

## **1.1 INTRODUCTION**

Pursuant to Eugene Code 9.6790, this Stormwater Management Manual was developed in order to implement the Stormwater Development Standards as outlined in Eugene Code 9.6791 through 9.6797.

Stormwater management is a key element in maintaining and enhancing the City's livability. There is a direct link between stormwater runoff and the City's surface and ground water quality and quantity. As cities develop, impervious surfaces that are created increase the amount of runoff during rainfall events and prevent groundwater recharge. Stormwater runoff picks up pollutants from parking lots, roadways, and rooftops and transports them to streams, rivers, and groundwater. Without controls, these conditions cause eroded stream channels and increased levels of water pollution. Properly managing stormwater is vital to protecting our water resources for a great number of uses, including fish and wildlife habitat, recreation, and drinking water.

The Federal Clean Water Act of 1972 established a national commitment to restore and maintain the chemical, physical, and biological integrity of the nation's waters. It prohibits the discharge of pollutants into water of the United States unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) Permit. The Clean Water Act requires large and medium sized (Phase I) cities such as Eugene to obtain an NPDES permit for their municipal separate stormwater sewer systems (MS4) which discharge into the nation's waters. Eugene's municipal stormwater system, comprised of catch basins, pipes, ditches and waterways, conveys runoff from properties within the City and drains directly into the Willamette River and indirectly to the river via other local waterways such as Amazon Creek. Compliance with its NPDES MS4 permit, first issued in 1994 and most recently re-issued in 2010, requires the City to implement a comprehensive stormwater management program including establishing controls on stormwater runoff from developing areas.

The City's Stormwater Development Standards, as set forth in Eugene Code 9.6791 through 9.6797 and this Stormwater Management Manual, emphasize low-impact development practices, source control measures for certain land use and activities, and operations and maintenance practices designed to properly manage stormwater runoff and protect our water resources.

## 1.2 PURPOSE OF THE MANUAL

The purpose of this manual is to set forth requirements consistent with EC 9.6790 and 7.143 (2) providing stormwater management principles and techniques that help preserve or mimic the natural hydrologic cycle and achieve water quality goals. The manual:

- Provides developers and design professionals with facility design requirements for reducing the impacts of stormwater runoff quantity and pollution resulting from new development.
- Is applicable to development that is subject to the adopted stormwater development standards (see **Appendix A**).
- Is applicable to stormwater facilities constructed in the public rights of way (see **Appendix A**).

These standards are not intended to limit innovation or creativity, particularly when such efforts result in higher quality and/or lower costs. Deviations from these standards shall be determined in accordance with the City's adjustment review process.

## 1.3 SUMMARY OF MANUAL CONTENTS

**Chapter 1.0: Stormwater Management in Eugene** outlines the purpose and use of this manual, defines terms, and the stormwater quality, flow control, and flood control design standards pertinent to Eugene.

**Chapter 2.0: Selecting, Designing, Constructing and Landscaping Stormwater Management Facilities** provides methods for selecting and designing stormwater management facilities that accomplish stormwater quality, flow control, and/or flood control goals.

**Chapter 3.0: Source Controls** addresses site activities and characteristics with the potential to generate pollutants that may not be addressed solely through the stormwater quality facilities presented in Chapter 2.0.

**Chapter 4.0: Operating & Maintaining Stormwater Facilities** includes operations and maintenance (O&M) submittal forms and templates for stormwater management facility O&M plans.

**Appendix A: Eugene Code (EC) - Stormwater Development Standards (EC Section 9.6790-9.6797), Stormwater Facility Operation and Maintenance (EC 6.615), Public Improvement Construction - Wastewater Sewer Systems and Stormwater Management Facilities (EC 7.143)** includes Eugene Code sections that regulate stormwater management policies and standards, and that authorizes the City's *Stormwater Management Manual* and stormwater management enforcement authority and requirements.

**Appendix B: Typical Facility Details** presents typical cross sectional detail for stormwater management facilities.

**Appendix C: Forms** includes SIM Form, DAR Form, Notice of O & M and O & M forms for recording purposes.

**Appendix D: Facility Planting Design** presents plant species recommendations for vegetated stormwater facilities.

**Appendix E: Approved Proprietary Stormwater Treatment Technologies** lists all proprietary stormwater treatment technologies approved for use to meet Eugene's stormwater quality requirements.

**Appendix F: Flow Control Structure and Pipe Outfall Sizing** present guidance and requirements for the design of flow control structures and pipe outfalls.

**Appendix G: Infiltration Testing** procedures for Simplified and Presumptive methods.

**Appendix H: Stormwater Analysis Reports** present content and format requirements for preparation of engineering stormwater reports.

**Appendix I: Infiltration Limited Areas Map and NRCS Soil Group Map** presents areas which may be infiltration limited due to generalized site conditions such as soil type and groundwater depth.

