# CITY OF STANWOOD

# 2015 STORMWATER COMPREHENSIVE PLAN

**City of Stanwood**
Public Works Department
10220 270th Street NW
Stanwood, WA 98292
360-629-2181

**Mayor**
Leonard Kelley

**City Manager**
Deborah Knight

**Public Works Director**
Kevin Hushagen

**Community Development Director**
Ryan Larsen

*Prepared By:*

PACE Engineers, Inc.
11255 Kirkland Way, Suite 300
Kirkland, Washington 98033-6715
425.827.2014

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# ACKNOWLEDGEMENTS

**City of Stanwood, Washington**

Leonard Kelley, Mayor

Rob Johnson, City Council Position 1
Arne Wennerberg, City Council Position 2
Rick Randall, City Council Position 3
Matt McCune, City Council Position 4
Larry Sather, City Council Position 5
Conrad Ryer, City Council Position 6
Dottie Gorsuch, City Council Position 7

Carly Ruacho, City Planner
Lisa Sokolik, Public Works Administrative Assistant
Trevor Harrison, Operation and Maintenance Lead

**PACE Engineers, Inc.**
Joe Simmler, PhD, Senior Principal Engineer
Kenneth Nilsen, PE, Vice President
Jessica Christofferson, EIT, Stormwater Engineer
John Forba, PE, Project Engineer
Josh Miller, GIS Analyst
Brenda Elder, GIS Analyst
April Cook, Project Administrator

**Northwest Hydraulic Consultants**
Derek Stuart, PE, Project Engineer

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# CERTIFICATE OF ENGINEER

2015 Stormwater Comprehensive Plan
City of Stanwood, Washington

This report has been prepared by, or under the direction of, the following registered professional engineers, licensed in accordance with the laws of the State of Washington to practice in the State of Washington:


Kenneth H. Nilsen, PE
Vice President
PACE Engineers, Inc.

Joseph Simmler, PhD
Senior Principal Engineer
PACE Engineers, Inc.

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# PREFACE

The City of Stanwood (City) is faced with a number of significant stormwater management (SWM) challenges, including an undersized, aging infrastructure and numerous regional and local flooding problems. To assist the City in addressing these challenges, PACE Engineers, Inc., (PACE) has been retained to review the City's existing Stormwater Management Program (SWMP) and develop a Stormwater Comprehensive Plan (SCP). The purpose of this SCP is to provide the City with a planning document that anticipates the need for compliance with various local, state, and federal stormwater regulatory requirements, most specifically the National Pollutant Discharge Elimination System (NPDES) Western Washington Phase II Permit (Permit), and allows the City to plan for, add, upgrade, and/or replace critical parts of the City's system of natural and manmade stormwater facilities. One of the primary products of this stormwater planning will be the development of an updated, prioritized list of stormwater Capital Improvement Program (CIP) projects that reduces flooding and property damage throughout the City.

This SCP evaluates the City's existing SWMP, including facility infrastructure and programmatic activities such as annual maintenance, and provides recommendations to improve the capacity of the City's stormwater collection, conveyance, and disposal/discharge system. It also includes an implementation plan with annual costs to satisfy the future requirements of the National Pollutant Discharge Elimination System (NPDES) Western Washington Phase II Permit (Permit) and initiate the City's CIP projects. The City is not currently under an NPDES Permit; however, it is anticipating the need for compliance over the next several years. It is using compliance with the Permit as a measure of the adequacy and effectiveness of its existing Stormwater Management Program and supporting capital facilities.

The resulting SCP defines the City's SWMP needs by setting priorities and identifying corresponding stormwater related activities, staffing, equipment, capital improvements, and annual revenue needs, including Stormwater Utility fees. A long-term implementation plan, in the form of annualized budgets for staffing, capital projects, and future regulatory compliance activities has been developed to help guide the process.

