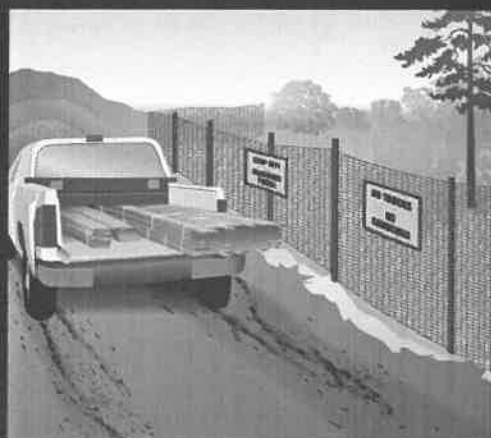


Stormwater Pollution Prevention for Small Residential Construction Sites



10 Steps to Stormwater Pollution Prevention on Small Residential Construction Sites

Stormwater management on small residential construction sites need not be complicated.

1 Protect Any Areas Reserved for Vegetation or Infiltration and Preserve Existing Trees

If you will be installing infiltration-based features such as rain gardens or bioswales, make sure these areas are designated as off limits to avoid compaction.

Save time and money by preserving existing mature trees during construction. Preserving mature trees minimizes the amount of soil that needs to be stabilized once construction is complete, and minimizes the amount of runoff during and after construction activity.

2 Stockpile Your Soil

EPA's CGP requires operators to preserve native topsoil on site unless infeasible and protect all soil storage piles from run-on and runoff. For smaller stockpiles, covering the entire pile with a tarp may be sufficient.

3 Protect Construction Materials from Run-On and Runoff

At the end of every workday and during precipitation events, provide cover for materials that could leach pollutants.

4 Designate Waste Disposal Areas

Clearly identify separate waste disposal areas on site for hazardous waste, construction waste, and domestic waste by designating with signage, and protect from run-on and runoff.

5 Install Perimeter Controls on Downhill Lot Line

Install perimeter controls such as sediment filter logs or silt fences around the downhill boundaries of your site.

6 Install Inlet Controls

Sediment control logs, gravel barriers, and sand or rock bags are options for effective inlet controls. Make sure to remove accumulated sediment whenever it has reached halfway up the control.

7 Install a Concrete/Stucco Washout Basin

Designate a leak-proof basin lined with plastic for washing out used concrete and stucco containers. Never wash excess stucco or concrete residue down a storm drain or into a stream!

