction Management	5.0%	\$13,045	Low: 2016 - 2029
					30.0%	\$78,270	
				<b>TOTAL =</b>	<b>\$384,000</b>		
<b>GENERAL ASSUMPTIONS:</b>							
Mobilization including staging area, equals approximately 20-percent of Subtotal							
Trench Safety equals approximately 2-percent of Subtotal (\$1000 minimum)							
CSTC installed at minimum 6-inch compacted depth							
ACP installed at minimum 6-inch compacted depth							
ACP density equals 2 tons/cy (approx)							
ACP patch width is 4 feet							
Pipe size and length is estimated only							
Traffic control based on 2 persons @ \$35/hour plus additional \$40/day for any traffic control plan and 200 LF of piping installation per day							
Estimate does not include obtaining land or easements							
Riprap gradation: Dmax = 24" nominal diameter							
Dmedian = 16"							
Dmin = 4"							
Riprap includes underlying filter fabric							

CITY OF COVINGTON		2009 Comprehensive Stormwater Plan Update		PROJECT TYPE:		O&M	
Preliminary Opinion of Probable Cost		Checked By: J. Coop 6/23/09		PROJECT SIZE:		Small	
CIP #:	1026 - 2008009	Project Name:	DP11010 Emerald Downs	Unit Cost	Amount	Percent of Construction Cost	PROJECT DESCRIPTION:
Prepared By:	C. Bufrago, 6/23/09	Description	Unit	Unit Cost	Amount	Percent of Construction Cost	PROJECT DESCRIPTION:
1	1	LS Mobilization	LS	\$29,800.00	\$29,800	16.66%	
2	1	DAY Traffic Control	DAY	\$600.00	\$600	0.34%	Rebuild pond: Muck out pond and re-establish low flow channel and hydroseed.
3	0	LS Restoration	LS	\$1,500.00	\$0	0.00%	
4	1	LS Trench Safety	LS	\$2,900.00	\$2,900	1.62%	
5	0.53	ACRE Erosion/Sedimentation Control	ACRE	\$50,000.00	\$26,500	14.82%	Acreage of pond parcel based on King County IMAP.
6	0.53	ACRE Clearing and Grubbing	ACRE	\$10,000.00	\$5,300	2.96%	Includes allowance for pipe and structures.
7	0.53	ACRE Seeding, Fertilizing and Mulching	ACRE	\$4,000.00	\$2,120	1.19%	
8	0	LF Saw Cutting	LF	\$2.50	\$0	0.00%	
9	0	TON Crushed Surfacing Top Course	TON	\$25.00	\$0.00	0.00%	
10	0	TON HMA For Pavement Repair Cl. 1/2In. P	TON	\$150.00	\$0.00	0.00%	
11	0	TON Asphalt Conc. Pavement CL. B	TON	\$85.00	\$0	0.00%	
12	1,285	CY Structure Excav Class B Incl Haul	CY	\$30.00	\$38,550.00	21.55%	
13	0	TON Select Borrow Incl. Haul	TON	\$10.00	\$0.00	0.00%	
14	1,285	CY Topsoil	CY	\$40.00	\$51,400.00	28.74%	
15	50	LF Corrugated PE Storm Sewer Pipe, 12-Inch Diam.	LF	\$35.00	\$1,750	0.98%	<b>PROJECT ASSUMPTIONS:</b>
16	0	LF Corrugated PE Storm Sewer Pipe, 18-Inch Diam.	LF	\$50.00	\$0	0.00%	Fence around perimeter of site. WSDOT Type 3 fence, 6-ft height.
17	0	LF Corrugated PE Storm Sewer Pipe, 24-Inch Diam.	LF	\$60.00	\$0	0.00%	
18	0	LF Corrugated PE Storm Sewer Pipe, 30-Inch Diam.	LF	\$70.00	\$0	0.00%	
19	50	LF Corrugated PE Storm Sewer Pipe, 36-Inch Diam.	LF	\$75.00	\$3,750	2.10%	
20	0	LF Corrugated PE Storm Sewer Pipe, 42-Inch Diam.	LF	\$85.00	\$0.00	0.00%	
21	0	LF Corrugated PE Storm Sewer Pipe, 48-Inch Diam.	LF	\$100.00	\$0	0.00%	
22	0	LF RC Storm Sewer Pipe, 36-Inch Diam.	LF	\$130.00	\$0	0.00%	
23	0	LF RC Storm Sewer Pipe, 42-Inch Diam.	LF	\$150.00	\$0.00	0.00%	
24	0	LF RC Storm Sewer Pipe, 48-Inch Diam.	LF	\$175.00	\$0	0.00%	
25	0	LF 12-inch SD, CIV RCP	LF	\$250.00	\$0.00	0.00%	
26	0	EA Catch Basin Type I	EA	\$950.00	\$0	0.00%	
27	0	EA Catch Basin Type II	EA	\$1,500.00	\$0	0.00%	
28	2	EA Catch Basin Type II, 48-Inch Diam.	EA	\$3,500.00	\$7,000	3.91%	
29	0	EA Catch Basin Type II, 54-Inch Diam.	EA	\$4,500.00	\$0.00	0.00%	
30	0	EA Catch Basin Type II, 60-Inch Diam.	EA	\$4,500.00	\$0	0.00%	
31	0	EA Catch Basin Type II, 72-Inch Diam. w/Tide Flex	EA	\$8,500.00	\$0	0.00%	
32	0	EA Catch Basin Type II, 84-Inch Diam.	EA	\$10,000.00	\$0	0.00%	
33	0	EA Catch Basin Type II, 96-Inch Diam. w/Tide Flex	EA	\$15,000.00	\$0	0.00%	
34	380	LF Coated Chain Link Fence	LF	\$15.00	\$5,700.00	3.19%	
35	1	EA Double 20-ft Coated Chain Link Gate	EA	\$1,200.00	\$1,200.00	0.67%	
36	0	EA Tidellex valve for 42-inch ID Conc. Pipe	EA	\$12,000.00	\$0.00	0.00%	
37	0	EA F&E 48-inch Tide Flex valves	EA	\$11,000.00	\$0.00	0.00%	
38	32	TON Riprap	TON	\$40.00	\$1,280.00	0.72%	
39	0	EA Adjust existing manhole rim	EA	\$4,000.00	\$0.00	0.00%	
40	0	EA Connect to existing manhole	EA	\$2,000.00	\$0.00	0.00%	
41	1	LS Dewatering	LS	\$1,000.00	\$1,000.00	0.56%	
42	0	CY Bioretention/bioinfiltration soil mix	CY	\$50.00	\$0.00	0.00%	
43	0	EA Connect to Existing Storm	EA	\$3,000.00	\$0.00	0.00%	
44	0	LS Plantings/Landscape	LS	\$10,000.00	\$0.00	0.00%	
45	0	LS WQ Facility	LS	0	\$0	0.00%	
				<b>Subtotal =</b>	<b>\$178,850</b>	<b>100.00%</b>	
				Contingency	30.0%	\$53,655	
				Sales Tax	8.8%	\$15,739	
				<b>Planning Level Construction Cost =</b>	<b>\$248,200</b>		
				Property Acquisition	\$0.00		Project Priority: Medium
				Environmental Permitting and Documentation	10.0%	\$24,820	Priority Schedule:
				Surveying	2.4%	\$5,964	High: 2010 - 2012
				Administration	5.0%	\$12,410	Medium: 2013 - 2015
				Preliminary Engineering, PS&E Engineering and Construction Management	30.0%	\$74,460	Low: 2016 - 2029
				<b>TOTAL =</b>	<b>\$366,000</b>		
<b>GENERAL ASSUMPTIONS:</b>							
Mobilization including staging area, equals approximately 20-percent of Subtotal							
Trench Safety equals approximately 2-percent of Subtotal (\$1000 minimum)							
CSTC installed at minimum 6-inch compacted depth							
ACP installed at minimum 6-inch compacted depth							
ACP density equals 2 tons/cy (approx)							
ACP patch width is 4 feet							
Pipe size and length is estimated only							
Traffic control based on 2 persons @ \$35/hour plus additional \$40/day for any traffic control plan and 200 LF of piping installation per day							
Estimate does not include obtaining land or easements							
Riprap gradation:							
Dmax = 24" nominal diameter							
Dmedian = 16"							
Dmin = 4"							
Riprap includes underlying filter fabric							

CITY OF COVINGTON		2009 Comprehensive Stormwater Plan Update		PROJECT TYPE:			
Preliminary Opinion of Probable Cost		Checked By: J. Coop 6/23/09		Capital Large			
CIP #:	1026 - 2008010			PROJECT SIZE:			
Project Name:	DT11045 Pioneer Ridge/High Point						
Prepared By:	C. Buitrago, 6/23/09						
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount	Percent of Construction Cost	PROJECT DESCRIPTION:
1	1	LS	Mobilization	\$40,500.00	\$40,500	16.66%	
2	1	DAY	Traffic Control	\$600.00	\$600	0.25%	Existing facility outfall swale on road embankment slope has failed. Replaces treatment function of swale with new treatment approach to reduce on-going erosion of road embankment and provide a more readily maintainable treatment system.
3	1	LS	Restoration	\$2,000.00	\$2,000	0.82%	
4	1	LS	Trench Safety	\$3,900.00	\$3,900	1.60%	
5	0	ACRE	Erosion/Sedimentation Control	\$50,000.00	\$0	0.00%	
6	0.0	ACRE	Clearing and Grubbing	\$10,000.00	\$0	0.00%	
7	0.0	ACRE	Seeding, Fertilizing and Mulching	\$4,000.00	\$0	0.00%	
8	340	LF	Saw Cutting	\$2.50	\$850	0.35%	
9	350	TON	Crushed Surfacing Top Course	\$25.00	\$8,750.00	3.60%	
10		TON	HMA For Pavement Repair Cl. 1/2In. P	\$150.00	\$0.00	0.00%	
11	260	TON	Asphalt Conc. Pavement CL. B	\$85.00	\$22,100	9.09%	
12	230	CY	Structure Excav Class B Incl Haul	\$30.00	\$6,900.00	2.84%	
13	0	TON	Select Borrow Incl. Haul	\$10.00	\$0.00	0.00%	
14	0	CY	Topsoil	\$40.00	\$0.00	0.00%	
15	200	LF	Corrugated PE Storm Sewer Pipe, 12-Inch Diam.	\$35.00	\$7,000	2.88%	
16	0	LF	Corrugated PE Storm Sewer Pipe, 18-Inch Diam.	\$50.00	\$0	0.00%	
17	0	LF	Corrugated PE Storm Sewer Pipe, 24-Inch Diam.	\$60.00	\$0	0.00%	
18	0	LF	Corrugated PE Storm Sewer Pipe, 30-Inch Diam.	\$70.00	\$0	0.00%	
19	0	LF	Corrugated PE Storm Sewer Pipe, 36-Inch Diam.	\$75.00	\$0	0.00%	
20	0	LF	Corrugated PE Storm Sewer Pipe, 42-Inch Diam.	\$85.00	\$0.00	0.00%	
21	0	LF	Corrugated PE Storm Sewer Pipe, 48-Inch Diam.	\$100.00	\$0	0.00%	
22	0	LF	RC Storm Sewer Pipe, 48-Inch Diam.	\$130.00	\$0	0.00%	
23	0	LF	RC Storm Sewer Pipe, 36-Inch Diam.	\$150.00	\$0	0.00%	
24	0	LF	RC Storm Sewer Pipe, 42-Inch Diam.	\$175.00	\$0	0.00%	
25	0	LF	12-inch SD, CI V RCP	\$250.00	\$0.00	0.00%	
26	0	EA	Catch Basin Type I	\$950.00	\$0	0.00%	
27	0	EA	Catch Basin Type IL	\$1,500.00	\$0	0.00%	
28	5	EA	Catch Basin Type II, 48-Inch Diam.	\$3,500.00	\$17,500	7.20%	
29	0	EA	Catch Basin Type II, 54-Inch Diam.	\$4,500.00	\$0.00	0.00%	
30	0	EA	Catch Basin Type II, 60-Inch Diam.	\$4,500.00	\$0	0.00%	
31	0	EA	Catch Basin Type II, 72-Inch Diam. w/Tide Flex	\$8,500.00	\$0	0.00%	
32	0	EA	Catch Basin Type II, 84-Inch Diam.	\$10,000.00	\$0	0.00%	
33	0	EA	Catch Basin Type II, 96-Inch Diam. w/Tide Flex	\$15,000.00	\$0	0.00%	
34	0	EA	F&I 12-inch Tide Flex	\$2,000.00	\$0.00	0.00%	
35	0	EA	F&I 36-inch Tide Flex	\$12,000.00	\$0.00	0.00%	
36	0	EA	Tideflex valve for 42-inch ID Conc. Pipe	\$12,000.00	\$0.00	0.00%	
37	0	EA	F&E 48-inch Tide Flex valves	\$11,000.00	\$0.00	0.00%	
38	0	TON	Riprap	\$40.00	\$0.00	0.00%	
39	0	EA	Adjust existing manhole rim	\$4,000.00	\$0.00	0.00%	
40	0	EA	Connect to existing manhole	\$2,000.00	\$0.00	0.00%	
41	0	CY	Bioretention/bioinfiltration soil mix	\$50.00	\$0.00	0.00%	
42	0	EA	Connect to Existing Storm	\$3,000.00	\$0.00	0.00%	
43	0	LS	Plantings/Landscape	\$10,000.00	\$0.00	0.00%	
44	1	LS	WQ Facility	133050	\$133,050	54.72%	
			<b>Subtotal =</b>		<b>\$243,150</b>	<b>100.00%</b>	
			Contingency	30.0%	\$72,945		
			Sales Tax	8.8%	\$21,397		
			<b>Planning Level Construction Cost =</b>		<b>\$337,500</b>		
		AC	Property Acquisition		\$0.00		Project Priority: Medium
			Environmental Permitting and Documentation	10.0%	\$33,750		Priority Schedule:
			Surveying	1.9%	\$6,400		High: 2010 - 2012
			Administration	5.0%	\$16,875		Medium: 2013 - 2015
			Preliminary Engineering, PS&E Engineering and Construction Management	30.0%	\$101,250		Low: 2016 - 2029
			<b>TOTAL =</b>		<b>\$496,000</b>		
<b>GENERAL ASSUMPTIONS:</b>							
Mobilization including staging area, equals approximately 20-percent of Subtotal							
Trench Safety equals approximately 2-percent of Subtotal (\$1000 minimum)							
CSTC installed at minimum 6-inch compacted depth							
ACP installed at minimum 6-inch compacted depth							
ACP density equals 2 tons/cy (approx)							
ACP patch width is 4 feet							
Pipe size and length is estimated only							
Traffic control based on 2 persons @ \$35/hour plus additional \$40/day for any traffic control plan and 200 LF of piping installation per day							
Estimate does not include obtaining land or easements							
Riprap gradation:							
Dmax = 24" nominal diameter							
Dmedian = 16"							
Dmin = 4"							
Riprap includes underlying filter fabric							