**Appendix J: Headwater Streams Map** presents headwater streams identified for flow controls.

**Appendix K: Flood Control Design Storm Tables** outlines the rainfall intensity, duration and frequency curves, storm recurrence intervals, and storm events for planning and designing stormwater flood control facilities.

**Appendix L: Water Quality Design Storm Development** outlines the rationale behind the development of Eugene's stormwater quality storm events.

**Appendix M: Santa Barbara Urban Hydrograph Method** describes the Santa Barbara Urban Hydrograph method and includes the City's 24-hour rainfall depths, formulas for computing time of concentration, and runoff curve numbers.

## 1.4 DEFINITIONS

**Note:** Definitions are intended to be consistent with Eugene Code Chapter 9, Land Use; Chapter 6, Environment and Health; and Chapter 7, Public Improvements.

***Above-Ground Storage Tank (AST):*** A stationary container, vessel, or other permanent holding device designated for the storage and/or distribution of a liquid product.

***Applicant:*** Any person, company, or agency that applies for a permit through the City of Eugene.

***Batch Discharge:*** The controlled discharge of a discrete, contained volume of water or wastewater. Batch discharges into the public wastewater system must conform to the requirements of Eugene Code sections 6.501-6.596, Industrial Pretreatment Program.

***Bulk Fuel Terminal:*** Any area with its primary function dedicated to the storage and distribution of fuel to distributors (such as gas stations).

***Bulk Materials:*** Product, by-product, and waste materials that aren't stored or completely held within a discrete area or container.

***Capacity:*** The capacity of a stormwater drainage system is the flow volume or rate that a facility (*e.g.*, pipe, pond, vault, swale, ditch, drywell, etc.) is designed to safely contain, receive, convey, reduce pollutants from or infiltrate stormwater that meets a specific performance standard. There are different performance standards for stormwater quality, detention, conveyance, and flood control, depending on location.

***Containment:*** The temporary storage of potentially contaminated stormwater or process wastewater when a hard-plumbed connection to the City wastewater system is not available for disposal.

***Control Structure:*** A device used to hold back or direct a calculated amount of stormwater to or from a stormwater management facility. Typical control structures include vaults or manholes fitted with baffles, weirs, or orifices.

***Conveyance:*** The transport of stormwater from one point to another.

***Destination:*** The ultimate discharge point for the stormwater runoff from a particular site. Destination can include on-site infiltration such as surface infiltration facilities, drywells and sumps, and soakage trenches, and off-site flow to ditches, drainage ways, rivers and streams, and off-site storm pipes.

***Detention Facility:*** A facility designed to receive and hold stormwater and release it at a slower rate, usually over a number of hours. The full volume of stormwater that enters the facility is eventually released.

**Development Footprint:** The new or redeveloped area covered by buildings or other roof structures and other impervious surface areas, such as roads, parking lots, and sidewalks.

**Discharge Point:** The ultimate destination for the stormwater runoff from a particular site. Destination can include on-site infiltration such as surface infiltration facilities, drywells and sumps, and soakage trenches, and off-site flow to ditches, drainage ways, rivers and streams, and off-site storm pipes.

**Drainage Basin:** A specific area that contributes stormwater runoff to a particular point of interest, such as a stormwater management facility, stream, wetland, or pipe.

**Drawdown Time:** The amount of time it takes for a facility to percolate runoff from the design storm.

**Filtration:** The percolation of water through designed soils or media with the use of under drains to convey treated runoff from the development site to approved discharge points.

**Flood Control:** The practice of managing stormwater drainage and flood protection. Drainage and flood protection strategies are outlined in the adopted City of Eugene Stormwater Basin Master Plans.

**Flood Control Design Storm:** A theoretical storm for evaluating the capacity of the storm drainage system and designing improvements for the required level of protection.

**Flow Control:** The practice of limiting the peak flow rates and volumes. Flow control is intended to protect downstream properties, infrastructure, and resources from the increased stormwater runoff peak flow rates and volumes resulting from development.

**Flow Control Facility:** Any structure or drainage device that is designed, constructed, and maintained to collect, retain, infiltrate, or detain surface water runoff during and after a storm event for the purpose of controlling post-development water quantity leaving the development site.

**Flow-Rate-Based Facility:** Facilities such as swales and vegetated filters, oil/water separators, and some proprietary treatment systems which are sized to treat a rate of flow to be conveyed through them.

**Green Infrastructure:** A comprehensive approach to water quality protection defined by a range of natural and built systems and practices that use or mimic natural hydrologic processes to infiltrate, evapotranspire, or reuse stormwater runoff on the site where it is generated.