8 Maintain a Stabilized Exit Pad

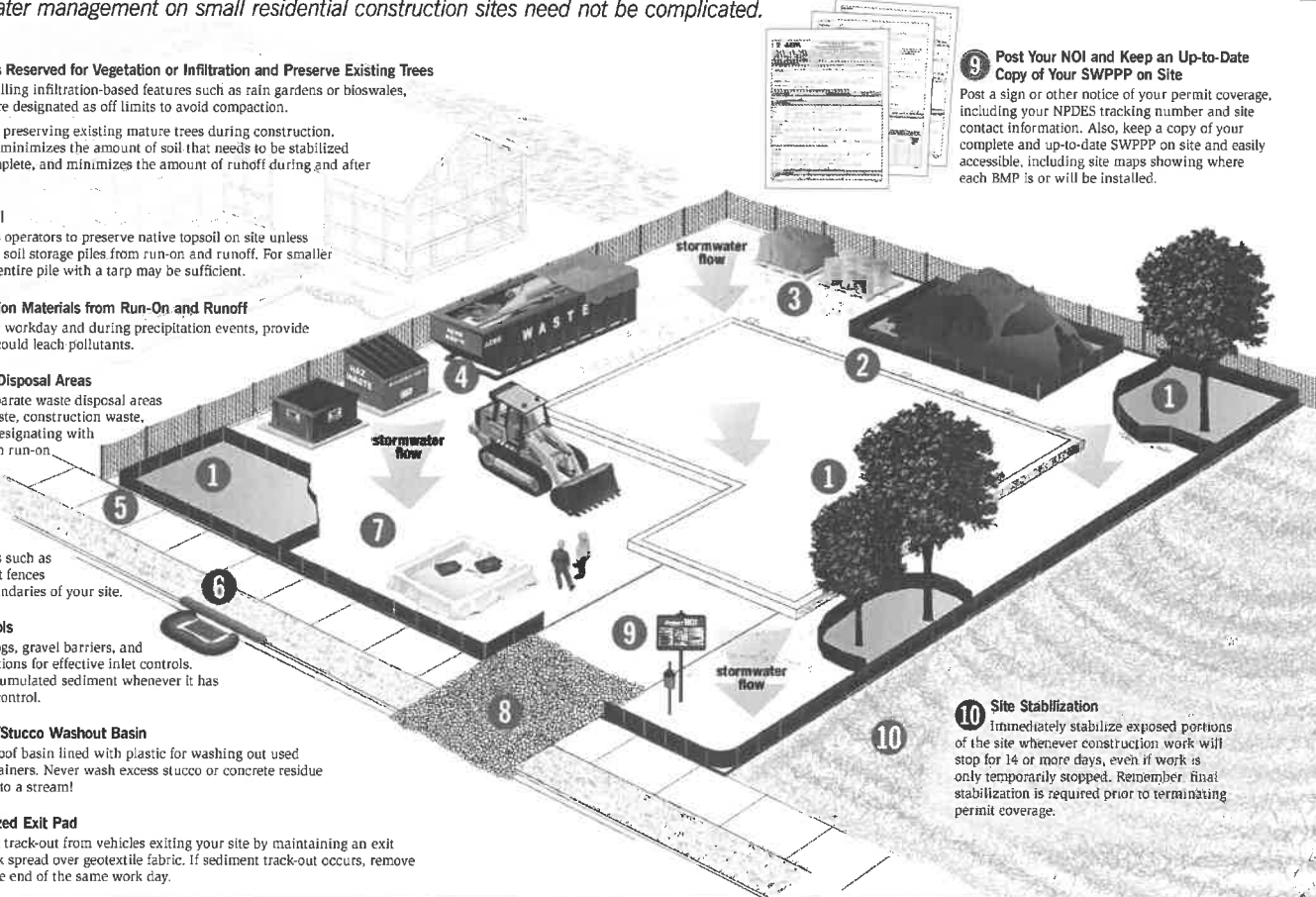
Minimize sediment track-out from vehicles exiting your site by maintaining an exit pad made of crushed rock spread over geotextile fabric. If sediment track-out occurs, remove deposited sediment by the end of the same work day.

9 Post Your NOI and Keep an Up-to-Date Copy of Your SWPPP on Site

Post a sign or other notice of your permit coverage, including your NPDES tracking number and site contact information. Also, keep a copy of your complete and up-to-date SWPPP on site and easily accessible, including site maps showing where each BMP is or will be installed.

10 Site Stabilization

Immediately stabilize exposed portions of the site whenever construction work will stop for 14 or more days, even if work is only temporarily stopped. Remember, final stabilization is required prior to terminating permit coverage.



EPA's Construction General Permit (CGP) Small Residential Lot Stormwater Pollution Prevention Plan (SWPPP) Template

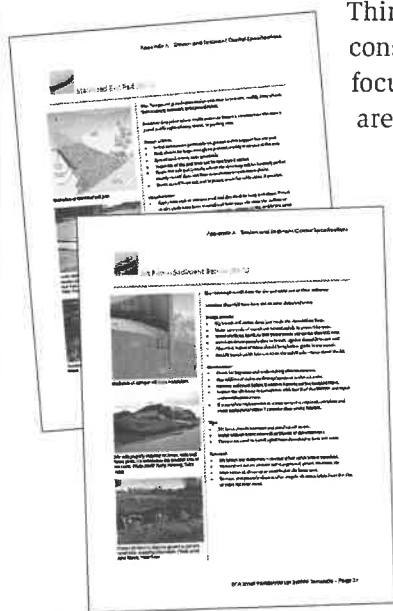
Who needs to seek coverage under the EPA CGP?

