

**ADDENDUM TO SECTION 4.4  
STORMWATER**

**ECLIPSE MILL LOW IMPACT  
DEVELOPMENT ALTERNATIVE**

## EVERETT RIVERFRONT PROJECT

### ECLIPSE MILL LOW IMPACT DEVELOPMENT ALTERNATIVE

This narrative has been generated as a response to comments on the DEIS for the Everett Riverfront Project. At least one comment was about the feasibility of using Low Impact Development (LID) principles for the Eclipse Mill site.

The Eclipse Mill Site was historically used as an industrial site. Activities on the site have included a car salvage business and a lumber mill. The Eclipse Site will look very different in the developed condition. Development plans include filling low lying areas with structural fill.

The attributes of the future fill are unknown, in particular, the infiltration capacity of the future fill soils. This uncertainty does not allow for the design of infiltration facilities at this time. While infiltration is desirable for LID, it is not absolutely necessary. Rain gardens can function with an under drain system that conveys the treated water to an approved discharge location.

Similarly, until the condition of soils is known, the discharge overflows to the River will require analysis at the final design phase. Conditions from the overflows, if not properly designed, can lead to erosion and slope failure. During design the soils affected by the outfalls will need to be analyzed along with the slopes (which at this point we understand to be 3:1) to assess if they can operate without erosion or if these areas will require additional design detail. If the soils are not sufficient alone to prevent erosion, techniques such as planting the area with slope stabilizing vegetation, use of rock pads (typically 2 feet wide and at least 6 inches deep) or other methods can be employed. A final alternative would be to use underdrain pipes and convey the overflow to a permitted discharge location.

The following describes the analysis that was conducted on the Eclipse Mill Site for the purposes of exploring the use of LID techniques, specifically the use of rain gardens to treat the runoff from paved areas.

- Pollution Generating Impervious Surface (PGIS) is defined as paved area that is subject to vehicle traffic. This is generally understood as roadways, driveways and parking areas. The current conceptual plan for the Eclipse Mill Site was used to estimate the amount of PGIS associated with developing the site. Total site area is 30 acres with ten of that being PGIS.
- A hydrologic model was used to determine the amount of runoff generated by 10 acres of impervious surface. The treatment goal for the site is the basic water treatment standard of treating the six-month storm. This standard results in the treatment of over 90% of the total runoff volume from the site each year. The water quality flow, i.e. the six-month storm, generated by the model was 1.52 cubic feet per second. This flow was then used to calculate the total area of rain garden needed for treatment.
- Rain gardens work by allowing storm flows to percolate through and amended soil mixture. Several physical and biological processes result in the removal of numerous pollutants. The Washington State Department of Ecology has developed standards for the design of rain gardens. These standards include an assumed percolation rate of 1 in/hour through the amended soil matrix. That assumed percolation rate was then used in combination with the required water quality treatment flowrate to determine the required square footage of rain garden(s). The result was that to treat 10 acres of pavement; 1 ½ acres of rain gardens are needed.
- Figure 4.4-8A shows some possible locations of rain gardens using the current conceptual layout for the site. The total area shown as possible rain gardens is 3.7 acres, or over twice as much as

would be needed. This was done to allow for flexibility in the choices of the future rain garden locations. Areas that would be best suited for rain gardens include linear vegetated planter strips along roadways and parking lots. The existing conceptual layout was used to estimate the amount of rain garden that could be accommodated in the linear vegetated areas. The estimated rain garden area that fits into the proposed planter strips is  $6/10^{\text{th}}$  of an acre. Using this amount as a given, only another  $9/10^{\text{th}}$  of an acre would be needed to be installed in the green open areas between the buildings.

Mar 07, 2008 - 10:04am mikes j:\Surface\_Water\250388.004 - Riverfront EIS Drainage\CAD\250388-Fig 4.4-8A.dwg Layout Name: MILL



Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. can not guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.


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**Eclipse Mill Alternative 1**  
**Stormwater Layout**  
 Everett Riverfront Redevelopment Project  
 Everett, Washington

**Figure**  
**4.4-8A**