

CHAPTER 1 - Requirements and Policies

1. How is the requirement for vegetated facility enforced per the Stormwater Hierarchy?

Vegetated facilities allow applicants to meet multiple stormwater requirements, as well as other city development goals. Per the policy provided in Chapter 1, specifically **pg 1-8** and the Stormwater Hierarchy on **pg 1-10**, vegetated systems are required to the maximum extent feasible for all four categories of the Hierarchy.

All projects that require stormwater management must consider vegetated systems first (including public works, commercial buildings, parking lots, driveways, and private drives under land divisions). Residential rooftops can go directly to drywells or soakage trenches if infiltration rates are adequate (see question #2 below for more information).

The vegetated facility requirement was adopted in 2004 and the level of implementation has improved over time. Initially there were many unknowns associated with the design and construction of vegetated systems, often making them difficult to require. Applicants and reviewers are more familiar with the requirement and implementation is now consistent.

If an applicant is unable to use a vegetated system, they must still meet the pollution reduction, flow control, and infiltration and discharge requirements.

2. When is roof runoff exempt from the pollution reduction requirements and how is this administered?

As discussed on **pg 1-11** and **Section 1.4** roof runoff can be exempted from pollution reduction requirements before it is discharged to a UIC. DEQ decides when pollution reduction is required before a UIC. DEQ allows residential and some commercial roof runoff to go directly to drywells without pollution reduction treatment (i.e. no vegetated system or Stormfilter). Pollution reduction treatment is required for roof runoff on industrial sites and most commercial sites (some industrial and commercial rooftops may also reviewed by BES Source Control for unique contaminants). In any case, DEQ has the authority to require pollution reduction on any site where proposed activities may impact water quality.

UICs are approved by DEQ through a rule authorization process. DEQ decides when rule authorization is required and whether or not it can be approved. UIC rule authorization is not required for 3 residential dwelling units or less.

The City is responsible to explain this to the applicant but is not responsible for assessment, tracking, evaluation, or enforcement of the DEQ UIC rule authorization program. If infiltration is adequate, groundwater separation can be met, and BES Source Control does not identify any hazardous soil conditions, the City can only assume UICs can be approved at time of building permit review, even though the applicant will still need to request rule authorization from DEQ.

3. When does “available space” limit the use of vegetated systems? What are the thresholds or criteria that exempt an applicant from using a vegetated facility?

Regarding space constraints the manual states on **pg 1-12**:

“Space constraints may prohibit the construction of onsite infiltration facilities. Code requirements such as minimum density, minimum lot coverage, and required zero lot line setback for urban districts may exempt the use of onsite retention facilities. (**Note:** Maximum density allowed by the zoning code does not exempt the applicant from stormwater requirements. In this case, technical requirements for infrastructure must be met before the development is approved.)”

Despite attempts to define ‘available space’ it is often determined by site-specific conditions. Steep topography or landslide hazards will prevent infiltration but not necessarily a vegetated system. Examples of space constraints include:

- No property line setbacks in urban districts
- Conflicts with screening requirements (Stormwater facilities may be designed to also meet screening requirements. When stormwater facilities are located immediately adjacent to property lines they typically require a waterproof lining. Liners limit plant selection, which in turn can conflict with plants desirable for screening.)

4. When are mechanical systems allowed?

Regarding manufactured water quality treatment devices, the Manual states on **pg 1-23**:

“There will be sites where BES staff members and permit applicants agree that it is not technically feasible for vegetated facilities, including swales and planters, to meet all stormwater management requirements for the proposed impervious area. Manufactured treatment devices may be considered for sites in separated storm sewer areas when slope and infiltration limitations prevent the use of any reasonably located vegetated facilities (lined or unlined) or for sites unable to size the water quality storm (.83” in 24 hours). In those instances, specific approved manufactured treatment technologies may be proposed for pollution reduction.”

Use of a manufactured treatment device is an exception to the vegetative facility requirement. While it is not necessary to submit the application under the Performance Approach or submit a Special Circumstance request, the applicant must request in writing (include in Stormwater Report in the hierarchy justification) to use a manufactured treatment device and document why a vegetated facility is not feasible. This is a BES/BDS plan review staff decision.

If the use of a detention tank is proposed, the application must be submitted under the Performance Approach.

Mechanical systems will only be allowed when the applicant documents that all other options are not feasible. This is a staff decision that must be documented in TRACS so all parties are aware of the decision and justification. City staff are working to develop to develop a consistent protocol, including inserting a line in the Info Tab of the Permit Folder in TRACS.

