



Hydromodification Control & Low Impact Development Implementation Charette Materials

Why Should I be Concerned about Hydromodification?

The term hydromodification is used to describe the alteration of the natural flow of water through a landscape. Disturbing and compacting soils, changing the vegetation cover, adding impervious surfaces, and altering drainage patterns limit the natural hydrologic cycle processes of absorption, infiltration, and evapotranspiration, and increase the volume and frequency of runoff. Hydromodification causes stream channel instability, degraded water quality, changes in groundwater recharge processes, and riparian and aquatic habitat impacts.

Projected growth on the Central Coast, and the remaining landscape available for urbanization, provides us with a widely recognized opportunity to propose a meaningful and efficient intervention in the way we build new communities, and redevelop existing ones.

While scientific research over the past 20 years has brought a much greater understanding of hydromodification, only in the last decade have water quality regulatory programs (e.g., stormwater, wetland, etc.) attempted to regulate hydromodification impacts. Early efforts focused on matching pre- and post-development peak flows for large storms. Subsequent efforts have revealed innovative policy and program strategies which aim to encourage or require Low Impact Development.

Human influence changes significant elements of a watershed's hydrologic processes and functions such as stormwater runoff, but also infiltration, subsurface flow, aquifer recharge, stream flow, and evapotranspiration. These hydrologic changes have resulted in adverse impacts to receiving waters and the beneficial uses of those systems. To improve our protection of receiving waters, we need to address the broader suite of hydrologic functions and processes in a watershed. As part of its Vision of a Healthy Watersheds, the Water Board has identified several desired conditions that are necessary to protect the water quality of the region's lakes, streams, rivers, and ocean. The Water Board has described the desired conditions of healthy watersheds as "the physical attributes and processes that are characteristic of watersheds possessing the essential water quality condition of physical and biological integrity" (Central Coast Water Quality Control Board, July 10, 2008). The Water Board has defined the following attributes of a healthy watershed:

- A. Rainfall surface runoff at pre-development levels,
- B. Watershed storage of runoff, through infiltration, recharge, baseflow, and interflow, at pre-development levels,
- C. Watercourse geomorphic regimes within natural ranges (stream banks are stable within natural range; sediment supply and transport within natural ranges), and
- D. Optimal riparian and aquatic habitats (including: stream flow, in-channel, water column, and biotic conditions). (ibid)

The challenge becomes how to translate these watershed function objectives into reasonable and clear requirements that municipalities, developers, and others can use to protect water resources. The Municipal Stormwater Permit requires municipalities to develop performance measures and in some cases, numeric criteria, to manage stormwater. Development of these measures and criteria requires substantial knowledge of urban hydrologic processes; appropriate use of LID techniques; and an understanding of technical, policy and regulatory issues related to implementing municipal stormwater control requirements.

The regional joint effort to develop hydromodification criteria will take into account the broader watershed hydrologic perspective and propose the development of measures and/or criteria that meet healthy watershed objectives. Additionally, because there is a need to link criteria to actual receiving water benefits, the joint effort will emphasize the development of performance-based criteria. These performance-based criteria will assist municipalities and developers in translating watershed management objectives into easily understandable performance requirements for new and redevelopment.

Proposed: County Land Use Permit Application - LID

Current language:

A. Describe measures that will be incorporated into the project design to address storm water quality (e.g. protect riparian corridors, reduce runoff, reduce directly connected impervious areas, eliminate pollutant sources, etc.)

Proposed revised language:

This section applies to the following development or redevelopment projects:

- 1. Residential subdivisions with 10 or more dwelling units.*
- 2. Commercial development of 0.5 acres or greater.*
- 3. Parking lots of 5,000 square feet or more or have 25 or more parking spaces and are potentially exposed to storm water runoff.*
- 4. Automotive repair shops.*
- 5. Retail gasoline outlets.*
- 6. Restaurants.*
- 7. Any new development or redevelopment exceeding one acre.*

A. Identify Low Impact Development (LID) measures that will be incorporated into the project design to address storm water quality. Select at least three out of four from the list below (or define constraints if not applicable). Describe selected LID measures and depict on the site plan with a legend.*

