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CLARK COUNTY
WASHINGTON

DEPARTMENT OF ENVIRONMENTAL SERVICES

Notice

TO: Clark County Western Washington Hydrology Model Users

FROM: Ron Wierenga, Clean Water Program Manager RW

DATE: June 23, 2014

SUBJECT: Discontinuing the Clark County version of the Western Washington Hydrology Model (CCWWHM) as the County locally-approved design model

BACKGROUND

The WWHM (Western Washington Hydrology Model) is modeling software created by the department of Ecology for the purpose of designing stormwater facilities that meet the state's unique flow duration -standard. Hydrologic parameter values for the WWHM were developed based on watershed studies in the Puget Sound Basin where the soils are different than Clark County's. In addition, the WWHM developers used regionalized rainfall and evaporation patterns. Local differences from Puget Sound conditions, particularly soil types, led Clark County to develop a locally-calibrated model to Clark County soils and hydrology. The locally-calibrated model also has more detailed rainfall distribution based on Clark County rain gauges and evapo-transpiration rates based on Upper Willamette Valley data. The locally-calibrated model was created in 2010 using the consultant services of Clear Creek Solutions and Otak. Ecology also contracts with Clear Creek Solutions to continue updating and maintaining the default version of the WWHM.

Under the Clark County NPDES Phase I Municipal Stormwater Permit, a locally developed WWHM version such as the CCWWHM must be approved by Ecology prior to use. Ecology conditionally approved the CCWWHM in 2010 by modifying Appendix 10 of the NPDES permit. The permit modification includes conditions requiring follow-up actions by Clark County. The follow-up actions are to collect additional flow data, perform validation analysis, and make recommendations for any adjustments to the model parameters by February 1, 2014. The modification also requires Clark County to submit a final report by July 1, 2014 including any recommendations for adjustments to the model parameters.

Clark County collected the additional flow data and completed the model validation analysis, submitted the report and recommendations to Ecology on January 28, 2014. The county report's conclusion was that there is no need to make changes to the model parameters based on the validation analysis. Clark County believed the CCWWHM was sufficiently accurate compared to observed stream flows.

On May 7, 2014, Ecology notified Clark County that the validation analysis report was inadequate and consequently the CCWWHM was not approvable without additional work. Ecology further stated that the county needed to complete the needed validation analysis before July 1, 2014 or be in violation of its NPDES permit if it continued to use the CCWWHM.

Lacking the resources to complete the additional analysis by July 1, 2014 and seeking to avoid the risks associated with a permit violation, Clark County has decided to revert to the default WWHM for new development projects.

UPDATED WWHM USE REQUIREMENTS

Clark County's 2009 stormwater design manual contains language that allows the county to require use of an approved model such as the default version of the WWHM model if there is no approved model under the permit specific to Clark County.

On page 5-6 the manual notes for use of the default WWHM:

> *Clark County is currently developing a calibrated WWHM model specific to local soils and rainfall data. Until a calibrated model specific to Clark County is available, HSG B soils with tested infiltration rates that render infiltrating stormwater impractical may be modeled as HSG C for the purpose of flow control design.*

Projects vested before July 1, 2014 will be allowed to use whichever version of the WWHM version they have been using.

Projects vested on or after July 1, 2014 must use an Ecology-approved model other than the locally-calibrated Clark County model.

The Ecology approved models for Clark County on or after July 1, 2014 are the default WWHM and the WSDOT design model MGS Flood.

MODEL DESCRIPTIONS

There are multiple versions of the WWHM that contain the default Western Washington model or the locally-calibrated Clark County model. Users can readily distinguish the two model versions based on the soil types they contain.

The default Western Washington model contains three soil types: Outwash (A/B), Till (C) and Saturated. The locally-calibrated Clark County model contains five soil types: Soil Group 1, Soil Group 2, Soil Group 3, Soil Group 4, and Soil Group 5.

WWHM versions that contain the default Western Washington model calibration include:

- WWHM3
- WWHM4
- WWHM2012 (Clark version have soil groups 1-5)

The new release of WWHM2012 (June 2014) will have the following two options:

- Clark 2010: Soil Groups 1-5
- Clark 2012: Soil Groups A/B, C, Saturated

NEXT STEPS FOR THE CLARK COUNTY VERSION OF THE HYDROLOGY MODEL

Clark County may pursue completing the required validation analysis, calibration, and model approval by Ecology if resources become available.