Stormwater discharges from construction activities that disturb one or more acres, or smaller sites disturbing less than one acre that are part of a common plan of development or sale, are regulated under the National Pollutant Discharge Elimination System (NPDES) stormwater permitting program. Prior to the start of construction, construction operators must obtain coverage under an NPDES permit, which is administered either by the state (if it is authorized to operate the NPDES program) or EPA. Where EPA is the permitting authority, operators may seek coverage under the EPA CGP. The CGP requires operators of construction sites to meet effluent limits (i.e., through the implementation of erosion and sediment controls) and requires operators to develop a SWPPP detailing erosion and sediment controls and pollution prevention measures that will be implemented to meet the requirements of the CGP.

What is the Small Residential Lot SWPPP Template?

The Small Residential Lot SWPPP Template is designed to help operators of small residential sites develop a streamlined SWPPP that meets the minimum requirements of EPA's CGP. This simplified template does not change, relax, or modify any existing conditions in the CGP, including the requirement to submit a Notice of Intent (NOI) for permit coverage.

How does it work?



Think of the Small Residential Lot SWPPP Template as a 1040EZ tax form for small construction sites. All of the same requirements apply, but compliance options are focused on only those controls that apply to small residential lot construction, and they are presented in a simplified, user-friendly format.

The Small Residential Lot SWPPP Template streamlines SWPPP development by providing a simplified menu of erosion and sediment control and pollution prevention practices that operators can select from to complete a SWPPP consistent with the minimum requirements in the CGP.

Easy to Use BMP Menu

The Small Residential Lot SWPPP Template provides operators with a walk-through menu of typical erosion and sediment control and pollution prevention practices (i.e., Best Management Practices or BMPs) appropriate for small construction sites.

Illustrated Appendix with Pull-Out BMP Spec Sheets

Clear, step-by-step BMP spec sheets for each practice you choose are provided in an illustrated appendix that you may edit based on your site-specific conditions.

Does my project qualify for EPA's Small Residential Lot SWPPP Template?

In order to use EPA's streamlined template, your site must meet a series of criteria, including:

- ✓ Projects must disturb less than one acre of land;
- ✓ Projects must be located outside of sensitive areas (areas with endangered species concerns, historic preservation issues, wetlands, etc.);
- ✓ Projects must not cause disturbance within 50 ft of a water of the U.S.;
- ✓ Projects must not require the use of chemical treatment for stormwater; and
- ✓ Projects must not disturb steep slopes.

To access EPA's streamlined Small Residential Lot SWPPP Template, visit:

www.epa.gov/national-pollutant-discharge-elimination-system-npdes/stormwater-discharges-construction-activities

What is Low Impact Development (LID)?

Ever wish you could simultaneously lower your site infrastructure costs, protect the environment, and increase your project's marketability? With LID techniques, you can. LID is an ecologically friendly approach to site development and storm water management that aims to mitigate development impacts to land, water, and air. The approach emphasizes the integration of site design and planning techniques that conserve the natural systems and hydrologic functions of a site.



Residential Lot with Bioretention
Somerset Development
Prince George's County,
MD

LID Benefits

In addition to the practice just making good sense, LID techniques can offer many benefits to a variety of stakeholders.

Developers

- Reduce land clearing and grading costs
- Potentially reduce infrastructure costs (streets, curbs, gutters, sidewalks)
- Reduce storm water management costs
- Potentially reduce impact fees and increase lot yield
- Increase lot and community marketability

Municipalities

- Protect regional flora and fauna
- Balance growth needs with environmental protection
- Reduce municipal infrastructure and utility maintenance costs (streets, curbs, gutters, sidewalks, storm sewer)
- Increase collaborative public/private partnerships

Environment

- Preserve integrity of ecological and biological systems
- Protect site and regional water quality by reducing sediment, nutrient, and toxic loads to water bodies
- Reduce impacts to local terrestrial and aquatic plants and animals
- Preserve trees and natural vegetation

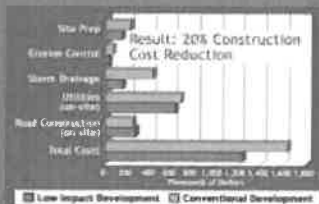
Cover Photo: R. Avenall

Case Study

Kensington Estates is a conventional development on 24 acres consisting of 103 single-family homes in Pierce County, WA. A study was conducted to redesign the site using a new state storm water model and to illustrate the full range of LID practices and technologies available to developers.

