



Clark County

Stormwater Management Plan

2014

Protecting water through stormwater management



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2014

DRAFT

Protecting water through stormwater management

Prepared by Clark County Environmental Services, Clean Water Program

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INDEX TO NPDES PERMIT COMPONENTS

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ACRONYMS AND GLOSSARY

- **AKART** – all known, available, and reasonable methods of prevention, control and treatment as the Ecology standard for the effort required to meet waste water discharge and NPDES permit requirements.
- **BMP** – best management practices (controls for stormwater runoff)
- **BOCC** – Board of Clark County Commissioners
- **CCSWMP** – *Clark County Stormwater Management Plan*
- **CIP** – Capital Improvement Program
- **CWP** – the Clean Water Program, a division of Clark County Environmental Services
- **DES** – the Clark County Department of Environmental Services
- **Ecology** – Washington State Department of Ecology
- **EPA** – Environmental Protection Agency
- **GIS** – geographic information system
- **GMS** – grounds maintenance specialist
- **IDDE** – illicit discharge detection and elimination
- **Illicit discharge** – a non-stormwater discharge or illegal connection to the storm sewer system (e.g. a sanitary sewer line connected to storm sewer system)
- **LID** – low impact development
- **MEP** – maximum extent practicable
- **MS4** – municipal separate storm sewer system
- **NOAA Fisheries** - National Oceanic and Atmospheric Administration, National Marine Fisheries Service
- **NOI** – Notice of Intent
- **NPDES** – National Pollutant Discharge Elimination Systems
- **NRS** – natural resources specialist
- **PPGS** – potential pollutant generating site
- **RCW** – Revised Code of Washington
- **SCIP** – Stormwater Capital Improvement Plan
- **SNAP** – Stormwater Needs Assessment Program
- **StormwaterClk** – a GIS database the county maintains for storm sewer infrastructure
- **SWMMPSB** – 1992 Stormwater Management Manual for the Puget Sound Basin, published by Department of Ecology
- **SMMWW** – 2012 *Stormwater Management Manual for Western Washington*, published by Ecology
- **SWMP** – stormwater management program
- **SWPPP** – stormwater pollution prevention plan

- **Tidemark** – a database the county maintains to track permits and code enforcement
- **TMDL** – total maximum daily load
- **UIC** – underground injection control
- **WAC** – Washington Administrative Code
- **WQDB** – *Water Quality Database*

RESPONSIBILITY INDEX

CD = Community Development

DES = Department of Environmental Services

PW = Public Works

| Abbreviation | Full Staff Title | Job Description |
|-----------------------------------|--|---|
| Applicant | (as stated) | Customer who utilizes the municipal code and stormwater manual to guide development projects |
| Assessment and GIS | (as stated) | Supports the county's GIS system |
| BOCC | Board of County Commissioners | Legal authority for permit compliance |
| CD Building Official | (as stated) | Oversees customer application for development, all building permits and permit counter |
| CD Dev. Services Mgr. | Development Services Manager | Coordinates a pre-application conference with potential applicants and provides planning approvals |
| CD Permit Tech | Permit technician | Processes permit applications |
| CD Building Safety | (as stated) | Enforces erosion control regulations and stormwater for residential building permits |
| CD Permit Services | (as stated) | Coordinates review of development applications |
| CD Planner | (as stated) | Supports the pre-application process and land use approvals |
| CRWWD | Clark Regional Wastewater District | Supports the coordination of illicit discharge protection |
| DES Director | (as stated) | Designated director for permit compliance |
| DES CWP Mgr. | Clean Water Program Manager | Oversees and manages the Clean Water Program |
| DES CWP NPDES Mgr. | Clean Water Program National Pollution Discharge Elimination System Permit Manager | Oversees compliance with the County's Phase 1 Municipal Stormwater Permit |
| DES CWP Infrastructure Mgr. | Clean Water Program Infrastructure Manager | Oversees / manages stormwater capital planning and infrastructure mapping, coordinates stormwater infrastructure inspection and maintenance |
| DES Enhancement & Permitting Mgr. | Enhancement and Permitting Manager | Coordinates environmental permitting for the department |
| DES CWP Eng. | Clean Water Program Engineer | Coordinates design and engineering of Clean Water projects |
| DES CWP Eng. | Clean Water Program Engineering | Inventory and maps the stormwater system |

| | | |
|---------------------------------------|---|--|
| Tech | Technician | |
| DES Source Control Specialist | Source Control Specialist | Technical assistance with citizens and businesses to comply with facility maintenance and source control regulations |
| DES Code Enforcement | (as stated) | Coordinates citizen complaints and code compliance |
| DES Natural Res. Spec. | Natural Resource Specialist | Performs monitoring and illicit discharge field work and analysis |
| DES Project Coordinator | (as stated) | Coordinates specific project tasks and work products |
| DES CWP Professional staff | (as stated) | Supports various work projects and products |
| DES Office Assistant (OA) | (as stated) | Coordinates document control and record-keeping |
| DES CWP Admin. | Clean Water Program Administration | Supports document control and record keeping |
| DES Sustainability & Outreach Manager | (as stated) | Oversees the education and outreach tools used to comply with the permit requirements |
| DES Americorps staff | (as stated) | Supports education and outreach efforts |
| DES Vegetation Mgmt. Mgr. | Vegetation Management Manager | Oversees the operations and maintenance of the vegetation management program |
| DES Vegetation Mgmt. Crew | Vegetation Management Crew | Performs all tasks associated with operations of the program |
| General Services Facilities Mgr. | Facilities Manager | Oversees the facilities program for county properties |
| General Services Facilities Crews | (as stated) | Performs all tasks associated with the operations of the program on county properties |
| Public Health | (as stated) | Coordinates illicit connection/discharge issues with DES staff |
| PW Answering Service | (as stated) | Coordinates after business hours service calls |
| PW Engineering Program Mgr. | Engineering Program Manager | Oversees PW engineer activities |
| PW Eng. Project Manager | Engineering Project Manager | Manages engineering related projects |
| PW Eng. Program Staff | Engineering Program Staff | Develops engineering related materials |
| PW Public Information Officer | (as stated) | Supports the development and delivery of public outreach and educational materials |
| PW Real Property Services | (as stated) | Coordinates property related information, such as titles, legal information, etc. |
| PW Survey | (as stated) | Coordinates all necessary survey data required for a project |
| PW Dev. Engineering Mgr. | Development Engineering Manager | Oversees the engineering review of development applications |
| PW Dev. Engineering Planning Tech | Development Engineering Planning Technician | Reviews development applications for compliance with county code and regulations. Coordinates bonds, compliance and final plat |
| PW Dev. Engineering | (as stated) | Conducts the engineering development review and participates in application |

| | | |
|---------------------------------------|---|---|
| Review Engineer | | meetings |
| PW Development Inspectors | (as stated) | Coordinates inspections and education |
| PW Construction Mgr. | Construction Management | Oversees the compliance of development construction with approved plans and code |
| PW Construction Management Engineer | (as stated) | Reviews PW construction projects for compliance with approved plans and applicable regulations |
| PW Construction Management Supervisor | (as stated) | Oversees the compliance with inspections of development construction |
| PW Construction Management Inspectors | (as stated) | Conducts on-site construction inspections to ensure compliance with approved plans and applicable regulations |
| PW Construction Management OA | Construction Management Office Assistant | Coordinates document management associated with project approvals |
| PW Ops Mgr | Operations Manager | Oversees all operation and maintenance responsibilities |
| PW Ops Road Super | Operations Road Supervisor | Oversees all elements associated road maintenance and operations |
| PW Ops Crew Chief | Operations Crew Chief | Leads and coordinates road crew activities |
| PW Ops Road Crews | Operations Road Crews | Perform all necessary road maintenance and operations activities to meet applicable standards and regulations |
| PW Ops Administration | Operations Administration | Provides support to various tasks, such as spill response and citizen complaints |
| PW Parks Mgr | Parks Manager | Oversees all of the administration, customer service, maintenance and operations of parks |
| PW Parks Super | Parks Superintendent | Oversees the maintenance and operations of the parks |
| Contract Services | Outside firm or agency contracted with Clark County | Hired to meet specific scope of work items per the appropriate fund and need |

Chapter 1 D R A F T

Introduction and Background

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Leadbetter Road along Lacamas Lake, 1951

Clark County Stormwater Management Plan



The *Clark County Stormwater Management Plan (CCSWMP)* describes the various ways that Clark County manages stormwater and related water resources issues in the unincorporated area. It acts as a resource for the public to learn about the county's efforts to reduce pollution in stormwater, an informative guide for staff, and a compliance measure for the county's municipal stormwater permit.

INTRODUCTION

As the county's population continues to increase, Clark County is committed to responsible stormwater management to keep our waterways clean for people, fish, and wildlife.

The Clark County Department of Environmental Services (DES) administers the Clean Water Program (CWP) to protect surface water and groundwater resources from polluted stormwater and to coordinate compliance with state and federal water pollution laws.

Primary responsibilities of the overall stormwater program include planning and building stormwater control facilities, water quality monitoring of stormwater and streams, public education and outreach, development and enforcement of water quality regulations, coordination with other municipalities, and maintenance of the county's stormwater system.

STORMWATER AND THE NPDES PERMIT

Much of the pollution in Washington State's waters comes from many different, hard-to-trace sources with no obvious point of collection and discharge. It is called "nonpoint source pollution" and it travels to our streams, lakes, and other water bodies through polluted stormwater runoff carried by the county's storm sewer system.

Most U.S. cities and counties that collect stormwater runoff in municipal separate storm sewers and discharge it to surface waters are required to obtain a permit under the federal Clean Water Act. Clark County qualifies under the Environmental Protection Agency (EPA) stormwater regulations for the National Pollutant Discharge Elimination Systems (NPDES) Phase I Municipal Stormwater Permit program. In Washington State,

EPA has delegated the Washington Department of Ecology (Ecology) the authority to develop and administer the NPDES permitting program.

Ecology issued a [NPDES Phase I Municipal Stormwater Permit to Clark County](#) and other western Washington jurisdictions in August 2012 with an effective date of August 1, 2013. This permit is for a five-year period expiring on July 31, 2018, when it is expected that Ecology will issue a revised permit.

Phase I permittees are cities and counties that operate large and medium municipal separate storm sewer systems (MS4s). Governmental bodies within their boundaries, such as state universities, public school districts and drainage districts, are also required to meet permit requirements. The permit regulates discharges to waters of Washington State from the permittees' MS4s in compliance with Washington Water Pollution Control Law (Chapter [90.48 RCW](#)) and the federal Clean Water Act ([Title 33 USC, Section 1251 et seq.](#)).

PERMIT COMPLIANCE

The NPDES Permit prescribes a variety of requirements and actions. It lists 21 general conditions; these include, among others, a requirement to notify Ecology of spills, a duty to avoid bypassing water quality treatment and flow control facilities, and a requirement to notify Ecology of a failure to comply with the permit.

The permit also lists nine special conditions that, among other things, specify permit coverage, list permittee responsibilities, and under Special Condition S5, prescribe a ten-component stormwater management program (SWMP).

The SWMP consists of actions meeting the ten required components and any additional actions and activities necessary to comply with Total Maximum Daily Load (TMDL) requirements. Clark County's SWMP is designed to reduce pollutant discharges to the federal maximum extent practicable (MEP) standard, meet state requirements for managing stormwater using all known, available, and reasonable methods of prevention, control and treatment (AKART), and protect water quality.

The county is required to prepare a stormwater management program plan to inform the public of planned program activities for the upcoming calendar year. The SWMP plan must be updated at least annually to include any program changes or revisions that occur and be submitted in part or in whole with the annual report to the Department of Ecology.

THE CLARK COUNTY STORMWATER MANAGEMENT PLAN AND STORMWATER MANAGEMENT PROGRAM

This *Clark County Stormwater Management Plan (CCSWMP)* encompasses efforts undertaken by Clark County, primarily in the Department of Environmental Services Clean Water Program, for the protection and monitoring of water quality and the management of stormwater and related concerns. The *Plan* includes, as chapter 2, the NPDES stormwater management program required by Ecology.

THE CLEAN WATER PROGRAM

The Clean Water Program (CWP) in Clark County's Department of Environmental Services is responsible for a majority of the county's NPDES compliance actions and activities, coordination and reporting. The program coordinates with a variety of county departments to achieve and facilitate compliance. The CWP is the primary author of reports and other documents required by Ecology.



In addition to activities addressing NPDES Permit compliance and surface water resource management, the CWP manages other important stormwater-related activities, including registering and managing stormwater injection wells regulated under the state's Underground Injection Control Rules ([173-218 WAC](#)) pursuant to the federal Safe Drinking Water Act, and giving engineering advice and support on flooding and drainage problems.

Funding & Budget

The Clean Water Program is funded primarily by an annual stormwater fee charged to developed parcels in the unincorporated area of the county. The county collects approximately \$5.1 million annually from approximately 65,000 rate payers. Other sources of funding may include grants and the General Fund. The Road Fund provides support for stormwater management associated with county roadways.

Clean Water Fee

The rate for each equivalent residential unit (ERU), equaling 3,500 square feet of impervious surface, is \$33 per year. Urban residential lots are presumed to contain one

ERU. Larger residential lots, mostly located in the rural area, are assessed a lower fee based on the assumption that the impervious surfaces have a lesser impact on the county’s stormwater system and on receiving waters. These prorated rates range from a high of \$29.70 for lots from ½ to one acre in size to a low of \$19.80 for lots greater than 20 acres. Commercial properties, roads, churches, and schools are assessed a fee based on the number of ERUs measured on the parcel.

Per [Clark County Code 13.30A](#), fee revenues are used to fund stormwater management activities.

Clean Water Fund

Revenues from the Clean Water Fee, from grants awarded to the Clean Water Program, and from fines are deposited into the Clean Water Fund by the Clark County Treasurer. Revenues in excess of annual operating expenses for maintenance, repair, enforcement, assessment, monitoring, and education remain in the fund balance for use in constructing new public storm sewer infrastructure or in retrofitting inadequate facilities.

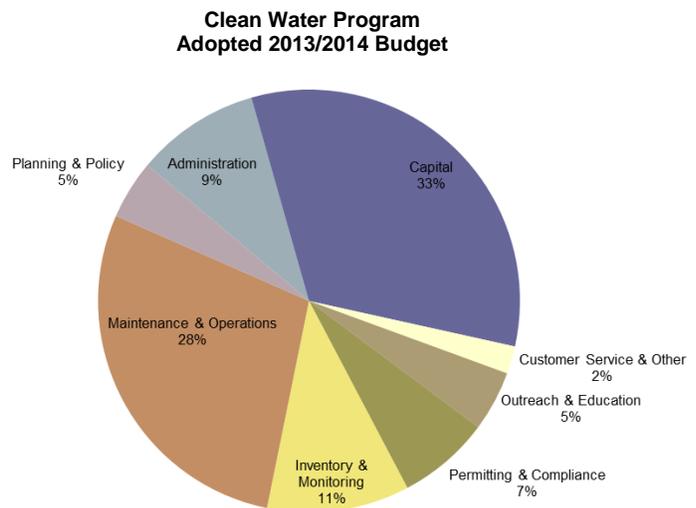
Budget

Clark County budgets on a two-year cycle. The Clean Water Program budget is set at the beginning of each cycle and modified, if necessary, through requests for additional appropriations from the Clean Water Fund during the biennium.

The budget is approved by the elected Board of Clark County Commissioners (BOCC). The BOCC sets the Clean Water Program budget in response to state priorities, expressed through the NPDES Municipal Stormwater Permit, and local priorities.

Areas of greatest expenditure include stormwater capital construction, maintenance and operation of storm sewer infrastructure, and assessment and monitoring of surface water and stormwater.

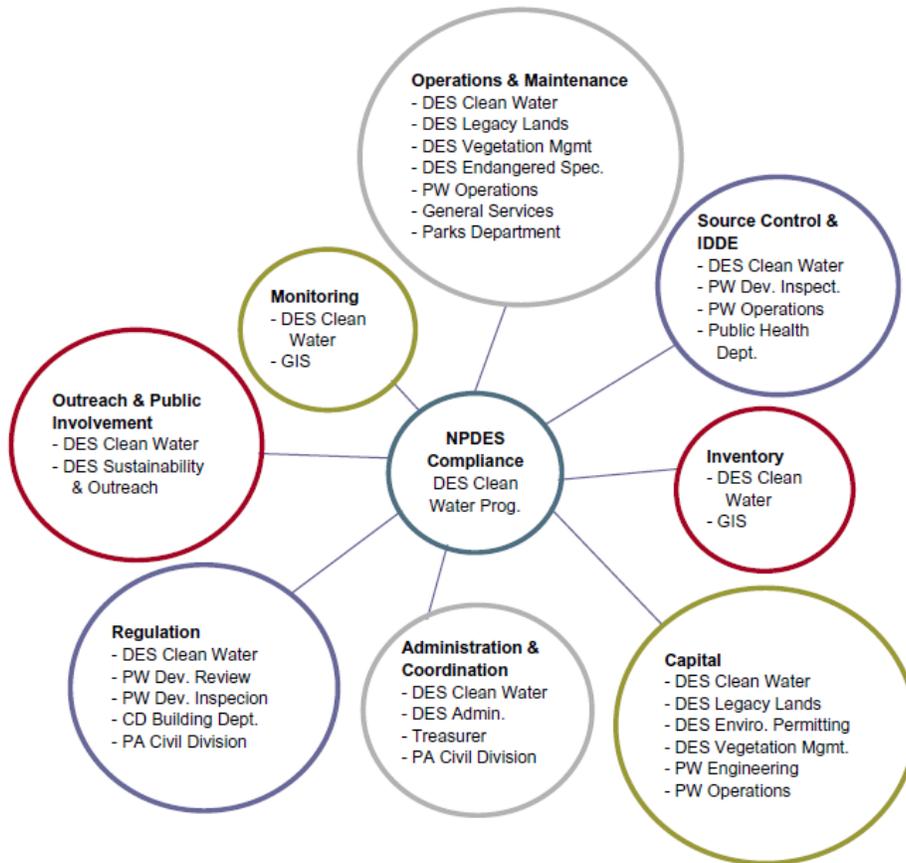
In recent years, a focus on building new stormwater facilities in under-served areas and on enhancing existing facilities has increased the overall budget and the proportion dedicated to capital construction. During the next biennium, an additional \$1.5 million is expected to be spent on new permit requirements for code revisions and watershed planning.



Organization & Staffing

The Clean Water Program employs a staff of 16 scientists, engineers, technical specialists, program coordinators and administrators who perform essential stormwater management functions. The program also coordinates with other county departments for additional essential stormwater services that fit within those department’s core services. This organizational structure allows the Clean Water Program to minimize expenses by engaging technical and professional experts such as design engineers, road maintenance crews, and educators employed by other county departments to complement a core staff of stormwater specialists.

NPDES Compliance Coordination



CD = Community Development Department
 DES = Department of Environmental Services
 GIS = Geographic Information Systems Department
 PA = Prosecuting Attorney
 PW = Public Works Department

Clean Water Program staff is directly responsible for storm sewer system inventory; source control inspections; illicit connection and discharge inspections; stormwater

capital planning; coordination with other jurisdictions and entities; and surface water and stormwater assessment and monitoring.

The program coordinates with other county departments to collect and process the Clean Water Fee; operate, inspect and maintain the storm sewer system; manage the design and construction of stormwater capital improvements; enforce development and building regulations related to NPDES Permit compliance; inform and educate the public about stormwater problems and solutions; and support the Clean Water Program with database programming and analysis.

County departments are responsible for complying with NPDES Permit requirements in their operational activities by directive of the County Administrator.

Chapter 2

DRAFT

Stormwater Management Program

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Turbid flow from Cougar Creek into Salmon Creek

Section 1

Legal Authority

REGULATORY REQUIREMENTS SUMMARY

NPDES Permit S5.C.1 – Legal Authority

The NPDES Permit requires the county to demonstrate that it has the legal authority to control discharges to and from its municipal separate storm sewer system (MS4).

LEGAL AUTHORITY TO REGULATE

Clark County maintains the legal authority required by the permit to control discharges to and from its MS4.

Clark County Code Chapter 13.26A – Water Quality

[Chapter 13.26A](#) prohibits illicit discharges and spills into the county’s MS4, requires the control of industrial site runoff, and adopts source control requirements in the *Clark County*

Pollution Control Manual. It maintains the county’s authority to inspect and enforce its provisions.

Clark County Code Title 32 – Enforcement

[Title 32](#) permits Clark County to enforce any of its civil codes through inspection, surveillance, monitoring, and enforcement actions.

Clark County Code Title 40 – Unified Development Code

[Title 40](#) contains a suite of requirements regulating the design, construction, and operation of stormwater controls on development and re-development sites that will discharge to

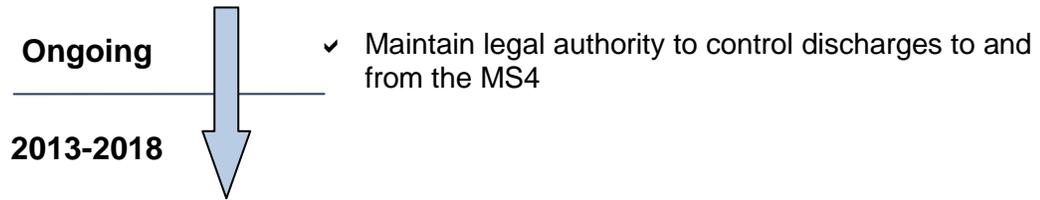
the MS4 or to waters of the state. Stormwater and erosion control measures are outlined in [Chapter 40.385](#).

Legislative Authority of the Board of Clark County Commissioners

Through the legislative authority of the Board of Clark County Commissioners (BOCC), Clark County has the ability to enter into contracts and intergovernmental agreements with other permittees and secondary permittees for the

purpose of controlling pollutants entering or leaving the county MS4.

TIMELINE



FOR MORE INFORMATION ON THE COUNTY'S LEGAL
AUTHORITY TO CONTROL DISCHARGES TO AND FROM THE
MS4

RON WIERENGA, CLEAN WATER PROGRAM MANAGER, 397-2121, x4264

RON.WIERENGA@CLARK.WA.GOV

Section 2

Inventorizing and Mapping the Storm Sewer Infrastructure



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| Inventory Quality Assurance and Reporting | 22 |
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Clark County operates a large municipal separate storm sewer system (MS4) within unincorporated Clark County. This system includes stormwater drainage ditches and pipes in county right-of-way and county-operated conveyances on easements.

An MS4 is a conveyance or system of conveyances that meets all of the following criteria:

1. Owned by a state, city, town, village, or other public entity that discharges to waters of the U.S.
2. Designed or used to collect or convey stormwater (including storm drains, pipes, ditches, etc.).
3. Not a combined sewer.
4. Not part of a publicly owned treatment works (sewage treatment plant).

A related type of infrastructure used to manage stormwater is a Class V stormwater injection well, which allows stormwater to be disposed directly into the ground instead of to a surface water body.

Clark County inventories and maps its storm sewer infrastructure and Class V injection wells to serve a variety of purposes. The inventory is a primary source of information for operation and maintenance of the MS4, stormwater well registration, illicit discharge detection and removal, drainage and source control support, stormwater assessment and monitoring, and capital planning.

Clark County administers a comprehensive program to inventory the storm sewer system in a geographic information system (GIS) database called *StormwaterClk*. All known existing infrastructure has been inventoried and mapped. An ongoing program inventories and maps storm sewer infrastructure built in the course of development and public capital improvement projects. The inventory includes all stormwater infrastructure inside of and outside of the county MS4, including:

- Flow control and water quality treatment facilities
- UIC-regulated Class V injection wells
- County outfall locations
- Conveyances (pipes, ditches, and culverts)
- Interconnections with other municipal systems
- Connections to the county MS4

REGULATORY REQUIREMENTS SUMMARY

NPDES Permit – S5.C.2.
Municipal Separate Storm
Sewer Mapping and
Documentation

The NPDES Permit requires the county to map and document components of the MS4, receiving waters, outfall catchments, and land uses within the MS4.

Chapter 173-218 WAC –
Underground Injection Control
(UIC) Program

Pursuant to [Chapter 90.48 RCW](#), Washington Administrative Code requires owners of Class V injection wells (underground drywells and infiltration trenches with perforated pipes that dispose stormwater into the ground) to comply

with regulations designed to protect groundwater quality for use as public water supplies. Clark County owns approximately 2,200 wells that are regulated under this rule.

COUNTY POLICIES, RULES AND REGULATIONS

Clark County Code Chapter
40.385 – Stormwater and
Erosion Control

[Chapter 40.385](#) describes county regulations for ownership of stormwater facilities and the lands on which they are located. Section 40.385.040 sets forth requirements to submit record drawings for completed projects. Section

40.385.020 sets forth requirements to document facility ownership.

Section 40.385.020 requires developers to register Class V underground injection wells that manage stormwater with the Department of Ecology and to notify the county prior to use.

Section 40.385.040 requires developers to submit record drawings to the county prior to 1) the issuance of building permits for single-family/duplex residential subdivisions, 2) the issuance of occupancy permits for site plan reviews (commercial development), and 3) within sixty days following completion of construction for other types of development.

Clark County Code Chapter
40.540.070 – Final Plat

[Chapter 40.540.070](#) describes county regulations for information about dedications and easements for utilities that must be contained on a plat.

Revised Code of Washington
Chapter 58.17.165 – Plats –
subdivisions – dedications

Washington state [code](#) prescribes information that must be shown on a plat when land is subdivided, including dedications of roadways and utilities and stormwater easements, tracts, or lots.

Public Project Record Drawings
Policy

Clark County Public Works Engineering Program maintains a policy for the preparation and distribution of record drawings, also known as as-built drawings, after completion of county capital improvement projects such as roads, parks, and stormwater facilities.

TOOLS

StormwaterClk

Clark County Environmental Services maintains a stormwater database called *StormwaterClk* within its GIS. The database is administered by the GIS Department, while data is maintained and updated by the Clean Water Program.

Tidemark

Clark County Community Development and Public Works maintain *Tidemark*, a database of regulatory and enforcement cases, including permits for land division and development projects.

Annexation Tracker

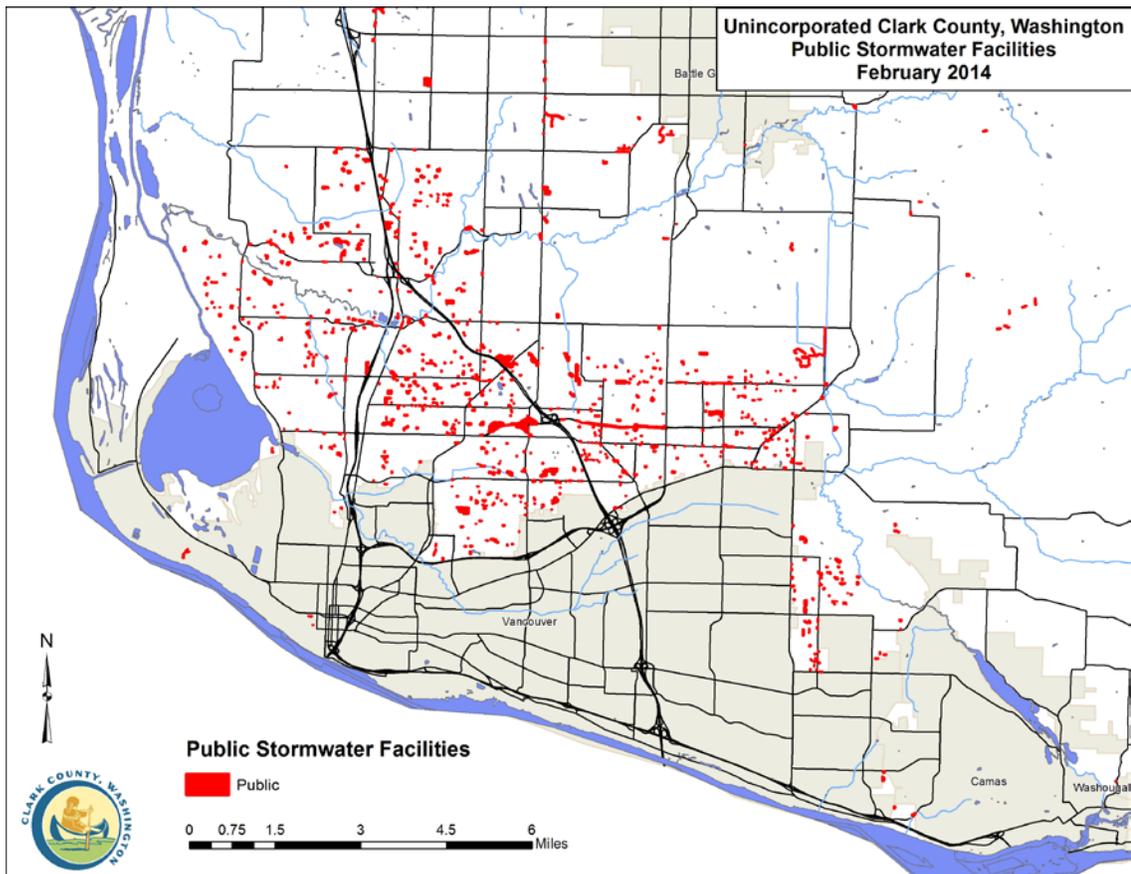
Annexation Tracker is an application developed by the GIS Department that helps county departments track annexations.

ON-GOING INVENTORY AND MAPPING

Purpose

Clark County maps and inventories stormwater treatment and control infrastructure because an accurate and complete inventory is critical to a successful program to inspect, maintain and regulate stormwater conveyances, detention facilities, and water quality facilities.

As part of the process, new outfalls, Class V injection control wells, and connections also are documented.



Clark County has been inventorying the MS4 in a GIS since 1999

Responsibilities Matrix

| Task | DES CWP Mgr | DES CWP Infrastructure Mgr | DES CWP Eng. Tech | PW Dev. Engineering Planning Tech | PW Dev. Engineering Manager | PW Construction Management Engineer | PW Construction Mgmt. OA | PW Construction Manager | PW Engineering Program Manager | PW Survey | PW Real Property Services |
|--|-------------|----------------------------|-------------------|-----------------------------------|-----------------------------|-------------------------------------|--------------------------|-------------------------|--------------------------------|-----------|---------------------------|
| Notify CWP of new private development completion | O | O | I | P | A | O | O | O | O | O | O |
| Notify CWP of new county capital improvement project physical completion | O | O | I | O | O | O | P | A | O | I | O |
| Notify CWP of new county capital improvement project final acceptance | O | O | I | O | O | O | P | A | O | I | O |
| Gather project information | A | S | P | C | O | C | O | O | A | C | C |
| Notify CWP of county project As-built location | O | O | I | O | O | S | O | S | O | A/P | O |
| Make final decision on maintenance owner | A | S | S | O | P | C | O | O | O | C | C |
| Inventory/ Map infrastructure | A | O | P | O | O | O | O | O | O | O | O |
| Track progress | A | S | P | O | O | O | O | O | O | O | O |
| Transfer information to Operations | A | S | P | O | O | O | O | O | O | O | O |

A = Accountable, P = Primary (doer), S = Supports, C = Consulted, I = Informed, O = Omitted

Background

Most stormwater infrastructure and conveyances in the county are built by the private sector during residential and commercial development. Other facilities are built by the county to retrofit previously developed areas or to handle runoff from new roads, parks, and other construction projects. The Clean Water Program builds some stormwater facilities to retrofit developed areas that lack adequate flow control or treatment. (See County Capital Improvements on page 62.)

After a project is constructed, Clean Water Program staff inventory the new facility and its related conveyance infrastructure including pipes, catch basins and connections in *StormwaterClk*.

Notification and Tracking

The first step of inventorying is becoming aware that a new development or county project, potentially with stormwater infrastructure, has been completed. Clean Water Program staff will receive different notifications depending on the source of the project (see below).

Upon receipt of a notification, the Clean Water Program engineering technician in charge of stormwater inventory will begin tracking the project. The engineering technician will create a folder for the project on the Clean Water Program's network drive, where copies of relevant documents relating to the project's storm sewer infrastructure will be stored.

Private Sector Projects Notification

The Public Works Development Engineering planning technician will notify the Clean Water Program engineering technician that a new residential or commercial development has been completed by forwarding a copy of the completion of construction letter sent to the developer.

In some cases, the first notification to the Clean Water Program may be a different document, such as notice of a plat recording. In those cases, the engineering technician will begin tracking the project as documented above.

County Projects Notification - Physical Completion

The Public Works Engineering Program Construction Management section will notify the engineering technician that a new public project is physically complete as a copy of the letter sent to the construction contractor. At this stage, the project's stormwater facilities are functional and should be added to *StormwaterClk* using the best available information.

Notification of Existing Projects

Infrequently, the engineering technician will discover engineering drawings or other evidence of an existing project that does not appear in the inventory. In those cases, the engineering technician will begin the mapping process as though it were a new facility by researching information about the project (see below), potentially using legacy data storage systems not discussed here.

Research _____ The engineering technician will research and assemble relevant documentation about the project from various sources, including Public Works Development Engineering and the Auditor.

To inventory and map the stormwater infrastructure, the engineering technician needs:

- Engineering drawings of the project
- For private sector projects, the preferred source is a record drawing (sometimes also called an as-built). An acceptable alternate source is an approved construction plan.
- For county projects, the preferred source is a record drawing; however, most projects will be documented initially from the final construction plan with as-built notes from the construction manager.
- Geographic location of the infrastructure.
- Maintenance responsibility for the infrastructure.
- Ownership of tracts or parcels containing the facilities, if any.
- Location of easements containing the facilities and related infrastructure, if any.

Finding documentation may take several steps, outlined below.

Locate and Verify Engineering Drawings

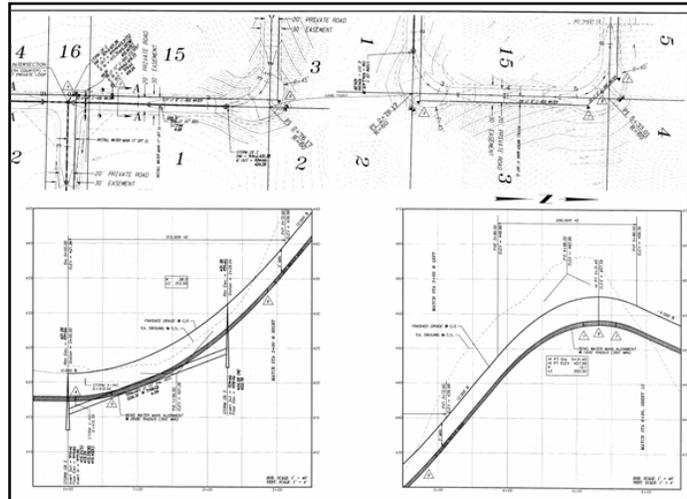
For private sector projects, record drawings are submitted by the private developer to the Development Engineering program. The engineering technician is then notified of the availability of record drawings.

For county capital improvement projects, Public Works Survey section maintains electronic copies of county projects and places them on the county Olympus server where they are accessible to the engineering technician. In cases where record drawings are not available, the engineering technician will verify the accuracy of construction as-built plan notes by the construction manager.

Select Sheets

Once engineering drawings have been located, the engineering technician will review the entire plan set and select sheets relevant to the storm system from the set. Relevant sheets may include:

- One or more plan views of the storm system and facilities (variously called storm sewer plan, street and storm plan, drainage plan, utility plan, or similar name).
- One or more profile views of the storm system and facilities.
- One or more detail views of particular storm system components.



The engineering technician will scan selected paper sheets or copy selected sheets of electronic engineering drawings to the project's folder on the Clean Water Program's network directory.

Determine Ownership and Maintenance Responsibility

The engineering technician will look for several types of information, including:

- The party responsible for maintaining the stormwater infrastructure.
- The owner of parcel(s) underlying any treatment or flow control facilities.
- The existence of easements for access to stormwater facilities and conveyances.

Responsibility for maintaining facilities may change over time. At this stage, the engineering technician will determine the current maintenance responsibility.

The engineering technician will evaluate information on the plat, final site plan, engineering drawings, and other documents as necessary to determine maintenance responsibility of the facility and ownership of the parcel, if any, on which it is sited.

If the engineering technician cannot determine maintenance responsibility due to conflicting or missing information, then the Clean Water Program manager will make the determination.

Inventory and Map (Digitize) The engineering technician will find the project's location in the GIS. Using the assembled information, the technician will digitize the project's stormwater facility or facilities and related infrastructure, such as conveyance and drywells, in *StormwaterClk*.

The engineering technician also will enter attributes of storm system components in the database. Attributes are unique to each component type. Some of the most important attributes that are common to most types of components include:

- Subwatershed (auto-populated)
- Custodial county department
- Service status
- Installation date
- Elevations
- Dimensions (pipe diameter, length, etc.)
- Facility name (for facility polygons only)
- Serial number of the parcel containing the facility (if relevant)

Transfer Information Information in *StormwaterClk* is routinely uploaded electronically into the Public Works Maintenance Management System (MMS) database which is used to track and schedule inspection and maintenance activities for stormwater infrastructure.

Outputs

- Updates to *StormwaterClk*

OTHER PERMIT-REQUIRED MAPPING/INVENTORY

Background The NPDES Permit requires both continuation of ongoing inventory/mapping activities (S5.C.2.a) and completion of several additional mapping tasks no later than December 31, 2017 (S5.C.2.b).

Specific requirements under permit section S5.C.2.a are addressed through already completed mapping efforts and the ongoing inventory and mapping program includes updates as new development is inventoried.

Most new mapping requirements under S5.C.2.b are addressed through already completed mapping efforts; additional efforts to address specific requirements are described below.

Responsibilities Matrix

| Task | DES CWP Mgr | DES CWP Infrastructure Mgr | DES CWP Eng. Tech | Assessment and GIS Department |
|---|--|----------------------------|-------------------|-------------------------------|
| Map land use | O | O | O | A/P |
| Map connections to tributary conveyances | O | A | P | O |
| Map connections between BMPs and tributary conveyances | Completed – updated as needed (DES CWP Eng Tech) | | | |
| Map receiving waters | * Completed * | | | |
| Map areas not draining to outfalls | * Completed * | | | |
| Map outfall catchments | Completed – updated as needed (DES CWP Eng Tech) | | | |
| Map tributary conveyances | Completed – updated as needed (DES CWP Eng Tech) | | | |
| A = Accountable, P = Primary (doer), S = Supports, C = Consulted, I = Informed, O = Omitted | | | | |

Procedures

Map Tributary Conveyances

Clark County completed an inventory of the conveyance system in early 2010.

Map Connections to Tributary Conveyances

No later than December 31, 2017, connections equal to 8 inches nominal diameter to tributary conveyances will be mapped. This effort primarily involves mapping private ditch connections to public road ditches.

Map Connections between BMPs and Tributary Conveyances

Existing connections between BMPs and tributary conveyances are mapped, and new connections will be mapped as part of the ongoing inventory and mapping program.

Map Outfall Catchments

In 2010, the Clean Water Program completed mapping catchments to most outfalls. This includes 487 outfalls, most of which are smaller than 24” nominal diameter. Catchments to new outfalls will be mapped as outfalls are added.

Map Outfall Land Use

Known outfalls are mapped, and new outfalls will be mapped as part of the ongoing inventory and mapping. Outfall catchments for most of the Urban Growth Areas (UGAs) are now mapped. As a result of Clark County’s function as a land use regulator, the Clark County Assessor maintains land use data at the parcel scale in a GIS.

To produce a map of land uses for outfalls, Clean Water Program staff or GIS Department staff will overlay land use data with outfall catchments in the GIS upon request or as needed.

Map Areas Not Draining to Outfalls

In 2010, the CWP and GIS Department mapped areas served by the MS4 that do not drain to surface water.

Outputs

- Updated inventory of Stormwater infrastructure in *StormwaterClk*
- Inventory of connections to tributary conveyances in *StormwaterClk*

INVENTORY QUALITY ASSURANCE AND REPORTING

Purpose

using various methods.

To assure accuracy of data in *StormwaterClk*, Clark County will periodically assess the data

Responsibilities Matrix

| Task | DES CWP Mgr | DES CWP Infrastructure Mgr | DES CWP Eng. Tech | Assessment and GIS Department |
|----------------------|-------------|----------------------------|-------------------|-------------------------------|
| Ongoing Data Updates | A | S | P | O |
| Reporting | A | S | P | S |

A = Accountable, **P** = Primary (doer), **S** = Supports, **C** = Consulted, **I** = Informed, **O** = Omitted

Ongoing Data Updates

The CWP Infrastructure Manager and the Engineering Technician will routinely and periodically verify accuracy of stormwater infrastructure in the GIS as annexations occur and as more accurate project plans are produced or discovered.

Annexation Updates

Annually, the engineering technician will check *Annexation Tracker* to determine if stormwater infrastructure has been annexed to a city. The engineering technician will change facility ownership attributes and update county MS4 municipal connection points in *StormwaterClk* where infrastructure has been annexed.

