CONTRA COSTA
CLEAN WATER
PROGRAM

Donald P. Freitas
Program Manager

July 2, 2007

Mr. Bruce H. Wolfe, Executive Officer
California Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612

Ms. Pamela Creedon, Executive Officer
California Regional Water Quality Control Board
Central Valley Region
11020 Sun Center Drive #200
Rancho Cordova, CA 95670-6114

Re: **Order R2-2006-0050**
Hydrograph Modification Management Plan (HMP)
Submittal of additional information as required

Dear Mr. Wolfe and Ms. Creedon:

As required by Order R2-2003-0022, the Contra Costa Clean Water Program (Program) submitted a final Hydrograph Modification Management Plan (HMP) on May 15, 2005. The San Francisco Bay Regional Water Quality Control Board (Water Board) adopted Order R2-2006-0050 on July 12, 2006. As that Order requires, the Program's municipalities began implementing the HMP on October 14, 2006.

Attachment A to Order R2-2006-0050 includes Section V, "Model Testing and Refinement." This section states requirements for additional information to be submitted to the Executive Officer by today.

That information is provided below.

The Order states as follows:

> V. Model Testing & Refinement
>
> Section 7, Attachment 2 of the Program's HMP describes five simplifying assumptions that the Program may address in the future in order to refine the

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model that establishes IMP sizing factors. The Program shall complete the following studies and data collection efforts as set forth below:

1. MODEL TESTING: The Program states that its model was calibrated to local stream flow data, based on the consultant team's previous experience using the same base model for projects in Contra Costa County streams and calibrating it to local stream gauge data at those times. The Program shall either (1) submit information demonstrating that the HMP model is calibrated to local stream flows, including but not limited to representative data sets, stream gauge data, and associated model calibration parameters; or (2) test the model results presented in the HMP by comparing model output with local stream gauging records in appropriate Bay Area watersheds and adjust the model and its outputs as necessary to produce a more accurate result set. All information supporting this model testing shall be submitted to the Executive Officer by July 1, 2007.

Response to Item V.1 — Model Testing

HSPF modeling performed for the development of the Contra Costa HMP was not used to simulate stream flow. Because the model was not used to simulate stream flow, it was not calibrated to stream flow data. While hydrologic modeling is often used to evaluate stream flow at the watershed scale, in this case the model was specifically formulated to evaluate runoff response at the lot scale for the purpose of developing IMP sizing factors. Because low impact development IMPs are distributed facilities that treat runoff at the individual lot scale, the model was used to simulate runoff from a generic, one-acre unit and evaluate the effect of each IMP configuration on that runoff. As stated in Attachment 2, Section 7.1, the model was therefore formulated using regional parameters and not calibrated to stream flow.

Monitoring data for IMP performance could be used to validate and/or calibrate the lot-scale model used to develop the IMP sizing factors. These data were not available at the time the Contra Costa HMP was being developed. Going forward, the Program has committed to monitor constructed IMPs, as required by Section III (i.e., "IMP Model Calibration and Validation") of Attachment A to the Order, for the purpose of gathering performance data that may be used to validate the HSPF modeling used to develop the IMP sizing factors,.

The Order further states as follows:

2. INFILTRATION RATES: To verify the HMP's assumption that the Type A soil infiltration rate in Contra Costa County is 0.3 inches per hour, the Program

> shall measure actual infiltration rates in Type A soils, done as standard percolation tests, in likely development sites in Contra Costa County. If results of this testing show average percolation rates are higher, then the Program shall re-analyze and correct the IMP sizing factors for Type A soils. The results of this work will be reported to the Executive Officer by July 1, 2007.

Response to Item V.2 — Infiltration Rates

As noted in Attachment 2, Appendix A, the value of the INFILT parameter used by HSPF to characterize the rate of soil infiltration is not directly correlated with measurable soil characteristics such as infiltration, percolation or permeability. Rather, it is a numeric representation of the portion of rainfall that enters the soil (rather than running off or being captured at the surface). The literature suggests typical INFILT ranges for each of the four soil groups. HSPF modeling guidance provided by EPA states that this parameter should be estimated using the ranges, and then adjusted during the calibration process so that model results approximate observed runoff.

Because appropriate calibration data were not available for this application of HSPF (see response to Item V.1), professional judgment and previous experience with calibrated models were used to adjust the estimated INFILT values. This process is described in Attachment 2, Appendix C of the May 15, 2005 Final HMP. As illustrated in Figure 1, the initial value selected from the literature for INFILT for Type A soils (0.7) did not produce any runoff at all for events up to Q5, and negligible runoff for events up to Q10. This result, in which all rainfall from very significant storm events was absorbed into the soil, was not consistent with the professional experience of the project team. Therefore other INFILT values were tested to inform the adjustment of this parameter (see Attachment 2, Appendix C, Figure 1). At INFILT = 0.3, the model simulation generated a small amount of runoff starting at approximately Q1, which was more consistent with the professional experience of the project team.

Closing

Contra Costa municipalities have required development projects with applications deemed complete after October 14, 2006 to demonstrate compliance with the HMP. Some projects are currently in preliminary design. None have yet been constructed. As these projects are implemented, we will have the opportunity to review, for the first time, how the Water Board's hydrograph modification management requirements work in the real world. We look forward to sharing our observations with you and your staff.

Mr. Bruce H. Wolfe
Ms. Pamela Creedon
July 2, 2007

Should you have any questions regarding this letter, please contact Tom Dalziel at (925) 313-2392.

Sincerely,

FOR:

Donald P. Freitas
Program Manager

DPF:td:kh
C. M. Graul, SFBRWQCB
G. Vaugh, CVRWQCB

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