CITY OF COVINGTON		2009 Comprehensive Stormwater Plan Update		PROJECT TYPE:		O&M	
Preliminary Opinion of Probable Cost				PROJECT SIZE:		Small	
CIP #:	1026 - 2008011						
Project Name:	DT11044 Pioneer Ridge/High Point						
Prepared By:	C. Bufrago, 6/23/09	Checked By: J. Coop 6/23/09					
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount	Percent of Construction Cost	PROJECT DESCRIPTION:
1	1	LS	Mobilization	\$25,600.00	\$25,600	16.67%	
2	1	DAY	Traffic Control	\$600.00	\$600	0.39%	
3	1	LS	Restoration	\$1,300.00	\$1,300	0.85%	Rebuild pond to as-built conditions. Muck out, clear bypass channel north of pond, and Hydroseed.
4	1	LS	Trench Safety	\$2,500.00	\$2,500	1.63%	
5	0.42	ACRE	Erosion/Sedimentation Control	\$50,000.00	\$21,000	13.67%	Acraege of pond parcel based on King County IMAP.
6	0.42	ACRE	Cleaning and Grubbing	\$10,000.00	\$4,200	2.73%	Includes allowance for pipe and structures.
7	0.42	ACRE	Seeding, Fertilizing and Mulching	\$4,000.00	\$1,680	1.09%	
8	0	LF	Saw Cutting	\$2.50	\$0	0.00%	
9	0	TON	Crushed Surfacing Top Course	\$25.00	\$0.00	0.00%	
10	16	TON	HMA For Pavement Repair Cl. 1/2In. P	\$150.00	\$2,400.00	1.56%	
11	0	TON	Asphalt Conc. Pavement Cl. B	\$85.00	\$0	0.00%	
12	1,015	CY	Structure Excav Class B Incl Haul	\$30.00	\$30,450.00	19.82%	
13	0	TON	Select Borrow Incl. Haul	\$10.00	\$0.00	0.00%	
14	1,015	CY	Topsoil	\$40.00	\$40,600.00	26.43%	
15	60	LF	Corrugated PE Storm Sewer Pipe, 12-Inch Diam.	\$35.00	\$2,100	1.37%	
16	0	LF	Corrugated PE Storm Sewer Pipe, 18-Inch Diam.	\$50.00	\$0	0.00%	
17	50	LF	Corrugated PE Storm Sewer Pipe, 24-Inch Diam.	\$60.00	\$3,000	1.95%	
18	0	LF	Corrugated PE Storm Sewer Pipe, 30-Inch Diam.	\$70.00	\$0	0.00%	
19	0	LF	Corrugated PE Storm Sewer Pipe, 36-Inch Diam.	\$75.00	\$0	0.00%	
20	0	LF	Corrugated PE Storm Sewer Pipe, 42-Inch Diam.	\$85.00	\$0.00	0.00%	
21	0	LF	Corrugated PE Storm Sewer Pipe, 48-Inch Diam.	\$100.00	\$0	0.00%	
22	0	LF	RC Storm Sewer Pipe, 36-Inch Diam.	\$130.00	\$0	0.00%	
23	0	LF	RC Storm Sewer Pipe, 42-Inch Diam.	\$150.00	\$0.00	0.00%	
24	0	LF	RC Storm Sewer Pipe, 48-Inch Diam.	\$175.00	\$0	0.00%	
25	0	LF	12-inch SD, CIV RCP	\$250.00	\$0.00	0.00%	
26	0	EA	Catch Basin Type I	\$950.00	\$0	0.00%	
27	0	EA	Catch Basin Type IL	\$1,500.00	\$0	0.00%	
28	2	EA	Catch Basin Type II, 48-Inch Diam.	\$3,500.00	\$7,000	4.56%	
29	0	EA	Catch Basin Type II, 54-Inch Diam.	\$4,500.00	\$0.00	0.00%	
30	0	EA	Catch Basin Type II, 60-Inch Diam.	\$4,500.00	\$0	0.00%	
31	0	EA	Catch Basin Type II, 72-Inch Diam. w/Tide Flex	\$8,500.00	\$0	0.00%	
32	0	EA	Catch Basin Type II, 84-Inch Diam.	\$10,000.00	\$0	0.00%	
33	0	EA	Catch Basin Type II, 96-Inch Diam. w/Tide Flex	\$15,000.00	\$0	0.00%	
34	2,035	SY	Geotextile liner under pond	\$5.00	\$10,175.00	6.62%	
35	0	EA	F&I 36-inch Tide Flex	\$12,000.00	\$0.00	0.00%	
36	0	EA	Tideflex valve for 42-inch ID Conc. Pipe	\$12,000.00	\$0.00	0.00%	
37	0	EA	F&E 48-inch Tide Flex valves	\$11,000.00	\$0.00	0.00%	
38	0	TON	Riprap	\$40.00	\$0.00	0.00%	
39	0	EA	Adjust existing manhole rim	\$4,000.00	\$0.00	0.00%	
40	0	EA	Connect to existing manhole	\$2,000.00	\$0.00	0.00%	
41	1	LS	Dewatering	\$1,000.00	\$1,000.00	0.65%	
42	0	CY	Bioretention/bioinfiltration soil mix	\$50.00	\$0.00	0.00%	
43	0	EA	Connect to Existing Storm	\$3,000.00	\$0.00	0.00%	
44	0	LS	Plantings/Landscape	\$10,000.00	\$0.00	0.00%	
45	0	LS	WQ Facility	0	\$0	0.00%	
				<b>Subtotal =</b>	<b>\$153,605</b>	<b>100.00%</b>	
				Contingency	30.0%	\$46,082	
				Sales Tax	8.8%	\$13,517	
				<b>Planning Level Construction Cost =</b>	<b>\$213,200</b>		
				AC	Property Acquisition	\$0.00	Project Priority: Medium
					Environmental Permitting and Documentation		Priority Schedule:
					Surveying	\$21,320	High: 2010 - 2012
					Administration	\$5,760	Medium: 2013 - 2015
					Preliminary Engineering, PS&E Engineering and Construction Management	\$10,660	Low: 2016 - 2029
						\$63,960	
				<b>TOTAL =</b>	<b>\$315,000</b>		
<b>GENERAL ASSUMPTIONS:</b>							
Mobilization including staging area, equals approximately 20-percent of Subtotal							
Trench Safety equals approximately 2-percent of Subtotal (\$1000 minimum)							
CSTC installed at minimum 6-inch compacted depth							
ACP installed at minimum 6-inch compacted depth							
ACP density equals 2 tons/cy (approx)							
ACP patch width is 4 feet							
Pipe size and length is estimated only							
Traffic control based on 2 persons @ \$35/hour plus additional \$40/day for any traffic control plan and 200 LF of piping installation per day							
Estimate does not include obtaining land or easements							
Riprap gradation:							
Dmax = 24" nominal diameter							
Dmedian = 16"							
Dmin = 4"							
Riprap includes underlying filter fabric							

CITY OF COVINGTON		2009 Comprehensive Stormwater Plan Update		PROJECT TYPE:		O&M	
Preliminary Opinion of Probable Cost		Checked By: J. Coop 6/23/09		PROJECT SIZE:		Small	
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount	Percent of Construction Cost	PROJECT DESCRIPTION:
CIP #:	1026 - 2008012						
Project Name:	DP11073 Allyssa Lane						
Prepared By:	C. Builtrago, 6/23/09						
1	1	LS	Mobilization	\$4,000.00	\$4,000	16.51%	
2	0	DAY	Traffic Control	\$600.00	\$0	0.00%	Removal of excessive vegetation and stabilize erosion at top of rocky.
3	0	LS	Restoration	\$200.00	\$0	0.00%	
4	1	LS	Trench Safety	\$1,000.00	\$1,000	4.13%	Acreage of pond parcel based on King County IMAP.
5	0.12	ACRE	Erosion/Sedimentation Control	\$50,000.00	\$6,000	24.76%	Includes allowance for pipe and structures.
6	0.12	ACRE	Clearing and Grubbing - heavy vegetation	\$20,000.00	\$2,400	9.91%	
7	0.12	ACRE	Seeding, Fertilizing and Mulching	\$4,000.00	\$480	1.98%	
8	0	LF	Saw Cutting	\$2.50	\$0	0.00%	
9	0	TON	Crushed Surfacing Top Course	\$25.00	\$0.00	0.00%	
10	0	TON	HMA For Pavement Repair Cl. 1/2In. P	\$150.00	\$0.00	0.00%	
11	0	TON	Asphalt Conc. Pavement CL. B	\$85.00	\$0	0.00%	
12	0	CY	Structure Excav Class B Incl Haul	\$30.00	\$0.00	0.00%	
13	60	TON	Select Borrow Incl. Haul	\$10.00	\$600.00	2.48%	
14	0	CY	Topsoil	\$40.00	\$0.00	0.00%	
15	50	LF	Corrugated PE Storm Sewer Pipe, 12-Inch Diam.	\$35.00	\$1,750	7.22%	<b>PROJECT ASSUMPTIONS:</b> Includes higher unit cost for clearing and grubbing due to larger vegetation and increased vegetation removal.
16	0	LF	Corrugated PE Storm Sewer Pipe, 18-Inch Diam.	\$50.00	\$0	0.00%	
17	0	LF	Corrugated PE Storm Sewer Pipe, 24-Inch Diam.	\$60.00	\$0	0.00%	Revegetation with hydroseeding for stabilization.
18	0	LF	Corrugated PE Storm Sewer Pipe, 30-Inch Diam.	\$70.00	\$0	0.00%	Revegetation with trees could result in damage to rocky similar to existing conditions.
19	0	LF	Corrugated PE Storm Sewer Pipe, 36-Inch Diam.	\$75.00	\$0	0.00%	
20	0	LF	Corrugated PE Storm Sewer Pipe, 42-Inch Diam.	\$85.00	\$0.00	0.00%	
21	0	LF	Corrugated PE Storm Sewer Pipe, 48-Inch Diam.	\$100.00	\$0	0.00%	
22	0	LF	RC Storm Sewer Pipe, 36-Inch Diam.	\$130.00	\$0	0.00%	
23	0	LF	RC Storm Sewer Pipe, 42-Inch Diam.	\$150.00	\$0.00	0.00%	
24	0	LF	RC Storm Sewer Pipe, 48-Inch Diam.	\$175.00	\$0	0.00%	
25	0	LF	12-inch SD, CIV RCP	\$250.00	\$0.00	0.00%	
26	0	EA	Catch Basin Type I	\$950.00	\$0	0.00%	
27	0	EA	Catch Basin Type II	\$1,500.00	\$0	0.00%	
28	2	EA	Catch Basin Type II, 48-Inch Diam.	\$3,500.00	\$7,000	28.89%	
29	0	EA	Catch Basin Type II, 54-Inch Diam.	\$4,500.00	\$0.00	0.00%	
30	0	EA	Catch Basin Type II, 60-Inch Diam.	\$4,500.00	\$0	0.00%	
31	0	EA	Catch Basin Type II, 72-Inch Diam. w/Tide Flex	\$8,500.00	\$0	0.00%	
32	0	EA	Catch Basin Type II, 84-Inch Diam.	\$10,000.00	\$0	0.00%	
33	0	EA	Catch Basin Type II, 96-Inch Diam. w/Tide Flex	\$15,000.00	\$0	0.00%	
34	0	EA	F&I 12-inch Tide Flex	\$2,000.00	\$0.00	0.00%	
35	0	EA	F&I 36-inch Tide Flex	\$12,000.00	\$0.00	0.00%	
36	0	EA	Tieflex valve for 42-inch ID Conc. Pipe	\$12,000.00	\$0.00	0.00%	
37	0	EA	F&E 48-inch Tide Flex valves	\$11,000.00	\$0.00	0.00%	
38	0	TON	Riprap	\$40.00	\$0.00	0.00%	
39	0	EA	Adjust existing manhole rim	\$4,000.00	\$0.00	0.00%	
40	0	EA	Connect to existing manhole	\$2,000.00	\$0.00	0.00%	
41	0	EA	PSIPE slope stabilization tree	\$20.00	\$0.00	0.00%	
41	1	LS	Dewatering	\$1,000.00	\$1,000.00	4.13%	
42	0	CY	Bioretention/bioinfiltration soil mix	\$50.00	\$0.00	0.00%	
43	0	EA	Connect to Existing Storm	\$3,000.00	\$0.00	0.00%	
44	0	LS	Plantings/Landscape	\$10,000.00	\$0.00	0.00%	
45	0	LS	WQ Facility	0	\$0	0.00%	
			<b>Subtotal =</b>		<b>\$24,230</b>	<b>100.00%</b>	
			Contingency	30.0%	\$7,269		
			Sales Tax	8.8%	\$2,132		
			<b>Planning Level Construction Cost =</b>		<b>\$33,600</b>		
		AC	Property Acquisition		\$0.00		Project Priority: Medium
			Environmental Permitting and Documentation	10.0%	\$3,360		High: 2010 - 2012
			Surveying	11.2%	\$3,769		Medium: 2013 - 2015
			Administration	5.0%	\$1,680		Low: 2016 - 2029
			Preliminary Engineering, PS&E Engineering and Construction Management	30.0%	\$10,080		
			<b>TOTAL =</b>		<b>\$52,000</b>		
<b>GENERAL ASSUMPTIONS:</b>							
Mobilization including staging area, equals approximately 20-percent of Subtotal							
Trench Safety equals approximately 2-percent of Subtotal (\$1000 minimum)							
CSTC installed at minimum 6-inch compacted depth							
ACP installed at minimum 6-inch compacted depth							
ACP density equals 2 tons/cy (approx)							
ACP patch width is 4 feet							
Pipe size and length is estimated only							
Traffic control based on 2 persons @ \$35/hour plus additional \$40/day for any traffic control plan and 200 LF of piping installation per day							
Estimate does not include obtaining land or easements							
Riprap gradation:							
Dmax = 24" nominal diameter							
Dmedian = 16"							
Dmin = 4"							
Riprap includes underlying filter fabric							

CITY OF COVINGTON		2009 Comprehensive Stormwater Plan Update		PROJECT TYPE:		PROJECT SIZE:	
Preliminary Opinion of Probable Cost				Capital		Small	
CIP #:	1026 - 2008013						
Project Name:	DP11083 The Reserve						
Prepared By:	C. Buitrago, 6/23/09	Checked By: J. Coop 6/23/09					
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount	Percent of Construction Cost	PROJECT DESCRIPTION:
1	1	LS	Mobilization	\$13,900.00	\$13,900	16.69%	
2	1	DAY	Traffic Control	\$600.00	\$600	0.72%	Remove willow tree growing in pond outlet.
3	0	LS	Restoration	\$700.00	\$0	0.00%	Includes allowance for pipe and structure in case of tree damage.
4	1	LS	Trench Safety	\$1,300.00	\$1,300	1.56%	
5	0.06	ACRE	Erosion/Sedimentation Control	\$50,000.00	\$3,000	3.60%	
6	0.06	ACRE	Clearing and Grubbing	\$10,000.00	\$600	0.72%	
7	0.06	ACRE	Seeding, Fertilizing and Mulching	\$4,000.00	\$240	0.29%	
8	0	LF	Saw Cutting	\$2.50	\$0	0.00%	
9	36	TON	Crushed Surfacing Top Course	\$25.00	\$900.00	1.08%	
10	37	TON	HMA For Pavement Repair Cl. 1/2In. P	\$150.00	\$5,550.00	6.66%	
11	0	TON	Asphalt Conc. Pavement CL. B	\$85.00	\$0	0.00%	
12	323	CY	Structure Excav Class B Incl Haul	\$30.00	\$9,690.00	11.64%	
13	0	TON	Select Borrow Incl. Haul	\$10.00	\$0.00	0.00%	
14	0	CY	Topsoil	\$40.00	\$0.00	0.00%	
15	100	LF	Corrugated PE Storm Sewer Pipe, 12-Inch Diam.	\$35.00	\$3,500	4.20%	
16	0	LF	Corrugated PE Storm Sewer Pipe, 18-Inch Diam.	\$50.00	\$0	0.00%	
17	0	LF	Corrugated PE Storm Sewer Pipe, 24-Inch Diam.	\$60.00	\$0	0.00%	
18	0	LF	Corrugated PE Storm Sewer Pipe, 30-Inch Diam.	\$70.00	\$0	0.00%	
19	0	LF	Corrugated PE Storm Sewer Pipe, 36-Inch Diam.	\$75.00	\$0	0.00%	
20	0	LF	Corrugated PE Storm Sewer Pipe, 42-Inch Diam.	\$85.00	\$0.00	0.00%	
21	0	LF	Corrugated PE Storm Sewer Pipe, 48-Inch Diam.	\$100.00	\$0	0.00%	
22	0	LF	RC Storm Sewer Pipe, 36-Inch Diam.	\$130.00	\$0	0.00%	
23	0	LF	RC Storm Sewer Pipe, 42-Inch Diam.	\$150.00	\$0.00	0.00%	
24	0	LF	RC Storm Sewer Pipe, 48-Inch Diam.	\$175.00	\$0	0.00%	
25	0	LF	12-inch SD, CIV RCP	\$250.00	\$0.00	0.00%	
26	0	EA	Catch Basin Type I	\$950.00	\$0	0.00%	
27	0	EA	Catch Basin Type II	\$1,500.00	\$0	0.00%	
28	0	EA	Catch Basin Type II, 48-Inch Diam.	\$3,500.00	\$0	0.00%	
29	0	EA	Catch Basin Type II, 54-Inch Diam.	\$4,500.00	\$0.00	0.00%	
30	0	EA	Catch Basin Type II, 60-Inch Diam.	\$4,500.00	\$0	0.00%	
31	2	EA	Catch Basin Type II, 72-Inch Diam.	\$6,000.00	\$12,000	14.41%	
32	0	EA	Catch Basin Type II, 84-Inch Diam.	\$10,000.00	\$0	0.00%	
33	0	EA	Catch Basin Type II, 96-Inch Diam. w/Tide Flex	\$15,000.00	\$0	0.00%	
34	10	CY	Concrete Retaining Wall	\$700.00	\$7,000.00	8.41%	
35	0	EA	F&I 36-inch Tide Flex	\$12,000.00	\$0.00	0.00%	
36	0	EA	Tideflex valve for 42-Inch ID Conc. Pipe	\$12,000.00	\$0.00	0.00%	
37	0	EA	F&E 48-inch Tide Flex valves	\$11,000.00	\$0.00	0.00%	
38	0	TON	Riprap	\$40.00	\$0.00	0.00%	
39	0	EA	Adjust existing manhole rim	\$4,000.00	\$0.00	0.00%	
40	0	EA	Connect to existing manhole	\$2,000.00	\$0.00	0.00%	
41	0	CY	Biotention/bioinfiltration soil mix	\$50.00	\$0.00	0.00%	
42	0	EA	Connect to Existing Storm	\$3,000.00	\$0.00	0.00%	
43	1	ALLOWANCE	Temporary shoring and dewatering	\$25,000.00	\$25,000.00	30.02%	
44	0	LS	WQ Facility	0	\$0	0.00%	
				<b>Subtotal =</b>	<b>\$83,280</b>	<b>100.00%</b>	
			Contingency	30.0%	\$24,984		
			Sales Tax	8.8%	\$7,329		
			<b>Planning Level Construction Cost =</b>		<b>\$115,600</b>		
		AC	Property Acquisition		\$0.00		Project Priority: High
			Environmental Permitting and Documentation	10.0%	\$11,560		High: 2010 - 2012
			Surveying	4.3%	\$5,005		Medium: 2013 - 2015
			Administration	5.0%	\$5,780		Low: 2016 - 2029
		Preliminary Engineering, PS&E Engineering and Construction Management		30.0%	\$34,680		
		Geotechnical engineering		10.0%	\$11,560		
			<b>TOTAL =</b>		<b>\$184,000</b>		
<b>GENERAL ASSUMPTIONS:</b>							
Mobilization including staging area, equals approximately 20-percent of Subtotal							
Trench Safety equals approximately 2-percent of Subtotal (\$1000 minimum)							
CSTC installed at minimum 6-inch compacted depth							
ACP installed at minimum 6-inch compacted depth							
ACP density equals 2 tons/cy (approx)							
ACP patch width is 4 feet							
Pipe size and length is estimated only							
Traffic control based on 2 persons @ \$35/hour plus additional \$40/day for any traffic control plan and 200 LF of piping installation per day							
Estimate does not include obtaining land or easements							
Riprap gradation: Dmax = 24" nominal diameter							
Dmedian = 16"							
Dmin = 4"							
Riprap includes underlying filter fabric							

