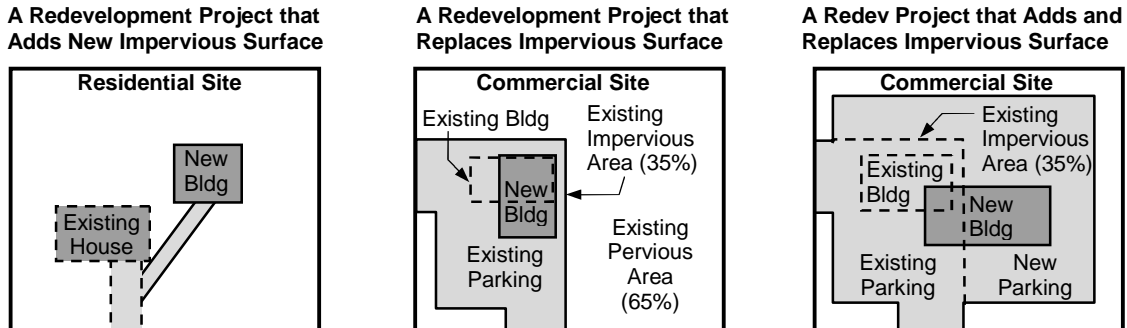


**Redevelopment project** means a project that proposes to add, replace, or modify impervious surfaces for purposes other than a residential subdivision or maintenance on a *site* that is already substantially developed in a manner consistent with its current zoning or with a legal non-conforming use, or has an existing impervious surface coverage of 35% or more. The following examples illustrate the application of this definition.



**Replaced impervious surface<sup>6</sup>** means any existing impervious surface on the *project site* that is proposed to be removed and re-established as impervious surface, excluding impervious surface removed for the sole purpose of installing utilities or performing maintenance. For the purposes of this definition, *removed* means the removal of buildings down to bare soil or the removal of Portland cement concrete (PCC) slabs and pavement or asphaltic concrete (AC) pavement. It does not include the removal of pavement material through grinding or other surface modification unless the entire layer of PCC or AC is removed.

**Replaced PGIS** means *replaced impervious surface* that is *pollution-generating impervious surface*.

**Severe building flooding problem** means there is flooding of the *finished floor area<sup>7</sup>* of a *habitable building<sup>8</sup>*, or the electrical/heating system of a habitable building for runoff events less than or equal to a 100-year event. Examples include flooding of finished floors of homes and commercial or industrial buildings, or flooding of electrical/heating system components in the crawl space or garage of a home.

**Severe erosion problem** means there is an open drainage feature with evidence of or potential for erosion/incision sufficient to pose a sedimentation hazard to downstream conveyance systems or pose a landslide hazard by undercutting adjacent slopes. Severe erosion problems do not include roadway shoulder rilling or minor ditch erosion.

**Severe flooding problem** means a *severe building flooding problem* or a *severe roadway flooding problem*.

**Severe roadway flooding problem** means there is flooding over all lanes of a *roadway<sup>9</sup>*, or a *sole access driveway<sup>10</sup>* is severely impacted, for runoff events less than or equal to the 100-year event. A severely impacted sole access driveway is one in which flooding overtops a culverted section of the driveway, posing a threat of washout or unsafe access conditions due to indiscernible driveway edges, or flooding is deeper than 6 inches on the driveway, posing a severe impediment to emergency access.

<sup>6</sup> *Replaced impervious surface includes impervious surface that is moved from one location to another on the project site, where the area from which the impervious surface is moved from will be restored to the same or better runoff discharge characteristics as the area being covered by the moved impervious surface.*

<sup>7</sup> *Finished floor area, for the purposes of defining severe building flooding problem, means any enclosed area of a building that is designed to be served by the building's permanent heating or cooling system.*

<sup>8</sup> *Habitable building means any residential, commercial, or industrial building that is equipped with a permanent heating or cooling system and an electrical system.*

<sup>9</sup> *Roadway, for the purposes of this definition, means the traveled portion of any public or private road or street classified as such in the King County Road Standards.*

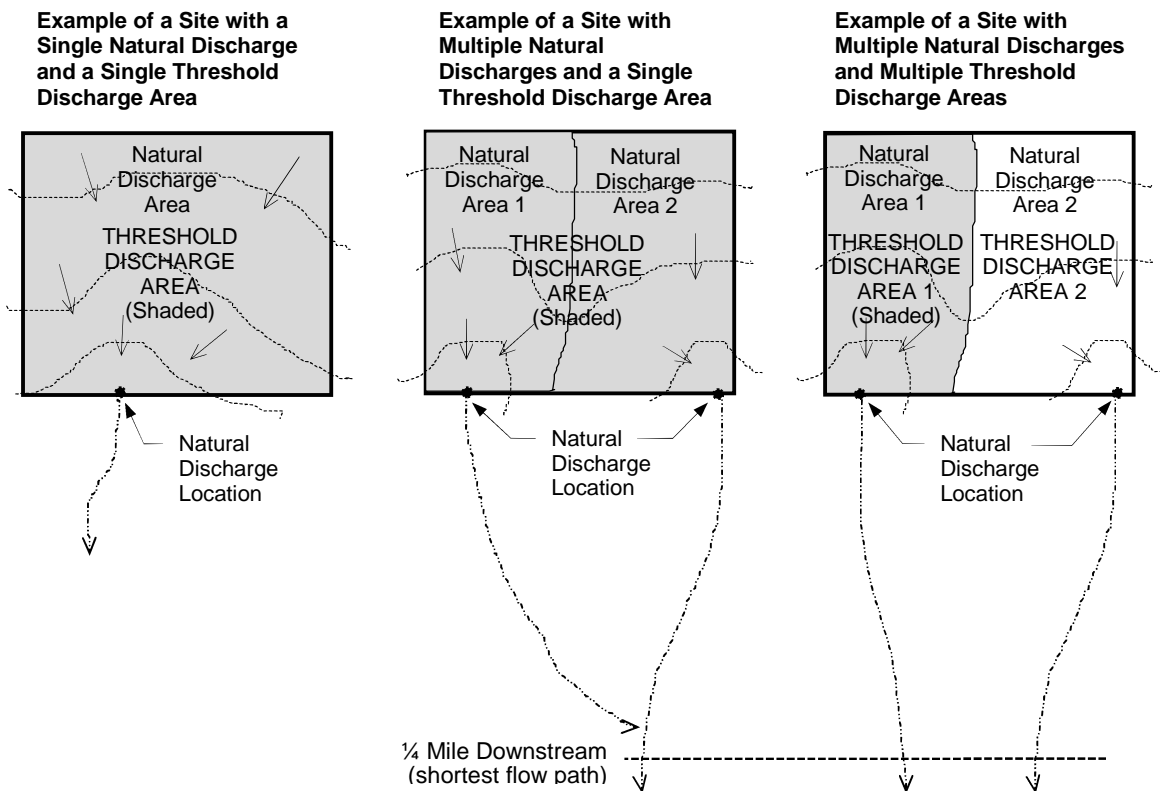
<sup>10</sup> *Sole access driveway means there is no other unobstructed, flood-free route for emergency access to a habitable building.*