This stormwater planning process is being complimented by a corresponding financial review and Drainage Utility rate study that is being conducted by another consultant. This stormwater planning process and resulting infrastructure management plan is part of a citywide land use and infrastructure planning process. The broader citywide process also involves water, sewer, and transportation infrastructure planning and is part of a unified effort to formulate an updated Growth Management Plan for the City by the end of the year.

This final report summarizes the technical information and memoranda that were prepared during the SWMP planning process. Technical information, geodatabase mapping, and supporting studies and analyses are presented in the following technical Appendices:

- Appendix A – Supporting Technical Documents
  - A.1: City of Stanwood SWMP Mission and Vision
  - A.2: City of Stanwood SWMP Policies
  - A.3: 2012 List of Detention Facilities
  - A.4: WRIA 5 Ecology Publication #11-11-010, August 2012
  - A.5: Memorandum of Understanding between City of Stanwood and Diking District 7
  - A.6: Snohomish County R/D Pond Maintenance Agreement
  - A.7: Memorandum of Understanding between City of Stanwood and Stillaguamish Tribe for Watershed Improvements, May 2013
  - A.8: NHC Technical Memorandum to PACE Engineers, Inc., "Modeling Needs Recommendations," March 2014
  - A.9: SWM Data List Request to City, December 2013
  - A.10: SWM Questionnaire, March 2014
  - A.11: SWM Public Survey, January 2014
  - A.12: Public Survey Selection of Mailed Responses, January 2014
  - A.13: Public Survey Electronic Forms
  - A.14: Public Survey Response Compilation
  - A.15: 2004 Budget Summary, Drainage Fund
  - A.16: Drainage Concerns Summary
- Appendix B – SWMP and NPDES Permit II Regulatory Gap Analysis Results

To assist in the reading of the document, *lists of abbreviations and definitions* have been provided in the front of the document.

This project was funded and managed through the City's Drainage Utility, and is annually administered by the Public Works Department. Input and direction were also periodically received from the City's Public Works Committee.

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# APPENDICES

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A.3: 2012 List of Regional Detention Facilities
A.4: WRIA 5 Ecology Publication #11-11-010, August 2012
A.5: Memorandum of Understanding between City of Stanwood and Diking District 7
A.6: Snohomish County R/D Pond Maintenance Agreement
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A.13: Public Survey Electronic Forms
A.14: Public Survey Response Compilation
A.15: 2004 Budget Summary, Drainage Fund
A.16: Drainage Concerns Summary

## APPENDIX B – SWM PROGRAM AND NPDES PERMIT II REGULATORY GAP ANALYSIS RESULTS

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# ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| AKART | All Known, Available, and Reasonable Methods of Prevention, Control, and Treatment |
| BMP | Best Management Practices |
| CESCL | Certified Erosion and Sediment Control Lead |
| CESCP | Contractor's Erosion and Sediment Control Plan |
| CFHMP | Comprehensive Flood Hazard Management Plan |
| CFR | Code of Federal Regulations |
| CIP | Capital Improvement Program |
| City | City of Stanwood |
| County | Snohomish County |
| CWA | Federal Clean Water Act |
| CWD | Stillaguamish River Clean Water District |
| DI | Ductile Iron |
| Ecology | Department of Ecology |
| EPA | Environmental Protection Agency |
| ESA | Endangered Species Act |
| ESC | Erosion and Sediment Control |
| FEMA | Federal Emergency Management Agency |
| FC | Fecal Coliform |
| FTE | Full Time Equivalents |
| FWS | U.S. Fish and Wildlife Service |
| GIS | Geographic Information System |
| GMA | Growth Management Act |
| HPA | Hydraulic Project Approval |
| IDDE | Illicit Discharge Detection and Elimination |
| ILA | Interlocal Agreement |
| LID | Low Impact Development |
| Manual | Stormwater Management Manual for Western Washington |
| MS4 | Municipal Separate Storm Sewer System |
| NPDES | National Pollutant Discharge Elimination System |
| NEPA | National Environmental Protection Act |
| NOI | Notice of Intent |
| OFM | Office of Financial Management |
| PACE | PACE Engineers, Inc. |
| Partnership | Puget Sound Partnership |
| Permit | NPDES Phase II Municipal Stormwater Permit for Western Washington |
| RCW | Revised Code of Washington |
| SCP | Stormwater Comprehensive Plan |