CITY OF COVINGTON		2009 Comprehensive Stormwater Plan Update		PROJECT TYPE:		PROJECT SIZE:	
Preliminary Opinion of Probable Cost				Capital		Small	
CIP #:	1026 - 2008014	Checked By: J. Coop 6/23/09					
Project Name:	DP11050 Fairfield Pond						
Prepared By:	C. Buitrage, 6/23/09						
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount	Percent of Construction Cost	PROJECT DESCRIPTION:
1	1	LS	Mobilization	\$12,500.00	\$12,500	16.64%	
2	0	DAY	Traffic Control	\$600.00	\$0	0.00%	Stabilize erosion on SE 260th ST and remove vegetation from outlet.
3	0	LS	Restoration	\$600.00	\$0	0.00%	Repair outfall on south side of SE 260th ST.
4	1	LS	Trench Safety	\$1,200.00	\$1,200	1.60%	
5	0.012	ACRE	Erosion/Sedimentation Control	\$50,000.00	\$600	0.80%	
6	0.012	ACRE	Clearing and Grubbing	\$10,000.00	\$120	0.16%	
7	0.012	ACRE	Seeding, Fertilizing and Mulching	\$4,000.00	\$48	0.06%	
8	100	LF	Saw Cutting	\$2.50	\$250	0.33%	
9	14	TON	Crushed Surfacing Top Course	\$25.00	\$350.00	0.47%	
10	14	TON	HMA For Pavement Repair Cl. 1/2In. P	\$150.00	\$2,100.00	2.80%	
11	0	TON	Asphalt Conc. Pavement CL. B	\$85.00	\$0	0.00%	
12	100	CY	Structure Excav Class B Incl Haul	\$30.00	\$3,000.00	3.99%	
13	0	TON	Select Borrow Incl. Haul	\$10.00	\$0.00	0.00%	
14	0	CY	Topsoil	\$40.00	\$0.00	0.00%	
15	0	LF	Corrugated PE Storm Sewer Pipe, 12-Inch Diam.	\$35.00	\$0	0.00%	
16	0	LF	Corrugated PE Storm Sewer Pipe, 18-Inch Diam.	\$50.00	\$0	0.00%	
17	50	LF	Corrugated PE Storm Sewer Pipe, 24-Inch Diam.	\$60.00	\$3,000	3.99%	
18	0	LF	Corrugated PE Storm Sewer Pipe, 30-Inch Diam.	\$70.00	\$0	0.00%	
19	0	LF	Corrugated PE Storm Sewer Pipe, 36-Inch Diam.	\$85.00	\$0	0.00%	
20	0	LF	Corrugated PE Storm Sewer Pipe, 42-Inch Diam.	\$100.00	\$0	0.00%	
21	0	LF	Corrugated PE Storm Sewer Pipe, 48-Inch Diam.	\$130.00	\$0	0.00%	
22	0	LF	RC Storm Sewer Pipe, 36-Inch Diam.	\$150.00	\$0.00	0.00%	
23	0	LF	RC Storm Sewer Pipe, 42-Inch Diam.	\$175.00	\$0	0.00%	
24	0	LF	RC Storm Sewer Pipe, 48-Inch Diam.	\$250.00	\$0.00	0.00%	
25	0	LF	12-inch SD, C I V RCP	\$950.00	\$0	0.00%	
26	0	EA	Catch Basin Type I	\$1,500.00	\$0	0.00%	
27	0	EA	Catch Basin Type II	\$3,500.00	\$10,500	13.98%	
28	3	EA	Catch Basin Type II, 48-Inch Diam.	\$4,500.00	\$0.00	0.00%	
29	0	EA	Catch Basin Type II, 54-Inch Diam.	\$4,500.00	\$0.00	0.00%	
30	0	EA	Catch Basin Type II, 60-Inch Diam.	\$8,500.00	\$0	0.00%	
31	0	EA	Catch Basin Type II, 72-Inch Diam. w/Tide Flex	\$10,000.00	\$0	0.00%	
32	0	EA	Catch Basin Type II, 84-Inch Diam.	\$15,000.00	\$0	0.00%	
33	0	EA	Catch Basin Type II, 96-Inch Diam. w/Tide Flex	\$7.00	\$1,050.00	1.40%	
34	150	SF	Concrete sidewalk	\$10,000.00	\$10,000.00	13.31%	
35	1	EA	Pipe anchoring system	\$12,000.00	\$0.00	0.00%	
36	0	EA	Tideflex valve for 42-inch ID Conc. Pipe	\$11,000.00	\$0.00	0.00%	
37	0	EA	F&E 48-inch Tide Flex valves	\$40.00	\$5,400.00	7.19%	
38	135	TON	Riprap	\$4,000.00	\$0.00	0.00%	
39	0	EA	Adjust existing manhole rim	\$2,000.00	\$0.00	0.00%	
40	0	EA	Connect to existing manhole	\$1,000.00	\$0.00	0.00%	
41	0	LS	Vactoring	\$50.00	\$0.00	0.00%	
42	0	CY	Bioretention/bioinfiltration soil mix	\$3,000.00	\$0.00	0.00%	
43	0	EA	Connect to Existing Storm	\$25,000.00	\$25,000.00	33.28%	
44	1	LLOWANC	Temporary shoring and dewatering	0	\$0	0.00%	
45	0	LS	WQ Facility				
				<b>Subtotal =</b>	<b>\$75,118</b>	<b>100.00%</b>	
				Contingency	30.0%		
				Sales Tax	8.8%		
				<b>Planning Level Construction Cost =</b>	<b>\$104,300</b>		
				Property Acquisition	\$0.00		Project Priority: High
				Environmental Permitting and Documentation	10.0%		Priority Schedule:
				Surveying	4.7%		High: 2010 - 2012
				Administration	5.0%		Medium: 2013 - 2015
				Construction Management	30.0%		Low: 2016 - 2029
				Geotechnical engineering	10.0%		
				<b>TOTAL =</b>	<b>\$167,000</b>		
<b>GENERAL ASSUMPTIONS:</b>							
Mobilization including staging area, equals approximately 20-percent of Subtotal							
Trench Safety equals approximately 2-percent of Subtotal (\$1000 minimum)							
CSTC installed at minimum 6-inch compacted depth							
ACP installed at minimum 6-inch compacted depth							
ACP density equals 2 tons/cy (approx)							
ACP patch width is 4 feet							
Pipe size and length is estimated only							
Traffic control based on 2 persons @ \$35/hour plus additional \$40/day for any traffic control plan and 200 LF of piping installation per day							
Estimate does not include obtaining land or easements							
Riprap gradation: Dmax = 24" nominal diameter							
Dmedian = 16"							
Dmin = 4"							
Riprap includes underlying filter fabric							

CITY OF COVINGTON		2009 Comprehensive Stormwater Plan Update		PROJECT TYPE:		PROJECT SIZE:	
Preliminary Opinion of Probable Cost				Capital		Small	
CIP #:	1026 - 2008015						
Project Name:	CS11070 Terrace Park						
Prepared By:	C. Buitrago, 6/23/09	Checked By: J. Coop 6/23/09					
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount	Percent of Construction Cost	PROJECT DESCRIPTION:
1	1	LS	Mobilization	\$17,500.00	\$17,500	16.63%	
2	0	DAY	Traffic Control	\$600.00	\$0	0.00%	26311 156th Ave SE Reserve/Fairfield drainage course.
3	1	LS	Restoration	\$900.00	\$900	0.86%	Stabilize erosion to channel. Restore Salmon habitat.
4	1	LS	Trench Safety	\$1,700.00	\$1,700	1.62%	Includes allowance for pipe and structures.
5	0.14	ACRE	Erosion/Sedimentation Control	\$50,000.00	\$7,000	6.65%	
6	0.14	ACRE	Clearing and Grubbing	\$10,000.00	\$1,400	1.33%	
7	0.14	ACRE	Seeding, Fertilizing and Mulching	\$4,000.00	\$560	0.53%	
8	0	LF	Saw Cutting	\$2.50	\$0	0.00%	
9	13	TON	Crushed Surfacing Top Course	\$25.00	\$325.00	0.31%	
10	14	TON	HMA For Pavement Repair Cl. 1/2In. P	\$150.00	\$2,100.00	2.00%	
11	0	TON	Asphalt Conc. Pavement CL. B	\$85.00	\$0	0.00%	
12	255	CY	Structure Excav Class B Incl Haul	\$30.00	\$7,650.00	7.27%	
13	0	TON	Select Borrow Incl. Haul	\$10.00	\$0.00	0.00%	
14	0	CY	Topsoil	\$40.00	\$0.00	0.00%	
15	20	LF	Corrugated PE Storm Sewer Pipe, 12-Inch Diam.	\$35.00	\$700	0.67%	
16	0	LF	Corrugated PE Storm Sewer Pipe, 18-Inch Diam.	\$50.00	\$0	0.00%	
17	0	LF	Corrugated PE Storm Sewer Pipe, 24-Inch Diam.	\$60.00	\$0	0.00%	
18	0	LF	Corrugated PE Storm Sewer Pipe, 30-Inch Diam.	\$70.00	\$0	0.00%	
19	0	LF	Corrugated PE Storm Sewer Pipe, 36-Inch Diam.	\$75.00	\$0	0.00%	
20	0	LF	Corrugated PE Storm Sewer Pipe, 42-Inch Diam.	\$85.00	\$0	0.00%	
21	10	LF	Corrugated PE Storm Sewer Pipe, 48-Inch Diam.	\$100.00	\$1,000	0.95%	<b>PROJECT ASSUMPTIONS:</b> Work area = 200-ft length x 30-ft width
22	0	LF	RC Storm Sewer Pipe, 36-Inch Diam.	\$130.00	\$0	0.00%	162 Tons of streambed gravel
23	0	LF	RC Storm Sewer Pipe, 42-Inch Diam.	\$150.00	\$0	0.00%	8 Large woody debris
24	0	LF	RC Storm Sewer Pipe, 48-Inch Diam.	\$175.00	\$0	0.00%	100 Tree plantings
25	0	LF	12-inch SD, C I V RCP	\$250.00	\$0.00	0.00%	12-inch thickness of bioretention soil mix on side
26	0	EA	Catch Basin Type I	\$950.00	\$0	0.00%	slopes and disturbed areas.
27	0	EA	Catch Basin Type II	\$1,500.00	\$0	0.00%	6-ft channel bottom width, 8-inch typical water depth.
28	2	EA	Catch Basin Type II, 48-Inch Diam.	\$3,500.00	\$7,000	6.65%	12-inch thickness of structure excavation and streambed gravel.
29	0	EA	Catch Basin Type II, 54-Inch Diam.	\$4,500.00	\$0	0.00%	
30	0	EA	Catch Basin Type II, 60-Inch Diam.	\$4,500.00	\$0	0.00%	
31	0	EA	Catch Basin Type II, 72-Inch Diam. w/Tide Flex	\$8,500.00	\$0	0.00%	
32	0	EA	Catch Basin Type II, 84-Inch Diam.	\$10,000.00	\$0	0.00%	
33	0	EA	Catch Basin Type II, 96-Inch Diam. w/Tide Flex	\$15,000.00	\$0	0.00%	
34	0	EA	F&I 12-inch Tide Flex	\$2,000.00	\$0.00	0.00%	
35	0	EA	F&I 36-inch Tide Flex	\$12,000.00	\$0.00	0.00%	
36	0	EA	Tidelflex valve for 42-inch ID Conc. Pipe	\$12,000.00	\$0.00	0.00%	
37	0	EA	F&E 48-inch Tide Flex valves	\$11,000.00	\$0.00	0.00%	
38	0	TON	Riprap	\$40.00	\$0.00	0.00%	
39	0	EA	Adjust existing manhole rim	\$4,000.00	\$0.00	0.00%	
40	0	EA	Connect to existing manhole	\$2,000.00	\$0.00	0.00%	
41	200	LF	Habitat Restoration: streambed gravel, LWD, trees, plants, etc.	\$250.00	\$50,000.00	47.51%	
42	148	CY	Bioretention/bioinfiltration soil mix	\$50.00	\$7,400.00	7.03%	
43	0	EA	Connect to Existing Storm	\$3,000.00	\$0.00	0.00%	
44	0	LS	Plantings/Landscape	\$10,000.00	\$0.00	0.00%	
45	0	LS	WQ Facility	0	\$0	0.00%	
				<b>Subtotal =</b>	<b>\$105,235</b>	<b>100.00%</b>	
				Contingency	30.0%		
				Sales Tax	\$31,571		
				<b>Planning Level Construction Cost =</b>	<b>\$9,261</b>		
				Property Acquisition	\$0.00		Project Priority: Low
				Environmental Permitting and Documentation	\$0.00		Priority Schedule:
				Surveying	10.0%		High: 2010 - 2012
				Administration	3.6%		Medium: 2013 - 2015
				Preliminary Engineering, PS&E Engineering and Construction Management	5.0%		Low: 2016 - 2029
					30.0%		
				<b>TOTAL =</b>	<b>\$217,000</b>		
<b>GENERAL ASSUMPTIONS:</b>							
Mobilization including staging area, equals approximately 20-percent of Subtotal							
Trench Safety equals approximately 2-percent of Subtotal (\$1000 minimum)							
CSTC installed at minimum 6-inch compacted depth							
ACP installed at minimum 6-inch compacted depth							
ACP density equals 2 tons/cy (approx)							
ACP patch width is 4 feet							
Pipe size and length is estimated only							
Traffic control based on 2 persons @ \$35/hour plus additional \$40/day for any traffic control plan and 200 LF of piping installation per day							
Estimate does not include obtaining land or easements							
Riprap gradation: Dmax = 24" nominal diameter							
Dmedian = 16"							
Dmin = 4"							
Riprap includes underlying filter fabric							

