

# CHAPTER 1

## Planning Stormwater Management for Development Projects

The hydrologic effects of urbanization or hardening of the landscape by land development on surface waters are well documented. Substantial increases in the total volume and flow rate of stormwater runoff intensifies downstream flooding and channel erosion. Flow in receiving waters becomes highly variable or flashy with reduced base flow altering its ecology.

Land development also affects the quality of stormwater. Runoff collected in storm sewers and drainage ditches bypasses natural treatment mechanisms, carrying eroded sediment and other pollutants washed from the site to the receiving waters both during and after construction. Pollutants may include organic and inorganic compounds, metals, salts, oils, nutrients, pathogens, and trash. Less obvious impacts can occur such as reduced dissolved oxygen and increased water temperature in receiving streams, as well as reduced recharge to groundwater supply, wetlands, and streams.

Awareness of the impacts of stormwater runoff generated during and after construction prepares the designer to best plan a development and select stormwater management practices to protect water resources. Consult more detailed studies and references to develop a better understanding of stormwater hydrology and chemistry prior to implementing the material presented in this and later chapters.

The following sub-chapters present a framework for protecting water resources. They will first outline the goals of stormwater management, offer strategies to develop land with less stormwater impact, and explain how to prepare a comprehensive Stormwater Pollution Prevention Plan for the proposed development, followed by specific practices to use resources already on site to manage stormwater.

### Stormwater Management Planning

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### Stormwater Resource Management Practices

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