



## CLEAR LAKE CITY WATER AUTHORITY

900 Bay Area Boulevard • Houston, Texas 77058 • 281/488-1164  
• Fax 281/488-3400

### Stormwater Quality Management Plan Planning Consideration and Compliance Guide

Planning consideration includes analysis of predevelopment site hydrology and effective utilization of the existing site features to maintain the predevelopment hydrologic regime. Site hydrology analysis allows full utilization of the property while maintaining the predevelopment hydrologic regime to the greatest extent possible. The planning consideration may require rethinking of the current practice of site development, site grading, and site layout and design. Hydrologic functions of the site should be maintained and managed with the use of reduced impervious surfaces, minimized land clearing and grading.

Low Impact Development techniques alone do not offer flood protection. Additional flood design criteria should be reviewed to ensure flood protection is provided.

Some specific planning considerations include:

1. Minimizing environmental impacts and hydrologic changes.
2. Preserve adequate open space within the development site for bio-retention, and treatment of runoff from rooftops and other impervious surfaces.

#### *Design Guidelines*

To reduce development impacts and preserve the predevelopment hydrologic conditions the following could be used as general guidelines.

1. Minimize land clearing that requires removal of the native vegetation.
2. Minimize or avoid mass grading and utilize selective clearing.
3. Reduce impervious surface area and minimize connected impervious surfaces.
4. Increase opportunity for on-site retention, detention, and treatment.
5. Maintain predevelopment hydrologic pattern.
6. Utilize native vegetation.
7. Utilize undisturbed existing vegetation buffer strips and areas.
8. Whenever site condition permits, utilize extensive use of swales, grass filter strips, and randomly placed biofilters. Direct roof and landscape open area runoff to vegetated biofilter strips and swales.
9. Preserve soils and areas with high infiltration rate.
10. Provide multi-purpose and multi-benefit stormwater detention basin onsite.
11. Grade the site to maximize the overland sheet flow distance.
12. Increase flow-paths or travel distances for surface runoff.
13. Maintain existing time of concentration and minimize impact on the runoff coefficient number.
14. Utilize cisterns, rain barrels, bioretention areas, and created seasonal or permanent wetlands.
15. Provide adequate buffers between development and natural resources, critical areas and drainage ways.
16. Lay out roads, utilities, and pervious surfaces to avoid existing wetlands and drainage paths.
17. Handle road runoff separate from roof top and landscape area runoff.
18. Integrate low-rise and high-rise buildings, town houses, in single-family residential to reduce land consumption.

# Guide for Stormwater Regulation Compliance for Contractors

## WHAT IS URBAN RUNOFF AND STORMWATER POLLUTION, AND WHAT IS THE DIFFERENCE BETWEEN THEM?

Urban runoff is the water that flows off our yards, streets, parking lots, and driveways into the storm drains and eventually into our creeks, lagoons and the ocean during the dry season. Whether it is from sprinkler over spray, car washing or hosing down the driveway, everyone is a potential contributor to urban runoff. Whereas storm water pollution occurs during the rainy season, with runoff picking up pollutants from our streets and gutters that flows directly into our local waterways. In either case, whether by rain or by everyday activities, the water flows into the storm drains picking up pollutants like soil, motor oil, pesticides, fertilizers, pet wastes, and litter. All these contaminants end up in our waterways. Many people mistakenly think that the water entering our storm drains is cleaned or treated in some way. **The storm drain system and sewer system are separate.** Our storm drain system channels water, untreated, directly into our creeks, lagoons and the ocean. If our runoff water and storm water is contaminated, it will cause beach closures and postings. Urban runoff is a major source of water pollution. **Acting Water Wise Helps Keep Our Waterways Clean. Prevent Stormwater Pollution and Urban Runoff.**

## HOW CAN DEVELOPMENT AFFECT OUR LOCAL CREEKS, LAGOONS, AND OCEANS?

When land is graded for a new development project - whether it is a park, houses, or a shopping center, our local environment feels the effects. Of primary concern is the potential for sediment and contaminants in the runoff from the construction projects. As the natural vegetation is cleared, soil is exposed and susceptible to the forces of erosion. Wind, water, humans, and machines carry sediments, contaminants, soil, litter, and debris away from the development site and into our local waterways, degrading the water quality. Everything carried, pushed, and picked-up by water flowing over the site finds its way into storm drains and, eventually and without treatment, into our local creeks, lagoons, and oceans. This untreated runoff affects water quality; human, animal, and environmental health; and can cause flooding when storm drains are clogged or blocked by sediment and debris.

