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

MAR 11 1993

OFFICE OF
WATER

Dear Colleague:

I am pleased to transmit to you the final guidance documents which will be the basis for new state coastal nonpoint pollution control programs required by section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA). The first of these, "Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters" was developed by the United States Environmental Protection Agency (EPA) in consultation with NOAA and other federal agencies and will serve as the technical foundation for the coastal nonpoint programs. The companion document, "Coastal Nonpoint Pollution Control Programs: Program and Development and Approval Guidance", was developed jointly by NOAA and EPA and describes how states can develop state nonpoint pollution control programs to implement the technical guidance in conformity with section 6217.

In addition, we will shortly be able to provide to those who wish it, upon request and for a fee to cover reproduction costs, a set of computer disks containing the text of the technical guidance document in WordPerfect 5.1. The figures and tables are not in WordPerfect format, however, and will have to be reproduced in hardcopy form.

Publication of these guidance documents represents a major step forward in assisting coastal states, localities and landowners to restore and protect the quality of our nation's coastal waters. Prepared with extensive assistance from other federal agencies and states, as well as extensive consultation with trade associations, environmental groups, industry, and other interested parties, the technical guidance provides the most comprehensive discussion to date of nonpoint source pollution control management strategies and practices for selected categories of nonpoint sources. The program guidance provides a framework for the first time on a national scale to assist states to bring together authorities and capabilities within their coastal zone management and water pollution control agencies to address the pressing problem of coastal nonpoint source pollution.

If we can be of further assistance to you in your efforts to assist and support your constituents as they work with the states to develop and implement effective coastal nonpoint pollution control programs, please contact me at (202) 260-7166 or Dov Weitman of my staff at (202) 260-7100.

Geoffrey H. Grubbs
Director
Assessment and Watershed Protection Division

Coastal Nonpoint Pollution Guidance

January 1993 | U.S. Environmental Protection Agency, Office of Wetlands, Oceans and Watersheds
National Oceanic and Atmospheric Administration, Office of Ocean and Coastal Resource Management

PROGRAM GUIDANCE

What is the Purpose of the State Coastal Nonpoint Pollution Control Programs?

Section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA), requires that states with federally approved coastal zone management programs develop Coastal Nonpoint Pollution Control Programs to be approved by EPA and NOAA. These programs will for the first time bring together authorities and capabilities within state coastal zone management and water quality agencies to jointly address the problem of coastal nonpoint pollution. The purpose of the program is to implement management measures for nonpoint source pollution by more fully integrating federal, state and local authorities.

The state Coastal Nonpoint Programs represent an innovative approach to dealing with coastal nonpoint pollution because they build upon state and local authorities and expertise. They will employ an initial technology-based approach generally throughout the coastal management area, to be followed by a more stringent water quality-based approach where necessary to address known water quality problems.

How Serious is the Coastal Nonpoint Source Pollution Problem?

Water pollution, as evidenced by beach closures, prohibitions on harvesting shellfish, and the loss of biological productivity in coastal habitats, remains a serious problem for coastal areas. Based on states' assessment of 75% of estuarine waters, current best estimates are that 35% of these waters are impaired and 10% are threatened. Although great strides in controlling point sources of pollution have been made, nonpoint source pollution remains a major problem in many coastal areas. According to state water quality assessments, the leading nonpoint contributors to estuarine waters are urban runoff (including certain construction and development activities and onsite disposal systems) and agriculture. Other significant nonpoint contributors in some coastal watersheds include silviculture, marinas, and hydromodification. In addition, the loss and degradation of wetlands and riparian areas has adversely impacted coastal water quality.

What is the Objective of the Program Guidance?

The Program Development and Approval guidance, issued jointly by EPA and NOAA, provides a road map for states to develop coastal nonpoint programs in a timely, resource efficient manner. State programs are due to EPA and NOAA for approval in July 1995. If a program is not approvable, certain grants must be curtailed to the States beginning in Fiscal Year 1996.

A key component of the state programs will be the implementation of management measures to address sources of coastal nonpoint pollution. Thus, this program guidance should be used in conjunction with "Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters". The latter technical guidance, containing management measures developed by EPA in consultation with NOAA and other federal agencies, is summarized in a separate fact sheet.

Why is the Program Guidance Important?

The Program Guidance describes what must be contained in each state's coastal nonpoint program and how NOAA and EPA will review and approve the state programs. Many issues will have to be addressed by the states, including where the program will operate geographically, how management measures should be selected and implemented, and how the program should be coordinated with other state and local agencies and the public. The Program Guidance provides states with the framework to incorporate on-going state and local pro-

grams and to work within existing institutions in implementing their coastal nonpoint programs.

NOAA and EPA will continue to work with the states to help them develop approvable programs that also reflect local conditions. The Agencies are committed to assisting the states and others in meeting the goals of CZARA.

What is in the Program Guidance?

The program guidance identifies and explains statutory provisions that state coastal nonpoint programs must address in order to be approved by NOAA and EPA.