**Hazardous Material:** Any material or combination of materials that, because of its quantity, concentration, or physical, chemical, or infectious characteristics, may cause or significantly contribute to an increase in mortality or an increase in serious, irreversible, or incapacitating reversible illness; or that may pose a present or potential hazard to either human health, safety, or welfare, or animal or aquatic life or the environment when

improperly used, stored, transported or disposed of, or otherwise managed. For purposes of chemical regulation by this manual, moderate to high toxicity and confirmed human carcinogenicity are the criteria used to identify hazardous substances. (Note: This manual does not use the Resource Conservation and Recovery Act (RCRA) definition of hazardous. For the purpose of this manual, hazardous material is intended to include hazardous, toxic, and other harmful substances.)

**Hazardous Material Containment Zone (HMC Zone):** An area where a specific individual activity involving use of a hazardous material takes place, and where chemical quantities at that location are expected to exceed defined thresholds. HMCs may include (but are not limited to) storage and/or process areas, transportation routes, work areas, and loading/unloading facilities.

**Headwaters Area:** The area within Eugene city limits that is above 500 feet.

**Headwater Streams:** Streams that: (1) are identified on the Headwater Streams Map (**Appendix J**) as having all or a portion of their length located on slopes greater than 10%; (2) are identified on the Sensitive Areas Map as having all or a portion of their length located in areas with highly erodible soils; (3) are at least 500 feet or longer; and, (4) drain at least 10 acres.

**High-Flow Bypass and/or Diversion Device:** A mechanism used to route stormwater runoffs which are greater than the water quality design storm around a stormwater management facility which is only designed to treat the water quality design storm. Flows routed around the stormwater quality facility must be taken to an approved destination.

**High-Flow Overflow:** An inlet located at an approved elevation and location within a stormwater management facility, meant to collect overflow waters and route those waters to an approved destination.

**High-Risk Site:** A site with characteristics and/or activities that have the potential to generate pollutants that may not be addressed solely through the stormwater quality facilities presented in Chapter 2.0. High-risk site characteristics and activities are listed in Chapter 4 – Source Controls.

**Impervious Surface/Area:** Any surface area that causes water to run off the surface in greater quantities or at an increased rate of flow from conditions pre-existing to development. Types of impervious surface include, but are not limited to, rooftops, asphalt and concrete parking lots, driveways, roads, sidewalks, and pedestrian plazas. *Note:* Slatted decks are considered pervious. Gravel surfaces are considered pervious unless they cover impervious surfaces or are compacted to a degree that causes their runoff coefficient to exceed 0.8.

**Impervious Area Reduction Technique:** Implementation of a facility used to intercept rainfall that would otherwise be impervious, such as a roof or sidewalk. Such facilities include pervious pavement, eco-roofs, contained planters, and tree credit trees.

***Infiltration:*** The percolation of water into the ground.

***Inlet:*** A structural facility located just below the ground surface, used to collect stormwater runoff for conveyance purposes. Generally located in streets and parking lots, inlets have grated lids, allowing stormwater from the surface to pass through for collection. The term “inlet” can also be used in reference to the point at which stormwater from impervious surfaces or conveyance pipe enters a stormwater management facility.

***LD-50:*** The lethal dose of a substance that is expected to kill approximately 50 percent of experimental animals through oral ingestion. (Refer to product Material Safety Data Sheet.)

***Local Dispensing Location:*** An area within 15 feet of an above-ground storage tank (AST) and used to dispense fuel directly from the AST, typically through a flexible hose.

***Low Impact Development (LID):*** A stormwater management approach that seeks to mitigate the impacts of increased runoff and stormwater pollution using a set of planning, design, and construction approaches and stormwater management practices that promote the use of natural systems for infiltration, evapotranspiration, and reuse of rainwater, and can occur at a wide range of landscape scales (i.e., regional, community, and site scales).

***Mechanical Treatment Facilities:*** Manufactured and proprietary stormwater quality devices used to remove pollutants from stormwater.

***Notice of Operations and Maintenance:*** A recorded document that identifies the presence of a privately maintained stormwater management facility.

***Off-Site Stormwater Facility:*** Any stormwater management facility located outside the property boundaries of a specific development, but designed to reduce pollutants from and/or control stormwater flows from that development.

***On-Site Stormwater Facility:*** Any stormwater management facility necessary to control stormwater within an individual development site and located within the boundaries of the development site.

***Operations and Maintenance (O&M):*** The continuing activities required to keep stormwater management facilities and their components functioning in accordance with design objectives.

***Operations and Maintenance Plan:*** Activities developed to identify the on-going operation and maintenance measures required to keep stormwater management facilities and their components functioning in accordance with design objectives and permit requirements.

***Outfall:*** A location where collected and concentrated water is discharged. Outfalls include discharge from stormwater management facilities, drainage pipe systems, and constructed open channels.

**Parking Area:** Any area which can be used by motor vehicles, recreational vehicles, trailers, and boats for parking, including driveways and access aisles providing access to the parking stalls.