**Single family residential project** means any project that (a) constructs or modifies a single family dwelling unit, (b) makes improvements (e.g., driveways, roads, outbuildings, play courts, etc.) or clears native vegetation on a lot that contains or will contain a single family dwelling unit, or (c) is a plat, short plat, or boundary line adjustment that creates or adjusts lots that will contain single family dwelling units.

**Site** (a.k.a. *development site*) means a single parcel, or two or more contiguous parcels that are under common ownership or documented legal control, used as a single parcel for purposes of applying for authority from King County to carry out a development/project proposal. For projects located primarily within dedicated rights-of-way, *site* includes the entire width of right-of-way within the total length of right-of-way subject to improvements proposed by the project.

**Steep slope hazard area** is the critical area designation, defined and regulated in KCC 21A, that is applied to areas on a slope of 40% or more within a vertical elevation change of at least 10 feet. See the "Definitions" section for more details.

**Threshold discharge area** means an onsite area draining to a single *natural discharge location*, or multiple *natural discharge locations* that combine within one-quarter-mile downstream (as determined by the shortest flowpath). The examples below illustrate this definition. This term is used to clarify how the thresholds, exemptions, and exceptions of this manual are applied to *sites* with multiple discharge locations.



**Transportation redevelopment project** means a stand-alone transportation improvement project that proposes to add, replace, or modify impervious surface, for purposes other than maintenance, within a length of dedicated public or private road right-of-way that has an existing impervious surface coverage of thirty-five percent or more. Road right-of-way improvements required as part of a subdivision, commercial, industrial or multifamily project may not be defined as a separate transportation redevelopment project.