- State programs must include state and locally developed management measures which are in conformity with those specified in EPA's technical guidance. States will have some flexibility in adopting management measures. For example, states may adopt either the measures specified in EPA's guidance or alternative management measures to better meet local conditions. Alternative measures must be as effective as EPA's measures in controlling coastal nonpoint pollution.
- State management measures must be implemented within three years of program approval (i.e., January 1999). EPA and NOAA provide a two year monitoring period (to January 2001) for states to assess the effectiveness of the measures in achieving water quality standards.
- States then have an additional three years (until January 2004) to implement additional measures where necessary to attain or maintain water quality standards.
- States must ensure the implementation of management measures through the use of enforceable policies and mechanisms ranging from traditional regulatory activities to innovative incentive programs.
- States are expected to provide technical assistance to local governments and to the public and opportunities for public comment throughout the coastal nonpoint program development and implementation process.

EPA and NOAA are committed to the successful implementation of CZARA and will continue to provide programmatic and technical assistance to states, local governments and other interested parties.

Coastal Nonpoint Pollution Guidance

January 1993 | U.S. Environmental Protection Agency, Office of Wetlands, Oceans, and Watersheds

MANAGEMENT MEASURES GUIDANCE

What Is the Guidance?

Section 6217 of the Coastal Zone Reauthorization Amendments of 1990 (CZARA) requires that states with federally approved coastal zone management programs develop and implement Coastal Nonpoint Pollution Control Programs to ensure protection and restoration of coastal waters. State programs are to achieve this result by implementing (1) generally applicable management measures to protect coastal waters from nonpoint pollution and (2) additional, more stringent management measures developed by each state as necessary to attain and maintain applicable state water quality standards. In a guidance document entitled Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters and described in this fact sheet, the U.S. Environmental Protection Agency (EPA) has specified the first set of generally applicable management measures. Under certain circumstances, states may use alternative management measures if the alternative measures provide an equivalent level of protection and control. The process for developing coastal nonpoint programs and the content of such programs is described in a companion guidance document issued jointly by the National Oceanic and Atmospheric Administration (NOAA) and EPA, *Coastal Nonpoint Pollution Control Program: Development and Approval Guidance.*

What are Management Measures?

The management measures are economically achievable measures for the control of pollutants from existing and new categories and classes of nonpoint sources of pollution. The measures reflect the greatest degree of pollutant reduction achievable through the application of best available technology, siting criteria, operating methods, or alternatives. The measures typically consist of a combination of practices, also specified in the guidance. States may select from a wide range of practices or combinations of practices that will achieve the level of control specified in the management measure. The guidance also includes:

- A description of activities and locations for which each measure may be suitable;
- An identification of pollutants that may be controlled by the measures and the water quality effects of the measures;
- A description of factors that should be taken into account in adapting the measures to specific sites and locations;
- Any necessary monitoring techniques to assess the effects of the measures in reducing pollutant loads and improving water quality.

How Serious Is the Nonpoint Source Pollution Problem?

Water pollution, as evidenced by beach closures, prohibitions on harvesting shellfish, and the loss of biological productivity in coastal habitats, remains a serious problem for coastal areas. Based on states' assessment of 75% of estuarine waters, current best estimates are that 35% of these waters are impaired and 10% are threatened. Although great strides in controlling point sources of pollution have been made, nonpoint source pollution remains a major problem in many coastal areas. According to state water quality assessments, the leading nonpoint contributors to estuarine waters are urban runoff (including certain construction and development activities and onsite disposal systems) and agriculture. Other significant nonpoint contributors in some coastal watersheds include silviculture, marinas, and hydromodification. In addition, the loss and degradation of wetlands and riparian areas has adversely impacted coastal water quality.

Who Developed the Guidance?

To address the broad requirements of the law and to draw on technical expertise outside the Agency, EPA convened workgroups for each of the five major pollutant

source group categories (Agriculture, Forestry, Urban, Marinas and Recreational Boating, and Hydromodification). Each of these groups held several meetings to develop the guidance and to refine it in response to extensive public comment on draft guidance published in June 1991. Workgroup members included representatives of EPA, NOAA, the U.S. Department of Agriculture (Soil Conservation Service, Extension Service, and Forest Service), the U.S. Fish and Wildlife Service, and several other federal agencies, as well as experts from state water quality and coastal zone management agencies.

What Is in the Guidance?

The guidance identifies the management measures specified for five major categories of nonpoint pollution: Agriculture, Forestry, Urban, Marinas and Recreational Boating, and Hydromodification.

The measures are described in terms of management systems rather than individual practices. Many of these systems include actions that reduce the generation of pollutants—a pollution prevention approach—as well as actions to keep the pollutant from reaching surface or ground waters. This approach is analogous to the use of treatment "trains" or a series of treatment steps used in most point source waste treatment systems.

- The measures reflect the greatest degree of pollutant reduction that is economically achievable. These measures serve as a benchmark for the development of other approaches that provide equivalent or better pollutant reduction.
- The measures focus first on pollution prevention activities such as carefully planning the application of nutrients and pesticides and minimizing soil erosion. These types of measures are often the most cost-effective. The measures often specify pollution delivery reduction measures, which intercept pollutants leaving the source by capturing the runoff or infiltrate.
- Whenever appropriate, the measures include consideration of nonpoint pollution of both ground water and surface water because of their interaction in the hydrologic cycle. In coastal areas, nonpoint sources which may contribute to groundwater contamination are of special concern because of the role ground water often plays in recharging coastal waters.

In addition to "measures," the guidance also describes "practices," which are illustrative of more specific approaches that can be taken to implement the more broadly described measures.

How Will the Guidance Be Implemented?