**Pollutant:** An elemental or physical product that can be mobilized by water or air and creates a negative impact on the environment. Pollutants include suspended solids (sediment), heavy metals (such as lead, copper, zinc, and cadmium), nutrients (such as nitrogen and phosphorus), bacteria and viruses, organics (such as oil, grease, hydrocarbons, pesticides, and fertilizers), floatable debris, and increased temperature.

**Post-Developed Condition:** A project's site plan of impervious surface and landscaping after development.

**Pre-Developed Condition:** The project site's surface conditions prior to the proposed development.

**Privately Engineered Public Improvement (PEPI):** A publicly maintained facility that is designed, constructed, and financed by a private developer, entity, or its agent.

**Public Works Project:** Any development conducted or financed by a local, state, or federal governmental body and includes local improvements and public improvements.

**Retention Facility:** A facility designed to receive and hold stormwater runoff. Rather than storing and releasing the entire runoff volume, retention facilities permanently retain a portion of the water on-site, where it infiltrates, evaporates, or is absorbed by surrounding vegetation. In this way, the full volume of stormwater that enters the facility is not released off-site.

**Retrofit:** Installation of a new stormwater facility to treat stormwater from existing impervious area, including, but not limited to existing roofs, patios, walkways, and driving or parking surfaces.

**Roadway:** Any paved surface used to carry vehicular traffic (cars/trucks, forklifts, farm machinery, or any other large machinery).

**Runoff:** The resulting stormwater flows across the ground surface during and after a rainfall event.

**Stormwater:** Water runoff that originates as precipitation on a particular site, basin, or watershed.

**Stormwater Facility Landscaping:** The vegetation (plantings), topsoil, drain rock, and other surface elements associated with stormwater management facility design.

**Stormwater Management:** The overall culmination of techniques used to reduce pollutants from, detain and/or retain, and provide a discharge location for stormwater to best preserve or mimic the natural hydrologic cycle on a development site. Public health

and safety, aesthetics, maintainability, capacity of existing infrastructure, and sustainability are important characteristics of a site's stormwater management plan.

**Stormwater Management Facility:** Any structure or configuration of the ground that is used as, or by its location becomes, a place where stormwater flows or is accumulated, including but not limited to, pipes, manholes, catch basins, ponds, open drainage ways, runoff control facilities, wetlands, and their accessories.

**Stormwater Quality Facility:** Any structure or drainage device that is designed, constructed, and maintained to collect and filter, retain, or detain surface water runoff during and after a storm event for the purpose of maintaining or improving surface and/or groundwater quality.

**Surface Conveyance:** The transport of stormwater on the ground surface from one point to another.

**Surface Infiltration Facility:** A facility designed to receive and infiltrate stormwater runoff at the ground surface to meet stormwater flood control requirements.

**Surface Retention Facility:** A facility designed to receive and hold stormwater runoff at the ground surface. Rather than storing and releasing the entire runoff volume, surface retention facilities permanently retain a portion of the water on-site, where it infiltrates, evaporates, or is absorbed by surrounding vegetation.

**Tenant Improvements:** Upgrades made to the interior or exterior of buildings to meet the needs of the tenant. Tenant improvements may trigger **Chapter 3.0** Source Controls if they take place on sites with specified high-risk activities.

**Time of Concentration ( $T_c$ ):** The amount of time it takes stormwater runoff to travel from the most distant point (measured by travel time) on a particular site or drainage basin to a particular point of interest, such as to an on-site retention system.

**Total Suspended Solids (TSS):** Matter suspended in stormwater excluding litter, debris, and other gross solids exceeding 1 millimeter in diameter.

**Underground Injection Control (UIC):** A federal program under the Safe Drinking Water Act, delegated to the Oregon Department of Environmental Quality (DEQ), which regulates the injection of water below ground. The intent of the program is to protect groundwater aquifers, primarily those used as a source of drinking water, from contamination.

**Vegetated Facilities:** As used in this manual, stormwater management facilities that rely on plantings to enhance their performance. Plantings can enhance many facility functions, including infiltration, pollutant removal, water cooling, flow calming, and prevention of erosion.

**Volume-Based Facility:** A stormwater quality facility, such as a wet pond, which is sized to store and treat a particular volume of runoff.

**Water Body:** Water bodies include rivers, streams, sloughs, drainages including intermittent streams and seeps, ponds, lakes, aquifers, wetlands, and coastal waters.

**Water Quality:** The chemical, physical, and biological characteristics of stormwater. Stormwater quality and flow control are two components of water quality management in stormwater runoff.

**Water Quality Design Storm:** A theoretical storm for estimating the amount of stormwater runoff to be treated.

## 1.5 PREPARING A STORMWATER MANAGEMENT PLAN

The intent of this section is to assist with an applicant's stormwater facility planning efforts. **These steps are not required** for design, permit, or construction approvals, yet are useful to consider when preparing stormwater management plans.

### Step 1 – Layout Your Proposed Footprint

Prepare a site plan that shows all existing development, proposed development and the grading details of the site.