**FIGURE 1.1.2.A FLOW CHART FOR DETERMINING TYPE OF DRAINAGE REVIEW REQUIRED**

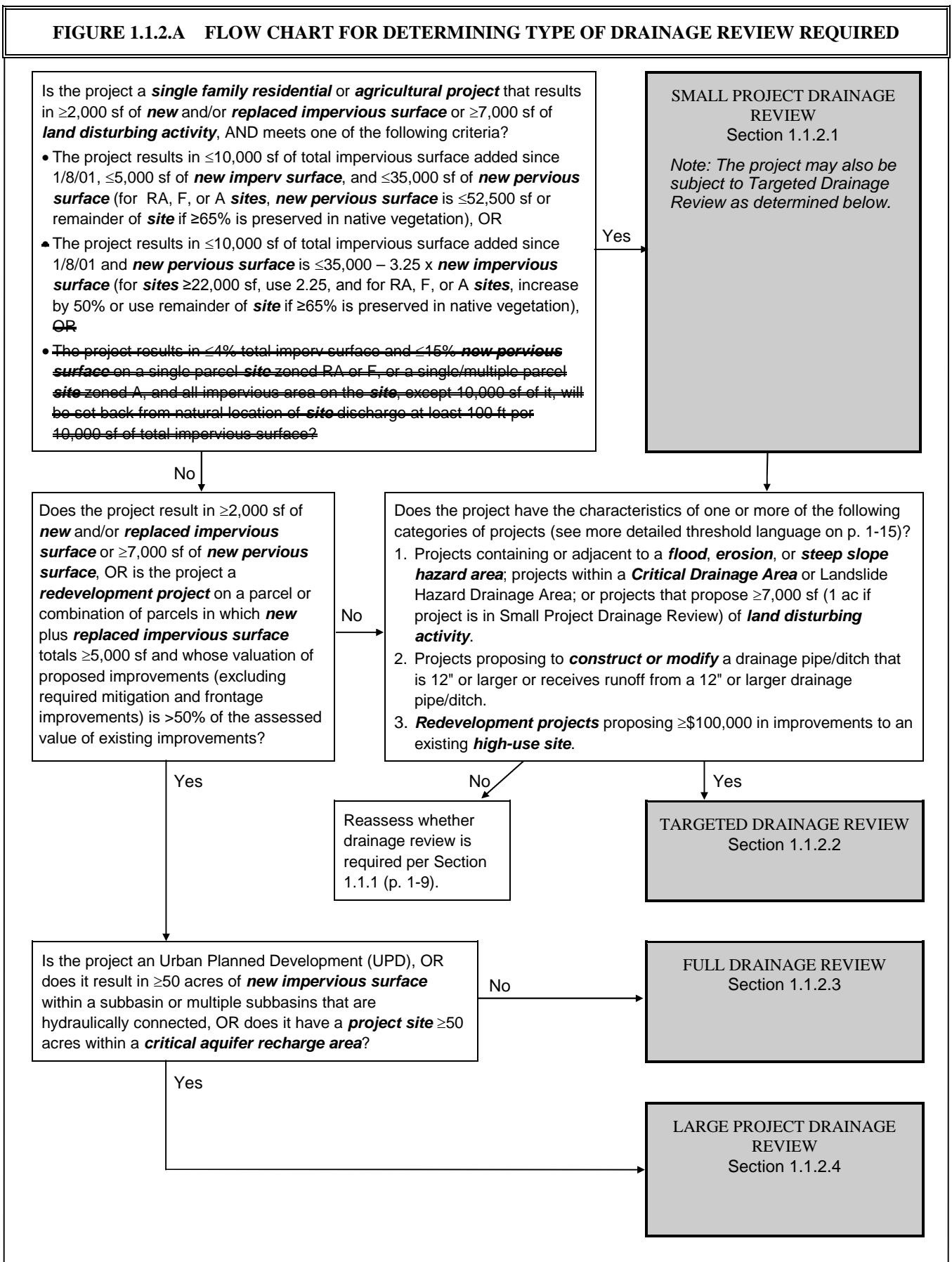


TABLE 1.1.2.A REQUIREMENTS APPLIED UNDER EACH DRAINAGE REVIEW TYPE

	Small Project Drainage Review	Targeted Drainage Review			Full Drainage Review	Large Project Drainage Review
	<b>Single family residential projects</b> and <b>agricultural projects</b> that result in $\geq 2,000$ sf of <b>new</b> and/or <b>replaced impervious surface</b> or $\geq 7,000$ sf of <b>land disturbing activity</b> but do not exceed the total impervious surface and <b>new pervious surface</b> thresholds specified in Sec. 1.1.2.1 (p. 1-13).	Projects that are not subject to Full or Large Project Drainage Review, AND have characteristics of <b>one or more</b> of the following categories of projects: 1. Projects containing or adjacent to a <b>flood, erosion, or steep slope hazard area</b> ; projects within a <b>Critical Drainage Area</b> or Landslide Hazard Drainage Area; or projects proposing $\geq 7,000$ sf of <b>land disturbing activity</b> (1 ac if in Small Project Drainage Review). 2. Projects that <b>construct or modify</b> a drainage pipe/ditch that is 12" or larger or receive runoff from a 12" or larger drainage pipe/ditch. 3. <b>Redevelopment projects</b> with $\geq \$100,000$ in improvements to a <b>high-use site</b> <sup>(1)</sup>			All projects that result in $\geq 2,000$ sf of <b>new</b> and/or <b>replaced impervious surface</b> or $\geq 7,000$ sf of <b>land disturbing activity</b> but are not subject to Small Project Drainage Review, OR <b>redevelopment projects</b> meeting drainage review threshold #7 in Section 1.1.1 (p. 1-9).	UPDs, OR projects that result in $\geq 50$ acres of <b>new impervious</b> within a sub-basin or multiple subbasins that are hydraulically connected, OR <b>project sites</b> $\geq 50$ acres within a <b>critical aquifer recharge area</b> .
		Category 1	Category 2	Category 3		
<b>SMALL PROJECT DRAINAGE REQUIREMENTS</b>	✓					
<b>CORE REQUIREMENT #1</b> Discharge at Natural Location		* <sup>(2)</sup>	✓		✓	✓
<b>CORE REQUIREMENT #2</b> Offsite Analysis		* <sup>(2)</sup>	✓ <sup>(3)</sup>		✓ <sup>(3)</sup>	✓ <sup>(3)</sup>
<b>CORE REQUIREMENT #3</b> Flow Control		* <sup>(2)</sup>			✓ <sup>(3)</sup>	✓ <sup>(3)</sup>
<b>CORE REQUIREMENT #4</b> Conveyance System		* <sup>(2)</sup>	✓		✓	✓
<b>CORE REQUIREMENT #5</b> Erosion & Sediment Control		✓	✓	✓	✓	✓
<b>CORE REQUIREMENT #6</b> Maintenance & Operations		* <sup>(2)</sup>	✓	✓	✓	✓
<b>CORE REQUIREMENT #7</b> Financial Guarantees & Liability		* <sup>(2)</sup>	✓ <sup>(3)</sup>	✓ <sup>(3)</sup>	✓ <sup>(3)</sup>	✓ <sup>(3)</sup>
<b>CORE REQUIREMENT #8</b> Water Quality		* <sup>(2)</sup>			✓ <sup>(3)</sup>	✓ <sup>(3)</sup>
<b>SPECIAL REQUIREMENT #1</b> Other Adopted Requirements		✓ <sup>(3)</sup>			✓ <sup>(3)</sup>	✓ <sup>(3)</sup>
<b>SPECIAL REQUIREMENT #2</b> Flood Hazard Area Delineation		✓ <sup>(3)</sup>			✓ <sup>(3)</sup>	✓ <sup>(3)</sup>
<b>SPECIAL REQUIREMENT #3</b> Flood Protection Facilities		✓ <sup>(3)</sup>			✓ <sup>(3)</sup>	✓ <sup>(3)</sup>
<b>SPECIAL REQUIREMENT #4</b> Source Control		✓ <sup>(3)</sup>	✓ <sup>(3)</sup>	✓ <sup>(3)</sup>	✓ <sup>(3)</sup>	✓ <sup>(3)</sup>
<b>SPECIAL REQUIREMENT #5</b> Oil Control				✓ <sup>(3)</sup>	✓ <sup>(3)</sup>	✓ <sup>(3)</sup>

<sup>(1)</sup> Category 3 projects installing oil controls that construct or modify a 12-inch pipe/ditch are also Category 2 projects.

<sup>(2)</sup> May be applied by DDES based on project or **site**-specific conditions.

<sup>(3)</sup> These requirements have exemptions or thresholds that may preclude or limit their application to a specific project.

### 1.1.2.1 SMALL PROJECT DRAINAGE REVIEW

Small Project Drainage Review is a simplified drainage review for small residential building, clearing, and subdivision projects or small **agricultural projects** that result in either (a) 10,000 square feet or less of impervious surface added on or after January 8, 2001 (the effective date of the ESA 4(d) Rule for Puget Sound Chinook salmon). ~~or (b) less than 4% of total impervious surface as specified in this section.~~ The core and special requirements applied under Full Drainage Review are replaced with simplified small project drainage requirements that can be applied by a non-engineer. These requirements include simple stormwater dispersion, infiltration, and **site** design techniques called flow control Best Management Practices (BMPs), which provide the necessary mitigation of flow and water quality impacts for small projects. Also included are simple measures for erosion and sediment control (ESC). This simplified form of drainage review acknowledges that drainage impacts for many small project proposals can be effectively mitigated without construction of costly flow control and water quality facilities.

The Small Project Drainage Review process minimizes the time and effort required to design, submit, review, and approve drainage facilities for these proposals. In most cases, the requirements can be met with submittals prepared by contractors, architects, or homeowners without the involvement of a **civil engineer**.

