APPENDIX A.3

Private Drainage Reserve Administrative Rules

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I. Program Goals and Objectives

The main goal of the drainage reserve code and associated administrative rules is to protect flow conveyance in both natural and manmade surface channels (drainageways), thereby minimizing scouring and erosion in local stream systems and protecting properties from impacts related to modifications of drainageways. Drainage reserves act as a no-build area, not an easement. Drainage reserves ensure that properties with drainage downstream and upstream of developing properties are not damaged or destabilized by ponding, flooding, or other impacts from excess flows. While reserves are implemented on a site-by site basis, the drainage reserve code and administrative rules strive to protect local waterways from cumulative impacts of development, especially in headwater areas. The code and administrative rules are intended to establish standards and appeal processes to meet the following objectives:

A. Responsibly manage stormwater and limit site impacts. Maintain the location of stormwater discharges and flows where they naturally occur within the development area and cause least detrimental environmental impact.

B. Limit off-site impacts. If any encroachments into the drainageway channel are proposed, identification of the upstream tributary drainage and a downstream analysis shall be required to ensure there are no substantive impacts to downstream properties. The kind of analysis required will depend on the cumulative impact of problems identified within the basin and the size of the planned project.

C. Control runoff. Proposed construction projects and system modifications or improvements shall provide runoff controls to limit the developed condition's peak rates of runoff to the pre-development peak rates for a specific design storm frequency, based on the proposed project site's existing runoff conditions.

D. Control erosion. All conveyance systems shall be designed and modified to prevent and reduce construction erosion and long-term, scour-related erosion within the drainageway. This includes the establishment of woody vegetation for scour protection and enhanced infiltration and water quality.

E. Provide operation and maintenance. The private property owner is responsible for retaining the drainageway as an open system and for maintaining all drainage facilities constructed or modified by a project, unless the City has specifically agreed to City operation and maintenance (O&M) before plan approval. Owners shall also be responsible for maintaining all enrichment elements approved by the City and covered by a drainage reserve O&M plan.

F. Maintain capacity. Because drainageways serve an important hydrologic function for small waterways, there may be a requirement to demonstrate that any encroachments into the drainageway will not affect storage or conveyance volumes of the drainageway. Mitigation may be required for any lost capacity in the drainageway resulting from encroachments.

While protection of flow conveyance is the purpose for establishing drainage reserves, the rules also include elements to meet secondary City goals such as plant diversity, water quality, habitat, and other watershed health issues such as restoring onsite hydrology, improving water quality, habitat, and biological communities.

II. Background

Throughout Portland are areas without constructed drainage facilities, where drainage flows over land through private properties and unimproved or substandard rights-of-way. Usually this overland flow of water collects into some kind of open conveyance that carries the water across the property. For the purposes of these rules, these open conveyances are collectively called drainageways. Drainageways may also fall into other City Code definitions concerning water movement, especially terms such as "streams" and "channels." Some drainageways may be formed or controlled by structures, such as culverts, that direct or pond water. Natural seeps, springs, and wetlands may generate water, but do not convey water across property and therefore are not specifically drainageways. These rules are not intended to cover these natural water features. Drainageways must be carefully considered when properties are developed, regardless of whether the drainageways are naturally occurring or have resulted after water has been moved, shifted, or modified as part of earlier developments or actions. It is critical for watershed health and public health and safety that these private flow conveyance systems be protected and improved if receiving any development impacts. Private property owners are responsible for maintaining flow conveyance and erosion prevention within any drainageway that runs through their property.

In the mid 1970s, the City of Portland implemented provisions within the City's land division code (known at the time as Title 34 and now known as the 600 series in Title 33) to ensure that open conveyance systems stayed open. The intent at that time was for subdivisions and planned unit developments to redesign around open conveyance channels when possible. Given the growing science of using open areas for managing drainage and for flood control, the City identified the need to establish drainage reserves over drainageways as a method of enhancing control of stormwater flows.

In 1994, the City began to rewrite its land division code. Drainage reserves were deemed a technical review item and moved into the public works code section 17.38, which is administered by the Bureau of Environmental Services (BES). Moving these regulations also reinforced that flow conveyance is a public infrastructure and public safety element, similar to other public works elements found in Title 17 of the City Code. This move also reinforced that such technical review items are distinct from more traditional subjective land use review items and that technical items are not open for appeal to the Oregon Land Use Board of Appeals (LUBA). By the time this code provision was moved in 2002, BES decided to expand the coverage of the drainageway regulations to apply to all types of development reviews (e.g., land use reviews, building permits, site development permits), not just land division reviews (one specific type of development review). This expansion to all types of development reviews enhanced City efforts to provide safe flow conveyance across the City, and the change provided equitable regulation across all forms of development.

During the 2002 code rewrite, new administrative rules were created to describe the technical review standards that were not described in the zoning code language. Those rules, which described how BES would administer drainage reserves across all forms of development review, were adopted in December 2002. (See Appendix A3-A.) The rules generally stated the technical standards and decision-making criteria that BES would use to determine whether a drainage reserve should be placed on a developing property. At that time, the City also defined drainage reserves as a condition of development approval, rather than as an easement that would be purchased or required by the City. That designation was made because no municipal facilities are involved on these private properties, and the City is not the party responsible for ongoing maintenance. Because of that decision, drainage reserves have not been shown on final plat surveys or on private property title searches. These new 2008 rules implement a procedure to record notice of conditions against a deed in order to provide some notice to property owners that a drainageway is present on their property. (See Appendix A.3-B.)These 2008 administrative rules supercede the 2002 rules.

III. Purpose of these Rules

These rules detail the criteria BES will use to establish drainage reserves and to review for drainage reserve encroachments related to development. Applicants are encouraged to either meet these rules outright or request an appeal to review site-specific conditions that could influence the establishment of a drainage reserve or the approval for encroachments. All appeals shall be prepared to address the intent of the standards and criteria outlined in this document. Appeals shall be processed as described in Section XII.