The engineering technician also will provide Public Works Real Property with a list of county-operated stormwater facilities annexed into each city. A real property agent or a

real property assistant will have responsibility for ensuring that property records are updated with the Assessor and for notifying the annexing municipality.

Ongoing Corrections

As possible mistakes in inventory data or needed revisions are discovered, the engineering technician will keep a list of possible corrections, then periodically research and, if necessary, correct *StormwaterClk*. Possible sources of discovery include discovery by Public Works Operations & Maintenance personnel, annual stormwater facility inspectors, and discovery by Clean Water Program engineers.

Reporting Monthly, quarterly, and annual performance measures to report inventory status were established in 2010 and are reported as scheduled.

Outputs

- Data updates in *StormwaterClk*
- Reports from *StormwaterClk*

UNDERGROUND INJECTION CONTROL (UIC) REGISTRATION

Purpose Pursuant to the Safe Water Drinking Act and [Chapter 90.48 RCW](#), Washington Administrative Code 173-218 requires new UIC-regulated stormwater disposal wells, also called Class V injection wells, to be registered with the Department of Ecology prior to construction.

Responsibilities Matrix

| Task | DES CWP Infra. Mgr | DES CWP Eng. Tech | DES CWP Engineer | PW Project Mgr | PW Const. Mgr. | Applicant | PW Dev Eng Mgr |
|--|--------------------|-------------------|------------------|----------------|----------------|-----------|----------------|
| Map new Class V injection wells | A | P | O | O | O | O | O |
| Locate unregistered Class V injection wells | A | P | I | O | O | O | O |
| Submit private project registrations to Ecology | O | O | O | O | O | P | A |
| Submit public project registrations to Ecology | O | O | O | P | A | O | O |
| Update registration status in <i>StormwaterClk</i> | A | P | O | O | O | O | O |
| A = Accountable, P = Primary (doer), S = Supports, C = Consulted, I = Informed, O = Omitted | | | | | | | |

UIC registration for County projects

For County projects that include new UICs, the PW Project Manager will register the UICs with the Washington Department of Ecology. Registration materials must be submitted to Ecology prior to construction. Registrations are verified prior to construction by the PW Construction Manager at the pre-construction conference.

The DES CWP Engineering Technician will add new UICs to *StormwaterClk* upon project completion as part of ongoing inventory and mapping activities.

UIC registration for private projects having public UICs

For privately-built projects that include new UICs in the public ROW or that are intended to be turned over to the County, the developer will register the UICs with the Washington Department of Ecology. For all such UICs, Clark County will be designated the owner on the registration form. Registration materials must be submitted to Ecology prior to construction.

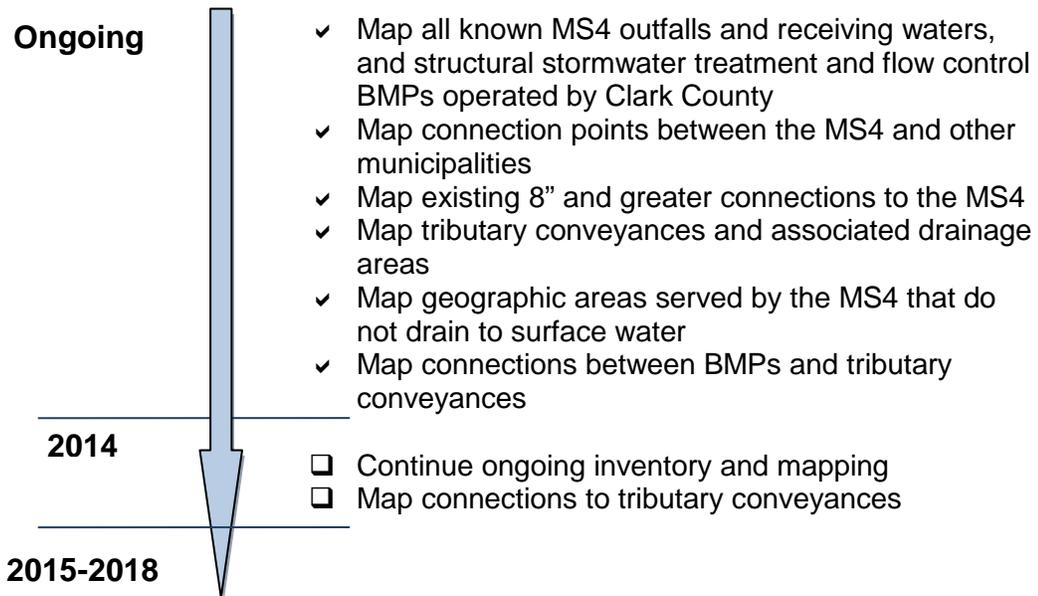
When a developer submits plans for review, Development Engineering staff will confirm if UIC-regulated systems are included, and inform the applicant of registration requirements. Registrations are verified prior to construction by Development Engineering at the pre-construction conference.

The DES CWP Engineering Technician will add new UICs to *StormwaterClk* upon project completion as part of ongoing inventory and mapping activities.

Outputs

- Updates to *StormwaterClk*

TIMELINE



FOR MORE INFORMATION ON MAPPING THE MS4

JEFF SCHNABEL, CLEAN WATER PROGRAM INFRASTRUCTURE MANAGER, 397-2121, x 4583

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Section 3

Operating and Maintaining the Storm Sewer System, County Property and Roadways

| | |
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The county inspects and maintains storm sewer infrastructure to maintain its ability to convey, detain, infiltrate, and treat stormwater. Clark County also manages its properties and roadways to reduce stormwater impacts from potential pollutant sources such as erosion, fertilizers, and pesticides.



County crew replacing filters in a stormwater filter vault system

REGULATORY REQUIREMENTS SUMMARY

NPDES Permit – S5.C.9 Operations and Maintenance

The NPDES Permit requires the county to manage its maintenance activities and regulate non-county stormwater facilities to prevent or reduce stormwater impacts. The program must

include:

- Maintenance standards and schedules for public and private stormwater facilities.
- Street operation and maintenance practices that reduce stormwater impacts.
- Policies and procedures to reduce pollution from pesticides, herbicides, and fertilizers used by the county.
- Operational practices that reduce stormwater impacts for equipment yards and storage facilities.
- Staff training.

Stormwater Management Manual for Western Washington

The permit requires the use of source control BMPs equivalent to [Volume IV](#) of the *Stormwater Management Manual for Western Washington* (Ecology, 2012) (*SMMWW*).

The permit also requires a stormwater facility maintenance inspection program equivalent to Chapter 4 of Volume V of the *SMMWW*.

Chapter 173-218 WAC – Underground Injection Control (UIC) Program

Pursuant to [Chapter 90.48 RCW](#), Washington Administrative Code requires the county to comply with regulations controlling the discharge of fluids, such as stormwater, into Class V injection wells. Examples of wells that

handle stormwater include drywells and infiltration trenches. The stormwater management program addresses the UIC Program requirement to maintain and address pollutant sources.

Endangered Species Act 4(d) Rule

The federal Endangered Species Act prohibits “take” of threatened or endangered salmon. Take is harassment, harm, wounding, or killing of an ESA-listed salmon, or harming the critical

habitat upon which it depends. The 4(d) rule directly prohibits take without authorization. However, the prohibition is limited under 13 different programs that describe procedures and processes by which an activity may be conducted to contribute to the conservation of the species overall. Road maintenance is an activity that, when

conducted according to the Regional Road Maintenance Forum guidelines, is certified by National Marine Fisheries Service to contribute to the conservation of listed salmon.

COUNTY POLICIES, RULES AND REGULATIONS

Clark County Code Chapter 40.385 – Stormwater and Erosion Control

facilities for compliance.

The chapter also requires ownership and maintenance responsibility of private facilities to be noted on subdivision final plats.

Chapter 40.385 requires newly constructed stormwater treatment facilities to be maintained in accordance with the county *Stormwater Facility Maintenance Manual*, and it gives the county authority to inspect privately-operated

Clark County Code Chapter 13.26A – Water Quality

Maintenance Manual, and adopts the *Clark County Stormwater Pollution Control Manual* that provides BMPs for business and public agency activities such as materials handling, landscape management, trash management and building exterior maintenance.

[Chapter 13.26A](#) requires inspection and maintenance of all public and private stormwater facilities and Class V injection wells in accordance with the [Stormwater Facility](#)

Stormwater Facility Maintenance Manual

The *Stormwater Facility Maintenance Manual* adopts maintenance standards for public and private stormwater facilities equivalent to the *SMMWW*.

Clark County Stormwater Pollution Control Manual

and private properties equivalent to Volume IV of the *SMMWW*.

The *Clark County Stormwater Pollution Control Manual: Best Management Practices for Businesses and Government Agencies* adopts source control and treatment standards for public

Water Quality Best Management Practices for Operation and Maintenance of Publicly-Owned Property

for county use by directive of the County Administrator.

The *Water Quality Best Management Practices for Operation and Maintenance of Publicly-Owned Property* manual provides water quality and vegetation management practices for county maintenance crews pursuant to Clark County Code Chapter 13.26A. The manual was adopted

Enforcement Procedures for Un-maintained Private Stormwater Facilities

Clark County Clean Water Program has a written policy on responding to non-compliant private regulated stormwater facilities.

Environmentally Responsible Purchasing Policy

Clark County adopted its Environmentally Responsible Purchasing Policy in 2004. One element addresses purchase of landscaping and vegetation maintenance products, including pesticides. The policy establishes a set of criteria, any of which will disqualify a pesticide from purchase, and a waiver system, allowing chemicals with no equivalent that is more environmentally-friendly to be used within specific limiting guidelines.

ESA Regional Road Maintenance Forum

Clark County Public Works has been a member of the ESA Regional Road Maintenance Forum since 2003. The group assisted the county in developing a regional road maintenance program designed to meet the requirements of the Endangered Species Act (ESA). In 2004, NOAA Fisheries approved the program and determined that it was compliant with the ESA 4(d) rule. The program seeks to protect salmon and steelhead by relying on the extensive use of pre-approved BMPs for routine maintenance activities.

TOOLS

Maintenance Management System (MMS)

The *Maintenance Management System* (MMS) is a database operated by Public Works for tracking infrastructure assets, recording condition, and scheduling inspections and maintenance. The MMS was implemented in 2011 and continues to evolve. The MMS will be used to prioritize, schedule, and track stormwater infrastructure inspections and maintenance by Public Works crews, as well as track asset condition.

For stormwater facilities and related infrastructure, the inventory in MMS is provided directly from *StormwaterClk* (see *Inventorizing and Mapping the Storm Sewer System* on page 12).

INSPECTIONS

Purpose

Clark County inspects both county-owned and regulated non-county stormwater facilities to evaluate condition and function and to determine if maintenance or repairs are

warranted. In the case of regulated non-county facilities, follow-up actions include technical support to the BMP owner and, in some cases, enforcement.

Responsibilities Matrix

| Task | DES CWP Infrastructure Mgr | DES CWP Admin | DES CWP Eng. Tech | PW Construction Management OA | PW Construction Management Supervisor | PW Construction Management Inspectors | PW Ops Road Crews | PW Ops Road Super |
|--|----------------------------|---------------|-------------------|-------------------------------|---------------------------------------|---------------------------------------|-------------------|-------------------|
| Inspect Regulated Facilities | I | O | S | S | A | P | O | O |
| Inspect Facilities During Heaviest Home Construction | I | S | S | S | A | P | O | O |
| Inspect County-owned Facilities | I | O | S | S | A | P | O | O |
| Inspect Catch Basins | I | O | S | O | O | O | P | A |

A = Accountable, **P** = Primary (doer), **S** = Supports, **C** = Consulted, **I** = Informed, **O** = Omitted

Inspect Regulated Facilities

Regulated facilities are treatment and flow control facilities owned and operated by private parties and non-county governmental bodies. Clark County will annually inspect at least 80% of regulated stormwater treatment and flow control facilities.

County responsibility for inspecting regulated facilities will begin at issuance of the completion of construction letter by Public Works Development Engineering. (See Regulatory Program for Development, Redevelopment, and Construction Projects on page 74.)

For facilities not in compliance with maintenance standards, the county will follow procedures to compel compliance through follow-up and enforcement actions if needed.

Track and Schedule Annual Inspections

Public Works Construction Management will use MMS to schedule and track regulated facility inspections.

Inspection

Inspections will be completed by Public Works Construction Management engineering technicians. The inspectors will compare facility condition with maintenance standards from the *Stormwater Facility Maintenance Manual*.

Contact Owners of Non-Compliant Facilities

If an inspection shows that a facility is out of compliance, the lead engineering tech will send a mailing to the owner(s) and/or responsible party. The mailing packet will include:

- Introductory letter.
- Property identification.
- Postcard to return for technical assistance.
- Facility defect report.
- *Managing Stormwater Facilities* pamphlet with links to additional information.



Facility inspection

Recipients will be referred to Construction Management for questions or problems.

Facility ownership or Homeowner Association leadership may change. In some cases, no viable Homeowner Association exists. Construction Management will refer these facilities to the Clean Water Program source control specialist.

Contact Owners of Compliant Facilities

If an inspection shows that a facility is compliant, the owner will be sent a postcard stating that the facility is compliant and thanking them.

Follow-Up Technical Assistance

The Construction Management inspectors will educate and assist owners who reply to the initial letter by giving advice on maintenance, including referrals to the City of Vancouver Small Works Roster for construction and maintenance companies. The assistance may include phone calls, additional correspondence and site visits. The inspector will facilitate compliance and use professional judgment to set deadlines for compliance activities.

Facilities that are not compliant after deadlines will be referred to the Clean Water Program source control specialist for further action. At this point, the case is entered into *Tidemark* as a code enforcement case.

Further Enforcement

If the owner or owners of a non-compliant facility are unresponsive, then the source control specialist will refer the case to the code enforcement officer.

The code enforcement officer will use progressive enforcement methods, terminating with a Notice and Order and issuance of fines and liens in cases of severe non-compliance.

Alternate Compliance Strategy

The county retains the option of maintaining the facility and billing the owner at any point after an inspection demonstrates that a facility is out of compliance.

Compliance Tracking

Public Works Construction Management will update facility records in the MMS with compliance information on a regular basis, including inspection results, contact information and other relevant facility information. A spread sheet system tracks correspondence to regulated facility owners and assistance provided. Follow-up and enforcement actions will be tracked by the Clean Water source control specialist and entered into *Tidemark* as code enforcement cases.

Facility Ownership Transfer While it rarely occurs, the county has a policy, criteria and procedures for accepting ownership of private stormwater facilities serving residential subdivisions. Facilities must meet county maintenance, safety and access standards before acceptance.

Inspect Facilities During Heaviest Home Construction Clark County will inspect permanent stormwater treatment and flow control facilities, including catch basins, in new residential developments every six months during the period of heaviest construction. The NPDES permit defines the period of heaviest construction as the time until 90 percent of the lots are built-out (see condition S5.C.9.b).

Create and Maintain Inspection List

The Clean Water Program office assistant will maintain a spreadsheet of potentially relevant subdivisions from *Tidemark*, including the number of lots in the subdivision and the number of lots having active building permits. The Clean Water Program office assistant will forward the list to the Public Works Construction Management inspection lead.

Schedule Inspections

The Public Works Construction Management lead inspector will consult the spreadsheet monthly and schedule project sites requiring inspection for the following month. Any subdivision with less than 90 percent of the lots built out will be scheduled. The Public

Works Construction Management lead inspector will schedule future six-month inspections for each project using the spreadsheet.

Inspection

Public Works Construction Management inspectors will inspect project sites using standards from the *Stormwater Facility Maintenance Manual* and fill out a paper field inspection sheet printed from the MMS.

Track Inspections

The Public Works Construction Management inspector or office assistant will enter the inspection results into Tidemark under the DIN (development inspection number). The electronic field inspection form is attached to the DIN case.

If the project is past warranty and owned by Clark County, the results will be entered into the MMS.

Enforcement

The method used to enforce maintenance compliance of a facility found to be out of compliance will depend on its ownership.

When a private facility or catch basin is out of compliance, the standard process for enforcement on a regulated facility will be followed.

When a county-owned facility or catch basin on maintenance warranty is out of compliance, the inspector will refer the violation to the Public Works development inspector assigned to that development project.

When a county-owned facility or catch basin is out of compliance after the warranty period, the facility will be treated as any other county-owned facility.

Inspect County-owned Facilities

The Clark County Public Works Construction Management Program annually will inspect at least 95% of county-owned stormwater treatment and flow control facilities. Facilities with known problems may be spot-checked by Public Works Operations and Maintenance after significant storm events in addition to routine inspections.

- For county capital improvement projects, inspection responsibility will transfer to the county at the issuance of the final acceptance letter to the contractor by Public Works Construction Management.
- For facilities constructed as part of a private-sector development project, responsibility will transfer to the county at issuance of the completion of construction letter to the developer. (See Regulatory Program for Development, Redevelopment, and Construction Projects on page 74.)

Inspection

Public Works Construction Management will inspect facilities using standards from the *Stormwater Facility Maintenance Manual*. Crews will note compliance and defects on paper field forms.

Spot Checks

After significant storms, Public Works crews will inspect facilities that are on a list of facilities with known problems associated with heavy rainfall.

Tracking

Public Works Construction Management inspectors or office staff will enter inspection records from the paper field forms into MMS.

Inspect and Clean Catch Basins The Clark County Public Works Operations and Maintenance Program will inspect catch basins in road right-of-way annually. Each catch basin is inspected and those exceeding sediment depth standards are scheduled for cleaning. Annual inspections may also be conducted on a circuit basis whereby 25% of catch basins and inlets are inspected, as described in permit section S5.C.9.d.

Catch basins in parks and other county facilities will be inspected and cleaned as part of routine maintenance by the custodial department.

Outputs

- MMS records of regulated facility inspections
- Updates to six-month inspection list
- Spot checks of public facilities after severe storms
- Catch basin cleaning
- MMS records of public facility inspections

COUNTY STORMWATER FACILITY AND CLASS-V INJECTION WELL MAINTENANCE

Purpose Maintenance of stormwater facilities and stormwater disposal wells ensures that facilities continue to perform their important environmental and drainage functions. Clark County Public Works is responsible for maintenance of most county stormwater infrastructure when it fails to meet a maintenance standard established by permit and county standards.

Responsibility for maintaining county-owned stormwater treatment and flow control facilities will begin at issuance of the final acceptance letter for those constructed as part of a county capital improvement and at the end of the maintenance warranty period for those built as part of a private-sector development project. (See Regulatory Program for Development, Redevelopment, and Construction Projects on page 74.)

The county does not maintain private stormwater facilities except in emergency situations or when pursuing an alternate compliance strategy for a non-compliant facility, whereby the county maintains the private facility at the owner’s expense.

Responsibilities Matrix

| Task | DES CWP Infrastructure Manager | DES CWP NPDES Mgr | DES CWP Eng. Tech | PW Road Ops Super | PW Ops Roads Crews | Contract Services |
|----------------------------------|--------------------------------|-------------------|-------------------|-------------------|--------------------|-------------------|
| Routine Facility Maintenance | I | I | S | A | P | O |
| Non-routine Facility Maintenance | C | C | S | A | P | P |

A = Accountable, **P** = Primary (doer), **S** = Supports, **C** = Consulted, **I** = Informed, **O** = Omitted

Typical Facility Maintenance

Clark County will perform routine maintenance, such as litter removal, mowing, and weed control, on swales, ponds, and filter strips that it owns. Typical maintenance is regular activities that maintain a facility’s function that can be accomplished primarily with hand tools, lawn mowers, and weed whackers, and do not require engineering evaluation or heavy equipment. It does include cleaning sediment traps using vacuum trucks.



The following procedure applies to stormwater facilities maintained by Public Works, such as those in subdivisions and road right-of-way. Maintenance of other county stormwater facilities located in parks and on county campuses is covered in the section pertaining to operation of county lands (below).

Schedule and Prioritize

Most of the typical facility maintenance will occur during the growing season (April to September). The Clark County Public Works water quality crew chief will schedule the work.

Maintenance

Mowing grass and controlling weeds by weed whacking are the primary typical maintenance activities. Other maintenance for defects including sediment accumulation in sediment traps, minor erosion, presence of trees in pond or swale bottoms, etc., are also part of typical maintenance.

Capital Construction Facility Maintenance

Prioritization and Budget

The Clean Water Program and Public Works will develop an annual work plan for maintaining and repairing facilities that require capital construction under \$25,000.

Individual maintenance projects estimated to cost more than \$25,000 are referred to the Stormwater Capital Program (page 62).



Inspection Data Review

The Public Works NPDES road operations superintendent and crew chief will schedule facility maintenance requiring construction in consultation with the Clean Water Program Infrastructure Manager

Implementation

Maintenance requiring construction is accomplished as resources and weather allow within permit timelines.

Drywell Maintenance

Public Works Operations and Maintenance Roads crews will maintain drywells (Class V stormwater injection wells) as necessary based on a visual inspection of defects. Drywells in stormwater facilities will be inspected annually as part of routine facility inspections. Drywells in streets and roads will be inspected at the time catch basins are inspected.

Outputs

- Stormwater facilities maintained and repaired to meet county standards.
- List of projects referred to the capital planning program for repairs greater than \$25,000.
- Database records of facility maintenance work (MMS).

USE OF WATER QUALITY BMPs DURING ROADWAY AND COUNTY PROPERTY OPERATION AND MAINTENANCE

Purpose

stormwater impacts.

Clark County maintains its properties and roadways in a manner that prevents or reduces



Responsibilities Matrix

| Task | DES CWP Infra- structure Mgr | DES CWP Permit Mgr | DES CWP Source Control Specialist | PW Ops Managers | PW Road Ops Super | PW Ops Roads Crews | PW Parks Super | PW Ops Parks Crews | DES Vegetation Mgmt. Mgr | DES Vegetation Mgmt. Crews | General Services, Facilities Mgr | General Services, Facilities Crews |
|--|---------------------------------------|-----------------------------|--|--------------------|-------------------------|--------------------------|----------------------|--------------------------|-----------------------------------|-------------------------------------|---|---|
| Annually inspect and maintain catch basins in parks | I | I | O | A | O | O | A | P | O | O | O | O |
| Annually inspect and maintain catch basins on campuses | I | I | O | C | O | O | A | P | O | O | A | O |
| Road maintenance practices | I | I | O | A | C | P | O | O | O | O | O | O |
| Landscape maintenance on campuses | I | I | C | C | O | O | A | P | O | O | A | O |
| Landscape maintenance in parks | I | I | C | A | O | O | A | P | O | O | O | O |
| Noxious weed removal practices | I | I | C | O | O | O | O | S | A | P | O | O |
| Exterior building and grounds maintenance | I | I | C | O | O | O | O | S | O | O | A | P |
| Training road maintenance crews | I | S | S | A | P | I | O | O | O | O | O | O |
| Training parks maintenance crews | I | S | S | A | O | O | P | I | O | O | O | O |
| Training weed management crews | I | S | S | O | O | O | O | O | A | P | O | O |
| Training Facilities Maintenance crews | I | S | S | O | O | O | O | O | O | O | A | P |
| Check SWPPPs | I | S | O | A | O | P | O | O | O | O | O | O |

A = Accountable, **P** = Primary (doer), **S** = Supports, **C** = Consulted, **I** = Informed, **O** = Omitted

Maintain Roadways and Sweep Streets

Road maintenance and operation will be conducted by the Public Works Operations and Maintenance program.

Clark County will maintain roadways and other traveled surfaces using pollution reduction practices defined by the ESA Regional Road Maintenance Program and in *Water Quality Best Management Practices for Operation and Maintenance of Publicly-Owned Property*.

Specific pollution-reduction activities include:

- Routinely sweeping road surfaces to remove fines and to prevent first flush contamination.
- Periodic removal of litter from conveyances, such as ditches.
- Catch basin cleaning.



Practices to prevent pollution will be implemented for the following maintenance activities:

- Pipe cleaning.
- Culvert cleaning.
- Ditch maintenance.
- Street cleaning.
- Road repair and resurfacing, including pavement grinding.
- Snow and ice control.
- Utility installation.
- Maintaining roadside areas, including vegetation management.
- Dust control.
- Pavement striping maintenance.
- Application of fertilizers, pesticides, and herbicides
- Sediment and erosion control
- Landscape maintenance and vegetation disposal
- Trash and pet waste management

- Building exterior cleaning and maintenance

Maintain Parks

Parks may contain any or all of the following types of land cover: pavement, landscaped areas, natural areas, structures, and stormwater facilities. Parks will be maintained by Public Works Operations and Maintenance, Parks program.

Clark County will maintain park vegetation and structures according to *Water Quality Best Management Practices for Operation and Maintenance of Publicly-Owned Property* and the *Clark County Stormwater Pollution Control Manual* and current pesticide application rules. Pesticides will be purchased according to the county's Environmentally Responsible Purchasing Policy. Parks maintenance crew members are trained under the ESA Regional Forum and are state licensed pesticide operators.

Parks crews will inspect catch basins within parks during routine park maintenance and will clean them as needed.

Parks crews will mow and remove litter from stormwater facilities within parks frequently during routine park maintenance. Public Works Road Operations will provide the balance of the maintenance.

Maintain County Property

County campuses are managed by the General Services department. General Services personnel maintain pavement and building exteriors; General Services has an agreement with Public Works Operations and Maintenance, Parks program for most outdoor vegetation management activities.



Clark County will maintain landscaping and hard surfaces on its campuses according to the *Clark County Pollution Control Manual* and as appropriate, the *Water Quality Best Management Practices for Operation and Maintenance of Publicly-Owned Property*. Pesticides will be purchased according to the county's Environmentally Responsible Purchasing Policy. Parks maintenance crew members are trained under the ESA

Regional Forum and are state licensed pesticide operators.

Parks crews will inspect and maintain catch basins on county campuses as needed.

Parks crews will mow and remove litter from stormwater facilities on county campuses as needed based on visual inspection.

Clark County implements a Stormwater Pollution Prevention Plan (SWPPP) for each of its seven heavy equipment and materials storage yards, operated by Public Works. Copies of the SWPPPs are kept at each site.

Control Weeds on County Property

State regulated noxious weed control on county properties is provided by the Environmental Services, Vegetation Management program.

Clark County will control weeds according to current pesticide application rules. Pesticides will be purchased and used according to the county's Environmentally Responsible Purchasing Policy.

Vegetation Management field crews are state licensed pesticide operators.

For some areas, such as mitigated wetlands and properties with legacy lands designation, Vegetation Management will compose a Site Specific Plan to ensure that compliance with all environmental regulatory requirements, including NPDES permit requirements, will be achieved.

Employee Training

Crews from both Public Works Operations and Maintenance and Environmental Services

Vegetation Management are trained under the ESA Regional Road Maintenance tracks 2 and 3. Track 2 coursework describes the biology of endangered fish and how road and park maintenance activities can harm them; it is generally provided to supervisors and managers. Track 3 provides crew chiefs and crew members with maintenance guidelines and procedures to protect endangered species during maintenance work.

Train New Personnel

Clark County Public Works will provide ESA Regional Road Maintenance training using an approved vendor for new or promoted staff, as necessary.

Outputs

- Maintenance of county property using proper BMP manuals
- Employee training
- Stormwater Pollution Prevention Plan at each heavy equipment and storage yard

TIMELINE

Ongoing

2014-2018

- ✓ Spot check facilities with known problems after significant storms
 - ✓ Annually inspect and clean, if needed, county-owned catch basins
 - ✓ Implement established practices to reduce stormwater impacts from county road maintenance activities
 - ✓ Implement established practices to reduce stormwater impacts from property and landscape maintenance activities for county property
 - ✓ Employee training
 - ✓ Implement updated SWPPPs for county equipment yards
 - ✓ Adopt and implement maintenance standards equivalent to the SMMWW
 - ✓ Require maintenance of regulated facilities to the SMMWW
 - ✓ Implement program to annually inspect all regulated facilities
 - ✓ Inspect all new facilities in new residential developments every 6 months during the period of heaviest construction
 - ✓ Inspect all county-owned facilities annually
- Continue the above

FOR MORE INFORMATION ON COUNTY OPERATION AND MAINTENANCE OF THE MS4

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Section 4

Detecting and Reducing Pollutants and Contamination



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Contaminants may enter the MS4 through improper connections and through discharge of contaminants from sites with private storm systems that are connected to the MS4. Eliminating improper connections and reducing the discharge of contaminants is an important part of the county’s Stormwater Management Program.

Improper connections may be discovered through routine screening of the system, site inspections or by complaint. When an improper connection is discovered, removal and disconnection is a high priority.

Regular and wide-spread inspections of business and multi-family sites helps ensure that sites are properly managing potential contaminants, maintaining catch basins and conveyance systems, and preventing non-stormwater discharges into their private systems that discharge to the MS4. Above NPDES Permit requirements, the program also addresses sources that do not discharge to the Permit-regulated MS4, including discharges to Class V injection wells, non-county storm drains and other conveyances to surface water and groundwater.

SOURCE CONTROL PROGRAM

REGULATORY REQUIREMENTS SUMMARY

NPDES Permit S5.C.7 – Source Control Program for Existing Development

commercial, industrial and multifamily properties; enforcing water quality ordinances; and reducing pollutants from pesticides, herbicides and fertilizers entering the MS4.

The NPDES Permit requires the county to reduce pollutants in runoff from areas that discharge to the MS4 by applying operational, structural source control, and treatment Best Management Practices (BMPs); enforcing proper BMPs on

Stormwater Management Manual for Western Washington

[*Volume IV of the SMMWW*](#) contains technical guidance for source control BMPs to meet Minimum Requirement 3 of the Permit.

COUNTY POLICIES, RULES AND REGULATIONS

Clark County Code Chapter 40.385 – Stormwater and Erosion Control

[Chapter 40.385](#) adopts the *Clark County Stormwater Pollution Control Manual* as the technical manual for meeting the Minimum Requirements of the Permit, including Minimum Requirement 3, Source Control of Pollution.

Clark County Code Chapter 13.26A – Water Quality

county’s surface and groundwater quality. The code and manual provide minimum requirements for reducing and controlling the discharge of contaminants by requiring all sites and activities to utilize source control Best Management Practices (BMPs) to control release of contaminants.

Clark County prohibits non-stormwater discharges to the MS4 and regulates the discharge of contaminants to surface water, stormwater, and groundwater to protect the

Chapter 13.26A also adopts the *Clark County Stormwater Pollution Control Manual* that provides BMPs for materials handling, landscape management, trash management, and building exterior maintenance.

Clark County Stormwater Manual

The *Clark County Stormwater Manual* contains technical guidance for meeting county stormwater code when developing, redeveloping, or constructing buildings on a site. It directs

users to consult the *Clark County Stormwater Pollution Control Manual* to fulfill minimum requirement 3, Source Control of Pollution.

**Clark County Stormwater
Pollution Control Manual**

The *Clark County Stormwater Pollution Control Manual: Best Management Practices for Businesses and Government Agencies* adopts source control and treatment standards for public and private properties equivalent to Volume IV of the SMMWW.

INVENTORY POTENTIAL POLLUTANT GENERATING SITES

Purpose

The inventory helps target education and enforcement of source control requirements on commercial, industrial, and multifamily sites.

Responsibilities Matrix

| Task | DES Source Control Specialist | GIS Analyst | CWP NPDES Mgr. |
|---|-------------------------------|-------------|----------------|
| Create inventory of tax lots by type | Completed | | |
| A = Accountable, P = Primary (doer), S = Supports, C = Consulted, I = Informed, O = Omitted | | | |

Inventory Maintenance

The Clean Water Program used the Clean Water Fee database to identify commercial, industrial, and multifamily sites in the county that have impervious surfaces.

The database is derived from the Clark County Assessor tax lot database and a GIS overlay of impervious surfaces. It includes parcel owner, site address, owner’s mailing address, square footage of impervious surface, and the primary land use code. As inspections have progressed to include most permanent business sites, a separate, inspection-based site inventory is maintained in the *Tidemark* inspection and enforcement tracking database.

Outputs

- Inventory of business and multifamily sites

SOURCE CONTROL AT BUSINESS AND MULTIFAMILY SITES

Purpose

Clark County inspects all business sites and many multifamily sites for compliance with

source control requirements to ensure pollutants are not discharged to the MS4 or groundwater via Class V stormwater infiltration wells.

Responsibilities Matrix

| Task | DES CWP NPDES Manager | DES Source Control Specialist | DES Code Enforcement Officer | DES Office Assistant |
|--------------------------|-----------------------|-------------------------------|------------------------------|----------------------|
| Site selection | A | P | O | O |
| Inspection / education | A | P | S | O |
| Follow-up for compliance | A | P | P | O |
| Referral | A | P | P | O |
| Record-keeping | A | P | P | P |

A = Accountable, P = Primary (doer), S = Supports, C = Consulted, I = Informed, O = Omitted

Site Selection

Each year, all business sites within selected subwatersheds will be inspected. The selection of subwatersheds will be the least recently visited subwatershed.

Inspection and Education

Inspections are conducted by qualified county staff. Currently, Clean Water Program Source Control Specialists inspect sites.

At each business site, county staff will approach the owner, manager, or other employees to obtain access to the storm system on the site and to ask questions about source control practices and, if relevant, structural source control BMPs.

Staff will note inspection findings on the “Clark County Stormwater Business Site Visit Report” field form.

During the visit, county staff will provide education and technical assistance as judged necessary or beneficial. Education or assistance could include brochures, BMP handouts, general information on stormwater pollution topics, copies of the county’s water quality ordinance, *Clark County Stormwater Pollution Control Manual: Best Management Practices for Businesses and Government Agencies*, or referrals to maintenance companies.



Follow-up Actions for Compliance

If a business is not in compliance, the source control specialist will work with the manager or owner to reach compliance. Follow-up actions may include phone calls, additional site visits, and letters. County staff may give additional technical assistance such as locating engineering drawings, providing handouts from the *Clark County Stormwater Pollution Control Manual: Best Practices for Businesses and Government Agencies* or Ecology and recommending new source control BMPs.

The source control specialist will set deadlines as necessary for compliance actions (e.g. cleaning catch basins).

Follow-up actions will also be recorded on the “Clark County Stormwater Business Site Visit Report” field form.

Referral

If necessary to gain compliance, the source control specialist will refer the case to another agency such as Clark County Public Health or the Clark Regional Wastewater District. The source control specialist will continue to follow the case to conclusion.

Further Enforcement Actions

Further enforcement will be provided by Clean Water Program Code Enforcement or by referral to Ecology in cases of continued inaction.

Record-keeping

Data from field forms for both inspection and follow-up will be entered into *Tidemark* as a CWP case type by an Environmental Services Clean Water Program office assistant.

Outputs

- Records of inspections and follow-up cases in *Tidemark*
- Report of numbers of inspections and referrals
- Case files

WATER QUALITY COMPLAINT INVESTIGATION

Purpose

Clark County investigates all legitimate complaints about water quality problems to reduce contamination of stormwater, surface water, and groundwater as well as to comply with its NPDES Permit.

Responsibilities Matrix

| Task | DES CWP NPDES Mgr. | DES Source Control Specialist | DES Office Assistant | DES Natural Res. Spec. | CD Code Enf. Officer |
|------------------------------|-----------------------|-------------------------------------|-------------------------|---------------------------|-------------------------|
| Refer potential cases to CWP | O | I | O | O | P |
| Open case | A | P | O | O | O |
| Investigation | A | P | O | S | O |
| Education and compliance | A | P | O | O | O |
| Record-keeping | A | S | P | O | O |

A = Accountable, **P** = Primary (doer), **S** = Supports, **C** = Consulted, **I** = Informed, **O** = Omitted

Open Case

Water quality complaints may arrive in a variety of ways, including the 24-hour water quality complaint line, referral from other agencies, referrals from Community Development Code Enforcement Officers, e-mail to the Clean Water Program general address, and phone calls to the Clean Water Program. Complaints may be made by the general public or agency staff.

Complaints will be referred or forwarded to the Environmental Services Clean Water Program source control specialist.

Investigation

The source control specialist will investigate every legitimate complaint beginning with a phone call and site visit.

For business sites, the specialist will fill out the “Clark County Stormwater Business Site Visit Report” field form and begin a case file.

For residential sites, the specialist will fill out the field form but generally will not begin a case file. In difficult or egregious cases, the specialist will begin a case file.

Education and Compliance

If a water quality or source control violation is found, the specialist will work with the property owner on compliance or refer the case to another agency, generally following the procedures for source control follow-up (above), and, if necessary, further enforcement actions.

Record-keeping

A Clean Water Program office assistant will enter data from the field forms into *Tidemark* as a CWP case type. The specialist will keep any case files.

Outputs

- Records of complaints, investigations and follow-up in *Tidemark*
- Case files

SOURCE CONTROL SUCCESS

In March 2013 the Department of Ecology contacted the county regarding an outfall from an oil/water separator in an auto service strip mall on Highway 99. A joint county-state investigation found two oil/water separators at the location, one leading to the MS4 and one to the sanitary sewer. There was one automotive business that had several source control issues and an interior floor drain plumbed to the oil/water separator connected to the MS4.

During the investigation, several corrective BMPs were discussed with the manager and the county issued a follow-up letter to the store manager and the property owner. The letter also identified an April 2013 deadline for completion repairs. A neighboring business pumped out the oil/water separator that connected to the sanitary sewer and brought that connection into compliance.

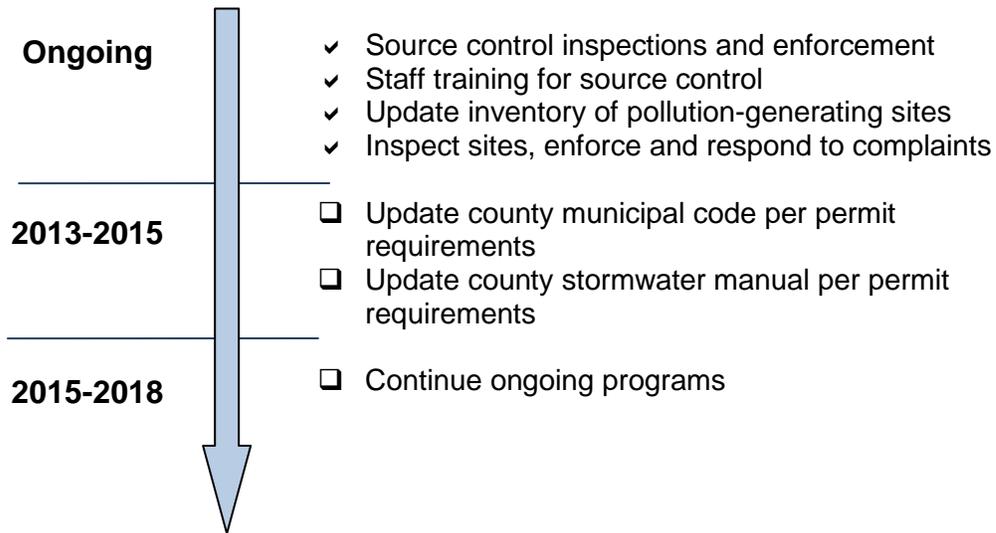
Over the course of the next couple of months, the business switched managers and eventually closed. The business was still out of compliance for an August re-inspection. The County contacted the property owner who indicated that they would hire a contractor to address the outstanding issues. The contractor started shortly after the re-inspection and the work included sealing the interior drains, sweeping the shop floors and having the open uncovered 55 gallon drums of used motor oil pumped and empty drums removed from the back storage area. County staff provided names of companies that could help with proper disposal of the materials. Within a week, the contractor had completed a clean-up of the site and set aside every container of hazardous material so another contractor could pick it up for proper disposal.

A re-inspection was conducted in August 2013; the shop was empty and clean with the floor drains plugged. The cooperation of the property owner created a successful cleanup of the property and protection to the Cougar Creek watershed.

TRAINING

Clean Water Program and Code Enforcement personnel have been performing source control inspections and enforcement since 2000. When applicable, new staff will be trained on enforcing the Water Quality Ordinance, including legal basis, BMPs, inspection procedures, enforcement process, and record keeping. When changes to manuals or procedures are made, all appropriate staff will be trained.

TIMELINE



FOR MORE INFORMATION ON THE SOURCE CONTROL PROGRAM

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ILLICIT CONNECTIONS AND ILLICIT DISCHARGES DETECTION AND ELIMINATION (IDDE)

REGULATORY REQUIREMENTS SUMMARY

NPDES Permit S5.C.8 – Illicit Connections and Illicit Discharges Detection and Elimination

The NPDES Permit requires the county to have a program to detect, remove, and prevent illicit connections and illicit discharges, including spills, into the MS4. Illicit connections are man-made conveyances connected to the MS4 without a permit, such as sanitary sewers and floor drains that can carry materials other than stormwater. Illicit discharges are discharges to the MS4 not composed entirely of storm water, except where allowed by a state waste discharge permit.

The Permit designates timelines for beginning an investigation of a suspected illicit connection and for terminating a confirmed illicit connection.