*Note: some projects subject to Small Project Drainage Review may also require Targeted Drainage Review if they meet any of the threshold criteria in Section 1.1.2.2 (p. 1-15).*

#### Threshold

Small Project Drainage Review is required for any **single family residential project** or **agricultural project** that will result in 2,000 square feet<sup>14</sup> or more of **new impervious surface, replaced impervious surface, or new plus replaced impervious surface**, or 7,000 square feet or more of **land disturbing activity**, AND that meets one of the following criteria:

- The project will result in no more than 10,000 square feet<sup>14</sup> of **total impervious surface** added on or after January 8, 2001, no more than 5,000 square feet of **new impervious surface**, and no more than 35,000 square feet<sup>14</sup> of **new pervious surface** (for **sites** zoned as RA, F, or A, the **new pervious surface** threshold may be increased to 52,500 square feet<sup>14</sup> or to the remaining portion of the **site** if 65% or more of the **site** is preserved in native vegetation by clearing limit, covenant, easement, or tract), OR
- The project will result in no more than 10,000 square feet<sup>13</sup> of **total impervious surface** added on or after January 8, 2001 and its **new pervious surface** area will be no more than 35,000 square feet minus 3.25 times the area of **new impervious surface** being proposed by the project (for **sites** larger than 22,000 square feet, a factor of 2.25 may be used instead of 3.25, and for **sites** zoned as RA, F, or A, the allowable amount of **new pervious surface** calculated herein may be increased by 50% or may be the remaining portion of **site** if 65% or more of the **site** is preserved in native vegetation by clearing limit, covenant, easement, or tract), OR
- ~~The project will result in no more than 4% total impervious surface and 15% new pervious surface on a single parcel site zoned as RA or F, or on a single or multiple parcel site zoned as A, AND all impervious surface area, except 10,000 square feet of it, will be set back from its natural location of discharge from the site at least 100 feet for every 10,000 square feet of total impervious area.~~

*Note: for the purposes applying this threshold to a proposed single family residential subdivision (i.e., plat or short plat project), the impervious surface coverage assumed on each created lot shall be 4,000 square feet (8,000 square feet if the site is zoned as RA) or the maximum allowed by KCC 21A.12.030, whichever is less. A lower impervious surface coverage may be assumed for any lot in which the lower impervious*

<sup>14</sup> The thresholds of 2,000 and 7,000 square feet shall be applied by project site. All other thresholds specified in terms of square feet of impervious or pervious surface shall be applied by **threshold discharge area** and in accordance with the definitions of these surfaces in Section 1.1. *Note: the calculation of total impervious surface added on after January 8, 2001 may exclude any such added impervious surface that is confirmed by DDES engineering staff to be already mitigated by a County approved and inspected flow control facility or BMP.*

*surface coverage is set as the maximum through a declaration of covenant recorded for the lot. Also, the **new pervious surface** assumed on each created lot shall be the entire lot area, except the assumed impervious portion and any portion in which native conditions are preserved by a clearing limit per KCC 16.82, a covenant or easement recorded for the lot, or a tract dedicated by the proposed subdivision.*

### Scope of Requirements

REQUIREMENTS

IF Small Project Drainage Review is required, THEN the proposed project must comply with the simplified small project submittal and drainage design requirements detailed in *Small Project Drainage Requirements* adopted as Appendix C to this manual and available as a separate booklet from DNRP or DDES. These requirements include simplified BMPs/measures for flow control and erosion and sediment control.

### Presumption of Compliance with Core and Special Requirements

The simplified drainage requirements applied under Small Project Drainage Review are considered sufficient to meet the overall intent of the core and special requirements in Sections 1.2 and 1.3, except under certain conditions when a proposed project has characteristics that trigger Targeted Drainage Review (see the threshold for Targeted Drainage Review in Section 1.1.2.2, p. 1-15) and may require the involvement of a *civil engineer*. Therefore, any proposed project that is subject to Small Project Drainage Review as determined above and complies with the small project drainage requirements detailed in Appendix C is presumed to comply with all the core and special requirements in Sections 1.2 and 1.3 **except** those requirements that would apply to the project if it is subject to Targeted Drainage Review as specified in Section 1.1.2.2 (p. 1-15).

### TDR Project Category #3

This category is intended to improve water quality by applying source control and oil control requirements to *redevelopment projects* located on the most intensively used *sites* developed prior to current water quality requirements. These are referred to as *high-use sites*.

REQUIREMENTS

IF the proposed project meets the characteristics of TDR Project Category #3, THEN the applicant must demonstrate that the proposed project complies with the following requirements:

- Core Requirement #5: Erosion and Sediment Control, Section 1.2.5 (p. 1-57)
- Core Requirement #6: Maintenance and Operations, Section 1.2.6 (p. 1-61)
- Core Requirement #7: Financial Guarantees and Liability, Section 1.2.7 (p. 1-62)
- Special Requirement #4: Source Control, Section 1.3.4 (p. 1-81)
- Special Requirement #5: Oil Control, Section 1.3.5 (p. 1-82).

*Note: In some cases, DDES may determine that application of these requirements does not require submittal of engineering plans and calculations stamped by a **civil engineer**. For example, if catch basin inserts are proposed to meet oil control requirements, engineered plans and calculations may not be necessary. A plot plan showing catch basin locations may suffice.*

### 1.1.2.3 FULL DRAINAGE REVIEW

Full Drainage Review is the evaluation by King County staff (DDES unless otherwise specified in KCC 9.04) of a proposed project's compliance with the full range of core and special requirements in this chapter. This review addresses the impacts associated with changing land cover on typical *sites*.

#### Threshold

Full Drainage Review is required for any proposed project, including a *redevelopment project*, that is subject to drainage review as determined in Section 1.1.1 (p. 1-9), OR that meets one or more of the following criteria:

- The project will result in 2,000 square feet<sup>15</sup> or more of *new impervious surface, replaced impervious surface*, and *new plus replaced impervious surface* but is not subject to Small Project Drainage Review as determined in Section 1.1.2.1 (p. 1-13), OR
- The project will result in 7,000 square feet<sup>15</sup> or more of *land disturbing activity* but is not subject to Small Project Drainage Review per Section 1.1.2.1, OR
- The project is a *redevelopment project* on a parcel or combination of parcels in which the total of *new plus replaced impervious surface* is 5,000 square feet<sup>15</sup> or more and whose valuation of proposed improvements (including interior improvements and excluding required mitigation and frontage improvements) exceeds 50% of the **assessed value** of the existing parcel improvements.