BES staff experience over the five years of implementing the 2002 drainageway rules has identified the need to have greater flexibility for encroachment. While the City code grants general authorities, it does not specifically describe how a development proposal will be reviewed and evaluated for the need to place a drainage reserve. These rules achieve the following:

- Clearly identify BES's obligations for ensuring appropriate protections of stormwater flows.
- Clarify BES's administrative review, submittal requirements, and evaluation standards for requiring drainage reserves.
- Detail the responsibilities for protecting drainage reserves from other site development.
- Explicitly describe the approval standards and process for modifications made within a designated reserve area.
- Reflect the differences between building permit review and land division review, especially the ability to redesign at a late stage of City review in the building permit process.
- Detail the issues of concern and the submittals required to approve encroachments into the reserve area versus into the drainageway channel.
- Identify the methods for an applicant to appeal and for site-specific consideration.
- Clarify the inspection and enforcement roles and responsibilities of all City parties.

- Identify the ongoing responsibilities of a property owner in protecting, using, and maintaining a drainageway and drainage reserve area.
- Create a new notice of condition recording process to ensure that property owners are aware that a drainage reserve is present on their property and that there are maintenance and encroachment review responsibilities.

In the last five years, the City has made substantial progress in identifying multiple watershed health objectives that should be met by all City activities. While **these rules are foremost for flow conveyance protection**, they also often result in improved vegetated facilities that meet multiple watershed health objectives. These other benefits are secondary; open flow conveyance is the primary objective of these rules. There may be site needs that result in a determination to pipe a drainageway for land stability or other safety issues. In these cases, public health and safety needs will be prioritized over other vegetative/habitat-related watershed benefits.

IV. Regulatory Authority

City Code Chapter 17.38.021 gives BES the authority to require drainage reserves as part of development review. The code states:

1. Authority. The Director may require drainage reserves or tracts over seeps, springs and drainageways as necessary to preserve the functioning of these areas and to limit flooding impacts from natural and man made channels, ditches, seeps, springs, intermittent flow channels and other open linear depressions. Standards and criteria for imposing drainage reserves or tract requirements shall be adopted by administrative rule. Placement and/or sizing of drainage reserves do not relieve property owners of their responsibility to manage stormwater in a manner that complies with the duties of property owners under applicable law. Drainage reserve or tract requirements may be imposed during land use reviews, building permit review or other development process that require Bureau of Environmental Services (BES) review.

2. Required management of the drainage reserve: Drainage reserves or tracts shall remain in natural topographic condition. No private structures, culverts, excavations or fills shall be constructed within drainage reserves or tracts unless authorized by the BES Chief Engineer. All changes must also comply with zoning regulations as described in Title 33, and grading and floodplain regulations as described in title 24.

While drainage reserves are routinely required at the building permit stage of development, BES staff will evaluate, identify, and propose conditions of approval at the land division stage of development to help enhance the ability of developers to design around reserve areas.

These rules do not specifically address existing development that has previously been built in areas that would meet the drainageway definitions found in this document. However, any new expansion of structures that encroach in the drainage reserve and trigger a building permit must comply with these rules.

V. Relationship of Drainage Reserve Code to Other Regulations

The City has multiple regulations that require management of open surface flow conveyance systems. Below are other regulations that may need to be addressed instead of or in addition to these drainage reserve regulations. The program descriptions identify differences among regulations and note any processes that coordinate review of drainage reserves with other reviews.

Land Division Tracts

BES participates in land division review processes to ensure the adequacy of sanitary services, onsite stormwater management, and drainageway protection. The main objective is to ensure that the property has sufficient space reserved for flow conveyances and post-development stormwater management facilities. Given the variety of regulatory mechanisms in the land division code (seep/spring tracts, stormwater management tracts, environmental tracts, and drainage reserves), Bureau of Development Services (BDS) and BES review staff coordinate closely to determine which regulatory mechanism is the most appropriate for protection of the drainageway. In many cases, drainageways are protected by the placement of a land division tract to ensure protection from future development.

Stormwater Management Manual (SWMM) Requirements

BES also administers regulations to control post-development stormwater flows for both water quality and quantity issues. The SWMM regulates new flows generated by new impervious surfaces in developments, while the drainageway regulations control the ***existing*** conveyance system for flows that cross an applicant's property. The onsite drainageway is often the ultimate approved disposal point for onsite structural facilities required by the SWMM.

Environmental Zones (E-zones)

Chapter 33.430 of the City's zoning code regulates impacts to the identified natural resources within the City's jurisdiction. These natural resources have been identified as providing benefits to the public, including fish and wildlife habitat, stream stability, and stormwater flow control. Development proposed within an environmental overlay zone (E-zone) must be sensitive to the site's protected resources and specifically provide protection to surface vegetation and land features, in addition to stream protection.

There are two kinds of environmental overlay zone: the Environmental Conservation overlay zone and the Environmental Protection overlay zone. BES's current practice is to establish drainage reserves in the Environmental Conservation overlay zone as necessary because development is allowed within that zone. Establishing drainage reserves in the Environmental Protection overlay zone is not necessary because allowed development is limited.

BES and BDS coordinate review when drainageways are identified within an E-zone. When an environmental review is required, BES provides drainage reserve comments on the development proposal along with its other environmental review comments related to the development proposal.

Drainageway-related regulations are BES's responsibility and are required as a separate review in any of the following situations:

- The development proposal requires an environmental plan check and there is a drainageway on the site that is not identified on the map of streams and waterbodies.
- The development proposal requires an environmental plan check.
- The development proposal is exempt from E-zone regulations.
- The drainageway is outside of the E-zone.