Revised Code of Washington Chapter 90.48 – State Water Pollution Control Act

The State Water Pollution Control Act prohibits the discharge of contaminants to waters of the state.

COUNTY POLICIES, RULES AND REGULATIONS

Clark County Code Chapter 13.26A – Water Quality

[Chapter 13.26A](#) prohibits the discharge of contaminants into surface water, stormwater, or groundwater, and it defines contaminants and illicit connections. It gives inspection and enforcement authority to authorized representatives of the Environmental Services Director or other department heads specified in established procedures to enforce that chapter.

Clark County Code Chapter 13.10 – Use of Sewer

[Chapter 13.10](#) requires the use of sewers to dispose of liquid wastes and water carrying waste materials.

Clark County NPDES Illicit Discharge Detection and Elimination Screening Quality Assurance Project Plan

The Project Plan addresses project design, schedule, methods of data collection and management, quality assurance and control requirements, data analysis, thresholds for further investigation, and reporting for the county’s program to screen the MS4 for illicit

connections.

ILLICIT CONNECTION SCREENING

Purpose

Screening for evidence of illicit connections helps county staff identify outfalls or points in the MS4 that appear to convey something other than stormwater, as well as meeting Permit requirements for ongoing screening.

Responsibilities Matrix

| Task | DES CWP Manager | DES CWP Permit Manager | DES Natural Resources Specialist |
|-------------------------|-----------------|------------------------|----------------------------------|
| Basin selection | A | S | P |
| Outfall selection | A | I | P |
| Site visits / screening | A | I | P |
| Sampling / evaluation | A | I | P |
| Record-keeping | A | I | P |

A = Accountable, P = Primary (doer), S = Supports, C = Consulted, I = Informed, O = Omitted

Ongoing Work

Clark County carried out an extensive screening program in 2006, 2007, 2008 and 2012,

completing the 2013 NPDES Permit requirement to screen the conveyance systems in the high density area and at least one rural sub-basin began under the 2007 permit term.

Environmental Services Clean Water Program natural resources specialists (NRS) will continue effectiveness monitoring on illicit connections discovered during previous field screening operations (see Illicit Connection and Discharge Response and Removal on page 54). In addition, a NRS or the source control specialist will respond to any complaints and referrals.

Source control inspections are an important element of illicit discharge detection (see Source Control Program on page 44).

Basin Selection

In 2014, a Clean Water Program NRS will select urbanized subwatersheds for screening based on professional judgment and watershed management objectives. This area will include at least 12 percent of the urban stormwater conveyance systems having outfall points of 24 inches or larger in nominal diameter.

Outfall Selection and Scheduling

A Clean Water Program NRS will use the county stormwater infrastructure inventory GIS database, *StormwaterClk*, to locate and map all outfalls within chosen basins. Staff will schedule site visits using this information.

Site Visits

During dry weather, a NRS will screen outfalls for indicators of illicit connections, such as flow or deposits.

Sampling and Evaluation



The NRS will take samples at flowing outfalls, send them for laboratory analysis, and then evaluate the results using defined protocols to determine if an investigation is warranted. In cases where an investigation is warranted, the discharge is called a suspected illicit discharge or connection.

Investigations and follow-ups are part of the Illicit Connections and Discharge Response program (below).

Record-keeping

The NRS will track all information regarding screening, illicit connection investigations and response to illicit discharges if applicable, in the IDDE screening database.

Reporting

Each year, the NRS will complete a report suitable for an auditor review describing the year's work from planning through removal of any discovered illicit connections of discharges. The report will be stored in the project folders by year.

Outputs

- Records in the IDDE screening database
- Annual written summary of screening activities, investigations and results
- Report of number of inspections and follow-ups
- Laboratory data and field measurements entered in the *Water Quality Database*

ILLICIT CONNECTION AND DISCHARGE RESPONSE AND REMOVAL

Purpose Clark County responds to all suspected illicit discharges and connections to the MS4 that it identifies through screening or other methods. Response is designed to eliminate the source of the discharge or the connection.

Responsibilities Matrix

| Task | DES CWP NPDES Mgr. | DES Natural Resources Specialist | DES Source Control Specialist | Public Health | CRWWD | Ecology |
|---------------------|--------------------------|---|-------------------------------------|------------------|-------|---------|
| Open case | A | I | P | O | O | O |
| Investigation | A | S | P | S | S | S |
| Follow-up / removal | A | I | P | S | S | S |
| Continued follow-up | A | S | P | S | S | S |
| Record-keeping | A | P | S | O | O | O |

A = Accountable, **P** = Primary (doer), **S** = Supports, **C** = Consulted, **I** = Informed, **O** = Omitted

Suspected Illicit Connection and Discharge Response

The DES Clean Water Program and Public Works Operations Division will receive and respond to reports of suspected illicit connections; however, some illicit connections of on-site sewage treatment systems are discovered and terminated by Clark County Public Health. The process described here is that used by the Clean Water Program and Public Works.

Notify Ecology of Severe Threats

The county immediately will notify Ecology if an illicit discharge or connection poses a severe threat to human health or the environment.

Open Case

The process begins with notification about a suspected illicit discharge or connection through referral from illicit detection screening (above), discovery through source control inspections (above), or complaint.

The source control specialist will open a case file.

Investigation

Within 21 days, the Clean Water Program source control specialist and a NRS will attempt to trace a suspected illicit discharge or connection back to its source to identify the problem. If tracing back to the source is not possible, they may elect to follow other protocols established in the IDDE Project Plan.

The source control specialist will confirm the presence or absence of the suspected illicit discharge or connection based on the findings, and, when possible, will specify the source.

Follow-up and Removal

For confirmed illicit discharges or connections, the source control specialist will work with the property owner and, if necessary, other county departments or agencies to eliminate the illicit connection. If relevant, Clark Regional Wastewater District, Public Health, cities, or the Department of Ecology may be requested to assist in areas where they have responsibility.

Addressing illicit discharges will follow standard source control procedures for follow-up actions (e.g. personal contacts) and further enforcement by a Code Enforcement Officer, if necessary.

Removal of illicit connections will be completed within six months of confirmation of an illicit connection through field verification.

Continued Follow-up

Following the IDDE Project Plan, questionable outfalls require continued follow up, which may include effectiveness monitoring at sites where illicit connections or discharges were found, repeat screening where low levels of pollutants were found, or additional visits by the source control specialist to verify that actions leading to an illicit discharge are ended.



Record-keeping

The source control specialist will inform the NRS of the results of the follow-up actions involving illicit discharge or connection abatement. The NRS will enter information into the IDDE screening database.

If the case is a suspected illicit connection, the date it was first discovered or reported will be used to track the requirement to initiate an investigation with 21 days.

After the illicit connection is confirmed, the requirement to terminate the connection within six-months will apply. If the suspected connection was identified through field observation, source control inspection, or complaint, the discovery date is the date the observation or complaint was made. If the suspected connection was identified through laboratory analysis, the discovery date is the date of the official laboratory report. Discovery dates will be recorded and tracked in the IDDE screening database.

A record is kept for every illicit connection referred to Ecology as a severe threat to human health or the environment.

Outputs

- Removal of illicit connections and reduction of illicit discharges to the MS4
- Entries in the IDDE screening database
- Reporting to Ecology

UPDATE IDDE PROGRAM PLAN

During 2014, the Clean Water Program NRS and Source Control Specialist will update the IDDE Screening and Illicit Discharge Project Plan to reflect Permit revisions and alternatives to outfall screening such as using routine catch basin inspections as potential IDDE screening points.

SPILL RESPONSE

Clark County responds to spills on surfaces, such as roadways, that discharge to the MS4, surface water, or ground water, and to improper dumping into the MS4.

Purpose

and stormwater.

The purpose is to reduce and prevent contamination of surface water, ground water,

Responsibilities Matrix

| Task | PW Operations Admin | PW Operations Crew Chief | PW Operations Road Crew | PW Operations OA |
|---------------------------|---------------------|--------------------------|-------------------------|------------------|
| Open case | I | A | I | P |
| Spill response / clean-up | I | A | P | O |
| Notify Ecology | A | P | S | P |
| Record-keeping | A | P | C | S |

A = Accountable, **P** = Primary (doer), **S** = Supports, **C** = Consulted, **I** = Informed, **O** = Omitted

Notification

Spill notification can arrive in a variety of ways, including detection by Public Works Operations and Maintenance roads crews or citizen complaint.

Clark County staff receiving notification of a spill will immediately notify Public Works Operations and Maintenance dispatch. For spills responded to by Public Works crews, the Crew Chief will call Ecology's spill response team in the Vancouver Field office if necessary.

The phone operator will also notify Ecology using the 24-hour spill reporting number. County personnel also will immediately refer significant spills to Department of Ecology.

Response

Spill reports received by Public Works generate a Maintenance Management System work order, the appropriate crew responds to work order and, if necessary, they call Ecology. For urgent complaints arriving after hours via telephone, the answering service will page the Public Works Operations and Maintenance on-call crew chief, who will determine the level of response following established Public Works guidelines.

Record-keeping

Records of spill incidents and responses will be kept in the Public Works customer service database. The Public Works phone operator enters the phoned-in spill report into the tracking system. The crew chief enters all follow-up information and closes out the work order.

Outputs

- Spill clean-up
- Records of incidents responses

WATER QUALITY PROBLEM REPORTING LINE

Purpose

Clark County advertises its 24-hour Public Works customer service line as a water quality complaint line. The line gives citizens an opportunity to report spills, dumping, and other water quality concerns at any time. The Ecology spill response number is also posted on the Clean Water Program web page.

Responsibilities Matrix

| Task | PW Operations Admin | PW Operations OA | PW Answering Service | CD Code Enf | Public Health | CWP |
|----------------------------------|---------------------|------------------|----------------------|-------------|---------------|-----|
| Take calls during business hours | A | P | O | P | P | P |
| Take calls after hours | A | I | P | O | O | O |
| Referral | A | P | P | P | P | P |
| Log calls in database | A | P | O | P | O | P |

A = Accountable, **P** = Primary (doer), **S** = Supports, **C** = Consulted, **I** = Informed, **O** = Omitted

Complaint and Referral

Complaints arriving on the Public Works 24-hour line are logged to the Public Works customer service database by Public Works office assistants. Incidents are generally routed to the Environmental Services Source Control Specialist or Department of Ecology, depending upon the nature of the incident.

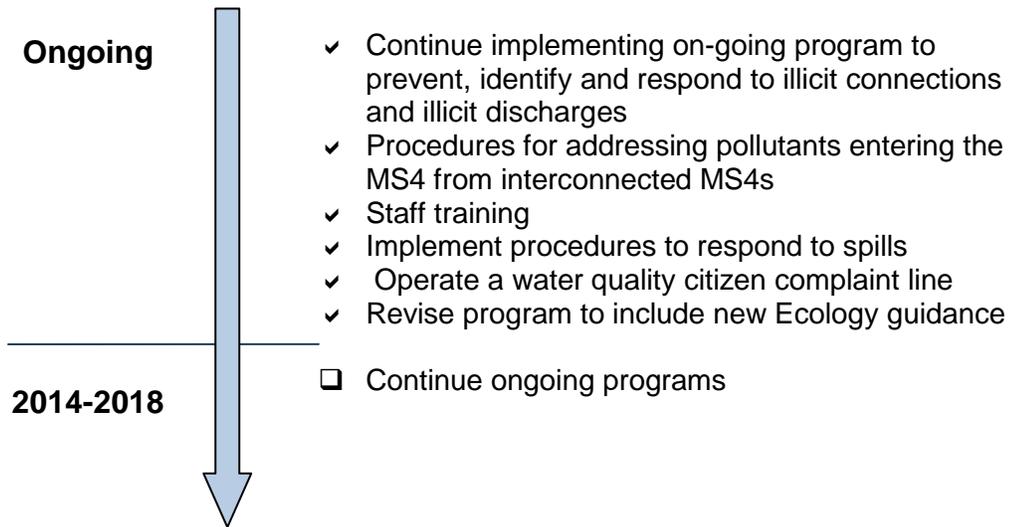
Water quality complaints are also received by other agencies or county departments including Ecology, Clark County Code Enforcement, and Clark County Public Health.

Response to complaints is described under Water Quality Complaint Investigation.

Outputs

- Report of number of calls to the general customer service line

TIMELINE



FOR MORE INFORMATION ON THE COUNTY PROGRAM TO
DETECT AND ELIMINATE ILLICIT CONNECTIONS AND
DISCHARGES TO THE MS4

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Section 5

Expanding and Improving the Stormwater Management Infrastructure



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As county population and development pressure increase, the primary means of controlling runoff from areas of new growth and for fixing problems caused by uncontrolled runoff from existing developed areas is by expanding and improving the existing stormwater management infrastructure.

In Clark County, stormwater management infrastructure is expanded in two ways:

County Stormwater Capital Improvement Projects

The county has a program to plan and construct new stormwater infrastructure and improve existing infrastructure to better control and treat runoff from areas where existing development does not include adequate stormwater controls. This addresses the permit requirement to mitigate for stormwater impacts from existing development.

Regulation of Development, Redevelopment, and Construction Projects

Private entities and government agencies develop the land, and the county regulates the design and construction of stormwater controls on it, many of which eventually become part of the county's own stormwater infrastructure.

The process for each of these types of projects is described below.



Roadway flooding during winter storm, 2007

COUNTY STORMWATER CAPITAL IMPROVEMENTS

Past stormwater management and drainage practices and development regulations have proven inadequate to prevent impacts of runoff on surface water, and thousands of developed acres in Clark County contribute to problems in streams, lakes, and rivers. Accordingly, the county has a program to construct stormwater capital improvements primarily to control and treat stormwater from areas of existing development with inadequate stormwater controls. In addition, the county may take opportunities to expand the treatment and flow control capacity of existing facilities when making repairs. These activities all are part of the county's stormwater capital improvement program.

REGULATORY REQUIREMENTS SUMMARY

NPDES Permit – S5.C.6. Structural Stormwater Controls

The NPDES Permit requires the county to implement a structural stormwater controls program to prevent or reduce impacts to waters of the state caused by discharges from the MS4.

The program considers projects including new flow control facilities, new water quality treatment facilities, retrofits of existing facilities, property acquisition, and maintenance with capital construction costs >\$25,000 to provide water quality or flow control benefits. Other means to reduce impacts are also considered, including riparian habitat acquisition, restoration of forest in upland areas and in riparian buffers, and floodplain reconnection projects. Small scale projects that are not planned in advance may also be included in meeting this requirement.

While the permit requires a structural stormwater control program, it does not prescribe a scope for it other than to note that the program will demonstrate it meets AKART and MEP standards.

The SWMP must include a list of planned individual projects updated in each annual report to the state.

The description of the structural stormwater control program in the SWMP must include the program's goals and the planning process, including budget and public involvement. Individual project descriptions must include estimated pollutant load reduction (if applicable), flow control benefits (if applicable), other expected environmental benefits, and plans for monitoring the facility. A table describing the 2013-2018 capital projects is attached as Appendix A.

Chapter 173-218 WAC –
Underground Injection Control
(UIC) Program

Pursuant to [Chapter 90.48 RCW](#), the state’s requirements for stormwater infiltration wells may result in capital improvements associated with county systems that are found to pose a threat to groundwater.

COUNTY POLICIES, RULES AND REGULATIONS

The Clean Water Program has the following policies for county stormwater capital improvements:

- Meet NPDES Permit requirements for the structural stormwater control program through stormwater capital planning and capital construction.

County goals for stormwater capital improvements include:

- Protect and enhance streams and wetlands in Clark County through planning and constructing modifications to the stormwater infrastructure.
- Minimize the degradation of receiving waters from impacts attributable to stormwater runoff in existing developed areas.
- Maximize public benefits of county-owned land by providing multiple uses, including recreation, and by leveraging funding from multiple sources.
- Provide stormwater facilities for future development and redevelopment.

GUIDING PRINCIPLES

In support of county policies and goals, the capital planning process strives to:

- Prioritize projects with the greatest potential to support multiple county programs and goals, including local and regional fish recovery, habitat enhancement, and water cleanup goals.
- Ensure a reliable scientific and engineering basis for projects.
- Establish that each project in the plan is needed, feasible, and cost-effective.
- Focus limited resources on the most pressing concerns and the most cost-beneficial solutions.
- Incorporate environmental benefits into needed infrastructure repair projects.
- Maintain a sufficient list of potential projects to enable replacement of any projects that become infeasible, and to take advantage of funding opportunities.
- Utilize partnerships, where feasible, to meet multiple community goals.

As-Built Plan Preparation

Clark County Public Works follows a management practice for the production of record drawings at the final acceptance of a public capital project.

STORMWATER CAPITAL PLANNING

Purpose

Planning ensures that stormwater capital improvements meet the county's goals.

Capital planning is a process for identifying potential projects, deciding if they are feasible, selecting the best for further development, and tracking their progress from inception through construction. The stormwater capital program will list projects scheduled for implementation on a six-year horizon.

- The proposed projects are considered to comply with MEP and AKART requirements under Permit Condition S5.C.6.
- Projects reflect what Clark County is best able to implement within its available funding and demands for structural control projects.
- Projects address stormwater impacts not adequately controlled by other permit-required actions, chiefly those caused by uncontrolled or untreated runoff from existing development, and habitat degradation that has already occurred.

By complying with permit condition S5.C.6., together with all of the remaining other permit requirements, Clark County complies with MEP and AKART as set forth in the county's NPDES Municipal Stormwater Permit condition S4.E.

Individually, projects meet AKART by being designed following practices described in the *Stormwater Management Manual for Western Washington*.

Responsibilities Matrix

| Task | DES CWP Infrastructure Manager | DES CWP Engineer | PW Eng. Program Manager | PW Eng. Project Manager | PW Eng. Program Staff | BOCC | DES Director |
|------------------------------|--------------------------------|------------------|-------------------------|-------------------------|-----------------------|------|--------------|
| Accept referrals | A | P | O | O | O | O | O |
| ID potential projects | A | P | O | O | S | O | O |
| Database entry & updates | A | P | O | O | O | O | O |
| List of potential projects | A | P | I | I | C | O | O |
| Formulate selection criteria | A | P | I | O | S | C | C |
| Apply selection criteria | A | P | C | C | S | O | C |
| Scoping and Selection | A | P | O | O | S | O | I |
| Six-year capital plan | A | P | C | S | S | C | C |

A = Accountable, **P** = Primary (doer), **S** = Supports, **C** = Consulted, **I** = Informed, **O** = Omitted

Referrals

Project ideas may be referred to the Clean Water Program from several sources, including field work completed by the Assessment and Monitoring Section, CWP engineer review of watershed plans and water quality reports, problems identified by Road Operations crews, and projects suggested by the public.

Referrals can arrive continuously throughout the year.

Project Tracking / Capital Planning Database

CWP engineers will enter potential capital projects selected for further consideration into the *Capital Planning Database* as they are evaluated.

The database tracks stormwater capital projects from inception to construction and close-out, or their status as shelved or dropped including the following attributes:

- Project category/type.
- Description and basis of the project and the problem being addressed.
- Estimated project benefits including flow control, pollutant load reduction, habitat enhancements, and other environmental benefits.
- Status of preliminary engineering and construction.
- Funding summary.
- Types of potential environmental impacts, including wetland, priority habitat, cultural resource, floodplain impacts, etc.

As projects advance and more information is developed, CWP engineers will update the database with new details on a regular basis.

Project Identification The capital plan considers projects within the entire unincorporated urban area and rural Clark County, but focuses on urban and urbanizing areas where stormwater impacts are greatest.

Most projects considered for the current capital plan were identified through one of three mechanisms: the county’s Stormwater Needs Assessment Program (SNAP), stormwater facility inspections, and assessment of drywell systems. Additionally, property acquisitions were identified through the Legacy Lands program under the Conservation Areas Acquisition Plan.

The SNAP watershed assessment effort evaluated the stormwater and surface water systems, identifying problems and opportunities that could be addressed through capital projects. SNAP was conducted county-wide from 2006-2010.

Routine field inspections of stormwater infrastructure identify the majority of repair projects. In addition, stormwater engineers may identify project opportunities while conducting regular business such as responding to drainage complaints, evaluating problems identified by county road operations crews and looking into projects suggested by members of the public.

The county’s Underground Injection Control Well Assessment (2013) identified wells potentially needing retrofits to eliminate threats to groundwater. Other focused efforts may include catch basin retrofits in highly urbanized drainages.

Screening Project identification may generate a large number of candidate projects. Screening is the first step in determining which opportunities should be evaluated more extensively.

Initial screening eliminates clearly infeasible or unproductive stormwater capital projects early in the planning process by determining at a general level whether the project is both worthwhile and feasible. The first question is answered through an objective scoring of *resource-based* criteria for whether or not they are likely to produce a significant benefit to the environment. The second, feasibility question is answered through an objective scoring of *engineering* criteria.

Scoping Project scoping is perhaps the most critical step in the planning process. Where initial screening takes a general approach, scoping begins to look quantitatively at feasibility and benefit as well as project costs. Scoping is where observed stormwater problems are linked to tangible solutions.

Outputs

- Database entries of potential projects and scoped projects, and detailed project attributes, for consideration in subsequent years
- Submittal of NPDES permit report Appendix 11
- Six-year capital plan with funding allocation



Construction of the Curtin Creek Enhancement Area

CAPITAL PROJECT CONSTRUCTION PROGRAM

Purpose

The construction program is the engine for designing, permitting, and building stormwater capital projects. The Public Works Engineering Program leads the effort through established project management systems.

Responsibilities Matrix

| Task | DES CWP Infrastructure Manager | DES CWP Engineer | DES Enhance. & Permitting Mgr. | DES Env. Permitting Manager | PW Eng. Program Manager | PW Eng. Project Management Manager | PW Eng. Project Manager | PW Eng. Program Engineers | PW Eng. Construction Manager | PW Eng. Construction Mgmt. Staff |
|----------------------------------|--------------------------------|------------------|--------------------------------|-----------------------------|-------------------------|------------------------------------|-------------------------|---------------------------|------------------------------|----------------------------------|
| Assign Project Team | I | I | S | S | A | P | S | S | S | S |
| Schedule and Budget | S | S | S | S | A | C | P | S | S | S |
| Preliminary Engineering | I | O | O | O | A | S | S | P | O | O |
| Permitting | I | O | A | P | I | O | I | C | C | O |
| Construction Management | I | I | I | C | I | S | S | C | A | P |
| Project Close Out | I | S | I | C | A | I | P | C | C | C |
| Update Capital Planning Database | A | P | O | O | O | O | O | O | O | O |

A = Accountable, **P** = Primary (doer), **S** = Supports, **C** = Consulted, **I** = Informed, **O** = Omitted

The Public Works Engineering Program designs and oversees construction of all types of capital improvement projects, including county stormwater projects. Their services include project management, survey, property acquisition, engineering, and construction management.

The program is responsible for the advancement of stormwater capital projects from the Stormwater Capital Program to construction. The responsibilities and procedures for this program are briefly reviewed below.

Team, Schedule, and Budget From the Stormwater Capital Program, the manager of the Project Management section will assign a team of professionals led by a project manager to each project.

The project manager, with the help of the team, will develop a detailed scope, schedule and budget for his/her assigned projects. The project manager will monitor each item closely throughout each project's life.

Preliminary Engineering and Environmental Permitting Public Works engineers will create engineering plans, design specifications, and cost estimates for each project in the plan. Department of Environmental Services permitting coordinators will shepherd each project through local, state, and federal permitting processes.



Encore Stormwater Facility Retrofit

As projects near completion of engineering design, the Engineering Program manager, in consultation with the Clean Water Program manager, will make the final decision to advance selected projects to construction.

Bid The project manager will coordinate with the Clean Water Program and the team to prepare and execute a project bid schedule.

Construction Management

The Public Works Engineering Program Construction Management team will review bids and prepare an award recommendation for the Board of Clark County Commissioners.

Once the contract is awarded, Construction Management will administer it and oversee construction.

As a project reaches completion, the construction manager will send a copy of the letter of physical completion to the Clean Water Program and Public Works Operations and Maintenance program. The Clean Water Program also will be copied on the letter of final acceptance.

Receipt of the physical completion and final acceptance letters by the Clean Water Program will initiate stormwater inventory tasks (see section 2 on page 12). Receipt of the final acceptance letter by Operations will initiate maintenance and operations tasks (see section 3 on page 26).

Close Out

The project manager and construction manager will coordinate preparation of close out documents, including final expenditures. The project manager will provide a final report and a CD of the electronic project files to the Clean Water Program Infrastructure Manager.

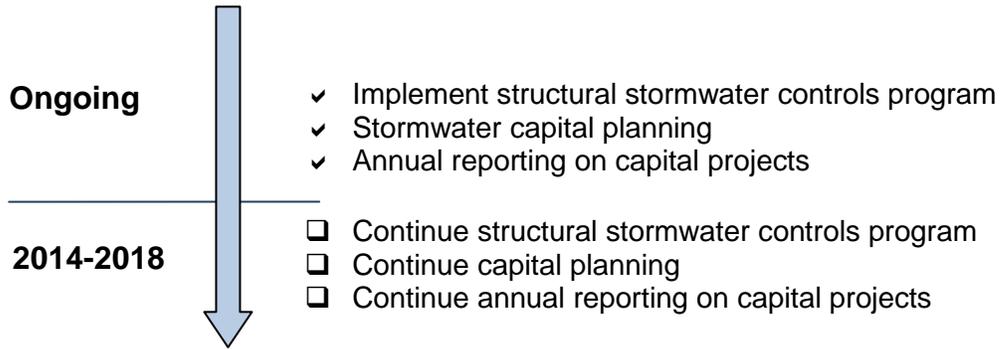
CWP engineers will update the *Capital Planning Database* with metrics from the final report.

Construction Management will oversee the production of record drawings, and Survey staff will notify the Clean Water Program of their location. The receipt of record drawings by Clean Water Program will initiate tasks to verify the stormwater infrastructure inventory.

Outputs

- Project plans, specifications, and estimates
- Completed stormwater capital projects
- As-built drawings (record drawings)
- Final expenditures and metrics for each project
- CD of electronic files to Clean Water Program
- Project final report

Timeline



FOR MORE INFORMATION ON PLANNING AND BUILDING COUNTY STORMWATER INFRASTRUCTURE

JEFF SCHNABEL, CLEAN WATER PROGRAM INFRASTRUCTURE MANAGER, (360) 397-6118, x4583

JEFF.SCHNABEL@CLARK.WA.GOV

DEVELOPMENT AND REDEVELOPMENT FLOW RESTORATION PROGRAM

On August 1, 2013, in response to a federal court ruling of liability for violating the Clean Water Act, Clark County amended its development code to include the Washington State Department of Ecology's historic, forested land cover requirements as its predevelopment flow control standard. This eliminated the program need for stormwater capital projects to provide credit for restoring historic flows. Therefore, the county's flow restoration program has been eliminated.

Subsequent to the federal court ruling the county negotiated a settlement with the plaintiffs in the Clean Water Act lawsuit. Under a Consent Decree, the county is required to pay \$3,000,000 in six annual payments of \$500,000 each to the Lower Columbia Fish Recovery Board to fund grants for third-party water quality enhancement and habitat improvement projects within the watersheds of WRIA 28 and Gee Creek. These projects are to reduce or prevent degradation caused by stormwater runoff associated with Clark County's municipal stormwater system. See Attachment A to the Consent Decree.

FOR MORE INFORMATION ON DEVELOPMENT AND REDEVELOPMENT FLOW RESTORATION

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REGULATORY PROGRAM FOR DEVELOPMENT, REDEVELOPMENT, AND CONSTRUCTION PROJECTS

The county is the local land use regulator. As such, the NPDES Permit requires the county to regulate the discharge of runoff from new development, redevelopment, and construction activities in the county.

In 2013, the county began a project to update its regulations in response to the newly issued 2013-2018 NPDES Permit. During 2014, Clark County will update its stormwater code and stormwater manual for public review and submittal of draft versions to Ecology for approval as equivalent to the permit requirements. Full implementation of the equivalent code and manual will be before July 1, 2015.

REGULATORY REQUIREMENTS SUMMARY

NPDES Permit S5.C.5.a and b. – Controlling Runoff from New Development, Redevelopment and Construction Sites

The NPDES Permit requires the county to have a program to prevent and control the impacts of runoff from new development, redevelopment, and construction activities. The program must apply to all development activity, including private-sector development and county projects such as roads and parks. The program must enforce development regulations that provide protection equivalent to the minimum requirements, thresholds, and definitions in Appendix 1 of the NPDES Phase I stormwater permit and the design standards in the August 2012 version of the *Stormwater Management Manual for Western Washington*. The program must also revise code and manuals to make low impact development the standard approach for stormwater management.

NPDES Permit S5.C.5.c. – Completing a watershed-scale stormwater plan

Along with updates to code, the NPDES Permit requires the county complete a study of Whipple Creek watershed to complete a study that will identify stormwater management strategies that would result in hydrologic and water quality conditions that fully support “existing uses” and “designated uses” as defined by state law under WAC 173-201A.

COUNTY POLICIES, RULES AND REGULATIONS

Clark County Code 40.385 – Stormwater and Erosion Control

Clark County regulates stormwater runoff and erosion control on development, redevelopment, and construction sites primarily in Chapter 40.385 Stormwater and Erosion Control. The purpose of the code is to safeguard public health, safety, and welfare by protecting the quality of surface and ground waters for drinking water supply, recreation, fishing and other beneficial uses through the application of best management practices (BMPs) for stormwater management and erosion control. It was adopted to minimize the degradation of receiving waters from impacts attributable to stormwater runoff, thereby not precluding the preservation of future restoration of beneficial uses.

The regulations generally apply to all development and construction projects, including county roads and parks that vested after April 13, 2009, whether or not they discharge to county storm sewers or to waters of the state. A notable exception is construction of buildings and impervious area for agricultural activity, which is only regulated under the stormwater and erosion control code if projects discharge directly or indirectly to the county storm sewer system.

Clark County Code 40.380 – Stormwater and Erosion Control

For development, redevelopment, and construction sites that received final engineering approval prior to December 28, 2011 and a vesting date before April 13, 2009, Clark County regulates stormwater runoff and erosion control under Chapter 40.380 Stormwater and Erosion Control (Clark County Code). Although this code has been superseded by Chapter 40.385, it remains in effect for those projects that remain vested under it.

Clark County Code 13.26A – Water Quality

Clark County regulates the discharge of contaminants to surface water, stormwater, and groundwater to protect the county's surface and groundwater quality by providing minimum requirements for reducing and controlling the discharge of contaminants and stormwater flows. It requires certain sites and activities to utilize best management practices to control release of contaminants.

For purposes of regulating development activities, the Chapter applies to those limited projects that only trigger minimum requirement 3 of the *Clark County Stormwater Manual*.

| | |
|---|--|
| <p>Clark County Code 40.430 – Geologic Hazard Areas</p> <hr/> | <p>Identifies sites where geologic concerns such as erosion and steep slopes are coincident in preparation of erosion control and stormwater site plans.</p> |
| <p>Clark County Stormwater Manual</p> <hr/> | <p>The <i>Clark County Stormwater Manual</i> is the technical guide that project proponents follow to meet the minimum requirements of the 2007 permit and meet county stormwater management requirements for development and construction projects in the county. The manual contains county requirements and procedures specific to Clark County that differ from the 2005 <i>SMMWW</i>; for the most part, the county manual references the 2005 <i>SMMWW</i> to meet the minimum requirements.</p> |
| <p>Stormwater Facility Maintenance Manual</p> <hr/> | <p>Chapter 40.385 CCC requires that all new stormwater treatment and flow control facilities be maintained according to the standards in Clark County’s <i>Stormwater Facility Maintenance Manual</i>. The manual is also applied to all existing facilities under Chapter 13.26A.</p> |
| <p>Stormwater Pollution Control Manual</p> <hr/> | <p>The <i>Clark County Stormwater Pollution Control Manual: Best Management Practices for Businesses and Government Agencies</i> is the BMP manual for meeting minimum requirement #3 from the <i>SMMWW</i>.</p> |
| <p>Clark County Code 40.450 and 40.440 – Wetlands and Habitat Protection</p> <hr/> | <p>Chapters 40.450 Wetland Protection and 40.440 Habitat Conservation regulate some stormwater discharges and the placement of treatment and control facilities in habitat and wetland buffers.</p> |
| <p>Clark County Code 40.510</p> <hr/> | <p>Applications for development, redevelopment, and construction require different levels of review depending on their impacts to the community, which are defined in Chapter 40.510. The levels of review are ministerial decisions (Type I), administrative decisions (Types II and II-A), and quasi-judicial decisions (Type III).</p> |
| <p>Management Practice: Review and Approval for Non-Manual Stormwater Treatment BMPs</p> <hr/> | <p>The Environmental Services Department follows a management practice that conforms to the <i>SMMWW</i> guidance for determining acceptability of stormwater treatment BMPs that are not in the <i>SMMWW</i>.</p> |

STORMWATER REVIEW AND ENFORCEMENT OF DEVELOPMENT AND CONSTRUCTION APPLICATIONS

Purpose

Clark County has a system of ordinances, technical manuals, plan review, inspection and enforcement to apply the NPDES Permit minimum requirements to development, redevelopment, and construction projects.

For stormwater, the purpose of the review is to determine:

- Applicability of the stormwater and erosion control minimum requirements.
- Compliance with applicable minimum requirements.
- Compliance with other county-specific stormwater requirements listed in chapters eight through 11 of the Clark County Stormwater Manual.

Inspection and enforcement strives to ensure that construction sites correctly and consistently use erosion control BMPs to prevent sediment-laden runoff from leaving the sites, and that permanent stormwater BMPs for conveyance, treatment, and flow control are properly installed, constructed, and transferred in good condition to the ultimate owners/operators.

Interdepartmental Responsibilities Summary

Responsibility for implementing the stormwater code is shared by several departments and is guided by interdepartmental MOUs. Environmental Services will update and maintain these agreements.

Community Development Department – Permit Services

Permit Services will accept most types of development and construction applications and determine if applications include the required submittals. Permit Services staff review residential building permit applications for stormwater compliance.

Community Development Department – Building Safety

Building Safety will accept and review site plans, condition building permits for stormwater requirements, inspect building construction sites for compliance with erosion control, source control, preservation of natural drainage, and onsite stormwater management.

Public Works Department – Development Engineering

Development Engineering staff will provide engineering review of stormwater and erosion control plans on development sites, including residential and non-residential

development sites, as well as Public Works projects. Development Engineering staff will oversee the issuance of the plat, the final engineering as-built documents (record drawings), and the maintenance warranty, if applicable.

Public Works Department – Construction Management

Construction Management staff will inspect development sites, including county projects, for compliance with stormwater engineering plans and erosion control plans.

Environmental Services Department – Clean Water Program

Clean Water Program staff will support decision-making regarding interpretation of the code and manuals, providing documentation of their findings.

Environmental Services Department – Code Enforcement

Code Enforcement will enforce erosion control violations on development and building construction sites as needed.

Responsibilities Matrices

The review and enforcement process varies depending on complexity and scope of the project. For stormwater review purposes, projects generally can be divided into residential development projects (subdivisions), non-residential development projects, residential construction projects (individual home construction), and Public Works projects.

The first matrix below describes responsibilities at the department and division level, and then four separate matrices describe responsibilities and accountability at the staff level for each type of review.

Overview of Regulatory Review and Enforcement Responsibilities

| Task | CD Permit Services | CD Building Safety | CD Building Official | DES Code Enforcement | PW Development Engineering | PW Dev. Engineering Manager | PW Construction Management | PW Const. Manager | DES Clean Water Program |
|--|--------------------|--------------------|----------------------|----------------------|----------------------------|-----------------------------|----------------------------|-------------------|-------------------------|
| Plan Review - residential construction | P | S | A | O | O | O | O | O | S |
| Inspect building construction sites | I | P | A | O | O | O | O | O | I |
| Engineering review - development | S | O | O | O | P | A | C | O | I |
| Accept "non-manual" treatment BMPs | O | O | O | O | P | A | O | O | C |
| Inspect development sites | O | O | O | O | S | O | P | A | I |
| Inspect Public Works sites | O | O | O | O | S | O | P | A | I |
| Enforce erosion control | I | P | A | P | O | O | P | A | I |
| Maintenance warranty inspection | O | O | O | O | S | O | P | A | I |
| A = Accountable, P = Primary (doer), S = Supports, C = Consulted, I = Informed, O = Omitted | | | | | | | | | |
| | | | | | | | | | |

Residential Development (Subdivision, Short Plat)

| Task | CD Building Official | CD Permit Tech | CD Dev. Services Mgr. | CD Planner | PW Dev. Engineering Manager | PW Review Engineer | PW Eng. Team Lead | PW Planning Technician | PW Office Assistant | PW Const. Manager | PW Inspector | DES CWP Engineering Tech |
|---|----------------------|----------------|-----------------------|------------|-----------------------------|--------------------|-------------------|------------------------|---------------------|-------------------|--------------|--------------------------|
| Accept applications and plans | A | P | O | S | C | O | S | S | S | O | O | O |
| Pre-application conference | O | S | A | S | C | P | S | I | I | O | O | O |
| Preliminary engineering review | O | S | I | I | A | P | C | S | S | O | O | O |
| Final engineering review | O | S | O | O | A | P | C | S | S | O | C | O |
| Construction approval | O | O | O | O | A | P | C | S | S | O | C | O |
| Pre-construction conference | O | O | O | O | I | C | C | S | S | A | P | O |
| Development inspection | O | O | O | O | I | C | C | S | S | A | P | O |
| Approve record drawings | O | O | O | O | A | P | C | S | S | S | S | O |
| Accept maintenance bond | O | O | O | O | A | S | O | P | S | S | I | I |
| Issue completion of construction notice | O | O | O | O | A | I | O | P | S | S | I | I |
| Record final plat | O | O | O | O | A | O | C | P | S | S | O | I |
| Distribute as-built to DES | O | O | O | O | A | O | O | S | P | S | O | I |
| 22-month off-warranty inspection | O | O | O | O | A | O | O | S | S | S | P | O |
| Release warranty bond | O | O | O | O | A | O | O | P | S | S | I | I |

A = Accountable, **P** = Primary (doer), **S** = Supports, **C** = Consulted, **I** = Informed, **O** = Omitted

Non-Residential Development

| Task | CD Building Official | CD Permit Tech | CD Dev. Svcs. Mgr. | CD Planner | PW Dev. Eng. Mgr. | PW Review Engineer | PW Eng. Team Lead | PW Planning Tech | PW Office Assistant | PW Inspector | DES CWP Eng. Tech |
|---|----------------------|----------------|--------------------|------------|-------------------|--------------------|-------------------|------------------|---------------------|--------------|-------------------|
| Accept applications and plans | A | P | I | S | O | S | O | S | S | S | O |
| Pre-application conference | O | S | A | P | O | S | O | O | O | O | O |
| Preliminary engineering review | O | S | I | I | A | P | C | S | I | O | O |
| Final engineering review | O | S | O | O | A | P | A | S | I | C | O |
| Construction approval | O | O | O | O | A | S | A | S | I | C | O |
| Pre-construction conference | O | O | O | O | A | C | O | O | O | P | O |
| Development inspection | O | O | O | O | A | C | O | O | S | P | O |
| Approve as-builts | O | O | O | O | A | P | O | I | S | S | I |
| Issue completion of construction notice | O | O | O | O | A | I | O | P | S | I | I |
| Distribute as-built to DES | O | O | O | O | A | O | O | O | P | O | I |

A = Accountable, **P** = Primary (doer), **S** = Supports, **C** = Consulted, **I** = Informed, **O** = Omitted

Residential Construction (Individual Lots)

| Task | CD Permit Technician | CD Building Safety Inspector | CD Building Official |
|-------------------------------|----------------------|------------------------------|----------------------|
| Accept applications and plans | P | O | A |
| Initial drainage inspection | S | P | A |
| Stormwater review | P | O | A |
| Issue Building Permit | P | O | A |
| Construction inspection | I | P | A |
| Issue Occupancy Permit | S | P | A |

A = Accountable, **P** = Primary (doer), **S** = Supports, **C** = Consulted, **I** = Informed, **O** = Omitted

Public Works Projects

| Task | DES CWP Eng. Tech | PW Dev. Eng. Manager | PW Dev. Eng. Team Lead | PW Dev. Eng. Engineer | PW Dev. Eng. Planning Tech | PW Eng. Design Manager | PW Design Engineer | PW Construction Section Manager | PW Construction Engineer | PW Construction Inspector | PW Survey | PW Operations and Maintenance |
|--|-------------------|----------------------|------------------------|-----------------------|----------------------------|------------------------|--------------------|---------------------------------|--------------------------|---------------------------|-----------|-------------------------------|
| Design | O | O | C | C | O | A | P | I | I | I | S | O |
| Pre-application conference | O | C | S | P | S | O | O | A | P | S | O | O |
| Preliminary engineering review | O | A | S | P | S | I | C | I | O | O | O | O |
| Final engineering review | O | A | S | P | S | I | C | I | O | O | O | O |
| Construction approval | O | O | O | O | O | O | O | A | P | S | O | O |
| Construction inspection | O | O | O | O | O | O | C | A | S | P | O | O |
| Final walk-through | O | O | O | O | O | O | S | A | S | P | O | S |
| Issue substantial completion | I | O | O | O | O | O | O | A | P | S | O | I |
| Issue physical completion | I | O | O | O | O | O | O | A | P | S | O | I |
| Issue final acceptance | I | O | O | O | O | O | O | A | P | S | O | I |
| Produce and distribute record drawings | I | O | O | O | O | O | S | A | P | S | S | I |

A = Accountable, P = Primary (doer), S = Supports, C = Consulted, I = Informed, O = Omitted

Residential Development Project Review

Residential development projects are divisions of land to create individual lots and construction of infrastructure such as roads and storm sewer.