#### Scope of Requirements

IF Full Drainage Review is required, THEN the applicant must demonstrate that the proposed project complies with the following requirements:

- All eight core requirements in Section 1.2
- All five special requirements in Section 1.3

Engineering plans and calculations stamped by a *civil engineer* must be submitted to demonstrate compliance with these requirements. The procedures and requirements for submittal of engineering plans and calculations are found in Section 2.3.

<sup>15</sup> The thresholds of 2,000, 5,000, and 7,000 square feet shall be applied by *project site*.



### Significance of Impacts to Existing Drainage Problems

The determination of whether additional onsite mitigation or other measures are needed to address an existing downstream drainage problem depends on the significance of the proposed project's predicted impact on that problem. For some identified problems, DDES will make the determination as to whether the project's impact is significant enough to require additional mitigation. For the three types of downstream drainage problems described on pages 1-24 and 1-25, this threshold of significant impact or aggravation is defined below.

For **conveyance system nuisance problems**, the problem is considered significantly aggravated if there is any increase in the project's contribution to the frequency of occurrence and/or severity of the problem for runoff events less than or equal to the 10-year event. *Note: Increases in the project's contribution to this type of problem are considered to be prevented if sufficient onsite flow control and/or offsite improvements are provided as specified in Table 1.2.3.A (p. 1-36).*

For **severe erosion problems**, the problem is considered significantly aggravated if there is any increase in the project's existing contribution to the *flow duration*<sup>20</sup> of peak flows ranging from 50% of the 2-year peak flow up to the full 50-year peak flow at the eroded area. *Note: Increases in the project's contribution to this type of problem are considered to be prevented if Level 2 flow control or offsite improvements are provided as specified in Table 1.2.3.A (p. 1-36).*

For **severe building flooding problems**, the problem is considered significantly aggravated if there is any increase in the project's existing contribution<sup>21</sup> to the frequency, depth, or duration of the problem for runoff events less than or equal to the 100-year event.

For **severe roadway flooding problems**, the problem is considered significantly aggravated if any of the following thresholds are exceeded and there is any increase in the project's existing contribution<sup>21</sup> to the frequency, depth, or duration of the problem for runoff events less than or equal to the 100-year event:

- The *existing flooding*<sup>22</sup> over all lanes of a **roadway** or overtopping the culverted section of a **sole access driveway** is predicted to increase in depth more than a quarter-inch or 10% (whichever is greater) for the 100-year runoff event.
- The existing flooding over all lanes of a **roadway** or severely impacting a **sole access driveway** is more than 6 inches deep or faster than 5 feet per second for runoff events less than or equal to the 100-year event. A **severely impacted sole access driveway** is one in which flooding overtops a culverted section of the driveway, posing a threat of washout or unsafe access conditions due to indiscernible driveway edges, or flooding is deeper than 6 inches on the driveway, posing a severe impediment to emergency access.
- The existing flooding over all lanes of a *sole access roadway*<sup>23</sup> is more than 3 inches deep or faster than 5 feet per second for runoff events less than or equal to the 100-year event, or is at any depth for runoff events less than or equal to the 10-year event.

<sup>20</sup> *Flow duration* means the aggregate time that peak flows are at or above a particular flow rate (e.g., the amount of time over the last 50 years that peak flows were at or above the 2-year flow rate). *Note: flow duration is not considered to be increased if it is within the tolerances specified in Chapter 3.*

<sup>21</sup> Increases in the project's contribution are considered to be prevented if sufficient onsite flow control and/or offsite improvements are provided as specified for **severe flooding problems** in Table 1.2.3.A (p. 1-36). For **severe flooding problems** located within the mapped 100-year floodplain of a **major receiving water** (see Table 1.2.3B, p. 1-37) or the mapped 100-year floodplain of a major stream for which there is an adopted basin plan, increases in the project's contribution are considered negligible (zero) regardless of the flow control standard being applied, unless DDES determines there is a potential for increased flooding separate from that associated with the existing 100-year floodplain.

<sup>22</sup> *Existing flooding*, for the purposes of this definition, means flooding over all lanes of the roadway or driveway has occurred in the past and can be verified by County records, County personnel, photographs, or other physical evidence.

<sup>23</sup> *Sole access roadway* means there is no other flood-free route for emergency access to one or more dwelling units.

## □ DRAINAGE PROBLEM-SPECIFIC MITIGATION REQUIREMENTS

1. IF a proposed project or *threshold discharge area* within a project drains to one or more of the three types of downstream drainage problems described in Section 1.2.2.1 (pages 1-24 and 1-25) as identified through a downstream analysis, THEN the applicant must do one of the following:
  - a) Submit a Level 2 or Level 3 downstream analysis per Section 2.3.1 demonstrating that the proposed project will not create or significantly aggravate the identified downstream drainage problem(s), OR
  - b) Show that the *natural discharge area* or *threshold discharge area* draining to the identified problem(s) qualifies for an exemption from Core Requirement #3: Flow Control (Section 1.2.3, p. 1-34) or an exception from the applicable area-specific flow control facility requirement per Section 1.2.3.1 (p. 1-35), OR
  - c) Document that the applicable area-specific flow control facility requirement specified in Core Requirement #3 is adequate to prevent creation or significant aggravation of the identified downstream drainage problem(s) as indicated in Table 1.2.3.A (p. 1-36) with the phrase, "No additional flow control needed," OR
  - d) Provide additional onsite flow control necessary to prevent creation or significant aggravation of the downstream drainage problem(s) as specified in Table 1.2.3.A (p. 1-36) and further detailed in Section 3.3.5, OR
  - e) Provide offsite improvements necessary to prevent creation or significant aggravation of the identified downstream drainage problem(s) as detailed in Chapter 3 unless identified as not necessary in Table 1.2.3.A (p. 1-36), OR
  - f) Provide a combination of additional onsite flow control and offsite improvements sufficient to prevent creation or significant aggravation of the downstream drainage problem(s) as demonstrated by a Level 2 or Level 3 downstream analysis.
2. IF it is identified that the manner of discharge from a proposed project may create a significant adverse impact as described in Core Requirement #1, THEN DDES may require the applicant to implement additional measures or demonstrate that the impact will not occur.
3. IF it is identified through a critical area review per KCC 21A.24.100 that the quantity of surface and storm water runoff from a proposed project or *threshold discharge area* within a proposed project could significantly alter the hydrology of a wetland, THEN DDES may require the applicant to implement additional flow control or other measures to mitigate the adverse impacts of this alteration in accordance with the wetland hydrology protection guidelines in Reference Section 5.