The management measures guidance will be implemented through state coastal nonpoint programs. These programs will for the first time bring together authorities and capabilities within existing federal and local authorities. The new coastal programs will be incorporated into existing or revised state coastal zone management and nonpoint source programs so as to build upon programs, authorities and institutional arrangements already in place.

State programs must include management measures in conformity with those specified in EPA's management measures. States will have some flexibility in that they may adopt either the measures specified in EPA's guidance or alternative measures to better meet local conditions, provided the alternative measures are as effective as EPA's measures in controlling coastal nonpoint pollution.

Within three years of program approval by NOAA and EPA (i.e., January 1999), states must provide for landowner implementation of the measures. Following a two-year monitoring period (to January 2001) to assess the effectiveness of the measures, states will then have an additional three years (until January 2004) to obtain landowner implementation of additional, more stringent management measures where necessary to attain or maintain state water quality standards.

Coastal Nonpoint Pollution Management Measures Guidance

January 1993 | U.S. Environmental Protection Agency, Office of Wetlands, Oceans, and Watersheds

AGRICULTURE

What Is the Coastal Nonpoint Pollution Program?

Section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states (including Great Lakes states) with approved coastal zone management programs to address nonpoint pollution impacting or threatening coastal waters. States must submit Coastal Nonpoint Pollution Control Programs for approval to both the U.S. Environmental Protection Agency (EPA) and the National Oceanic and Atmospheric Administration (NOAA). Requirements for state programs are described in a document entitled *Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance* and are summarized in a separate fact sheet.

What Are Management Measures?

CZARA requires EPA, in consultation with NOAA and other federal agencies, to publish guidance specifying "management measures" to restore and protect coastal waters from specific categories of nonpoint source pollution. EPA has done so in a document entitled *Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters*. State Coastal Nonpoint Programs must provide for implementation of these measures or alternative management measures in conformity with these measures in the coastal management area generally. "Management measures" are defined by law to be economically achievable measures that reflect the best available technology for reducing pollutants. States may select from a wide range of practices or combinations of practices that will achieve the level of control specified in the management measure. This fact sheet summarizes the management measures applicable to agricultural sources. Other fact sheets summarize the measures for forestry, urban areas, marinas and recreational boating, hydromodification, and wetlands/riparian areas.

What Are the Sources of Agriculture-Related Nonpoint Source Pollution?

The primary agricultural nonpoint source pollutants are nutrients (particularly nitrogen and phosphorus), sediment, animal wastes, pesticides, and salts. Agricultural nonpoint sources enter surface water through direct surface runoff or through seepage to ground water that discharges to a surface water outlet. Various farming activities result in the erosion of soil particles. The sediment produced by erosion can damage fish habitat and wetlands and, in addition, often transports excess agricultural chemicals resulting in contaminated runoff. This runnoff in turn affects changes to aquatic habitat such as temperature increases and decreased oxygen. The most common sources of excess nutrients in surface water from nonpoint sources are chemical fertilizers and manure from animal facilities. Such nutrients cause eutrophication in surface water. Pesticides used for pest control in agricultural operations can also contaminate surface as well as ground-water resources. Return flows, runoff, and leachate from irrigated lands may transport sediment, nutrients, salts, and other materials. Finally, improper grazing practices in riparian, as well as upland areas, can also cause water quality degradation.

MANAGEMENT MEASURES SUMMARY

SEDIMENT/EROSION CONTROL—Soil erosion is one of the leading causes of water pollution in the United States. The goal of this measure is to minimize the delivery of sediment from agricultural lands to receiving waters. Land owners have a choice of one of two approaches: (1) apply the erosion component of the U.S. Department of Agriculture's Conservation Management

System through such practices as conservation tillage, strip cropping, contour farming, and terracing *or* (2) design and install a combination of practices to remove settleable solids and associated pollutants in runoff for all but the larger storms.

CONFINED ANIMAL FACILITY—Animal waste contaminates many of our waters with pathogens and nutrients. The management measure for *all* new facilities and existing facilities over a certain size is to limit discharges from confined animal facilities to waters of the United States by storing wastewater and runoff caused by all storms up to and including the 25-year, 24-hour frequency storm. For smaller existing facilities, the management measure is to design and implement systems that collect solids, reduce contaminant concentrations, and reduce runoff to minimize the discharge of contaminants in both facility wastewater and runoff caused by all storms up to and including 25-year, 24-hour frequency storms.

This measure also specifies management of stored runoff and solids through proper waste utilization and use of disposal methods which minimize impacts to surface/ground water. Confined animal facilities required to obtain a discharge permit under the NPDES permit program are not subject to these management measures.

NUTRIENT MANAGEMENT—This measure calls for development and implementation of comprehensive nutrient management plans. The fundamentals of a comprehensive nutrient management plan include a nutrient budget for the crop, identification of the types and amounts of nutrients necessary to produce a crop based on realistic crop yield expectations, and an identification of the environmental hazards of the site. Other items called for in the measure include soil tests and other tests to determine crop nutrient needs and proper calibration of nutrient equipment.

PESTICIDE MANAGEMENT—This measure is designed to minimize water quality problems by reducing pesticide use, improving the timing and efficiency of application, preventing backflow of pesticides into water supplies, and improving calibration of pesticide spray equipment. A key component of this measure is use of integrated pest management (IPM) strategies. IPM strategies include evaluating current pest problems in relation to the cropping history, previous pest control measures, and applying pesticides only when an economic benefit to the producer will be achieved, i.e., application based on economic thresholds. If pesticide applications are necessary, pesticides should be selected based on consideration of their environmental impacts such as persistence, toxicity, and leaching potential.