CITY OF COVINGTON		2009 Comprehensive Stormwater Plan Update		PROJECT TYPE:		Capital	
Preliminary Opinion of Probable Cost		PROJECT SIZE:		Large			
CIP #:	1026 - 2008016	Checked By:	J. Coop 6/23/09	Unit Cost	Amount	Percent of Construction Cost	
Project Name:	DP21054 Foxwood Div 2	Description		Unit Cost	Amount	Percent of Construction Cost	
Prepared By:	C. Buitrago, 6/23/09	Description		Unit Cost	Amount	Percent of Construction Cost	
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount	Percent of Construction Cost	PROJECT DESCRIPTION:
1	1	LS	Mobilization	\$55,800.00	\$55,800	16.66%	
2	1	DAY	Traffic Control	\$600.00	\$600	0.18%	Rebuild pond: muck out 3 cell wet pond, remove of excessive vegetation and hydroseed.
3	0	LS	Restoration	\$2,800.00	\$0	0.00%	
4	1	LS	Trench Safety	\$5,500.00	\$5,500	1.64%	Acreage of pond parcel based on King County IMAP.
5	0.98	ACRE	Erosion/Sedimentation Control	\$50,000.00	\$49,000	14.63%	Includes allowance for pipe and structures.
6	0.98	ACRE	Clearing and Grubbing	\$10,000.00	\$9,800	2.93%	
7	0.98	ACRE	Seeding, Fertilizing and Mulching	\$4,000.00	\$3,920	1.17%	
8	0	LF	Saw Cutting	\$2.50	\$0	0.00%	
9	4	TON	Crushed Surfacing Top Course	\$25.00	\$100.00	0.03%	
10	4	TON	HMA For Pavement Repair Cl. 1/2In. P	\$150.00	\$600.00	0.18%	
11	0	TON	Asphalt Conc. Pavement CL. B	\$85.00	\$0	0.00%	
12	2,460	CY	Structure Excav Class B Incl Haul	\$30.00	\$73,800.00	22.04%	
13	0	TON	Select Borrow Incl. Haul	\$10.00	\$0.00	0.00%	
14	0	CY	Topsoil	\$40.00	\$0.00	0.00%	
15	150	LF	Corrugated PE Storm Sewer Pipe, 12-Inch Diam.	\$35.00	\$5,250	1.57%	
16	0	LF	Corrugated PE Storm Sewer Pipe, 18-Inch Diam.	\$50.00	\$0	0.00%	
17	50	LF	Corrugated PE Storm Sewer Pipe, 24-Inch Diam.	\$60.00	\$3,000	0.90%	
18	0	LF	Corrugated PE Storm Sewer Pipe, 30-Inch Diam.	\$70.00	\$0	0.00%	
19	0	LF	Corrugated PE Storm Sewer Pipe, 36-Inch Diam.	\$75.00	\$0	0.00%	
20	0	LF	Corrugated PE Storm Sewer Pipe, 42-Inch Diam.	\$85.00	\$0.00	0.00%	
21	0	LF	Corrugated PE Storm Sewer Pipe, 48-Inch Diam.	\$100.00	\$0	0.00%	
22	0	LF	RC Storm Sewer Pipe, 36-Inch Diam.	\$130.00	\$0	0.00%	
23	0	LF	RC Storm Sewer Pipe, 42-Inch Diam.	\$150.00	\$0.00	0.00%	
24	0	LF	RC Storm Sewer Pipe, 48-Inch Diam.	\$175.00	\$0	0.00%	
25	0	LF	12-inch SD, CI V RCP	\$250.00	\$0.00	0.00%	
26	0	EA	Catch Basin Type I	\$950.00	\$0	0.00%	
27	0	EA	Catch Basin Type II	\$1,500.00	\$0	0.00%	
28	2	EA	Catch Basin Type II, 48-Inch Diam.	\$3,500.00	\$7,000	2.09%	
29	0	EA	Catch Basin Type II, 54-Inch Diam.	\$4,500.00	\$0.00	0.00%	
30	0	EA	Catch Basin Type II, 60-Inch Diam.	\$4,500.00	\$0	0.00%	
31	0	EA	Catch Basin Type II, 72-Inch Diam. w/Tide Flex	\$8,500.00	\$0	0.00%	
32	0	EA	Catch Basin Type II, 84-Inch Diam.	\$10,000.00	\$0	0.00%	
33	0	EA	Catch Basin Type II, 96-Inch Diam. w/Tide Flex	\$15,000.00	\$0	0.00%	
34	0	EA	F&I 12-inch Tide Flex	\$2,000.00	\$0.00	0.00%	
35	0	EA	F&I 36-inch Tide Flex	\$12,000.00	\$0.00	0.00%	
36	0	EA	Tideflex valve for 42-inch ID Conc. Pipe	\$12,000.00	\$0.00	0.00%	
37	0	EA	F&E 48-inch Tide Flex valves	\$11,000.00	\$0.00	0.00%	
38	0	TON	Riprap	\$40.00	\$0.00	0.00%	
39	0	EA	Adjust existing manhole rim	\$4,000.00	\$0.00	0.00%	
40	0	EA	Connect to existing manhole	\$2,000.00	\$0.00	0.00%	
41	1	LS	Dewatering	\$2,000.00	\$2,000.00	0.60%	
42	2,370	CY	Bioretention/bioinfiltration soil mix	\$50.00	\$118,500.00	35.39%	
43	0	EA	Connect to Existing Storm	\$3,000.00	\$0.00	0.00%	
44	0	LS	Plantings/Landscape	\$10,000.00	\$0.00	0.00%	
45	0	LS	WQ Facility	0	\$0	0.00%	
				<b>Subtotal =</b>	<b>\$334,870</b>	<b>100.00%</b>	
				Contingency	30.0%	\$100,461	
				Sales Tax	8.8%	\$29,469	
				<b>Planning Level Construction Cost =</b>	<b>\$464,800</b>		
				Property Acquisition	\$0.00	\$0.00	Project Priority: Low
				Environmental Permitting and Documentation	10.0%	\$46,480	Priority Schedule:
				Surveying	1.5%	\$6,888	High: 2010 - 2012
				Administration	5.0%	\$23,240	Medium: 2013 - 2015
				Engineering and Construction Management	30.0%	\$139,440	Low: 2016 - 2029
				Geotechnical engineering	10.0%	\$46,480	
				<b>TOTAL =</b>	<b>\$727,000</b>		
<b>GENERAL ASSUMPTIONS:</b>							
Mobilization including staging area, equals approximately 20-percent of Subtotal							
Trench Safety equals approximately 2-percent of Subtotal (\$1000 minimum)							
CSTC installed at minimum 6-inch compacted depth							
ACP installed at minimum 6-inch compacted depth							
ACP density equals 2 tons/cy (approx)							
Pipe size and length is estimated only							
Traffic control based on 2 persons @ \$35/hour plus additional \$40/day for any traffic control plan and 200 LF of piping installation per day							
Estimate does not include obtaining land or easements							
Riprap gradation:							
Dmax = 24" nominal diameter							
Dmedian = 16"							
Dmin = 4"							
Riprap includes underlying filter fabric							

CITY OF COVINGTON		2009 Comprehensive Stormwater Plan Update		PROJECT TYPE:		O&M	
Preliminary Opinion of Probable Cost		Checked By: J. Coop 6/23/09		PROJECT SIZE:		Small	
CIP #:	1026 - 2008017						
Project Name:	DP21055 Foxwood						
Prepared By:	C. Buitrago, 6/23/09						
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount	Percent of Construction Cost	PROJECT DESCRIPTION:
1	1	LS	Mobilization	\$17,500.00	\$17,500	16.66%	
2	0	DAY	Traffic Control	\$600.00	\$0	0.00%	Rebuild Pond: Repair exposed plastic liner, remove vegetation from inlet and Hydroseed.
3	1	LS	Restoration	\$900.00	\$900	0.86%	
4	1	LS	Trench Safety	\$1,700.00	\$1,700	1.62%	
5	0.78	ACRE	Erosion/Sedimentation Control	\$50,000.00	\$39,000	37.12%	Acreage of pond parcel based on King County IMAP.
6	0.78	ACRE	Cleaning and Grubbing	\$10,000.00	\$7,800	7.42%	Includes allowance for pipe and structures.
7	0.78	ACRE	Seeding, Fertilizing and Mulching	\$4,000.00	\$3,120	2.97%	
8	0	LF	Saw Cutting	\$2.50	\$0	0.00%	
9	0	TON	Crushed Surfacing Top Course	\$25.00	\$0.00	0.00%	
10	0	TON	HMA For Pavement Repair CI. 1/2In. P	\$150.00	\$0.00	0.00%	
11	0	TON	Asphalt Conc. Pavement CL. B	\$85.00	\$0	0.00%	
12	445	CY	Structure Excav Class B Incl Haul	\$30.00	\$13,350.00	12.71%	
13	0	TON	Select Borrow Incl. Haul	\$10.00	\$0.00	0.00%	
14	0	CY	Topsoil	\$40.00	\$0.00	0.00%	
15	50	LF	Corrugated PE Storm Sewer Pipe, 12-Inch Diam.	\$35.00	\$1,750	1.67%	
16	0	LF	Corrugated PE Storm Sewer Pipe, 18-Inch Diam.	\$50.00	\$0	0.00%	
17	0	LF	Corrugated PE Storm Sewer Pipe, 24-Inch Diam.	\$60.00	\$0	0.00%	
18	0	LF	Corrugated PE Storm Sewer Pipe, 30-Inch Diam.	\$70.00	\$0	0.00%	
19	0	LF	Corrugated PE Storm Sewer Pipe, 36-Inch Diam.	\$75.00	\$0	0.00%	
20	0	LF	Corrugated PE Storm Sewer Pipe, 42-Inch Diam.	\$85.00	\$0.00	0.00%	
21	0	LF	Corrugated PE Storm Sewer Pipe, 48-Inch Diam.	\$100.00	\$0	0.00%	
22	0	LF	RC Storm Sewer Pipe, 36-Inch Diam.	\$130.00	\$0	0.00%	
23	0	LF	RC Storm Sewer Pipe, 42-Inch Diam.	\$150.00	\$0.00	0.00%	
24	0	LF	RC Storm Sewer Pipe, 48-Inch Diam.	\$175.00	\$0	0.00%	
25	0	LF	12-inch SD, CIV RCP	\$250.00	\$0.00	0.00%	
26	0	EA	Catch Basin Type I	\$950.00	\$0	0.00%	
27	0	EA	Catch Basin Type II	\$1,500.00	\$0	0.00%	
28	1	EA	Catch Basin Type II, 48-Inch Diam.	\$3,500.00	\$3,500	3.33%	
29	0	EA	Catch Basin Type II, 54-Inch Diam.	\$4,500.00	\$0.00	0.00%	
30	0	EA	Catch Basin Type II, 60-Inch Diam.	\$4,500.00	\$0	0.00%	
31	0	EA	Catch Basin Type II, 72-Inch Diam. w/Tide Flex	\$8,500.00	\$0	0.00%	
32	0	EA	Catch Basin Type II, 84-Inch Diam.	\$10,000.00	\$0	0.00%	
33	0	EA	Catch Basin Type II, 96-Inch Diam. w/Tide Flex	\$15,000.00	\$0	0.00%	
34	950	LF	Coated Chain Link Fence	\$15.00	\$14,250.00	13.56%	
35	1	EA	Double 20-ft Coated Chain Link Gate	\$1,200.00	\$1,200.00	1.14%	
36	0	EA	Tideflex valve for 42-Inch ID Conc. Pipe	\$12,000.00	\$0.00	0.00%	
37	0	EA	F&E 48-inch Tide Flex valves	\$11,000.00	\$0.00	0.00%	
38	0	TON	Riprap	\$40.00	\$0.00	0.00%	
39	0	EA	Adjust existing manhole rim	\$4,000.00	\$0.00	0.00%	
40	0	EA	Connect to existing manhole	\$2,000.00	\$0.00	0.00%	
41	1	LS	Dewatering	\$1,000.00	\$1,000.00	0.95%	
42	0	CY	Bioretention/bioinfiltration soil mix	\$50.00	\$0.00	0.00%	
43	0	EA	Connect to Existing Storm	\$3,000.00	\$0.00	0.00%	
44	0	LS	Plantings/Landscape	\$10,000.00	\$0.00	0.00%	
45	0	LS	WQ Facility	0	\$0	0.00%	
				<b>Subtotal =</b>	<b>\$105,070</b>	<b>100.00%</b>	
				Contingency	30.0%		
				Sales Tax	\$9,246		
				<b>Planning Level Construction Cost =</b>	<b>\$145,800</b>		
				Property Acquisition	\$0.00		Project Priority: Low
				Environmental Permitting and Documentation			Priority Schedule:
				Surveying	10.0%	\$14,580	High: 2010 - 2012
				Administration	3.6%	\$5,279	Medium: 2013 - 2015
				Preliminary Engineering, PS&E Engineering and Construction Management	5.0%	\$7,290	Low: 2016 - 2029
					30.0%	\$43,740	
				<b>TOTAL =</b>	<b>\$217,000</b>		
<b>GENERAL ASSUMPTIONS:</b>							
Mobilization including staging area, equals approximately 20-percent of Subtotal							
Trench Safety equals approximately 2-percent of Subtotal (\$1000 minimum)							
CSTC installed at minimum 6-inch compacted depth							
ACP installed at minimum 6-inch compacted depth							
ACP density equals 2 tons/cy (approx)							
ACP patch width is 4 feet							
Pipe size and length is estimated only							
Traffic control based on 2 persons @ \$35/hour plus additional \$40/day for any traffic control plan and 200 LF of piping installation per day							
Estimate does not include obtaining land or easements							
Riprap gradation:							
Dmax = 24" nominal diameter							
Dmedian = 16"							
Dmin = 4"							
Riprap includes underlying filter fabric							

CITY OF COVINGTON		2009 Comprehensive Stormwater Plan Update		PROJECT TYPE:		PROJECT SIZE:	
Preliminary Opinion of Probable Cost		Checked By: J. Coop 6/23/09		Capital		Small	
CIP #:	1026 - 2008018						
Project Name:	DP21065 Parke Meadows						
Prepared By:	C. Buitrago, 6/23/09						
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount	Percent of Construction Cost	PROJECT DESCRIPTION:
1	1	LS	Mobilization	\$23,200.00	\$23,200	16.70%	
2	0	DAY	Traffic Control	\$600.00	\$0	0.00%	Rebuild cell dividing berm and remove excessive vegetation from embankments.
3	0	LS	Restoration	\$1,200.00	\$0	0.00%	
4	1	LS	Trench Safety	\$2,300.00	\$2,300	1.66%	
5	0.99	ACRE	Erosion/Sedimentation Control	\$50,000.00	\$49,500	35.62%	Acreege of pond parcel based on King County IMAP.
6	0.99	ACRE	Clearing and Grubbing	\$10,000.00	\$9,900	7.12%	Includes allowance for pipe and structures.
7	0.99	ACRE	Seeding, Fertilizing and Mulching	\$4,000.00	\$3,960	2.85%	
8	0	LF	Saw Cutting	\$2.50	\$0	0.00%	
9	14	TON	Crushed Surfacing Top Course	\$25.00	\$350.00	0.25%	
10	8	TON	HMA For Pavement Repair Cl. 1/2In. P	\$150.00	\$1,200.00	0.86%	
11	0	TON	Asphalt Conc. Pavement CL. B	\$85.00	\$0	0.00%	
12	1,265	CY	Structure Excav Class B Incl Haul	\$30.00	\$37,950.00	27.31%	
13	0	TON	Select Borrow Incl. Haul	\$10.00	\$0.00	0.00%	
14	125	CY	Topsoil or soil amendment as liner	\$40.00	\$5,000.00	3.60%	
15	50	LF	Corrugated PE Storm Sewer Pipe, 12-Inch Diam.	\$35.00	\$1,750	1.26%	
16	0	LF	Corrugated PE Storm Sewer Pipe, 18-Inch Diam.	\$50.00	\$0	0.00%	
17	0	LF	Corrugated PE Storm Sewer Pipe, 24-Inch Diam.	\$60.00	\$0	0.00%	Property acquisition based on assessed land value of adjacent recreational parcel of homeowners association.
18	0	LF	Corrugated PE Storm Sewer Pipe, 30-Inch Diam.	\$70.00	\$0	0.00%	
19	0	LF	Corrugated PE Storm Sewer Pipe, 36-Inch Diam.	\$75.00	\$0	0.00%	Relocate existing basketball court and picnic tables; leave existing playground equipment in place.
20	0	LF	Corrugated PE Storm Sewer Pipe, 42-Inch Diam.	\$85.00	\$0	0.00%	Extend existing fence around new pond area.
21	0	LF	Corrugated PE Storm Sewer Pipe, 48-Inch Diam.	\$100.00	\$0	0.00%	
22	0	LF	RC Storm Sewer Pipe, 36-Inch Diam.	\$130.00	\$0	0.00%	
23	0	LF	RC Storm Sewer Pipe, 42-Inch Diam.	\$150.00	\$0	0.00%	
24	0	LF	RC Storm Sewer Pipe, 48-Inch Diam.	\$175.00	\$0	0.00%	
25	0	LF	12-inch SD, CI V RCP	\$250.00	\$0.00	0.00%	
26	0	EA	Catch Basin Type I	\$950.00	\$0	0.00%	
27	0	EA	Catch Basin Type IL	\$1,500.00	\$0	0.00%	
28	0	EA	Catch Basin Type II, 48-Inch Diam.	\$3,500.00	\$0	0.00%	
29	0	EA	Catch Basin Type II, 54-Inch Diam.	\$4,500.00	\$0	0.00%	
30	0	EA	Catch Basin Type II, 60-Inch Diam.	\$4,500.00	\$0	0.00%	
31	0	EA	Catch Basin Type II, 72-Inch Diam. w/Tide Flex	\$8,500.00	\$0	0.00%	
32	0	EA	Catch Basin Type II, 84-Inch Diam.	\$10,000.00	\$0	0.00%	
33	0	EA	Catch Basin Type II, 96-Inch Diam. w/Tide Flex	\$15,000.00	\$0	0.00%	
34	190	LF	Coated Chain Link Fence	\$15.00	\$2,850.00	2.05%	
35	0	EA	F&I 36-inch Tide Flex	\$12,000.00	\$0.00	0.00%	
36	0	EA	Tideflex valve for 42-inch ID Conc. Pipe	\$12,000.00	\$0.00	0.00%	
37	0	EA	F&E 48-inch Tide Flex valves	\$11,000.00	\$0.00	0.00%	
38	0	TON	Riprap	\$40.00	\$0.00	0.00%	
39	0	EA	Adjust existing manhole rim	\$4,000.00	\$0.00	0.00%	
40	0	EA	Connect to existing manhole	\$2,000.00	\$0.00	0.00%	
41	1	LS	Dewatering	\$1,000.00	\$1,000.00	0.72%	
42	0	CY	Bioretention/bioinfiltration soil mix	\$50.00	\$0.00	0.00%	
43	0	EA	Connect to Existing Storm	\$3,000.00	\$0.00	0.00%	
44	0	LS	Plantings/Landscape	\$10,000.00	\$0.00	0.00%	
45	0	LS	WQ Facility	\$ 5,600.00	\$0	0.00%	
				<b>Subtotal =</b>	<b>\$138,960</b>	<b>100.00%</b>	
				Contingency	30.0%		
				Sales Tax	8.8%		
				<b>Planning Level Construction Cost =</b>	<b>\$192,900</b>		
0.45	AC		Property Acquisition	1111.1	\$500.00		Project Priority: Low
			Environmental Permitting and Documentation	10.0%	\$19,290		High: 2010 - 2012
			Surveying	2.9%	\$5,629		Medium: 2013 - 2015
			Administration	5.0%	\$9,645		Low: 2016 - 2029
			Preliminary Engineering, PS&E Engineering and Construction Management	30.0%	\$57,870		
				<b>TOTAL =</b>	<b>\$286,000</b>		
<b>GENERAL ASSUMPTIONS:</b>							
Mobilization including staging area, equals approximately 20-percent of Subtotal							
Trench Safety equals approximately 2-percent of Subtotal (\$1000 minimum)							
CSTC installed at minimum 6-inch compacted depth							
ACP installed at minimum 6-inch compacted depth							
ACP density equals 2 tons/cy (approx)							
ACP patch width is 4 feet							
Pipe size and length is estimated only							
Traffic control based on 2 persons @ \$35/hour plus additional \$40/day for any traffic control plan and 200 LF of piping installation per day							
Estimate does not include obtaining land or easements							
Riprap gradation:							
Dmax = 24" nominal diameter							
Dmedian = 16"							
Dmin = 4"							
Riprap includes underlying filter fabric							