Many aspects of residential development project review will not concern stormwater; only aspects concerning stormwater are covered in this plan.

Pre-Application Phase

Applicants typically submit initial information and may meet with a planner, engineer, and other pertinent staff in a Pre-application Conference (PAC) before an applicant submits a completed development application. The PAC will help determine options and likely requirements for stormwater control, among many other regulations and requirements.

Preliminary Land Division and Preliminary Engineering Review Phase

The applicant will submit an application for residential land division (subdivision or short plat) to the Permit Center along with a preliminary stormwater plan in accordance with section 3.2 of the *Clark County Stormwater Manual*.

Development Engineering staff will review the preliminary stormwater plan to evaluate whether the proposal for stormwater controls is feasible given existing site conditions and constraints. The engineer's Findings and Conditions of Approval will appear in the Staff Report, which will be forwarded to the applicant. The applicant will have seven years from vesting to obtain a fully complete determination on the final land division (plat) application.

Findings describe the engineer's determination of whether or not each aspect of the stormwater proposal meets county code. Conditions of Approval list the engineer's requirements for how to meet code, in cases where the proposal does not meet it, and they must be met in the final engineering plan.

Final Engineering Review Phase

The applicant will submit final plans for the residential development, including a final stormwater plan in accordance with section 3.3 of the *Clark County Stormwater Manual*. The final stormwater plan will provide final engineering design (Technical Information Report) and construction drawings for the stormwater aspects of the proposed project and a construction Stormwater Pollution Prevention Plan (SWPPP).

Development Review engineers will:

- Ensure that the Conditions of Approval from the preliminary land division have been met.
- Verify that applicable county and NPDES permit requirements have been met.

- Review engineering calculations of stormwater flows, sizing of flow control facilities, and sizing of conveyances.
- Verify adequacy of erosion control BMPs.
- Perform any other engineering review required for stormwater.

Responsible officials from Public Works, Community Development, Environmental Services, and Public Health will sign the final plans. The Development Engineering manager will make the final approval. Then the planning technician will return the approved plans to the applicant.

The Development Engineering office assistant will open a development inspection case in *Tidemark* in preparation for the next phase of the process.

Development Inspection Phase

During development inspection, the applicant will construct the development's infrastructure, including grading, roads, and stormwater controls, according to the approved final plans. Public Works development inspectors will inspect the site for conformity with the plans.

The process begins when the applicant submits the final construction plan and application for development inspection.

The assigned development inspector will hold a Preconstruction Conference with the applicant. During the Preconstruction Conference, the inspector will review erosion control requirements, including requirements related to a high potential for sediment to be discharged from the site with the applicant and will receive the name of the Certified Erosion Control and Sediment Lead (CECSL) for the site. The inspector will reiterate storm system requirements and additional inspection-related policies for storm system installation. Department of Ecology state construction stormwater permit enforcement staff are also invited to each Preconstruction Conference. After the conference, the development inspector will give approval to begin constructing the project.

During construction of the development, the development inspector will inspect the site to ensure that erosion control measures are operational and effective. The inspector will work with the developer to achieve compliance, using correction notices and stop work orders if necessary. If there is evidence of continued neglect, the inspector will call a code enforcement officer to enforce erosion control measures through citations and penalties.

The development inspector also will verify that stormwater facilities are constructed as designed.

At the end of construction, the applicant will submit record drawings and a maintenance bond, if applicable, for any public improvements. (Public improvements are roads and

stormwater conveyance and facilities that will fall into public ownership upon acceptance of the development.) A Development Engineering engineer will approve the record drawing and then a Development Engineering planning technician will accept the maintenance bond, if applicable.

Development Engineering staff will provide an electronic record drawing file to Environmental Services, then send the Mylar plan to the state archives.

After these steps are complete, the planning technician will issue a notice of completion of construction to the applicant and copy it to several departments, including the Clean Water Program and Public Works Maintenance and Operations. The notice signals the start of the stormwater facility maintenance warranty period, if applicable (see below).

The notice of completion of construction constitutes provisional county acceptance of the public infrastructure, including public stormwater facilities. In the case of private facilities, completion of construction is the end of county involvement in construction and the regulated facility operation and maintenance inspection process will begin.

Receipt of the notice of completion of construction will initiate some stormwater mapping tasks (see Mapping the Storm Sewer Infrastructure on page 12) and some maintenance inspection tasks (see Operating and Maintaining the Storm Sewer System, County Property and Roadways on page 26).

Final Land Division Phase

The final land division will begin after the development inspection phase begins but before it ends.

The applicant will submit the final land division application and the draft plat. The plat will contain required information describing facility ownership and maintenance responsibility, stormwater tracts, and drainage easements. The plat will be routed to several departments for review and approval.

After approval of the draft plat, the applicant will submit a Mylar version that will be signed by the Planning Director, the County Engineer, and the Board of Clark County Commissioners. Development Engineering staff then will record the final plat with the Auditor and issue a plat notification to the developer, copied to several departments, including the Clean Water Program.

Receipt of the plat notification by Clean Water program may initiate some stormwater mapping tasks, (see Mapping the Storm Sewer Infrastructure on page 12).

The final plat must be recorded before building permits for home construction will be issued for lots in the development (see Residential Construction Project Review on page 90).

Maintenance Warranty Period

Most, but not all, residential developments will have public improvements, including public stormwater infrastructure.

For residential developments with public improvements, a two-year maintenance warranty period will begin at completion of construction. During the maintenance warranty period, the developer will be responsible for continued maintenance of the stormwater facilities.

During the 22nd month of the maintenance warranty, a development inspector will inspect the public stormwater facilities for compliance with maintenance standards.

If the stormwater facilities are found to be in good condition and properly maintained, the development inspector will recommend release of the maintenance bond. The Development Engineering planning technician will release the bond and notify the Clean Water Program and Public Works Maintenance and Operations.

If the facility has components that fail the maintenance inspection, the planning technician and development inspector will work with the developer to obtain needed repairs. If the developer fails to make repairs, the planning technician will demand the bond from the surety company.

After repairs are made, the Clean Water Program will initiate stormwater mapping tasks, if necessary, (see Mapping the Storm Sewer Infrastructure on page 12), and Public Works Maintenance and Operations will initiate maintenance and operations tasks (see Operating and Maintaining the Storm Sewer System, County Property and Roadways on page 26).

Non-Residential Development Project Review

Non-residential developments include commercial and industrial projects as well as schools, churches, and other non-residential land uses. These projects construct infrastructure such as roads and stormwater along with the buildings. Multifamily housing projects also are reviewed using this process. Occasionally, commercial projects may also go through a land division. Many aspects of non-residential development project review will not concern stormwater and are not covered in this plan. Also, many projects do not trigger stormwater requirements because they do not add or replace a sufficient amount of impervious surface; examples include cell tower placement, sign construction, and building façade replacement.

Pre-Application Phase

Applicants typically submit initial information and meet with a planner, engineer, and other pertinent staff in a Pre-application Conference (PAC) before submitting a

completed development application. The PAC will help determine options and tentative requirements for stormwater control, among many other regulations and requirements.

Preliminary Site Plan and Preliminary Engineering Phase

To begin the process, the applicant submits an application for preliminary site review to the Permit Center along with a preliminary stormwater plan in accordance with chapter 3.2 of the *Clark County Stormwater Manual*.

The assigned Development Engineering engineer will review the preliminary stormwater plan to evaluate whether the proposal for stormwater controls is feasible given the available information on existing site conditions and constraints. The engineer's Findings and Conditions of Approval will appear in the Staff Report and Decision (or Land Use Hearing Examiner Decision), which will be forwarded to the applicant.

Findings describe the engineer's determination of whether or not each aspect of the stormwater proposal meets county code. Conditions of Approval list the engineer's requirements for how to meet code, in cases where the proposal does not meet it, and they must be met in the final engineering plan.

Under state development project vesting rules, the applicant will have several years to begin the construction process, depending on circumstances.

Final Site Plan and Final Engineering Review Phase

The applicant will submit final plans for the development, including a final stormwater plan in accordance with section 3.3 of the *Clark County Stormwater Manual*. The final stormwater plan will provide final engineering design and construction drawings for the stormwater aspects of the proposed project and a construction Stormwater Pollution Prevention Plan (SWPPP).

The assigned Development Review engineer will:

- Ensure that the Conditions of Approval from the Final Decision have been met.
- Verify that applicable NPDES permit and county code minimum requirements have been met.
- Review engineering calculations of stormwater flows, sizing of flow control facilities, and sizing of conveyances.
- Verify adequacy of erosion control BMPs.
- Perform any other engineering review required for stormwater.

Responsible officials from Public Works, Community Development, and Public Health will sign the final plans. The Development Engineering manager will make the final approval. The approved plans are returned to the applicant.

Development Engineering will open a development inspection case in *Tidemark* in preparation for the next phase of the process.

Building Permit Review

The applicant will submit building permit applications to Permit Services. Construction of structures will be concurrent with construction of the development; therefore, most stormwater review will have already occurred.

The building permit must be issued before construction of structures may begin.

Development Inspection Phase

During development inspection, the applicant will construct the development's infrastructure, including grading, roads, and stormwater controls. The project's buildings are also erected during this phase.

The process begins when the applicant submits the final construction plans and application for development inspection.

The assigned Public Works development inspector will hold a Preconstruction Conference with the applicant. The inspector will review erosion control requirements with the applicant, including



requirements related to a high potential for sediment to be discharged from the site and will receive the name of the Certified Erosion Control and Sediment Lead worker (CECSL) for the site. Department of Ecology state construction stormwater permit enforcement staff are also invited to each Preconstruction Conference. The inspector will reiterate storm system requirements and additional inspection-related policies for storm system installation. After the conference, the development inspector will give approval to begin constructing the project.

During construction, the development inspector will inspect the site as needed to ensure that erosion control measures are operational and protective. If necessary, a code enforcement officer will be called to enforce erosion control measures. If the project has a state-issued NPDES construction permit, then violations may be referred to Ecology.

The inspector also will ensure that stormwater facilities are constructed as designed.

At the end of construction, the inspector will verify that the facility was built as shown on approved design plans. The applicant will submit record drawings and, if applicable, a maintenance bond for any public improvements in the right-of-way. A Public Works engineer will review the record drawings for accuracy before approving it. After approval of the completed facilities and record drawings, a Development Engineering planning technician will accept the maintenance bond.

When a record drawing is received, Development Engineering staff will give an electronic file to Environmental Services and send the Mylar plan to the state archives.

The planning technician will issue the notice of completion of construction to the applicant and copy it to several county agencies, including the Clean Water Program. The notice signals the start of the maintenance warranty period, if applicable.

Receipt of the completion of construction by the Clean Water Program will initiate some stormwater mapping tasks for projects with either public or private stormwater facilities (see Mapping the Storm Sewer Infrastructure on page 12).

Maintenance Warranty Period

The maintenance warranty period is relevant for those few non-residential developments that have public stormwater infrastructure in public right-of-way. However, with increasing use of LID BMPs such as bioretention facilities in county right-of-way, they will become more common.

A two-year maintenance warranty period will begin at completion of construction. During the period, the developer will be responsible for continued maintenance of the stormwater facilities.

During the 22nd month of the warranty, a development inspector will inspect the public stormwater facilities for compliance with maintenance standards.

If the stormwater facilities are found to be in good condition and properly maintained, the development inspector will authorize release of the maintenance bond and will notify the Clean Water Program and Public Works Maintenance and Operations that the bond has been released.

Receipt of the bond release notification will initiate maintenance and operations tasks, (see Operating and Maintaining the Storm Sewer System, County Property and Roadways on page 26).

If the facility has components that fail the maintenance inspection, the planning technician and development inspector will require the developer to obtain needed maintenance and repairs. If the developer fails to make repairs, the planning technician will demand the bond from the surety company.

After repairs are made, the Clean Water Program will initiate stormwater mapping tasks, if necessary, (see Mapping the Storm Sewer Infrastructure on page 12), and Public Works Maintenance and Operations will initiate maintenance and operations tasks (see Operating and Maintaining the Storm Sewer System, County Property and Roadways on page 26).

Single Lot Residential Construction Project Review

Single lot residential construction projects include construction or expansion of single-family and duplex homes and their appurtenances, such as decks, garages, and driveways, and outbuildings. Many aspects of residential construction project review will not concern stormwater and are not addressed here.

Building Permit Application Review – Stormwater

The applicant will submit a residential building permit application including a stormwater site plan showing proposed building footprint(s), erosion control measures, and on-site stormwater control BMPs to the Permit Center. Projects triggering Minimum Requirements 1-10 are referred to Development Engineering for review.

The permit technician will review the residential building permit application to verify applicability of the minimum requirements and selection and use of allowed stormwater BMPs and erosion control BMPs. They will also check for the mapped presence of steep slopes or geo-hazard areas. If they conflict with the proposed stormwater BMPs, the applicant will be required to consult a licensed geotechnical engineer to design stormwater controls.

If the residential construction site is within an existing subdivision with an approved stormwater plan that provides flow control and treatment, then the permit technician will recommend that the applicant consult the development project's engineering plans to determine stormwater requirements, such as roof drain infiltration and amended soils, for the lot. In those cases, the permit technicians also will include requirements from the recorded plat and subdivision engineering drawings and attach them as conditions on the building permit.

If the residential construction site is not part of an existing subdivision with an approved stormwater plan, then applicants will follow minimum requirements applicable to their projects. Generally, if minimum requirements 1- 5 apply, the applicant can complete the stormwater plan on his or her own. If minimum requirements 1-10 apply, the applicant will need to consult an engineer complete the stormwater plan that complies with county code and the NPDES permit requirements under an engineering review by Public Works Development Engineering.

The Permit Center will issue the building permit before construction may begin.

Construction Inspection

Before construction is allowed to begin on the site, a Building Safety Division inspector will inspect the site as part of a foundation inspection to also verify that the erosion control BMPs are properly installed and that any unusual site conditions that might lead to sediment transport off site.

All sites are required to maintain an erosion control log with an attached site plan and form that includes the required onsite stormwater management BMPS

At the end of construction, an inspector will retrieve the erosion control log and stormwater plan to place in the project file.

Public Works Project Review Projects built by the Public Works department, including roads, parks, and stormwater facilities will be reviewed under the same procedures as privately-developed non-residential projects with a few key differences.

Many Public Works projects will not require land use review, including roadways through existing right-of-way; therefore, the process will frequently begin at the final engineering review phase. Those that require land use review will begin at the preliminary site plan and preliminary engineering phase (above).

Additionally, the development inspection phase is replaced by a construction management phase. Public Works will use its own construction inspectors to oversee the construction of the project to ensure that it is built as designed and bid. Enforcement of erosion control and other measures is through contract management.

Before completion of a project, the construction engineer will invite stakeholders, including the Public Works Maintenance and Operations water quality crew chief, to a walk-through of the new roadways and/or facilities. The construction manager also will copy the Clean Water Program and the Public Works Operations and Maintenance program on the letters of physical completion and final acceptance of the project.

At the final acceptance, Public Works will develop a record drawing according to its *As-Built Plan Preparation Policy*, dated May 7, 2009.

Outputs

General outputs:

- Stormwater site plans that meet county standards
- Construction site management that controls excessive runoff and sediment
- Completed projects include stormwater facilities meeting county standards
- Assigned ownership and maintenance responsibility for stormwater control facilities

- Record drawings are completed
- Completed project notifications to programs

Residential Development Project Review Outputs

- Final Decision denying, approving, or approving with conditions the proposed development project
- Technical Information Report
- Approved final construction plan
- SWPPP
- Record drawings
- Approved final plat
- Notice of completion of construction
- Maintenance bond release letter, if applicable

Non-Residential Development Project Review Outputs

- Final Decision denying, approving, or approving with conditions the proposed development project
- Technical Information Report
- Approved Final Site Plan
- Approved final construction plan
- SWPPP
- Record drawings
- Erosion control log
- Building plan
- Notice of completion of construction
- Maintenance bond release letter, if applicable

Residential Construction Project Review Outputs

- Building Permit including plot plan with stormwater requirements
- Erosion control plan
- Erosion control log
- Building Plans

Public Works Project Review Outputs

- Technical Information Report
- Approved final construction plan
- Record drawings
- Completion of Construction notice
- Physical Completion letter
- Final Acceptance letter

CODE AND MANUAL REVISIONS

Updates to Implement the 2012 SWMWW

The 2013-2018 NPDES permit requirement S5.C.5.a. requires Clark County to update its development code and stormwater manuals to be equivalent to minimum requirements in

Appendix 1 of the permit and the design standards of the *2012 Stormwater Management Manual for Western Washington*. Draft code and manuals must be submitted to Ecology for review by July 1, 2014, with final adoption by June 30, 2015.

To meet these deadlines, Clark County began a [project](#) early in 2013 to update the code and create a *Clark County Stormwater Manual* based on the Ecology 2012 SWMMWW and existing county manual elements. In 2014, Clark County will complete internal and external stakeholder review of preliminary code and Clark County Stormwater Manual. The preliminary code and manual language will be finalized as a draft code and manual for public review in April 2014. After review of public comments, the draft code and manual will be submitted to Ecology approval.

Outputs

- Draft Stormwater and Erosion Control Chapter 40.386
- Draft *Clark County Stormwater Manual* to meet all relevant NPDES permit code and manual requirements

Adopt LID Standards and Associated Code Changes

The 2013-2018 NPDES permit requirement S5.C.5.b. requires Clark County to make code and standards revisions that make LID the preferred and commonly used approach to site

development. This is primarily a code and standards to minimize creation of impervious surfaces, minimize the loss of native vegetation, and other methods to reduce stormwater runoff. Stormwater LID BMPs themselves are included in the 2012 SWMMWW. The code and process revisions must be completed and adopted June 30, 2015. To meet these deadlines, Clark County will begin in early 2013 a project to update the code and standards during, which included a review of county development code and policies for barriers to LID. The review is summarized in a table of potential barriers and suggested code revisions and comprehensive plan revisions.

During 2014, county staff will draft code revisions to Title 40 Clark County Unified Development Code.

Outputs

- Draft revisions to Title 40 Clark County Unified Development Code

WATERSHED-SCALE STORMWATER PLANNING

Adopt LID Standards and Associated Code Changes

The 2013-2018 NPDES permit requirement S5.C.5.c. requires Clark County to select a basin and complete a watershed-scale stormwater plan following permit prescribed steps. The final report must be submitted to Ecology by October 1, 2016, with a scope of work submitted by April 1, 2014. In order to meet the permit submittal deadlines, Clark County began development of a scope of work in spring of 2013.

During 2014, Clark County will submit a scope of work and schedule to Ecology to approve.

Other watershed-scale planning activities will include:

- Collecting stream flow data
- Collecting rainfall data
- Collecting additional water quality and benthic macroinvertebrate data
- Evaluating existing watershed conditions
- Assembling data and existing hydrologic models
- Beginning hydrologic and water quality model calibration
- Completing other specific elements of the Ecology-approved scope of work

Outputs

- Scope and schedule submittal to Ecology
- Stream gauges construction and operation
- Workspace and existing data reports
- Draft hydrologic and water quality models

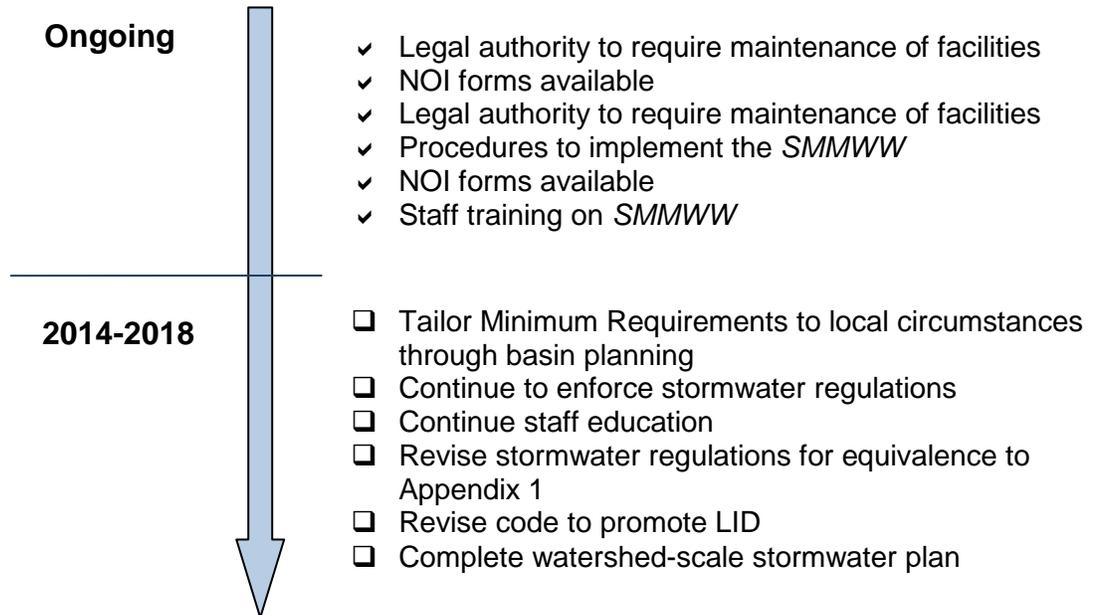
STORMWATER BASIN PLANNING

The county's NPDES Permit allows certain requirements for controlling runoff on development sites to be tailored to local circumstances through the use of basin plans or other similar water quality and quantity plans. The alternate requirements must provide equal or similar protection of receiving waters and equal or similar levels of pollutant control as compared to Appendix 1 of the permit, which defines minimum requirements.

Currently two basin plans are under review by Ecology for inclusion in the June 2014 draft Clark County Stormwater Manual as alternative flow control standards under Minimum Requirement #7.

The technical analysis process is discussed in more detail in Chapter 3.

TIMELINE



FOR MORE INFORMATION ON HOW DEVELOPMENT,
REDEVELOPMENT, AND CONSTRUCTION SITES ARE
REGULATED FOR STORMWATER AND EROSION CONTROL

RON WIERENGA, CLEAN WATER PROGRAM MANAGER, 397-2121, x 4264

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Section 6

Public Involvement, Education and Outreach about Stormwater and the Stormwater Management Program



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Clark County provides ongoing opportunities for the public to review and comment on the stormwater management program through various mechanisms. Public input is one way to tailor policy within the guidelines of the NPDES Permit. The county also offers numerous stormwater education opportunities for the public. The education program is aimed at various audiences and is designed to help raise awareness to reduce or eliminate behaviors and practices that cause or contribute to adverse stormwater impacts.

PUBLIC INFORMATION, INVOLVEMENT AND PARTICIPATION

REGULATORY REQUIREMENTS SUMMARY

NPDES Permit S5.C.4 - Public Involvement and Participation

The NPDES Permit requires the county to provide ongoing opportunities for public involvement in the stormwater management program development and implementation. The public must have opportunities to participate in the development, implementation and update of the SWMP and the county must consider public comments on it. The Stormwater Management Program Plan, annual report and other submittals required by the permit must be posted on the Web.

COUNTY POLICIES, RULES AND REGULATIONS

Clark County Code Chapter 13.30A

County Code [Chapter 13.30A.040](#) defines the role of the Clark County Clean Water Commission (CWC), a citizen commission formed to advise the Board of Clark County Commissioners (BOCC). The CWC will advise the BOCC on the focus of the SWMP, the effectiveness of the SWMP, program service levels, financing, and policies on surface and stormwater issues.

PUBLIC INFORMATION

Purpose

The Clean Water Program provides information to the public about the stormwater management program to publicize the program's services to rate payers and keep the community abreast of current stormwater management issues.

Environmental Services » Stormwater

CLARK COUNTY Environmental Services

Stormwater

As residents of the rainy Pacific Northwest, we might assume that clean, fresh water will always be ours for the asking. But pollution, urbanization and other population pressures challenge this assumption.

Clark County administers the Clean Water Program to safeguard the quality of our water and comply with the federal Clean Water Act. The program's primary activities include stormwater capital improvements, water quality monitoring, public education and outreach, regulations and enforcement and stormwater maintenance. As the county's population continues to increase, the Clean Water Program is committed to keeping our waterways clean for people, fish and wildlife.

Clean water fee
Fee rates and payment due dates

Clean water projects
Current and recently completed projects developed to collect and treat polluted storm runoff

Salmon and steelhead protection
County efforts to protect the declining salmon and steelhead population

Stormwater facility maintenance
Maintenance standards for public and private stormwater facilities

Stormwater management
Stormwater plan, code and manual update process and Clean Water Commission meeting notes

What you can do for clean water
Programs and resources to help improve our clean water habits and our community's water resources.

To report spills, dumping into surface water or storm drains, and illicit sewer and waste water connections to the stormwater drainage system, call Washington Department of Ecology 24-hour Surface Water Quality and Spill Complaint line: (800) 258-5990.

Micro-blogs

- Stormwater manual TWC and SAC meetings coming in January and February 2014.
- NPDES Municipal Stormwater Newsletter - December 2013 (PDF)
- NPDES Stormwater Update - Frequently asked questions (PDF)
- Need to find LID features in our community? Visit our updated map!

Related information

- NPDES Municipal Stormwater Code and Design Manual Update Project - 2013-2014 (PDF)
- Long-Term Index Site Monitoring Summary 2002-2011 (PDF)
- Clean Water Commission
- Drinking and well water
- Low impact development - Stormwater partners
- Low impact development resources - Dept. of Ecology
- Stormwater Partners
- Clark County Wetland Soil Grading (2010) (PDF)
- Clark County Version of the Western Washington Hydrology Model (2010) (PDF 13 MB)

Find it
Having trouble finding what you are looking for?

- Contact us on the phone

Responsibilities Matrix

| Task | DES CWP Manager | DES Sustainability & Outreach Manager | DES Outreach Project Coordinator | PW Public Information Officer | DES CWP Professional Staff |
|----------------------------|-----------------|---------------------------------------|----------------------------------|-------------------------------|----------------------------|
| Provide content | A | I | I | S | P |
| Write / design eNewsletter | S | A | P | S | S |
| Manage CWP mailing list | O | A | P | O | O |
| Web updates | I | A | P | O | S |
| Write media releases | S | A | P | S | S |

A = Accountable, **P** = Primary (doer), **S** = Supports, **C** = Consulted, **I** = Informed, **O** = Omitted

e-Newsletter

Clark County Environmental Services Clean Water Program publishes an e-Newsletter to distribute information about current NPDES stormwater code and manual updates. The current distribution is about 300 email addresses, including local businesses, school districts, non-profit organizations and individual citizens. During the update process, the e-Newsletter is distributed monthly and posted on the stormwater web page.

Clean Water Program Web Site

The Clean Water Program Web site offers an opportunity for the public to review many program activities, services and documents, as well as receive educational messages about stormwater. The website address is: www.clark.wa.gov/stormwater. The Web site was updated in 2013 to the new county web format focusing on services provided, and as new products, services and changes in program activities occur. The new format archived older technological reports and focuses on current programs, information and activities.

Media Releases

The Clean Water Program releases information on various topics to the media to publicize noteworthy events. The Environmental Services director or Clean Water Program manager will call for a media release. The program coordinator will write the release with the support of the Public Works Department public information officer and the Clark County Public Information Office. Releases will be distributed to the media by the Clark County Public Information Office.

Outputs

- E-Newsletter
- Content on CWP Web site
- Media releases

PUBLIC INVOLVEMENT AND PARTICIPATION

Purpose

The purpose of involving the public in the SWMP is to make an effort to tailor the program, while considering the prescriptive nature of the permit, to the local community's priorities. Public feedback about program effectiveness and the public's needs also helps the Board of Clark County Commissioners set policies for stormwater management.

Responsibilities Matrix

| Task | BOCC | DES CWP Manager | DES CWP Program Coord. | DES CWP NPDES Permit Manager | DES CWP Office Assistant | DES CWP Staff | DES Enhanc. & Permitting Manager | DES Enviro. Permitting Coord. | |
|--|-------|-----------------|--|------------------------------|--------------------------|---------------|----------------------------------|-------------------------------|---|
| Appoint Clean Water Commission | A / P | I | I | I | I | I | O | O | |
| CWC liaison | C | A | P | S | S | S | O | O | |
| CWC secretary | O | A | S | O | P | O | O | O | |
| Respond to SWMP public comments | I | A | S | P | I | I | O | O | |
| Respond to SEPA comments for stormwater capital projects | I | I | O | O | O | S | A | P | |
| Community presentations | I | A | P | S | S | S | O | O | |
| Other code update coordination | I | A | responsibilities assigned as needed | | | | | O | O |
| Customer service adaptive management | I | A | any CWP staff may be primary in his/her area | | | | | O | O |

A = Accountable, P = Primary (doer), S = Supports, C = Consulted, I = Informed, O = Omitted

Clean Water Commission

The Clean Water Commission ([CWC](#)) is a nine-member advisory panel appointed by the Board of Clark County Commissioners. It provides a forum for public participation in the stormwater management program and also informs the BOCC about stormwater topics and policy recommendations.

Staff Support

Clean Water Program staff support the CWC in a variety of ways. A program coordinator is the primary staff liaison to the CWC. The liaison will attend most meetings and provide minimal facilitation when required and respond to requests for information from CWC members.

The Clean Water Program office assistant will attend each meeting to take notes and distribute meeting materials. The Clean Water Commission Web pages will be updated with current commission member information and terms, meeting summary notes and meeting audio files.

Other staff members may attend meetings, as required, to present updates on program activities or documents.

Member Appointments

Openings on the CWC will be listed in local newspapers by the BOCC. Interested applicants, including incumbents seeking another term, must submit a letter of interest and a resume to the BOCC, which will conduct interviews and select a candidate to fill the position.

Public Meetings

The Clean Water Commission will hold six public meetings each year, every other month starting in January. Meetings are held on the first Wednesday of the month at 6:30 p.m. usually in the Public Service Center (1300 Franklin St.) in downtown Vancouver, Washington.

Discussion topics will include updates from staff on the stormwater management program and updates from staff on other Clean Water Program functions, such as surface water / stormwater monitoring, capital project planning, and regulatory changes.

At meetings, the CWC will review and discuss major stormwater policy recommendations. All meetings will be documented with a meeting summary (.pdf file) and an audio recording. The meeting documentation will be available on the Clean Water Commission [web page](#).

The Commission will hear public comment both prior to and following the discussion.

Communications with the Board of Clark County Commissioners

Annual Meeting

Annually, the Clean Water Commission will request a meeting with the Board of County Commissioners (BOCC) in a public meeting to present a review of the effectiveness of the Clean Water Program and to discuss other stormwater topics or concerns. The CWC will present an annual report at this meeting.

Other Communications

The Clean Water Commission may elect to communicate with the BOCC at any time via letter, memorandum, or during scheduled public comment periods at BOCC Work Sessions and Hearings.

Stormwater Management Plan Review and Input

Clark County will offer its *Stormwater Management Plan* each year on the Clean Water Program Web site for review and comment by the public at

www.clark.wa.gov/environment/stormwater/management/plan.html.

The Clean Water Program manager or a designee will respond to comments.

Stormwater Capital Projects SEPA

As the Clean Water Program builds stormwater capital projects (see County Stormwater Capital Projects on page 62), each project will be subject to public review and comment under the

Washington State Environmental Policy Act (SEPA).

The DES Environmental Permitting coordinator assigned to the project will write and distribute to stakeholders a Determination of Significance or a Determination of Non-Significance. The required public comment period will be held. The coordinator will respond to any comments received, and, if warranted, require changes to the project's design.

Each capital project may also include a package of outreach materials to inform potentially impact citizens and stakeholders of the project. Typical products include a "Head's Up" notice to citizens in the immediate project area, a detailed project letter to adjacent property owners (describing project timeline and potential impacts), a project sign at the construction site, and informational fliers. Materials may also be posted on the CWP stormwater capital project web page.

Community Presentations

As requested, Clean Water Program staff will provide information on the program's activities

to community and civic groups, at times in concert with the Clean Water Commission, to distribute information about the stormwater management program and get feedback on community priorities.

Code Updates

Code revisions for water quality, stormwater and erosion control, and the Clean Water Fee

regulations require extensive public outreach, review and comment, which will be coordinated by the Clean Water Program. The code update process will include significant public involvement to consult and inform the community and stakeholders.

Per the 2013-2018 NPDES Municipal Stormwater Permit, a public outreach plan was developed to inform the public about stormwater code and manual updates. The plan describes outreach efforts via several venues, including: a Technical Advisory Committee (meets every 6 weeks); a Stakeholder Advisory Committee (meets every

two months); monthly e-newsletters; web page updates and special media releases for special communications.

Customer Service / Adaptive Management

The Clean Water Program and its designees maintain regular contact with the public through daily programmatic activities such as customer service for the Clean Water Fee, source control inspections (section 4), inspections of regulated stormwater control facilities at businesses and subdivisions (section 3), response to information requests, and complaint response. Staff receives feedback during these contacts and frequently incorporates suggestions into their daily procedures and processes.

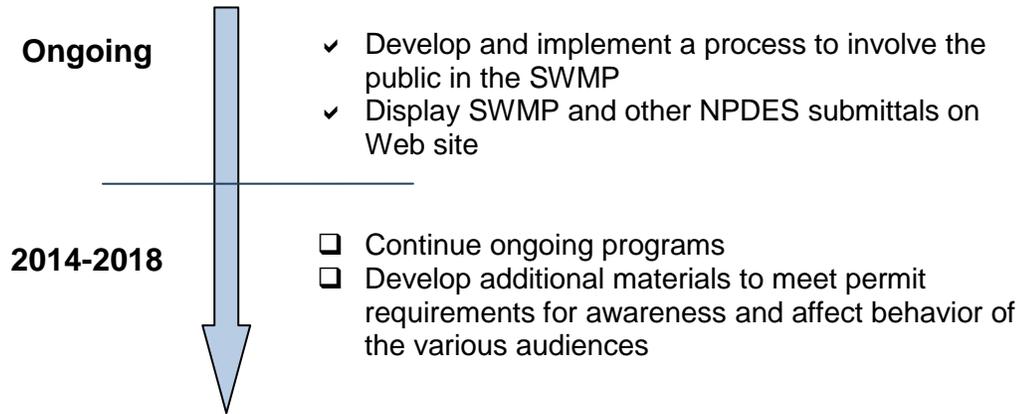
For example, as a result of public feedback, the Clean Water Program initiated a program to educate residential subdivision Homeowners' Associations about proper maintenance of their stormwater facilities

<http://www.stormwaterpartners.com/maintenance/index.html>.

Outputs

- Bi-monthly Clean Water Commission notes including public comments
- Clean Water Commission Annual Report to the Board of Clark County Commissioners
- Log of public comments on the Stormwater Management Program
- Log of public comments from community presentations
- SEPA file for each stormwater capital project
- Public testimony transcripts from code update Hearings
- Record of public input for code updates
- Media releases
- E-Newsletters
- Web content

TIMELINE



FOR MORE INFORMATION ON THE COUNTY'S EFFORTS TO
INFORM AND INVOLVE THE PUBLIC IN THE STORMWATER
MANAGEMENT PROGRAM

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EDUCATION AND OUTREACH PROGRAM

REGULATORY REQUIREMENTS SUMMARY

| | |
|--|--|
| <u>NPDES Permit S5.C.10 - Education and Outreach Program</u> | The NPDES Permit requires the county to have an educational program aimed at various audiences to build general awareness and effect behavior change to help reduce or eliminate pollution in runoff. The Clean Water Program will provide stewardship opportunities to encourage residents to participate in stormwater related activities. |
|--|--|

COUNTY POLICIES, RULES AND REGULATIONS

| | |
|---|---|
| <u>Clark County Code Chapter 13.26A</u> | County Code Section 13.26A.005 describes the use of education and technical assistance to business owners and the general public as a primary means of implementing a successful pollution source control and prevention program. |
|---|---|

| | |
|---|--|
| <u>Clark County Code Chapter 13.30A</u> | Section 13.30A.050(D) states that “many of the difficulties in managing of surface and stormwater problems result in part from the general lack of public knowledge about the relationship between human actions and surface and stormwater management. In order to achieve a comprehensive approach to surface and stormwater management, the county should provide general information to the public about land use and human activities that affect surface and stormwater management.” |
|---|--|

EDUCATION FOR THE GENERAL PUBLIC

| | |
|----------------|--|
| <u>Purpose</u> | The goal of the stormwater education and outreach program is to reduce or eliminate behaviors and practices that adversely impact stormwater runoff. The support and awareness of the general public is crucial to achieving this goal. Education for the general public will focus on the following topics: |
|----------------|--|

- Importance of clean water.
- General impacts of stormwater flows into surface waters, including watershed management.
- Impacts from impervious surfaces.
- Contributions we each make to the problem.

- Each person’s ability to help protect and improve the quality of Clark County’s water resources through source control BMPs and environmental stewardship.

Responsibilities Matrix

| Task | DES CWP Manager | DES Sustainability & Outreach Manager | DES Outreach Project Coordinator | DES AmeriCorps | Partner Agencies / Contractors |
|--|-----------------|---------------------------------------|----------------------------------|----------------|--------------------------------|
| Coordinate education programs | A | P | P | S | C |
| Track and measure deliverables | S | A | P | S | S |
| Create messages, programs and collateral | S | A | P | P | P |
| Distribute messages and collateral | C | A | P | P | P |

A = Accountable, **P** = Primary (doer), **S** = Supports, **C** = Consulted, **I** = Informed,

Regional Advertising Campaign

The Regional Coalition for Clean Rivers and Streams is a group of Portland/Vancouver metropolitan-area cities, counties, and stormwater utilities. The focus of the group is to coordinate, develop and implement a regional public awareness media campaign promoting nonpoint stormwater pollution prevention.

Clark County will continue to participate in the coalition’s regional awareness campaign through the remainder of the permit term.

Educational information is on the Web at www.cleanriversandstreams.org.

Canines for Clean Water

The Canines for Clean Water program provides information to dog owners about proper management and disposal of pet waste. The program’s [web page](#) provides educational information, directions for properly managing and disposing of pet waste, and a pledge for dog owners to pick up after their dogs.

A sustainability specialist will oversee the program, and an AmeriCorps staff will complete the majority of the tasks, including creation of collateral materials such as calendars and a coloring book.



The AmeriCorps staff will distribute flyers and posters to local veterinarians; attend local community events, including dog park openings and fairs; and give presentations to community groups.

The AmeriCorps staff will track and respond to pledges, coordinate with veterinarians, book and staff events, and generally distribute information to the public.

Neighbors for Clean Water Neighbors for Clean Water expands the Canines for Clean Water program by offering support and resources, such as yard signs and garbage can stickers, to neighborhood groups that want to start a grass-roots effort to promote pet waste pickup within their own neighborhoods.

Staff will deliver outreach material, attend neighborhood meetings and community events, distribute resources, and track participation.

Green Neighbors Program Clark County launched the Green Neighbors program in 2012. The program, which promotes sustainable practices (including stormwater) to homeowners is web-based (www.clarkgreenneighbors.org), however, will host workshops and other educational events, including information on what homeowners can do to protect minimize polluted stormwater runoff.

Web Site The Clean Water Program operates a web site at www.clark.wa.gov/stormwater, as well as specific program sites, that showcase information about stormwater pollution and prevention techniques aimed at all audiences. The site also contains information on endangered species at www.clark.wa.gov/environment/stormwater/salmon, with multiple links to additional resources on endangered species.

The Web site was redesigned in 2013 by the county’s Public Information and Outreach office and updated primarily by the DES Clean Water Program staff.

Publications and Displays Environmental Services staff will produce displays and publications generally as a part of specific program areas, such as pet waste management, natural gardening to prevent toxic runoff, pollution prevention techniques, and others.

Many displays and publications have already been produced. Staff will continue to display and distribute them at community events, targeted environmental events, Clean Water Program presentations, Clean Water Commission meetings, and other targeted community events.

Outreach Events Environmental Services sustainability specialists staff informational booths at a variety of community events, such as the Clark County Fair and the annual Home and Garden Idea Fair. Outreach includes information about water quality, the effects of stormwater pollution and pollution prevention.