Geotechnical Issues

Section 24.70 of the City's building regulations specifies City regulations regarding clearing, grading, and erosion control (as does Title 10). BDS reviews all development proposals to determine whether any clearing, grading, or geologic condition on private property is or may become a hazard to life and limb; endanger property; cause erosion; adversely affect drainage; or adversely affect the safety, use, or stability of a public right-of-way or drainage channel. BES and BDS coordinate review of any development or mitigation proposed within a drainage reserve.

Floodplain Regulations

If the drainageway is located in a floodway mapped by the Federal Emergency Management Area (FEMA), a specific drainage reserve is not required, since the floodplain regulations of Title 24 and Title 33 are sufficient to protect flow conveyance. Drainageways may also be classified as unidentified watercourse flood zones, even if they are not identified in a federal insurance study, and may be subject to further regulations as provided for in the flood hazard chapter (Section 24.50.050.I) of the City Code.

VI. Definitions

Pursuant to City Code Title 17.38 and these administrative rules, the following definitions apply to these administrative rules. They are not necessarily the same as dictionary or zoning code definitions:

A. *Channel*. For the purposes of these rules, a channel is the portion of the drainageway that demonstrates evidence of the passage of water. It is the depression between the banks worn by the regular and usual flow of the water. The channel need not contain water year-round.

B. *Drainage*. Drainage is a general term for waters generated at or conveyed through a particular site. Drainage is predominantly surface runoff generated from rainfall. Surface groundwater shall be considered drainage.

C. *Drainageway*. A drainageway is an open linear depression, whether constructed or natural, that functions for the collection and drainage of surface water across a property. It may be permanently or temporarily inundated, act as a headwater or tributary to a larger drainage system, and may be present as a distinct channel tributary. Natural seeps, springs, or wetlands where subsurface waters come to the surface are not considered drainageways unless they are part of a conveyance carrying waters across a property.

D. *Drainage Reserve*. A drainage reserve is a portion of property set aside to protect the functional flow values of the drainageway. This reserve is placed during the development review process and is legally reserved as a no-build area on the building permit or application. Previous rules and City Code called this a drainageway easement.

E. *Headwaters***.** Headwaters are the source of a stream or river (e.g., a spring). [Department of State Lands definition OAR 141-085-0010 (93)]. They are an area where groundwater surfaces and forms an open drainage channel.

F. *Outfall*. An outfall (as specified in the BES *Sewer Design Manual*) is a location where collected and concentrated water is discharged. An outfall can occur at the end of a pipe system, from a structural facility, or from an open drainage channel.

VII. Identifying Drainageways on Properties

BES review staff will evaluate mapped stream layers, site development plans, aerials, and other information to ascertain whether a drainageway may be present on a property that is in for development or building permit review. City review or inspection staff (usually from BES or BDS) will usually make a site visit to collect information on site conditions. BES staff will make a final determination of the existence of a drainageway area, based on both topographic and infrastructure indicators on and near the site and on any evidence of concentrated flow and/or ponding. Factors may be present in wet or dry seasons or both. The determination of an onsite drainageway does not depend on water being present, only on factors that demonstrate the presence of water during a previous wet season. In making a determination, staff will evaluate

the factors listed below. Placement of a drainage reserve may be based on any combination of these factors; not all of the factors must be present.

A. Year-round Factors
   1. Topography.
   2. Infrastructure type, size, and location (e.g., culverts, right-of-way ditches, outfalls).
   3. Soil type.
   4. Erosion/incision.
   5. Channel substrate.
   6. Evidence of drift lines, waterborne sediment deposits, or sorting.
   7. Soil saturation within 18 inches of the surface.
   8. Characteristic vegetation
   9. Visual topographic or vegetative connection to nearby wetlands, streams, seeps/springs, and sensitive natural areas identified by other regulatory agencies.
   10. Maps, photographs, and historical records.
   11. Identification of any municipally owned stormwater control structures or management facilities along the drainageway or at its outlet.

B. Additional Wet Season Factors
   1. Visible flowing or ponding water.
   2. Volume and velocity of existing drainage on, upstream of, and downstream of the site (including groundwater flows). The amount of upland development will be coarsely evaluated to help identify the quantity of presumed flow.

VIII. Placing and Protecting Drainage Reserves

BES will place a drainage reserve over any portion of a property with flow conveyance features that meet the drainageway definitions and are not already protected by environmental stream mapping or land division tracts (described earlier). If the environmental overlay zones or land division tracts are insufficiently sized to cover the presumed 30-foot-wide reserve width, drainage reserves may be placed on top of these other protection methods to ensure full protection of the full desired width for flow conveyance. The drainage reserve shall be considered a no-disturbance area for the purposes of the proposed site development. Proposed developments that wish to encroach into the designated reserve area must meet the standards and submittals of Section IX (Drainage Reserve Encroachment Standards and Review). In essence, the drainage reserve can be thought of as a buffer, protecting the flowing water from development. The standard buffer is 15 feet from the centerline of the flowing water on both sides of the flowing water. Like a setback, these generally are areas that should stay clear of structures, but can be approved for use by specific types of development.

A. Sizing

Drainage reserves shall be sized to ensure that the current flow rate and pattern of the drainage continues to be adequately conveyed through the site. Current flow volumes and/or drainageway capacities may be determined through reviewing a number of sources, including but not limited to:

1. Drainage basin hydrology and hydrologic records.
2. Delineation of the drainage catchment, including any impacts of adjacent open and piped drainage systems on the catchment of concern.
3. Modeling information, including volume and velocity, using a continuous simulation model to be approved by BES.
4. Historical data.
5. High-water marks.
6. Soil inundation records.
7. Photographs of past flooding limits.
8. Placement. Drainage reserves are typically 30 feet in width and placed on a site in one of the following manners:
   a. 15 feet from the centerline of the identified channel on both sides, or
   b. Within the boundary of designated environmental zones (if the zone is less than a total 30-foot zone), or
   c. For full coverage of the channel, plus 15 feet from top of bank, if the 30-foot width will not fully protect the channel width on larger drainageways.

