

# MANAGING STORM WATER IN IOWA COMMUNITIES

## IMPLEMENTING NEW REQUIREMENTS

Managing storm water runoff and its impacts is a serious issue facing Iowa and the nation. State and federal governments mandate local storm water programs to control storm water pollution. The intent of these regulations is to improve water quality by reducing storm water runoff and the contaminants carried by storm water.

### WHAT IS STORM WATER RUNOFF?

Storm water runoff is rainfall or snowmelt that runs off permeable surfaces or impervious surfaces like roads, buildings, sidewalks or compacted ground surfaces. It can drain directly into streams, rivers and lakes by traveling over ground or through storm drains. These drains, commonly called storm sewers, should not be confused with sanitary sewers that transport wastewater to a treatment plant before discharging to surface waters. Storm water entering storm sewers does not receive any treatment before it flows to surface waters such as lakes and streams.

### THE PROBLEM

Contaminants in storm water runoff that flow through municipal storm sewers may impact drinking water sources, recreational waters and aquatic life.

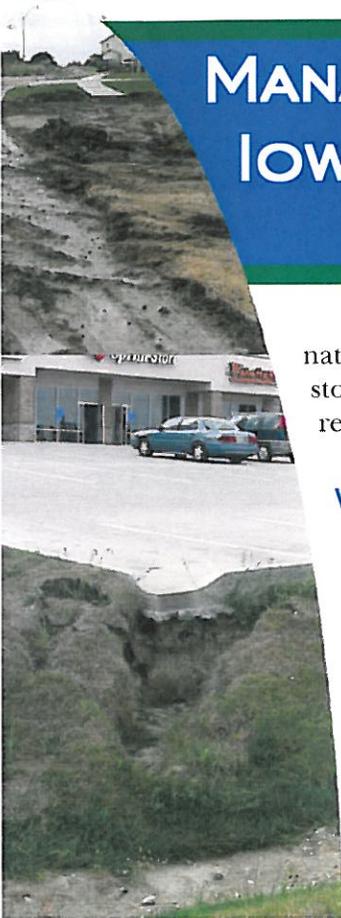
Storm water problems are often most evident in urban areas. As communities grow, they often experience more storm water runoff problems due to their increasing impervious areas. Impervious areas reduce the amount of rainwater that can naturally infiltrate into the soil. This causes an increase in the volume and rate of storm water runoff. It can lead to more frequent and severe flooding, stream bank erosion, and potential damages to public and private property and water quality.

### PRINCIPLES OF STORM WATER MANAGEMENT

The traditional approach to storm water management drains runoff water off-site through pipes and storm sewers as quickly as possible. Traditional detention-based storm water systems only manage the large storm events for flood control and generally do not provide water quality protection. This approach does not minimize the amount of runoff generated or prevent or reduce the pollution to the receiving water body. The increased volume and duration of flows can cause water quality and quantity issues including stream bank erosion and property damage.

Today, more comprehensive storm water management is needed. Storm water must be managed for both flood control and water quality protection. Infiltration-based storm water management practices are the key to a more comprehensive approach. Infiltrating small rains and the first flush of larger storms minimizes the amount of runoff generated and the pollutant loads that are delivered to surface waters.

Runoff must be managed to protect water quality in cost effective ways. Site planning that uses more natural ways to infiltrate or convey rainfall can save money over traditional pipe and detention-based systems. It can also reduce costs associated with long-term maintenance of infrastructure.



**STORM WATER POLLUTANTS AND SOURCES INCLUDE:**

- Sediment from construction sites, streambank erosion, disturbed areas
- Pesticides and fertilizers from lawns, parks and roadsides
- Bacteria from pet wastes and septic systems
- Nutrients from lawn fertilizer
- Oil and grease from car leaks, gas stations and industrial areas
- Road salt and sand from snow and ice control applications
- Carelessly discarded trash such as cigarette butts, paper wrappers and plastic bottles
- Illicit connections to storm sewers
- Illegally dumped pollutants
- Thermal impacts from sun-heated impervious surfaces transferring heat to rainfall runoff