LIVESTOCK GRAZING—The goal of this measure is to protect sensitive areas. Sensitive areas include streambanks, wetlands, estuaries, ponds, lake shores, and riparian zones. Protection is to be achieved with improved grazing management that reduces the physical distance and direct loading of animal waste and sediment caused by livestock by restricting livestock access to sensitive areas through a range of options. In addition, upland erosion is to be reduced by either: (1) applying the range and pasture components of a Conservation Management System or (2) maintaining the land in accordance with the activity plans established by either the Bureau of Land Management or the Forest Service. Such techniques include the restriction of livestock from sensitive areas through locating salt, shade, and alternative drinking sources away from sensitive areas, and providing livestock stream crossings.

IRRIGATION—This measure promotes an effective irrigation system that delivers necessary quantities of water yet reduces nonpoint pollution to surface waters and groundwater. To achieve this, the measure calls for uniform application of water based upon an accurate measurement of cropwater needs and the volume of irrigation water applied. When applying chemicals through irrigation (a process known as chemigation), special additional precautions apply. The measure also recognizes that states' water laws that conflict with the measure will take precedence over the measure.

Coastal Nonpoint Pollution Management Measures Guidance

January 1993 | U.S. Environmental Protection Agency, Office of Wetlands, Oceans, and Watersheds

FORESTRY

What Is the Coastal Nonpoint Pollution Program?

Section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states (including Great Lakes states) with approved coastal zone management programs to address nonpoint pollution impacting or threatening coastal waters. States must submit Coastal Nonpoint Pollution Control Programs for approval to both the U.S. Environmental Protection Agency (EPA) and the National Oceanic and Atmospheric Administration (NOAA). Requirements for state programs are described in a document entitled *Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance* and are summarized in a separate fact sheet.

What Are Management Measures?

CZARA requires EPA, in consultation with NOAA and other federal agencies, to publish guidance specifying "management measures" to restore and protect coastal waters from specific categories of nonpoint source pollution. EPA has done so in a document entitled *Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters*. State Coastal Nonpoint Pollution Control Programs must provide for implementation of these measures or alternative management measures in conformity with these measures, in the coastal management area generally. "Management measures" are defined by law to be economically achievable measures that reflect the best available technology for reducing pollutants. States may select from a wide range of practices or combinations of practices that will achieve the level of control specified in the management measure. This fact sheet summarizes the management measures applicable to forestry sources. Other fact sheets summarize the measures for agriculture, urban areas, marinas and recreational boating, hydromodification, and wetlands/riparian areas.

What Are the Major Sources of Pollutants from Forestry Operations?

Silvicultural nonpoint source pollution impacts depend on site characteristics, climatic conditions, and the forest practice employed. Sediment, nutrients, pesticides, and temperature are pollutants commonly associated with forestry activities.

MANAGEMENT MEASURES SUMMARY

PREHARVEST PLANNING—The objective of this management measure is to ensure that silvicultural activities, including timber harvesting, site preparation, and associated road construction, are conducted in a way that takes into account potential nonpoint source pollutant delivery to surface waters. Preharvest planning has been demonstrated to play an important role in the control of nonpoint source pollution and efficient forest management operations. Components of this measure address key aspects of forestry operations relevant to water quality protection, including the timing, location, and design of harvesting and road construction, the identification of sensitive areas or high-erosion-hazard areas; and the potential for additional cumulative contributions to existing water quality impairments.

STREAMSIDE SPECIAL MANAGEMENT AREAS (SMA)—This management measure establishes areas along surface waters that are managed to protect the water quality of the adjacent waterbody. Streamside Management Areas (SMAs) protect against soil disturbance and reduce the delivery to waterbodies of sediment and nutrients from upslope activities. Canopy species in SMAs shade waterbodies, which moderates water temperature, and provide the detritus that often serves as an energy source for stream ecosystems. Trees in the SMA also provide a source of large, woody debris to waterbodies.

ROAD CONSTRUCTION/RECONSTRUCTION —Road construction is often the largest source of silviculture-produced sediment. The purpose of this management measure is to reduce the generation and delivery

of sediment from road construction or reconstruction. This is to be accomplished by following the preharvest plan layouts and designs for the road system, incorporating adequate drainage structures, and properly installing stream crossings. Other components of this measure include avoiding constructing roads in SMAs, removing debris from streams, and stabilizing areas of disturbed soil such as road fills.

ROAD MANAGEMENT—The objective of this management measure is to manage existing roads to prevent sedimentation and pollution from runoff-transported materials. This management measure describes how to manage existing roads to minimize erosion, maintain stability, and reduce the risk of failure or decreased effectiveness of drainage structures and stream crossings. Components of this measure include the use of inspections and maintenance actions to prevent erosion of road surfaces and ensure the continued effectiveness of stream crossing structures. The measure also addresses appropriate actions for closing roads that are no longer in use.

TIMBER HARVESTING—This management measure is intended to reduce NPS pollution resulting from timber harvesting operations. The measure includes components for the location of landings, for the operation of groundskidding and cable yarding equipment, and for the prevention of pollution from petroleum products. Harvesting practices that protect water quality and soil productivity can also reduce total mileage of roads and skid trails, lower equipment maintenance costs, and provide better road protection and reduce road maintenance. Appropriate skidtrail location and drainage and proper harvesting in SMAs are addressed by this measure. Erosion from the siting and operation of timber harvest operations can be reduced by conducting preharvest planning.

SITE PREPARATION AND FOREST REGENERATION —In some areas mechanical site preparation is of great concern for potential impacts to water quality. This is especially true in areas that have steep slopes on highly erodible soils, or where the site is located in close proximity to a waterbody. Careful regeneration of harvested forest lands is important in providing water quality protection from disturbed soils. This management measure is intended to reduce the impacts of mechanical site preparation and regeneration operations and to confine on-site potential nonpoint source pollution. Components of this measure address keeping slash materials out of drainages, operating machinery on the contour and protecting the ground cover in ephemeral drainages and SMAs.

FIRE MANAGEMENT—Prescribed burning is aimed at reducing slash and competition for nutrients among seedlings and protecting against wildfire. Prescribed fires that burn intensely on steep slopes in close proximity to streams and that remove most of the forest floor and litter down to the mineral soil, are most likely to adversely affect water quality. The purpose of this management measure is to reduce the potential nonpoint source pollution and erosion resulting from prescribed fire for site preparation and from methods for suppression of wildfire. Prescribed fires should be conducted under conditions to avoid the loss of litter and incorporated soil organic matter. Bladed firelines should be stabilized to prevent erosion, or practices such as handlines, firebreaks, or hose lays should be used where possible.

REVEGETATION OF DISTURBED AREAS—Revegetation of areas of disturbed soil can successfully prevent sediment and pollutants associated with the sediment (such as nutrients) from entering nearby streams. The objective of this management measure is to reduce erosion and sedimentation by the rapid revegetation of areas of soil disturbance from harvesting and road construction. The disturbed areas to be revegetated are those localized areas within harvest units or road systems where mineral soil is exposed or agitated such as road cuts, fill slopes, landing surfaces, cable corridors, or skidtrails.

FOREST CHEMICAL MANAGEMENT—Chemicals used in forest management are generally pesticides (insecticides, herbicides, and fungicides) and fertilizers. Since pesticides may be toxic, they must be properly mixed, transported, loaded, and applied and their containers must be properly disposed of to prevent potential nonpoint source pollution. Fertilizers must also be properly handled and applied since they also may be toxic or may shift surface water energy dynamics, depending on the exposure and concentration. The objective of this management measure is to ensure that the application of pesticides and fertilizers does not lead to contamination of surface waters. Components of this measure include applications by skilled workers according to label instructions, careful prescription of the type and amount of chemical to be applied, and the use of buffer areas for surface waters to prevent direct application or deposition.

WETLAND FOREST MANAGEMENT—Forested wetlands provide many beneficial water quality functions and provide habitat for aquatic life. The purpose of this management measure is to protect the aquatic functions of forested wetlands.

Coastal Nonpoint Pollution Management Measures Guidance

January 1993 | U.S. Environmental Protection Agency, Office of Wetlands, Oceans, and Watersheds

URBAN

What Is the Coastal Nonpoint Pollution Program?

Section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states (including Great Lakes states) with approved coastal zone management programs to address nonpoint pollution impacting or threatening coastal waters. States must submit Coastal Nonpoint Pollution Control Programs for approval to both the U.S. Environmental Protection Agency (EPA) and the National Oceanic and Atmospheric Administration (NOAA). Requirements for state programs are described in a document entitled *Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance* and are summarized in a separate fact sheet.

What Are Management Measures?

CZARA requires EPA, in consultation with NOAA and other federal agencies, to publish guidance specifying "management measures" to restore and protect coastal waters from specific categories of nonpoint source pollution. EPA has done so in a document entitled *Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters*. State Coastal Nonpoint Pollution Control Programs must provide for implementation of these measures or alternative managment measures in conformity with these measures in the coastal management area generally. "Management measures" are defined by law to be economically achievable measures that reflect the best available technology for reducing pollutants. States may select from a wide range of practices or combinations of practices that will achieve the level of control specified in the management measure. This fact sheet summarizes the management measures applicable to urban areas. Other fact sheets summarize the measures for agriculture, forestry, marinas and recreational boating, hydromodification, and wetlands/riparian areas.

What Are the Major Sources of Urban Nonpoint Source Pollution?

Urbanization has been linked to the degradation of urban waterways. The major pollutants found in runoff from urban areas include sediment, nutrients, oxygen-demanding substances, road salts, heavy metals, petroleum hydrocarbons, pathogenic bacteria, and viruses. Suspended sediments constitute the largest mass of pollutant loadings to receiving waters from urban areas. Construction is a major source of sediment erosion. Nutrient and bacterial sources of contamination include fertilizer usage, pet wastes, leaves, grass clippings, and faulty septic tanks. Petroleum hydrocarbons result mostly from automobile sources.

MANAGEMENT MEASURES SUMMARY

NEW DEVELOPMENT—The new development management measure is intended to mitigate the effects of new development on water quality. This measure specifies that runoff from new development be managed so as to meet two conditions:

(1) The average annual total suspended solid (TSS) loadings after construction is completed are reduced:

   a) by 80 percent, or

   b) so that they are no greater than predevelopment loadings; and

(2) To the extent practicable, post-development peak runoff rate and average volume are maintained at levels that are similar to predevelopment levels.

New developments required to obtain NPDES permits are not subject to this management measure.

WATERSHED PROTECTION/SITE DEVELOPMENT—The purpose of these measures is to encourage comprehensive planning for development on a watershed scale and for small-scale site development as well, including planning and designing to protect sensitive ecological areas, minimize land disturbances and retain natural drainage and vegetation whenever possible.

CONSTRUCTION EROSION/SEDIMENT CONTROL—The purpose of this measure is to reduce erosion and transport of sediment from construction sites to surface water. A sediment and erosion control plan should be developed and approved prior to land disturbance. This measure applies to construction sites of less than 5 acres.

CONSTRUCTION SITE CHEMICAL CONTROL—This measure addresses the transport of toxic chemicals to surface water by limiting the application, generation, and migration of chemical contaminants (i.e., petrochemicals, pesticides, nutrients) and providing proper storage and disposal.

EXISTING DEVELOPMENT—This measure addresses reduction of pollution loadings from already developed areas. Watershed management programs should be developed that identify the sources, specify appropriate controls such as retrofitting or the establishment of buffer strips, and provide a schedule by which these controls are to be implemented.

NEW ONSITE DISPOSAL SYSTEMS—This measure addresses nutrient/pathogen loadings to surface water from new on-site disposal systems. The measure specifies that new onsite disposal systems (OSDS) are to be designed, installed and operated properly and to be situated away from open waterbodies and sensitive resources such as wetlands, and floodplains. Protective separation between the OSDS and the groundwater table is to be established. The OSDS unit should be designed to reduce nitrogen loadings in areas where surface waters may be adversely affected.

OPERATING ONSITE DISPOSAL SYSTEMS—This management measure calls for policies and systems to operate and maintain OSDS so as to prevent surface water discharge and reduce pollutant loadings to ground water. It also calls for inspection at regular time intervals and repair or replacement of faulty systems.

POLLUTION PREVENTION—This measure includes techniques and activities to prevent nonpoint source pollutants from entering surface waters. Primary emphasis is placed on public education to promote methods for proper disposal and/or recycling of hazardous chemicals, pet waste management strategies, management practices for lawns and gardens, OSDSs, and commercial enterprises such as service stations and parking lots.

SITING ROADS, HIGHWAYS, AND BRIDGES—The measure calls for roads, highways, and bridges to be situated away from areas that are sensitive ecosystems and susceptible to erosion and sediment loss. The siting of such structures should not adversely impact water quality, minimize land disturbances, and retain natural vegetation and drainage features.

CONSTRUCTION PROJECTS FOR ROADS, HIGHWAYS, AND BRIDGES—This measure calls for the development and implementation of an approved erosion and sediment control plan prior to construction, which would reduce erosion and improve retention of sediments onsite during and after construction.

CONSTRUCTION SITE CHEMICAL CONTROL FOR ROADS, HIGHWAYS, AND BRIDGES—The measure limits toxic and nutrient loadings at construction sites by ensuring the proper use, storage, and disposal of toxic materials to prevent significant chemical and nutrient runoff to surface water.

OPERATION AND MAINTENANCE FOR ROADS, HIGHWAYS, AND BRIDGES—This measure provides an operation and maintenance approach designed to reduce pollutant loadings to receiving waters during operation and maintenance of roads, highways, and bridges.

RUNOFF SYSTEMS FOR ROADS, HIGHWAYS, AND BRIDGES—This measure specifies development of runoff management systems to reduce pollutant concentrations in runoff from existing roads, highways, and bridges. Runoff management systems should identify priority pollutant reduction opportunities and schedule implementation of retrofit projects to protect impacted areas and threatened surface waters.

Coastal Nonpoint Pollution Management Measures Guidance

January 1993 | U.S. Environmental Protection Agency, Office of Wetlands, Oceans, and Watersheds

MARINAS AND RECREATIONAL BOATING

What Is the Coastal Nonpoint Pollution Program?

Section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states (including Great Lakes states) with approved coastal zone management programs to address nonpoint pollution impacting or threatening coastal waters. States must submit Coastal Nonpoint Pollution Control Programs for approval to both the U.S. Environmental Protection Agency (EPA) and the National Oceanic and Atmospheric Administration (NOAA). Requirements for state programs are described in a document entitled *Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance* and are summarized in a separate fact sheet.

What Are Management Measures?

CZARA requires EPA, in consultation with NOAA and other federal agencies, to publish guidance specifying "management measures" to restore and protect coastal waters from specific categories of nonpoint source pollution. EPA has done so in a document entitled *Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters.* State Coastal Nonpoint Pollution Control Programs must provide for implementation of these measures or alternative management measures in conformity with these measures in the coastal management area generally. "Management measures" are defined by law to be economically achievable measures that reflect the best available technology for reducing pollutants. States may select from a wide range of practices or combinations of practices that will achieve the level of control specified in the management measure. This fact sheet summarizes the management measures applicable to marinas and recreational boating. Other fact sheets summarize the measures for agriculture, forestry, urban areas, hydromodification, and wetlands/riparian areas.

What Are the Nonpoint Source Pollution Problems Associated with Marinas and Recreational Boating?

Marinas are located right at the water's edge, and often there is no buffering of pollutants coming from boats or transported by runoff from parking lots and hull maintenance areas. Documented adverse environmental impacts include dissolved oxygen deficiencies and high concentrations of toxic metals in aquatic organisms. In addition, construction activities can lead to the physical destruction of sensitive ecosystems and bottom-dwelling aquatic communities.

MANAGEMENT MEASURES SUMMARY

MARINA FLUSHING—The measure requires that marina siting and design allow for maximum flushing of the water supply for the site. Adequate flushing reduces the potential for the stagnation of water in a marina and helps to maintain the biological productivity and reduce the potential for toxic accumulation in bottom sediment.

WATER QUALITY ASSESSMENT—This measure specifies that water quality be considered in the siting and design of both new and expanding marinas.

HABITAT ASSESSMENT—Marinas should be designed and located so as to protect against adverse impacts on shellfish resources, wetlands, submerged aquatic vegetation, and other important habitat areas as designated by local, state, or federal governments.

SHORELINE STABILIZATION—Where shoreline erosion is a nonpoint source pollution problem, shorelines should be stabilized. Vegetative methods are strongly preferred unless structural methods are cost-effective.

STORMWATER RUNOFF—This measure, which applies to runoff from the marina site only, specifies implementation of runoff control strategies which include the use of pollution prevention activities and the proper design of hull maintenance areas. At least 80% of suspended solids must be removed from stormwater runoff coming from the hull maintenance areas. Marinas which obtain a NPDES permit for their hull maintenance areas are not required to conform to this hull maintenance area provision.

FUELING STATION DESIGN—This measure specifies that fueling stations should be located and designed so that, in the case of an accident, spill contaminants can be contained in a limited area. Fueling stations should have fuel containment equipment as well as a spill contingency plan.

SEWAGE FACILITIES—To prevent the discharge of sewage directly to coastal waters, new and expanding marinas are to install pumpout, pump station, and restroom facilities where needed.

SOLID WASTE—This measure specifies that solid wastes produced by the operation, cleaning, maintenance, and repair of boats should be properly disposed of to limit their entry to surface waters.

FISH WASTES—In sufficient quantity, fish wastes can result in the depletion of dissolved oxygen and odor problems. To address this concern, the measure requires that sound fish waste management be promoted through a combination of fish cleaning restrictions, public education, and proper disposal.

LIQUID MATERIAL—This management measure provides for appropriate storage, transfer, containment, and disposal facilities for liquid materials commonly used in boat maintanance and encourages the recycling of these materials.

PETROLEUM CONTROL—This measure addresses the problem of fuel and oil leaks, which often occur during the refueling and operation of boats. The amount of fuel and oil leakage from fuel tank air vents should be reduced.

BOAT CLEANING—This measure minimizes the use of potentially harmful hull cleaners and bottom paints and their release to marinas and coastal waters.

PUBLIC EDUCATION—Public education/outreach/training programs should be instituted for boaters, as well as marina operators, to prevent improper disposal of polluting materials.

MAINTENANCE OF SEWAGE FACILITIES—This measure specifies that pumpout facilities be maintained in operational condition and that their use be encouraged to reduce untreated sewage discharges to surface waters.

BOAT OPERATION—This measure deals with ecological problems resulting from boating operations outside marinas. In shallow areas, intense boating activities may contribute to shoreline erosion. The measure is designed to prevent increased turbidity and physical destruction of shallow-water habitat resulting from boating activities.

Coastal Nonpoint Pollution Management Measures Guidance

January 1993 | U.S. Environmental Protection Agency, Office of Wetlands, Oceans, and Watersheds

HYDROMODIFICATION

What Is the Coastal Nonpoint Pollution Program?

Section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states (including Great Lakes states) with approved coastal zone management programs to address nonpoint pollution impacting or threatening coastal waters. States must submit Coastal Nonpoint Pollution Control Programs for approval to both the U.S. Environmental Protection Agency (EPA) and the National Oceanic and Atmospheric Administration (NOAA). Requirements for state programs are described in a document entitled *Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance* and are summarized in a separate fact sheet.

What are Management Measures?

CZARA requires EPA, in consultation with NOAA and other federal agencies, to publish guidance specifying "management measures" to restore and protect coastal waters from specific categories of nonpoint source pollution. EPA has done so in a document entitled *Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters*. State Coastal Nonpoint Pollution Control Programs must provide for implementation of these measures or alternative management measures in conformity with these measures in the coastal management area generally. "Management Measures" are defined by law to be economically achievable measures that reflect the best available technology for reducing pollutants. States may select from a wide range of practices or combinations of practices that will achieve the level of control specified in the management measure. This fact sheet summarizes the management measures applicable to hydromodification. Other fact sheets summarize the measures for agriculture, forestry, urban areas, marinas and recreational boating, and wetlands/riparian areas.

What Are the Nonpoint Source-Related Problems Associated with Hydromodification?

Hydromodification activities have been separated into the categories of channelization and channel modification, dams, and streambank and shoreline erosion.

A frequent result of channelization and channel modification activities is a diminished suitability of instream and streamside habitat for fish and wildlife. They can also alter instream patterns of water temperature and sediment type, as well as the rates and paths of sediment erosion, transport, and deposition. Hardening of banks along waterways has increased the movement of NPS pollutants from the upper reaches of watersheds into coastal waters.