BES staff retains the authority to modify or remove drainage reserves if the drainageway poses or may pose a landslide, flooding, or other public health and safety concern. In those instances, BES may allow drainageways to be moved, modified, or piped to protect public health and safety, in compliance with Title 24 and 33 regulations.

B. Long-term Protection

Drainage reserves shall be protected during the course of any proposed or future development to ensure the continuation of flow conveyance and other benefits. Drainage reserves shall be protected and maintained to meet the following standards:

1. The limits of the drainage reserve shall remain in natural topographic condition to the maximum extent practicable, as determined by BES.

2. No new vegetation proposed within the drainage reserve limits shall be on Portland's lists of nuisance plants or prohibited plants. Preference shall be given to native vegetation, especially for erosion control and water quality purposes.

C. Recording Notice of Conditions against the Property Deed

T o help ensure long-term protection of drainage reserve areas, BES will require the applicant to record notice of condition against the property deed. This notice of condition is to notify future property owners of the presence of a drainage reserve onsite and the requirements to maintain it as an open, functional flow conveyance feature. (See Appendix A.3-B for a sample notice of condition form.)

D. Protection during Site Development

Development proposals shall meet all of the following minimum standards to ensure drainageway protection.

1. All proposed disturbances on the site, including but not limited to structures, pipes, culverts, excavations, and fills, shall be located away from the existing drainageway and drainage reserve limits to the maximum extent practicable, as determined by BES review staff. Small facility outfalls are exempted. (See Section 3-B, below).
2. Temporary and permanent erosion control measures shall meet the requirements in the City's *Erosion Control Manual* (City Code Title 10.30.020). Additional erosion control measures (e.g., reinforced silt fence, bio-filter bags, or erosion blankets) may be required to ensure adequate protection of the drainageway during construction and during the establishment of vegetation within the drainage reserve.
3. During site construction, water shall be safely conveyed around or through the drainageway. The channel shall not be obstructed, with the exception of properly employed erosion control measures (such as bio-filter bags) when necessary. Seasonal limitations on development in or near the reserve may be placed if there are special site conditions such as those defined in Title 10.
4. No heavy machinery that produces ground compaction shall be allowed within the drainage reserve limits during construction. Low ground-pressure vehicles (such as spider hoes) may be allowed if the applicant can show adequate soil and vegetation protection.

E. Development Plan Submittal Requirements

To assess proper protection of drainage reserves during development review, the following information must be included for BES review:

1. Land Use Reviews (other than land division and environmental overlay related reviews). In addition to standard plan sets that show topography, general development layout, and large trees, BES will review for the following information, which should be located on a separate plan sheet or on an existing erosion control plan sheet:

    a. Location of drainageways, both natural and manmade. The limits of the identified drainageway shall be clearly delineated.

b. Location of proposed drainage reserve. The standard 30-foot reserve shall be used, or alternatively a smaller reserve proposal shall be made. (See Section 3 below for supporting documentation requirements.) Describe the tools to be used to demarcate the drainageway on the development property for staff review during onsite visits (flags, tape, fencing, etc). Provide construction plan notes to ensure proper installation, inspection, and maintenance of construction protection devices (orange construction fence, sediment fence, etc.) for issues such as sediment removal, inspection for undercutting, and bank sloughing.

c. Location and type of proposed encroachment or modification into the required drainage reserve area or into the drainageway itself.

2. Building Permit Reviews. ***In addition to the information above***, development-type permits must also include:

   a. A **site plan** of the entire property, including all items below, shall be submitted as part of the building permit or site development permit submittals. Submittals shall ensure that all of the following elements are included:

      i. Property lines and dimensions.

      ii. Location of the proposed development activity, disturbance area, and staging and/or stockpiling areas.

      iii. Location of existing trees 6 inches or greater dbh (diameter at breast height) and all proposed vegetation.

      iv. Location and dimensions of existing and proposed roads, driveways, utilities, parking areas, and building footprints.

      v. Existing and proposed topographic contour lines for site grading.

   b. An **erosion control plan** shall be submitted to identify how drainageways on the site will be protected during construction (including exclusionary fencing to prevent encroachment and protect drainageways from soil stockpiles, backfill, construction debris, construction equipment, etc.) and how disturbed soil will be permanently stabilized. For proposals that include construction activity within or adjacent to the limits of a drainage reserve, the erosion control fencing that protects the drainage reserve shall be reinforced. Refer to Section IX-B below for reserve encroachment review submittal requirements.

   c. A **development schedule** shall be submitted that notes any seasonal development limitations for drainageway protection.

   BES reviewers will evaluate the development submittals to determine if the proposed development adequately meets the standards for protection of drainageways identified above.

3. Requests for Smaller Reserves. An applicant may make a request for a smaller reserve area to BES. Any such request shall be sent to the appeals recipient described in Section XII of these rules and shall include an engineer's design report, as detailed in Section X: Channel Encroachment Standards and Review. BES will review and determine whether a smaller reserve sufficiently meets the drainage reserve goals

outlined in this section. Smaller drainage reserve areas shall be noted on all deed notice of conditions.