CITY OF COVINGTON		2009 Comprehensive Stormwater Plan Update		PROJECT TYPE:		Capital	
Preliminary Opinion of Probable Cost		Checked By: J. Coop 6/23/09		PROJECT SIZE:		Large	
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount	Percent of Construction Cost	PROJECT DESCRIPTION:
1	1	LS	Mobilization	\$92,900.00	\$92,900	16.67%	
2	1	DAY	Traffic Control	\$600.00	\$600	0.11%	
3	0	LS	Restoration	\$4,600.00	\$0	0.00%	Install water quality treatment to two existing outfalls to Pipe Lake. On south side of lake on SE 268th St and SE 268th Ct.
4	1	LS	Trench Safety	\$9,100.00	\$9,100	1.63%	
5	0.734	ACRE	Erosion/Sedimentation Control	\$50,000.00	\$36,700	6.58%	
6	0.734	ACRE	Clearing and Grubbing	\$10,000.00	\$7,340	1.32%	
7	0.734	ACRE	Seeding, Fertilizing and Mulching	\$4,000.00	\$2,936	0.53%	
8	0	LF	Saw Cutting	\$2.50	\$0	0.00%	
9	90	TON	Crushed Surfacing Top Course	\$25.00	\$2,250.00	0.40%	
10	95	TON	HMA For Pavement Repair Cl. 1/2In. P	\$150.00	\$14,250.00	2.56%	
11	0	TON	Asphalt Conc. Pavement CL. B	\$85.00	\$0	0.00%	
12	245	CY	Structure Excav Class B Incl Haul	\$30.00	\$7,350.00	1.32%	
13	0	TON	Select Borrow Incl. Haul	\$10.00	\$0.00	0.00%	
14	0	CY	Topsoil	\$40.00	\$0.00	0.00%	
15	0	LF	Corrugated PE Storm Sewer Pipe, 12-Inch Diam.	\$35.00	\$0	0.00%	
16	0	LF	Corrugated PE Storm Sewer Pipe, 18-Inch Diam.	\$50.00	\$0	0.00%	
17	200	LF	Corrugated PE Storm Sewer Pipe, 24-Inch Diam.	\$60.00	\$12,000	2.15%	<b>PROJECT ASSUMPTIONS:</b> Contech Stormfilter™ cartridge system for water quality treatment for both outfalls.
18	0	LF	Corrugated PE Storm Sewer Pipe, 30-Inch Diam.	\$70.00	\$0	0.00%	Sufficient head for 27-inch cartridge height.
19	0	LF	Corrugated PE Storm Sewer Pipe, 36-Inch Diam.	\$75.00	\$0	0.00%	Includes allowance for temporary by-pass.
20	0	LF	Corrugated PE Storm Sewer Pipe, 42-Inch Diam.	\$85.00	\$0	0.00%	Internal high flow by-pass for west outfall treatment system.
21	0	LF	Corrugated PE Storm Sewer Pipe, 48-Inch Diam.	\$100.00	\$0	0.00%	External high flow by-pass for east outfall treatment system.
22	0	LF	RC Storm Sewer Pipe, 36-Inch Diam.	\$130.00	\$0	0.00%	
23	0	LF	RC Storm Sewer Pipe, 42-Inch Diam.	\$150.00	\$0	0.00%	
24	0	LF	RC Storm Sewer Pipe, 48-Inch Diam.	\$175.00	\$0	0.00%	
25	0	LF	12-inch SD, CI V RCP	\$250.00	\$0.00	0.00%	The area for Erosion/Sedimentation Control, Clearing and Grubbing, and Seeding, Fertilizing and Mulching is for the open tract parcel for the west outfall.
26	0	EA	Catch Basin Type I	\$950.00	\$0	0.00%	
27	0	EA	Catch Basin Type II	\$1,500.00	\$0	0.00%	
28	6	EA	Catch Basin Type II, 48-Inch Diam.	\$3,500.00	\$21,000	3.77%	
29	0	EA	Catch Basin Type II, 54-Inch Diam.	\$4,500.00	\$0.00	0.00%	The area for property acquisition is for an easement for the east outfall.
30	0	EA	Catch Basin Type II, 60-Inch Diam.	\$4,500.00	\$0	0.00%	
31	0	EA	Catch Basin Type II, 72-Inch Diam. w/Tide Flex	\$8,500.00	\$0	0.00%	West Basin: 2.54 acres of contributing area; 50% impervious, 50% lawn.
32	0	EA	Catch Basin Type II, 84-Inch Diam.	\$10,000.00	\$0	0.00%	
33	0	EA	Catch Basin Type II, 96-Inch Diam. w/Tide Flex	\$15,000.00	\$0	0.00%	West treatment system: 8-ft x 6-ft vault with 9 cartridges.
34	0	EA	F&I 12-inch Tide Flex	\$2,000.00	\$0.00	0.00%	
35	0	EA	F&I 36-inch Tide Flex	\$12,000.00	\$0.00	0.00%	East Basin: 21.50 acres of contributing area; 50% impervious, 50% lawn.
36	0	EA	Tidiflex valve for 42-inch ID Conc. Pipe	\$12,000.00	\$0.00	0.00%	
37	0	EA	F&E 48-inch Tide Flex valves	\$11,000.00	\$0.00	0.00%	East treatment system: 2 each 8-ft x 16-ft vaults with 73 cartridges.
38	0	TON	Riprap	\$40.00	\$0.00	0.00%	Treatment system cost approximated based on ratio of cost per cartridge for CIP 1027-2008010.
39	0	EA	Adjust existing manhole rim	\$4,000.00	\$0.00	0.00%	
40	0	EA	Connect to existing manhole	\$2,000.00	\$0.00	0.00%	
41	1	LS	Temporary Bypass Pumping	\$20,000.00	\$20,000.00	3.59%	
42	0	CY	Bioretention/bioinfiltration soil mix	\$50.00	\$0.00	0.00%	
43	0	EA	Connect to Existing Storm	\$3,000.00	\$0.00	0.00%	
44	0	LS	Plantings/Landscape	\$10,000.00	\$0.00	0.00%	
45	1	LS	WQ Facility - East and West sites	\$ 331,000.00	\$331,000	59.38%	
			<b>Subtotal =</b>		<b>\$557,426</b>	<b>100.00%</b>	
			Contingency	30.0%	\$167,228		
			Sales Tax	8.8%	\$49,053		
			<b>Planning Level Construction Cost =</b>		<b>\$773,700</b>		
0.047	AC		Property Acquisition	\$657,143	\$30,885.72		Project Priority: High
			Environmental Permitting and Documentation	10.0%	\$77,370		Priority Schedule:
			Surveying	1.0%	\$7,743		High: 2010 - 2012
			Administration	5.0%	\$38,685		Medium: 2013 - 2015
			Construction Management	30.0%	\$232,110		Low: 2016 - 2029
			Geotechnical engineering	10.0%	\$77,370		
			<b>TOTAL =</b>		<b>\$1,238,000</b>		
<b>GENERAL ASSUMPTIONS:</b>							
Mobilization including staging area, equals approximately 20-percent of Subtotal							
Trench Safety equals approximately 2-percent of Subtotal (\$1000 minimum)							
CSTC installed at minimum 6-inch compacted depth							
ACP installed at minimum 6-inch compacted depth							
ACP density equals 2 tons/cy (approx)							
Pipe size and length is estimated only							
Traffic control based on 2 persons @ \$35/hour plus additional \$40/day for any traffic control plan and 200 LF of piping installation per day							
Estimate does not include obtaining land or easements							
Riprap gradation: Dmax = 24" nominal diameter							
Dmedian = 16"							
Dmin = 4"							
Riprap includes underlying filter fabric							

CITY OF COVINGTON		PROJECT TYPE:		PROJECT SIZE:		Capital		
2009 Comprehensive Stormwater Plan Update		PROJECT TYPE:		PROJECT SIZE:		Large		
Preliminary Opinion of Probable Cost								
CIP #:	1074							
Project Name:	180th Ave. SE Drainage Improvements, SE 240th St. to SE 248th St.							
Prepared By:	J. Coop	Checked By:						
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount	Percent of Construction Cost	PROJECT DESCRIPTION:	
1	1	LS	Mobilization	\$28,100.00	\$28,100	6.53%	Improve conveyance system to alleviate flooding.	
2	15	DAY	Traffic Control	\$600.00	\$9,000	2.09%		
3	1	LS	Restoration	\$3,900.00	\$3,900	0.91%		
4	1	LS	Trench Safety	\$7,600.00	\$7,600	1.77%		
5	1	LS	Erosion/Sedimentation Control	\$3,700.00	\$3,700	0.86%		
6	0.57	ACRE	Cleaning and Grubbing	\$10,000.00	\$5,700	1.33%		
7	0.57	ACRE	Seeding, Fertilizing and Mulching	\$4,000.00	\$2,280	0.53%		
8	2,475	LF	Saw Cutting	\$2.50	\$6,188	1.44%		
9	480	TON	Crushed Surfacing Base Course	\$35.00	\$16,800.00	3.91%		
10		TON	Crushed Surfacing Top Course	\$25.00	\$0.00	0.00%		
11	496	TON	HMA For Pavement Repair Cl. 1/2in. P	\$150.00	\$74,400.00	17.30%		
12		TON	Asphalt Conc. Pavement CL. B	\$85.00	\$0	0.00%		
13	2,825	CY	Structure Excav Class B Incl Haul	\$20.00	\$56,500.00	13.14%		
14		TON	Select Borrow Incl. Haul	\$10.00	\$0.00	0.00%		
15		CY	Embankment compaction	\$2.00	\$0.00	0.00%		
16	540	LF	Corrugated PE Storm Sewer Pipe, 12-inch Diam.	\$35.00	\$18,900	4.39%		
17	1,800	LF	Corrugated PE Storm Sewer Pipe, 18-inch Diam.	\$50.00	\$90,000	20.92%		
18		LF	Corrugated PE Storm Sewer Pipe, 24-inch Diam.	\$60.00	\$0	0.00%		
19	700	LF	Corrugated PE Storm Sewer Pipe, 30-inch Diam.	\$70.00	\$49,000	11.39%		
20		LF	Corrugated PE Storm Sewer Pipe, 36-inch Diam.	\$75.00	\$0	0.00%		
21		LF	Corrugated PE Storm Sewer Pipe, 42-inch Diam.	\$85.00	\$0.00	0.00%		
22		LF	Corrugated PE Storm Sewer Pipe, 48-inch Diam.	\$100.00	\$0	0.00%		
23		LF	RC Storm Sewer Pipe, 36-inch Diam.	\$130.00	\$0.00	0.00%		
24		LF	RC Storm Sewer Pipe, 42-inch Diam.	\$150.00	\$0.00	0.00%		
25		LF	RC Storm Sewer Pipe, 48-inch Diam.	\$175.00	\$0	0.00%		
26		LF	12-inch SD, CIV RCP	\$250.00	\$0.00	0.00%		
27	9	EA	Catch Basin Type I	\$950.00	\$8,550	1.99%		
28		EA	Catch Basin Type II	\$1,500.00	\$0	0.00%		
29	6	EA	Catch Basin Type II, 48-inch Diam.	\$3,500.00	\$21,000	4.88%		
30	3	EA	Catch Basin Type II, 54-inch Diam.	\$4,500.00	\$13,500.00	3.14%		
31		EA	Catch Basin Type II, 60-inch Diam.	\$4,500.00	\$0	0.00%		
32		EA	Catch Basin Type II, 72-inch Diam. w/Tide Flex	\$8,500.00	\$0	0.00%		
33		EA	Catch Basin Type II, 84-inch Diam.	\$10,000.00	\$0	0.00%		
34	1	EA	Catch Basin Type II, 96-inch Diam. w/Tide Flex	\$15,000.00	\$15,000	3.49%		
35		EA	F&I 12-inch Tide Flex	\$2,000.00	\$0.00	0.00%		
36		EA	F&I 36-inch Tide Flex	\$12,000.00	\$0.00	0.00%		
37		EA	Tideflex valve for 42-inch ID Conc. Pipe	\$12,000.00	\$0.00	0.00%		
38		EA	F&E 48-inch Tide Flex valves	\$11,000.00	\$0.00	0.00%		
39		TON	Riprap	\$40.00	\$0.00	0.00%		
40		EA	Adjust existing manhole rim	\$4,000.00	\$0.00	0.00%		
41		EA	Connect to existing manhole	\$2,000.00	\$0.00	0.00%		
42		CY	Bioretention/bioinfiltration soil mix	\$50.00	\$0.00	0.00%		
43		EA	Connect to Existing Storm	\$3,000.00	\$0.00	0.00%		
44		LS	Plantings/Landscape	\$10,000.00	\$0.00	0.00%		
45		LS	WQ Facility	0	\$0	0.00%		
				<b>Subtotal =</b>	<b>\$430,118</b>	<b>100.00%</b>		
				Contingency	30.0%			
				Sales Tax	8.8%			
				<b>Planning Level Construction Cost =</b>	<b>\$597,000</b>			
				AC	Property Acquisition	\$25,700.00		
					Environmental Permitting and Documentation	10.0%		
					Surveying	1.2%		
					Administration	5.0%		
					Preliminary Engineering, PS&E Engineering and Construction Management	30.0%		
				<b>TOTAL =</b>	<b>\$873,000</b>			
<b>GENERAL ASSUMPTIONS:</b>								
Mobilization equals approximately 7-percent of Subtotal								
Restoration equals approximately 1-percent of Subtotal								
Trench Safety equals approximately 2-percent of Subtotal (\$1000 minimum)								
Erosion/Sedimentation Control equals approximately 1-percent of Subtotal (\$500 minimum)								
CSTC installed at minimum 6-inch compacted depth								
ACP installed at minimum 6-inch compacted depth								
ACP density equals 2 tons/cy (approx.)								
ACP patch width is 4 feet								
Pipe size and length is estimated only								
Traffic control based on 2 persons @ \$35/hour plus additional \$40/day for any traffic control plan and 200 LF of piping installation per day								
Estimate does not include obtaining land or easements								
Riprap gradation: Dmax = 24" nominal diameter								
Dmedian = 16"								
Dmin = 4"								
Riprap includes underlying filter fabric								
				Project Priority: Medium				
				Priority Schedule:				
				High: 2010 - 2012				
				Medium: 2013 - 2015				
				Low: 2016 - 2029				
				\$287.17 PER LF				

CITY OF COWINGTON		2009 Comprehensive Stormwater Plan Update		PROJECT TYPE:		
Preliminary Opinion of Probable Cost				Capital Small		
CIP #:	1066	PROJECT SIZE:				
Project Name:	Little Soos Creek Channel Widening at SE 264th Avenue SE	Checked By:		J. Coop 6/23/09		
Prepared By:	C. Bufrago, 6/18/09	Description		Percent of Construction Cost		
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount	PROJECT DESCRIPTION:
1	1	LS	Mobilization	\$11,400.00	\$11,400	
2	1	DAY	Traffic Control	\$600.00	\$600	Improve channel capacity along the existing location of the stream to decrease flooding near 167th SE.
3	1	LS	Restoration	\$1,600.00	\$1,600	Quantifies from 2002 Comprehensive Stormwater Plan.
4	1	LS	Trench Safety	\$3,200.00	\$3,200	Unit costs updated.
5	1	LS	Erosion/Sedimentation Control	\$1,500.00	\$1,500	
6	0.1	ACRE	Clearing and Grubbing	\$10,000.00	\$1,000	
7	0.4	ACRE	Seeding, Fertilizing and Mulching	\$4,000.00	\$1,600	
8	0	LF	Saw Cutting	\$2.50	\$0	
9	0	TON	Crushed Surfacing Base Course	\$35.00	\$0.00	
10	0	TON	Crushed Surfacing Top Course	\$25.00	\$0.00	
11	50	TON	HMA For Pavement Repair CI. 1/2In. P	\$185.00	\$9,250.00	
12	0	TON	Asphalt Conc. Pavement CL. B	\$85.00	\$0	
13	3,350	CY	Structure Excav Class B Incl Haul	\$30.00	\$100,500.00	
14	0	TON	Select Borrow Incl. Haul	\$10.00	\$0.00	
15	0	CY	Embankment compaction	\$2.00	\$0.00	
16	135	LF	Corrugated PE Storm Sewer Pipe, 12-Inch Diam.	\$35.00	\$4,725	
17	0	LF	Corrugated PE Storm Sewer Pipe, 18-Inch Diam.	\$50.00	\$0	
18	0	LF	Corrugated PE Storm Sewer Pipe, 24-Inch Diam.	\$60.00	\$0	
19	0	LF	Corrugated PE Storm Sewer Pipe, 30-Inch Diam.	\$70.00	\$0	
20	0	LF	Corrugated PE Storm Sewer Pipe, 36-Inch Diam.	\$75.00	\$0	
21	0	LF	Corrugated PE Storm Sewer Pipe, 42-Inch Diam.	\$85.00	\$0.00	
22	0	LF	Corrugated PE Storm Sewer Pipe, 48-Inch Diam.	\$100.00	\$0	
23	0	LF	RC Storm Sewer Pipe, 36-Inch Diam.	\$130.00	\$0	
24	0	LF	RC Storm Sewer Pipe, 42-Inch Diam.	\$150.00	\$0.00	
25	0	LF	RC Storm Sewer Pipe, 48-Inch Diam.	\$175.00	\$0	
26	0	LF	12-inch SD, CI V RCP	\$250.00	\$0.00	
27	0	EA	Catch Basin Type I	\$950.00	\$0	
28	0	EA	Catch Basin Type IL	\$1,500.00	\$0	
29	2	EA	Catch Basin Type II, 48-Inch Diam.	\$3,500.00	\$7,000	
30	0	EA	Catch Basin Type II, 54-Inch Diam.	\$4,500.00	\$0.00	
31	0	EA	Catch Basin Type II, 60-Inch Diam.	\$4,500.00	\$0	
32	0	EA	Catch Basin Type II, 72-Inch Diam. w/Tide Flex	\$8,500.00	\$0	
33	0	EA	Catch Basin Type II, 84-Inch Diam.	\$10,000.00	\$0	
34	0	EA	Catch Basin Type II, 96-Inch Diam. w/Tide Flex	\$15,000.00	\$0	
35	0	EA	F&I 12-inch Tide Flex	\$2,000.00	\$0.00	
36	0	EA	F&I 36-inch Tide Flex	\$12,000.00	\$0.00	
37	0	EA	Tideflex valve for 42-inch ID Conc. Pipe	\$12,000.00	\$0.00	
38	0	EA	F&E 48-inch Tide Flex valves	\$11,000.00	\$0.00	
39	0	TON	Riprap	\$40.00	\$0.00	
40	0	EA	Adjust existing manhole rim	\$4,000.00	\$0.00	
41	0	EA	Connect to existing manhole	\$2,000.00	\$0.00	
42						
43	645	CY	Biotention/bioinfiltration soil mix	\$50.00	\$32,250.00	18.47%
44	0	EA	Connect to Existing Storm	\$3,000.00	\$0.00	0.00%
45	0	LS	Plantings/Landscape	\$10,000.00	\$0.00	0.00%
46	0	LS	WQ Facility	0	\$0	0.00%
			<b>Subtotal =</b>		<b>\$174,625</b>	<b>100.00%</b>
			Contingency	30.0%	\$52,388	
			Sales Tax	8.8%	\$15,367	
			<b>Planning Level Construction Cost =</b>		<b>\$242,400</b>	
			Property Acquisition	\$73,500.00	\$36,750.00	High: 2010 - 2012
	0.5	AC	Environmental Permitting and Documentation	10.0%	\$24,240	Medium: 2013 - 2015
			Surveying	2.4%	\$5,932	Low: 2016 - 2029
			Administration	5.0%	\$12,120	
			Preliminary Engineering, PS&E Engineering and Construction Management	30.0%	\$72,720	
			<b>TOTAL =</b>		<b>\$394,000</b>	
<b>GENERAL ASSUMPTIONS:</b>						
Mobilization equals approximately 7-percent of Subtotal						
Restoration equals approximately 1-percent of Subtotal						
Trench Safety equals approximately 2-percent of Subtotal (\$1000 minimum)						
Erosion/Sedimentation Control equals approximately 1-percent of Subtotal (\$500 minimum)						
CSTC installed at minimum 6-inch compacted depth						
ACP installed at minimum 6-inch compacted depth						
ACP density equals 2 tons/cy						
ACP patch width is 4 feet						
Pipe size and length is estimated only						
Traffic control based on 2 persons @ \$35/hour plus additional \$40/day for any traffic control plan and 200 LF of piping installation per day						
Estimate does not include obtaining land or easements						
Riprap gradation:						
Dmax = 24" nominal diameter						
Dmedian = 16"						
Dmin = 4"						
Riprap includes underlying filter fabric						