**FEDERAL ROLE AND REGULATIONS: NPDES STORM WATER PROGRAM**

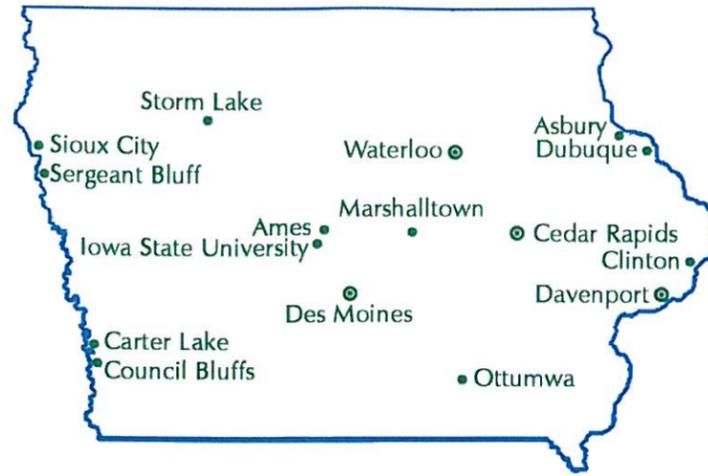
The federal Clean Water Act (CWA) is the primary basis for all federal and state water quality programs. The CWA was enacted with a goal of making all U.S. waters fishable and swimmable.

The CWA established the Environmental Protection Agency's (EPA) National Pollutant Discharge Elimination System (NPDES) program to control water pollution by regulating sources that discharge pollutants into waters.

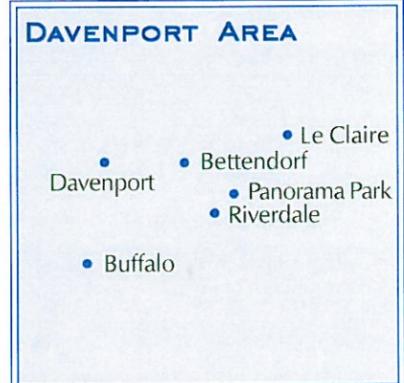
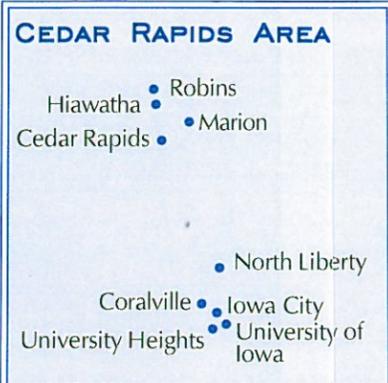
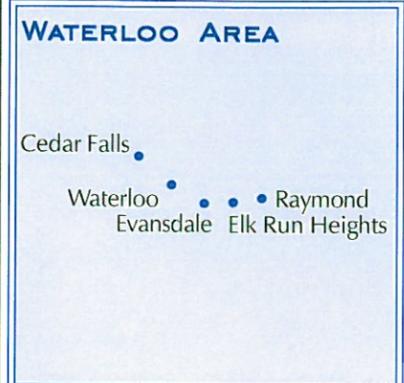
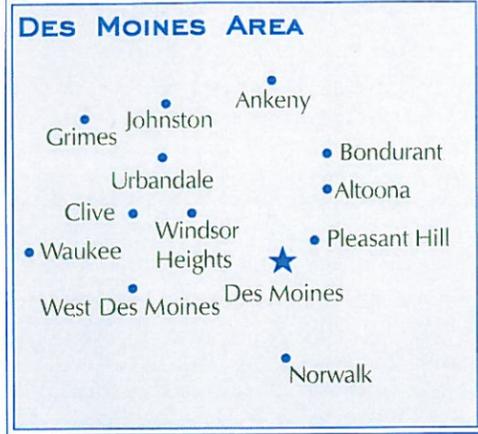
The EPA set standards for federal water quality programs and assures that state programs are operating in accordance with the federal guidelines.

In Iowa, the Iowa Department of Natural Resources (DNR) is authorized by the EPA to administer the NPDES program and issues permits for storm water discharges subject to permit requirements.