Environmental Services partners with Clark County Community Development to use the “Planet Clark” trailer containing environmental displays, including a stormwater

display, for educational outreach. The trailer is set up at numerous community events each year.

For several years, Environmental Services offers a “Do It Yourself” Fair, promoting sustainable practices for homeowners, including installing pervious pavers and rain gardens. The event is planned to be an annual event.

In 2013, Environmental Services hosted the new “Making Every Day Earth Day Awards” to recognize local citizens and organizations who work to protect the environment.

Outputs

- www.cleanriversandstreams.org, and www.cleanwaterdogs.com
- Public contacts at events
- Workshops
- Fact sheets
- Pledges to pick up pet waste
- Collateral materials such as calendars, stickers, magnets, etc.

EDUCATION FOR BUSINESSES

Purpose

Education for businesses helps meet county goals for assisting commercial, industrial, and governmental enterprises in preventing contribution of pollutants to stormwater runoff or to receiving waters. Outreach and assistance will focus on:

- General stormwater issues
- Information about illicit discharges
- Preventing and controlling the discharge of contaminants through proper use of BMPs
- Equipment maintenance.

Responsibilities

Most activities for this requirement are conducted concurrently or in association with procedures described elsewhere in the SWMP. Responsibilities are described in their respective sections.

Clark County Green Business Program

Clark County’s Green Business Program (www.clarkgreenbiz.com) recognizes and promotes local businesses that document “green” practices, including stormwater BMPs. The program currently supports over 30 local businesses that have completed sustainability assessments and have met the requirements to be a local Green Business.

Technical assistance visits and education to promote proper handling and disposal of toxic and hazardous materials and stormwater BMPs is an integral part of the program.

Outputs

- www.clarkgreenbiz.com
- Other outputs listed in relevant sections

EDUCATION FOR HOMEOWNERS, LANDSCAPERS AND PROPERTY MANAGERS

Purpose

Homeowners, landscapers and property managers are caretakers for a large percentage of the county’s impervious surfaces, such as roofs and driveways, as well as lawn and landscaped areas that may contribute pollutants to runoff. Education messages will focus on the following topics:

- Impacts of stormwater on surface waters.
- Rural property management techniques.
- Yard care techniques.
- Proper storage and use of pesticides, fertilizers, and other chemicals.
- Proper maintenance of stormwater treatment and flow control facilities.
- Low Impact Development principles and practices.
- Proper maintenance of vehicles, equipment and home/buildings.
- Proper techniques for carpet cleaning and auto repair.

Responsibilities Matrix

| Task | DES CWP Manager | DES Sustainability & Outreach Manager | DES Outreach Project Coordinator | DES AmeriCorps | Agencies Providing Services |
|--|-----------------|---------------------------------------|----------------------------------|----------------|-----------------------------|
| Coordinate education programs | A | P | P | S | C |
| Track and measure deliverables | S | A | P | S | S |
| Create messages, programs and collateral | S | A | P | P | P |
| Distribute messages and collateral | C | A | P | P | P |
| A = Accountable, P = Primary (doer), S = Supports, C = Consulted, I = Informed, O = Omitted | | | | | |

Small Acreage Education Program

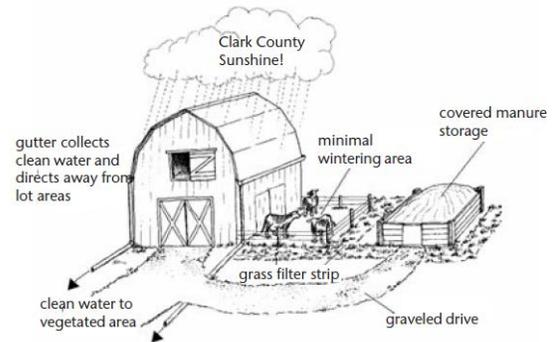
The Small Acreage program, funded by the Clean Water Program in partnership with WSU Clark County Extension, provides educational workshops and other outreach to residents on

water quality topics unique to rural properties.

The goal of the Small Acreage (SA) program is to reduce pollution entering storm and surface water coming from residential and agricultural properties by giving residents the knowledge and skills necessary to manage their land and animals in a way that will help keep water clean.

WSU Clark County Extension will provide one full-time program coordinator and oversight by the Extension director. The coordinator will facilitate workshops, training sessions, and follow-up activities. The coordinator also will attend community events to recruit new trainees.

The DES education and outreach program coordinator will track deliverables of the program and negotiate the annual scope of work with the Extension director. Extension will submit quarterly and annual reports detailing deliverables.



Workshops

The Small Acreage program offers workshops throughout the year on issues of interest to rural landowners. Topics include mud and manure management, pasture management, wells and septic maintenance, and fencing for livestock.

The SA program coordinator will coordinate and give most presentations.

Living on the Land: Stewardship for Small Acreages

For those landowners who seek more in-depth information, the program offers a 12-week training series twice a year. During training, each participant creates a workable plan for his or her property using knowledge gained in class.

The SA program coordinator will coordinate each training and follow-up activities.

The SA program coordinator will offer “Model Farm” recognition signage to graduates who implement a plan to protect water quality on their properties.

Targeted Outreach for Landscapers (or Workshops and Presentations)

Department of Public Works, and the Washington States departments of Agriculture and Labor & Industries.

Clark County participates in the Local Interagency Networking Cooperative (LINC), an education and outreach partnership between Clark County departments of Environmental Services and Public Health, City of Vancouver

Regulated Facility Maintenance Inspections

Clark County combines site visits for regulated stormwater facility maintenance inspection with delivery of technical assistance materials such as relevant pages from the *Stormwater Facility*

Maintenance Manual. Please see Operating and Maintaining the Storm Sewer System, County Property, and Roadways on page 26 for a complete description of the process.

Stormwater Facility Assistance & Stormwater Partners

Clark County continues to partner with municipalities within the county in the Stormwater Partners of SW Washington, a program to provide common stormwater

messages and education and guidance to the public on how to properly maintain privately-owned stormwater treatment and flow control facilities.

The Stormwater Partners Web site (www.stormwaterpartners.com) contains a how-to video and a user-friendly guidebook, as well as traditional outreach materials, such as brochures, door hangers, and newsletters.

In 2013, the education and outreach coordinator will complete deliverables on a grant from Ecology to provide outreach on Low Impact Development. Grant deliverables include technical assistance visits to homeowners interested in implementing LID practices on their property; technical training for staff and local professionals; and a guidebook to local LID projects and features.

Detention Pond

A stormwater detention pond is an open basin built by excavating below existing ground or by constructing above-ground basins (reticulated). The detention pond temporarily stores stormwater runoff during rain events and slowly releases it through an outlet (control structure). Detention ponds are typically designed to completely drain within 24 hours after the completion of a storm event. They are very green from well-maintained to natural appearing. Generally, more natural appearing vegetation is preferred for reduced maintenance and enhanced wildlife habitat. Some facilities are designed to appear as natural water bodies or are in park-like areas.

Facility objects that are typically associated with a detention pond include:

- access road or easement
- fence, gate, and water quality sign
- control structure/flow restrictor
- energy dissipaters
- debris barrier (e.g. trash rack)
- residential stormwater pipe



Stormwater Facility Maintenance Manual 3

The Clean Water Program education and outreach coordinator will continue to work with the Stormwater Partners to develop and implement additional activities.

Low Impact Development Training (LID)

Clark County staff received a grant from the State of Washington to develop education

materials and training for Low Impact Development. A Tour Book of LID sites in Clark County was produced in hard copy as well as a Google map on the Stormwater Partners web page.

A complimentary two-day training workshop was hosted in June 2013. The training targeted professional stormwater planners and designers and covered detailed aspects of LID techniques, including permeable pavers, site design and operations/maintenance. The sessions were attended by over 75 local professionals.

Related Activities

Other Environmental Services programs distribute information about water quality, the effects of stormwater pollution, and pollution prevention techniques as integral parts of their program outreach and education messages to the general public.

- Naturally Beautiful Backyards curriculum delivered through a contract with WSU Clark County Extension's Master Gardeners program - less toxic gardening and yard care
- Master Composter Recyclers - less toxic gardening and yard care
- Hazardous Waste Reduction - proper disposal of household and business hazardous wastes
- Recycling A-Z Web site at www.recyclinga-z.com – proper disposal of tires, electronics and household hazardous waste

Outputs

- Fact sheets
- Workshops
- Videos
- Landowner trainings
- Staff LID training
- LID site tour guidebook
- Collateral materials

EDUCATION FOR DEVELOPMENT AND CONSTRUCTION COMMUNITY AND COUNTY PLANNERS AND REVIEWERS

Purpose

The individuals, businesses and agencies involved in development project planning and construction (both regulated communities and the regulators) have great influence on the impacts of stormwater from new development and redevelopment. Education to these communities will focus on the following topics:

- Technical standards for stormwater site and erosion control plans.
- Low impact development techniques.
- Stormwater treatment and flow control BMPs and facilities.

Responsibilities Matrix

| Task | DES CWP Manager | DES Outreach Project Coordinator | DES Ameri Corps | DES CWP Permit Manager | DES CWP NRS | Comm. Dev. | PW Dev. Eng. |
|----------------------------------|-----------------|----------------------------------|-----------------|------------------------|-------------|------------|--------------|
| Code update outreach | A | P | O | P | O | I | S |
| Construction Management training | A | O | O | P | O | O | O |
| Facility inspection training | A | O | O | S | P | O | O |
| WWHM training | A | O | O | S | O | I | I |
| CD web site | O | O | O | O | O | A / P | C |
| Pre-application conference | O | O | O | O | O | A / P | P |
| Small Projects BMP handout | A | S | S | S | O | P | O |
| DEAB | I | O | O | O | O | I | P |

A = Accountable, **P** = Primary (doer), **S** = Supports, **C** = Consulted, **I** = Informed, **O** = Omitted

Workshops and Presentations

Stormwater Facility Inspection Training

Public Works Construction Management has an ongoing stormwater facility inspection program. Training will be provided to new inspectors or when there is a change in procedures or manual requirements.

Training on Demand

Clean Water Program staff will provide training, code interpretation, BMP manual interpretation and informational materials to technical, professional and field workers as requested.

Education Delivered Through Development Review

Many active development community stakeholders receive educational and outreach messages about stormwater and erosion control and water quality topics as an integral aspect of

the regulatory development review process, including individual residential building permits.

For detailed information on the development review process, see Regulatory Program for Development, Redevelopment, and Construction Projects on page 74.

Community Development Web Site

The Clark County department of Community Development hosts a Web site devoted to compliance with erosion control measures at

<http://www.clark.wa.gov/development/building/erosion.html>

Pre-Application Conference

All Type II and Type III development applications require the applicant to attend a pre-application conference with county planners and engineers where, among other topics, stormwater and erosion control requirements and submittal requirements are reviewed.

Clark County Stormwater Manual

The *Clark County Stormwater Manual*, which guides applicants for development and new development through stormwater requirements and submittal requirements, contains educational messages about the importance of stormwater management.

Small Project BMP Handouts for Permit Center

Clark County provides BMP packet handouts for small projects that are required to have stormwater site plans, erosion controls and on-site stormwater management BMPs but don't require an engineered design. The target audience is mainly applicants for single family residential building permits and other small building projects.

Low Impact Development (LID) Study

With a grant from the Washington Department of Commerce (formerly Community, Trade, and Economic Development) and assistance from Cascadia Region Green Building Council,

Vancouver and Clark County studied barriers to sustainable, affordable, residential development (including LID techniques) and developed strategies for removing them. The study resulted in three reports and recommendations aimed at local decision-makers.

Development Engineering Advisory Board

The Development engineering Advisory Board (DEAB) is a technical and policy review body reporting to the Board of Clark County Commissioners. The DEAB also serves as a

mechanism for coordinating with the development community and consulting engineers to distribute information and organize training.

Outputs

- Presentations
- Employee training
- Development community training
- Small Project BMP Handout
- Sustainable and affordable development reports
- Educational messages in *Clark County Stormwater Manual*

EDUCATION FOR STUDENTS

Purpose

Students are the next generation to own property, own or manage businesses, or simply live, work, and recreate in Clark County. Education for students will focus on the following topics:

- Raising awareness of the importance of clean water.
- Introducing the idea of pollutants entering water through stormwater.

Responsibilities Matrix

| Task | DES Sustainability & Outreach Manager | DES Outreach Project Coordinator | DES AmeriCorps | Agencies Providing Services |
|--|---------------------------------------|----------------------------------|----------------|-----------------------------|
| Coordinate education programs | A | P | S | C |
| Track and measure deliverables | A | P | S | S |
| Create messages, programs and collateral | A | P | P | P |
| Distribute messages and collateral | A | P | P | P |

A = Accountable, **P** = Primary (doer), **S** = Supports, **C** = Consulted, **I** = Informed, **O** = Omitted

Student Water Quality Monitoring Program

In partnership with City of Vancouver, Clark County involves K – 12th grade students in water quality monitoring of sites near their schools.

Teachers and students receive mentoring in water quality and macroinvertebrate monitoring, and conduct stream studies. Students share their findings with peers and the community at an annual Student Watershed Congress.

Program activities and outreach will be conducted primarily by City of Vancouver staff. Clark County staff will negotiate the annual scope of work and track deliverables.

County staff may participate in the Student Watershed Congress as facilitators or judges.

Washington Green Schools

Environmental Services helped launch the statewide Washington Green Schools program.

A non-profit organization now runs the program full time, with financial support from Clark County and other entities. <http://www.wagreenschools.org/>

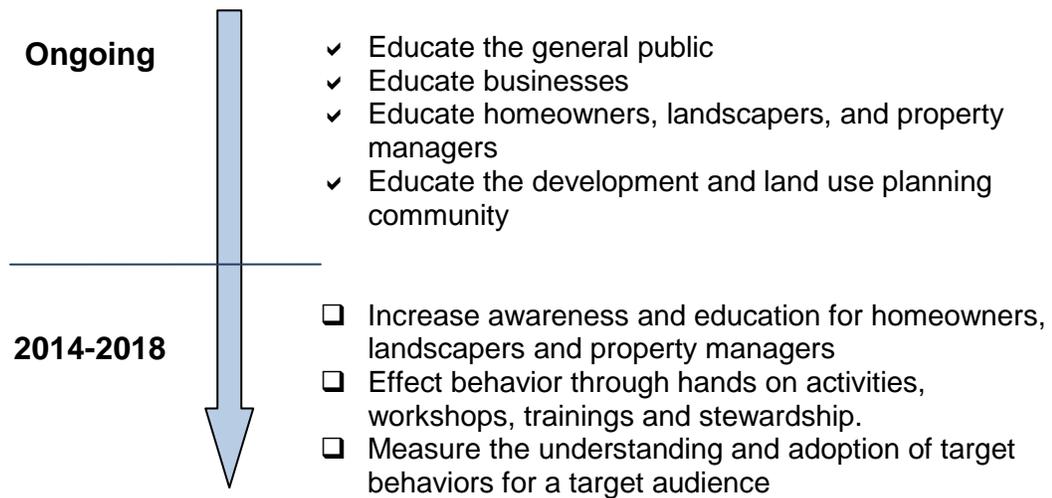
Schools complete assessments in five environmental categories, including water. More than 40 schools in Clark County currently participate in the program. A sustainability specialist serves as a resource for local participating Green Schools.

The new School Grounds Assessment developed in 2013 covers stormwater management and use on school grounds, as well as natural landscaping techniques to reduce chemical use on school grounds.

Outputs

- Student Watershed Monitoring Network and Watershed Congress
- Washington Green Schools

TIMELINE



FOR MORE INFORMATION ON PROGRAMS TO PROVIDE
EDUCATION AND OUTREACH ABOUT STORMWATER AND THE
SWMP

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Section 7 Coordination



| | |
|--|-----|
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Clark County coordinates internally and with other local governments and agencies on a variety of environmental and planning topics.

REGULATORY REQUIREMENTS SUMMARY

| | |
|---|--|
| NPDES Permit S5.C.3 – Coordination | The NPDES Permit requires the county to coordinate among its own departments and with neighboring jurisdictions to eliminate barriers to permit compliance and to encourage coordinated stormwater policies, programs and projects within a watershed. |
|---|--|

COUNTY POLICIES, RULES AND REGULATIONS

The following policies and regulations promote permit implementation by county departments.

| | |
|---|--|
| Clark County Code Chapter 13.26A – Water Quality | Chapter 13.26A requires inspection and maintenance of all public and private stormwater facilities and stormwater disposal wells in accordance with the <i>Stormwater Facility Maintenance Manual</i> , and adopts the <i>Clark County Stormwater Pollution Control Manual</i> that provides source control BMPs for materials handling, landscape management, trash management and building exterior maintenance. Both of these manuals are equivalent to maintenance standards in Volume V and source control standards in Volume IV of the <i>SMMWW</i> . |
|---|--|

Environmentally Responsible Purchasing Policy

Clark County adopted its Environmentally Responsible Purchasing Policy in 2004. One element addresses purchase of landscaping and vegetation maintenance products, including pesticides. The policy establishes a set of criteria, any of which will disqualify a pesticide from purchase. A waiver process requires further examination of the pesticide by the Environmentally Responsible Purchasing Team to determine if a more environmentally-friendly alternative exists. If no alternative is found, the pesticide can be purchased and used within specific limiting guidelines. The policy promotes a coordinated approach to the pesticide and fertilizer use reduction.

Regional Road Maintenance Program

Clark County has been a member of the ESA Regional Road Maintenance Forum since 2003. The group assisted the county in developing a Regional Road Maintenance Program that is designed to meet the requirements of the Endangered Species Act (ESA). In 2004, NOAA Fisheries approved Clark County's Regional Road Maintenance Program and determined that it was compliant with the ESA. The program seeks to protect salmon and steelhead by relying on the extensive use of pre-approved BMPs for routine maintenance activities. The program promotes systematic adherence to pollution control standards for road operations.

INTRA-GOVERNMENTAL COORDINATION

Purpose

Intra-governmental coordination helps ensure cooperation of all Clark County departments in meeting the terms of the NPDES Municipal Stormwater Permit and in protecting local water resources.

Responsibilities

Responsibility for negotiating interdepartmental and programmatic agreements lies with the Clean Water Program manager or a designee and with managers of coordinating programs and departments.

Responsibilities for implementing the agreed-upon activities are shown in detail in responsibility matrices and program descriptions in the appropriate sections.

Agreements

The Clean Water Program coordinates the county's NPDES Permit compliance efforts. Although the program coordinates with other departments, it is not responsible for all compliance actions. The Clean Water Program maintains memoranda of understanding or other agreement mechanisms with several county departments to support compliance. Agreements include services provided for payment by the CWP and description of permit requirements that must be met by departments.

Public Works Road and Parks Maintenance Division

Public Works completed an intra-departmental agreement between the Clean Water Program and the Road and Parks Maintenance Division to implement requirements under permit requirements S5.C.9, Operations and Maintenance Program, including:

- Standards and schedules for stormwater facility and catch basin maintenance.
- Practices for operating streets, roads, and highways.
- Spill response practices.
- Private facility inspection and enforcement.
- Water quality BMPs for maintaining public land.
- Training.
- Stormwater Pollution Prevention Plans (SWPPs) for heavy equipment yards.
- Record keeping.
- Reporting requirements for the NPDES Permit annual report.

Public Works Development Engineering Division

Public Works provides development review services for enforcing Clark County Code Chapter 40.385 Stormwater and Erosion Control and its predecessor, Chapter 40.380.

Public Works provides the following services:

- Review and approval of development project applications.
- Administration of development project record keeping.
- Training for staff whose primary job duties include permitting and plan review.

Public Works Engineering and Construction Division

Public Works provides services to implement permit requirements under S5.C.5, S5.C.6 and S5.C.7.

Public Works provides the following services:

- Project management for stormwater capital improvements.
- Design and construction management for stormwater capital improvements.
- Capital planning assistance.
- Development site inspection.
- Program to inspect stormwater facilities during maintenance warranty.
- Enforce stormwater, erosion control, and water quality codes.
- Inspection program record keeping.
- Regulated stormwater facility inspection and follow-up.
- Training for staff whose primary job duties include design, construction site inspection, and enforcement.

Community Development

Department of Environmental Services maintains an interdepartmental agreement with Community Development to implement requirements under permit requirement S5.C.5, including:

- Accept development applications.
- Review site plans for residential building projects that do not require engineered designs.
- Review and inspect erosion controls, on-site stormwater controls at residential building sites, primarily single-family residential construction sites.
- Enforce stormwater, erosion control, and water quality codes.
- Maintain records of applications, reviews, inspections and enforcement actions.
- Training for staff whose primary job duties include permitting and plan review.

GIS Department and Application Services

Department of Environmental Services maintains an agreement with the GIS Department for various services that support SWMP implementation, including administration of the county's storm sewer infrastructure asset database, *StormwaterClk*, the stormwater asset Maintenance Management System, stormwater fee database administration, software support, GIS data used for capital planning and monitoring studies, developing Web applications and internet access to program information, and database development.

Other Intra-governmental Coordination

The Clean Water Program also coordinates informally with other county programs and departments on various stormwater-related and environmental efforts.

General Services

The Clean Water Program provides information on BMPs and coordinates with the General Services department to aid implementation of water quality BMPs for building exterior maintenance on various county properties.

Public Health

The Clean Water Program coordinates with Clark County Public Health on spill responses, illicit discharge investigations, and other environmental complaints.

Outputs

- Interdepartmental memoranda of understanding for services and permit requirements performed

INTERGOVERNMENTAL COORDINATION

Purpose

Clark County informally coordinates with Phase II permittees and other local organizations to control pollutants between physically interconnected storm sewer systems, to attempt to provide consistent stormwater management for shared water bodies and to collaborate on permit implementation tools and TMDL implementation.

Responsibilities Matrix

| Task | DES Director | DES CWP Manager | DES NPDES Permit Manager | DES Infrastructure Manager |
|-------------------------------|--------------|-----------------|--------------------------|----------------------------|
| VLWP Steering Committee rep. | A | P | O | S |
| VLWP TAC representative | A | S | O | P |
| Provide input to TMDL DIPs | O | A | S | P |
| TMDL advisory committees rep. | O | A | S | P |
| WRIA Planning coordination | A | P | S | S |

Coordination to Clarify Roles and Responsibilities for Interconnected Systems

The Clean Water Program has identified approximately 500 connection points between the county MS4 and other municipal entities such as cities and WSDOT right of way. Within the urban area, the Clean Water Program assesses the potential for intersystem pollutant discharges using IDDE procedures.

Clark County has informal discussions with NPDES Phase II permittees regarding mapping and illicit discharge screening programs. Clark County will develop a more formal agreement during the permit term.

General Intergovernmental Coordination

Clark County participates with other local governments and agencies on several joint efforts, including:

- Shared education and outreach programs with the city of Vancouver
- A regional education program covering facility maintenance to stormwater facility owners within Vancouver, Battle Ground, Camas, Washougal, Ridgefield, and La Center

- Operation of the regional street waste decant facility with WSDOT, Vancouver, Battle Ground, Camas, and Washougal

Coordination for Shared Water Bodies: Vancouver Lake Watershed Partnership

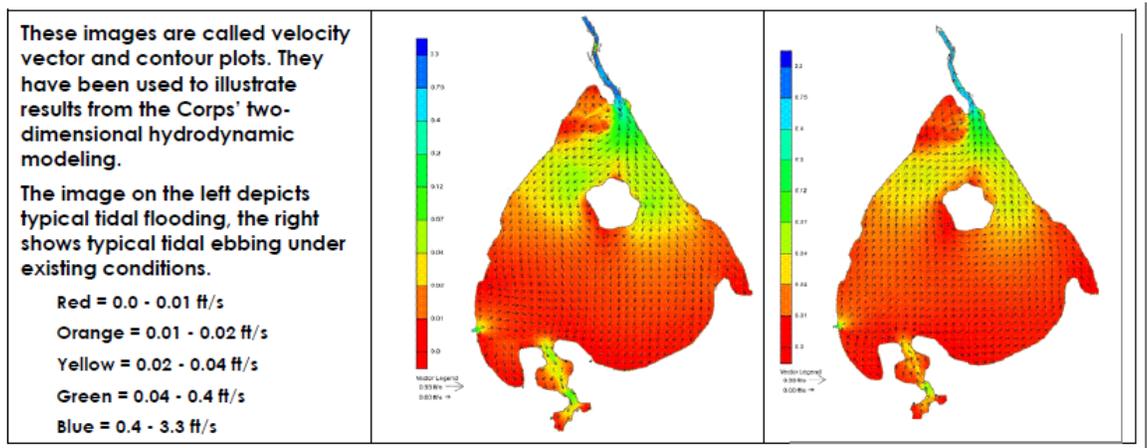
The Vancouver Lake Watershed Partnership (VLWP) was established through an intergovernmental agreement between the Port of Vancouver, the city of Vancouver, Clark County, and Vancouver-Clark Parks and Recreation.

Other participants include the Fruit Valley Neighborhood Association, the Port of Ridgefield, Clark Public Utilities, Washington Department of Fish and Wildlife, Washington Department of Natural Resources, Washington Department of Ecology, the U.S. Army Corps of Engineers, the Lower Columbia River Estuary Partnership, and nine citizen members.

The partnership was formed to consider the community vision and strategies to manage Vancouver Lake.

Clark County will continue to act as the financial manager for the partnership.

The Clean Water Program will continue to provide one representative to the Steering Committee – the Clean Water Program manager – and one representative to the Technical Advisory Committee, the Stormwater Infrastructure Manager.



Images from the Vancouver Lake Watershed Partnership 2008 Annual Report

TMDL Coordination

Clark County coordinates with other local entities on TMDL implementation. Upon request, the NPDES Permit Manager will provide input to Ecology in development and update of Detailed Implementation Plans. The Stormwater Infrastructure Manager will

continue to participate on the local advisory committees for the following existing or emerging TMDL water bodies:

- Burnt Bridge Creek Watershed
- East Fork Lewis River
- Gibbons Creek
- Salmon Creek
- Lacamas Creek

Clark County complies with TMDL requirements by implementing its Stormwater Management Program.

Water Resources Inventory Area (WRIA) Planning

The Environmental Services Policy and Planning Division Manager will coordinate with Ecology, the Lower Columbia Fish Recovery Board and local partners for WRIA plan development and

implementation for WRIA 27 and WRIA 28. Goals of the WRIA plan include improving stream habitat and low flows, which are compatible with stormwater program objectives and actions.

Outputs

- Various outputs from education and outreach programs (see section 6)
- Vancouver Lake Watershed Partnership annual reports
- Technical reports from the VLWP Technical Advisory Committee
- Reports from scientific studies commissioned by the VLWP
- Notes and summaries from each TMDL's Advisory Committee meetings
- WRIA Plan development and implementation input from Clark County

**FOR MORE INFORMATION ON WAYS THE COUNTY
COORDINATES WITH OTHER JURISDICTIONS AND PERMITTEES**

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County staff monitoring water quality at the Jones Creek stream gauge

Assessment and Monitoring



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 Monitoring Resource Center 131

Clark County is a regional leader in natural resource monitoring and assessment. The Assessment and Monitoring section implements a variety of projects to collect scientific data about stormwater, surface waters, stream corridor condition, and habitat to support and implement NPDES permit requirements.

The core goal is to provide information leading to successful on-the-ground actions that improve natural resources in Clark County. The program utilizes sound science and data collection practices to inform the county’s policy and program management decisions, and provide information vital to the success of Clark County programs.

REGULATORY REQUIREMENTS SUMMARY

| | |
|---|--|
| <p><u>NPDES Permit – S8 Monitoring</u></p> | <p>The NPDES Permit requires the county to develop and implement a monitoring program with two components: 1) characterize status and trends in stormwater runoff quantity and quality, and 2) evaluate the effectiveness stormwater treatment and hydrologic management BMPs.</p> |
| <p><u>NPDES Permit – S5.C.5 Controlling Runoff from New Development, Redevelopment and Construction Sites</u></p> | <p>The NPDES Permit allows flow control regulations for controlling runoff on development sites to be tailored to local circumstances through the use of basin plans. The alternate requirements must provide equal or similar protection of receiving waters and equal</p> |

or similar levels of pollutant control as compared to Appendix 1 of the permit.

The permit also allows alternative flow control or treatment requirements to be tailored on a local basis through the adoption of basin plans.

COUNTY POLICIES, RULES AND REGULATIONS

Clark County Code Chapter 40.385 – Stormwater and Erosion Control

Clark County regulates stormwater runoff and erosion control on development, redevelopment, and construction sites in Chapter 40.385 Stormwater and Erosion Control. The purpose of the code is to safeguard public health, safety, and welfare by protecting the quality of surface and ground waters for drinking water supply, recreation, fishing and other beneficial uses through the application of BMPs for stormwater management and erosion control. It was adopted to minimize the degradation of receiving waters from impacts attributable to stormwater runoff, thereby not precluding the preservation of future restoration of beneficial uses.

At present, the code applies flow control regulations equally across all subwatersheds in the county.

TOOLS THAT SUPPORT PERMIT COMPLIANCE

The Assessment and Monitoring section provides the tools and staffing to support completion of permit-required Watershed-Scale Stormwater Planning technical analysis and the permit's S8 stormwater monitoring requirements. These are standard procedures for collecting environmental data, database systems for storing data, quality assurance and quality control procedures, and methods to analyze and present data results.

Standard Procedures for Monitoring Activities

data.

The Clean Water Program maintains the *Standard Procedures for Monitoring Activities* for use in guiding field and laboratory work. It details the protocols and means used to generate

Water Quality Database

The *Water Quality Database* (WQDB) is a centralized repository for the Clean Water Program's water quality and benthic macroinvertebrate data. The WQDB is a SQL 2000® database with Access® interfaces for data entry and retrieval. A batch uploading tool enables rapid entry of large datasets.

The *Water Quality Database* (WQDB) is a centralized repository for the Clean Water

Capital Planning Database

The *Capital Planning Database* is an integrated data management system for tracking

information about stream problems and project opportunities from discovery through implementation. The tool is a SQL 2000® geodatabase with two interfaces: 1) an Access® interface for tracking data relating to stormwater capital projects and 2) an ArcMap® interface for photos and data relating to stream problems and project opportunities.

Hydrology Databases

Data from the county's hydrologic and stormwater monitoring sites (storm flow, stream flow and rainfall gages) is stored in an Aquarius® database.

MONITORING

STORMWATER MONITORING

Purpose Stormwater monitoring includes three projects that address an ongoing need for information about the quality of stormwater stemming from different land uses, the effectiveness of specific stormwater facilities in controlling flow and pollutants, and the ability of management activities to improve stormwater quality.

Stormwater Characterization is a multi-year project evaluating stormwater quality from one commercial and one high-density suburban residential area. The project focuses on characterizing runoff from typical land uses and describing long-term changes in pollutant loading and stormwater quality as the stormwater management program is implemented.

Best Management Practice Effectiveness Monitoring is a several-year project proposal under requirement S8.C. to evaluate one stormwater treatment BMPs and to continue an ongoing permeable paver installation monitored under the 2007 permit. As required by the permit, Clark County submitted a project proposal to Ecology in February 2014. If the proposal is approved, the county will write a study plan for Ecology's approval and treatment BMP monitoring will begin in fall 2014.

The county is also required to pay into a collective fund managed by Ecology for effectiveness studies. By electing to perform two effectiveness studies on its own the county's annual payments to Ecology will be \$43,308 and will begin in 2014 through the permit term.

Stormwater Management Program Effectiveness Monitoring is a multi-year project from the 2007-2012 permit to evaluate the impact of a targeted education program on stormwater quality and the behavior of the target audience. The project utilizes stormwater characterization project data from a residential area to quantify changes in targeted yard maintenance chemicals found in the areas in stormwater following a targeted education campaign. The project also includes surveys of the residents before and after the targeted outreach. This project will be completed in 2014.

Method Stormwater monitoring utilizes sophisticated automatic sampling equipment and technology to collect data and samples from targeted locations. The county has made a significant investment in the installation of stormwater monitoring stations, including data recorders, sensors, telemetry equipment, and water/sediment samplers that are programmed to operate during targeted storm and runoff events.

Multiple samples are collected for individual storms to create a composite of each storm. The samples are sent to an analytical lab to be tested for scores of pollutants. Continuous flow data is collected to calculate pollutant loads. Additional water and sediment samples are collected for characterization and toxicity testing during first-flush storm events.

Outputs

- Annual stormwater data reports and pollutant loads for two sites
- Completed report for targeted effectiveness study (2014)
- Project plan for status and trends monitoring (2014)
- Project plan for treatment BMP monitoring (2014)
- Updated project plan for permeable paver site monitoring (2014)
- Enter stormwater data into the Ecology EIM database (July 2013)



Crews install a weir at a treatment wetland BMP monitoring site

LONG-TERM STREAM MONITORING

Purpose Long-term stream monitoring includes three projects that address an ongoing need for information about the physico-chemical, biological, and hydrological health of Clark County streams.

Clark County suspended long-term stream monitoring in October 2013 due to funding limitations. Activities may resume in the future if funding becomes available or as requirements in future NPDES stormwater permits change.

ILLICIT DISCHARGE MONITORING

This activity is described in detail in Illicit Connections and Illicit Discharges Detection and Elimination (IDDE) on page 51.

OTHER FUNCTIONS

BASIN PLANNING AND STUDIES

Purpose Basin planning is the technical and policy process by which Ecology recommends tailoring state standards to local conditions. Under the NPDES permit, basin planning may be used to tailor minimum requirements #6 (Runoff Treatment), #7 (Flow Control), and #8 (Wetlands) in *Appendix 1 Minimum Technical Requirements for New Development and Redevelopment*. Section 4.7 Flow Control states that alternative flow control requirements may be established through watershed-scale hydrological modeling and supporting field observations.

The goal of basin planning in Clark County is to develop appropriate alternative flow control standards in selected basins that are tailored to basin-specific conditions, protective of existing and desired beneficial uses, and approvable by Ecology.

Along with basin plans, other types of studies may be employed to support an alternative standard. Recently, the city of Issaquah established an alternative flow control standard of existing land cover for areas draining to stable, low gradient streams. A field geomorphology assessment was used to support the alternative standard.

Method The development of alternative flow control standards relies on basin-wide hydrologic models, coupled with detailed hydraulic modeling and sediment transport calculations carried out at representative reaches. Technical analysis at each detailed study reach includes a geomorphic assessment, a hydrologic assessment, and a hydraulic assessment to provide an integrated understanding of the historic, current, and projected fluvial processes at work. Alternative flow control standards are then recommended based on the combined results of these analyses.

Technical analyses are submitted to Ecology for approval. Policy options are then drafted for presentation to the BOCC. Code revision or basin plan adoption may follow, at the discretion of the BOCC.

Clark County began developing an alternative flow control standard for the Mill Creek subwatershed in 2009. Fieldwork and technical analyses were completed in early 2010. The technical report and recommended alternative standards are under review by Ecology.

Clark County began a study of Curtin Creek basin land use, channel gradient, channel geomorphology and channel stability in 2012, and expects to submit an alternative flow control standard for parts of Curtin Creek basin in 2013. If approved the plans will be incorporated into the pending code and stormwater design manual updates in 2015.

Outputs during the Permit

Term

- An alternative flow control proposal for parts of Mill Creek (proposal to Ecology in 2013)
- An alternative flow control proposal for parts of Curtin Creek (proposal to Ecology in 2013)
- Reports or memorandum on policy options



Stream bed stability testing in the Mill Creek subwatershed, 2009

MONITORING RESOURCE CENTER

Purpose

The Volunteer Monitoring Resource Center lends monitoring equipment to volunteers who wish to monitor water bodies in Clark County. The program loans sampling equipment and professional-grade field meters. Staff scientists provide limited overview of how to use the equipment for their project.

Method Staff assemble, calibrate, and track equipment on loan to qualified borrowers. Citizens can visit the volunteer website for equipment checklists and resource information to support a successful project. The web page is:
clark.wa.gov/environment/stormwater/streamhealth/monitoring.html

Many of the users for this service are related to school research or neighborhood information.

Outputs during Permit Term

- Log of Monitoring Resource Center borrowers
- Log of data requests

Outcomes during Permit Term

- Equipment checkouts to individuals, agencies and groups

**FOR MORE INFORMATION ON SERVICES PROVIDED BY THE
ASSESSMENT AND MONITORING SECTION**

ROD SWANSON, CLEAN WATER PROGRAM NPDES PERMIT MANAGER, 397-2121, x4581
ROD.SWANSON@CLARK.WA.GOV

Appendix A. Stormwater Management Plan 2014 - Capital Projects List

| Program | Project Name | Project Number | Description | WQ Benefit (tons TSS red/year) | Flow Control Restoration to Historic | | | Hydrology Benefit (% red in 2-year flow) | Other Env. Benefits | Estimated Cost | Actual Cost | Project Status | Completion Year |
|------------|----------------------------------|----------------|--|--------------------------------|--------------------------------------|---------|------|--|--|----------------|-------------|----------------|-----------------|
| | | | | | Lawn | Pasture | Imp | | | | | | |
| Structural | Parkside Manor SWF Retrofit | 401890 | This project combines three undersized stormwater facilities discharging insufficiently treated stormwater to an intact headwater wetland of Whipple Creek. The project will replace three biofiltration swale/detention pond facilities with a biofiltration swale/bioretention cell and stormwater wetland. Existing detention capacity will be approximately doubled (from 2.2 to 4.5 acre-feet) and enhanced stormwater treatment will be provided for 26 acres of residential development | 0.9 | 11 | 0 | 8 | 80 | Habitat improvement and aesthetics | \$1,393,000 | \$950,088 | Complete | 2013 |
| Structural | Stones Throw SWF Repair | 403264 | Reconstruct an existing bio-swale by excavating/re-grading the facility to eliminate standing water and ensure flow of runoff to the existing detention pond. Install an underdrain. Eliminate the existing swale segment at a right angle, located on the eastside of the pond. Reconstruct the failing retaining wall on the north side of the facility. | na | na | na | na | na | na | \$261,200 | \$169,681 | Complete | 2013 |
| Structural | Thomas Wetland East | 401792 | The new stormwater facility will serve approximately 125 acres of a fully developed residential area. The project will excavate and lower the existing ditched wetland to construct a stormwater wetland pond within the south portion of the county property. The lowered ground surface will provide improved hydrology for wetland plants. The additional storage developed will reduce peak flows/volumes that would eventually discharge to Burnt Bridge Creek. The project will also provide recreational opportunities such as walking paths that will connect neighborhoods and nearby parks. | na | 9.9 | 0 | 13.1 | 68 | Improve wetland habitat and provide recreation | \$2,220,000 | na | Design | 2014 |
| Structural | Drywell Retrofits | 403731 | The project provides water quality treatment retrofits for 35 existing drywells that currently discharge untreated stormwater to vulnerable groundwater resources. | na | na | na | na | na | na | \$611,000 | na | Design | 2015 |
| Structural | Harding Farms SWF Retrofit | 401882 | Harding Farms Stormwater Facility Retrofit will improve an existing stormwater facility and expand/enhance natural wetlands adjacent to the facility through rehabilitation of wetland function and installation of improved flow control structures. The existing facility treats stormwater runoff from the 5-acre Harding Farms subdivision. Adjacent wetlands receive untreated stormwater from an additional 75 acres of residential development. A portion of that runoff will also be treated prior to discharge to the wetland area. Drainage from the project site enters Salmon Creek in a reach with impacted water quality subject to multiple 303(d) listings and active TMDLs. | 5.2 | 4 | 0 | 5 | 21 | Improve wetland habitat | \$1,161,000 | na | Design | 2016 |
| Structural | Flume Creek Riparian Acquisition | tbd | Acquire 165 acres of riparian and mature forest habitat in the lower Flume Creek watershed. | na | na | na | na | na | na | \$2,212,000 | na | Planning | 2014 |
| Structural | Schmid Riparian Acquisition | tbd | Acquire 20.65 acres of land, most of it in the floodplain of the Washougal River. | na | na | na | na | na | na | \$500,000 | na | Planning | 2014 |
| Structural | POCH Riparian Acquisition | tbd | Acquire 6.5 acres of land along Salmon Creek near 112 th Ave | na | na | na | na | na | na | \$130,000 | na | Planning | 2014 |
| Structural | Catch Basin Treatment Retrofits | tbd | Install water quality treatment retrofits for ~10 catch basins in priority areas with no existing stormwater treatment | 0.5 | na | na | na | na | na | \$320,000 | na | Design | 2014-2018 |
| Structural | UIC Water Quality Retrofits | tbd | Retrofit or decommission existing UIC wells identified as high threat to groundwater | na | na | na | na | na | na | \$250,000 | na | Planning | 2015-2018 |
| Structural | SWF Repairs >\$25K | tbd | Repair stormwater facilities with capital repair costs greater than \$25,000. | na | na | na | na | na | na | \$950,000 | na | Design | 2015-2018 |

Clark County Environmental Services

Stormwater Capital Program 2013-2018



Prepared by Clark County Environmental Services, Clean Water Program



For other formats, contact the Clark County ADA Office
Voice (360) 397-2000, **Relay** 711 or (800) 833-6388,
Fax (360) 397-6165, **E-mail** ADA@clark.wa.gov.