CITY OF COVINGTON		2009 Comprehensive Stormwater Plan Update		PROJECT TYPE:			
Preliminary Opinion of Probable Cost		PROJECT SIZE:		Capital Large			
CIP #:	1077	Checked By: J. Coop 6/23/09					
Project Name:	Jenkins Creek North Regional Detention Pond						
Prepared By:	C. Buitrago, 6/18/09						
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount	Percent of Construction Cost	PROJECT DESCRIPTION:
1	1	LS	Mobilization	\$84,500.00	\$84,500	6.55%	
2	3	DAY	Traffic Control	\$600.00	\$1,800	0.14%	Construct regional detention pond north of SE 244th
3	1	LS	Restoration	\$11,900.00	\$11,900	0.92%	Place SE (funded by private development). (W2)
4	1	LS	Trench Safety	\$23,400.00	\$23,400	1.81%	Quantities from 2002 Comprehensive Stormwater Plan.
5	1	LS	Erosion/Sedimentation Control	\$11,000.00	\$11,000	0.85%	
6	4	ACRE	Clearing and Grubbing	\$10,000.00	\$40,000	3.10%	
7	4	ACRE	Seeding, Fertilizing and Mulching	\$4,000.00	\$16,000	1.24%	
8	0	LF	Saw Cutting	\$2.50	\$0	0.00%	
9	0	TON	Crushed Surfacing Base Course	\$35.00	\$0.00	0.00%	
10	0	TON	Crushed Surfacing Top Course	\$25.00	\$0.00	0.00%	
11	90	TON	HMA For Pavement Repair Cl. 1/2In. P	\$185.00	\$16,650.00	1.29%	
12	0	TON	Asphalt Conc. Pavement CL. B	\$85.00	\$0	0.00%	
13	26,260	CY	Structure Excav Class B Incl Haul	\$30.00	\$787,800.00	61.02%	
14	0	TON	Select Borrow Incl. Haul	\$10.00	\$0.00	0.00%	
15	0	CY	Embankment compaction	\$2.00	\$0.00	0.00%	
16	360	LF	Corrugated PE Storm Sewer Pipe, 12-Inch Diam.	\$35.00	\$12,600	0.98%	
17	120	LF	Corrugated PE Storm Sewer Pipe, 18-Inch Diam.	\$50.00	\$6,000	0.46%	
18	120	LF	Corrugated PE Storm Sewer Pipe, 24-Inch Diam.	\$60.00	\$7,200	0.56%	
19	0	LF	Corrugated PE Storm Sewer Pipe, 30-Inch Diam.	\$70.00	\$0	0.00%	
20	0	LF	Corrugated PE Storm Sewer Pipe, 36-Inch Diam.	\$75.00	\$0	0.00%	
21	0	LF	Corrugated PE Storm Sewer Pipe, 42-Inch Diam.	\$85.00	\$0.00	0.00%	
22	0	LF	Corrugated PE Storm Sewer Pipe, 48-Inch Diam.	\$100.00	\$0	0.00%	
23	0	LF	RC Storm Sewer Pipe, 36-Inch Diam.	\$130.00	\$0	0.00%	
24	0	LF	RC Storm Sewer Pipe, 42-Inch Diam.	\$150.00	\$0.00	0.00%	
25	0	LF	RC Storm Sewer Pipe, 48-Inch Diam.	\$175.00	\$0	0.00%	
26	0	LF	12-inch SD, CI V RCP	\$250.00	\$0.00	0.00%	
27	0	EA	Catch Basin Type I	\$950.00	\$0	0.00%	
28	0	EA	Catch Basin Type II	\$1,500.00	\$0	0.00%	
29	4	EA	Catch Basin Type II, 48-Inch Diam.	\$3,500.00	\$14,000	1.08%	
30	0	EA	Catch Basin Type II, 54-Inch Diam.	\$4,500.00	\$0.00	0.00%	
31	0	EA	Catch Basin Type II, 60-Inch Diam.	\$4,500.00	\$0	0.00%	
32	0	EA	Catch Basin Type II, 72-Inch Diam. w/Tide Flex	\$8,500.00	\$0	0.00%	
33	0	EA	Catch Basin Type II, 84-Inch Diam.	\$10,000.00	\$0	0.00%	
34	0	EA	Catch Basin Type II, 96-Inch Diam. w/Tide Flex	\$15,000.00	\$0	0.00%	
35	0	EA	F&I 12-inch Tide Flex	\$2,000.00	\$0.00	0.00%	
36	0	EA	F&E 36-inch Tide Flex	\$12,000.00	\$0.00	0.00%	
37	0	EA	Tidelflex valve for 42-inch ID Conc. Pipe	\$12,000.00	\$0.00	0.00%	
38	0	EA	F&E 48-inch Tide Flex valves	\$11,000.00	\$0.00	0.00%	
39	0	TON	Riprap	\$40.00	\$0.00	0.00%	
40	0	EA	Adjust existing manhole rim	\$4,000.00	\$0.00	0.00%	
41	0	EA	Connect to existing manhole	\$2,000.00	\$0.00	0.00%	
42	5,163	CY	Bioretention/bioinfiltration soil mix	\$50.00	\$258,150.00	20.00%	
43	0	EA	Connect to Existing Storm	\$3,000.00	\$0.00	0.00%	
44	0	LS	Plantings/Landscape	\$10,000.00	\$0.00	0.00%	
45	0	LS	WQ Facility	0	\$0	0.00%	
				<b>Subtotal =</b>	<b>\$1,291,000</b>	<b>100.00%</b>	
				Contingency	30.0%		
				Sales Tax	8.8%		
				<b>Planning Level Construction Cost =</b>	<b>\$1,791,900</b>		Project Priority: Low
				Property Acquisition	\$600.00		High: 2010 - 2012
				Environmental Permitting and Documentation	10.0%		Medium: 2013 - 2015
				Surveying	0.5%		Low: 2016 - 2029
				Administration	5.0%		
				Preliminary Engineering, PS&E Engineering and Construction Management	30.0%		
				<b>TOTAL =</b>	<b>\$2,610,000</b>		
<b>GENERAL ASSUMPTIONS:</b>							
Mobilization equals approximately 7-percent of Subtotal							
Restoration equals approximately 1-percent of Subtotal							
Trench Safety equals approximately 2-percent of Subtotal (\$1000 minimum)							
Erosion/Sedimentation Control equals approximately 1-percent of Subtotal (\$500 minimum)							
CSTC installed at minimum 6-inch compacted depth							
ACP installed at minimum 6-inch compacted depth							
ACP density equals 2 tons/cy							
ACP patch width is 4 feet							
Pipe size and length is estimated only							
Traffic control based on 2 persons @ \$35/hour plus additional \$40/day for any traffic control plan and 200 LF of piping installation per day							
Estimate does not include obtaining land or easements							
Riprap gradation:							
Dmax = 24" nominal diameter							
Dmedian = 16"							
Dmin = 4"							
Riprap includes underlying filter fabric							

CITY OF COVINGTON		2009 Comprehensive Stormwater Plan Update		PROJECT TYPE:			
Preliminary Opinion of Probable Cost		Checked By: J. Coop 6/23/09		PROJECT SIZE:			
CIP #:	1064			Capital			
Project Name:	SE 262nd Place Storm Drainage Improvement Study			Small			
Prepared By:	C. Bufrago 6/18/09						
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount	Percent of Construction Cost	PROJECT DESCRIPTION:
1	1	LS	Mobilization	\$2,600.00	\$2,600	6.45%	
2	1	DAY	Traffic Control	\$600.00	\$600	1.49%	
3	1	LS	Restoration	\$400.00	\$400	0.99%	Study the flooding issues along SE 262nd Place east of 180th Avenue SE. Develop and implement solution.
4	1	LS	Trench Safety	\$1,000.00	\$1,000	2.48%	
5	1	LS	Erosion/Sedimentation Control	\$500.00	\$500	1.24%	Quantities from 2002 Comprehensive Stormwater Plan.
6	0.1	ACRE	Clearing and Grubbing	\$10,000.00	\$1,000	2.48%	
7	0.1	ACRE	Seeding, Fertilizing and Mulching	\$4,000.00	\$400	0.99%	
8	0	LF	Saw Cutting	\$2.50	\$0	0.00%	
9	0	TON	Crushed Surfacing Base Course	\$35.00	\$0.00	0.00%	
10	0	TON	Crushed Surfacing Top Course	\$25.00	\$0.00	0.00%	
11	15	TON	HMA For Pavement Repair Cl. 1/2In. P	\$150.00	\$2,250.00	5.58%	
12	0	TON	Asphalt Conc. Pavement CL. B	\$85.00	\$0	0.00%	
13	720	CY	Structure Excav Class B Incl Haul	\$30.00	\$21,600.00	53.60%	
14	0	TON	Select Borrow Incl. Haul	\$10.00	\$0.00	0.00%	
15	0	CY	Embankment compaction	\$2.00	\$0.00	0.00%	
16	100	LF	Corrugated PE Storm Sewer Pipe, 12-inch Diam.	\$35.00	\$3,500	8.68%	
17	0	LF	Corrugated PE Storm Sewer Pipe, 18-inch Diam.	\$50.00	\$0	0.00%	
18	0	LF	Corrugated PE Storm Sewer Pipe, 24-inch Diam.	\$60.00	\$0	0.00%	
19	0	LF	Corrugated PE Storm Sewer Pipe, 30-inch Diam.	\$70.00	\$0	0.00%	
20	0	LF	Corrugated PE Storm Sewer Pipe, 36-inch Diam.	\$75.00	\$0	0.00%	
21	0	LF	Corrugated PE Storm Sewer Pipe, 42-inch Diam.	\$85.00	\$0.00	0.00%	
22	0	LF	Corrugated PE Storm Sewer Pipe, 48-inch Diam.	\$100.00	\$0	0.00%	
23	0	LF	RC Storm Sewer Pipe, 36-inch Diam.	\$130.00	\$0	0.00%	
24	0	LF	RC Storm Sewer Pipe, 42-inch Diam.	\$150.00	\$0.00	0.00%	
25	0	LF	RC Storm Sewer Pipe, 48-inch Diam.	\$175.00	\$0	0.00%	
26	0	LF	12-inch SD, CI V RCP	\$250.00	\$0.00	0.00%	
27	0	EA	Catch Basin Type I	\$950.00	\$0	0.00%	
28	0	EA	Catch Basin Type IL	\$1,500.00	\$0	0.00%	
29	0	EA	Catch Basin Type II, 48-inch Diam.	\$3,500.00	\$0	0.00%	
30	0	EA	Catch Basin Type II, 54-inch Diam.	\$4,500.00	\$0.00	0.00%	
31	0	EA	Catch Basin Type II, 60-inch Diam.	\$4,500.00	\$0	0.00%	
32	0	EA	Catch Basin Type II, 72-inch Diam. w/Tide Flex	\$8,500.00	\$0	0.00%	
33	0	EA	Catch Basin Type II, 84-inch Diam.	\$10,000.00	\$0	0.00%	
34	0	EA	Catch Basin Type II, 96-inch Diam. w/Tide Flex	\$15,000.00	\$0	0.00%	
35	0	EA	F&I 12-inch Tide Flex	\$2,000.00	\$0.00	0.00%	
36	0	EA	F&I 36-inch Tide Flex	\$12,000.00	\$0.00	0.00%	
37	0	EA	Tideflex valve for 42-inch ID Conc. Pipe	\$12,000.00	\$0.00	0.00%	
38	0	EA	F&E 48-inch Tide Flex valves	\$11,000.00	\$0.00	0.00%	
39	0	TON	Riprap	\$40.00	\$0.00	0.00%	
40	0	EA	Adjust existing manhole rim	\$4,000.00	\$0.00	0.00%	
41	0	EA	Connect to existing manhole	\$2,000.00	\$0.00	0.00%	
42							
43	129	CY	Bioretention/bioinfiltration soil mix	\$50.00	\$6,450.00	16.00%	
44	0	EA	Connect to Existing Storm	\$3,000.00	\$0.00	0.00%	
45	0	LS	Plantings/Landscape	\$10,000.00	\$0.00	0.00%	
46	0	LS	WQ Facility	0	\$0	0.00%	
			<b>Subtotal =</b>		<b>\$40,300</b>	<b>100.00%</b>	
			Contingency	30.0%	\$12,090		
			Sales Tax	8.8%	\$3,546		
			<b>Planning Level Construction Cost =</b>		<b>\$55,900</b>		
			Property Acquisition		\$0.00		Project Priority: High
		AC	Environmental Permitting and Documentation	10.0%	\$5,590		High: 2010 - 2012
			Surveying	7.6%	\$4,236		Medium: 2013 - 2015
			Administration	5.0%	\$2,795		Low: 2016 - 2029
			Preliminary Engineering, PS&E Engineering and Construction Management	30.0%	\$16,770		
			<b>TOTAL =</b>		<b>\$85,000</b>		\$850.00 PER LF
<b>GENERAL ASSUMPTIONS:</b>							
Mobilization equals approximately 7-percent of Subtotal							
Restoration equals approximately 1-percent of Subtotal							
Trench Safety equals approximately 2-percent of Subtotal (\$1000 minimum)							
Erosion/Sedimentation Control equals approximately 1-percent of Subtotal (\$500 minimum)							
CSTC installed at minimum 6-inch compacted depth							
ACP installed at minimum 6-inch compacted depth							
ACP density equals 2 tons/cy							
ACP patch width is 4 feet							
Pipe size and length is estimated only							
Traffic control based on 2 persons @ \$35/hour plus additional \$40/day for any traffic control plan and 200 LF of piping installation per day							
Estimate does not include obtaining land or easements							
Riprap gradation:							
Dmax = 24" nominal diameter							
Dmedian = 16"							
Dmin = 4"							
Riprap includes underlying filter fabric							