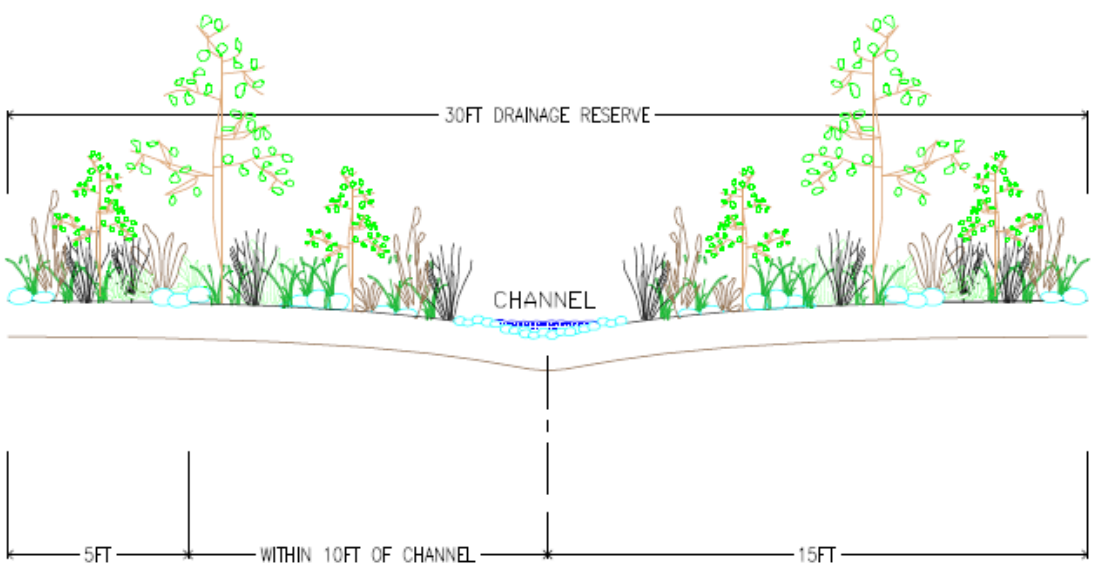
IX. Drainage Reserve Encroachment Standards and Review

Proposed encroachments into the drainage reserve will require additional review by City staff. Encroachments into a drainage reserve are evaluated based on the encroachment feature's proximity to an actual channel of the drainageway. In-channel structures can cause flow diversion, flow capacity, and bank stabilization issues. Encroachments into the reserve can cause floodplain impingements for high-flow conditions. The amount of encroachment can have negative impacts resulting from the cumulative loss of floodplain space. For ease of review, BES has separated encroachment into two types:

- Channel encroachment – within 10 feet of the channel centerline or for encroachments that remove more than 10 percent of the entire reserve area on the development-related side of the drainage channel.
- Reserve encroachment – usually within only the outside 5-foot edge of a reserve.

Exhibit A.3-1 shows this distinction. This section specifies the standards and submittal requirements for all reserve encroachments. Section X identifies additional standards and submittals required for channel encroachments. Appendix A.3-C summarizes development and submittal requirements for drainage reserve and channel encroachments.

Exhibit A.3-1: Cross-Section View of Drainage Reserve



A. Reserve Encroachment Standards. The proposal will be approved if the applicant has clearly demonstrated that ALL of the following standards can be met:

1. The encroachment shall be minimized to the maximum extent possible.

2. The encroachment shall occur in the most environmentally sensitive manner, considering seasonality, slope, soil, geologic, and erosion control issues to limit disturbance impact to flow capacity and channel stability.
3. All mitigation for disturbances within the drainage reserve limits shall be located on the project site. Proposed mitigation shall equal or exceed any loss in conveyance volume, flow rate control, and vegetation density within the drainage reserve limits.
4. All structures, mitigation plantings, and drainageway improvements shall be maintained in accordance with the submitted O&M plan.
5. Proper temporary and permanent erosion control and exclusionary fencing measures, including but not limited to those found in the *Erosion Control Manual* (City Code Title 10.30.020), shall be employed to ensure adequate protection of the drainageway during construction and during the establishment of vegetation within the drainage reserve limits.
6. Flows shall be conveyed around the encroachment area during construction.

B. Reserve Encroachment Review Submittal Requirements. In addition to the general review submittals required in section VIII-B, the applicant shall provide information specific to encroachment, including but not limited to:

1. Type of encroachment/improvement structure.
2. Boundary of disturbance (both permanent and temporary) to the reserve caused by the encroachment. Type and size of any proposed encroachments. (Refer to Section IX-B for reserve encroachment review submittal requirements).
3. Estimate of flow impacts to the drainageway, including decreases in cross-sectional flow volume, flow path alteration, or any structure that could cause flow ponding.
4. Number or density and type of vegetation to be removed within the reserve boundaries.
5. A **mitigation plan** that clearly identifies existing and proposed conditions (included in the building plans). The mitigation plan shall include calculations and channel cross-sections to demonstrate where lost flow conveyance capacity will be restored within the project site. The plan shall include a revegetation plan that shows how proposed areas of disturbance within the drainage reserve limits will be protected from erosion by replanting with native plants that are similar types and sizes, or equivalent basal area, as those removed. Because plantings are used for long-term erosion control purposes, all plantings must be within the drainageway and drainage reserve area.
6. An **operations and maintenance plan** for the actual structure that is encroaching and for the mitigation plan elements, submitted in accordance with Section XII: Operations and Maintenance Requirements.

X. Channel Encroachment Standards and Review

The following additional requirements apply to encroachments within 10 feet of a drainage channel or for encroachments that remove more than 10 percent of the entire reserve area on the

development-related side of the drainage channel. Modifications to channels shall be considered facilities and shall require ongoing maintenance by the property owner.

A. Channel Encroachment Exemptions. Single, small-gauge outfalls from stormwater management facilities, regardless of location, are allowed to encroach outright if they meet the standards that govern outfalls in the City's environmental zoning code (Chapter33.430). These standards address many environmental sensitivity issues and are being used as a guide for the approval of all small outfalls, both within and outside of environmental overlay zones, that reach a drainageway. Outfalls that meet these E-zone standards are exempt from channel encroachment review and submittal requirements. All other outfalls that do not meet these standards shall be processed by the review standards and submittals detailed below.