Introduction

Clean Water Program

The Clark County Department of Environmental Services administers the Clean Water Program to protect surface water and groundwater resources from polluted storm runoff and to coordinate compliance with state and federal water pollution laws. Primary responsibilities of this stormwater management program include planning and building stormwater control facilities, water quality monitoring of stormwater runoff and streams, public education and outreach, development and enforcement of water quality regulations, coordination with other municipalities and maintenance of the county's stormwater system.

As the county's population continues to increase, Clark County is committed to responsible stormwater management to keep our waterways clean for people, fish, and wildlife. Unfortunately, many past drainage and stormwater management practices and regulations have proven inadequate to prevent stormwater runoff impacts to streams and groundwater, and thousands of developed acres in Clark County currently contribute to problems in streams, lakes and rivers.

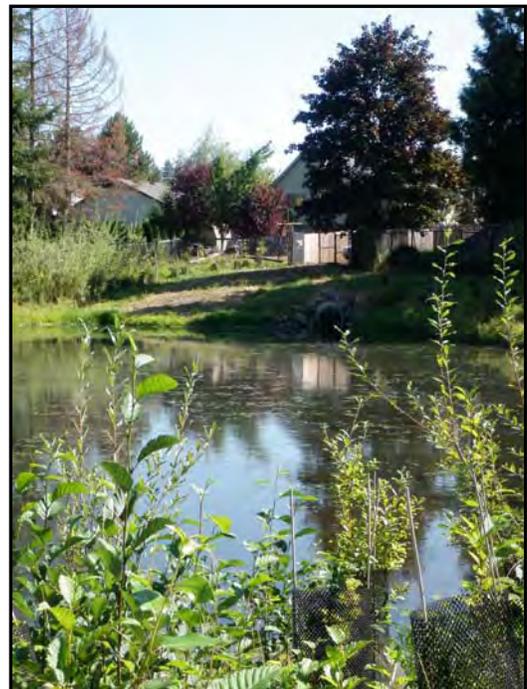
The primary means of controlling runoff from areas of new growth and for fixing problems caused by uncontrolled runoff from existing developed areas is by expanding and improving the stormwater management infrastructure.

Stormwater Impacts and Solutions

Impacts of stormwater runoff on surface water are well-documented and widespread. In Clark County, runoff contributes to impaired stream health, diminished fish populations, and degraded habitat conditions. These impacts have been observed in the *2010 Clark County Stream Health Report*, the *2010 Lower Columbia Salmon Recovery and Fish & Wildlife Subbasin Plan*, and the Washington Department of Ecology's statewide list of impaired water bodies.

Stormwater runoff impacts water bodies in two critical ways: water quality and water quantity.

Stormwater runoff from roads, fields, rooftops, parking lots, and yards carries with it a variety of pollutants deposited by everyday activities. Fertilizers, oil, grease, heavy metals, pesticides, chemicals, soil, and animal wastes all can make



their way to water bodies in stormwater runoff. These pollutants degrade stream water quality, posing risks to both human health and stream life.

Hard surfaces and cleared areas increase the amount and speed of runoff flowing into streams. The result often is streams that have too much flow during storms, and too little flow during non-storm periods. Left unchecked, this situation leads to increased erosion during storms, decreased habitat quality, and negative impacts to groundwater recharge, stream life and overall water quality.

Keeping existing stormwater facilities in good repair, updating old facilities, constructing new projects to remove pollutants or slow down runoff, planting trees, preserving intact forested or streamside habitats, and rehabilitating stream channels are ways Clark County can help limit the impacts of stormwater runoff. These activities and projects all are part of the county's Stormwater Capital Program.

Regulatory Requirements Summary

Clark County selects projects for the Stormwater Capital Program based on environmental factors as well as to meet regulatory requirements stemming from federal and state laws. The Clean Water Act's National Pollutant Discharge Elimination Systems (NPDES) municipal stormwater permit program and Washington's state water pollution laws provide regulatory objectives.

NPDES PERMIT – S5.C.6. STRUCTURAL STORMWATER CONTROLS

The NPDES Permit requires the county to have a program to construct structural stormwater controls to prevent or reduce impacts to waters of the state caused by discharges from the municipal separate storm sewer system, often referred to as the MS4. Projects include flow control facilities, water quality treatment facilities, facilities to trap sediment, retrofits of existing facilities, and property acquisition to provide water quality or flow control benefits. Other recognized means of reducing impacts include riparian habitat acquisition and restoration of forest in upland areas or in riparian buffers.

CHAPTER 173-218 WAC – UNDERGROUND INJECTION CONTROL (UIC) PROGRAM

Pursuant to Chapter 90.48 RCW, the state's requirements for stormwater infiltration wells may drive capital improvements if the county finds systems that pose a threat to groundwater quality.

NPDES PERMIT S5.C.5 – CONTROLLING RUNOFF FROM NEW DEVELOPMENT, REDEVELOPMENT AND CONSTRUCTION SITES

The NPDES Permit requires the county to have a program to prevent and control the impacts of runoff from new development, redevelopment, and construction activities. The program must apply to all development activity, including county projects such as roads and parks. The program must enforce development regulations that provide protection equivalent to the minimum requirements, thresholds, and definitions in Appendix 1 of the NPDES Phase I Municipal Stormwater permit and the design standards in the *Stormwater Management Manual for Western Washington*.

As allowed by the NPDES Phase I Municipal Stormwater Permit, Clark County elected to adopt an alternate and equally protective method of achieving the Permit's flow control requirements for development and redevelopment sites (referred to as development projects). Clark County developed an alternate approach to apply the NPDES Permit's flow control standard that utilizes both development regulations and a capital program to meet the requirement to control duration of erosive flows to historic rates.

Stormwater Capital Program Local Framework

POLICIES AND GOALS

County policies for the stormwater capital program include:

- Meet the Phase 1 Municipal Stormwater Permit requirements through stormwater capital planning and capital construction.

County goals for stormwater capital projects include:

- Protect and enhance streams and wetlands in Clark County through planning and constructing modifications to the stormwater infrastructure.
- Minimize the degradation of receiving waters from impacts attributable to stormwater runoff in existing developed areas.
- Maximize public benefits of county-owned land by providing multiple uses, including recreation, and by leveraging funding from multiple sources.
- Provide stormwater facilities for future development and redevelopment.

GUIDING PRINCIPLES

In support of county policies and goals, the capital planning process strives to:

- Prioritize projects with the greatest potential to support multiple county programs and goals, including local and regional fish recovery, habitat enhancement, and water cleanup goals.
- Ensure a reliable scientific and engineering basis for projects.

- Establish that each project in the plan is needed, feasible, and cost-effective.
- Focus limited resources on the most pressing concerns and the most cost-beneficial solutions.
- Incorporate environmental benefits into needed infrastructure repair projects.
- Maintain a sufficient list of potential projects to enable replacement of any projects that become infeasible, and to take advantage of funding opportunities.

WHAT IS IN THIS PROGRAM

The remainder of this document includes:

- A description of project types and strategies for implementation
- A description of the process used to develop the capital program
- The Six-Year Program Matrix
- A map and index of projects
- Project detail sheets

Project Types

Stormwater capital projects come in many shapes and sizes, which are grouped into seven basic types for evaluation and prioritization purposes. Projects of all types are then programmed for implementation under three general program categories described in the next section, Program Development.

CAPITAL REPAIRS

Description

Capital repair projects are stormwater facility repair projects costing more than \$25,000. Repairs of this kind are required under the county’s municipal stormwater permit; however, due to the often high costs associated with repair work, the permit does not set a time limit for completing these projects. Typical repair activities include replacing pipes and flow control structures, addressing drainage problems, and replacing retaining walls or access roads.



Strategy

Repairing and maintaining existing infrastructure is a county priority. Routine inspection of county stormwater facilities identifies repair needs. Given regulatory requirements and funding constraints, Clark County intends to address as many of the existing list of repair projects as feasible by 2018.

WATER QUALITY RETROFITS

Description

A retrofit is like a remodel. Water quality retrofits include a variety of modifications to existing stormwater infrastructure to add or enhance water quality treatment, including installation of cartridge filter systems, conversion of swales to rain gardens or wet ponds, and other improvements to stormwater facilities or conveyance systems where water quality treatment is either inadequate or can be significantly improved.

Strategy

Water quality retrofits typically qualify for the permit-required Structural Stormwater Controls program, so a significant annual investment in these projects is expected. Water quality retrofits are located primarily in areas that have been urbanized for many years, as



these areas were often developed with little or no water quality treatment and contribute disproportionately to water quality degradation. The focus is on areas with no treatment, followed by those with outdated treatment facilities.

HYDROLOGY IMPROVEMENT FACILITIES

Description

Hydrology improvement facilities address problems from too much runoff and include new facilities, retrofits focused on providing detention or retention of runoff, and structural low impact development practices aimed at reducing the volume of runoff.

Strategy

Hydrology improvement facilities are needed to meet obligations accrued under permit condition S5.C.5 and the county's Flow Restoration Program.

In addition to S5.C.5 obligations, hydrology improvement facilities may be used to meet Structural Stormwater Control requirements and often address significant stormwater runoff impacts.

Hydrology improvement facilities are focused on urbanizing areas where streams are still in the process of adjusting to development and increased runoff. In these areas, increased flow control can slow ongoing stream degradation and help promote the eventual recovery of aquatic systems.



GROWING GREEN

Description

The Growing Green Program enhances county properties with native vegetation. Intact and rehabilitated forested areas provide stormwater benefits because water evaporates from foliage, soaks into the ground, or is taken up by vegetation. These projects maximize the ecological and stormwater benefits of the properties, supporting numerous local and regional environmental goals.



Strategy

Growing Green projects provide stormwater benefits that often qualify for the Structural Stormwater Controls program, so they may be included in stormwater capital plans; however, these projects represent only a subset of the overall Growing Green program. Projects scheduled for 2013 planting are represented in this plan, along with continuing maintenance for existing projects. Placeholders are included for expected implementation levels in the remaining plan years.

Environmental Services is preparing a Growing Green Management Plan. As part of that plan, the Clean Water Program is evaluating stormwater-related priorities for planting projects on county lands. Projects and priorities from these efforts will be represented in future Stormwater Capital Programs.

UNDERGROUND INJECTION CONTROL (UIC) RETROFITS

Description

UIC Retrofit projects improve stormwater infiltration systems that are a demonstrated threat to groundwater quality. Improvements typically include the addition of upstream treatment devices or the replacement of failing infiltration wells with stormwater retention facilities.

Strategy

Under requirements in Chapter 90.48 RCW, Clark County has identified and registered 2,200 UICs with the Washington State Department of Ecology and is currently assessing each one's risk of polluting groundwater. The county's obligation to retrofit failing or at-risk facilities begins in 2015. Some UIC retrofit projects may also satisfy municipal stormwater permit requirements for the Structural Stormwater Controls program.



IN-STREAM HABITAT IMPROVEMENT



Description

In-stream Habitat improvement projects typically include channel enhancements or stabilization, floodplain reconnections, or culvert/fish barrier removal.

Strategy

Habitat improvement projects are usually very cost-effective methods to improve stream habitat and function where past impacts have been significant. Their presence is limited in the capital plan because these projects typically do not qualify as Structural Stormwater Controls or for use as hydrology improvements under the permit. In-stream habitat improvement projects often rely on the availability of grant funding, or use remaining budget after regulatory requirements have been met.

PROPERTY ACQUISITION FOR STORMWATER BENEFIT

Description

Clark County purchases sites with existing high-quality habitat along streams, in wetlands, or in forested upland areas. Preservation of these areas provides significant long-term watershed benefits, including stormwater control. Property purchases are often costly and are dependent on the availability of willing sellers; however, preventing stormwater problems before they occur is among the most cost-beneficial means of managing stormwater impacts.

Strategy

Property acquisitions are prioritized and pursued through the county's Legacy Lands program. Current anticipated acquisitions are subject to future updates of the Conservation Areas Acquisition Plan. When possible, Clark County seeks to leverage stormwater program and Conservation Futures funds together.



Acquisition of intact riparian or forest habitat often qualifies for the Structural Stormwater Controls program. Property acquisition utilizing stormwater funding is usually focused on developing areas where stormwater impacts are currently limited but are expected to increase significantly.

Program Development

At its core, capital planning is the process of identifying and implementing projects that are necessary, feasible, and cost-effective. Planning ensures that stormwater capital projects are aligned with the county's goals and reflect a consistent set of strategies and processes.

The approach to developing the Stormwater Capital Program 2013-2018 included five general steps:

- 1) Project identification
- 2) Screening
- 3) Scoping
- 4) Prioritization
- 5) Programming

The final product is a matrix that lists scoped projects and shows Clark County's plan for funding and constructing them over the six years of the capital program.

PROJECT IDENTIFICATION

The capital plan considers projects within the entire unincorporated urban area and rural Clark County, but focuses on urban and urbanizing areas where stormwater impacts are greatest.

Most projects considered for this capital plan were identified through one of three mechanisms: the county's Stormwater Needs Assessment Program (SNAP), stormwater facility inspections, and assessment of drywell systems. Additionally, property acquisitions were identified through the Legacy Lands program under the Conservation Areas Acquisition Plan.

The SNAP is a watershed assessment effort that evaluates the stormwater and surface water systems, identifying problems and opportunities that may be addressed through capital projects. SNAP was conducted county-wide from 2006-2010.

Routine field inspections of stormwater infrastructure identify the majority of repair projects. In addition, stormwater engineers may identify project opportunities while conducting regular business such as responding to drainage complaints, evaluating problems identified by county road operations crews and looking into projects suggested by members of the public.

Drywell inspections identify needed retrofits to underground injection systems that are at risk of polluting groundwater.

County engineers and scientists are developing additional processes to identify capital projects in focused, high-needs areas based on predictive tools and a new generation of field

assessments. Several projects from a prototype application of these processes at the Clark County Fairgrounds are included in this plan. Other focused efforts may include catch basin retrofits in highly urbanized drainages and water quality treatment in major rural roadside ditches.

Candidate projects are entered in the *Capital Planning Database* for further consideration through the planning process. The database tracks stormwater capital projects from inception through construction and close-out.

SCREENING

Project identification generates a large number of candidate projects. Screening is the first step in determining which opportunities should be evaluated more extensively.

Initial screening eliminates clearly infeasible or unproductive stormwater capital projects early in the planning process by determining at a general level whether the project is both worthwhile and feasible. The first question is answered through an objective scoring of *resource-based* criteria. The second is answered through an objective scoring of *engineering* criteria.

The Resource Benefit criteria assess:

- Support for regional watershed rehabilitation and salmon recovery objectives
- Location of the project in the watershed
- Stream health rating in the project vicinity
- Documented need for the project
- Expected future development impacts

Projects that receive a passing score on the Resource screen move on to the Engineering screen. As appropriate for various project types, engineering criteria assess:

- Potential physical site constraints
- Infiltration and soil suitability
- Potential to achieve measurable benefit
- Feasibility of environmental permitting
- Potential legal constraints

The final step of the screening process is the development of a project basis statement. This statement briefly identifies the problem to be addressed, documenting the purpose and need for a project based on watershed assessments, screening results, and staff knowledge.

Projects passing both portions of the initial screen proceed to the more rigorous scoping stage.

SCOPING

Project scoping is perhaps the most critical step in the planning process. Where initial screening takes a general approach, scoping begins to look quantitatively at feasibility and benefit as well as project costs. Scoping is where observed stormwater problems are linked to tangible solutions.

The goal of the scoping process is to ensure that projects have the best possible chance of successful implementation. While significant issues can still arise later in the design phase, scoping is expected to expose most barriers to project implementation and determine with good confidence that the project is both cost-effective and feasible.

Scoping includes the following elements:

- Feasibility and Cost Effectiveness Check (CWP engineering staff)
- Independent Review (PW engineering staff)
- Project justification and discussion (selected CWP/PW managers and staff)

FEASIBILITY AND COST EFFECTIVENESS CHECK

The Feasibility and Cost Effectiveness Check clarifies the need and purpose for each project, describes the problem cause and effect, and proposes a solution. Costs, water quality and flow control benefits, and cost/benefit ratio are calculated. CWP engineers and scientists also apply checklists to establish the rationale for the necessary engineering and environmental permit approvals.

A strong rationale for approval is one key to sending successful projects to design. The checklists help determine whether a project can meet the approved water quality and flow control requirements of the original facility being retrofitted, demonstrate that the proposed project will not cause or worsen any upstream or downstream flooding, and assess the likelihood of difficult environmental permitting approvals or expensive environmental mitigation needs.

This information is presented in a brief pre-design report that includes summary tables designed to meet Municipal Stormwater Permit reporting requirements.

REVIEW

Public Works design engineers are typically responsible for designing the projects listed in the capital plan. To facilitate common understanding and a smooth transition of project development between Environmental Services and Public Works, each pre-design report is reviewed by a Public Works engineer. Public Works comments and suggestions are incorporated directly into the report as part of the final product.

PROJECT JUSTIFICATION

Project justification is an opportunity for a group of experienced stormwater practitioners to examine each project with a critical eye and discuss potential fatal flaws. CWP engineers and scientists act as project proponents, with a team of Public Works and DES staff and managers looking for flaws. Projects that appear problematic or lack consensus support by the examination team are removed from consideration or programmed in the latter years of the plan to allow for more extensive review before passing to Public Works for design.

PRIORITIZATION

A robust capital planning program generates more scoped projects than can be implemented in a six-year plan. Prioritization is the process of determining which of the feasible projects of each type best meet program goals and provide the most cost-effective solutions. Within the constraints of regulatory requirements and available funding, the subsequent Programming step strives to implement higher-priority projects.

Each project type requires slightly different prioritization criteria; in all cases, criteria are intended to be simple yet meaningful. The Resource screen provides an initial prioritization step for all project types by forwarding only those projects that appear to provide significant natural resource benefits. Another key consideration goes beyond the parameters of stormwater management: in all cases, priority is given to projects that also meet other related county goals.

CAPITAL REPAIRS

Repair projects are required, and therefore cannot truly ‘fail’ the Resource screen; however, screening scores along with watershed assessment information and engineering judgment are used to prioritize those projects where continued malfunction poses the most serious problems.

Repair projects are split into four groups in diminishing order of priority:

- 1) Represents a threat to public safety, or; Passes Resource screen AND has retrofit potential
- 2) Passes Resource screen and is a repair ONLY
- 3) Fails Resource screen AND has retrofit potential
- 4) Fails Resource screen and is a repair ONLY

WATER QUALITY RETROFITS

Water quality retrofit projects are prioritized based on the severity of the project need and the results of the cost/benefit analysis.

HYDROLOGY IMPROVEMENT FACILITIES

Hydrology improvement facilities are prioritized based on the severity of the project need and the results of the cost/benefit analysis.

GROWING GREEN

Growing Green projects typically have a fairly constant per-acre cost across all projects, so a cost/benefit analysis does not provide significant basis for prioritization. Priority is therefore given to projects that directly benefit streams where the Washington Department of Ecology has established Water Cleanup Plans to address elevated water temperatures. Secondary priority is given to projects in streams that are listed for temperature issues on the statewide list of polluted water bodies, but do not yet have cleanup plans. At both levels, projects that support multiple program goals are given priority. Examples include projects where reforestation can support Parks master plans or improve habitat diversity within identified wildlife corridors.

UNDERGROUND INJECTION CONTROL (UIC) RETROFITS

UIC retrofits are prioritized based on cost-benefit and the results of the risk analysis the county is required to complete under Chapter 90.48 RCW.

IN-STREAM HABITAT IMPROVEMENTS

In-stream habitat improvements are prioritized based on cost-benefit, applicability to Lower Columbia Fish Recovery Board and other recovery group plans, and the degree to which the project complements other planned stormwater projects within a drainage area.

PROPERTY ACQUISITION FOR STORMWATER BENEFIT

Selection and prioritization of property acquisitions is described in the Conservation Areas Acquisition Plan (2004). A Conservation Areas Advisory Committee appointed by the Board of County Commissioners produced an acquisition plan divided into three categories: critical habitat, greenways or trail corridors, and farmland. Within these categories, work groups devised methods to identify and prioritize project areas and set acquisition targets. Prioritization for property acquisition in the capital program is based on the outcome of those discussions and is determined by the Legacy Lands program.

PROGRAMMING

Programming applies regulatory requirements and available funding to the list of scoped and prioritized projects to develop a six-year program matrix that can meet Permit requirements and program goals. Where specific projects have not yet been identified for implementation, placeholder values for projected spending are included in the matrix as ongoing programs.

SIX-YEAR MATRIX

Capital projects are placed in the Six-Year Program Matrix based on regulatory requirements, programmatic goals, project prioritization, and available funding.

Most projects have multiple benefits. For example, projects intended to improve hydrology typically deliver water quality and habitat benefits as well. Similarly, many water quality or habitat improvement projects also benefit stream hydrology.

PROGRAM CATEGORIES

For simplicity, the matrix identifies projects using three general programming categories depending on their primary objective: Water Quality Improvement Projects, Hydrology Improvement Projects and Stream Restoration Projects.

Water Quality Improvement Projects

Water quality projects have the primary objective of directly protecting or improving surface water or ground water quality by removing pollutants from stormwater runoff. Examples include stormwater wetlands, biofiltration swales, filter vaults, bioretention facilities, or catch-basin treatment inserts. The common purpose of these facilities is to remove certain types and amounts of pollutants from the runoff before it is discharged to a stream, dispersed over the ground, discharged into wetlands or injected into groundwater through a drywell.

Capital Repair, Water Quality Retrofit, Property Acquisition and UIC Retrofit projects may be included in this category.

Hydrology Improvement Projects

Hydrology improvement projects have the primary objective of directly protecting or improving stream channels by capturing and slowing down stormwater runoff or allowing it to filter back into the ground. Examples include infiltration facilities, retention and detention ponds, underground storage tanks or vaults and bioretention facilities. Intact forested areas perform the same function as water evaporates from foliage, soaks into the ground, or is taken up by vegetation. The common purpose of these projects is to reduce the volume and rate of stormwater flow from a specific drainage area to reduce flooding, limit flow damage to streams and reduce downstream erosion.

Capital Repair, Hydrology Improvement Facilities, Property Acquisition and Growing Green projects may be included in this category.

Stream Restoration Projects

Stream restoration projects have the primary objective of protecting or improving stream and riparian function and habitat. Examples include rehabilitating stream channels that were historically straightened, adding in-stream woody debris, stabilizing eroding channels, installing channel-spanning log jams to reconnect

floodplain areas, replacing invasive weeds with native vegetation, improving fish passage and aquatic habitat and acquiring intact habitats to minimize the impact of adjacent land-use activities. The common purpose of these projects is to correct long-term degradation caused by land-use activities and in some cases to prevent degradation before it occurs.

In-stream Habitat Improvement, Property Acquisition, and Growing Green projects may be included in this category.

FUNDING

This capital program includes projects totaling approximately \$19 million over six years, with about \$15 million going toward Clean Water Program funded projects and \$4 million toward Conservation Futures funded project. The list slightly exceeds the projected budget over the six-year planning period because over-programming allows projects that become infeasible to be replaced easily. Unexpected grant opportunities or other funding sources also encourage Environmental Services to keep a supply of shovel-ready projects on hand.

Funding for the Stormwater Capital Program comes primarily from three sources: the Clean Water Fund, Conservation Futures Fund, and competitive grant programs, as described below.

Clean Water Fund

The County established the Clean Water Fund in 2000 to implement requirements of its NPDES municipal stormwater permit. Current rates for a standard taxlot are \$33.00 per year and bring in approximately \$4.9 million annually to support county-wide stormwater management. The Clean Water Program's five areas of effort include:

- Operations and maintenance of the stormwater system
- Stormwater capital planning and projects
- Natural resource assessment and monitoring
- Enforcement and regulations
- Education and outreach

Conservation Futures Fund

Clark County instituted the Conservation Futures Fund in 1985. The primary revenue source for the fund is the conservation futures property tax levy, a county-wide levy that cannot exceed \$0.0625 per \$1,000 valuation. The levy has generated \$2.3 to \$2.4 million annually over the last five years. The Legacy Lands Program in the Environmental Services Department manages the fund with the goal of bringing together the people, groups and community support to establish, restore and maintain an interconnected system of parks, natural areas, trails and open spaces within the region. The program coordinates various projects, partners and funding sources to protect and improve lands highly valued for habitat, scenic corridors, low-impact recreation or other qualities that enhance the local environment, including stormwater benefits.

Grant Funding

Grants are highly competitive and available sources are subject to fluctuation from year to year. Where available, grant funds are aggressively pursued.

The most common grant source for stormwater capital projects has been Ecology's Statewide Stormwater Grant Program; in the most recent (2012) round, Clark County was offered approximately \$3.4 million in grant funding toward six applications. More commonly, the county receives an annual average of approximately \$500,000 from this source.

The most consistent grant sources for the Legacy Lands program have been the suite of grants managed by the State Recreation and Conservation Office, including Washington Wildlife and Recreation Program (WWRP) and Salmon Recovery Funding Board (SRFB). WWRP grant opportunities are available every other year while SRFB grant opportunities are available each year. Between 2006 and 2011, the County successfully competed for approximately \$4.2 million through these sources, an annual average of about \$700,000.

Six-Year Program Matrix

2013-2018 Storm Water Capital Program
Project Funding Analysis

CLEAN WATER PROGRAM

| CRP | Project Name | Category | Phase | Sept 2012 Spent to Date | | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | | 2013-2018 Expenses | Project Total | | |
|--------|--|--------------------|--------------|-------------------------|------------------|----------------|----------------|----------|--------------|----------|----------|--------------|----------|--------------|----------|--------------|----------|--------------------|------------------|--------------|---------|
| | | | | PE | ROW | CWF | Grants/Loans | CWF | Grants/Loans | Other | CWF | Grants/Loans | CWF | Grants/Loans | CWF | Grants/Loans | CWF | | | Grants/Loans | |
| 401890 | Parkside Manor SWF Retrofit | Hydrology | PE | 179,000 | 15,000 | | | | | | | | | | | | | 15,000 | 194,000 | | |
| | | | ROW | | 10,000 | | | | | | | | | | | | | | 10,000 | 10,000 | |
| | | | CN | 1,000 | 297,000 | 891,000 | | | | | | | | | | | | | 1,188,000 | 1,189,000 | |
| | | | Total | 180,000 | 1,213,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,213,000 | 1,393,000 | | |
| 401882 | Harding Farms SWF Retrofit | Hydrology | PE | 165,000 | | | | | | | | | | | | | | 20,000 | 185,000 | | |
| | | | ROW | 16,000 | | | | | | | | | | | | | | | 0 | 16,000 | |
| | | | CN | 1,000 | 959,000 | | | | | | | | | | | | | | 959,000 | 960,000 | |
| | | | Total | 182,000 | 0 | 979,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 979,000 | 1,161,000 | | |
| tbd | Country Meadow UIC Retrofit | Water Quality | PE | | 31,000 | 19,000 | | | | | | | | | | | | | 50,000 | 50,000 | |
| | | | ROW | | | | | | | | | | | | | | | | | 0 | 0 |
| | | | CN | | 48,000 | 143,000 | | | | | | | | | | | | | | 191,000 | 191,000 |
| | | | Total | 0 | 241,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 241,000 | 241,000 | | |
| 28385 | SR-503 CTR Retrofit | Water Quality | PE | | 19,000 | | | | | | | | | | | | | | 19,000 | 19,000 | |
| | | | ROW | | 101,000 | | | | | | | | | | | | | | 101,000 | 101,000 | |
| | | | CN | | 60,000 | | | | | | | | | | | | | | 60,000 | 60,000 | |
| | | | Total | 0 | 180,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 180,000 | 180,000 | | |
| 403264 | Stones Throw SWF Repair | Water Quality | PE | 1,000 | 85,000 | | | | | | | | | | | | | | 85,000 | 86,000 | |
| | | | ROW | | | | | | | | | | | | | | | | | 0 | 0 |
| | | | CN | | 100,000 | | | | | | | | | | | | | | | 100,000 | 100,000 |
| | | | Total | 1,000 | 185,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 185,000 | 186,000 | | |
| 403454 | Cold Creek Court SWF Repair | Hydrology | PE | 5,000 | 59,000 | | | | | | | | | | | | | | 59,000 | 64,000 | |
| | | | ROW | | | | | | | | | | | | | | | | | 0 | 0 |
| | | | CN | | 100,000 | | | | | | | | | | | | | | | 100,000 | 100,000 |
| | | | Total | 5,000 | 159,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 159,000 | 164,000 | | |
| GG1201 | Salmon Creek Greenway 12 Reforestation | Stream Restoration | PE | | | | | | | | | | | | | | | | 0 | 0 | |
| | | | ROW | | | | | | | | | | | | | | | | | 0 | 0 |
| | | | CN | | 134,000 | 11,000 | | | | | | | | | | | | | | 145,000 | 145,000 |
| | | | Total | 0 | 134,000 | 11,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 145,000 | 145,000 | | |
| 007485 | Heritage Farm Parking Lot LID Project | Hydrology | PE | 27,000 | 61,000 | | | | | | | | | | | | | | 61,000 | 88,000 | |
| | | | ROW | | | | | | | | | | | | | | | | | 0 | 0 |
| | | | CN | | 246,000 | 246,000 | | | | | | | | | | | | | | 492,000 | 492,000 |
| | | | Total | 27,000 | 61,000 | 492,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 553,000 | 580,000 | | |
| tbd | Avalon Meadows SWF Repair | Water Quality | PE | | 50,000 | | | | | | | | | | | | | | 50,000 | 50,000 | |
| | | | ROW | | | | | | | | | | | | | | | | | 0 | 0 |
| | | | CN | | 169,000 | | | | | | | | | | | | | | | 169,000 | 169,000 |
| | | | Total | 0 | 50,000 | 169,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 219,000 | 219,000 | | |
| tbd | Tay Terrace UIC Retrofit | Water Quality | PE | | 34,000 | 55,000 | | | | | | | | | | | | | 89,000 | 89,000 | |
| | | | ROW | | | | | | | | | | | | | | | | | 0 | 0 |
| | | | CN | | 206,000 | 308,000 | | | | | | | | | | | | | | 514,000 | 514,000 |
| | | | Total | 0 | 89,000 | 514,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 603,000 | 603,000 | | |
| tbd | Rosemary Ridge UIC Retrofit | Water Quality | PE | | 31,000 | 19,000 | | | | | | | | | | | | | 50,000 | 50,000 | |
| | | | ROW | | | | | | | | | | | | | | | | | 0 | 0 |
| | | | CN | | 11,000 | 35,000 | | | | | | | | | | | | | | 46,000 | 46,000 |
| | | | Total | 0 | 50,000 | 46,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 96,000 | 96,000 | | |
| 401972 | Thomas Wetland East | Hydrology | PE | 163,000 | 38,000 | | | | | | | | | | | | | | 201,000 | 201,000 | |
| | | | ROW | 474,000 | | | | | | | | | | | | | | | | 474,000 | 474,000 |
| | | | CN | 1,000 | | | | | | | | | | | | | | | 644,000 | 644,000 | |
| | | | Total | 638,000 | 38,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,544,000 | 1,544,000 | | |
| tbd | Aquila UIC Retrofit | Water Quality | PE | | | 31,000 | 19,000 | | | | | | | | | | | | 50,000 | 50,000 | |
| | | | ROW | | | | | | | | | | | | | | | | | 0 | 0 |
| | | | CN | | | 42,000 | 124,000 | | | | | | | | | | | | | 166,000 | 166,000 |
| | | | Total | 0 | 0 | 50,000 | 166,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 216,000 | 216,000 | | |

2013-2018 Storm Water Capital Program
Project Funding Analysis

CLEAN WATER PROGRAM

| CRP | Project Name | Category | Phase | Sept 2012 Spent to Date | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | | 2013-2018 Expenses | Project Total |
|--------|--|--------------------|--------------------------|-------------------------|--------|--------------|--------|--------------|---------|-----|--------------|-----|--------------|-----|--------------|-----|--------------------|---------------|
| | | | | | CWF | Grants/Loans | CWF | Grants/Loans | Other | CWF | Grants/Loans | CWF | Grants/Loans | CWF | Grants/Loans | CWF | | |
| tbd | Lakeshore Elementary School SWF | Water Quality | PE ROW CN Total | 0 | | | | | 80,000 | | | | | | | | 80,000 | 80,000 |
| tbd | Anderson UIC Retrofit | Water Quality | PE ROW CN Total | 0 | 31,000 | 19,000 | 0 | | 80,000 | | 367,000 | | | | | | 367,000 | 367,000 |
| tbd | NE 99th St @ Cougar Creek WQ Retrofit | Water Quality | PE ROW CN Total | 0 | | | 50,000 | | 120,000 | | | | | | | | 170,000 | 170,000 |
| tbd | Andy's Acres (A) SWF Repair | Water Quality | PE ROW CN Total | 0 | | | 0 | | 50,000 | | 280,000 | | | | | | 330,000 | 330,000 |
| tbd | Columbia River High School SWF Retrofit | Hydrology | PE ROW CN Total | 0 | 21,000 | 63,000 | 0 | | 50,000 | | 77,000 | | | | | | 127,000 | 127,000 |
| 401902 | NE 99th St & 25th Ave SWF | Water Quality | PE ROW CN Total | 20,000 | | | 84,000 | | 237,000 | | 75,000 | | | | | | 321,000 | 321,000 |
| tbd | Winchester Hills I Tract A SWF Repair/Retrofit | Water Quality | PE ROW CN Total | 22,000 | | | 0 | | 0 | | 25,000 | | 730,000 | | | | 805,000 | 827,000 |
| tbd | Whipple Creek Trib 6.44 Habitat Improvement | Stream Restoration | PE ROW CN Total | 0 | | | 0 | | 0 | | 25,000 | | 47,000 | | | | 72,000 | 72,000 |
| tbd | Highway 99 @Tenny Creek WQ Retrofit | Water Quality | PE ROW CN Total | 0 | | | 0 | | 0 | | 50,000 | | | | | | 50,000 | 50,000 |
| tbd | NE 119th St @ Cougar Creek WQ Retrofit | Water Quality | PE ROW CN Total | 0 | | | 0 | | 0 | | 50,000 | | 100,000 | | | | 150,000 | 150,000 |
| tbd | Clark County Amphitheater Wetland Retrofit | Hydrology | PE ROW CN Total | 0 | | | 0 | | 0 | | 95,000 | | 283,000 | | | | 378,000 | 378,000 |
| 402357 | Clark County Amphitheater SWF #4 Retrofit | Hydrology | PE ROW CN Total | 0 | | | 0 | | 0 | | 450,000 | | | | | | 1,350,000 | 1,800,000 |
| tbd | Highway 99 & NE 102nd St SWF | Hydrology | PE ROW CN Total | 0 | | | 0 | | 0 | | 60,000 | | 285,000 | | 367,000 | | 712,000 | 712,000 |

**2013-2018 Storm Water Capital Program
Project Funding Analysis**

CLEAN WATER PROGRAM

| CRP | Project Name | Category | Phase | Sept 2012 Spent to Date | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | | 2013-2018 Expenses | Project Total |
|-----|--------------------------------|---------------|-------|-------------------------|------|--------------|------|--------------|------|--------------|------|--------------|------|--------------|------|--------------|--------------------|---------------|
| | | | | | CWF | Grants/Loans | | |
| tbd | NE 229th St & NE 221st Ave SWF | Hydrology | PE | | | | | | | | | | | | | | 0 | 60,000 |
| | | | ROW | | | | | | | | | | | | | | 0 | 494,000 |
| | | | CN | | | | | | | | | | | | | | | 0 |
| | | | Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 889,000 | 60,000 |
| tbd | Harvest Meadows SWF | Water Quality | PE | | | | | | | | | | | | | | 0 | 100,000 |
| | | | ROW | | | | | | | | | | | | | | 0 | 60,000 |
| | | | CN | | | | | | | | | | | | | | 0 | 100,000 |
| | | | Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 160,000 | 160,000 |
| tbd | Regency Park Phase I SWF | Water Quality | PE | | | | | | | | | | | | | | 0 | 60,000 |
| | | | ROW | | | | | | | | | | | | | | 0 | 100,000 |
| | | | CN | | | | | | | | | | | | | | 0 | 100,000 |
| | | | Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 160,000 | 160,000 |

ONGOING PROGRAMS

| | Category | Phase | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | | 2013-2018 Expenses | Project Total |
|--|---------------|-------|-------|--------------|---------|--------------|---------|--------------|---------|--------------|---------|--------------|---------|--------------|--------------------|---------------|
| | | | CWF | Grants/Loans | CWF | Grants/Loans | CWF | Grants/Loans | CWF | Grants/Loans | CWF | Grants/Loans | CWF | Grants/Loans | | |
| Catch Basin Treatment Retrofits | Water Quality | PE | | | 50,000 | | 50,000 | | 50,000 | | 50,000 | | 50,000 | | 250,000 | 250,000 |
| | | ROW | | | | | | | | | | | | | 0 | 0 |
| | | CN | | | | | 200,000 | | 200,000 | | 200,000 | | 200,000 | | 800,000 | 800,000 |
| | | | Total | 0 | 0 | 50,000 | 50,000 | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 1,050,000 | 1,050,000 | 250,000 |
| UIC Water Quality Retrofit Program | Water Quality | PE | | | | | | | | | | | | | 0 | 0 |
| | | ROW | | | | | | | | | | | | | 0 | 0 |
| | | CN | | | 200,000 | | 200,000 | | 200,000 | | 200,000 | | 200,000 | | 800,000 | 800,000 |
| | | | Total | 0 | 0 | 50,000 | 50,000 | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 1,050,000 | 1,050,000 | 250,000 |
| Growing Green | Hydrology | PE | | | | | | | | | | | | | 0 | 0 |
| | | ROW | | | | | | | | | | | | | 0 | 0 |
| | | CN | | | 100,000 | | 125,000 | | 165,000 | | 235,000 | | 235,000 | | 860,000 | 860,000 |
| | | | Total | 0 | 0 | 100,000 | 125,000 | 165,000 | 165,000 | 235,000 | 235,000 | 235,000 | 235,000 | 860,000 | 860,000 | 0 |
| 2010 - 2012 Reforestation Maintenance (7 projects) | Hydrology | PE | | | | | | | | | | | | | 0 | 0 |
| | | ROW | | | | | | | | | | | | | 0 | 0 |
| | | CN | | | 52,000 | | 40,000 | | 25,000 | | 184,000 | | 184,000 | | 184,000 | 184,000 |
| | | | Total | 0 | 67,000 | 52,000 | 40,000 | 40,000 | 25,000 | 25,000 | 0 | 0 | 0 | 184,000 | 184,000 | |

SUMMARY TABLE

| Revenue Source | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | | 6 Year SW CIP Total |
|--------------------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|---------------------|
| | CWF | Grants/Loans | |
| Annual Totals By Funding | 1,340,000 | 1,127,000 | 1,957,000 | 444,000 | 1,620,000 | 1,292,000 | 2,219,000 | 2,219,000 | 2,280,000 | 0 | 2,452,000 | 0 | \$14,977,000 |
| Annual Totals By Phase | PE | 516,000 | 304,000 | 0 | 280,000 | 280,000 | 905,000 | 100,000 | 100,000 | 100,000 | 100,000 | 100,000 | |
| ROW | 111,000 | 0 | 0 | 0 | 0 | 0 | 0 | 285,000 | 285,000 | 0 | 0 | 0 | |
| CN | 1,840,000 | 2,343,000 | 2,632,000 | 1,314,000 | 1,314,000 | 1,314,000 | 1,314,000 | 1,895,000 | 1,895,000 | 1,895,000 | 2,352,000 | 2,352,000 | |
| Annual Totals | 2,467,000 | 2,647,000 | 2,912,000 | 2,219,000 | 2,219,000 | 2,219,000 | 2,219,000 | 2,280,000 | 2,280,000 | 0 | 2,452,000 | 2,452,000 | |