**Intent:** To ensure provisions are made (if necessary) to prevent creation or significant aggravation of the three types of downstream drainage problems requiring special attention by this manual, and to ensure compliance with the discharge requirements of Core Requirement #1.

In addressing downstream drainage problems per Problem-Specific Mitigation Requirement 1 above, additional onsite flow control will often be the easiest provision to implement. This involves designing the required onsite flow control facility to meet an additional set of performance criteria targeted to prevent significant aggravation of specific downstream drainage problems. To save time and analysis, a set of predetermined flow control performance criteria corresponding to each of the three types of downstream drainage problems is provided in Table 1.2.3.A (p. 1-36) and described in more detail in Chapter 3.

Note that in some cases the area-specific flow control facility requirement applicable to the proposed project per Section 1.2.3.1 (p. 1-35) is already sufficient to prevent significant aggravation of many of the defined downstream drainage problem types. Such situations are noted in Table 1.2.3.A (p. 1-36) as not needing additional onsite flow control or offsite improvements. For example, if the project is located within a Conservation Flow Control Area subject to the Level 2 flow control standard per Section 1.2.3.1.B (p. 1-40), and a *conveyance system nuisance problem* is identified through offsite analysis per

### 1.2.3.1 AREA-SPECIFIC FLOW CONTROL FACILITY REQUIREMENT

REQUIREMENT

Projects subject to Core Requirement #3 must provide flow control facilities as specified by the area-specific facility requirements and exceptions for the **designated flow control area** in which the proposed project or **threshold discharge area** of the proposed project is located as described in Subsections A, B, and C below.

#### Guide to Applying the Area-Specific Flow Control Facility Requirement

The flow control facility requirement varies across the county landscape according to the *flow control area* within which the project or a **threshold discharge area** of the project is located. Flow control areas are designated by the county to target the level of flow control performance to the broad protection needs of specific basins or subbasins. There are currently three such flow control areas, which are depicted on the Flow Control Applications Map adopted with this manual (see map pocket on inside of back cover). These are the **Basic Flow Control Areas**, **Conservation Flow Control Areas**, and **Flood Problem Flow Control Areas**. Each flow control area has an area-specific set of minimum flow control facility performance criteria, design assumptions, surfaces that must be mitigated, and exceptions. These provisions all comprise what is referred to as the "area-specific flow control facility requirement."

Note that the minimum required performance of the facility as specified by this requirement may need to be increased to ensure that downstream drainage problems are not created or significantly aggravated as set forth in Section 1.2.2.2, "Drainage Problem-Specific Mitigation Requirements" (p. 1-30). Table 1.2.3.A (p. 1-36) provides a quick guide for selecting the flow control performance criteria necessary to meet both the area-specific flow control facility requirement and the problem-specific mitigation requirement. This is further explained in Step 4 below.

For efficient application of the flow control facility requirement, the following steps are recommended:

1. Check the Direct Discharge Exemption on Page 1-37 ~~and the Impervious Surface Exemption on Page 1-38~~ to determine if and/or which portions of your project are exempt from the flow control facility requirement. If exempt from the flow control facility requirement, proceed to Step 6.
2. Use the Flow Control Applications Map to determine the flow control area in which your project is located. If this determination cannot be made from the map, a more detailed delineation of flow control areas is available on King County's Geographic Information System (GIS).
3. Consult the detailed requirement and exception language for the identified flow control area to determine if and how the flow control facility requirement applies to your project. This requirement and exception language is detailed on subsequent pages for each of the three flow control areas depicted on the Flow Control Applications Map. If a flow control facility is not applicable per the area-specific exceptions, proceed to Step 6.
4. If downstream drainage problems were identified through offsite analysis per Core Requirement #2 and are proposed to be addressed through onsite flow control, use Table 1.2.3.A (p. 1-36) to determine if and what additional flow control performance is necessary to mitigate impacts (i.e., to prevent creation or aggravation of the identified problems).
5. Use Section 1.2.3.2 (p. 1-45) to identify the applicable requirements for implementing the flow control facility requirement. These requirements cover facility siting, analysis and design, unusual situations, and other site-specific considerations.
6. Use Section 1.2.3.3 (p. 1-50) to identify the flow control BMPs that must be applied to your **project site** regardless of whether a flow control facility is required.