B. Channel Encroachment Standards. The proposal will be approved if the applicant has clearly demonstrated that ALL of the following standards can be met:

1. The encroachment shall not worsen any existing drainageway conditions, such as channel erosion or water impoundment.
2. Construction activities shall not occur during the wet-weather season (October 1 through April 30) or outside of designated work season windows for Oregon Department of Fish and Wildlife designated streams.
3. The channel encroachment shall be mitigated by modifying the channel to retain its original capacity or by enhancing storage and conveyance volumes.
4. Flows resulting from the encroaching facility shall leave the site in a location and manner that maximizes the watershed benefits of the drainageway. Flow rates and outlet locations may be altered to improve watershed function. Hydrologic modeling may be required, depending on site conditions and the extent of encroachment.
5. Additional erosion control measures, independent of those required on the building permit, shall be used to ensure protection and functionality of the existing stormwater conveyance system during construction of the improved/modified drainageway.

C. Channel Encroachment Review Submittals Requirements. Modifications to existing drainageway channels shall be done under a BDS building permit, either for drainageway work specifically or combined with a property-wide building permit. The site drainageway protections and structures encroaching into a drainage reserve shall be inspected as part of overall site erosion control inspections. Reserve protections shall be in place by the time of the preconstruction erosion control inspections. Drainageway encroachments must meet all elements of area floodway and floodplain regulations, if applicable. The permit submittal shall include all of the submittals required in the reserve encroachment section, plus the following information:

1. Engineering design report. This report, stamped by a licensed engineer, shall include technical evaluation of all site and drainageway concerns and all of the following information:

    a. A hydrologic modeling analysis of the upstream tributary drainage area and a downstream analysis shall be conducted. The analysis must extend downstream of the proposed project location to a point in the public drainage system where the proposed project site constitutes less than 15 percent of the total tributary drainage

area. This point shall not be less than 1,500 feet downstream of the site. The level of analysis required will depend on the problems identified within the basin by the deign engineer, in consultation with the City, and the size of the project being planned.

b. Cross-sectional data for the new and existing channel shall be incorporated into the hydrologic modeling analysis. The report shall include cross-sectional data at various points along the existing and proposed sections of open channel. These cross-sectional data shall be provided at:

   i. Locations several feet from the beginning and the end of the open channel.

   ii. Points of significant change in configuration (e.g., grade, size, or shape of channel). The following data shall be provided for each cross-section:

   - Width, depth, shape, and invert elevation.
   - Roughness coefficient/condition of the open channel (e.g., rocky, dense vegetation, large woody debris).

c. For proposed pipes, cross-sectional data shall include:

   i. Diameter, length, slope, and invert elevations at beginning and end of pipe.

   ii. Pipe material.

2. Construction management plan. This plan shall be submitted to show the limits of all disturbance areas for the entire site, including the area within the drainage reserve that will be disturbed during construction. It may be submitted as a separate sheet or combined with the erosion control plan, and shall describe:

   a. The nature of the disturbance, including construction access roads and areas where materials and equipment will be stored/stockpiled.

   b. Areas where equipment will be maneuvered, staging areas, and the limits of grading. The plan shall identify how undisturbed and tree protection areas will be protected.

   c. A schedule of activities. A narrative description of the type, sequence, and timing of all major construction activities shall be written on or attached to the construction management plan.

XI. Relationship to Public Drainage Improvements

Public improvements in drainageways are reviewed and administered through the City public works process, usually administered through a BES public works permit. Most of the guidelines for encroachment described above are implemented via BES public works permits, based on technical review by the BES Chief Engineer. It is the City's practice to avoid drainageway impacts where practicable. Appropriate road-crossing methodology shall be dictated by site-specific drainageway flow characteristics. All designs shall meet the evaluation criteria of the City Code Title 17.38 drainageway code and the following general standards:

A. The applicant has demonstrated that it is possible to construct street improvements within the right-of-way that will meet all of the following standards:
   1. The proposed street improvements shall not impede or restrict flows within the drainageway.
   2. The street improvements shall provide minimal impact to the slope, width, and depth of the stream channel, spring, or seep.
   3. The street improvements shall not impede fish passage in a drainageway that has been identified by the Oregon Department of Fish and Wildlife as fish bearing.
   4. Exposed soil shall be replanted with native seed mix and plants from the Portland Plant List, with preference give to native plants.

XII. Appeals

If the applicant does not agree with the BES staff determination of the location, size, or delineation of the existing drainageway or with the sizing of the drainage reserve, the applicant may appeal the BES determination. ***Appeals must be made through the BES administrative appeals process.*** Drainageway appeals are not allowed to be resolved through a building code appeals process. Drainage reserves that are either less than or greater than 30 feet may be placed over a drainageway, either at the discretion of BES staff based on evaluation of the criteria listed in Section VIII or at the request of the applicant through the appeals process. The applicant shall submit a written appeal and shall submit a land survey from a licensed land surveyor that includes, at minimum, the following information:

A. Property lines with dimensions.
B. Delineation and extent of the drainageway.
C. Distance from all points of intersection of the drainageway with the property lines, to the property corners.
D. Elevation of the drainageway at all points of intersection with property lines.
E. Modeling support information from Section X: Channel Encroachment Standards and Review.
F. A plan set showing the existing and proposed configurations.
G. A fee of $100.

Appeals will be reviewed by the Stormwater Early Assistance Team manager and routed to appropriate engineering staff for calculation and cross-section review. Reviews should take approximately 4 to 6 weeks. Appeals shall be sent to:

Stormwater Early Assistance Team Manager
City of Portland - Bureau of Environmental Services
1120 SW 5th Ave, RM 1000
Portland, OR 97204-1972

XIII. Inspections

In general, drainageways on private property will be inspected for protection and encroachment measures during the building permit process. All plan sets shall clearly demark the drainage reserve and appropriate protection measures (fencing, etc.). Any applicable maintenance measures, such as removal of collected sediment, shall also be noted on plan sets. BDS will verify that drainageway protections and encroachments shown on the site plan are in place. They will consult with BES staff on any concerns regarding adequacy of permitee efforts. Violations or failure to comply with drainage reserve protection requirements will be referred to BES staff for investigation and enforcement.