- Minimize overall disturbance by conserving and protecting natural areas, drainages, soils, and vegetation and reducing overall impervious area (includes previously established development envelope)*
- Direct runoff from impervious surfaces (roof downspouts, driveways, roads) safely to pervious areas (e.g. open space, landscape, or permeable pavement with base)*
- Slow and reduce runoff using infiltration (e.g. trench, basin), biofilters (e.g. swales, bioretention, buffer strips, landscape planter box) and/or rainwater reuse (e.g. drywell, cisterns, rain barrels)*
- Other LID design features* (e.g. roadway / sidewalk / driveway design, lot layout, parking and roadways, clustering units, onsite wastewater reuse, vegetated roof, permeable paving, etc.). Describe below:*

** For descriptions, illustrations and technical fact sheets see: [Low Impact Development Handbook: Stormwater Management Strategies \(2007\)](http://www.sdcounty.ca.gov/dplu/docs/LID-Handbook.pdf). San Diego County Department of Planning and Land Use. <http://www.sdcounty.ca.gov/dplu/docs/LID-Handbook.pdf> and <http://www.sdcounty.ca.gov/dplu/docs/LID-Appendices.pdf>*

*B. Describe measures incorporated into project design to remove pollutants from storm water runoff including pollutant reduction through source control / site design measures and treatment of runoff (bioswales, buffer strips, bioretention, detention ponding, etc). Show where adequate space is reserved for storm water treatment control measures on site plan.**

** For add'l info on application completeness, see:
http://www.sbprojectcleanwater.org/Application_Completeness.html*

Existing: County Policy

Element Hillside and Watershed Protection Policy 7 & Coastal Plan Policy 3-19:

Degradation of the water quality of groundwater basins, nearby streams, or wetlands shall not result from development of the site. Pollutants, such as chemicals, fuels, lubricants, raw sewage, and other harmful waste shall not be discharged into or alongside coastal streams or wetlands either during or after construction.

Interpretive and Implementation Guidelines (approved by Board of Supervisors, September 2002)

The following definitions shall be used to interpret this policy:

“Degradation” of water quality means a negative alteration to the physical, chemical, or biological qualities of surface water (including storm water runoff) or groundwater compared to existing conditions. Degradation includes detrimental impacts to aquatic and terrestrial organisms, adverse effects on aesthetic qualities (due to sheens, sediment, floatable material, etc.), or other negative impacts to the beneficial uses of receiving water.

In order of preference, the following BMPs shall be used to minimize water quality impacts associated with new development and redevelopment projects in urban and rural areas:

- *Site planning to avoid, protect, and restore sensitive areas (e.g., wetlands and riparian corridors);*
- *Minimizing impervious surfaces and directly connected impervious surfaces, using existing natural features to allow for on-site infiltration of water;*
- *Vegetative treatment (e.g., bio-swales, vegetative buffers, constructed or artificial wetlands);*
- *Mechanical or structural treatment (e.g., storm drain filters and inserts).*

Combinations of BMPs listed above may be required to reduce runoff and water quality.

Existing: County Land Use & Development Code

35.30.180 – Storm Water Runoff Requirements

- A. Applicability.** *The following development or redevelopment is subject to the requirement that project-appropriate controls are in place to prevent or minimize water quality impacts:*
- 1. Residential subdivisions with 10 or more dwelling units.*
 - 2. Commercial development of 0.5 acres or greater.*
 - 3. Parking lots of 5,000 sf or more or have 25 or more parking spaces and are potentially exposed to storm water runoff.*
 - 4. Automobile repair shops*
 - 5. Retail gasoline outlets.*
 - 6. Restaurants.*
 - 7. One-family residences located on slopes of 20 percent or greater.*
 - 8. Any new development or redevelopment exceeding one acre.*
- B. Processing.** *No permit for any development listed in Subsection A. (Applicability) above, shall be approved except in compliance with the Comprehensive Plan, and the California Environmental Quality Act, if applicable.*