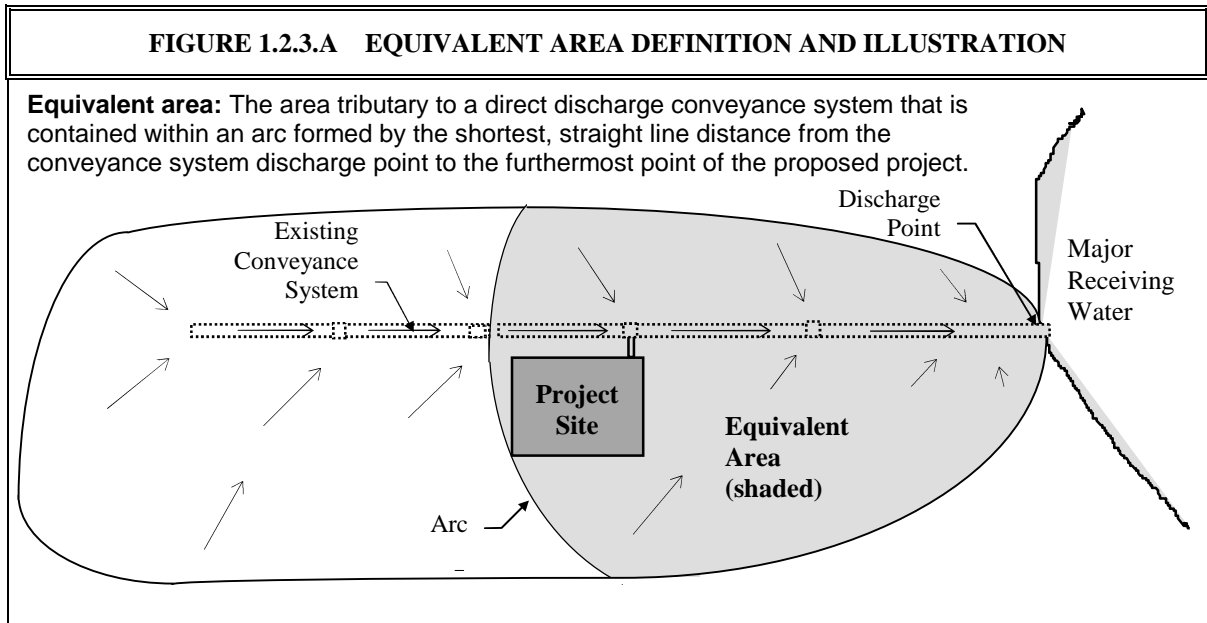
<b>TABLE 1.2.3.A</b>			
<b>SUMMARY OF FLOW CONTROL PERFORMANCE CRITERIA ACCEPTABLE FOR IMPACT MITIGATION<sup>(1)</sup></b>			
<b>IDENTIFIED PROBLEM DOWNSTREAM</b>	<b>AREA-SPECIFIC FLOW CONTROL FACILITY REQUIREMENT</b>		
	<b>Basic Flow Control (FC) Areas</b>	<b>Conservation FC Areas</b>	<b>Flood Problem FC Areas</b>
<b>No Problem Identified</b> Apply the minimum area-specific flow control performance criteria.	Apply the Level 1 flow control standard, which matches <b>existing site conditions</b> 2- and 10-year peaks	Apply the <b>historic site conditions</b> Level 2 flow control standard, which matches historic durations for 50% of 2-yr through 50-year peaks AND matches historic 2- and 10-year peaks	Apply the <b>existing or historic site conditions</b> Level 2 flow control standard (whichever is appropriate based on downstream flow control area) AND match <b>existing site conditions</b> 100-year peaks
<b>Type 1 Drainage Problem Conveyance System Nuisance Problem</b>	<u>Additional Flow Control</u> Hold 10-year peak to overflow $T_r$ peak <sup>(2)(3)</sup>	<i>No additional flow control or other mitigation is needed</i>	<i>No additional flow control or other mitigation is needed</i>
<b>Type 2 Drainage Problem Severe Erosion Problem</b>	<u>Additional Flow Control</u> Apply the <b>existing site conditions</b> Level 2 flow control standard <sup>(3)(4)</sup>	<i>No additional flow control is needed, but other mitigation may be required<sup>(4)</sup></i>	<i>No additional flow control is needed, but other mitigation may be required<sup>(4)</sup></i>
<b>Type 3 Drainage Problem Severe Flooding Problem</b>	<u>Additional Flow Control</u> Apply the <b>existing site conditions</b> Level 3 flow control standard to peak flows above the overflow $T_r$ peak. If flooding is from a closed depression, make design adjustments as needed to meet the "special provision for closed depressions" <sup>(3)(5)</sup>	<u>Additional Flow Control</u> Apply the <b>historic site conditions</b> Level 3 flow control standard. If flooding is from a closed depression, make design adjustments as needed to meet the "special provision for closed depressions" <sup>(3)(5)</sup>	<u>Additional Flow Control</u> If flooding is from a closed depression, make design adjustments as needed to meet the "special provision for closed depressions" <sup>(3)(5)</sup>
<b>Potential Impact to Wetland Hydrology as Determined through a Critical Area Review per KCC 21A.24.100</b>	<u>Additional Flow Control</u> DDES may require design adjustments per the wetland hydrology protection guidelines in Reference Section 5	<u>Additional Flow Control</u> DDES may require design adjustments per the wetland hydrology protection guidelines in Reference Section 5	<u>Additional Flow Control</u> DDES may require design adjustments per the wetland hydrology protection guidelines in Reference Section 5
<p><i>Notes:</i></p> <p>(1) More than one set of problem-specific performance criteria may apply if two or more downstream drainage problems are identified through offsite analysis per Core Requirement #2. If this happens, the performance goals of each applicable problem-specific criteria must be met. This can require extensive, time-consuming analysis to implement multiple sets of outflow performance criteria if additional onsite flow control is the only viable option for mitigating impacts to these problems. In these cases, it may be easier and more prudent to implement the <b>historic site conditions</b> Level 3 flow control standard in place of the otherwise required area-specific standard. Use of the historic Level 3 flow control standard satisfies the specified performance criteria for all the area-specific and problem-specific requirements except if adjustments are required per the special provision for closed depressions described below in Note 5.</p> <p>(2) Overflow <math>T_r</math> is the return period of conveyance system overflow. To determine <math>T_r</math> requires a minimum Level 2 downstream analysis as detailed in Section 2.3.1.1. To avoid this analysis, a <math>T_r</math> of 2 years may be assumed.</p> <p>(3) Offsite improvements may be implemented in lieu of or in combination with additional flow control as allowed in Section 1.2.2.2 (p. 1-28) and detailed in Section 3.3.5.</p> <p>(4) A tightline system may be required regardless of the flow control standard being applied if needed to meet the discharge requirements of Core Requirement #1 (p. 1-21) or the outfall requirements of Core Requirement #4 (p. 1-54), or if deemed necessary by DDES where the risk of severe damage is high.</p> <p>(5) <b>Special Provision for Closed Depressions with a Severe Flooding Problem:</b> IF the proposed project discharges by overland flow or conveyance system to a closed depression experiencing a <b>severe flooding problem</b> AND the amount of <b>new impervious surface</b> area proposed by the project is greater than or equal to 10% of the 100-year water surface area of the closed depression, THEN use the "point of compliance analysis technique" described in Section 3.3.6 to verify that water surface levels are not increasing for the return frequencies at which flooding occurs, up to and including the 100-year frequency. If necessary, iteratively adjust onsite flow control performance to prevent increases. <i>Note: The point of compliance analysis relies on certain field measurements taken directly at the closed depression (e.g., soils tests, topography, etc.). If permission to enter private property for such measurements is denied, DDES may waive this provision and apply the <b>existing site conditions</b> Level 3 flow control standard with a mandatory 20% safety factor on the storage volume.</i></p>			