**IOWA COMMUNITIES IMPLEMENTING**



**PHASE II REGULATIONS**



Maps are not to scale.

**MUNICIPAL STORM WATER PERMITS AND REGULATIONS**

Phase I of the storm water permitting process relied on NPDES permit coverage to improve the quality of storm water runoff. Larger municipalities with separate storm sewer systems (MS4s) were included in Phase I regulations. Des Moines and Cedar Rapids were the only Iowa cities required to obtain a permit to discharge storm water under the Phase I program.

Effective in 2003, NPDES Phase II required that 41 more Iowa communities and two universities obtain permits and strive to improve storm water quality. The permit requires that each community develop and implement a comprehensive storm water quality management program.

Those involved in construction activities disturbing one or more acres of land require an NPDES permit and development and implementation of a storm water pollution prevention plan (SWPPP) for the site. A key component of the SWPPP is to identify practices that reduce erosion and prevent sediment loss from construction sites.

**INDUSTRIAL STORM WATER PERMITS**

Many industrial activities and facilities also require permits and SWPPPs. Permitted industrial activities include manufacturing, transportation, oil and gas, hazardous waste and other facilities. Also included are some governmental facilities including landfills, airports and wastewater treatment plants.



**SIX NEW REQUIREMENTS FOR IOWA COMMUNITIES**

To reduce nonpoint source pollution, Phase II cities are required to develop a program that addresses six main areas. These programs should significantly reduce water pollution associated with urban runoff.

1. Control erosion and retain sediment on construction sites.
2. Improve storm water management to control flooding and protect water quality.
3. Inspect storm drain outlets regularly to detect and eliminate any illicit discharges.
4. Implement "good housekeeping" practices to ensure municipal operations are not contributing to water quality degradation.
5. Educate residents how to contribute to water quality protection.
6. Involve the public in implementing the city's plan for protecting water quality.

**PERMITS FOR LAND DISTURBING ACTIVITIES**

Land disturbing activities at construction sites often contribute large amounts of sediment to adjacent streams and lakes. NPDES Phase II regulations address urban construction activities throughout Iowa, even at sites not located in Phase II communities.

Those involved in construction

**EFFECTIVE STORM WATER POLLUTION PREVENTION PLANS FOR CONSTRUCTION ACTIVITIES INCLUDE:**

- Develop a storm water management plan
- Minimize clearing and grading
- Phase essential grading to limit soil exposure
- Immediately stabilize exposed soils
- Protect steep slopes and cuts
- Protect and stabilize drainage ways
- Install perimeter controls to keep sediment on-site
- Train contractors to properly implement SWPPPs
- Inspect SWPPP practices weekly and after storms
- Perform needed maintenance to pollution prevention controls
- Adjust the plan as needed during the construction process

**RUNOFF DEGRADES WATER QUALITY**

Pollutants accumulate on impervious surfaces between rainfall events, and frequent small rains wash these pollutants into rivers and lakes.

The pollution level is very high in this 'first flush' of water runoff.

Therefore, managing the runoff from small storms and the first flush of larger storms is key to protecting water quality.

## FOR MORE INFORMATION

Iowa Stormwater Education Program  
in cooperation with the Iowa Stormwater Partnership  
Pat Sauer: (515) 289-1999  
[www.iowastormwater.org](http://www.iowastormwater.org)

Iowa Department of Natural Resources  
Joe Griffin, Program Coordinator: (515) 281-7017  
[www.iowadnr.com/water/stormwater/](http://www.iowadnr.com/water/stormwater/)

U.S. Environmental Protection Agency Stormwater Program  
[www.epa.gov/ebtpages/watestormwater.html](http://www.epa.gov/ebtpages/watestormwater.html)

Iowa Statewide Urban Design and Specifications (SUDAS)  
[www.iowasudas.org](http://www.iowasudas.org)

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### ***Iowa Stormwater Education Program***

The Iowa Stormwater Education Program provides educational resources and guidance to member communities about storm water management. Participating communities can then make information available to local stakeholders to make informed decisions on urban water quality policy and programs.

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