**2013-2018 Storm Water Capital Program
Project Funding Analysis**

CONSERVATION FUTURES

| CRP | Project Name | Category | Phase | Sept 2012 Spent to Date | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | | 2013-2018 Expenses | Project Total |
|--------|---|--------------------|-------|-------------------------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|--------------|--------------------|---------------|
| | | | | | Con Futures | Grants/Loans | | |
| tbd | East Fork Lewis River Grant Reforestation | Stream Restoration | PE | | | | | | | | | | | | | | | |
| | | | ROW | 44,000 | 15,000 | 8,000 | 18,000 | | | | | | | | | | | |
| | | | CN | 44,000 | 23,000 | 8,000 | 18,000 | | | | | | | | | | | |
| | | | Total | 44,000 | 23,000 | 8,000 | 18,000 | | | | | | | | | | | |
| | | | PE | | | | | | | | | | | | | | | |
| | | | ROW | | | | | | | | | | | | | | | |
| | | | CN | | | | | | | | | | | | | | | |
| | | | Total | | | | | | | | | | | | | | | |
| GG1204 | Zimmerly DIF Grant Reforestation | Stream Restoration | PE | | | | | | | | | | | | | | | |
| | | | ROW | | | | | | | | | | | | | | | |
| | | | CN | | 36,000 | 36,000 | 36,000 | | | | | | | | | | | |
| | | | Total | 0 | 36,000 | 36,000 | 36,000 | | | | | | | | | | | |
| | | | PE | | | | | | | | | | | | | | | |
| | | | ROW | | | | | | | | | | | | | | | |
| | | | CN | | 374,000 | 374,000 | 374,000 | | | | | | | | | | | |
| | | | Total | 0 | 374,000 | 374,000 | 374,000 | | | | | | | | | | | |
| | | | PE | | | | | | | | | | | | | | | |
| | | | ROW | | | | | | | | | | | | | | | |
| | | | CN | | | | | | | | | | | | | | | |
| | | | Total | 0 | 500,000 | 500,000 | 500,000 | | | | | | | | | | | |
| | | | PE | | | | | | | | | | | | | | | |
| | | | ROW | | | | | | | | | | | | | | | |
| | | | CN | | | | | | | | | | | | | | | |
| | | | Total | 0 | 2,212,000 | 2,212,000 | 2,212,000 | | | | | | | | | | | |
| | | | PE | | | | | | | | | | | | | | | |
| | | | ROW | | | | | | | | | | | | | | | |
| | | | CN | | | | | | | | | | | | | | | |
| | | | Total | 0 | 200,000 | 200,000 | 200,000 | | | | | | | | | | | |
| | | | PE | | | | | | | | | | | | | | | |
| | | | ROW | | | | | | | | | | | | | | | |
| | | | CN | | | | | | | | | | | | | | | |
| | | | Total | 0 | 200,000 | 200,000 | 200,000 | | | | | | | | | | | |
| | | | PE | | | | | | | | | | | | | | | |
| | | | ROW | | | | | | | | | | | | | | | |
| | | | CN | | | | | | | | | | | | | | | |
| | | | Total | 0 | 200,000 | 200,000 | 200,000 | | | | | | | | | | | |
| | | | PE | | | | | | | | | | | | | | | |
| | | | ROW | | | | | | | | | | | | | | | |
| | | | CN | | | | | | | | | | | | | | | |
| | | | Total | 0 | 200,000 | 200,000 | 200,000 | | | | | | | | | | | |

ONGOING PROGRAMS

| | Phase | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | | 2013-2018 Expenses | Project Total |
|--|-------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|--------------|------|--|--------------------|---------------|
| | | Con Futures | Grants/Loans | | | | |
| | PE | | | | | | | | | | | | | | |
| | ROW | | | | | | | | | | | | | | |
| | CN | 101,000 | | 72,000 | | 50,000 | | 35,000 | | | | | | 258,000 | 258,000 |
| | Total | 101,000 | | 72,000 | | 50,000 | | 35,000 | | | | | | 258,000 | 258,000 |

SUMMARY TABLE

| Revenue Source | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | | 6 Year SW CIP Total |
|--------------------------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|--------------|------|-------------|---------------------|
| | Con Futures | Grants/Loans | | | |
| Annual Totals By Funding | 975,000 | 0 | 1,178,000 | 1,306,000 | 50,000 | 0 | 35,000 | 0 | 0 | 0 | 0 | \$3,544,000 | |
| Annual Totals By Phase | | | | | | | | | | | | | |
| PE | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| ROW | 874,000 | | 2,412,000 | 2,412,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| CN | 101,000 | | 72,000 | 72,000 | 50,000 | 0 | 35,000 | 0 | 0 | 0 | 0 | | |
| Annual Totals | 975,000 | | 2,484,000 | 2,484,000 | 50,000 | 0 | 35,000 | 0 | 0 | 0 | 0 | | |

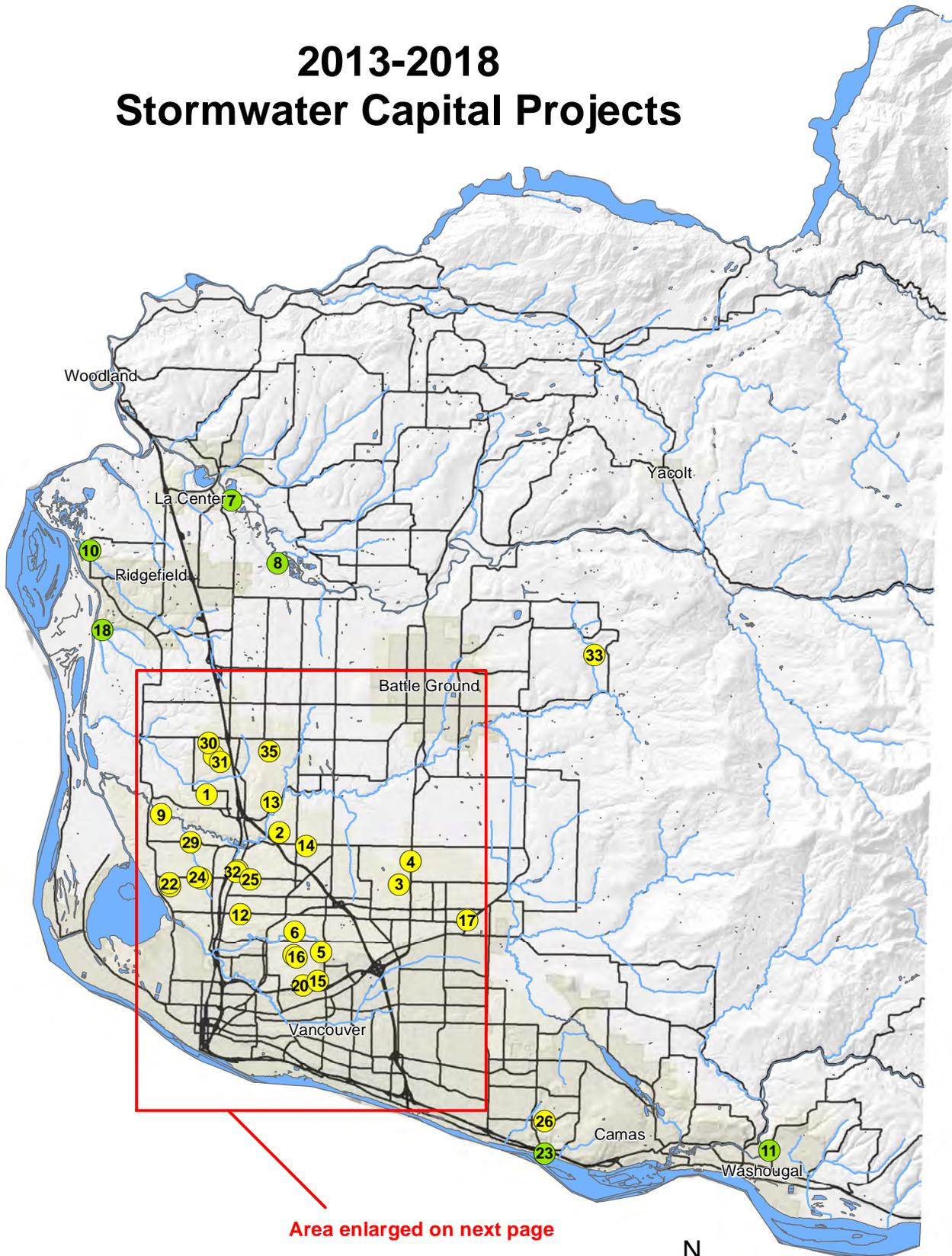
Project Index and Map

2013-2018 Stormwater Capital Program Project Index

| Map ID | WO | Project | Subwatershed |
|--------|--------|---|------------------------------|
| 1 | 401890 | Parkside Manor SWF Retrofit | Whipple Creek (Upper) |
| 2 | 401882 | Harding Farms SWF Retrofit | Salmon Creek (r.m. 03.83) |
| 3 | tbd | Country Meadows UIC Retrofit | Curtin Creek |
| 4 | 28385 | SR-503 CTR Retrofit | Curtin Creek |
| 5 | 403264 | Stones Throw Subdivision SWF Repair | Lower Burnt Bridge Creek |
| 6 | 403454 | Cold Creek Court SWF Repair | Lower Burnt Bridge Creek |
| 7 | tbd | East Fork Lewis River Grant Reforestation | East Fork Lewis (r.m. 03.19) |
| 8 | GG1204 | Zimmerly DIF Grant Reforestation Project | East Fork Lewis (r.m. 03.19) |
| 9 | GG1201 | Salmon Creek Greenway 12 Reforestation | Salmon Creek (r.m. 03.83) |
| 10 | tbd | Gee Creek Tributary Acquisition | Gee Creek (Lower) |
| 11 | tbd | Lower Washougal Schmid Acquisition | Washougal (Lower) |
| 12 | 007485 | Heritage Farm Parking Lot LID Project | Cougar Creek |
| 13 | tbd | Avalon Meadows SWF Repair | Salmon Creek (r.m. 03.83) |
| 14 | tbd | Tay Terrace SWF Retrofit | Salmon Creek (r.m. 03.83) |
| 15 | tbd | Rosemary Ridge UIC Retrofit | Lower Burnt Bridge Creek |
| 16 | 401972 | Thomas Wetland East | Lower Burnt Bridge Creek |
| 17 | tbd | Aquila UIC Retrofit | Upper Burnt Bridge Creek |
| 18 | tbd | Flume Creek Acquisition | Flume Creek |
| 19 | tbd | Lakeshore Elementary School SWF | Lakeshore |
| 20 | tbd | Anderson UIC Retrofit | Lower Burnt Bridge Creek |
| 21 | tbd | NE 99th St @ Cougar Creek WQ Retrofit | Cougar Creek |
| 22 | tbd | Andys Acres (A) SWF Repair | Lakeshore |
| 23 | tbd | Groenveld Acquisition | Columbia Slope |
| 24 | tbd | Columbia River High School SWF Retrofit | Cougar Creek |
| 25 | 401902 | NE 99th St & 25th Ave SWF | Salmon Creek (r.m. 03.83) |
| 26 | tbd | Winchester Hills I Tract A SWF Repair/Retrofit | Columbia Slope |
| 27 | tbd | Whipple Creek Trib 6.44 Habitat Improvement | Whipple Creek (Upper) |
| 28 | tbd | Highway 99 @ Tenny Creek WQ Retrofit | Salmon Creek (r.m. 03.83) |
| 29 | tbd | NE 119th St @ Cougar Creek WQ Retrofit | Cougar Creek |
| 30 | tbd | Clark County Amphitheater Wetland Habitat Improvement | Whipple Creek (Upper) |
| 31 | 402357 | Clark County Amphitheater SWF#4 Retrofit | Whipple Creek (Upper) |
| 32 | tbd | Highway 99 & NE 102nd St SWF | Salmon Creek (r.m. 03.83) |
| 33 | tbd | NE 229th St & NE 221st Ave SWF | Rock Creek |
| 34 | tbd | Harvest Meadows SWF Repair/Retrofit | Lower Burnt Bridge Creek |
| 35 | tbd | Regency Park Phase 1 SWF Repair/Retrofit | Mill Creek |

 Conservation Futures projects

2013-2018 Stormwater Capital Projects

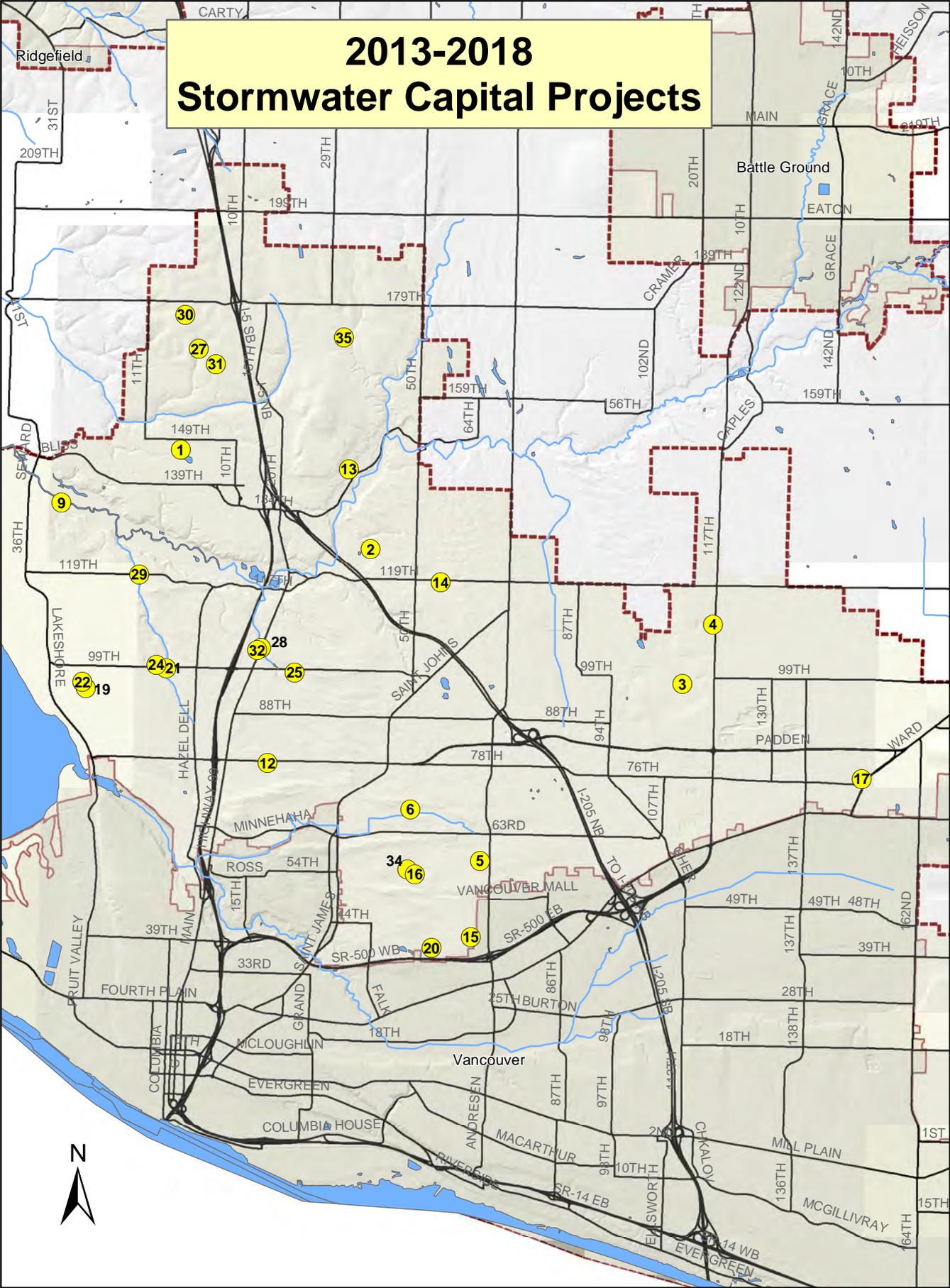


Area enlarged on next page

-  Clean Water Fund
-  Conservation Futures



2013-2018 Stormwater Capital Projects

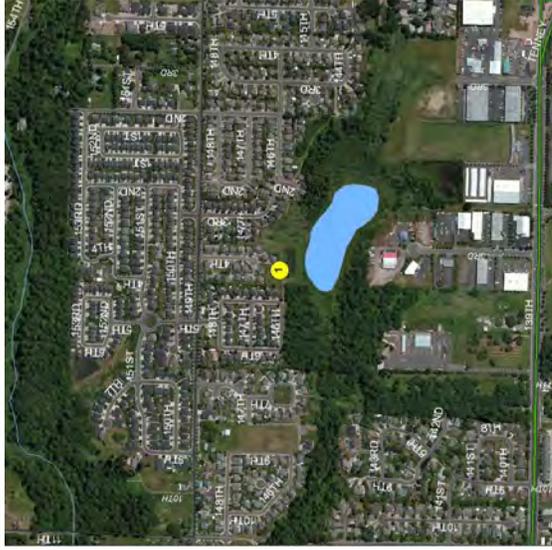


Project Detail Sheets

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Parkside Manor SWF Retrofit

Vicinity Map



Site Photo



Project Summary

Site ID: OS-93 **Subwatershed:** Whipple Creek (Upper)
Work Order Number: 401890 **Location:** NW 4th Ct. south of NW 149th St
Project Manager: Scott Fakler

Description: This project combines three undersized stormwater facilities discharging insufficiently treated stormwater to an intact headwater wetland of Whipple Creek. The project will replace three biofiltration swale/detention pond facilities with a biofiltration swale/bioretention cell and stormwater wetland. Existing detention capacity will be approximately doubled (from 2.2 to 4.5 acre-feet) and enhanced stormwater treatment will be provided for 26 acres of residential development

Basis: Whipple Creek is a rapidly developing, significantly impacted watershed that received 'poor' scores for water quality, biological health, and stream flow impacts in the 2010 Clark County Stream Health Report. Watershed assessments and regional planning documents place a high priority on protection and restoration of threatened or degraded wetlands in Whipple Creek, and recommend reducing the amount of stormwater discharged to tributary streams. The project is expected to help protect an existing high quality wetland, improve water quality, and stabilize channel conditions.

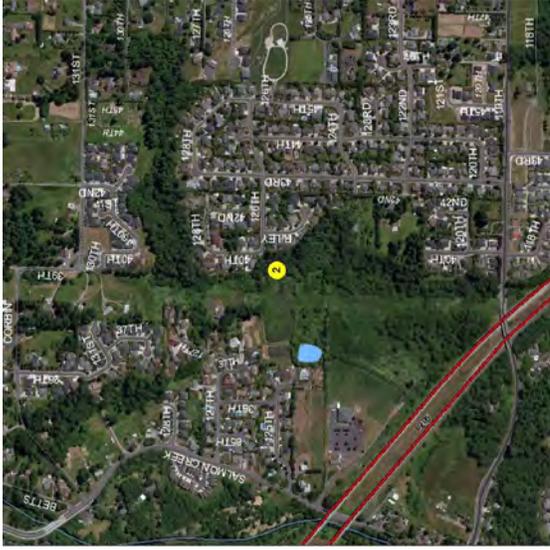
Schedule and Estimated Cost

| | |
|-----------------------------------|--------------------|
| Project Status: | Design |
| Planned Construction Year: | 2013 |
| Engineering/Permitting: | \$194,000 |
| Property Acquisition: | \$10,000 |
| Construction: | \$1,189,000 |
| ESTIMATED TOTAL: | \$1,393,000 |

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Harding Farms SWF Retrofit

Vicinity Map



Project Summary

Site ID: OS-79 **Subwatershed:** Salmon Creek (r.m. 03.83)
Work Order Number: 401882 **Location:** Vicinity of NE 126th Street & NE 40th Ave
Project Manager: Troy Pierce

Description: This project will construct a new biofiltration swale and stormwater wetland to capture and treat runoff from approximately 75 acres of fully developed residential area. The treated and controlled runoff will then drain back into the existing storm sewer outfall in the south west corner of the property, which discharges directly to Salmon Creek approximately 1/4 mile west of the new facility. The project will repair the existing outfall and construct a new maintenance access. An existing biofiltration swale on the west side will remain unchanged but the project will increase storage capacity in the existing detention pond.

Basis: Stormwater runoff from a large drainage area in the Pleasant Valley drainage basin is currently discharged to a wetland with no flow control or water quality treatment. Evidence of high stormwater discharge is present at the existing outfall to Salmon Creek. Salmon Creek in this vicinity is subject to multiple TMDLs and is a moderate regional priority for salmon recovery. The 2010 Stream Health Report and regional analyses recommend increased treatment and infiltration of stormwater runoff in this watershed.

Site Photo



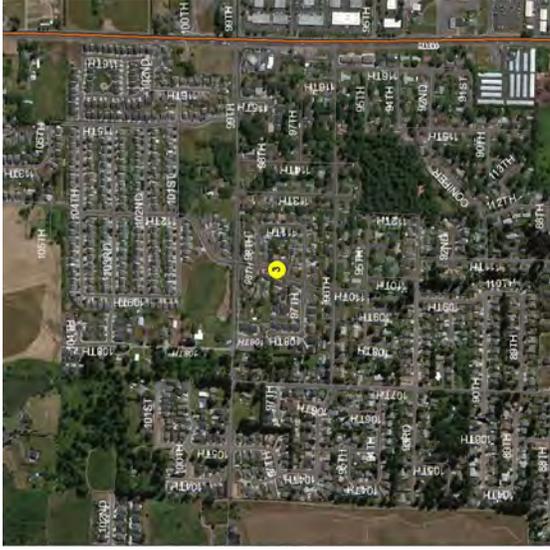
Schedule and Estimated Cost

| | |
|-----------------------------------|--------------------|
| Project Status: | Design |
| Planned Construction Year: | 2014 |
| Engineering/Permitting: | \$185,000 |
| Property Acquisition: | \$16,000 |
| Construction: | \$960,000 |
| ESTIMATED TOTAL: | \$1,161,000 |

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Country Meadows UIC Retrofit

Vicinity Map



Project Summary

Site ID: CP-156 **Subwatershed:** Curtin Creek
Work Order Number: TBD **Location:** Vicinity of NE 110th Avenue & NE 97th Street
Project Manager: TBD

Description: This project will retrofit existing catchbasins and install up to 13 storm filter cartridges to provide water quality treatment before discharging to drywells, providing treatment for runoff from approximately 10 acres of residential development.

Basis: Water routed to drywells directly recharges the Pleistocene gravel aquifer that is the water source for 50 to 60 percent of the residents in urban Clark County. Country Meadows subdivision is situated in a high groundwater area. Due to the lack of sufficient groundwater separation and pre-treatment, untreated stormwater discharge is adversely impacting groundwater quality. The project improves water quality in 303(d) listed water bodies, while supporting groundwater protection requirements under RCW 90.48 and Chapter 173-200 WAC.

Site Photo



Schedule and Estimated Cost

| | |
|-----------------------------------|------------------|
| Project Status: | Planning |
| Planned Construction Year: | 2013 |
| Engineering/Permitting: | \$50,000 |
| Property Acquisition: | \$0 |
| Construction: | \$191,000 |
| ESTIMATED TOTAL: | \$241,000 |

STORMWATER CAPITAL IMPROVEMENT PROGRAM

SR-503 CTR Retrofit

Vicinity Map



Project Summary

Site ID: CP-169 **Subwatershed:** Curtin Creek

Work Order Number: 28385 **Location:** NE 117th Ave (SR-503, MP 2.37), South of NE 112th Dr

Project Manager: Matt Griswold

Description: This project will construct a new stormwater facility to manage stormwater runoff that will be generated as a result a road improvement project along SR-503 (construction of a new right turn lane). The project will help reduce runoff volume that is currently discharged to an existing undersized infiltration system.

Basis: The SR-503 CTR project will create additional impervious area by adding a right turn auxiliary lane that includes a concrete pedestrian island. Runoff from SR 503 is now being managed through infiltration within the existing WSDOT ROW. The existing infiltration system is undersized and is failing. Construction of a new stormwater facility is warranted here to manage the current and future runoff, particularly since effective infiltration of stormwater is critical to maintaining groundwater resources that sustain summer streamflow in Curtin Creek.

Site Photo



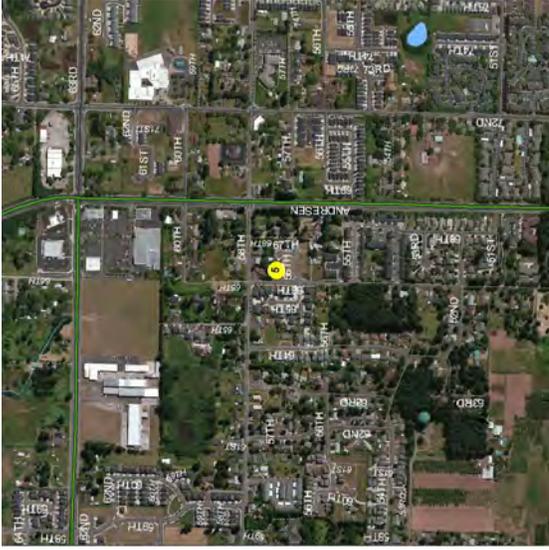
Schedule and Estimated Cost

| | |
|-----------------------------------|------------------|
| Project Status: | Design |
| Planned Construction Year: | 2013 |
| Engineering/Permitting: | \$19,000 |
| Property Acquisition: | \$101,000 |
| Construction: | \$60,000 |
| ESTIMATED TOTAL: | \$180,000 |

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Stones Throw Subdivision SWF Repair

Vicinity Map



Project Summary

Site ID: CP-133 **Subwatershed:** Lower Burnt Bridge Creek
Work Order Number: 403264 **Location:** East of NE 66th Avenue & South of NE 58th Street; Parcel No. 160846054
Project Manager: Scot Brantley

Description: Reconstruct an existing bio-swale by excavating/re-grading the facility to eliminate standing water and ensure flow of runoff to the existing detention pond. Install an underdrain. Eliminate the existing swale segment at a right angle, located on the eastside of the pond. Reconstruct the failing retaining wall on the north side of the facility.

Basis: The existing bio-swale is non-functional due to poor grading. A retaining wall along the north side of the bio-swale is failing due to poor construction and seepage from the swale. There is a threat of flooding and property damage to the adjacent property.

Site Photo



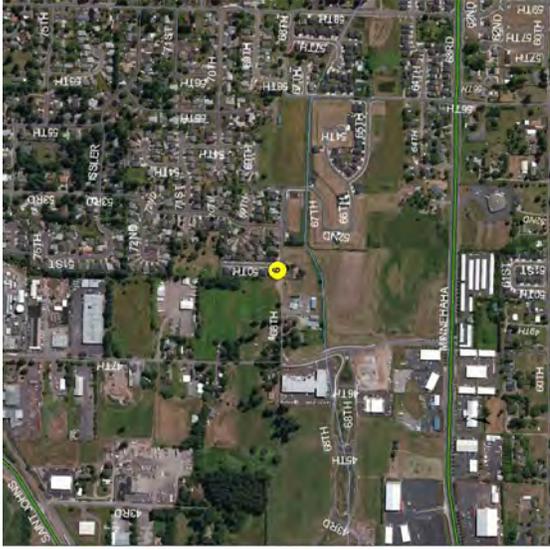
Schedule and Estimated Cost

| | |
|-----------------------------------|------------------|
| Project Status: | Design |
| Planned Construction Year: | 2013 |
| Engineering/Permitting: | \$86,000 |
| Property Acquisition: | \$0 |
| Construction: | \$100,000 |
| ESTIMATED TOTAL: | \$186,000 |

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Cold Creek Court SWF Repair

Vicinity Map



Site Photo



Project Summary

Site ID: CP-141 **Subwatershed:** Lower Burnt Bridge Creek
Work Order Number: 403454 **Location:** NE 50th Avenue, North of NE 68th Street
Project Manager: Scot Brantley

Description: Install a new infiltration trench to retain a portion of runoff from the subdivision to minimize impact at the existing undersized stormwater facility. Install a pair of storm filter catch basins to capture and treat runoff prior to sending it to the infiltration trench. Alternatively, route the overflow from the existing system by installing new perforated pipe along 68th avenue to an existing flow control manhole located to the east.

Basis: The problem is street flooding at the intersection of NE 50th Avenue and NE 68th Street. No homes are reported flooded, however street flooding occurs repeatedly and can be considered chronic flooding. The facility constructed to treat and dispose stormwater from Cold Creek Court subdivision has failed to function as intended. The existing filter vault with four cartridges provides insufficient treatment. Flow from the treatment vault is routed to a drywell and a short infiltration trench. The drywell routinely fills up completely and backs up water into the street.

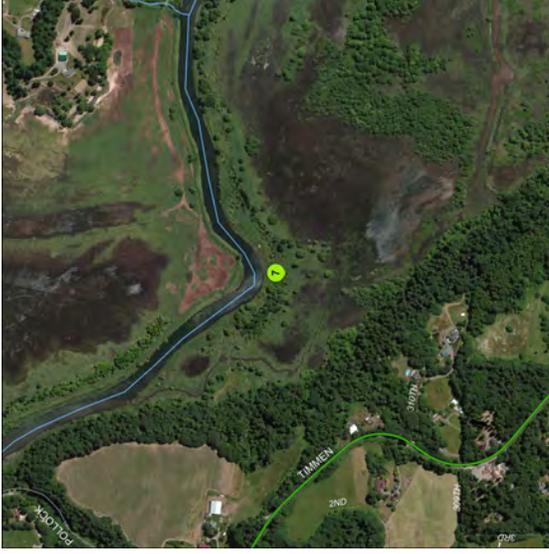
Schedule and Estimated Cost

| | |
|-----------------------------------|------------------|
| Project Status: | Design |
| Planned Construction Year: | 2013 |
| Engineering/Permitting: | \$64,000 |
| Property Acquisition: | \$0 |
| Construction: | \$100,000 |
| ESTIMATED TOTAL: | \$164,000 |

STORMWATER CAPITAL IMPROVEMENT PROGRAM

East Fork Lewis River Grant Reforestation

Vicinity Map



Project Summary

Site ID: CP-161 **Subwatershed:** East Fork Lewis (r.m. 03.19)
Work Order Number: GG2012-04 **Location:** Vicinity of NW Pollock Rd and NW Timmen Rd (Parcel No. 211474000)
Project Manager: Travis Goddard

Description: Plant native trees and shrubs on approximately 10 acres of county-owned land along the East Fork Lewis River.

Basis: This project re-establishes native vegetation along the East Fork Lewis River Greenway, adjacent to the LaCenter Bottoms wildlife area. The East Fork is subject to a temperature TMDL, with the highest temperatures typically recorded in the lower watershed in the vicinity of the project area. The project improves long-term shade conditions in an East Fork tributary and the floodplain area within this reach. The East Fork is a regional priority for salmon recovery; improving wetlands and riparian forest in the lower watershed is recognized as a priority management technique.

Site Photo



Schedule and Estimated Cost

| | |
|-----------------------------------|------------------|
| Project Status: | Design |
| Planned Construction Year: | 2013 |
| Engineering/Permitting: | \$0 |
| Property Acquisition: | \$0 |
| Construction: | \$103,000 |
| ESTIMATED TOTAL: | \$103,000 |

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Zimmerly DIF Grant Reforestation Project

Vicinity Map



Site Photo



Project Summary

Site ID: OS-41 **Subwatershed:** East Fork Lewis (r.m. 03.19)
Work Order Number: GG1204 **Location:** NE Bjur Rd, north of NE 269th St (Parcel No. 212103000)
Project Manager: Travis Goddard

Description: Plant native trees and shrubs on approximately 15 acres of county owned land.

Basis: This project re-establishes native vegetation along the East Fork Lewis River Greenway. The East Fork is subject to a temperature TMDL, and the project location along a tributary stream is expected to improve long-term shade conditions. The East Fork is a regional priority for salmon recovery; improving wetlands and riparian forest in the lower watershed is recognized as a priority management technique.

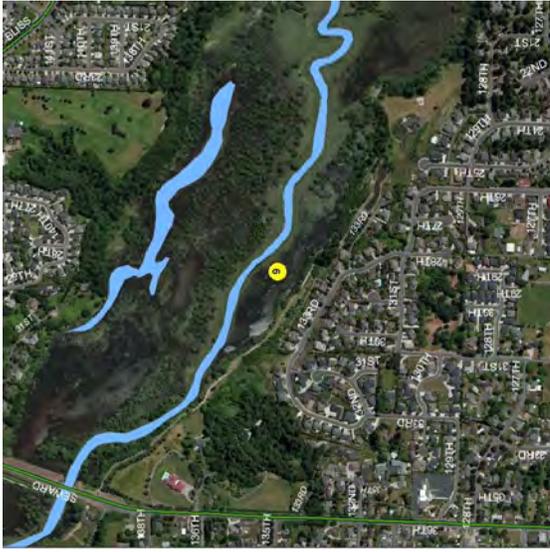
Schedule and Estimated Cost

| | |
|-----------------------------------|------------------|
| Project Status: | Design |
| Planned Construction Year: | 2013 |
| Engineering/Permitting: | \$0 |
| Property Acquisition: | \$0 |
| Construction: | \$146,000 |
| ESTIMATED TOTAL: | \$146,000 |

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Salmon Creek Greenway 12 Reforestation

Vicinity Map



Project Summary

Site ID: OS-243 **Subwatershed:** Salmon Creek (r.m. 03.83)
Work Order Number: GG1201 **Location:** In the vicinity of NW 133rd St & NW 28th Ave (Parcel No. 187564000)
Project Manager: Travis Goddard

Description: Plant native trees and shrubs on county owned land along lower Salmon Creek.
Basis: Salmon Creek is a moderate priority for regional salmon recovery and also subject to the Salmon Creek temperature TMDL. The project improves shading and riparian habitat along the Salmon Creek Greenway in support of both efforts.

Site Photo



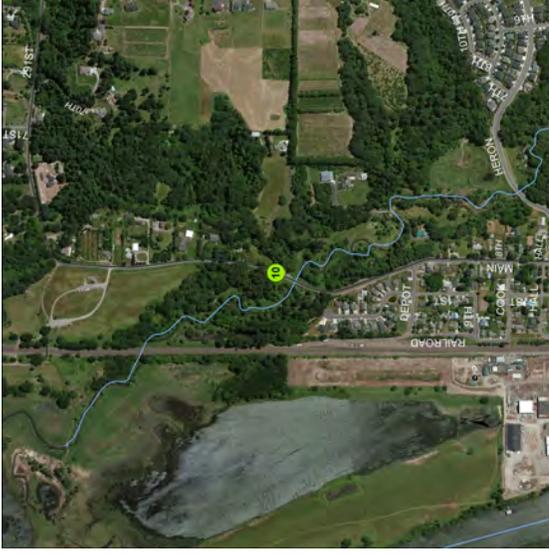
Schedule and Estimated Cost

| | |
|-----------------------------------|------------------|
| Project Status: | Design |
| Planned Construction Year: | 2013 |
| Engineering/Permitting: | \$0 |
| Property Acquisition: | \$0 |
| Construction: | \$145,000 |
| ESTIMATED TOTAL: | \$145,000 |

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Gee Creek Tributary Acquisition

Vicinity Map



Site Photo

Project Summary

Site ID: CP-171 **Subwatershed:** Gee Creek (Lower)
Work Order Number: TBD **Location:** N Main Avenue @ Gee Creek (Parcel No. 218238000)
Project Manager: Pat Lee

Description: Acquire riparian corridor with mature trees adjacent to Ridgecrest Park (20 acres)
Basis: This project acquires approximately 20 acres along the Gee Creek Greenway between Abrams Park and the Ridgefield National Wildlife Refuge. The project protects important riparian habitat and facilitates construction of an off-road trail connecting downtown Ridgfield and the Refuge as called for in the City of Ridgefield Parks and Recreation Comprehensive Plan.

Schedule and Estimated Cost

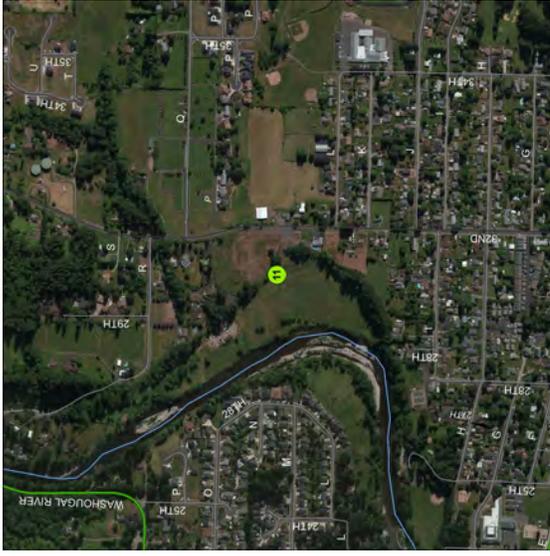
| | |
|-----------------------------------|------------------|
| Project Status: | Planning |
| Planned Construction Year: | 2013 |
| Engineering/Permitting: | \$0 |
| Property Acquisition: | \$374,000 |
| Construction: | \$0 |
| ESTIMATED TOTAL: | \$374,000 |

**NO IMAGE
AVAILABLE**

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Lower Washougal Schmid Acquisition

Vicinity Map



Project Summary

Site ID: CP-173 **Subwatershed:** Washougal (Lower)
Work Order Number: TBD **Location:** Near 32nd Avenue & L Street (Parcel No. 131880000)
Project Manager: Pat Lee

Description: Acquire 20.65 acres of land, most of it in the floodplain of the Washougal River, just inside the Washougal city limits off 32nd Avenue.

Basis: This property represents an extremely rare opportunity to conserve 20 acres of habitat and potential park land along the Washougal River. This property contains the largest undeveloped section of river frontage on the lower Washougal River. This section of the Washougal is ranked as tier one for protection and restoration of salmon species by the Lower Columbia Fish Recovery Board. The floodplain portion of the property also supports many terrestrial and avian species, while the upland section of the property along 32nd Street is highly desirable from a public parks perspective and is directly in line with the City of Washougal's Comprehensive Parks Plan.

Site Photo



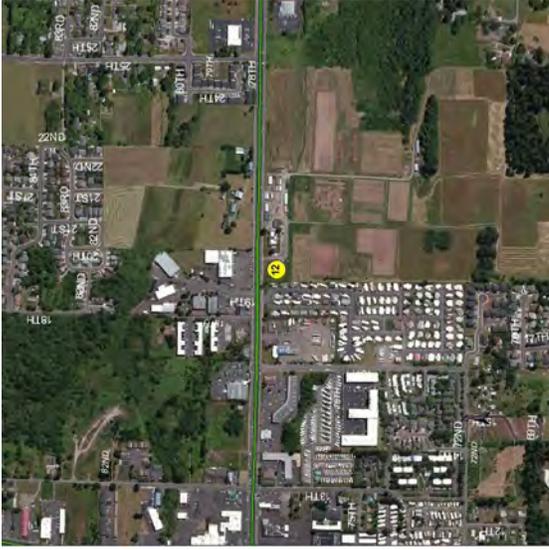
Schedule and Estimated Cost

| | |
|-----------------------------------|------------------|
| Project Status: | Planning |
| Planned Construction Year: | 2013 |
| Engineering/Permitting: | \$0 |
| Property Acquisition: | \$500,000 |
| Construction: | \$0 |
| ESTIMATED TOTAL: | \$500,000 |

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Heritage Farm Parking Lot LID Project

Vicinity Map



Project Summary

Site ID: CP-94 **Subwatershed:** Cougar Creek
Work Order Number: 007485 **Location:** NE 78th Street, East of NE 19th Court
Project Manager: Laura Pederson

Description: The master plan developed for Heritage Farm includes a new parking lot on approximately 0.7 acres of vacant land along 78th Street, west of the administration building. This project will incorporate LID techniques to manage on-site stormwater runoff.

Basis: Cougar Creek is heavily urbanized and highly impacted by increased stormwater flows. The project is located at the headwaters where increased infiltration and retention of stormwater is most beneficial. All of the parking lot stormwater will be managed on-site, significantly reducing stormwater runoff to Cougar Creek. The project is an opportunity to showcase and promote sustainable stormwater management practices.

Site Photo



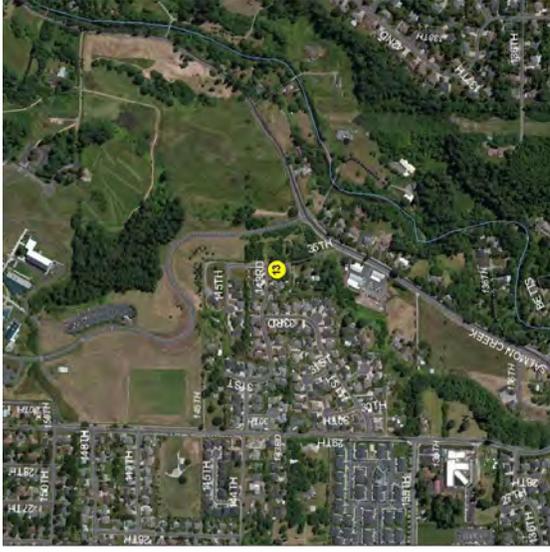
Schedule and Estimated Cost

| | |
|-----------------------------------|------------------|
| Project Status: | Design |
| Planned Construction Year: | 2014 |
| Engineering/Permitting: | \$88,000 |
| Property Acquisition: | \$0 |
| Construction: | \$492,000 |
| ESTIMATED TOTAL: | \$580,000 |

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Avalon Meadows SWF Repair

Vicinity Map



Project Summary

Site ID: CP-65 **Subwatershed:** Salmon Creek (r.m. 03.83)
Work Order Number: TBD **Location:** NE 143rd St & NE 35th Ave; Parcel No. 118255928
Project Manager: TBD

Description: This project will remove the existing biofiltration swale and construct a bioretention facility to provide water quality treatment.

