

Water Is Not a Pollutant

Jeff R. Bowman, MSPH, CHMM
Texas A&M Engineering Extension Service
September 17, 2013



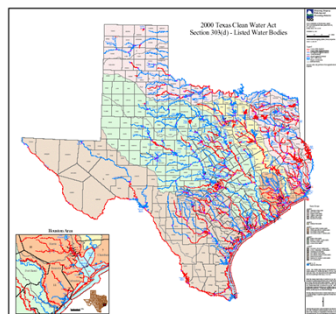
What is Stormwater Runoff?

- Texas Definition:
 - Rainfall runoff, snow melt runoff, and surface runoff and drainage.
- EPA Definition:
 - Storm water runoff is generated when precipitation from rain and snowmelt events flows over land or impervious surfaces and does not percolate into the ground. As the runoff flows over the land or impervious surfaces (paved streets, parking lots, and building rooftops), it accumulates debris, chemicals, **sediment** or other pollutants that could adversely affect water quality if the runoff is discharged untreated.

Source: TPDES General Permit TXR150000 and EPA: http://cfpub.epa.gov/npdes/home.cfm?program_id=6

Regulating Stormwater Runoff

- In 1987 Congress mandated the EPA, under amendments to the Clean Water Act [402(p)], control certain storm water discharges under an **NPDES** permit in an effort to achieve *water quality improvement* for the **Waters of the United States**.



Source: National Research Council: http://www.epa.gov/npdes/pubs/nrc_stormwaterreport.pdf

Key Terms

Waters of the United States

- **Waters of the United States** means:
 - All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
 - All *interstate* waters including interstate wetlands;
 - All other *intrastate* waters which could be used for interstate recreation, fishing, or commerce;
 - Tributaries & impoundments of water
 - The *territorial sea*;
 - *Wetlands* adjacent to waters (other than waters that are themselves wetlands)

40 CFR 230.3(s)

Key
Terms

NPDES

- The National Pollutant Discharge Elimination System (NPDES) program under the Clean Water Act is the primary federal vehicle to regulate the quality of the nation's waterbodies.
- The NPDES program was initially developed to reduce pollutants from industrial process wastewater and municipal sewage discharges.

Source: National Research Council: http://www.epa.gov/npdes/pubs/nrc_stormwaterreport.pdf

Key
Terms

NPDES

- These industries were known to be responsible for poor, often drastically degraded conditions, in receiving waterbodies.



Source: National Research Council: http://www.epa.gov/npdes/pubs/nrc_stormwaterreport.pdf

Key
Terms

NPDES

- They were easily regulated because they emanated from identifiable locations, such as pipe outfalls called a *point source*.



Source: National Research Council: http://www.epa.gov/npdes/pubs/nrc_stormwaterreport.pdf

Key
Terms

Point Sources

- **Point Sources** means any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged.

MS4s

Regulating Stormwater

- Requirements for municipal separate storm sewer systems (MS4) and industrial activities including construction came about in two phases:
 - Phase I (1990)
 - MS4s for populations >100,000.
 - Industrial Activities by SIC code
 - Construction Activities >= 5 acres
 - Phase II (1999)
 - Small MS4s for urbanized populations <100,000
 - Small Construction Activities >1 acre and <5 acres

Source: National Research Council: http://www.epa.gov/npdes/pubs/nrc_stormwaterreport.pdf

Permits

Stormwater Permits

- Permits generally apply to the areas that meet the regulatory definition of an MS4, industrial facility, and construction activity.
- A regulated area (e.g., the infrastructure boundary of an MS4) can differ from the jurisdictional boundary of the regulated entity (e.g., a municipality's jurisdictional boundary).

Permits

Stormwater Permits

- The Clean Water Act (CWA) requires NPDES permits to contain technology-based effluent limits and water quality-based effluent limits (WQBELs) when the technology-based limits alone do not adequately protect water quality.
- Permits for MS4s require controls to reduce the discharge of pollutants to the maximum extent practicable (MEP) to protect water quality.
- Stormwater permits require implementation of BMPs, identified as narrative effluent limits, deemed by the permitting authority to be appropriate to meet the intent of the CWA.

