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July 23, 2010

Jeanine Townsend, Clerk to the Board
State Water Resources Control Board
1001 I Street 24th floor
Sacramento, CA 95814

Submitted electronically to commentletters@waterboards.ca.gov

RE: **Comment Letter – 2nd Draft Phase II Small MS4 General Permit**

Dear Ms. Townsend:

This letter provides comments on the hydromodification provisions in the subject draft tentative order.

My experience includes ten years of research and practice in the field of urban hydromodification impacts and management, and co-authorship of the report released earlier this year entitled: Hydromodification Assessment and Management in California[1], prepared for the State Water Resources Control Board.

Section E.12.e. specifies a hydromodification control standard based on a 2-year, 24-hour storm, or a 5-year, 24-hour storm, depending on geomorphic province. The proposed criteria are inconsistent with current scientific understanding for the following reasons:

1. The permit is specifying *event*-based criteria, whereas current scientific understanding of hydromodification impacts is that a *range* of moderately frequent, "geomorphically significant" flows transport the majority of the sediment over the long term[2,3,4] and are the most influential in determining channel form. Rather than focusing on a single event, hydromodification control requirements should therefore address this critical range of flows. This scientific understanding has been reflected in other hydromodification regulations in the State of California by establishing flow-control criteria that require pre-project flow rates, volumes and durations to be matched across a *range* of flows (e.g., 0.5Q2 through Q10).

2. The literature has shown that the use of controls based on matching peak flow rates are not only ineffective at mitigating impacts of hydromodification, but may increase the frequency and duration with which channels are exposed to erosive effects[5,6], resulting in an *increase* in downstream impacts.

More broadly, the use of a flow-control criterion (even one based on a control of post-project flow rates, volumes and durations) assumes this range of flows to be appropriate for all receiving waters, and has recently been used as an easy-to-implement option for smaller development projects only. Field research and modeling show that characteristics of the receiving stream channel (such as cross-section, slope, and sediment size) *will* influence the in-stream effects of a changed runoff regime. This is why larger developments have been required to use an Erosion Potential metric to establish design criteria to minimize excess erosion and channel instability, as it accounts for both in-stream characteristics and the full range of flows.

I recommend that the Board modify the draft tentative order for the Phase II MS4 permit as follows:

- Specify the use of an Erosion Control metric or equivalent for larger projects.
- Specify the use of a range of flows for which post-project rates, volumes and durations must meet pre-project conditions for smaller projects.

Hydromodification management is especially critical in areas where urban land use is currently low, but where development is growing, as represented by the regions covered under the Phase II Permit. I urge you to establish standards based on our current best understanding of the science of hydromodification impacts in order to protect stream resources in these regions.

Sincerely,

Felicia Federico, D.Env.
Executive Director, UCLA La Kretz Center

[1]Stein, E.D., Federico, F., Booth, D.B., Bledsoe, B.P., Bowles, C., Rubin, Z., Kondolf, G.M., Sengupta, A., 2012. *Hydromodification Assessment and Management in California.* Southern California Coastal Water Research Project Technical Report 667, April 2012.

[2]King County. 1990. Soos Creek Basin Plan and Final Environmental Impact Statement: Seattle, Department of Public Works, Surface Water Management Division. Seattle, WA.

[3]Bledsoe, B.P. 2002. Stream erosion potential and stormwater management strategies. *Journal of Water Resources Planning and Management* 128: 451-455.

[4]Roesner, L. and B. Bledsoe. 2003. Physical Effects of Wet Weather Flows on Aquatic Habitats: Present Knowledge and Research Needs. Water Environment Research Foundation Report 00-WSM-4Rep.

[5] McCuen, R.H. and G.E. Moglen. 1988. Multicriterion Stormwater Management Method. *Journal of Water Resources Planning and Management* 114:414-431.

[6] Bledsoe, B.P., M. C. Brown and D.A. Raff. 2007. GeoTools: A Toolkit for Fluvial System Analysis. *Journal of the American Water Resources Association* 43:757-772.