### Step 2 – Identify Your Stormwater Management Needs

**Flood Control:** All stormwater runoff from impervious surfaces must discharge to approved discharge points (Eugene Code 9.6791, **Appendix A**). Identify existing impervious surfaces, the existing stormwater discharge points for those existing impervious surfaces, and the available existing stormwater systems. For more information on “Stormwater Flood Control” see **Section 1.6** of this manual.

**Stormwater Quality:** Generally, all development and redevelopment land use applications and building permits that propose 1000 square feet or more of new or replaced impervious surface must treat the stormwater runoff from that impervious area on-site before discharging to the public stormwater system (for exemption review, see Eugene Code 9.6792, **Appendix A**). For more information on “Stormwater Quality” see **Section 1.7** of this manual.

**Oil Control:** Eugene Code 9.6794 (**Appendix A**)

**Flow Control:** Stormwater runoff from non-residential development sites that will be conveyed by an open drainage way located in a Headwaters Stream (see map, **Appendix J**), may require retention or detention (see Eugene Code 9.6793 for specific code requirements). For more information on “Flow Control” see **Section 1.9**. If the site is at or above elevation 500 feet, and using a vicinity map, trace the stormwater runoff flow pattern from the development site to an elevation below 500 feet. If the stormwater runoff does not enter a Headwater Stream, no flow control standards are needed.

**Source Controls:** Site uses and characteristics such as, fuel dispensing, above ground storage of liquids and bulk storage, material transfer areas, loading docks, solid waste storage, vehicle and equipment washing areas, and parking areas may trigger additional water quality measures. For specific code requirements on what uses and characteristics will require additional measures, see Eugene Code 9.6795. Typical source control measures include covering potential pollutant areas, paving the areas to protect the underlying soils, hydraulically isolating drainage patterns, and containing potential pollutants. **Chapter 3** of this manual will provide details on which measures to implement.

### Step 3 – Evaluate Your Development Site and Development Plan

Identify the types of soils and infiltration rates of the soils. Identify the ultimate discharge point(s) of the stormwater runoff from the site. Calculate your new/replaced impervious surface area(s).

#### **Step 4 – Identify Your Flood Control Plan**

Identify where the stormwater runoff from new ore replaced impervious surface area(s) will be discharged. Confirm that system has flood control capacity. For guidance evaluating capacity, see **Section 1.6** “Stormwater Flood Control” of this manual.

#### **Step 5 – Identify Your Stormwater Quality Plan**

Evaluate whether the site has infiltration potential. If the site cannot infiltrate runoff, evaluate whether filtration treatment can be located on-site. Calculate the treatment facility size(s) and locate facilities on the site plan of the proposed development. If there is insufficient area for the treatment facilities, implement mechanical treatment. For guidance on “Stormwater Quality”, see **Section 1.7** of this manual.

#### **Step 6 – Select Your Stormwater Facilities**

Select and design an approved stormwater facility from those provided in **Chapter 2** of this manual.

#### **Step 7 – Develop an Operation & Maintenance Plan**

Applicants are responsible for on-going operation and maintenance of stormwater facilities. Select and prepare an operation and maintenance plan as outlined in **Chapter 4** of this manual.

#### **Step 8 - Technical Assistance**

At any time during the planning, designing, or permitting process, you may contact the City of Eugene for technical assistance. To request a consultation or speak with someone about the stormwater development standards that apply to your project, call 541-682-5086.

## 1.6 STORMWATER FLOOD CONTROL

### 1.6.1 The Purpose of Stormwater Flood Control

Stormwater flood control refers to managing the discharge of stormwater runoff generated by large, intense rainfall events for the purpose of protecting life and property from flood and drainage hazards by maintaining the capacity of the city's stormwater conveyance system.

All development permit applications and land use applications are required to discharge their stormwater runoff into discharge facilities having the capacity to remove the stormwater runoff from the basin without creating a risk of flooding or flood damage to other properties in the basin. Applicants may discharge their runoff into off-site stormwater facilities that have capacity or retain or detain flows on-site with an approved infiltration facility.

Off-site flow methods include discharge to drainage ways (including roadside ditches and natural drainages and streams), rivers, and engineered stormwater facilities (including culverts, pipes, channels, or other structures). On-site infiltration methods include surface infiltration and underground injection system infiltration.

The appropriate discharge point is site-specific and depends on a number of factors, including soil type, slopes, and availability of public and private infrastructure. Off-site discharge to conveyance facilities under the ownership of Lane County or the Junction City Water Control District will require the review and approval from the corresponding agency.

### 1.6.2 Flood Control Design Methodology

The Rational Method flow calculation, using the Flood Control Design Storm information and desired level of protection provided in **Appendix K**, must be used when evaluating the capacity of the discharge stormwater facility. When determining the basin area, include all developments in the drainage basin area draining into the facility having tentative or final plan approval at the time of your submitted application.