Basis: Avalon Meadows is a poorly performing facility serving a 7.5 acre residential subdivision in the lower Salmon Creek watershed. Salmon Creek has degraded water quality, is subject to multiple TMDLs, and is a regional priority for salmon recovery. The facility is very near the mainstem of Salmon Creek and discharges urban runoff with no other viable location for treatment.

Site Photo



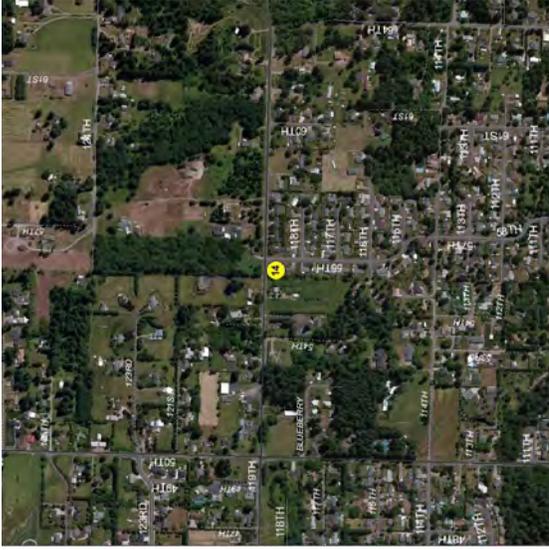
Schedule and Estimated Cost

| | |
|-----------------------------------|------------------|
| Project Status: | Planning |
| Planned Construction Year: | 2014 |
| Engineering/Permitting: | \$50,000 |
| Property Acquisition: | \$0 |
| Construction: | \$169,000 |
| ESTIMATED TOTAL: | \$219,000 |

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Tay Terrace Subdivision UIC Retrofit

Vicinity Map



Site Photo



Project Summary

Site ID: OS-74 **Subwatershed:** Salmon Creek (r.m. 03.83)
Work Order Number: TBD **Location:** NE 119th St & NE 56th Ave
Project Manager: Troy Pierce

Description: This project will construct up to 8 curb extensions upstream of the existing catchbasins along NE 56th Avenue, located between NE 116th Street and NE 119th Street, to provide water quality treatment before stormwater runoff is discharged to the existing infiltration system (three drywells and infiltration pipes). The project will replace the existing drywells with new wells to improve infiltration capacity and provide adequate separation between these structures and the groundwater table. Alternatively, the project may replace the existing drywell/infiltration pipe system with a conveyance pipe within NE 56 Avenue right-of-way and construct a new stormwater facility (bioretention/pond) inside a county owned parcel located south of NE 119th Street and west of NE 56th Avenue.

Basis: This project addresses three high-risk drywells located in an area with vulnerable groundwater resources. Pollutants of particular concern include total and suspended solids, nutrients, metals, and hydrocarbons. The project is located in the lower main stem Salmon Creek watershed, an area with multiple TMDLs. The 2010 Clark County Stream Health Report highlights increased infiltration and retention of stormwater runoff throughout the Salmon Creek watershed as one of the most effective means to protect stream channels and maintain base flow in this salmon-bearing system.

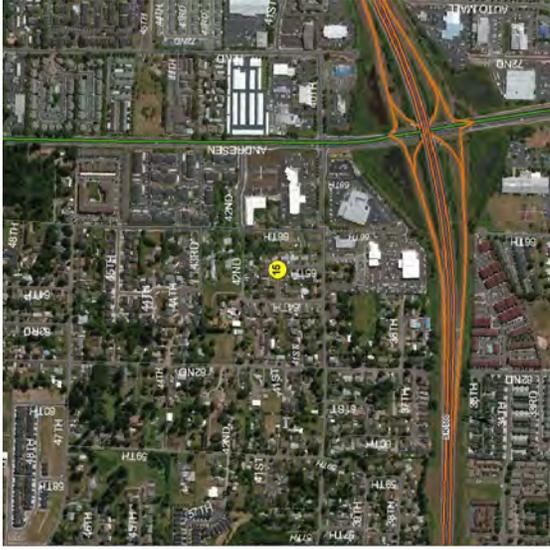
Schedule and Estimated Cost

| | |
|-----------------------------------|------------------|
| Project Status: | Planning |
| Planned Construction Year: | 2014 |
| Engineering/Permitting: | \$89,000 |
| Property Acquisition: | \$0 |
| Construction: | \$514,000 |
| ESTIMATED TOTAL: | \$603,000 |

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Rosemary Ridge UIC Retrofit

Vicinity Map



Project Summary

Site ID: CP-155 **Subwatershed:** Lower Burnt Bridge Creek
Work Order Number: TBD **Location:** Vicinity of NE 65th Avenue & NE 41st Street
Project Manager: TBD

Description: Install 6 curb extension rain gardens upstream of existing drywells within the subdivision to provide pre-treatment to the runoff prior to discharging to groundwater.

Basis: Water routed to drywells directly recharges the Pleistocene gravel aquifer that is the water source for 50 to 60 percent of the residents in urban Clark County. Rosemary Ridge subdivision is situated in a high groundwater area and is also within a designated well-head protection zone. Due to the lack of sufficient groundwater separation and pre-treatment, untreated stormwater discharge is adversely impacting the groundwater quality. The project improves water quality in 303(d) listed water bodies, while supporting groundwater protection requirements under RCW 90.48 and Chapter 173-200 WAC.

Site Photo



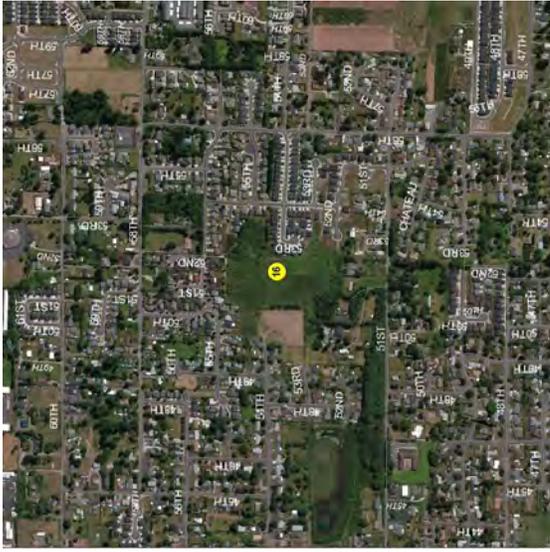
Schedule and Estimated Cost

| | |
|-----------------------------------|-----------------|
| Project Status: | Planning |
| Planned Construction Year: | 2014 |
| Engineering/Permitting: | \$50,000 |
| Property Acquisition: | \$0 |
| Construction: | \$46,000 |
| ESTIMATED TOTAL: | \$96,000 |

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Thomas Wetland East

Vicinity Map



Project Summary

Site ID: CP-2 **Subwatershed:** Lower Burnt Bridge Creek
Work Order Number: 401972 **Location:** NE 55th Street and NE 53rd Avenue
Project Manager: Scott Fakler

Description: The new stormwater facility will serve approximately 125 acres of a fully developed residential area. The project will excavate and lower the existing ditched wetland to construct a stormwater wetland pond within the south portion of the county property. The lowered ground surface will provide improved hydrology for wetland plants. The additional storage developed will reduce peak flows/volumes that would eventually discharge to Burnt Bridge Creek. The project will also provide recreational opportunities such as walking paths that will connect neighborhoods and nearby parks.

Basis: Burnt Bridge Creek is a heavily developed, significantly impacted watershed that received a 'poor' score for water quality in the 2010 Clark County Stream Health Report. The report highlights the need for protection of remaining headwater and stream corridor wetlands, and suggests increasing infiltration and retention of stormwater runoff whenever possible. The project is a regional watershed improvement to rehabilitate a ditched wetland, restoring the natural hydrology and providing water quality treatment for an area with limited stormwater detention and treatment. The project also addresses general recommendations of the 1995 Burnt Bridge Creek Watershed Plan to replace wetlands and open water areas.

Site Photo



Schedule and Estimated Cost

| | |
|-----------------------------------|--------------------|
| Project Status: | Design |
| Planned Construction Year: | 2015 |
| Engineering/Permitting: | \$201,000 |
| Property Acquisition: | \$474,000 |
| Construction: | \$1,545,000 |
| ESTIMATED TOTAL: | \$2,220,000 |

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Flume Creek Acquisition

Vicinity Map



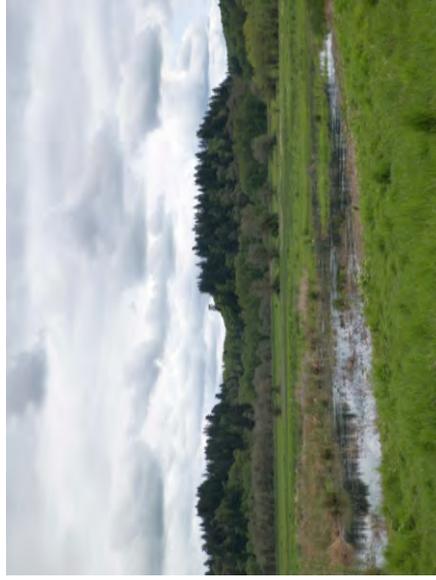
Project Summary

Site ID: CP-170 **Subwatershed:** Flume Creek
Work Order Number: TBD **Location:** NW 234th Street, west of NW 51st Ave (Parcel No. 220031000)
Project Manager: Pat Lee

Description: Acquire 165 acres of riparian and mature forest habitat in the lower Flume Creek watershed.

Basis: The property is extensively covered by Priority Habitat and Species polygons for both riparian and non-riparian priority habitat. Non-riparian priority habitat values include "Biodiversity Area and Corridor"; waterfowl concentrations; and Oregon White Oak. PHS mapping also identifies use by Sandhill Cranes. Flume Creek is presumed to support ESA-listed coho and steelhead. The project site is located on the Lake River Water Trail. The Flume Creek drainage includes additional vacant parcels which might allow for futures phases of land conservation to support both habitat and farm land preservation.

Site Photo



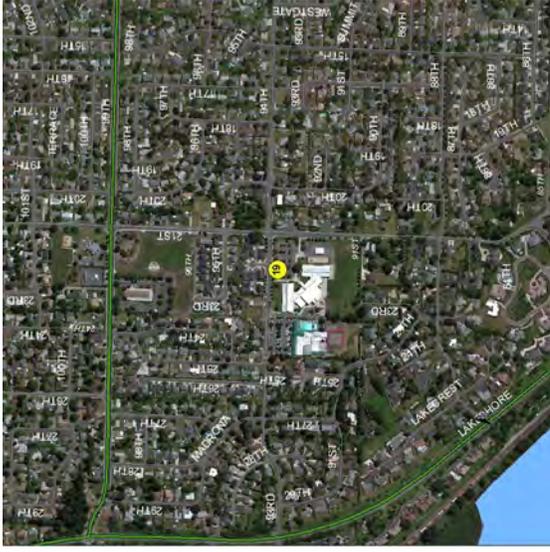
Schedule and Estimated Cost

| | |
|-----------------------------------|--------------------|
| Project Status: | Planning |
| Planned Construction Year: | 2014 |
| Engineering/Permitting: | \$0 |
| Property Acquisition: | \$2,212,000 |
| Construction: | \$0 |
| ESTIMATED TOTAL: | \$2,212,000 |

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Lakeshore Elementary School SWF

Vicinity Map



Project Summary

Site ID: CP-104 **Subwatershed:** Lakeshore
Work Order Number: TBD **Location:** NW 94th Street & NW 21st Ave
Project Manager: TBD

Description: This project will construct parking lot swales and bioretention facilities inside the Lakeshore Elementary School property to provide water quality treatment. The project also intends to reduce runoff volumes that currently leave the school site to help minimize localized flooding at the west end of NE 94th Street.

Basis: The Lakeshore subwatershed drains directly to Vancouver Lake, a regionally significant water body with multiple 303(d) listings. The lake is the subject of significant research and management efforts through the Vancouver Lake Watershed Partnership. Runoff from rooftops and high-traffic parking areas at Lakeshore Elementary receives very limited water quality treatment prior to discharging to Vancouver Lake. Although flow control is not required in this area, the downstream drainage system is near capacity; reduction of runoff from the project site serves to decrease pressure on the downstream system.

Site Photo



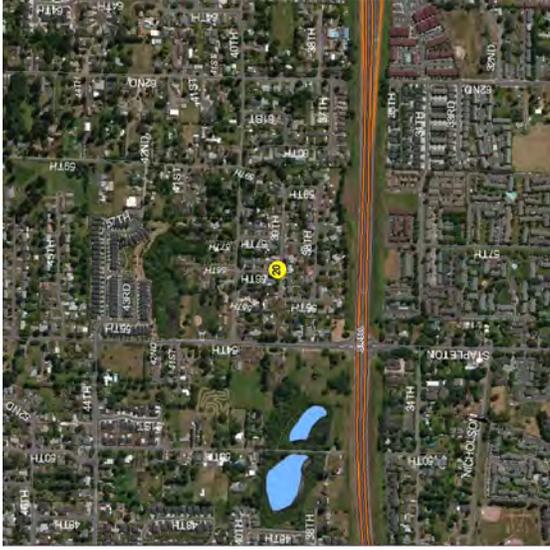
Schedule and Estimated Cost

| | |
|-----------------------------------|------------------|
| Project Status: | Planning |
| Planned Construction Year: | 2016 |
| Engineering/Permitting: | \$80,000 |
| Property Acquisition: | \$0 |
| Construction: | \$367,000 |
| ESTIMATED TOTAL: | \$447,000 |

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Anderson UIC Retrofit

Vicinity Map



Project Summary

Site ID: CP-154 **Subwatershed:** Lower Burnt Bridge Creek
Work Order Number: TBD **Location:** Vicinity of NE 56th Avenue & NE 39th Street
Project Manager: TBD

Description: Install 12 curb extension rain gardens upstream of the existing drywells within the subdivision to treat the runoff prior to discharging to the drywells.

Basis: Water routed to drywells directly recharges the Pleistocene gravel aquifer that is the water source for 50 to 60 percent of the residents in urban Clark County. Anderson subdivision is situated in a high groundwater area and is also within a designated well-head protection zone. Due to the lack of sufficient groundwater separation and pre-treatment, untreated stormwater discharge is adversely impacting groundwater quality. The project improves water quality in 303(d) listed water bodies, while supporting groundwater protection requirements under RCW 90.48 and Chapter 173-200 WAC.

Site Photo



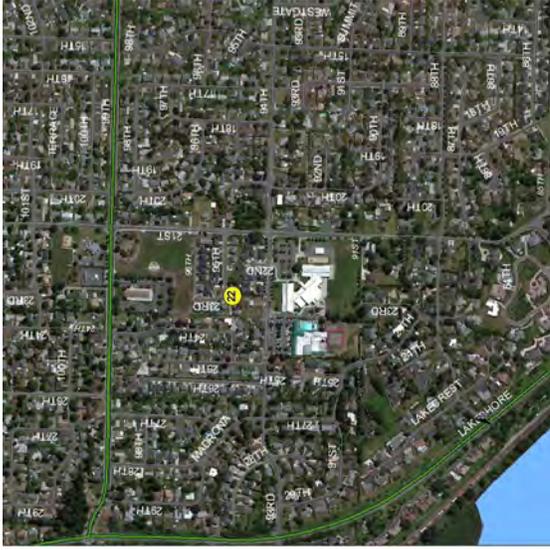
Schedule and Estimated Cost

| | |
|-----------------------------------|------------------|
| Project Status: | Planning |
| Planned Construction Year: | 2015 |
| Engineering/Permitting: | \$50,000 |
| Property Acquisition: | \$0 |
| Construction: | \$120,000 |
| ESTIMATED TOTAL: | \$170,000 |

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Andys Acres (A) SWF Repair

Vicinity Map



Project Summary

Site ID: CP-151 **Subwatershed:** Lakeshore

Work Order Number: TBD **Location:** NW 95th Street & NW 23rd Avenue

Project Manager: TBD

Description: This project will replace two existing catchbasins with catchbasins containing 4 filter cartridges to provide water quality treatment. Alternatively, existing manholes may be modified to include filter cartridges.

Basis: Much of the Lakeshore subwatershed was developed with minimal water quality treatment, leaving a significant need for water quality retrofitting. This project area drains directly to Vancouver Lake with no water quality treatment; Vancouver Lake is 303(d) listed for multiple water quality issues, and is the subject of extensive current research and planning for improved management.

Site Photo



Schedule and Estimated Cost

| | |
|-----------------------------------|------------------|
| Project Status: | Planning |
| Planned Construction Year: | 2016 |
| Engineering/Permitting: | \$50,000 |
| Property Acquisition: | \$0 |
| Construction: | \$77,000 |
| ESTIMATED TOTAL: | \$127,000 |

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Groenveld Acquisition

Vicinity Map



Project Summary

Site ID: CP-172 **Subwatershed:** Columbia Slope
Work Order Number: TBD **Location:** SE Evergreen HWY near 192nd Ave (Parcel No. 125654000)
Project Manager: Pat Lee

Description: Acquire a 16-acre property in the Columbia Slope Acquisition Corridor on the river side of SR-14 near the 192nd Avenue interchange.

Basis: The Conservation Areas Acquisition Plan identifies the Columbia South Slope as a target area, with a goal of acquiring 15-25 acres. The site fulfills the greenway plan elements due to the inclusion of Columbia River waterfront and associated uplands. This is a joint acquisition with Vancouver-Clark Parks and assists in meeting park acreage standards in a highly developed area where potential acquisitions are limited (Parks District 4).

Site Photo



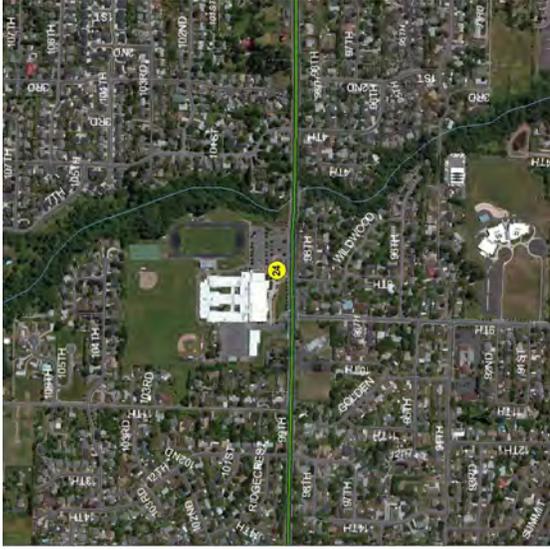
Schedule and Estimated Cost

| | |
|-----------------------------------|------------------|
| Project Status: | Planning |
| Planned Construction Year: | 2014 |
| Engineering/Permitting: | \$0 |
| Property Acquisition: | \$200,000 |
| Construction: | \$0 |
| ESTIMATED TOTAL: | \$200,000 |

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Columbia River High School SWF Retrofit

Vicinity Map



Project Summary

Site ID: CP-134 **Subwatershed:** Cougar Creek
Work Order Number: TBD **Location:** NW 99th Street and NW 9th Ave
Project Manager: TBD

Description: Currently, there are two large parking lots located on the eastside and westside of the school building. This project will construct LID structures such as parking lot swales and rain gardens to provide water quality treatment before stormwater runoff is discharged to Cougar Creek.

Basis: Cougar Creek is a significantly impacted tributary to Salmon Creek, and lags behind documented water quality improvements in the larger watershed. The creek is subject to multiple TMDLs. This project reduces fecal coliform, turbidity and nutrient inputs to Cougar Creek in support of these TMDLs, reduces toxin loading to a salmon-bearing stream system, and limits documented erosion in a susceptible stream channel.

Site Photo



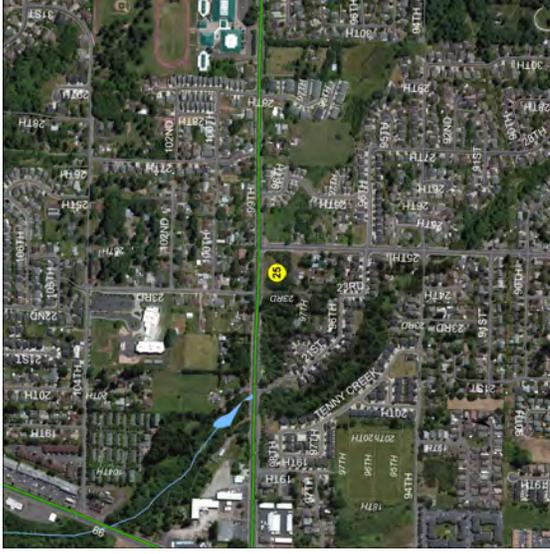
Schedule and Estimated Cost

| | |
|-----------------------------------|------------------|
| Project Status: | Planning |
| Planned Construction Year: | 2015 |
| Engineering/Permitting: | \$84,000 |
| Property Acquisition: | \$0 |
| Construction: | \$237,000 |
| ESTIMATED TOTAL: | \$321,000 |

STORMWATER CAPITAL IMPROVEMENT PROGRAM

NE 99th St & 25th Ave SWF

Vicinity Map



Project Summary

Site ID: OS-72 **Subwatershed:** Salmon Creek (r.m. 03.83)
Work Order Number: 401902 **Location:** NE 99th St & NE 25th Ave
Project Manager: Don Andrews

Description: This project will replace a failed biofiltration swale with a bioretention facility or a stormwater wetland to provide enhanced water quality treatment and increased detention storage. The facility will treat runoff generated by approximately 5 acres of NE 99th Street. This will result in removing sediment that would otherwise be discharged to Swan Pond and Tenny Creek.

Basis: Tenny Creek has documented water quality problems and drains to lower Salmon Creek, a salmon-bearing stream subject to multiple active TMDLs. Water quality treatment is lacking in many areas, highlighting the importance of maximizing treatment in existing underperforming facilities where feasible.

Site Photo



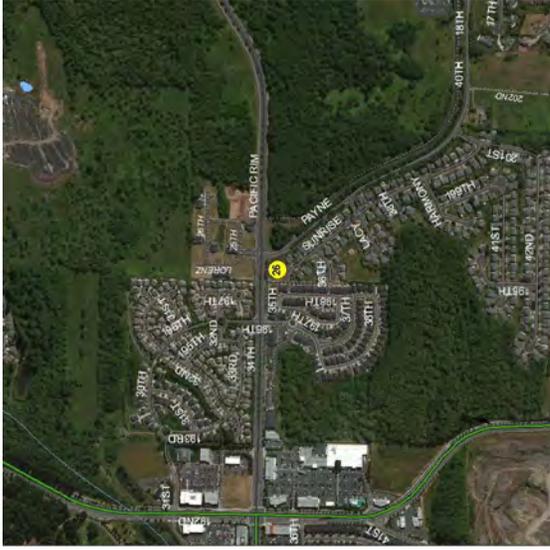
Schedule and Estimated Cost

| | |
|-----------------------------------|------------------|
| Project Status: | Planning |
| Planned Construction Year: | 2017 |
| Engineering/Permitting: | \$95,000 |
| Property Acquisition: | \$1,000 |
| Construction: | \$731,000 |
| ESTIMATED TOTAL: | \$827,000 |

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Winchester Hills I Tract A SWF Repair/Retrofit

Vicinity Map



Project Summary

Site ID: CP-142 **Subwatershed:** Columbia Slope
Work Order Number: TBD **Location:** SE 34th Street & Payne Rd
Project Manager: TBD

Description: Reconstruct the bio-swale with a minimum of 4 feet bottom width and 2:1 side slopes. Place a liner underneath the facility to keep groundwater out. Construct a sedimentation trap and install hand placed riprap at the end of bio swale. Flush out the existing 24-inch detention pipe, clean the bottom of North pond to its original grade, and remove sediment/debris from existing flow control structure.

Basis: The existing bio swale is wet most of the time due to groundwater exfiltration and does not support healthy grass growth. The swale is much narrower than intended in the original design. These conditions result in ineffective water quality treatment for 5 acres of developed area.

Site Photo



Schedule and Estimated Cost

| | |
|-----------------------------------|-----------------|
| Project Status: | Planning |
| Planned Construction Year: | 2017 |
| Engineering/Permitting: | \$25,000 |
| Property Acquisition: | \$0 |
| Construction: | \$47,000 |
| ESTIMATED TOTAL: | \$72,000 |

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Whipple Creek Trib 6.44 Habitat Improvement

Vicinity Map



Project Summary

Site ID: CP-166 **Subwatershed:** Whipple Creek (Upper)
Work Order Number: TBD **Location:** Tributary channel North of NE 164th Street (Parcel No. 182144000)
Project Manager: TBD

Description: Install in-stream structures to reduce erosion by re-directing stream flow. Amend the soil, using erosion control and biostabilization methods to stabilize exposed soil. Remove invasive species and replant the riparian buffers with native vegetation.

Basis: This project is in a riparian habitat corridor located on a headwater stream in the Whipple Creek watershed. The project is part of a package of stormwater improvements in and around the Clark County Fairgrounds aimed at reducing erosive flows in Whipple Creek and rehabilitating past channel damage. The project improves stability in a steep and historically eroded channel. Site reconnaissance and a stream assessment completed by Clark County engineering staff showed significant need for a channel stabilization project in this tributary.

Site Photo



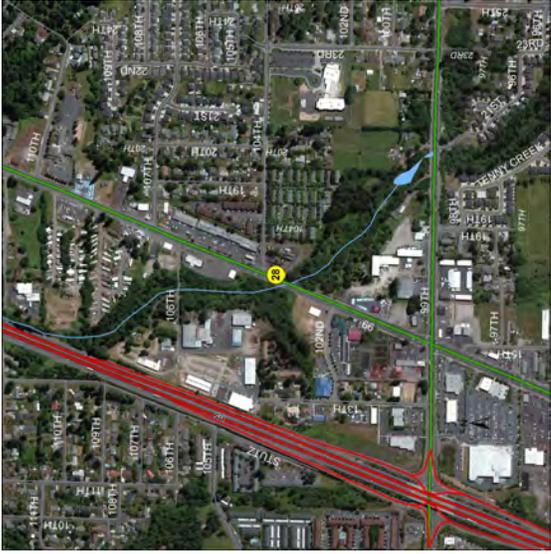
Schedule and Estimated Cost

| | |
|-----------------------------------|------------------|
| Project Status: | Planning |
| Planned Construction Year: | TBD |
| Engineering/Permitting: | \$129,080 |
| Property Acquisition: | \$0 |
| Construction: | \$708,920 |
| ESTIMATED TOTAL: | \$838,000 |

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Highway 99 @ Tenny Creek WQ Retrofit

Vicinity Map



Site Photo



Project Summary

Site ID: CP-22 **Subwatershed:** Salmon Creek (r.m. 03.83)
Work Order Number: TBD **Location:** Highway 99 at Tenny Creek
Project Manager: TBD

Description: This project will replace existing catchbasins along Highway 99 with Catchbasin StormFilters to treat stormwater runoff prior to discharging to Tenny Creek. As an alternative design, consider using UrbanGreen BioFilter. The UrbanGreen BioFilter may also include one or more StormFilter cartridges which provide reliable pollutant removal for the portion of the design storm that exceeds the capacity of the biofilter bay.

Basis: Highway 99 in the vicinity of Tenny Creek has no existing stormwater treatment infrastructure and discharges untreated stormwater from a high traffic corridor directly to the stream. Tenny Creek flows into Salmon Creek less than a mile downstream from Highway 99, flushing roadway pollutants into a salmon-bearing stream identified as a moderate regional recovery priority. Salmon Creek is also subject to multiple TMDLs; the increased water quality treatment from this project directly supports TMDL goals in the watershed.

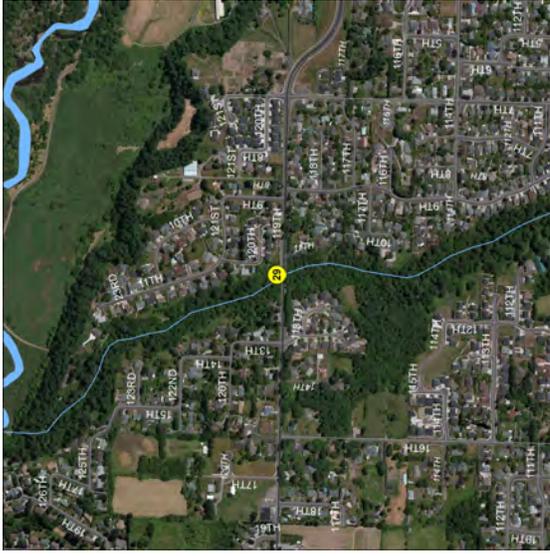
Schedule and Estimated Cost

| | |
|-----------------------------------|------------------|
| Project Status: | Planning |
| Planned Construction Year: | 2017 |
| Engineering/Permitting: | \$50,000 |
| Property Acquisition: | \$0 |
| Construction: | \$100,000 |
| ESTIMATED TOTAL: | \$150,000 |

STORMWATER CAPITAL IMPROVEMENT PROGRAM

NE 119th St @ Cougar Creek WQ Retrofit

Vicinity Map



Project Summary

Site ID: CP-17 **Subwatershed:** Cougar Creek
Work Order Number: TBD **Location:** NE 119th Street at Cougar Creek
Project Manager: TBD

Description: Replace existing catchbasins along NE 119th Street with Catchbasin StormFilters to treat stormwater runoff prior to discharging to Cougar Creek. As an alternative design, consider using UrbanGreen BioFilter. The UrbanGreen BioFilter may also include one or more StormFilter cartridges which provide reliable pollutant removal for the portion of the design storm that exceeds the capacity of the biofilter bay.

Basis: Cougar Creek has well-documented water quality degradation, and as a tributary to Salmon Creek is subject to multiple TMDLs. The project treats stormwater from NE 119th Street and a residential subdivision that is currently discharged directly to Cougar Creek with no water quality treatment.

Site Photo



Schedule and Estimated Cost

| | |
|-----------------------------------|------------------|
| Project Status: | Planning |
| Planned Construction Year: | 2017 |
| Engineering/Permitting: | \$50,000 |
| Property Acquisition: | \$0 |
| Construction: | \$100,000 |
| ESTIMATED TOTAL: | \$150,000 |

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Clark County Amphitheater Wetland Habitat Improvement

Vicinity Map



Project Summary

Site ID: CP-165 **Subwatershed:** Whipple Creek (Upper)
Work Order Number: TBD **Location:** Near northwest corner of parcel no. 182214000
Project Manager: TBD

Description: Rehabilitate Wetland Area#1 with a series of rain gardens and reforestation.

Basis: This project rehabilitates a degraded wetland at the headwaters of Whipple Creek. The project is part of a package of stormwater improvements in and around the Clark County Fairgrounds aimed at reducing erosive flows in Whipple Creek and rehabilitating past channel damage. The project improves wetland function and infiltration in a heavily developed headwater area.

Site Photo



Schedule and Estimated Cost

| | |
|-----------------------------------|------------------|
| Project Status: | Planning |
| Planned Construction Year: | 2017 |
| Engineering/Permitting: | \$95,000 |
| Property Acquisition: | \$0 |
| Construction: | \$283,000 |
| ESTIMATED TOTAL: | \$378,000 |

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Clark County Amphitheater SWF#4 Retrofit

Vicinity Map



Site Photo



Project Summary

Site ID: CP-24 **Subwatershed:** Whipple Creek (Upper)
Work Order Number: 402357 **Location:** NE 164th St, west of NE 6th Ave (Parcel No. 182148000)
Project Manager: TBD

Description: Replace the existing facility with a large wetpond to provide water quality treatment and greater detention storage for stormwater runoff from approximately 49 acres of mostly impervious drainage area. Install a modern flow control structure to more efficiently regulate outflows and help reduce erosion along the receiving tributary channel of Whipple Creek.

Basis: The project is part of a package of stormwater improvements in and around the Clark County Fairgrounds aimed at reducing erosive flows in Whipple Creek and rehabilitating past channel damage. The facility is located at the head of a Whipple Creek tributary. Basin assessments indicate the tributary is susceptible to erosion and large existing headcuts are present a short distance downstream of the project site. Hydraulic modeling suggests a high likelihood of increased erosion in this catchment as build-out occurs. Whipple Creek downstream of the project site has poor water quality, including high turbidity, as well as documented erosion problems.

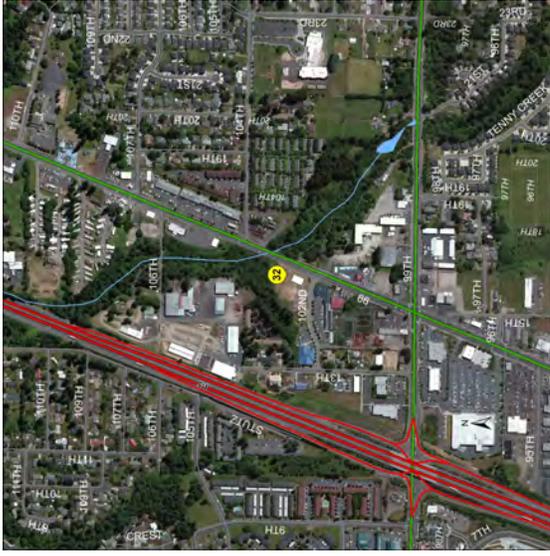
Schedule and Estimated Cost

| | |
|-----------------------------------|--------------------|
| Project Status: | Design |
| Planned Construction Year: | 2018 |
| Engineering/Permitting: | \$450,000 |
| Property Acquisition: | \$1,350,000 |
| Construction: | \$1,800,000 |
| ESTIMATED TOTAL: | \$1,800,000 |

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Highway 99 & NE 102nd St SWF

Vicinity Map



Project Summary

Site ID: CP-79 **Subwatershed:** Salmon Creek (r.m. 03.83)
Work Order Number: TBD **Location:** Highway 99 at NE 102nd Street; Parcel No. 117988000 & 117986015
Project Manager: TBD

Description: Purchase two privately owned parcels and build a new stormwater wetland/detention facility.

Basis: The large commercial drainage basin to be served by this facility currently has no stormwater management, discharging large amounts of untreated and undetained stormwater to lower Tenny Creek just upstream of the confluence with Salmon Creek. Salmon Creek is subject to multiple TMDLs and is a medium priority for regional salmon recovery. The increased stormwater detention and water quality treatment from this project directly support both of these watershed goals.

Site Photo



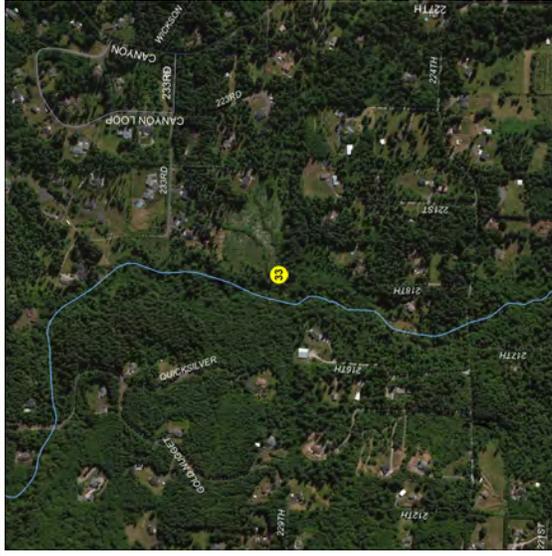
Schedule and Estimated Cost

Project Status: Screened
Planned Construction Year: 2018
Engineering/Permitting: \$60,000
Property Acquisition: \$285,000
Construction: \$367,000
ESTIMATED TOTAL: \$712,000

STORMWATER CAPITAL IMPROVEMENT PROGRAM

NE 229th St & NE 221st Ave SWF

Vicinity Map



Project Summary

Site ID: CP-83 **Subwatershed:** Rock Creek
Work Order Number: TBD **Location:** NE 229th St and NE 221st Ave; Parcel No. 236611016
Project Manager: TBD

Description: Purchase a private property and excavate flood plain bench and/or construct an off-line detention facility. The project may include wetland enhancement/reforestation.

Basis: The Rock Creek (Salmon Creek) subwatershed is a medium priority for regional salmon recovery and has been characterized by Ecology as an area where hydrologic processes should be protected. The drainage basin for this project has undergone significant clearing to accommodate rural residential development in the headwaters of Rock Creek. Drainage is primarily through roadside ditches; there is no water quality treatment or flow control. The project protects and improves headwater wetlands and riparian habitat while improving stormwater treatment and helping maintain summer stream flows through increased groundwater recharge.

Site Photo



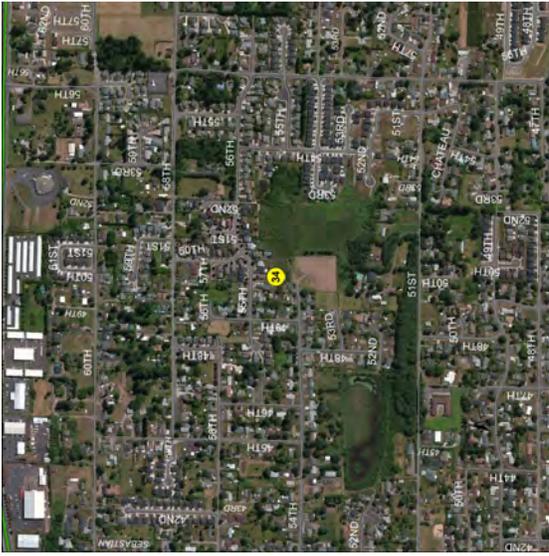
Schedule and Estimated Cost

| | |
|-----------------------------------|------------------|
| Project Status: | Screened |
| Planned Construction Year: | TBD |
| Engineering/Permitting: | \$60,000 |
| Property Acquisition: | \$494,000 |
| Construction: | \$335,000 |
| ESTIMATED TOTAL: | \$889,000 |

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Harvest Meadows SWF Repair/Retrofit

Vicinity Map



Project Summary

Site ID: CP-152 **Subwatershed:** Lower Burnt Bridge Creek
Work Order Number: TBD **Location:** NE 55th Street, East of NE 49th Avenue
Project Manager: TBD

Description: Construct a two cell wet pond or a stormwater wetland facility by replacing the existing detention pond to improve water quality and the hydrologic benefit of the facility.

Basis: Burnt Bridge Creek is a heavily developed, significantly impacted watershed that received a 'poor' score for water quality in the 2010 Clark County Stream Health Report and has well-documented erosion and stream channel degradation. Suggested stream health strategies for Burnt Bridge Creek include increasing infiltration and retention of stormwater runoff to replace lost watershed storage. The existing stormwater detention facility is located on a fairly large stormwater tract with no water quality component and a sub-standard flow control structure. Conversion to a two cell wet pond or a stormwater wetland will improve both water quality and flow control.

Site Photo



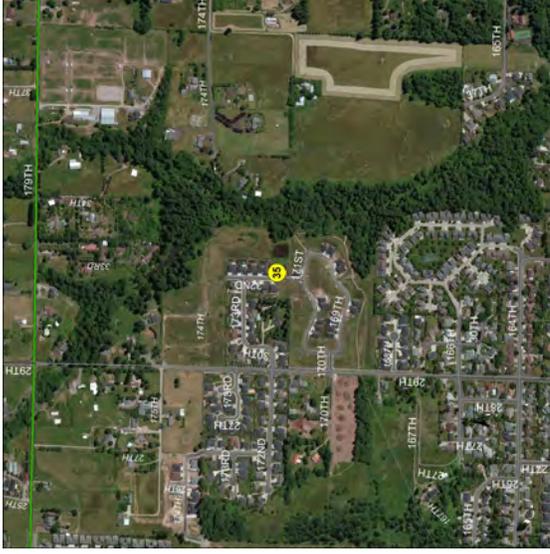
Schedule and Estimated Cost

| | |
|-----------------------------------|------------------|
| Project Status: | Screened |
| Planned Construction Year: | TBD |
| Engineering/Permitting: | \$60,000 |
| Property Acquisition: | \$0 |
| Construction: | \$100,000 |
| ESTIMATED TOTAL: | \$160,000 |

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Regency Park Phase 1 SWF Repair/Retrofit

Vicinity Map



Project Summary

Site ID: CP-148 **Subwatershed:** Mill Creek
Work Order Number: TBD **Location:** NE 32nd Ave, South of NE 173rd Street
Project Manager: TBD

Description: Replace the existing biofiltration swale with a wet swale or wetland swale to provide water quality treatment.

Basis: The existing bioswale is wet year-round due to the presence of base flow (springs) and subsequently provides limited water quality treatment.

Site Photo



Schedule and Estimated Cost

| | |
|-----------------------------------|------------------|
| Project Status: | Screened |
| Planned Construction Year: | TBD |
| Engineering/Permitting: | \$60,000 |
| Property Acquisition: | \$0 |
| Construction: | \$100,000 |
| ESTIMATED TOTAL: | \$160,000 |