CITY OF COVINGTON		2009 Comprehensive Stormwater Plan Update		PROJECT TYPE:		PROJECT SIZE:	
Preliminary Opinion of Probable Cost		Checked By: J. Coop 6/23/09		Capital		Large	
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount	Percent of Construction Cost	PROJECT DESCRIPTION:
1	1	LS	Mobilization	\$97,500.00	\$97,500	6.54%	
2	5	DAY	Traffic Control	\$600.00	\$3,000	0.20%	Construct regional detention pond north of SR 516, east of 160th Avenue.
3	1	LS	Restoration	\$13,800.00	\$13,800	0.93%	
4	1	LS	Trench Safety	\$27,000.00	\$27,000	1.81%	Quantities from 2002 Comprehensive Stormwater Plan.
5	1	LS	Erosion/Sedimentation Control	\$12,800.00	\$12,800	0.86%	
6	3.8	ACRE	Clearing and Grubbing	\$10,000.00	\$38,000	2.55%	
7	3.8	ACRE	Seeding, Fertilizing and Mulching	\$4,000.00	\$15,200	1.02%	
8	0	LF	Saw Cutting	\$2.50	\$0	0.00%	
9	0	TON	Crushed Surfacing Base Course	\$35.00	\$0.00	0.00%	
10	0	TON	Crushed Surfacing Top Course	\$25.00	\$0.00	0.00%	
11	153	TON	HMA For Pavement Repair Ci. 1/2In. P	\$150.00	\$22,950.00	1.54%	
12	0	TON	Asphalt Conc. Pavement CL. B	\$85.00	\$0	0.00%	
13	31,930	CY	Structure Excav Class B Incl Haul	\$30.00	\$957,900.00	64.29%	
14	0	TON	Select Borrow Incl. Haul	\$10.00	\$0.00	0.00%	
15	0	CY	Embankment compaction	\$2.00	\$0.00	0.00%	
16	500	LF	Corrugated PE Storm Sewer Pipe, 12-inch Diam.	\$35.00	\$17,500	1.17%	
17	500	LF	Corrugated PE Storm Sewer Pipe, 18-inch Diam.	\$50.00	\$25,000	1.68%	
18	0	LF	Corrugated PE Storm Sewer Pipe, 24-inch Diam.	\$60.00	\$0	0.00%	
19	0	LF	Corrugated PE Storm Sewer Pipe, 30-inch Diam.	\$70.00	\$0	0.00%	
20	0	LF	Corrugated PE Storm Sewer Pipe, 36-inch Diam.	\$75.00	\$0	0.00%	
21	0	LF	Corrugated PE Storm Sewer Pipe, 42-inch Diam.	\$85.00	\$0.00	0.00%	
22	0	LF	Corrugated PE Storm Sewer Pipe, 48-inch Diam.	\$100.00	\$0	0.00%	
23	0	LF	RC Storm Sewer Pipe, 36-inch Diam.	\$130.00	\$0	0.00%	
24	0	LF	RC Storm Sewer Pipe, 42-inch Diam.	\$150.00	\$0.00	0.00%	
25	0	LF	RC Storm Sewer Pipe, 48-inch Diam.	\$175.00	\$0	0.00%	
26	0	LF	12-inch SD, CIV RCP	\$250.00	\$0.00	0.00%	
27	0	EA	Catch Basin Type I	\$950.00	\$0	0.00%	
28	0	EA	Catch Basin Type IL	\$1,500.00	\$0	0.00%	
29	4	EA	Catch Basin Type II, 48-inch Diam.	\$3,500.00	\$14,000	0.94%	
30	0	EA	Catch Basin Type II, 54-inch Diam.	\$4,500.00	\$0.00	0.00%	
31	0	EA	Catch Basin Type II, 60-inch Diam.	\$4,500.00	\$0	0.00%	
32	0	EA	Catch Basin Type II, 72-inch Diam. w/Tide Flex	\$8,500.00	\$0	0.00%	
33	0	EA	Catch Basin Type II, 84-inch Diam.	\$10,000.00	\$0	0.00%	
34	0	EA	Catch Basin Type II, 96-inch Diam. w/Tide Flex	\$15,000.00	\$0	0.00%	
35	0	EA	F&I 12-inch Tide Flex	\$2,000.00	\$0.00	0.00%	
36	0	EA	F&I 36-inch Tide Flex	\$12,000.00	\$0.00	0.00%	
37	0	EA	Tideflex valve for 42-inch ID Conc. Pipe	\$12,000.00	\$0.00	0.00%	
38	0	EA	F&E 48-inch Tide Flex valves	\$11,000.00	\$0.00	0.00%	
39	0	TON	Riprap	\$40.00	\$0.00	0.00%	
40	0	EA	Adjust existing manhole rim	\$4,000.00	\$0.00	0.00%	
41	0	EA	Connect to existing manhole	\$2,000.00	\$0.00	0.00%	
42	4,905	CY	Bioretention/bioinfiltration soil mix	\$50.00	\$245,250.00	16.46%	
43	0	EA	Connect to Existing Storm	\$3,000.00	\$0.00	0.00%	
44	0	LS	Plantings/Landscape	\$10,000.00	\$0.00	0.00%	
45	0	LS	WQ Facility	0	\$0	0.00%	
				<b>Subtotal =</b>	<b>\$1,489,900</b>	<b>100.00%</b>	
				Contingency	30.0%		
				Sales Tax	8.8%		
				<b>Planning Level Construction Cost =</b>	<b>\$2,068,000</b>		
3.8	AC		Property Acquisition	\$18,990.00	\$72,162.00		Project Priority: Low
			Environmental Permitting and Documentation	10.0%	\$206,800		High: 2010 - 2012
			Surveying	0.5%	\$9,703		Medium: 2013 - 2015
			Administration	5.0%	\$103,400		Low: 2016 - 2029
			Preliminary Engineering, P&S&E Engineering and Construction Management	30.0%	\$620,400		
				<b>TOTAL =</b>	<b>\$3,080,000</b>		
<b>GENERAL ASSUMPTIONS:</b>							
Mobilization equals approximately 7-percent of Subtotal							
Restoration equals approximately 1-percent of Subtotal							
Trench Safety equals approximately 2-percent of Subtotal (\$1000 minimum)							
Erosion/Sedimentation Control equals approximately 1-percent of Subtotal (\$500 minimum)							
CSTC installed at minimum 6-inch compacted depth							
ACP installed at minimum 6-inch compacted depth							
ACP density equals 2 tons/cy							
ACP patch width is 4 feet							
Pipe size and length is estimated only							
Traffic control based on 2 persons @ \$35/hour plus additional \$40/day for any traffic control plan and 200 LF of piping installation per day							
Estimate does not include obtaining land or easements							
Riprap gradation: Dmax = 24" nominal diameter							
Dmedian = 16"							
Dmin = 4"							
Riprap includes underlying filter fabric							

CITY OF COVINGTON		2009 Comprehensive Stormwater Plan Update		PROJECT TYPE:			
Preliminary Opinion of Probable Cost		Checked By: J. Coop 6/23/09		PROJECT SIZE:			
CIP #:	1078			Capital Large			
Project Name:	Lakeside Regional Detention Pond						
Prepared By:	C. Buitrago 6/18/09						
Item No.	Estimated Quantity	Unit	Description	Unit Cost	Amount	Percent of Construction Cost	PROJECT DESCRIPTION:
1	1	LS	Mobilization	\$58,200.00	\$58,200	6.54%	
2	5	DAY	Traffic Control	\$600.00	\$3,000	0.34%	Construction regional detention pond south of SR 28, north of Timberlane. (M2)
3	1	LS	Restoration	\$8,200.00	\$8,200	0.92%	
4	1	LS	Trench Safety	\$16,100.00	\$16,100	1.81%	
5	1	LS	Erosion/Sedimentation Control	\$7,500.00	\$7,500	0.84%	Quantities from 2002 Comprehensive Stormwater Plan.
6	3.4	ACRE	Clearing and Grubbing	\$10,000.00	\$34,000	3.82%	
7	3.4	ACRE	Seeding, Fertilizing and Mulching	\$4,000.00	\$13,600	1.53%	
8	0	LF	Saw Cutting	\$2.50	\$0	0.00%	
9	0	TON	Crushed Surfacing Base Course	\$35.00	\$0.00	0.00%	
10	0	TON	Crushed Surfacing Top Course	\$25.00	\$0.00	0.00%	
11	77	TON	HMA For Pavement Repair Ci. 1/2In. P	\$150.00	\$11,550.00	1.30%	
12	0	TON	Asphalt Conc. Pavement C.L. B	\$85.00	\$0	0.00%	
13	22,680	CY	Structure Excav Class B Incl Haul	\$20.00	\$453,600.00	50.99%	
14	0	TON	Select Borrow Incl. Haul	\$10.00	\$0.00	0.00%	
15	0	CY	Embankment compaction	\$2.00	\$0.00	0.00%	
16	500	LF	Corrugated PE Storm Sewer Pipe, 12-Inch Diam.	\$35.00	\$17,500	1.97%	
17	200	LF	Corrugated PE Storm Sewer Pipe, 18-Inch Diam.	\$50.00	\$10,000	1.12%	
18	200	LF	Corrugated PE Storm Sewer Pipe, 24-Inch Diam.	\$60.00	\$12,000	1.35%	
19	0	LF	Corrugated PE Storm Sewer Pipe, 30-Inch Diam.	\$70.00	\$0	0.00%	
20	100	LF	Corrugated PE Storm Sewer Pipe, 36-Inch Diam.	\$75.00	\$7,500	0.84%	
21	0	LF	Corrugated PE Storm Sewer Pipe, 42-Inch Diam.	\$85.00	\$0.00	0.00%	
22	0	LF	Corrugated PE Storm Sewer Pipe, 48-Inch Diam.	\$100.00	\$0	0.00%	
23	0	LF	RC Storm Sewer Pipe, 36-Inch Diam.	\$130.00	\$0	0.00%	
24	0	LF	RC Storm Sewer Pipe, 42-Inch Diam.	\$150.00	\$0.00	0.00%	
25	0	LF	RC Storm Sewer Pipe, 48-Inch Diam.	\$175.00	\$0	0.00%	
26	0	LF	12-inch SD, CI V RCP	\$250.00	\$0.00	0.00%	
27	0	EA	Catch Basin Type I	\$950.00	\$0	0.00%	
28	0	EA	Catch Basin Type II	\$1,500.00	\$0	0.00%	
29	5	EA	Catch Basin Type II, 48-Inch Diam.	\$3,500.00	\$17,500	1.97%	
30	0	EA	Catch Basin Type II, 54-Inch Diam.	\$4,500.00	\$0.00	0.00%	
31	0	EA	Catch Basin Type II, 60-Inch Diam.	\$4,500.00	\$0	0.00%	
32	0	EA	Catch Basin Type II, 72-Inch Diam. w/Tide Flex	\$8,500.00	\$0	0.00%	
33	0	EA	Catch Basin Type II, 84-Inch Diam.	\$10,000.00	\$0	0.00%	
34	0	EA	Catch Basin Type II, 96-Inch Diam. w/Tide Flex	\$15,000.00	\$0	0.00%	
35	0	EA	F&I 12-inch Tide Flex	\$2,000.00	\$0.00	0.00%	
36	0	EA	F&I 36-inch Tide Flex	\$12,000.00	\$0.00	0.00%	
37	0	EA	Tideflex valve for 42-inch ID Conc. Pipe	\$12,000.00	\$0.00	0.00%	
38	0	EA	F&E 48-inch Tide Flex valves	\$11,000.00	\$0.00	0.00%	
39	0	TON	Riprap	\$40.00	\$0.00	0.00%	
40	0	EA	Adjust existing manhole rim	\$4,000.00	\$0.00	0.00%	
41	0	EA	Connect to existing manhole	\$2,000.00	\$0.00	0.00%	
42	4,388	CY	Bioretention/bioinfiltration soil mix	\$50.00	\$219,400.00	24.66%	
43	0	EA	Connect to Existing Storm	\$3,000.00	\$0.00	0.00%	
44	0	LS	Plantings/Landscape	\$10,000.00	\$0.00	0.00%	
45	0	LS	WQ Facility	0	\$0	0.00%	
				<b>Subtotal =</b>	<b>\$889,650</b>	<b>100.00%</b>	
				Contingency	30.0%		
				Sales Tax	8.8%		
				<b>Planning Level Construction Cost =</b>	<b>\$1,234,800</b>		
3.4	AC		Property Acquisition	\$25,700.00	\$87,380.00		Project Priority: Low
			Environmental Permitting and Documentation	10.0%	\$123,480		High: 2010 - 2012
			Surveying	0.7%	\$8,620		Medium: 2013 - 2015
			Administration	5.0%	\$61,740		Low: 2016 - 2029
			Preliminary Engineering, PS&E Engineering and Construction Management	30.0%	\$370,440		
				<b>TOTAL =</b>	<b>\$1,886,000</b>		
<b>GENERAL ASSUMPTIONS:</b>							
Mobilization equals approximately 7-percent of Subtotal							
Restoration equals approximately 1-percent of Subtotal							
Trench Safety equals approximately 2-percent of Subtotal (\$1000 minimum)							
Erosion/Sedimentation Control equals approximately 1-percent of Subtotal (\$500 minimum)							
CSTC installed at minimum 6-inch compacted depth							
ACP installed at minimum 6-inch compacted depth							
ACP density equals 2 tons/cy (approx.)							
ACP patch width is 4 feet							
Pipe size and length is estimated only							
Traffic control based on 2 persons @ \$35/hour plus additional \$40/day for any traffic control plan and 200 LF of piping installation per day							
Estimate does not include obtaining land or easements							
Riprap gradation: Dmax = 24" nominal diameter							
Dmedian = 16"							
Dmin = 4"							
Riprap includes underlying filter fabric							

**APPENDIX G**

**Review for Little Soos Creek  
Regional Flow Control**

CITY OF COVINGTON			
Stormwater Comprehensive Plan Update			
Field Review of Conceptual Regional Flow Control Facility for Little Soos Creek, vicinity of SE 256th Street			
Site	General Location	Advantage	Disadvantage
A	North of SE 256th St, north of 173rd Ave SE	Undeveloped site	Would require significant excavation volume because site is higher than Little Soos Creek
B	North of SE 256th Street; east of Crystal View Park	Undeveloped site; would not require as much excavation as Site A. Pebble count performed at this location	Would not require as much excavation as Site A. Would disturb good riparian vegetation.
C	South of SE 256th Street; east of Little Soos Creek	Site has existing house but significant open space	Would require significant excavation volume because site is higher than Little Soos Creek
D	Downstream of current problem area; north of Wingfield development	Low-lying area; existing park but no structures	Downstream of problem area.
			Field Observations
			Site located on private property and not accessible for further observations.
			Emerald Downs stormwater system outfall located in site vicinity. Outfall discharges into the stream along the right bank (northeast), and appears to be in the floodplain. The bank adjacent to 170th PL SE is very steep and vegetated and not likely suitable for a regional facility. The opposing bank, in floodplain, contains large trees and good riparian vegetation. Pebble count performed at this site.
			Site drains to the east away from the Little Soos Creek basin.
			Site has been cleared and a park constructed. The park's northwest corner appears to have been constructed at a low elevation as part of floodplain fill compensation. The stream near this location is a deep, narrow channel, well connected to the floodplain, and the substrate appears to be clean. Salmonids observed in the stream.



JR.  
HIGH  
SCHOOL

164TH AVE SE

SE  
256TH  
ST.

"A"  
IN  
CREEK -  
PLAIN

"B" IN ROAD PLAIN

Copyright © 2008 i-cubed

1:10,000

ESRI

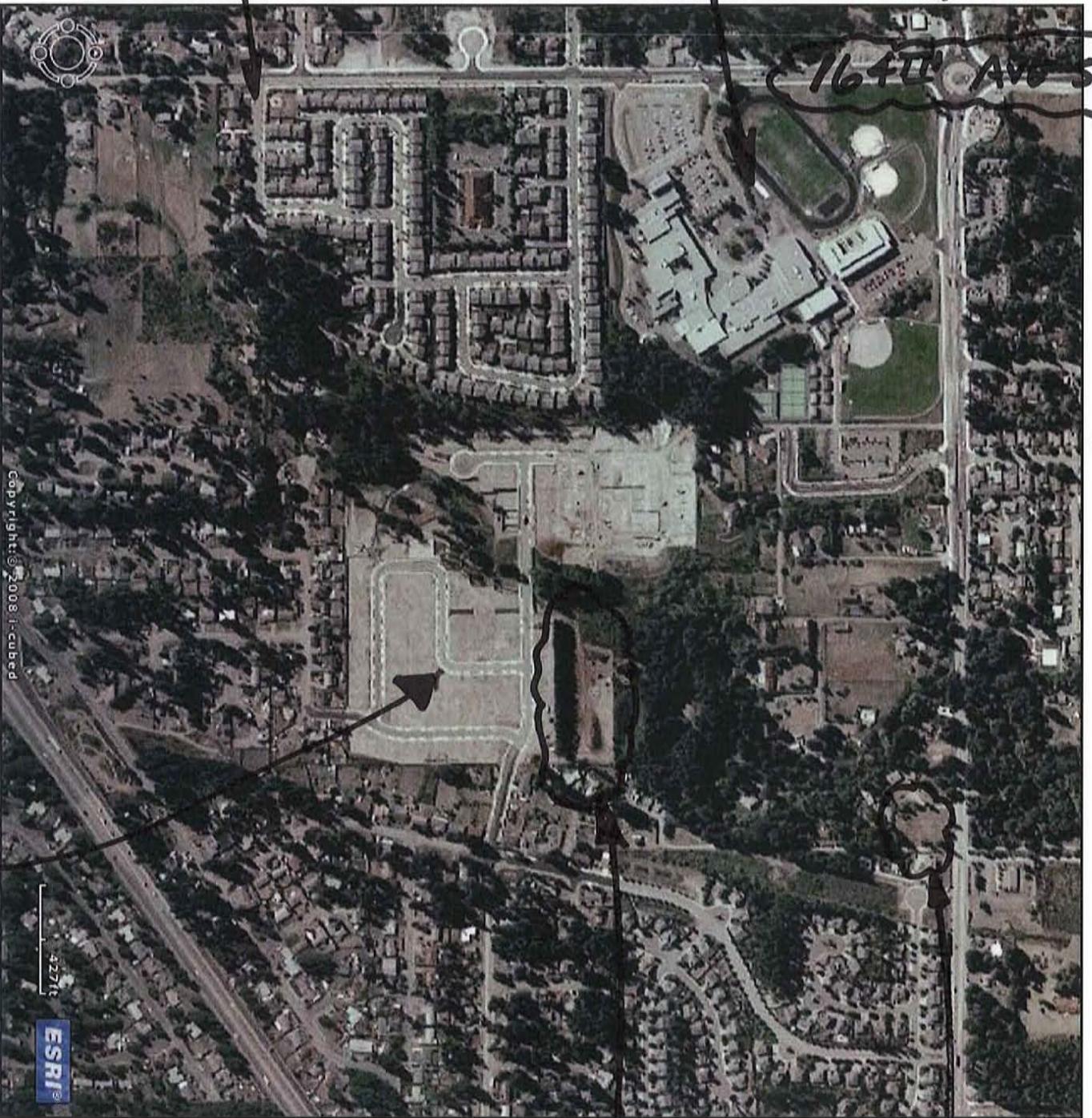
Little Soos Creek Regional Flow Control - South of SE 256th St.