XIV. Operations and Maintenance Requirements

An Operations and Maintenance (O&M) plan is required if there is a permitted improvement or encroachment to the drainage reserve. For encroachments into the drainage reserve area, the O&M plan shall be kept on file with BES and attached to TRACS for public access. For encroachments into the active channel area, O&M plans shall be recorded with an O&M Form (Form 3) in the county of the subject property. See SWMM Appendix D for O&M Form instructions. The applicant may elect to use the O&M plan in A.3-D or may create a different one, which must be approved by BES. The drainage reserve and any mitigation must remain in their permitted condition.

A. Minimum Maintenance. The following minimum maintenance activities shall occur on all structures, channel enhancements, and mitigation sites approved for encroachment.
   1. Mitigation plants that die shall be replaced with the same species, same size, and in the same location. BES must approve proposals to relocate or substitute plants.
   2. Any structure that impedes flow (e.g., a fallen tree, illegally dumped garbage, sediment deposition) shall be removed, and the channel shall be restored to the natural or approved designed cross-section. Fallen trees, landslides, or other debris that blocks part of the channel conveyance shall be removed as quickly as practical. All repairs shall be made using handheld equipment, unless otherwise preapproved by BES staff.
      a. Structures or debris shall be removed within 30 days of their discovery.
      b. Any disturbance that has occurred to the drainageway or reserve shall be replanted or reinforced. If erosion occurs, the eroded area shall be reinforced with rocks, plantings, etc.
      c. Replanting/reinforcing shall occur within 15 days after the impediment is removed during the dry months or within 7 days during the wet months.
B. Log Sheets. The following information, at a minimum, shall be recorded on a log sheet on an annual basis for 5 years after mitigation is completed:
   1. Condition of mitigation plants and any replacement that has occurred.
   2. Soil erosion within the drainage reserve.
   3. Channel erosion or sedimentation.
   4. Condition and functionality of any flow control structures, such as culverts.

XV. Enforcement

Any unauthorized encroachment or other harm made within the drainage reserve or failure to obey the site-specific drainage reserve O&M plan shall be considered a violation of Title 17.38 and these rules. BES staff in the Spill Protection/Citizen Response (SP/CR) section shall respond to, investigate, and resolve all drainage reserve violation cases and shall respond to any complaints or referrals in a timely manner.

A. Staff may use education and technical assistance to remediate any discovered violations, especially with parties who are unlikely to have knowledge of regulatory requirements or knowledge of the reserve placement on their property. Timely remediation of any site issues such as vegetation removal that exposes bare ground, drainageway diversions, or blockages of the drainageway shall be priorities. Staff may work with property owners to establish an agreeable schedule for the remedy, but BES reserves the right to remediate any violations posing an imminent threat to public safety or water quality.

B. Enforcement to gain compliance with the standards of these rules and City Code shall generally follow the escalating steps of enforcement called out in the stormwater administrative rules (under separate cover). Measures such as stop work orders (especially for violations resulting from construction activities), administrative reviews, formal voluntary compliance agreements, financial penalties and/or criminal charges are available enforcement tools. Appeal to the City Code hearings officer is available, pursuant to City Code Section 22.10.

Appendix A.3-A: Previous Drainage Reserve Administrative Rules Adopted in December 2002*

V. Protection of Drainageway Areas

III.B.1. c Easements/ Drainage Reserves. *Are there easements or drainage reserves already present that would influence site design? Other than pipe easement described in (4) above, applications may be required to obtain a drainageway reserve*. (From *Sewer Design Manual* and Technical Review Standards above)

(1) Definition. Drainageway is an open linear depression, whether constructed or natural, which functions for the collection and drainage of surface water. It may be permanently or temporarily inundated.

(2) Drainageway Reserves. A drainageway reserve shall be placed to assure adequate and environmentally beneficial conveyance of stormwater across a developing site. Because of the unpredictable nature of storm events and great variation in potential flows, the sizing of drainageway reserves does not guarantee prevention of damages in all situations. Requirements imposed by the Bureau of Environmental Services are designed to address typical flows and do not relieve property owners of their responsibility to manage stormwater in a manner that complies with the duties of property owners under applicable law. Reserves shall be placed on a proposed development site in one of the following manners:

(a) 15 feet from the centerline of the channel; or

(b) 15 feet from the delineated edge of a designated water feature (i.e. seep, spring, wetland); or

(c) Within the boundary of a designated environmental zone; or

(d) Over a designated seep, spring and stream tract.

Exemptions: Drainage reserves shall not be required for drainageways located within a FEMA designated and mapped area.

(3) Sizing of Drainageway Reserves. Drainage reserves shall be sized to assure that the current flow rate and pattern of the drainageway continues to be adequately conveyed through the development site. Current flow volumes and/or drainageway capacities will be determined by:

(a) Reviewing existing data, which may include available hydrologic records, drainage basin hydrology, historical data, high water marks, soil inundation records, photographs of past flooding, and other similar information.

(4) Improvements within Drainageway Reserves. Improvements within the drainageway reserve shall only be approved when all of the following conditions exist:

(a) Where the modification will not impede or reduce flows within the drainageway; and

(b) Where the improvement will enhance the surface flow capacity and habitat values of the drainageway; and

(c) Where the improvement shall provide additional safety to public or privately held properties or facilities; and

* Adopted as part of the Title 17 Land Division Related Administrative Rules package

(d) Where the improvement is constructed with minimal hard surface armoring of the drainageway.

(5) Improvement Development Standards: All improvements shall meet one of the following development standards:

(a) All improvements shall comply with City codes and standards that apply to the improvement being proposed (i.e. erosion control manual, street design standards, and *Sewer Design Manual*); or

(b) Other design guidelines may be used, but only if approved by the BES Chief Engineer.