Overall, the redesigned LID site could have:

- Resulted in construction cost savings of over 20%;
- Preserved 62% of the site in open space;
- Maintained the project density of 103 lots;
- Reduced the size of storm pond structures and eliminated catchments and piped storm conveyances; and
- Achieved "zero" effective impervious surfaces.



Cost Comparison: LID vs. Conventional Development

For More Information

- Low Impact Development Center
<http://www.lowimpactdevelopment.org>
- Prince George's County, Maryland
<http://www.goprincegeorgescounty.com>
- NAHB Research Center Toolbase Services
<http://www.toolbase.org>
- U.S. EPA
<http://www.epa.gov/owow/nps/urban.html>



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Builder's Guide to Low Impact Development

Would you be interested in saving upwards of \$70,000* per mile in street infrastructure costs by eliminating one lane of on-street parking on residential streets?

Did you know that communities designed to maximize open space and preserve mature vegetation are highly marketable and command higher lot prices?

Are you aware that most homeowners perceive Low Impact Development practices, such as bioretention, as favorable since such practices are viewed as additional builder landscaping?

Did you know that by reducing impervious surfaces, disconnecting runoff pathways, and using on-site infiltration techniques, you can reduce or eliminate the need for costly storm water ponds?

LID Site Planning and Design Concepts

Successful LID projects simultaneously reduce land development and infrastructure costs while protecting a property's natural resources and functions. During the development process, the designer, developer, and reviewing agency should work together to identify solutions that integrate the following concepts:

- Preserve Open Space and Minimize Land Disturbance;
- Protect and Incorporate Natural Systems (wetlands, stream/wildlife corridors, mature forests) as Design Elements;
- Utilize Neo-Traditional Street and Lot Layouts and Designs;
- Decentralize and Micromanage Storm Water at its Source Using LID Storm Water Management Practices.

LID and Storm Water Management

LID aims to mimic natural hydrology and processes by using small-scale, decentralized practices that infiltrate, evaporate, and transpire rainwater. Specifically, LID aims to:

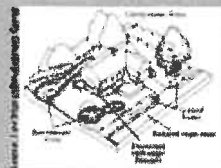
- Minimize impervious surfaces;
- Disconnect hydrologic elements (roofs, downspouts, parking areas);
- Minimize runoff flow paths and times; and
- Utilize decentralized treatment practices.

Retention Areas

Storm water directed to these shallow topographic depressions in the landscape is filtered, stored, and infiltrated into the ground using specialized vegetation and engineered soils.

Grassed Swales

Water moving through these systems is slowed, filtered, and percolated into the ground. These systems connect as low-cost alternatives to curbs, gutters, and pipes.



LID LOW IMPACT SOURCE CONTROLS

Preserve Open Space and Minimize Land Disturbance

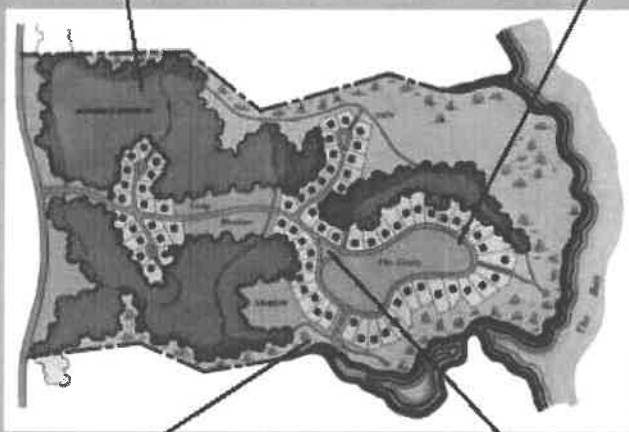


Community Open Space
Madison Homes
Vandalia, WI

Decentralize and Micromanage Storm Water at its Source using LID Storm Water Management Practices