SE  
256TH  
ST. →

KENTWOOD  
HIGH  
SCHOOL

SE  
264TH  
ST. →

164TH AVE SW



"C"

OUTSIDE  
FLOWLAW

"D"

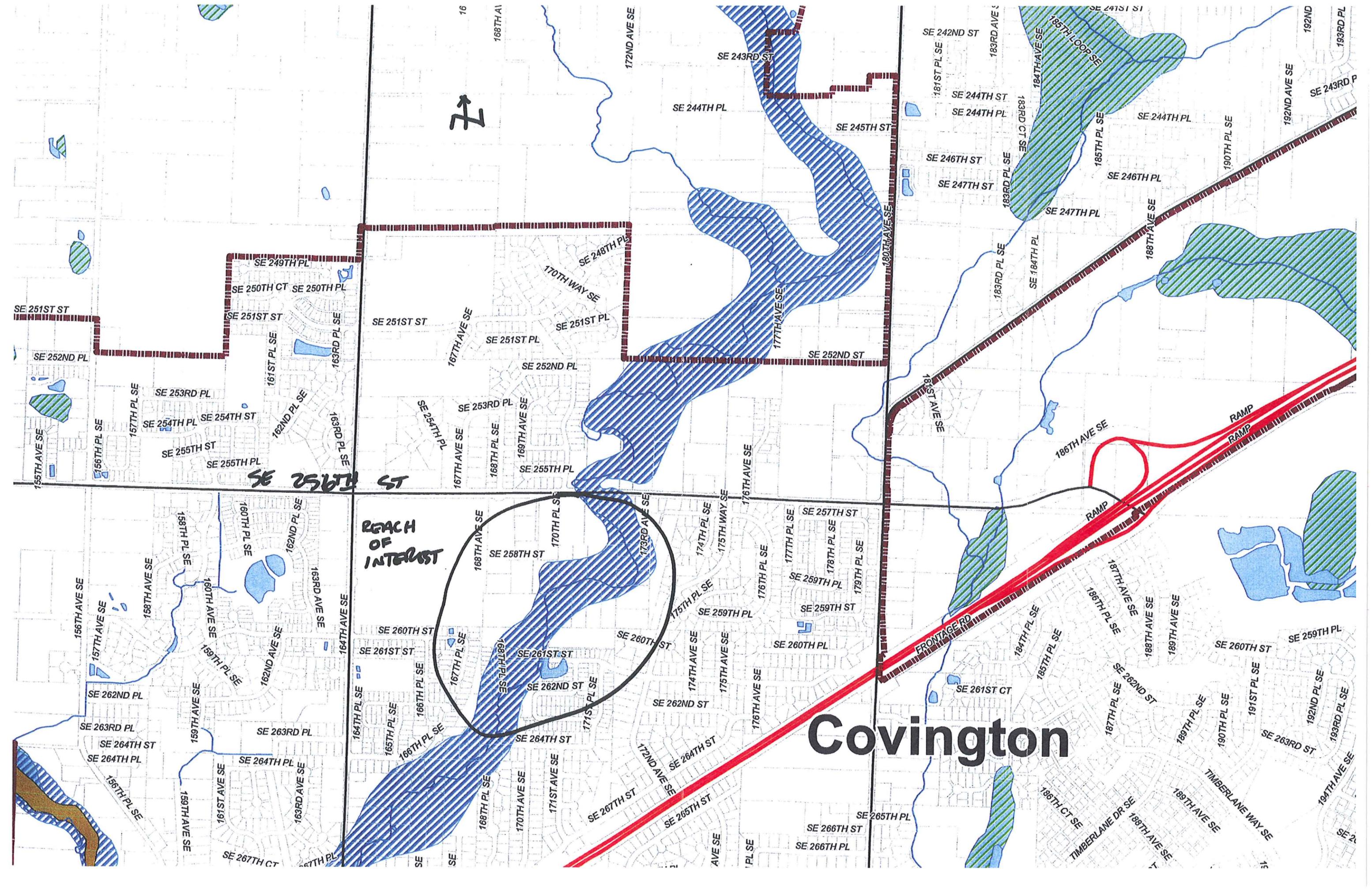
IN  
FLOWLAW

WINBEYERD  
DEVELOPMENT

Copyright: © 2008 i-cubed

4271





**REACH  
OF  
INTEREST**

**Covington**

**SE 256TH ST**

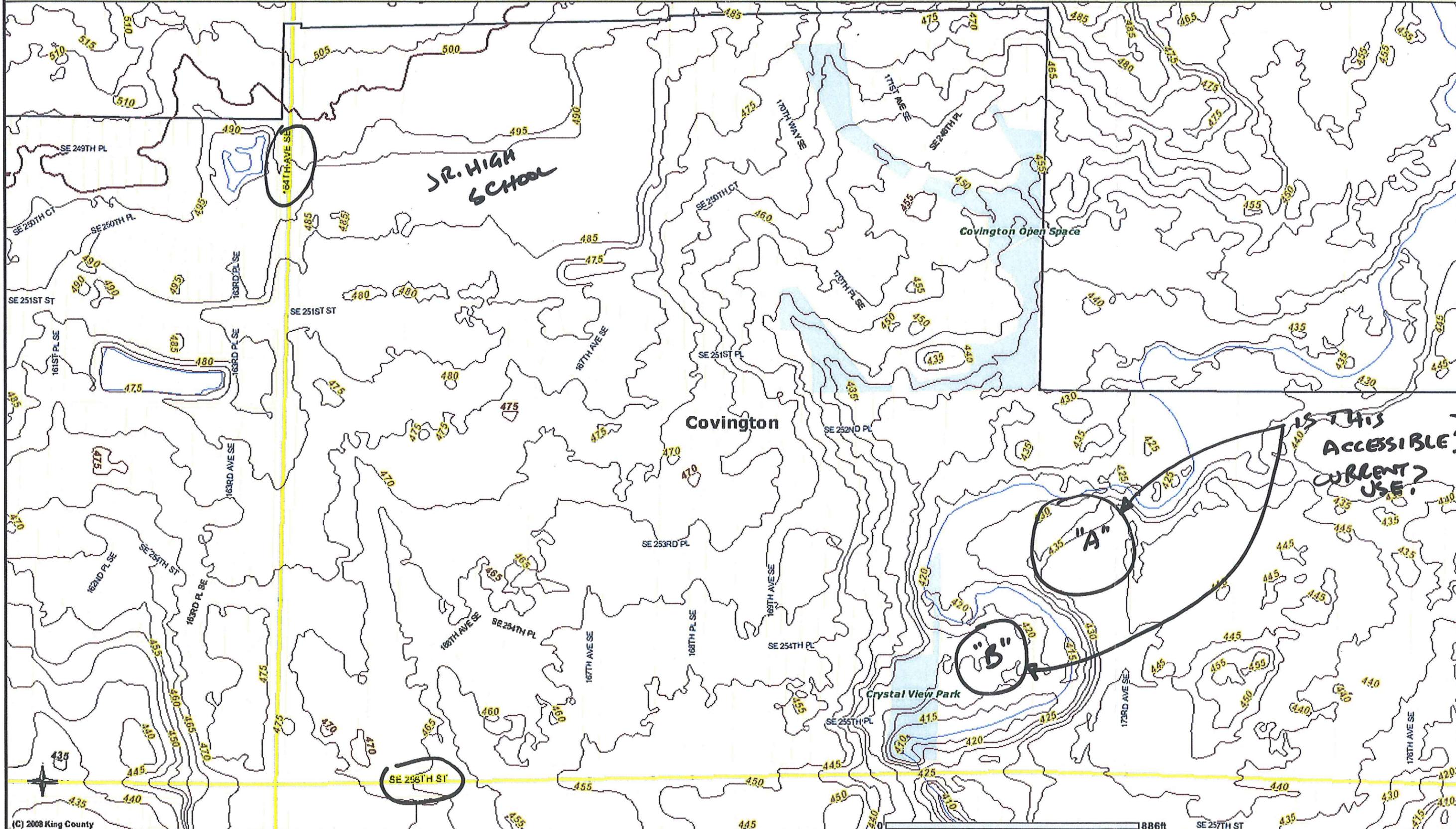
**FRONTAGE RD**

**RAMP**

**RAMP**

**RAMP**

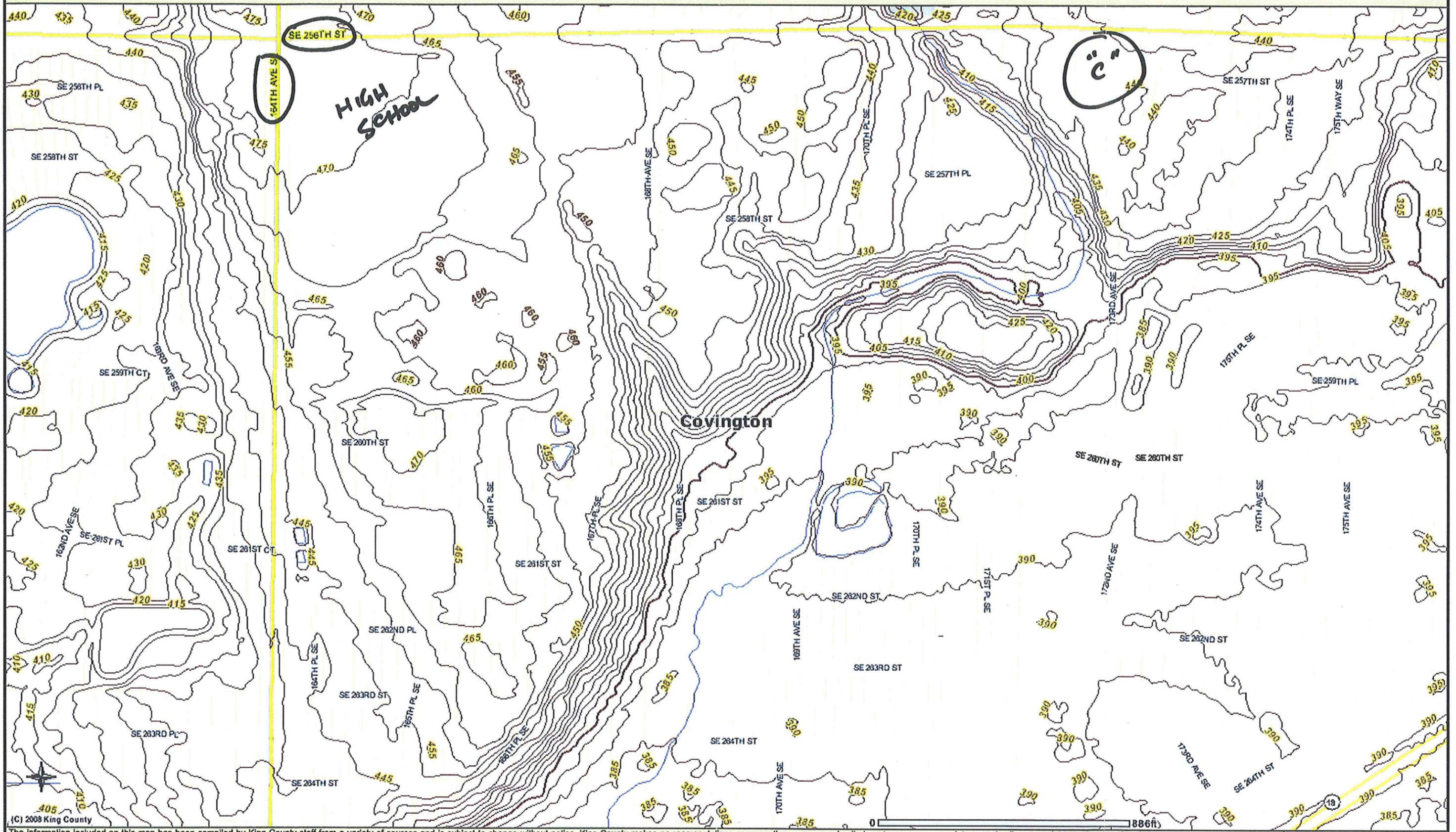
# Little Soos Creek Regional Flow Control - NORTH OF SE 256TH ST.



(C) 2008 King County

The information included on this map has been compiled by King County staff from a variety of sources and is subject to change without notice. King County makes no representations or warranties, express or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a survey product. King County shall not be liable for any general, special, indirect, incidental, or consequential damages including, but not limited to, lost revenues or lost profits resulting from the use or misuse of the information contained on this map. Any sale of this map or information on this map is prohibited except by written permission of King County.

# Little Soos Creek Regional Flow Control - SOUTH OF SE 256TH ST.



(C) 2008 King County

The information included on this map has been compiled by King County staff from a variety of sources and is subject to change without notice. King County makes no representations or warranties, express or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a survey product. King County shall not be liable for any general, special, indirect, incidental, or consequential damages including, but not limited to, lost revenues or lost profits resulting from the use or misuse of the information contained on this map. Any sale of this map or information on this map is prohibited except by written permission of King County.



Stream Name: Little Soos Creek

Reach Name: Soos Creek Sewer Dist. Lift Station #14-N. of 256th St. Culvert

Field Crew: J. Hungerford, J. Friebel

Date: 6/11/09

**Cross Section #1**

bankfull width = 19 ft

D<sub>50</sub> 0.062

D<sub>84</sub> 24.16

Particle #	Size (mm)
1	0.062
2	0.062
3	0.062
4	0.062
5	0.062
6	0.062
7	10
8	13
9	5
10	0.062
11	4
12	10
13	6
14	12
15	14
16	0.062
17	11
18	0.062
19	0.062
20	6
21	0.062
22	155
23	85
24	25
25	29
26	35
27	13
28	50
29	15
30	5
31	10
32	20
33	120
34	5
35	27
36	17
37	145
38	15
39	12
40	6

Stream Name: Little Soos Creek

Reach Name: Soos Creek Sewer Dist. Lift Station #14-N. of 256th St. Culvert

Field Crew: J. Hungerford, J. Friebe

Date: 6/11/09

**Cross Section #1**

bankfull width = 19 ft

D<sub>50</sub> 0.062

D<sub>84</sub> 24.16

Particle #	Size (mm)
41	25
42	75
43	23
44	18
45	9
46	24
47	12
48	170
49	9
50	28
51	7
52	100
53	60
54	0.062
55	0.062
56	0.062
57	0.062
58	0.062
59	0.062
60	1
61	0.062
62	0.062
63	0.062
64	0.062
65	80
66	0.062
67	0.062
68	0.062
69	0.062
70	0.062
71	0.062
72	0.062
73	0.062
74	0.062
75	0.062
76	0.062
77	0.062
78	0.062
79	0.062
80	0.062

Stream Name: Little Soos Creek

Reach Name: Soos Creek Sewer Dist. Lift Station #14-N. of 256th St. Culvert

Field Crew: J. Hungerford, J. Friebe

Date: 6/11/09

**Cross Section #1**

bankfull width = 19 ft

D<sub>50</sub> 0.062

D<sub>84</sub> 24.16

Particle #	Size (mm)
81	0.062
82	0.062
83	0.062
84	0.062
85	0.062
86	0.062
87	0.062
88	0.062
89	0.062
90	0.062
91	0.062
92	0.062
93	0.062
94	0.062
95	0.062
96	0.062
97	0.062
98	0.062
99	0.062
100	0.062

Notes:

Silt given an assumed value of .062 mm

Bedrock give an assumed value of 270

**Table**  
**Rating Table for Irregular Channel**

Project Description	
Project File	untitled
Worksheet	Covington
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Discharge

Constant Data	
Water Surface Elevation	10.00 ft ← SET EQUAL TO BANKFULL DEPTH

Input Data			
	Minimum	Maximum	Increment
Channel Slope	0.010000	0.020000	0.002000 ft/ft

Rating Table		
Channel Slope (ft/ft)	Wtd. Mannings Coefficient	Discharge (ft <sup>3</sup> /s)
0.010000	0.035	98.24
0.012000	0.035	107.62
0.014000	0.035	116.24
0.016000	0.035	124.27
0.018000	0.035	131.81
0.020000	0.035	138.94

Flow Area = 22.07 ft<sup>2</sup>

wetted Perimeter = 20.56 ft

Top width = 19.4 ft

Depth (avg) = 1.4 ft.

Velocity = 1.45 ft/s @ Bankfull w/ S = 0.01