Appendix A.3-B: Notice of Condition Form for Recording Against Property Deed

After Recording Return Copy to:
LAND USE REVIEW DIVISION
BUREAU OF DEVELOPMENT SERVICES
1900 SW Fourth Avenue, Suite 4500
Portland, OR 97201

This Space Reserved For Recorder's Use:

PORTLAND BUREAU OF ENVIRONMENTAL SERVICES (BES)
1900 SW Fourth Avenue, Suite 5000
Portland, OR 97201

Notice of Condition of Development Permit Approval Conditions

_____ is the declarant of lot or parcel with Legal Description # _____ located at Site Address _____Multnomah County Records. Approval of the development permit for this parcel is based on the Portland City Code Title 17.38. Section 17.38.021 requires that drainage flows from above to below this property be conveyed in an open drainageway, which can appear as a channel or depression that conveys flows across a site. To assure continued operation and maintenance of this drainageway in an open, naturalized condition, the City's Bureau of Environmental Services (BES) has placed a drainage reserve on this property. The reserve is a 30 foot buffer, centered on the centerline of a drainageway, with 15 feet of reserve area on each side of the centerline. This buffer overlay where development encroachment, flow path alteration, or vegetation disturbance is prohibited without BES review and approval. Parcel or Lot owners and future parcel/lot owners should verify the constraints on their lots in the applicable land use and building permit decisions and conditions of approval, and with BES land use review staff.

Name and title of declaring

By:_____

The forgoing instrument was acknowledged before me on this _____ day of _____,_____ by declarant, the developer of the lot or parcel with R number _____.

Appendix A.3-C: Summary of Development and Submittal Requirements for Drainage Reserve and Channel Encroachments

Requirement	Location		
	In Drainage Reserve: • At least 10 feet away from channel AND • Less than (<)10% total of the reserve area on the development side of the channel	In Drainage Reserve: • Within 10 feet of the channel OR • More than (>)10% total of the reserve area on the development side of the channel	In Drainageway Channel
Site Plan	Required	Required	Required
Erosion Control Plan	Required	Required	Required
Mitigation Plan	Required	Required	Required
Construction Management Plan		Required	Required
Work Period	Any	Dry Weather Only	Dry Weather Only
Engineering Design Report			Required
Hydrologic Modeling		May be Required	Required
Cross-Sectional Data			Required
O&M Plan	Office Copy	Office Copy	Recorded with County
Notice of Condition Against Deed	Recorded with County	Recorded with County	Recorded with County

Appendix A.3-D: Drainage Reserve Operations and Maintenance Plan

Private drainage channels, which have been modified through a City permit process, must be inspected and maintained in order to ensure proper function and prevent property damage. All facility components, vegetation, and source controls shall be inspected for proper operations and structural stability, at a minimum, quarterly for the first 2 years from the date of installation, 2 times per year thereafter, and within 48 hours after each major storm event (defined as ½" in 24 hours). The facility owner must keep a log, recording all inspection dates, observations, and maintenance activities. This log must be available to City inspector upon request. The following items shall be inspected and maintained as stated:

Inlet **(culvert/outfall) shall maintain an unimpeded and controlled flow of water entering the drainageway**.

- Source of erosion shall be identified and controlled when native soil is exposed or erosion channels are forming.
- Sediment accumulation shall be hand-removed with minimum damage to vegetation using proper erosion control measures. Sediment shall be removed if it is more than 4" thick or so thick as to damage or kill vegetation.
- Inlet shall be cleared when conveyance capacity is plugged. Sources of sediment and debris shall be identified and corrected.
- Rock splash pads shall be replenished to prevent erosion.

Banks/Side Slopes **shall be maintained to prevent erosion that introduces sediment into the drainageway.**

- Slopes shall be stabilized and planted using appropriate erosion control measures when native soil is exposed or erosion channels are forming.

Drainageway Outlet **shall maintain sheet flow of water exiting drainageway unless a collection drain is used. Source of erosion damage shall be identified and controlled when native soil is exposed or erosion channels are forming.**

- Outlets such as drains and overland flow paths shall be cleared when 50% of the conveyance capacity is plugged.
- Sources of sediment and debris shall be identified and corrected.

Vegetation shall be healthy and dense enough to provide filtering while protecting underlying soils from erosion. Mulch shall be replenished as needed to ensure survival of vegetation.

- Vegetation, large shrubs or trees that impedes flow within the drainageway channel shall be pruned.
- Fallen leaves and debris from deciduous plant foliage shall be removed.
- Nuisance and prohibited vegetation from the Portland Plant List (such as Himalayan blackberries and English Ivy) shall be removed when discovered. Invasive vegetation contributing up to 25% of vegetation of all species shall be removed and replaced.
- Dead vegetation and woody material shall be removed to maintain less than 10% of area coverage or when drainageway flow is impeded. Vegetation shall be replaced within 3 months, or immediately if required to maintain cover density and control erosion where soils are exposed.

Spill Prevention measures shall be exercised when handling substances that contaminate stormwater. Releases of pollutants shall be corrected as soon as identified.

Training and/or written guidance information for operating and maintaining modified drainage channels shall be provided to all property owners and tenants. A copy of the O&M Plan shall be provided to all property owners and tenants.

Access to the drainageway shall be safe and efficient. Egress and ingress routes shall be maintained to design standards. Roadways shall be maintained to accommodate size and weight of vehicles, if applicable.

- Obstacles preventing maintenance personnel and/or equipment access to the drainageway shall be removed.
- Gravel or ground cover shall be added if erosion occurs, e.g., due to vehicular or pedestrian traffic.

If used at this site, the following will be applicable:

Check Dams shall control and distribute flow.

- Causes for altered water flow shall be identified, and obstructions cleared upon discovery.
- Causes for channelization shall be identified and repaired.