Grassed Swale
Somerset Development
Prince George's County, MD



Best Management Design for 100-year Flood Risk in Central and Southern Maryland, by Robert S. Jansen, University of Maryland System, Department of Civil and Environmental Engineering, College Park, MD

Protect and Incorporate Natural Systems as Design Elements



Wetland System
Parrish Crossing
Gainesville, FL

Utilize Neo-Traditional Street and Lot Layouts and Designs



Southman Park
Vanderbilt Community
Vanderbilt, NC



What you can do as a Developer

U.S. EPA | STORMWATER OUTREACH AT EPA NEW ENGLAND



Credit: South Burlington Stormwater Utility

STORMWATER is a leading cause of poor water quality. Rain or melted snow runs down driveways, sidewalks and streets carrying oil, dirt and other pollutants into nearby waterways. Polluted runoff, which can cause erosion and flooding, runs into waterways and degrades plants, fish, shellfish and other wildlife. In water used for recreation, the runoff can lead to illness, and people who eat contaminated fish can also become sick. Untreated stormwater can also contaminate drinking water sources.

INTRO:

Development has sprawled across New England over the past few decades, consuming farms and forests two times as fast as the population is growing. Past development practices have created more roads, driveways and roofs so that water that used to seep into the ground now runs across pavement, picking up chemicals and pollutants. This stormwater then flows into nearby waterways, both polluting them and scouring their banks. Local zoning often unintentionally encourages sprawl, but this is beginning to change. Some developers are leading the way with better – and often cheaper – ways to develop. Here are some of their practices:

USE INNOVATIVE DEVELOPMENT PRACTICES:

Select your site wisely — Developing in an already-developed area can lower infrastructure costs because sewer, water, utilities and roads may be available.

Choose the areas of your site to develop carefully — You can avoid putting the development where it will have an effect on important natural resources. In addition, you can cluster buildings and leave at least half of the property undeveloped so that it can handle rainwater through natural resources. This will reduce costs and add to open space.

Use Low Impact Development (LID) practices — Roads, parking lots and other non-porous areas are the largest contributors to stormwater runoff. Generally the less porous the area, the worse the condition of nearby waterways. Low Impact Development allows developed land to handle rain more like how it was handled before the site was developed. The goal is to mimic a site's predevelopment hydrology by infiltrating, filtering, storing, evaporating and detaining stormwater runoff.

Address barriers early — Developers interested in LID are often concerned about cost, cold weather, drinking water and public safety. Many of these concerns need not represent barriers:

- **Costs** — An EPA study found grading, landscaping, paving and infrastructure costs were lower for LID than conventional development. These low-impact development techniques can also eliminate or reduce the size of stormwater systems, leaving more open space for buildable lots.

- **Cold weather** — Most LID stormwater approaches monitored by the University of New Hampshire Stormwater Center worked well year-round. Porous pavement in particular was found to be especially effective in winter.

- **Drinking water** — The UNH Stormwater Center found that filtering stormwater through infiltration practices removes pollution, and on occasion, can reduce contaminant levels beyond requirements. Furthermore, infiltration replenishes groundwater for future use. In certain areas, including those where groundwater is a source of drinking water or those identified as sensitive groundwater areas, infiltration without treating the water first may not be appropriate. In some cases, stormwater infiltration may be regulated as well under the Safe Drinking Water Act. Developers should contact state or regional authorities before they use infiltration practices.

- **Public safety** — Studies have shown narrower streets can provide ample access, parking and circulation for residents and emergency vehicles. Some studies have shown that narrower streets are associated with less traffic, slower speeds and fewer accidents.

KEY CONTACTS:

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CUSTOMER SERVICE**
1-888-EPA-7341

LEARN MORE AT:
[www.epa.gov/region1/
topics/water/stormwater.html](http://www.epa.gov/region1/topics/water/stormwater.html)

The most common source of pollution associated with construction activities is **sedimentation** caused by erosion.