## AS A DEVELOPER, YOU CAN REDUCE YOUR PROJECT'S IMPACT ON WATER QUALITY.

Ideally, the only thing that should leave your project's site and enter a storm drain is rainwater - clean, uncontaminated rainwater. An effective storm water management program is one in which all potential pollutants are recognized and a plan to control/prevent them is designed. The program must include a combination of best management practices (BMPs) to target each potential pollutant. Moreover, as a developer, you are legally responsible for containing all possible forms of contaminants on your site. The following BMPs provide various ways you can control and prevent contaminated runoff from leaving your construction site. As a result, you will be ensuring the safety of the public and preserving the quality of our local waterways.

## PLANNING AND SCHEDULING

Grading and clearing should be phased to reduce the amount and the duration of sediment exposure. If possible, schedule grading during the dry season (Mid-April through October), particularly avoiding December through February.

Erosion Control – Practices that protect soil surfaces and prevent soil particles from being detached)

Preserve existing vegetation – Keeping existing vegetation minimizes potential soil erosion by stabilizing the soil and preserves aesthetics.

Physical Stabilization – Covering exposed soil can effectively protect against erosion. Suggested methods include:

- Geotextiles/Mats – Used for temporary or permanent soil stabilization, and are especially effective on steep slopes and channels. Geotextiles and mats are used to reduce erosion from rainfall impact, hold soil in place, and absorb and hold moisture near the soil surface.
- Soil Binders – Soil binding (i.e. bonded fiber matrix) consists of applying and maintaining polymeric or lignin sultanate soil stabilizers. Soil binders typically are applied to disturbed areas requiring temporary protection from erosion.

- Hydroseeding – Hydroseeding consists of applying a mixture of wood, fiber, seed, fertilizer, and stabilizing emulsion with hydromulching equipment. It is typically applied to disturbed areas requiring temporary protection from erosion.
- Plant new vegetation ASAP – Planting ground cover, sod, shrubs, and trees provides long-term benefits such as slope and soil stabilization, water infiltration, and sediment filtration.

#### **SIMPLE AND COST EFFECTIVE WAYS TO COMPLY WITH STORMWATER REGULATIONS**

- Flow Control and Velocity Control – Facilities to decrease velocity of runoff for reducing erosion potential and removal of sediments.
- Earthen Dikes – These are structures that intercept, divert, and convey surface run-off, generally sheet flow, to a sediment-trapping device or stabilized outlet.
- Drainage Swales and Lined Ditches – These are used to divert off-site runoff around the construction site; divert runoff from stabilized areas around disturbed areas; and direct runoff into sediment basins or traps.
- Outlet Protection/Velocity Dissipation Devices – Physical devices composed of rock, grouted riprap, or concrete rubble placed at pipe outlets to prevent scour and reduce the velocity and/or energy of exiting storm water flows.
- Slope Roughening or Terracing – Creating uneven depressions or steps in the slope traps sediment, impedes erosion by reducing run-off velocity, and increases infiltration.
- Sediment Control – Facilities to remove sediment from runoff.
- Storm Drain Inlet Protection – Devices, such as gravel bags or tubes, are used at storm drain inlets to detain and/or filter sediment-laden runoff to allow sediment to settle and/or filter sediment.
- Silt Fence – A silt fence is a temporary barrier of permeable fabric designed to intercept and slow the flow of sediment-laden sheet flow runoff from exposed, erosion-prone soil. They must be properly anchored into the ground.
- Sandbag or Gravel Bag Barriers/Berms – A barrier or berm is a temporary sediment barrier consisting of stacked bags designed to intercept and slow the flow of sediment-laden sheet or gutter flow runoff, and to allow sediment to settle from the runoff before water leaves the construction site.
- Fiber Rolls – A fiber roll consists of materials rolled or bound into a roll and placed on a slope to intercept runoff, reduce its flow velocity, release the runoff as sheet flow, and provide some removal of sediment from the runoff.
- Desilting or Sediment Basin – Sediment-laden runoff is directed to a designed temporary or permanent basin that sediment to settle out before the runoff is discharged.
- Off-site Sediment Tracking - Stabilized entrances/exits to construction sites reduce the tracking of mud and dirt onto public roads by construction vehicles.

#### ***WASTE MANAGEMENT***

Methods for managing construction wastes to prevent contaminated runoff from entering the drainage system include: Spill Prevention and Control; Solid Waste Management; Hazardous Waste Management; Concrete Waste Management; and Liquid Waste Management.

#### ***CONCLUSION***

These BMPs should be used in combination for best results. Planning, erosion control, flow and velocity control, sediment control, and waste management are essential measures to prevent anything but clean rainwater from entering storm drains, and ultimately our creeks, lagoons, and oceans.

**To report illegal dumping or for more information on preventing storm water pollution and urban run-off, please call the Clear Lake City Water Authority at (281) 488-1164. You can also visit the Clear Lake City Water Authority website for more information at [www.clewa.org](http://www.clewa.org).**