TMDLs to Stormwater Permits Handbook

Permits

Stormwater Permits

- Operators of MS4s develop and implement Stormwater Management Plans (**SWMPs**) that cover a variety of activities discharging to the MS4,
- Operators of industrial facilities and construction activities must develop and implement facility-specific stormwater pollution prevention plans (**SWPPPs**).

TMDLs to Stormwater Permits Handbook

Impaired Waters

Impaired Waters

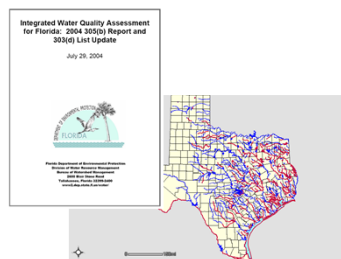
- Thousands of impaired waterbodies require total maximum daily loads (TMDLs) for pollutants, such as pathogens, nutrients, sediments, and metals – pollutants commonly associated with urban stormwater discharges.



Key Terms

Impaired Waters

- A surface water body is considered impaired if it does not meet the criteria for support of one or more of its **beneficial uses**:
 - Aquatic life use
 - Contact recreation
 - Public Water Supply
 - Fish Consumption/Oyster Waters



TMDLs

TMDL Implementation Plan

- Section 303(d) of the CWA requires states, territories, and authorized tribes to identify and establish a priority ranking for waters for which technology-based effluent limitations required by section 301 are not stringent enough to implement applicable water quality standards.
- They are also required to establish **TMDLs** for the pollutants causing impairment in those waters, and periodically submit to the EPA the list of waters in which water quality standards are not attained or maintained and for which TMDLs are required.

TMDLs

Total Maximum Daily Load

- **TMDL** – Determines the maximum amount (load) of a pollutant that a water body can receive and still maintain uses, and allocates this load to sources in the watershed.

Texas Commission on Environmental Quality
Total Maximum Daily Load Program

Improving Water Quality in the Houston Area


Thirteen TMDLs for Dioxin

Water Quality in the Houston Ship Channel and Upper Galveston Bay
The state of Texas currently receives water quality information from the Houston Ship Channel and Upper Galveston Bay. The water quality information is used to assess and monitor the health of the water body and to ensure that the water body is suitable for all of these uses. The water body is currently receiving water quality information from the Houston Ship Channel and Upper Galveston Bay. The water quality information is used to assess and monitor the health of the water body and to ensure that the water body is suitable for all of these uses.

Fishing is not supported in the area as a result of a drinking water consumption advisory for dioxin and dioxin-like PCBs issued by the Texas Department of Health. The advisory was issued to protect consumers from adverse health effects caused by dioxin found in specimens analyzed from the area. Dioxin is a generic term for a wide of toxic and environmentally persistent compounds.

In response to these conditions, a total maximum daily load (TMDL) project has been initiated to determine the maximum amount of dioxin that can be discharged to the Houston Ship Channel and Upper Galveston Bay. The goal of a TMDL is to determine the amount (or load) of a pollutant that a body of water can receive and still support its designated uses. The allowable load is then allocated among all the potential sources of pollution within the watershed, and measures to reduce pollutant loads are developed as necessary.

Learn more about water quality standards and TMDLs by visiting www.tceq.texas.gov.



The dioxin TMDL project also includes three designated segments not considered part of the Houston Ship Channel System:

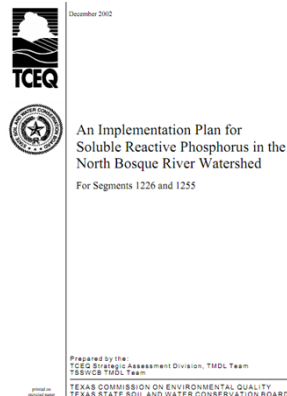
- Cedar Bayou Total (Segment 0901), Upper Galveston Bay (Segment 0421) and Bayport Channel (Segment 2438).

The Houston Ship Channel System is located in the San Jacinto River Basin, the westernmost estuary.

TMDLs

TMDL Implementation Plan

- **TMDL Implementation Plan**
 - A detailed description of the regulatory and voluntary management measures necessary to achieve the pollutant reductions identified in a TMDL.

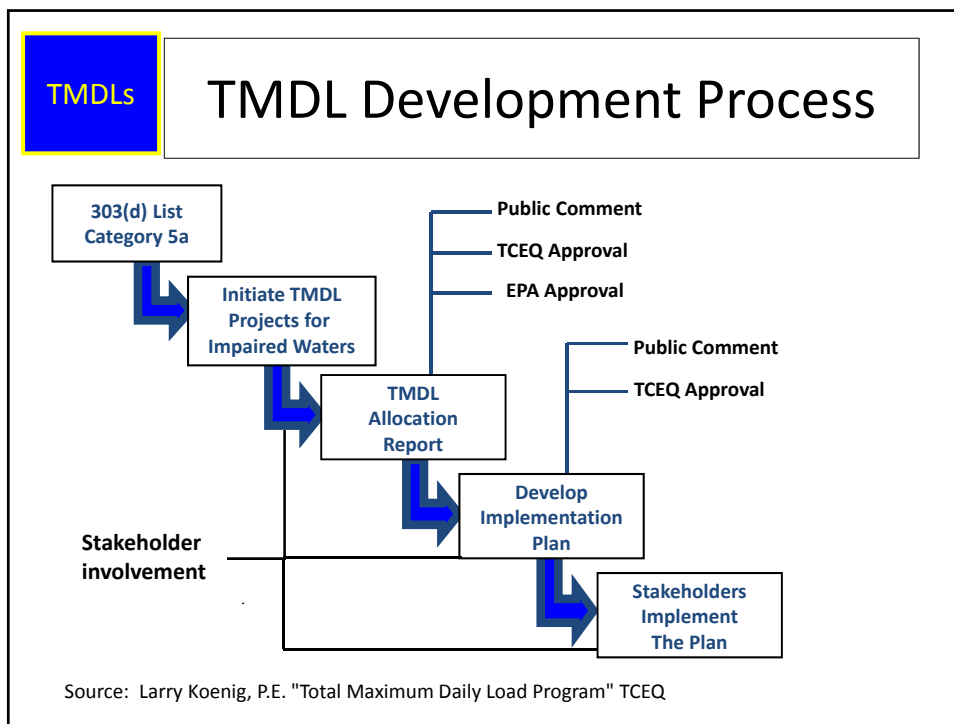


TMDLs

What Is a TMDL?

- A TMDL is *a scientific analysis* (often based on a computer simulation model) that:
 - determines the **maximum** amount (or load) of a particular pollutant that a water body can receive and attain and maintain its standards
 - “allocates” this allowable load to point and nonpoint sources of pollution in the watershed
$$\text{TMDL} = \text{WLA} + \text{LA} + \text{MOS}$$
- A TMDL is also *a document* submitted to the EPA. It identifies the pollutant of concern and its sources, and allocates the allowable load.

Source: Larry Koenig, P.E. "Total Maximum Daily Load Program" TCEQ



Sediment

Sediment TMDLs

United States
Environmental
Protection Agency

Office of Water
4503 F
Washington DC 20460

EPA 841-B-99-004
October 1999

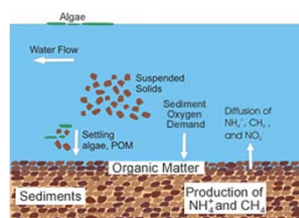
Protocol for Developing Sediment TMDLs

First Edition

Sediment

Sediment TMDLs

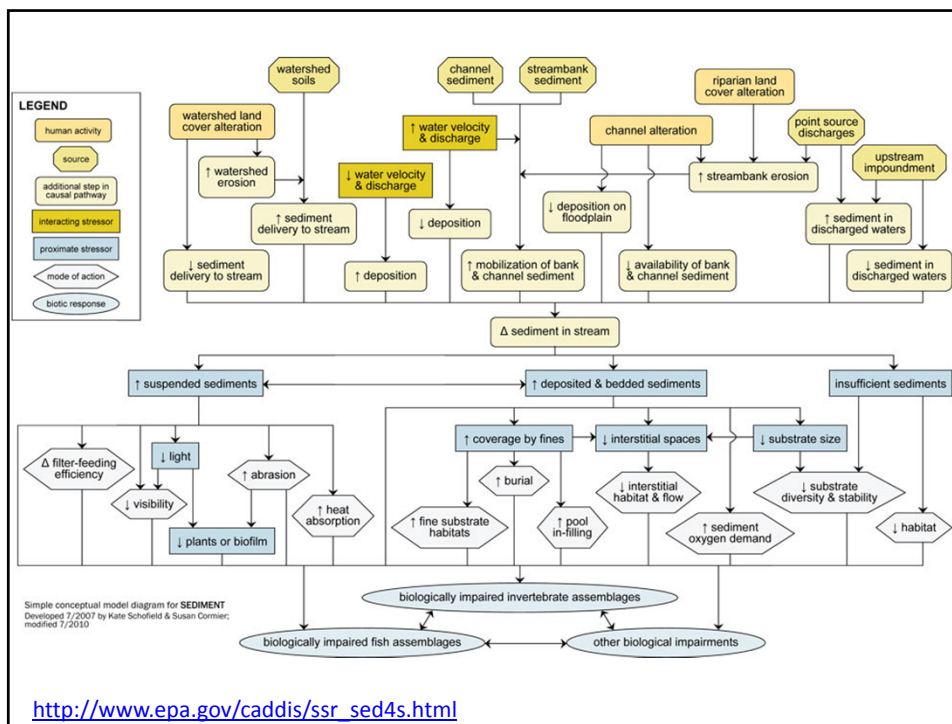
- Unlike many chemical pollutants, sediment is a vital natural component of water bodies and the uses they support.
- However, sediments can impair designated uses in many ways.



Sediment

Sediment TMDLs

- Excessive sediments and insufficient sediments both can adversely affect aquatic biota and lead to biological impairment.
- Although sediments are a natural component of stream ecosystems, human activities have greatly altered sediment budgets (i.e., the supply, movement and retention of mineral and organic particles of all sizes) in many watersheds.
- When the volume, discharge, and pattern of water movement are altered, increased force of moving water transports sediments; when the force lessens, sediments are deposited..



Sediment

Sediment TMDLs

- The traditional approach to TMDL formulation is to identify the total capacity of a waterbody for loading of a specific pollutant while meeting *water quality standards*.
- This loading capacity is not to be exceeded by the *sum* of pollutant loads *allocated* to individual point sources, nonpoint sources, and natural background.
- TMDLs are often expressed in terms of *maximum allowable mass load per unit of time*.

Sediment

Sediment TMDLs

- Alternative approaches to sediment TMDL analysis may be appropriate.
 - Often difficult or impossible to relate sediment mass loading levels to designated or existing use impacts or to source contributions.
 - Analytical connections can be difficult to make:
 - Sediment yields vary radically not only within a watershed, but across the country, making it difficult to derive meaningful “average” sediment conditions.
 - Sediments are a natural part of all waterbody environments, and it can be difficult to determine whether too much or too little mass loading is expected to occur in the future and how sediment loads compare to natural or background conditions.
 - A significant level of *uncertainty* is associated with sediment delivery, storage, and transport estimates.

Sediment

Sediment TMDLs

- The alternative measures for sediment TMDLs can take several forms, including the following:
 - Expression of numeric targets in terms of substrate or channel condition, aquatic biological indicators, or hillslope indicators
 - Expression of numeric targets and source allocations in terms of time steps different from daily loadings and as functions of other watershed processes such as precipitation or runoff.
 - Expression of allocations in terms other than loads or load reductions (e.g., *specific actions shown to be adequate to result in attainment of TMDL numeric targets and water quality standards*).

TMDLs
&
Stormwater

TMDLs and Storm Water



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

NOV 12 2010

MEMORANDUM

SUBJECT: Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Waste load Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs"

FROM: James A. Hanlon, Director
Office of Wastewater Management
Denise Keelner, Director
Office of Wetlands, Oceans and Watersheds

TO: Water Management Division Directors
Regions 1 - 10

This memorandum updates aspects of EPA's November 22, 2002 memorandum from Robert H. Wayland, III, Director of the Office of Wetlands, Oceans and Watersheds, and James A. Hanlon, Director of the Office of Wastewater Management, on the subject of "Establishing Total Maximum Daily Load (TMDL) Waste load Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs" (hereafter "2002 memorandum").

Background

Section III of the 2002 memorandum "affirm[ed] the appropriateness of an iterative, adaptive management best management practices (BMP) approach" for improving stormwater management over time as permitting agencies, the regulated community, and other involved stakeholders gain more experience and knowledge. Since 2002, States and EPA have obtained considerable experience in developing TMDLs and WLAs that address stormwater sources. The technical capacity to monitor stormwater and its impacts on water quality has increased. In many areas, monitoring of the impacts of stormwater on water quality has become more sophisticated and widespread. Better information on the effectiveness of stormwater controls to reduce pollutant loadings and address water quality impairments is now available. In many parts of the country, permitting agencies have issued several rounds of permits for Phase I municipal separate storm sewer systems (MS4s), Phase II MS4s, and stormwater discharges associated with industrial activity, including stormwater from construction activities. Notwithstanding these developments, stormwater discharges remain a significant cause of water quality

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TMDLs
&
Stormwater

TMDLs and Storm Water

- On November 12, 2010, the Environmental Protection Agency (EPA) issued a memorandum entitled:
 - "Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Waste load Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs"

TMDLs and Storm Water

- A key issue addressed in the 2010 memorandum is the feasibility of including numeric effluent limitations in NPDES permits for storm water discharges.
- EPA has found that the use of numeric effluent limitations no longer is a novel or unique approach to storm water permitting.
- Therefore, numeric effluent limitations are no longer as rare as they were in 2002.

TMDLs and Storm Water

- Some are concerned that the 2010 memo can be read as:
 - Advising NPDES permit authorities to impose end-of-pipe limitations on each individual outfall in a municipal separate storm sewer system.



TMDLs
&
Stormwater

TMDLs and Storm Water

- EPA **does not** anticipate that end-of-pipe effluent limitations on each municipal separate storm sewer system outfall will be used frequently.

TMDLs
&
Stormwater

TMDLs and Storm Water

- The memorandum expressly describes **numeric** limitations in broad terms, including:
 - “numeric parameters acting as surrogates for pollutants such as storm water flow volume or percentage or amount of impervious cover.”



TMDLs
&
Stormwater

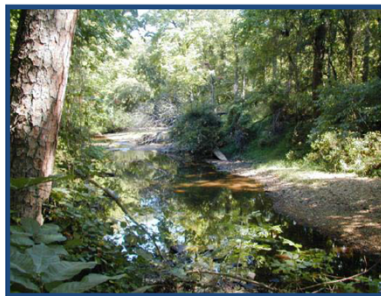
TMDLs and Storm Water

- The term “numeric effluent limitation” should be viewed as a significantly broader term than just end-of-pipe limitations, and could include:
 - limitations expressed as pollutant reduction levels for parameters that are applied system-wide rather than to individual discharge locations
 - expressed as requirements to meet performance standards for surrogate parameters or for specific pollutant parameters, or
 - could be expressed as in-stream targets for specific pollutant parameters.
- Under this approach, NPDES authorities have significant flexibility to establish numeric effluent limitations in storm water permits

TMDL for Benthic Impairments in the Accotink Creek Watershed

Fairfax County, City of Fairfax and Town of Vienna, Virginia

Established by the United States Environmental Protection Agency, Region III



/Signed/
Jon Capacasa
Director,
Water Protection Division

April 18, 2011
Date

Accotink
Creek

The Accotink Creek watershed in Northern Virginia

- EPA has proposed to cure the benthic impairment in Accotink Creek predominantly through a limitation on the amount of water it will allow to flow into the creek, using the Municipal Separate Storm Sewer System (MS4) permit program as the means to limit flow.

<http://www.epa.gov/quality/informationguidelines/documents/10009.pdf>

Accotink
Creek

The Accotink Creek watershed in Northern Virginia

- Following its establishment, Virginia is required to incorporate this TMDL into Virginia's Water Quality Management Plan.
- As you know, all new or revised National Pollutant Discharge Elimination System permits must be consistent with the TMDL wasteload allocations...



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1600 Arch Street
Philadelphia, Pennsylvania 19103-2029

4/18/2011

Ellen Gilinsky, Ph.D., Director
Division of Water Quality Programs
Virginia Department of Environmental Quality
629 E. Main Street
P.O. Box 1100
Richmond, Virginia 23218

Dear Dr. Gilinsky:

The U.S. Environmental Protection Agency (EPA), Region III, has developed a Total Maximum Daily Load (TMDL) to address aquatic life use impairments in the Accotink Creek Watershed. The report, *TMDL for Benthic Impairments in the Accotink Creek Watershed, Fairfax County, City of Fairfax and Town of Vienna, Virginia*, was established in accordance with Section 303(d)(1)(c) and (2) of the Clean Water Act to address impairments of water quality as identified on Virginia's Section 303(d) List.

In accordance with Federal regulations at 40 CFR §130.7, a TMDL must comply with the following requirements: (1) be designed to attain and maintain the applicable water quality standards; (2) include a total allowable loading and an appropriate wasteload allocation for point sources and load allocations for nonpoint sources; (3) consider the impacts of background pollutant contributions; (4) take critical stream conditions into account (the conditions when water quality is most likely to be violated); (5) consider seasonal variations; (6) include a margin of safety (which accounts for uncertainties in the relationship between pollutant loads and stream water quality); and (7) be subject to public participation. In addition, this TMDL considered reasonable assurance that the TMDL allocations assigned to nonpoint sources can be reasonably met. The TMDL for the Accotink Creek Watershed satisfies each of these requirements. Copies of EPA's TMDL report and response to comments document are enclosed with this letter.

Following its establishment, Virginia is required to incorporate this TMDL into Virginia's Water Quality Management Plan pursuant to 40 CFR §130.7(d)(2). As you know, all new or revised National Pollutant Discharge Elimination System permits must be consistent with the TMDL wasteload allocations pursuant to 40 CFR §122.44 (d)(1)(vii)(B). Please submit all such permits to EPA for review as per EPA's letter dated October 1, 1998.

<http://www.epa.gov/quality/informationguidelines/documents/10009.pdf>

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VDOT, Fairfax County Sue EPA Over Accotink Creek Restrictions

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The Virginia Department of Transportation (VDOT) and the Fairfax County Board of Supervisors today sued the United States Environmental Protection Agency (EPA) seeking relief from restrictions EPA seeks to impose on the flow of water in the Accotink Creek watershed, restrictions that the state and county say exceed the federal agency's legal authority under the Clean Water Act (CWA) and divert public funds that could be spent more effectively on stream restoration for Accotink Creek and other waterways in the region.



Accotink Creek watershed

The complaint, filed in the U.S. District Court in Alexandria, challenges a "massive expansion" of EPA's regulatory power. "EPA literally is treating water itself—the very substance the Clean Water Act was created to protect—as a pollutant," the complaint notes.

At issue is the EPA's authority to establish Total Maximum Daily Load (TMDL) restoration plans with maximum acceptable levels of "pollutant" discharges to meet water quality standards to EPA's recently claimed authority to control the quantity or flow of water itself.

"Rather than establish a TMDL for one of the pollutants in Accotink Creek, such as sediment, EPA chose to issue a TMDL for a surrogate, the flow of water."

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF VIRGINIA
ALEXANDRIA DIVISION

VIRGINIA DEPARTMENT OF
TRANSPORTATION
1401 E. Broad St.
Richmond, VA 23219, and

BOARD OF SUPERVISORS,
FAIRFAX COUNTY, VIRGINIA
12000 Government Center Pkwy.
Fairfax, VA 22035

Plaintiffs,

v.

UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY, and
LISA P. JACKSON, ADMINISTRATOR
1200 Pennsylvania Ave., N.W.
Washington, DC 20460, and

UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY REGION III, and
SHAWN M. GARVIN, REGIONAL
ADMINISTRATOR
1630 Arch St.
Philadelphia, PA 19103

Defendants.

Civil Action No. _____

"Such a reduction in flow as demanded by EPA in a highly urbanized area cannot be achieved by VDOT through retrofitting existing storm water management structures due to functionally impervious soils, the presence of environmentally sensitive areas, and the public safety needs of maintaining the structural integrity of building foundations, roadways, bridge abutments, and retaining walls."

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF VIRGINIA
ALEXANDRIA DIVISION

VIRGINIA DEPARTMENT OF
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1401 E. Broad St.
Richmond, VA 23219, and
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Washington, DC 20460, and
UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY REGION III, and
SHAWN M. GARVIN, REGIONAL
ADMINISTRATOR
1650 Arch St.
Philadelphia, PA 19103
Defendants.

Civil Action No. _____

“Consequently, efforts to achieve such a reduction in storm water flow as demanded by EPA would require significant public takings of private property in order to build numerous new storm water management structures.”

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ALEXANDRIA DIVISION

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1650 Arch St.
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Defendants.

Civil Action No. _____


“In addition, since much of the storm water flow from VDOT property into Accotink Creek originates from adjacent properties, EPA is effectively forcing VDOT to regulate runoff from property that it neither owns nor controls.”

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Virginia wins legal victory against EPA overreach on water runoff

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The Court agreed and issued a finding that “Storm water runoff is not a pollutant, so EPA is not authorized to regulate it.”

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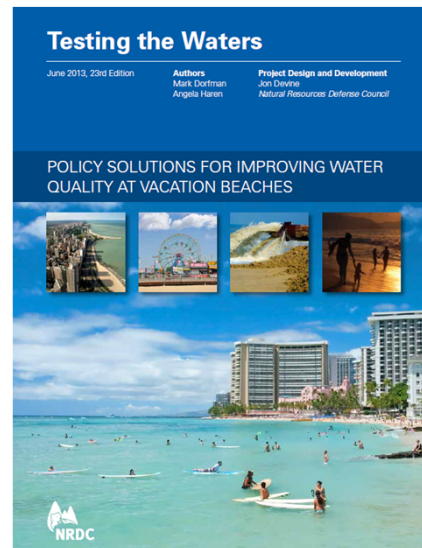
Yesterday, a Federal District Court in Alexandria, Va., found that the U.S. Environmental Protection Agency (EPA) had exceeded its authority in an effort to enforce the Clean Water Act.

The future?

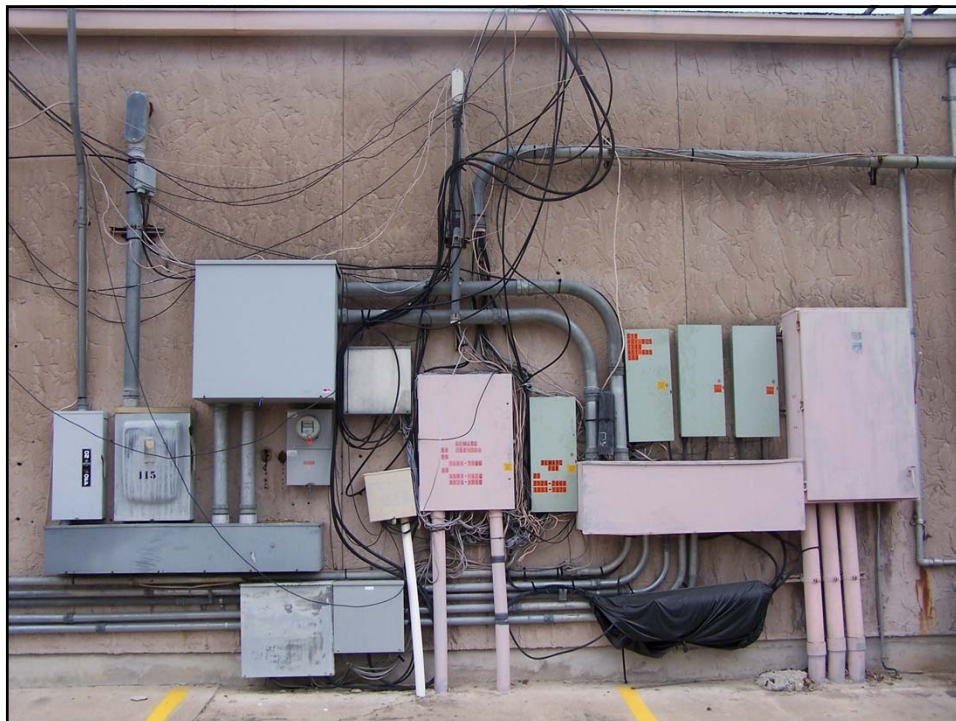
- According to the Court:
 - The language of § 1313(d)(1)(C) is clear. The Clean Water Act (CWA) authorizes EPA “to set TMDLs to regulate pollutants, and pollutants are carefully defined.” Because storm water runoff is not a pollutant, EPA is not authorized to regulate it via TMDL.”
- If they can’t have a **surrogate**, they will have to limit the pollutant – *which sediment is* – another way.
- That “end of pipe monitoring” that they said they do not anticipate...

Time will tell...

*Historically, the permitting process for stormwater systems has done a poor job of ensuring that discharges from those systems will not contribute to degraded water quality. In particular, municipal sewer systems and private developers frequently **have not** been required to meet **quantitative limits** on stormwater runoff volumes and associated pollution levels from sites undergoing development or redevelopment...*



<http://www.nrdc.org/water/oceans/ttw/action-plan.asp>



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Sources

TCEQ TMDL Program Website:

www.tceq.state.tx.us/implementation/water/tmdl/

Larry Koenig lkoenig@tceq.state.tx.us (512) 239-4533

http://www.google.com/imgres?imgurl=http://www.tn.gov/environment/wpc/images/storm_water.jpg&imgrefurl=http://www.tn.gov/environment/wpc/stormh2o/&usq=_K9hkg_atEvgi7322iRlIuvCr_ROQ=&h=236&w=300&sz=30&hl=en&start=0&sig2=e85C0nRiAeYcQgV2faM1jw&zoom=1&tbnid=mF8B9N_oPvd47M:&tbnh=149&tbnw=178&ei=Je1TZurA4mGtwfE3lHqDg&prev=/images%3Fq%3Dsediment%2Bimpact%2Bwater%2BEPA%26h%3Den%26biw%3D1280%26bih%3D939%26gbv%3D2%26tbn%3Ddisc&itbs=1&iact=hc&vpx=833&vpy=103&dur=1692&hovh=188&hovw=240&tx=129&ty=102&page=1&ndsp=27&ved=1t:429,r:4,s:0

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