### 1.6.3 Off-Site Stormwater Facilities

Development permit applicants discharging runoff to manmade drainage systems designed to accommodate the runoff generated by the stormwater basin area do not need to provide additional analysis of the system for their proposed development. The City of Eugene has developed a flood control strategy for each of the drainage basins within the Urban Growth Boundary and published its findings in the adopted Stormwater Basin Master Plans. The Stormwater Basin Master Plans can be used to determine whether the manmade drainage system to which runoff from the development site will discharge was designed to accommodate runoff generated by the stormwater basin area.

Development permit applications discharging to manmade drainage systems not designed to accommodate runoff generated by the basin area and **all** land use applications must demonstrate the off-site flood control facility has capacity to carry post-construction stormwater runoff as outlined in **Section 1.6.2** above or retain or detain runoff on-site or construct a new flood control facility that has flood control capacity.

#### **1.6.4 On-Site Retention and Detention**

On-site retention and detention includes structural detention facilities and infiltration facilities having the ability to store and infiltrate the Flood Control Design Storm presented in **Appendix K**. When using infiltration options, the facility must either be located outside infiltration limited areas as identified on the City's Infiltration Limited Areas Map (See **Appendix I**) or the design professional must prove the viability of on-site infiltration using one of the following Infiltration Testing methods:

- Open pit falling head,
- Encased falling head, or
- Double ring infiltrometer

#### **1.6.5 Underground Injection Control Structures (UICs)**

Underground Injection Control Structures are regulated under the Safe Drinking Water Act. The UIC Program is administered by the Oregon Department of Environmental quality. This section provides general information only. Complete regulations and requirements are available on the Oregon Department of Environmental Quality (DEQ) website: <http://www.deq.state.or.us/wq/uic/uic.htm>. The DEQ can also be contacted at 503-229-5696.

Owners or operators of new and existing UICs are required to register and provide inventory data to DEQ. This information helps DEQ determine if the UIC is eligible for "rule authorization." Rule authorization allows the owner or operator to operate the UIC without a permit from DEQ. UICs that do not qualify for rule authorization must either be closed, modified to meet requirements for rule authorization, or the owner must submit a water pollution control facility permit application to DEQ and obtain a permit.

Compliance with DEQ criteria for rule authorization must be demonstrated during the registration process. Compliance can generally be more readily accomplished if stormwater management efforts focus on maximizing source controls, using surface vegetated water quality facilities, and disposing of stormwater through surface infiltration or shallow subsurface facilities.

Registration and inventory data should be submitted to DEQ at least 60 days in advance of potential start of construction. In some cases, DEQ and the City will need additional information from the applicant in order to make a determination on the potential for use of a UIC.

## 1.7 STORMWATER QUALITY

### 1.7.1 The Purpose of Stormwater Quality

The purpose of stormwater quality is to reduce runoff pollution and mitigate the volume, duration, time of concentration and rate of stormwater runoff from development by implementing low impact development practices and green infrastructure while capturing and treating 80% of the annual average rainfall. This runoff collects and transports pollutants to downstream receiving waters. Pollutants include:

- Suspended solids (sediment)
- Heavy metals (dissolved and particulate, such as lead, copper, zinc, and cadmium)
- Nutrients (such as nitrogen and phosphorus)
- Bacteria and viruses
- Organics (such as oil, grease, hydrocarbons, pesticides, and fertilizers)
- Floatable debris
- Increased thermal load (temperature)

### 1.7.2 Stormwater Quality Design Methodologies

Stormwater quality facilities shall be designed, at a minimum, to treat the Water Quality Design Storm. Stormwater quality facilities which are designed using an approach other than the Simplified Approach must be sized using the following design values:

**Flow-rate based design:** Swales, oil/water separators, and proprietary treatment systems shall be sized to treat a rate of flow draining through them.

- A rainfall intensity of 0.13 inches per hour shall be used to design the off-line conveyance type facilities.
- A rainfall intensity of 0.22 inches per hour shall be used to design the on-line conveyance type facilities.

**Combination rate/volume based design:** Other stormwater quality facilities, such as stormwater planters, rain gardens, sand filters, drywells and soakage trenches shall be sized to treat a volume of runoff.

- When using the SBUH (see **Appendix M**), facilities shall be designed to treat runoff generated by 1.4 inches of rainfall over 24 hours (with NRCS Type 1A rainfall distribution)

See **Appendix L** for more detailed information regarding the formulation of Eugene's stormwater quality standards and Water Quality Design Storm.

## **1.8 OIL CONTROL FOR HIGH-RISK VEHICLE AND EQUIPMENT TRAFFIC AREAS**

Oil controls can include either (1) spill control manholes presented in **Section 2.3.14** or (2) the incorporation of Lynch-type catch basins within the parking lot or prior to discharging to stormwater quality facilities. The discharge of stormwater with a visible sheen off-site or into on-site UIC's is prohibited.

## 1.9 FLOW CONTROL

Flow control is intended to protect downstream properties, infrastructure, and natural resources from the increases in stormwater runoff peak flow rates and volumes resulting from development.

The City's policy is to ensure that runoff leaving the post-development site:

- Does not exceed the capacity of the receiving conveyance facility
- Does not increase the potential for stream bank and channel erosion
- Does not create or increase any flooding problems

Flow controls are required in the Headwaters Area of Eugene (see the Headwaters Streams Map in **Appendix J**). For construction of new or replaced impervious surface in this area, on-site infiltration or on-site detention is required to control stormwater volumes and flow rates. Regardless of the method used, flow control shall be sufficient to maintain peak flow rates at or below their pre-development levels for storms larger than the Water Quality Design Storm and smaller than the Flood Control Design Storm.

Flow control is also required for development in areas where the downstream capacity of an open or closed stormwater system is not sufficient to convey the post development flows.

To meet the flow control requirements, surface infiltration and filtration facilities are required to the maximum extent feasible. Impervious area reduction techniques may also be used to reduce runoff. Structural systems can be used as a last option to provide storage capacity. Flow control facilities include detention and retention:

### **DETENTION FACILITIES**

Detention facilities temporarily store stormwater runoff in a pond, tank, vault, or pipe. The water is slowly released from the facility, typically over a number of hours.

### **RETENTION FACILITIES**

Retention facilities also store stormwater runoff. Rather than storing and releasing the entire runoff volume, however, the facility permanently retains a portion of the water on-site, where it infiltrates and recharges the groundwater aquifer, and in the case of surface retention facilities, evaporates or is absorbed and used by surrounding vegetation. Retention facilities reduce the total volume of water released downstream.

## **1.10 INTERLOT DRAINAGE**

Interlot drainage refers to stormwater flow across property boundaries. This may include sheet flow, minor open channels and enclosed storm drain pipe systems, upon private properties that serve only to collect and remove stormwater runoff generated within the boundaries of private properties. All maintenance of interlot drainage systems is the responsibility of the property owner or abutting property owners.

## **1.11 OTHER REGULATORY STORMWATER PROGRAMS**

Conformance with this manual's requirements does not relieve the applicant of other applicable local, state, or federal regulatory or permit requirements. This manual is intended to complement any additional regulation, and is not expected to conflict with, exclude, or replace those regulations. Some of the more common additional regulations that may apply are summarized below.

### **1.11.1 Illicit Discharge Program**

The City expects spill response supplies, such as absorbent material and protective clothing, to be available at all potential spill areas. Employees should be familiar with the site's operations and maintenance plan and/or proper spill cleanup procedures.

### **1.11.2 Industrial Pretreatment Program**

Some facilities may be required to obtain a State of Oregon NPDES stormwater permit before discharging to the City's storm sewer system or to waters of the state. Applicants may also be required to obtain an industrial wastewater permit for discharges to the wastewater system. Facilities subject to these requirements are generally commercial or industrial facilities. Typical discharges include process wastewater, cooling water, or other discharges generated by facilities identified in this manual that drain to the City stormwater or wastewater systems. Contact Public Works Wastewater Division staff at 541-682-8600 for a list of current wastewater discharge limits.

An evaluation will be done during the building permit review process to determine if an industrial discharge permit is required. If a permit is required, the industrial permit application process will be independent of the building permit review/issuance process. However, building permit applications may have to be revised to accommodate industrial permitting compliance requirements (*i.e.* sampling points, pretreatment facilities, *etc.*).

### **1.11.3 Oregon DEQ Underground Injection Control (UIC) Program**

The Oregon Department of Environmental Quality (DEQ) identifies drywells, sumps, and piped soakage trenches as "Class V Injection Wells" under the federal Underground Injection Control (UIC) Program. Because the UIC Program states that these types of wells may have a direct impact on groundwater, registration or permitting with DEQ is required. See **Section 1.6.5** for additional information.

### **1.11.4 Other Local, State, and Federal Programs**

Other applicable codes or regulations, include, but are not limited to the hazardous substances storage requirements of articles 79 and 80 of the Oregon State Fire Code; the spill prevention control and containment (SPCC) regulations of 40 CFR 112 (EPA); and the Resource Conservation and Recovery Act (RCRA).

Additional City of Eugene and Oregon Department of Environmental Quality (DEQ) permit requirements may apply. Contact Public Works staff at 541-682-8600 for additional information about stormwater or wastewater discharges to City-owned wastewater or stormwater systems.

FEMA Special Flood Hazard Area may apply to larger drainage channels. Please contact the Permit and Information for applicable flood control standards.

The City of Eugene requires erosion prevention permits for any construction activities that disturb an area one acre or greater in size or disturb more than 500 square feet or involve the excavation or placement of 20 cubic yards of material within a sensitive area. A site is considered a sensitive area if it meets one of the following criteria:

- The slope of the site is greater than 10%,
- The site contains highly erodible soils, or
- The site has the potential to directly drain into a water feature or its designated buffer area.

## **1.12 STORMWATER MANAGEMENT RETROFITS**

Retrofits help the City incrementally provide the stormwater management for runoff from existing development. Any retrofit required as part of a land use decision, development permit or building permit must meet the standards set forth in the code and the Stormwater Management Manual.

Voluntary retrofits of private facilities with the intent to qualify for system impact credits or fee reductions must meet the standards set forth in the Stormwater Management Manual to qualify. All other voluntary retrofits of private facilities are encouraged to use the Stormwater Management Manual for guidance but are not required to comply given there are no permits or approvals required for the specific work (i.e., land use, building permits, UIC, etc.).

## 1.13 STORMWATER SYSTEM DEVELOPMENT CHARGES

Stormwater Systems Development Charges (SDC's) provide a funding mechanism to account for the costs and value of public infrastructure system capacity required by new development. SDC methodology includes a rate for providing stormwater quantity and quality capacity and a rate for providing public off-site low impact development (LID) water quality facilities off-site. The LID component provides for off-site public infiltration/filtration stormwater quality treatment to be paid only by development subject to the 2014 low impact development water quality treatment standards that does not construct private on-site stormwater infiltration or filtration treatment facilities. The LID component cost of the increased SDC is roughly comparable to the cost of constructing an equivalent on-site stormwater treatment facility.

### 1.13.1 Credits

Stormwater *quantity* credits for SDC's and Utility Billing monthly user fees are based on a public system benefit from development reducing the quantity of stormwater entering the public system through on-site retention methods. Developments utilizing private means for reducing the quantity of water discharged from a development site to the public system can reduce the demand for additional capacity in downstream public water conveyance facilities. Establishing stormwater quantity SDC and user fee credits provides a general recognition of reduced demand.

Stormwater *quality* credits for SDC's and user fees are based on a public system benefit from development treating stormwater quality through privately constructed and maintained facilities and effective impervious area reduction techniques. Developments utilizing private means for operation and maintenance of water quality treatment can reduce the demand for downstream public facilities for water quality treatment. Establishing stormwater quality SDC and user fee credits provides a general recognition of reduced demand and provides a modest incentive for meeting and exceeding minimum water quality treatment requirements.

Implementation of stormwater quality SDC and user fee credits is related to adoption of stormwater development standards which require water quality treatment at sites of new development. Adopted standards provide a basis for evaluation of the degree of impact reduction of a development. These credits recognize impact reduction and provide incentives for stormwater quality across three types of development sites:

- Those not subject to the standards for stormwater quality but which treat all or a portion (minimum 20%) of the total impervious area of the development site;
- Sites where a portion of the site impervious area is subject to the standards for stormwater quality but which treat runoff from 20% or more impervious area than the minimum required, or which reduce a minimum of 20% of the total impervious area of the development site through use of impervious area reduction techniques; and,
- Sites where all of the site impervious area is subject to the standards for stormwater quality but which reduce a minimum of 20% of the total impervious area of the development through the use of impervious area reduction techniques.

See the adopted City of Eugene Systems Development Charges (SDC) Methodologies document for SDC credits. See the adopted City of Eugene Stormwater Service Charges methodology document for user fee credits.

Stormwater *LID* credits for SDC's are available only to those paying the LID capacity component and based on a decreased public system burden from development treating stormwater quality through privately constructed and maintained mechanical treatment facilities. Private mechanical treatment facilities alone remove pollutants but do not provide the full benefits of LID treatment facilities. A single-level stormwater quality SDC credit of 50% of the LID capacity component of the stormwater SDC will be applied to development choosing to install an approved on-site mechanical treatment facility that treats all site impervious area subject to the standards for stormwater quality.

## **1.14 EQUIVALENT ON-SITE AREA GUIDELINES**

Equivalent on-site areas are existing impervious surface areas that would otherwise not require stormwater quality treatment, being an equal or greater surface area of the new or replaced impervious surface area that requires stormwater quality treatment of its stormwater runoff.

When designing a stormwater quality system using equivalent on-site areas, plans shall show and identify the following information:

- The new or replaced impervious surface areas which, by code, require stormwater quality treatment of its stormwater runoff.
- The new or replaced impervious surface areas which, by code, require stormwater quality treatment of its stormwater runoff, but will not receive stormwater quality treatment.
- The equivalent on-site (i.e. existing) impervious surface areas which will receive stormwater quality treatment of its stormwater runoff.

Using the square footages from the bulleted items above, the stormwater quality treatment facilities shall be sized using either the Simplified or Presumptive Approach.

The use of equivalent on-site areas to meet stormwater quality standards does not exempt new or replaced impervious surfaces from having to meet flood control, flow control, oil control, or source control standards. The redesign of existing surfaces must meet current codes, including stormwater management.