**❑ DIRECT DISCHARGE EXEMPTION**

Any onsite **natural drainage area** is exempt from the flow control facility requirement if the area drains to one of the **major receiving waters** listed in Table 1.2.3.B at right, AND meets the following criteria for *direct discharge*<sup>26</sup> to that receiving water:

- a) The **flowpath** from the **project site** discharge point to the edge of the 100-year floodplain of the major receiving water will be **no longer than a quarter mile**, except for discharges to Lake Sammamish, Lake Washington, and Puget Sound, AND
- b) The conveyance system between the **project site** and the **major receiving water** will extend to the ordinary high water mark, and will be **comprised of manmade conveyance elements** (pipes, ditches, etc.) and will be within public right-of-way or a public or private drainage easement, AND
- c) The conveyance system will have **adequate capacity**<sup>27</sup> per Core Requirement #4, Conveyance System, for the entire contributing drainage area, assuming **build-out conditions** to current zoning for the *equivalent area* portion (defined in Figure 1.2.3.A, below) and existing conditions for the remaining area, AND
- d) The conveyance system will be adequately **stabilized to prevent erosion**, assuming the same basin conditions as assumed in Criteria (c) above, AND
- e) The direct discharge proposal will not **divert flows** from or increase flows to an **existing wetland or stream** sufficient to cause a significant adverse impact.

<b>TABLE 1.2.3.B MAJOR RECEIVING WATERS</b>
<ul style="list-style-type: none"> <li>• Cedar River downstream of Taylor Creek confluence</li> <li>• Green/Duwamish River below River Mile 6 (S. Boeing Access Road)</li> <li>• Snoqualmie River mainstem downstream of Middle Fork Snoqualmie River confluence</li> <li>• Middle Fork Snoqualmie River downstream of Rainy Creek confluence</li> <li>• Sammamish River<sup>25</sup></li> <li>• White/Stuck River downstream of Huckleberry Creek confluence</li> <li>• South Fork Skykomish River downstream of Tye and Foss River confluences</li> <li>• Lake Sammamish</li> <li>• Lake Washington</li> <li>• Puget Sound</li> </ul>
<p><i>Note: The <b>major receiving waters</b> listed above do not include side adjacent or associated channels, spring- or groundwater-fed streams, or wetlands.</i></p>



<sup>25</sup> Projects discharging directly to the Sammamish River must infiltrate runoff to the extent feasible before discharge to the River.

<sup>26</sup> Direct discharge means undetained discharge from a proposed project to a **major receiving water**.

<sup>27</sup> Note: If the conveyance system is an existing King County-owned system, the County may charge a special use fee.

~~□ IMPERVIOUS SURFACE PERCENTAGE EXEMPTION~~

~~Any onsite **threshold discharge area** is exempt from the flow control facility requirement if it meets all of the following conditions:~~

- ~~a) The amount of **new impervious surface plus existing impervious surface** that is **not fully dispersed** per the criteria on Page 1-46 must be no more than 4% of the **threshold discharge area**, AND~~
- ~~b) The amount of **new pervious surface** must be no more than 15% of the natural drainage area, AND~~
- ~~c) Flow control BMPs must be applied to **new impervious surfaces** as specified in Section 1.2.3.3 (p. 1-50), AND~~
- ~~d) All impervious surface area, except 10,000 square feet of it, must be **set back** from its natural location of discharge from the **site** at least 100 feet for every 10,000 square feet of total impervious surface, AND~~
- ~~e) Increased runoff that is not **fully dispersed** from the **new impervious surface** and **new pervious surface** must not significantly impact a **critical area, severe flooding problem, or severe erosion problem**, AND~~
- ~~f) The **manner in which runoff is discharged** from the **project site** does not create a significant adverse impact per Core Requirement #1.~~

**A. BASIC FLOW CONTROL AREAS**

Basic Flow Control Areas are designated in two ways. Basic Flow Control Areas refer to areas that discharge to a closed conveyance system, which discharges eventually to water bodies that are designated as **major receiving waters**. Basic Flow Control Areas are also designated by King County, with approval from the state Department of Ecology, where the County has determined that maintaining peak flows is sufficient to protect natural and constructed conveyance systems. The latter method is usually based on the findings of a plan or study that has determined that such conveyance systems are not sensitive to development-induced increases in runoff volume and durations. Basic Flow Control Areas are delineated on the Flow Control Applications Map adopted with this manual (see map pocket on inside of back cover). A more detailed delineation is available on the County's Geographic Information System.

*Note: For projects located at or near the delineated boundary of the Basic Flow Control Area, **site-specific topography or drainage information** may be needed to determine whether a project or any **threshold discharge area** of a project is indeed within the flow control area. Any **threshold discharge area** is considered to be within the Basic Flow Control Area if the **threshold discharge area** drains to a waterbody or drainage system that is clearly within the mapped Basic Flow Control Area.*

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Within Basic Flow Control Areas, required flow control facilities must comply with the following minimum requirements for facility performance and mitigation of targeted surfaces, except where such requirements or the facility requirement itself is waived or reduced by the area-specific exceptions at the end of this subsection.

**Minimum Required Performance**

Facilities in **Basic Flow Control Areas** must comply with the following flow control performance standards and assumptions unless modified by offsite analysis per Core Requirement #2 (see Table 1.2.3.A, p. 1-36):

**Level 1 Flow Control:** Match the developed peak discharge rates to **existing site conditions** peak discharge rates for 2- and 10-year return periods.

**Reduced Level 1 Flow Control:** A modified version of this standard, controlling only the 10-year frequency peak flow rate, is allowed if the applicant demonstrates both of the following: