



EPA841-R-10-002
May 12, 2010

Guidance for Federal Land Management in the Chesapeake Bay Watershed

Chapter 1. Introduction

Nonpoint Source Pollution
Office of Wetlands, Oceans, and Watersheds
U.S. Environmental Protection Agency

Chapter 1.

Introduction

1 Background

On May 12, 2009, President Barack Obama signed Executive Order 13508, which recognizes the Chesapeake Bay as a national treasure and calls on the federal government to lead a renewed effort to restore and protect the nation's largest estuary and its watershed. In the Executive Order, the President states that despite significant efforts by federal, state, and local governments and other interested parties, water pollution in the Chesapeake Bay prevents the attainment of existing state water quality standards and the *fishable and swimmable* goals of the Clean Water Act. The President further notes that at the current level and scope of pollution control within the Chesapeake Bay's watershed, restoration of the Chesapeake Bay is not expected for many years. Nutrients (forms of both nitrogen and phosphorus) and sediment delivered from the Chesapeake Bay watershed are the pollutants largely responsible for the continued degradation and restoration complexities of the Chesapeake Bay.

The Executive Order expresses the great challenge facing our renewed efforts to restore the health of the Chesapeake Bay,

Restoration of the health of the Chesapeake Bay will require a renewed commitment to controlling pollution from all sources as well as protecting and restoring habitat and living resources, conserving lands, and improving management of natural resources, all of which contribute to improved water quality and ecosystem health.

To meet that challenge, the Executive Order lays out a series of steps. One of the first key steps requires the federal agencies to define the "*next generation* of tools and actions to restore water quality in the Chesapeake Bay and describe the changes to be made to regulations, programs, and policies to implement these actions." The Executive Order assigns the lead responsibility to the U.S. Environmental Protection Agency (EPA), and the federal government published the final report on November 24, 2009. The report is at <http://executiveorder.chesapeakebay.net> (President Barack Obama 2009).

Another key step in the Executive Order is for EPA to publish this guidance document. Section 502 of the Executive Order states,

The Administrator of the EPA shall, within 1 year of the date of this order and after consulting with the Committee and providing for public review and comment, publish guidance for Federal land management in the Chesapeake Bay watershed describing proven, cost-effective tools and practices that reduce water pollution, including practices that are available for use by Federal agencies.

2 Purpose of This Document

This document provides information and data on land management practices for federal agencies with land, facilities, or installation management responsibilities affecting 10 or more acres within the watershed of the Chesapeake Bay to contribute toward the restoration of the Chesapeake Bay and its watershed. The ultimate goal of the Executive Order—to restore the health of the Chesapeake Bay—is very high. Yet, as the Executive Order states, the Chesapeake Bay is, “one of the largest and most biologically productive estuaries in the world.” It is certainly deserving of the ambitious effort laid out in the Executive Order.

However, we cannot underestimate the challenge. In particular, abating nonpoint source¹ pollution, which is the focus of this document, presents a huge challenge to the recovery of the Bay. Unless we adequately address the vast majority of nonpoint source pollution, the Chesapeake Bay will not be restored. Consider the following:

- Almost half of all the nitrogen and phosphorus pollution delivered to the Chesapeake Bay derive from agricultural sources, from both livestock production and row crop land.
- In addition to contributing 31 percent of phosphorus loads and 11 percent of nitrogen loads to the Bay, urban runoff and stormwater sources compose the only significant pollutant source category that is increasing in the Bay watershed.
- River basins with the highest percentage of agricultural lands yield the highest overall amount of sediment each year, while basins with the highest percentage of forest cover yield the lowest amount of sediment.

¹ This document uses the term *nonpoint source* broadly, as EPA has in the past, to refer to sources that are treated as nonpoint sources in EPA’s implementation of section 319 of the Clean Water Act. Some of those sources may legally be made subject to regulation as point sources under section 402(p) of the Clean Water Act. EPA has designated several categories of those stormwater sources for regulation, such as small municipal separate storm sewer systems, and may designate others for regulation in the future.

- On a per-acre basis, construction sites can contribute the most sediment of all land uses—as much as 10 to 20 times that of agricultural lands.
- A large percentage of riparian buffers in the Chesapeake Bay have been lost or degraded. While the Chesapeake Bay Commission set a goal in 2004 to achieve buffer along 70 percent of riparian lands, the percentage currently stands at 60 percent.

For those and other reasons, it is critically important that we achieve, at a minimum, the nonpoint source implementation measures set forth in this document for the various land management categories. The implementation measures are designed to promote the use of the best, cost-effective and reasonable practices available to achieve the Executive Order's broad and ambitious goals for the Chesapeake Bay. In turn, the practices and actions described and recommended in this document are those that are indicated by the current, state-of-the-art scientific and technical literature to be the most effective and cost-effective in achieving the Chesapeake Bay goals. Thus, the information presented in this document will enable practitioners to design and implement on-the-ground solutions that collectively will move the entire watershed toward achieving the goals.

Note: This document provides guidance regarding practices that may be used to reduce nonpoint source pollution in the Chesapeake Bay and other waterbodies. At times, this document refers to statutory and regulatory provisions that contain legally binding requirements. This document does not substitute for those provisions or regulations, nor is it a regulation itself. Thus, it does not impose legally binding requirements on EPA, other federal agencies, or any other entity and might not apply to a particular situation according to the circumstances. EPA, other federal agencies and any other user of this document retain the discretion to adopt approaches to control nonpoint source pollution that differ from this guidance where appropriate. EPA may change this guidance in the future.

3 Scope

As required by Section 502 of the Executive Order, this document (1) provides guidance for federal land management in the Chesapeake Bay and (2) describes proven, cost-effective tools and practices that reduce water pollution, including practices that are available for use by federal agencies. Federal agencies in the Chesapeake Bay watershed will find this guidance useful in managing their lands, ranging from the development and redevelopment of federal facilities to managing agricultural, forested, riparian, and other land areas the federal government owns or manages.

At the same time, the great majority of land in the Chesapeake Bay watershed is nonfederal land that private landowners, states, and local governments manage. Indeed, the vast majority of actions to restore the Chesapeake Bay will need to take place on nonfederal lands, and nonfederal actors will be implementing them. From the perspective of land management and water quality restoration/protection, the same set of “proven cost-effective tools and practices that reduce water pollution” are appropriate for both federal and nonfederal land managers to restore and protect the Chesapeake Bay.

Therefore, states and others (e.g., states, local governments, conservation districts, watershed groups, developers, farmers and other citizens in the Chesapeake Bay watershed) may choose to use this guidance document to the extent that they find it relevant and useful to their needs. The document presents practices and actions that are not unique to federal lands and thus will often be applicable to lands that are managed by nonfederal land managers. Thus, while this document has been written specifically to address the needs of federal land managers, other parties may also find it to provide a useful guide to implementing the most effective and cost-effective practices available to restore and protect the Chesapeake Bay.

In addition, many of the nutrient and sediment sources in the Chesapeake Bay watershed are similar to sources in other watersheds around the country. Many of the practices needed to protect and restore the Bay are the same as or very similar to those used in other large-scale, multistate watersheds in the country. Indeed, while great efforts have been made in preparing this document to assure the consideration of all relevant data on the Chesapeake Bay watershed, data from outside the Bay watershed have also been used when deemed relevant and applicable to the Bay. For that reason, much of the information provided in this document is relevant to other areas of the United States. Therefore, practitioners outside the watershed may wish consider this guidance document as they develop and implement their own watershed plans and strategies to address nutrient and sediment pollution from nonpoint sources.

This document provides information pertaining to all the major categories and subcategories of nonpoint source pollution that are relevant to the Chesapeake Bay. Those categories include agriculture, urban and suburban development, hydromodification, decentralized wastewater treatment, forestry, and riparian streamside areas.

Each chapter describes the problem presented by the relevant nonpoint source category or subcategory of activity and its relevance to the Chesapeake Bay’s recovery. Each chapter states the key goals that readers should strive to achieve to attain the ambitious overall goals for the Chesapeake Bay set forth in the Executive Order. The goals are accompanied by information and data on the cost-effective tools and practices that practitioners can employ to help achieve the goals. It also provides available effectiveness data and cost data.

4 Relationship to Previous Documents

EPA has produced a considerable amount of technical information regarding the effectiveness and costs of various measures and practices to address nonpoint source pollution in the past. In 1993, as required by section 6217 of the Coastal Zone Act Amendments of 1990, EPA published the *Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters* (USEPA 1993), which contains chapters on agriculture, forestry, urban runoff, marinas and recreational boating, hydromodification, and wetlands and riparian areas (see <http://www.epa.gov/owow/nps/MMGI/>). Section 6217 defines *management measures* as, “economically achievable measures for the control of the addition of pollutants...which reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint pollution control practices, technologies, processes, siting criteria, operating methods, or other alternatives.” The 1993 guidance includes a set of management measures in each chapter and then provides information on available practices, their effectiveness, and their costs.

The National Management Measures volumes expand a chapter from the 1993 coastal guidance into an entire book series that contains national management measures patterned after the coastal guidance, complete with updated data (see <http://www.epa.gov/owow/nps/pubs.html>). All the practices and actions in the National Management Measures books are based on those established in the 1993 publication, but the newer publications provide updated information and addresses to some extent select newly emerging issues and practices. The six *National Management Measures* books are

- *National Management Measures for the Control of Nonpoint Pollution from Agriculture* (USEPA 2003)
- *National Management Measures to Control Nonpoint Sources of Pollution from Forestry* (USEPA 2005b)
- *National Management Measures to Protect and Restore Wetlands and Riparian Areas for the Abatement of Nonpoint Source Pollution* (USEPA 2005c)
- *National Management Measures to Control Nonpoint Source Pollution from Urban Areas* (USEPA 2005d)
- *Handbook for Managing Onsite and Clustered (Decentralized) Wastewater Treatment Systems* (USEPA 2005a)
- *National Management Measures to Control Nonpoint Source Pollution from Hydromodification* (USEPA 2007)

This guidance document builds on those two earlier efforts but also differs in significant ways. It focuses to a considerable extent on newer, more effective approaches to controlling some of the most significant aspects of nonpoint pollution in the Chesapeake Bay watershed. Most importantly, it responds to the imperative of implementing in the Chesapeake Bay watershed those “next generation tools and actions” that reflect, in the words of the Executive Order, “a renewed commitment to controlling pollution from all sources as well as protecting and restoring habitat and living resources, conserving lands, and improving management of natural resources, all of which contribute to improved water quality and ecosystem health.”

5 Some Topics Receive New or Special Emphasis

The key areas in which this document focuses on next-generation tools and actions that go beyond the previous nonpoint source guidance documents are the following:

1. Nutrient Management. This document focuses specifically on significantly expanding on practices and actions that control the delivery of nutrients and sediment from agriculture by employing a whole-farm nutrient management planning approach from source control and avoidance, in-field control, and edge-of-field trapping and treatment. The practices and actions presented here build from the most recent, state-of-the-art literature in nutrient management planning and provide information on achieving reduced nutrient losses from both livestock production on animal feeding operations and row crop agricultural lands.

2. Control of Urban Runoff and Stormwater. In this document, EPA recognizes and emphasizes that hydrology is the principal driver of water quality impairments in developed and developing areas. From that understanding, EPA establishes in this document a primary focus on the goal of maintaining and restoring predevelopment hydrology to the maximum extent technically feasible (METF). The guidance presents background information, data, examples, and resources that demonstrate how practitioners can achieve that goal by implementing low impact development (LID) and other green infrastructure techniques that infiltrate, evapotranspire, and use rainwater on-site.

3. Turf Management. At 3.8 million acres, the total cultivated area for turf makes it the number one crop grown in the Chesapeake Bay watershed. A significant portion of the turf is grown in a manner that includes high inputs of fertilizers. Thus, turf management practices can at present contribute a substantial amount of nutrient to the Chesapeake Bay. Therefore, this document includes implementation measures that can help reduce nutrient runoff from turf.

4. Decentralized Wastewater Treatment Systems. This document presents an increased emphasis on reducing nitrogen from decentralized systems, because of both the need to reduce

nutrient delivery to the Chesapeake Bay and the rapidly advancing state of the art. In addition, this document uses the term *decentralized systems* rather than *onsite systems*, reflecting the technical, feasibility, and management advantages of cluster treatment systems that treat effluent from multiple lots at nearby off-site locations.

6 Some Topics are Addressed by Reference to Existing Documents

Some nonpoint source practices remain important, but EPA has already adequately addressed them in previous management measures documents and in other published literature. In those cases, this document does not repetitively include details on those practices. (The six *National Management Measures* books total approximately 1,500 pages.) Instead, this document briefly acknowledges the issue or subject and then refers the reader to the appropriate existing documents.

7 References

President Barack Obama. 2009. *Executive Order 13508: Chesapeake Bay Protection and Restoration*. The White House, Office of the Press Secretary, Washington, DC. <<http://executiveorder.chesapeakebay.net>>. Accessed January 28, 2010.

USEPA (U.S. Environmental Protection Agency). 1993. *Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters*. EPA 840-B-92-002. U.S. Environmental Protection Agency, Washington, DC.

USEPA (U.S. Environmental Protection Agency). 2003. *National Management Measures to Control Nonpoint Pollution from Agriculture*. EPA 841-F-05-001. U.S. Environmental Protection Agency, Washington, DC.

USEPA (U.S. Environmental Protection Agency). 2005a. *Handbook for Managing Onsite and Clustered (Decentralized) Wastewater Treatment Systems*. EPA 832-B-05-001. Office of Wastewater Management. Washington, DC.

USEPA (U.S. Environmental Protection Agency). 2005b. *National Management Measures to Control Nonpoint Sources of Pollution from Forestry*. EPA 841-B-05-001. U.S. Environmental Protection Agency, Office of Water, Washington, DC.

USEPA (U.S. Environmental Protection Agency). 2005c. *National Management Measures to Protect and Restore Wetlands and Riparian Areas for the Abatement of Nonpoint Source Pollution*. EPA 841-B-05-003. U.S. Environmental Protection Agency, Office of Water, Washington, DC.

USEPA (U.S. Environmental Protection Agency). 2005d. *National Management Measures to Control Nonpoint Source Pollution from Urban Areas*. EPA 841-B-05-004. U.S. Environmental Protection Agency, Office of Water, Washington, DC.

USEPA (U.S. Environmental Protection Agency). 2007. *National Management Measures to Control Nonpoint Source Pollution from Hydromodification*. EPA 841-B-07-002. U.S. Environmental Protection Agency, Office of Water, Washington, DC.