| | |
|---|---|
| SMC | Stanwood Municipal Code |
| SMMWW | Department of Ecology's 2005 Stormwater Management Manual for Western Washington |
| SWM | Stormwater Management |
| SWMP | Stormwater Management Program |
| SWPPP | Stormwater Pollution Prevention Plan |
| TESC | Temporary Erosion and Sediment Control |
| TMDL | Total Maximum Daily Load |
| UGA | Urban Growth Area |
| UIC | Underground Injection Control (Rule) |
| USDA | United States Department of Agriculture |
| WAC | Washington Administrative Code |
| WDFW | Washington Department of Fish and Wildlife |
| WRIA | Water Resource Inventory Area 5 |

# DEFINITIONS[1]

**Annual Flood**

The highest peak discharge on average which can be expected in any given year.

**Applicable BMPs**

Applicable BMPs are those source control BMPs that are expected to be required by local governments at new development and redevelopment sites. Applicable BMPs will also be required if they are incorporated into NPDES permits, or if they are included by local governments in a stormwater program for existing facilities.

**As-built Drawings**

Engineering plans which have been revised to reflect all changes to the plans which occurred during construction.

**Bankfill Discharge**

A flow condition where stream flow completely fills the stream channel up to the top of the bank. In undisturbed watersheds, the discharge conditions occur on average every 1.5 to 2 years and controls the shape and form of natural channels.

**Base Flood**

A flood having a one percent chance of being equaled or exceeded in any given year. This is also referred to as the 100-year flood.

**Base Flood Elevation**

The water surface elevation of the base flood. It shall be referenced to the National Geodetic Vertical Datum of 1929 (NGVD).

**Best Management Practice (BMP)**

The schedules of activities, prohibitions of practices, maintenance procedures, and structural and/or managerial practices, that when used singly or in combination, prevent or reduce the release of pollutants and other adverse impacts to waters of Washington State.

**Biofilter**

A designed treatment facility using a combined soil and vegetation system for filtration, infiltration, adsorption, and biological uptake of pollutants in stormwater when runoff flows over and through the facility. Vegetation growing in these facilities acts as both a physical filter which causes gravity settling of particulates by regulating velocity of flow, and also as a biological sink when direct uptake of dissolved pollutants occurs. The former mechanism is probably the most important in western Washington where the period of major runoff coincides with the period of lowest biological activity.

[1] The majority of these definitions are sourced from the Washington Department of Ecology (Ecology) Western Washington Phase II Municipal Stormwater Permit (Phase II Permit). Definitions not provided from the Phase II Permit were taken from other sources, including Ecology's Stormwater Management Manual for Western Washington and Environmental Protection Agency's (EPA) NPDES website glossary.

**Bioswale**

A shallow drainage conveyance with relatively gentle side slopes, generally manmade that provides water quality treatment, and is usually vegetated.

**Catch Basin**

A drainage structure which collects water. May be either a structure where water enters from the side or through a grate.

**Conveyance System**

The drainage facilities, both natural and manmade, which collect and carry surface and stormwater flow. Conveyance systems can include one or more of the following: gutters, drainage inlets, pipes, catch basins, manholes, channels, swales, ditches, small drainage courses, streams, and rivers.

**Critical Areas**

At a minimum, areas which include wetlands, areas with a critical recharging effect on aquifers used for potable water, fish and wildlife habitat conservation areas, frequently flooded areas, geologically hazardous areas, including unstable slopes, and associated areas and ecosystems.

**Critical Drainage Area**

An area with such severe flooding, water quality, drainage and/or erosion/sedimentation conditions that the area has been formally adopted as a Critical Drainage Area by rule under the procedures specified in an ordinance.

**Detention**

The release of stormwater runoff from the site at a slower rate than it is collected by the stormwater facility system, the difference being held in temporary storage and released slowly over time as the flow decreases.

**Dry Weather Flow**

The combination of groundwater seepage and allowed non-stormwater flows found in storm sewers during dry weather. Also that flow in streams during the dry season.

**Floodway**

The channel of the river or stream and those portions of the adjoining floodplains that are reasonably required to carry and discharge the base flood flow. The portions of the adjoining floodplains which are considered to be "reasonably required," as defined by flood hazard regulations.

**Groundwater**

Water in a saturated zone or stratum beneath the land surface or a surface water body.

**Impervious**

A surface which cannot be easily penetrated. For instance, rain does not readily penetrate paved surfaces.

**Infiltration**

Means the downward movement of water from the surface through the subsoil.

**Low Impact Development (LID)**

Low Impact Development (LID) is a stormwater management approach with a basic principle that is modeled after nature: manage rainfall at the source using uniformly distributed, decentralized

micro-scale controls. The goal of LID is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to its source. Techniques are based on the premise that stormwater management should not be seen as stormwater disposal.

**Maintenance**

Activities conducted to extend the life and ensure proper operation of existing facilities. Maintenance should not expand the use or capacity of a facility beyond the existing or designed use and results in no significant adverse hydrologic impact.

**Maintenance Standard**

Describes the type and frequency of cleaning, repair, or other maintenance that is required to sustain the design functions of a given facility.

**National Pollutant Discharge Elimination System (NPDES)**

The national program for issuing, modifying, revoking, reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements under sections 307, 402, 318, and 405 of the Federal Clean Water Act for the discharge of pollutants to surface waters of the state from point sources. These permits are referred to as NPDES permits and, in Washington State, are administered by the Washington Department of Ecology.

**Overflow**

A pipeline or conduit device, together with an outlet pipe, that provides for the discharge of portions of combined sewer flows into receiving waters, usually associated with elevated flows or other points of disposal, after a regular device has allowed the portion of the flow which can be handled by interceptor sewer lines and pumping and treatment facilities to be carried by and to such water pollution control structures.

**Permit**

NPDES Western Washington Phase II Municipal Stormwater Permit, issued by the Department of Ecology on January 17, 2007 and modified June 17, 2009. A new Permit was issued on August 1, 2013.

**Pollutant**

A waste material that pollutes wind, water, or soil. A non-stormwater discharge that enters the stormwater collection and conveyance system.

**Receiving Waters**

Any water body receiving stormwater runoff, including surface water, groundwater, and the stormwater collection and conveyance system.

**Retention/Detention Facility (R/D)**

A type of drainage facility designed either to hold water for a considerable length of time and then release it by evaporation, plant transpiration, and/or infiltration into the ground; or to hold surface and stormwater runoff for a short period of time and then release it to the surface and stormwater management system.

**Runoff**

Water originating from rainfall and other precipitation that is found in drainage facilities, rivers, streams, springs, seeps, ponds, lakes, and wetlands, as well as shallow groundwater. As applied in this

manual, it also means the portion of rainfall or other precipitation that becomes surface flow and interflow.

**Stormwater**

That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes and other features of a stormwater drainage system into a defined surface water body, or a constructed infiltration facility.

**Underground Injection Control Wells**

UIC wells are manmade structures used to discharge fluids into the subsurface. Examples include drywells, infiltration trenches with perforated pipe, and any structure deeper than the widest surface dimension. The majority of UIC wells in Washington are used to manage stormwater (i.e., drywells) and sanitary waste (large on-site systems), return water to the ground, and help clean up/dispose of contaminated sites. The potential for groundwater contamination from injection wells depends upon well construction and location; quality of the fluids injected; and the geographic and hydrologic settings in which the injection occurs.

**Water Quality**

The chemical, physical, and biological characteristics of water, usually with respect to its suitability for a particular purpose.

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