Failure to maintain adequate Erosion and Sediment Controls (ESCs) at construction sites often results in sediment discharges into the storm drain system. In the Wachusett Reservoir watershed, most storm drains flow directly into lakes, streams and rivers – and then into the Wachusett Reservoir, a drinking water supply for 2.2 million Massachusetts residents.

Once this discharge reaches waterways, it creates problems such as turbidity (cloudiness of the water) and chemical changes to the water. These changes effect drinking water quality and can even kill fish and other aquatic wildlife.



Ideally, the only thing that should leave your project's site and enter a storm drain is **rainwater** – **clean, uncontaminated rainwater**. An effective stormwater management program is one in which **ALL** potential pollutants are recognized and a plan is designed to control or prevent them. As a result, you will ensure the safety of the public and preserve the quality of local waters.

For a more comprehensive list of Best Management Practices and stormwater guidance for the construction industry, go to the EPA's website at: www.epa.gov and search "construction stormwater."

Wachusett Reservoir Watershed
Department of Conservation and Recreation
Division of Water Supply Protection
180 Beaman Street
West Boylston, MA 01583
508-792-7806
www.mass.gov/dcr/watersupply.htm

May 2012



General Construction and Site Supervision Stormwater Tips

***The Wachusett
Reservoir is only
a storm drain
away.***

What goes in here ...



... comes out here.

Allowing stormwater with sediment or pollutants to leave your construction site and enter into a storm drain or waterway is against federal, state, and some local laws!

As an owner, operator, or supervisor of a construction site, you may be held financially responsible for any environmental damage caused by your subcontractors or employees!

Plan In Advance to Prevent Pollution:

- Remove existing vegetation only as needed.
- Schedule excavation, grading, and paving operations for dry weather periods.
- Designate a specific area of the site, well away from storm drains or waterways, for material storage and equipment maintenance.
- Educate your employees and subcontractors about stormwater management requirements and their pollution prevention responsibilities.
- Have extra erosion controls (such as hay bales and silt fence/silt socks) on site in case of any emergency.
- Develop and implement an effective combination of erosion and sediment controls for the site.

Best Management Practices and good housekeeping can significantly reduce pollutant discharges from your construction site.

Please follow the suggestions below to keep local waterways free from pollutants.

- Protect all storm drain inlets and streams located near the site.
- Limit access to and from the site and stabilize construction entrances and exits.
- Sweep frequently.
- Protect stockpiles by storing under a roof, impermeable tarp, or plastic sheeting.
- Do not store or stockpile materials near a storm drain, wetland or stream.
- Perform major maintenance and repairs of vehicles off site.
- Wash out concrete mixers only in designated washout areas away from resources, and set up small mixers on tarps.
- Remove trash, debris, and wastes on a regular basis and ensure that dumpsters are covered.
- Clean up small spills immediately using dry cleanup methods, such as an absorbent. Sweep as soon as possible.
- Prevent erosion by implementing soil stabilization practices such as mulching, temporary or permanent seeding.
- Maintain all haybales and silt fence to make sure no materials are getting beyond them; replace if necessary.



You are subject to coverage under the EPA NPDES Construction General Permit (CGP) if greater than 1 acre of disturbance is proposed and stormwater may leave your site. This permit requires a Stormwater Pollution Prevention Plan (SWPPP) before ANY work begins.

The SWPPP is a plan to control stormwater discharges from your construction site. It is broader and more complicated than a typical erosion and sediment control plan, and contains more information. The SWPPP needs to be updated as work progresses, and the plan **MUST** be available on site.

For more information on SWPPP development and the CGP Notice of Intent process refer to: www.epa.gov/npdes/stormwater/cgp.

For any disturbance within the Wachusett Reservoir watershed greater than 1 acre, you most likely will also need to complete a BRP WM09 permit issued through the Mass Department of Environmental Protection as well (www.mass.gov/dep/water/approvals/surffms.htm#npdes2).

If you don't have Construction General Permit coverage, you could be fined up to \$32,500 per day!