



City of Tacoma
Public Works Department

February 13, 2009

Mr. Kurt Fremont
Department of Ecology
Water Quality Program
Municipal Stormwater Permits
P.O. Box 47696
Olympia, WA 98504-7696

Dear Mr. Fremont:

The City of Tacoma reviewed Ecology's comments dated November 26, 2008. The comments are addressed directly in red on the enclosed "City of Tacoma Response to Comments and Questions on the City of Tacoma's Response to Ecology's April 10, 2008 Comments on the draft Stormwater Manual". Changes to the September 22, 2008, City of Tacoma Surface Water Management Manual required to address Ecology's comments are also enclosed.

The text that follows in this letter attempts to respond to the comment regarding Minimum Requirement #7 - Flow Control, and its application in the T-Street/Lower Puyallup Watershed.

Historically, the T-Street Gulch has experienced severe erosion due to storm flows from its 2,700 acre tributary area. The erosion resulted in undercut culverts and had exposed sanitary sewer pipe in several locations. Photos of the eroded conditions are enclosed.

In 1996, the City of Tacoma initiated a study to develop alternatives to stabilize the gulch. The study included a hydraulic and geotechnical evaluation of the full length of the gulch and its two side branches. The study was summarized in the *T-Street Gulch Drainage Basin Study (1997)*. The report has been included for your reference.

The purpose of the hydraulic analysis was to determine the velocities of storm flow in various reaches of the gulch. Table 3-3 of the enclosed *T-Street Gulch Drainage Basin Study* shows peak flow velocities for various reaches of the gulch. For a two-year type 1A design storm, velocities generally ranged from 5 to 9 f/s, and increased for higher intensity storms.

AGRA Earth and Environmental, Inc. was hired to take soil samples of the gulch and characterize the soils, determining the maximum velocities the channel could convey without causing erosion. Soils at different locations in the channel have differing susceptibility to erosion. Where normally consolidated Vashon drift soils (sands) are present, velocities of only 2.5 to 3 fps can be accommodated. Where alluvium is present in the channel, velocities of 3 to 5 fps can be accommodated. Other soils can handle velocities up to 6 fps. These maximum velocities are also included in Table 3.3 of the enclosed *T-Street Gulch Drainage Basin Study*.

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Peak flow velocities in all but two reaches exceeded recommended maximum velocities.

To remedy the erosion in the gulch, the City initiated two capital projects in 1997 and 1998. Pipe was installed in the most severely eroding areas, and other areas of the channel were armored with an engineered graded fill. A few areas did not require armoring since expected velocities were lower than the velocity of the soil and were not part of the project.

In 2008, in preparation for this letter, City staff walked the most critical areas of the gulch. No erosion was seen. The City believes this gulch is not susceptible to erosion due to the capital projects completed in the late 90's and therefore would not require detention in the tributary area. Treatment will be required according to the standard thresholds of Minimum Requirement #6.

If you require additional information or would like to visit the site, please contact me at (253) 502-2192.

Sincerely,



Lorna Mauren, P.E.
Assistant Division Manager

lm:mh:crt

Enclosures