5. *Is pollution reduction required when discharging to a combined sewer?*

As stated on **pg 1-25**, pollution reduction is required for sites that discharge to a combined sewer and vegetated facilities are required to the maximum extent feasible to meet that requirement. When it is determined that vegetated facilities are not feasible on a site that discharges to a CSO, manufactured treatment devices will not be required. In order to meet the pollution reduction requirement, the applicant may choose to pay the off site management fee instead of installing a manufactured treatment device.

6. *Clarify the groundwater requirements and how they are administered.*

Depth to groundwater requirements are presented on **pg 1-34**. DEQ requires separation between the bottom of a UIC and groundwater. BES requires a separation distance between the bottom of an infiltration facility and groundwater.

Separation Distances

- UICs
 - Single Family Residential: (up to 3 attached units): DEQ requires 5' of separation for new single family residential UICs receiving runoff from only roof and/or footing drains.
 - All other UICs: DEQ requires 10' of separation for new UICs greater than 5' deep (excluding SF residential up to 3 attached units). UICs 5' deep or less require a 5' separation.
- Non UICs
 - Surface Infiltration Facilities: Separation distance for vegetated facilities is the same as the 2004 SWMM – 4' of separation is required between the bottom of rock trench in the facility and the depth to groundwater. Separation distance for pervious pavement is 3' from bottom of base rock to high ground water (separation distance also applies to any below grade impervious layer (including hardpan, solid rock, etc.).

Depth to Ground Water Investigations

The depth to groundwater investigation is a specific process required by DEQ to determine separation distance for public and private UICs. Depth to groundwater investigations are required where the depth to seasonal high groundwater is estimated to be less than 50 feet below the ground surface, based on the City's Depth to Groundwater map (referred to on **pg 1-35** and in **Appendix F.1** and available online at <http://www.portlandmaps.com/> under the Stormwater Management tab). Both BES and BDS Site Development will notify an applicant when depth to groundwater investigation requirements apply.

BDS Site Development reviews separation distances for private UICs. BDS notifies the applicant of the depth to groundwater requirement but is not responsible to enforce or oversee the actual monitoring. The applicant's geotechnical professional is responsible to determine if there is adequate ground water separation for the proposed facility. If an applicant has questions about depth to groundwater investigation on private property, they should contact DEQ at (503) 229-6371. In a well field protection area, BDS will not approve onsite infiltration until Water and BES issue approval.

BES reviews for separation distances for public UICs. If an applicant has questions about depth to groundwater investigation on public property or in the public right-of way, they should contact the BES plan review staff they are working with.

The City of Portland's Depth to Groundwater map is a modified version of the USGS map that represents seasonal high groundwater levels. The USGS version of the map uses mean depth to groundwater levels. Using the seasonal high groundwater (the City's version) results in about a 3 foot difference in water levels in most areas of the City. The estimated depths to groundwater are from ground surface. The City's maps show 2 foot, 10 foot, and 20 foot contours. The 10 foot map specifically shows the 50 foot contour - but either of the maps can be used to estimate the location of the 50 foot contour.

Groundwater monitoring may be critical at the 20' contour where separation conflict is highly likely, but it is unlikely that a 5' deep drywell near the 50' contour would require more than a 10' deep test pit and geotechnical opinion for approval.

Piezometer vs. Monitoring Well

Appendix F.1 uses the terms piezometer and monitoring well interchangeably, to allow flexibility in the groundwater investigation to meet other potential data needs, if any. BES does not have a specific preference for piezometers or monitoring wells. BES is relying on Oregon licensed professionals (registered geologist, certified engineering geologist, or professional engineer) to develop an appropriate scope of work to collect and document accurate depth to water measurements.

CHAPTER 2 – Facility Design

7. When does an applicant determine whether to use the Simplified, Presumptive or Performance Approach?

On **pg 2-15** the manual describes each of these approaches and states the applicants must select one. Each approach has a unique plan review and approval process that establishes a permit track for the project.

This should be determined as soon as possible in the development review process, and stated in Land Use responses whenever possible. The BES Early Assistance and Development Review teams will be the primary source to determine the design approach. BES and BDS will need to coordinate to ensure consistency.

Staff have the discretion to require the Presumptive or Performance approaches based on the site conditions or available storm discharge points. Review staff will exercise the right to require either approach over the Simplified design as needed.

The 2008 SWMM states a site cannot be divided into multiple catchments to avoid using the Presumptive Approach. However, in some cases, it may be appropriate when the majority of the development is roof top that is proposed to drain directly to drywells, the remaining area of the site (parking etc) may use the SIM form for sizing vegetated treatment facilities that overflow to properly sized drywells.

8. What are the stormwater submittal requirements?

All forms and submittal requirements are provided in **Appendix D**. There are two main submittal tracks: Simplified Approach and Presumptive Approach

1. The **Simplified Approach** would include the new SIM form (Form 1) the new O&M form (Form 2) plus any site plans, cross sections or other design details.
2. The **Presumptive Approach** includes a Stormwater Management Report, with PAC calculations, an O&M Report and the new O&M form (Form 2) plus any site plans, cross sections or other design details.

If a project does not fall into one of these tracks then it should either be submitted under the **Performance Approach** or the applicant submits a **Special Circumstance** request. The Performance Approach submittal requirements are the same as the Presumptive Approach. A Special Circumstance request requires that the Special Circumstances form (Form 3) be submitted. (Forms 4 through 10 are Source Control forms and whether or not they are needed is determined by Source Control staff.)

Document Services is responsible to collect the following documents at intake:

Proposed IA < 200sf	=	Site plan with drainage patterns (at minimum)
Proposed IA > 500sf	=	Simplified Approach Form
< 10,000sf	=	(unless SW Management Report is submitted)
Proposed IA > 10,000sf	=	Stormwater Management Report

Questions interpreting Simplified vs. Presumptive Approach are resolved by BES. Draft O&M's are not required at time of plan submittal for building permits. BES will assess what additional forms will be required at time of review.

9. *How will the requirement for infiltration tests be implemented at application submittal?*

As presented in **Section 2.2** infiltration testing is required when the use of infiltration facilities are proposed. All applications (including either the SIM form or a stormwater management report) require infiltration testing data. If the applicant has valid reasons for not conducting an infiltration test, they should explain on the SIM form or in the storm report (referencing specific research or documented site conditions). Zero lot line setbacks that preclude meeting mandatory lot line or property line setbacks, steep slopes, contaminated soils, or a geotechnical professional report recommending against infiltration are all valid reasons to not conduct the test, but the applicant needs to document this.

BDS Land Use Review and/or Site Development will decide if infiltration testing is required on private property at the time of plan submittal. Infiltration testing can be waived at any time with BDS site Development's approval, including a potential waiver for widespread areas agreed to in southwest Portland.

BDS will not require infiltration testing where lot-line-to-lot-line development is allowed, although they will confirm if stormwater requirements were addressed during the planning stages of the project. Other factors that may influence the use of an infiltration facility include but are not limited to: setbacks, topography, known infiltration rates, zoning or space limitations. When infiltration testing is waived, BDS will document in TRACs.

Stormwater Facility Site Evaluation Maps are now available to assist with the preliminary investigation of a site’s infiltration capacity. They can be found online at <http://www.portlandmaps.com/> under the Stormwater Management tab.

Infiltration Rates

Simplified Approach - 2"/hour (tested infiltration rate) = total infiltration required

Presumptive Approach - 2"/hour (design infiltration) = total infiltration required

Note: Partial infiltration is not a requirement, but instead an option to consider when discharge options are limited or it is the goal of the applicant. Where partial infiltration is being considered, qualified design professionals must verify the infiltration testing results and stamp the stormwater submittals. Both BES and BDS will agree when this is appropriate and document the circumstances.

10. Is an engineer’s stamp required for every Presumptive and Performance submittal?

No stamp is required for the Simplified Approach. The submittal requirement for the Presumptive or Performance Approach is a Stormwater Management Report. For both private property and improvements in the public right of way the Stormwater Management Report must be stamped by a licensed engineer. The data output from the PAC are to be included in the Stormwater Management Report. Anyone can use the PAC, but if the outputs are used in a Stormwater Management Report, the Report must be stamped by a licensed engineer. Phasing projects to avoid having to hire an engineer is not acceptable.

11. Is an engineer’s stamp required for pervious pavement?

Refer to Exhibit 2-7 on **pg 2-42**.

	Concrete (inches)	Asphalt (inches)	Pavers (inches)	Engineering Required?	Compaction Required?
Residential Driveway or Pedestrian Only	4	2.5	2 3/8	Site specific. May require geotech if a long or steep driveway.	No
Private Street, Parking Lot, or Fire Lane	4	3	3 1/8	Yes	Yes As directed by geotech
Public Street	7	6	3 1/8	Yes	95%

12. Define the term “design professional.”

The term “Design Professional” is used throughout the manual and staff may reserve the right to establish whether or not some architects or landscape architects would qualify as such. The definition of the Design Professional involves the applicant’s ability to report engineering data and reliable site/civil plans. BDS Site Development will also reserve the

right to also qualify someone as a Design Professional for geotechnical data, for some projects.

13. Are sand filters allowed?

Yes, sandfilters as described on **pg 2-78** are allowed. Projects using sand filters are required to submit under the **Performance Approach**. Because sand filters do not include vegetation and have not been through the testing procedures that Stormfilters have, BES does not presume that they meet the stormwater management pollution reduction requirements. Specifically BES has concerns about clogging and long term maintenance. By submitting under the Performance Approach, the burden of proof is placed on the design engineer to demonstrate that the sand filter is properly designed to accommodate the flows from the site and that it will be properly maintained. Flow through sand filters are not allowed.

CHAPTER 4 - Source Control

14. Section 1.3.3 Pollution Reduction, page 1-24, Vehicle Repair and Sales.

Does this apply to areas where the vehicles are stored awaiting repair or where repair is occurring outdoors?

The vehicle repair and sales examples are referencing the areas where the parked vehicles or equipment that are awaiting service will be stored. It does not include outdoor repair areas because maintenance of vehicles or equipment is not allowed outdoors. In some special circumstances (equipment too large to repair indoors such as cranes), repair can occur outdoors with proper best management practices in place.

Does this requirement include areas where new vehicles are stored?

If only the sale of new vehicles or new equipment is occurring, then the additional pollution reduction requirements DO NOT apply. However, if there are any used vehicle or equipment sales, the requirements DO apply in those areas.

What is the definition of vehicles? The section title alludes to equipment and traffic areas, but there is no further mention of these areas in the following text?

The term vehicles includes cars, trucks, tractors, in some cases refrigeration units, heavy equipment, industrial equipment, and other types of mobile equipment that may leak fluids and create an exposure of pollutants to stormwater.

One of the use characteristics that trigger the additional pollution reduction requirements (second bullet item "Areas with high likelihood of total oil and grease loadings") and the examples that follow are unclear. Also, are high truck traffic areas at terminals or business' with large parking lots that attract high levels of traffic also required to install additional pollution reduction devices?

At this time, large parking lots, such as large grocery store parking lots or business' that are terminals and rely on over the road hauling are not required to meet these requirements. However, if an industrial area receiving high traffic is violating water quality standards or NPDES permit requirements, or there has been documentation (through inspections of the property) that there are oil sheens, then the pollution reduction control will be required.

15. Section 4.3.4, page 4-8, requires laboratory reports to be submitted when developing on or near contaminated sites, but, section 4.11, page 4-44 states development on or near known or suspected contaminated sites trigger the 4.11 and testing requirements. These sections seem to contradict each other.

Section 4.3.4, includes suspected contaminated sites.

16. Section 4.4.5.4, page 4-15, Discharge Assessment for Long-Term Discharges. This section mentions that designs must reduce flows to a deminimis standard. What is the deminimis standard?

The word deminimis should be deleted from the sentence and “the greatest extent practical” inserted in its place. This clarification remains consistent with the rest of the section and the original intent. The “greatest extent practical” is further defined in 4.4.5.4.a.

17. Section 4.4.7.2, page 4-19, Temporary discharges. This section mentions that BES must issue a batch discharge authorization, but under long-term discharges this is not required. Why?

The temporary discharge language should be consistent with the language that is under the long-term discharge authorization form requirements. Therefore, the language “must be issued by the BES Source Control Division. The Batch Discharge Authorization” should be stricken from the paragraph, which clarifies the requirements and obligations for BES Source Control.

18. Section 4.5.1, page 4.22, Solid Waste. This section references that a special request must be filled out if gravity service to the sanitary sewer cannot be obtained. What is a special request form?

The Special Request form is the old language for what is now the Special Circumstance Form located in Appendix D of the 2008 SWMM. This reference will be corrected in the next update to the SWMM.

19. Section 4.7.2, page 4-30, Fueling requirements. A fuel pad is required to be paved per the paving requirements and must be adequate to cover the activity area. The requirements further state that fuel pumps or fuel islands must be located a minimum of 7 feet from the edge of the fueling pad. What if there is an above-ground storage tank (AST) with only one pump and fueling occurs on one side of the pump only, do we still need the minimum of 7 feet on the side there is no fueling occurring? Additionally, the covering requirements would then require the side where no fueling is occurring to be covered with a canopy. Please clarify.

For an AST with only one fuel pump, the pad would need to extend a minimum of 7 feet on the fueling side only. The design of an AST with a pump/nozzle attached, may not lend itself to include paving under the pump/nozzle system. The isolation of the pumping/nozzle system is needed to help prevent contaminants from coming in contact with stormwater. Therefore, the pump/fuel nozzle system even when it is attached to the tank must meet the

covering, secondary containment, and paving requirements. Since the fuel pump attached to an AST can be isolated in many different ways to meet the intent and goals of the requirements, the alternatives are not prescriptive; and therefore are reviewed on a case-by-case basis. Examples of ways the fuel pump/nozzle system can be met include: a small structure around the pumping mechanism – cover with bottom drip tray, or placing the AST's in secondary containment totes with covers.

The other side of the pump that would not have equipment or vehicles pulling up to be fueled would not be required to be paved or covered. However, the minimum cover overhang requirements of 3 feet or 5 feet, whichever is required per the covering requirements, must still be met on both sides of the fueling pad, island or pump.

20. Section 4.7.2, page 4-30, Fueling requirements. The fuel dispensing area must be covered, but what is the definition of fuel dispensing area?

The fuel dispensing area includes the fuel pump and the minimum 7 feet from the edge of pavement. If the pump resides on an above ground storage tank (AST) then the pump, couplings, and dispenser must be covered, but the whole tank does NOT need to be covered.

21. Section 4.11, page 4-46. What exactly are the requirements to submit an Environmental Site Assessment?

BES Source Control must receive information that provides a good characterization of the site specific soils and groundwater. The characterization, in the form of an Environmental Site Assessment Phase II or additional site sampling plans, must provide analytical data showing the extent of contaminated media onsite or possibly the migration offsite onto private or public properties, if applicable. An Environmental Site Assessment Phase I or Geotechnical Report usually does not provide sampling data and if it does it is not comprehensive enough for the DEQ or the BES to base good sound environmental decisions.

If the site has been working with or has worked with the DEQ, the record of decision (ROD), or no further action (NFA), in addition to the remedy decision or remedy proposal, and Work Plan may be helpful or needed to obtain the information required by BES.

If a comprehensive characterization with analytical data has not been performed or is not available, BES may require sampling as outlined in section 4.11 in order to evaluate stormwater management and requirements at the time of land use review or development.

CORRECTIONS

1. Regarding Sidewalks and Driveways as discussed on **pg 1-7** the following clarification is made:

In any case, it is not expected that a separate stormwater facility will be constructed to serve only a ~~sidewalk~~ or residential driveway under 500 square feet or a sidewalk.

2. Under the section header **Stormwater Hierarchy** on **pg 1-11** the following is stated:

“Roof runoff is exempt from pollution reduction requirements and may drain directly to a UIC. Residential roofs (up to three units) are excluded from UIC authorization. See **Section 1.4** for further clarification of UIC requirements.”

To include the second sentence (*in green*) in this section causes confusion. The pollution reduction requirements are a separate issue from the UIC rule authorization requirements and process. While the second sentence is accurate, it is a level of detail that does not belong in this section. Delete the second sentence from this section.

3. Regarding infiltration rates, page **1-12** and **1-28** both define poor infiltration rates as **less than 2” per hour tested rate**. In both instances, the text should read **less than 2” per hour design rate**.
4. Regarding stormwater requirements for non-conforming parking lots as discussed in Section 1.5 page **1-37** the following clarification is made:

Grade: Existing grades must allow for stormwater to ~~sheet-flow~~ directly towards the new vegetated facilities. This requirement does not apply when it is impractical for runoff to flow into landscaped areas.

5. Chapter 4, Page 4-16, Section 4.4.5.4.c, in the first paragraph the last sentence is a duplicate of the sentence above it and should be deleted from the paragraph.

6. **Appendix A.3:**

“City Code Chapter ~~17.38.021~~ **17.38.030** gives BES the authority to require drainage reserves as part of development review.

7. The following plant species are **deleted** from the Stormwater Manual Plant List found in **Appendix F.4** :

Polypodium glycyrrhiza, Licorice Fern
Pteridium aquilinum, Bracken Fern
Salix purpurea nana, Blue Arctic Willow
Delosperma ssp., Ice Plant
Carex comans, New Zealand Hair Sedge
Acer capestre ‘Evelyn’ – Queen Elizabeth Hedge Maple

8. **Appendix D.3** and **D.4** submittal guides note that footprints of structures and impervious areas must be provided on the development plans. For buildings, footprint refers to the roofline not simply the foundation of the structure.