Dams can adversely impact the hydraulic regime, the quality of the surface waters, and habitat in the stream or river where they are located. A variety of impacts can result from the siting, construction, and operation of these facilities.

The erosion of shorelines and streambanks is a natural process that can have either beneficial or adverse impacts on the creation and maintenance of riparian habitat. Excessively high sediment loads can smother submerged aquatic vegetation, cover shellfish beds and tidal flats, fill in riffle pools, and contribute to increased levels of turbidity and nutrients.

MANAGEMENT MEASURES SUMMARY

Management Measures for Channelization and Channel Modification

PHYSICAL AND CHEMICAL CHARACTERISTICS OF SURFACE WATERS—This measure ensures that the planning process for new channelization projects includes an evaluation of the potential effects on the physical and chemical characteristics of surface waters

that may occur as a result of the proposed work. The measure encourages planning and design of new projects to reduce undesirable impacts. The operation and maintenance programs for existing modified channels should identify and implement any available opportunities to improve the physical and chemical characteristics of surface waters in those channels.

INSTREAM AND RIPARIAN HABITAT RESTORATION FOR CHANNELIZATION AND CHANNEL MODIFICATION—This measure ensures that the planning process for new channelization projects includes an evaluation of the potential effects on instream and riparian habitat that may occur as a result of the proposed work. The measure encourages planning and design of new projects to reduce undesirable impacts. The operation and maintenance programs for existing modified channels should identify opportunities to restore instream and riparian habitat in those channels. The habitat characteristics that may be influenced by channelization and channel modification include: elimination of stream bank vegetation, reduced freshwater availability, and accelerated delivery of pollutants.

Management Measures for Dams

These management measures apply to dams 25 feet or more in height and greater than 15 acre-feet in capacity, or to dams six feet or more in height and greater that 50 acre-feet in capacity. The measures also apply only to those projects and activities that fall outside of existing jurisdiction of the National Pollutant Discharge Elimination System permit program.

EROSION AND SEDIMENT CONTROL—This measure provides for reducing erosion and retaining sediment onsite, to the extent practicable, during and after construction of dams. An approved erosion and sediment control plan, or similar administrative document that contains erosion and sediment control provisions, should be prepared and implemented prior to land disturbance.

CHEMICAL AND POLLUTANT CONTROL—This measure ensures the proper storage and disposal of certain chemicals, substances, and other materials that are used in construction or maintenance activities at dams. These include construction chemicals such as concrete additives, petrochemicals, solid wastes, cement washout, pesticides and fertilizers. The measure limits the application, generation, and migration of toxic substances, and ensures their proper storage and disposal. The measure also ensures that nutrients are applied at rates necessary to establish and maintain vegetation without causing significant nutrient runoff to surface waters.

PROTECTION OF SURFACE WATER QUALITY AND INSTREAM AND RIPARIAN HABITAT—This measure ensures that the operation of dams will be assessed for impacts to surface water quality and instream and riparian habitat, and that the potential for improvement will be evaluated. Significant nonpoint source pollution problems that exist from excessive surface water withdrawals will also be assessed and evaluated.

Management Measure for Streambank and Shoreline Erosion

STREAMBANK AND SHORELINE EROSION—Eroding streambanks and shorelines should be stabilized, where streambank and shoreline erosion is a nonpoint source problem. Vegetative methods such as marsh creation and vegetative bank stabilization ("bioengineering") are the preferred methods. The measure also ensures that streambank and shoreline features such as wetlands and riparian areas with the potential to reduce NPS pollution are protected. Streambanks and shorelines should also be protected from erosion due to uses of either the shorelands or adjacent surface waters.

Coastal Nonpoint Pollution Management Measures Guidance

January 1993 | U.S. Environmental Protection Agency, Office of Wetlands, Oceans, and Watersheds

WETLANDS, RIPARIAN AREAS, VEGETATED TREATMENT SYSTEMS

What Is the Coastal Nonpoint Pollution Program?

Section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states (including Great Lakes states) with approved coastal zone management programs to address nonpoint pollution impacting or threatening coastal waters. States must submit Coastal Nonpoint Pollution Control Programs for approval to both the U.S. Environmental Protection Agency (EPA) and the National Oceanic and Atmospheric Administration (NOAA). Requirements for state programs are described in a document entitled *Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance* and are summarized in a separate fact sheet.

What Are Management Measures?

CZARA requires EPA, in consultation with NOAA and other federal agencies, to publish guidance specifying "management measures" to restore and protect coastal waters from specific categories of nonpoint source pollution. EPA has done so in a document entitled *Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters.* State Coastal Nonpoint Pollution Control Programs must provide for implementation of these measures or alternative management measures in conformity with these measures in the coastal management area generally. "Management measures" are defined by law to be economically achievable measures that reflect the best available technology for reducing pollutants. States may select from a wide range of practices or combinations of practices that will achieve the level of control specified in the management measure. Chapters 2-6 of the *Guidance* specify management measures that represent the most effective systems of practices to prevent or reduce coastal nonpoint source pollution from five specific categories of sources (agriculture, forestry, urban areas, marinas and recreational boating, and hydromodification). In chapter 7, management measures are specified that apply to a wide variety of sources, including the five categories of sources addressed in the preceding chapters, as well as to the protection and restoration of wetlands and riparian areas. This fact sheet summarizes the management measures specified in chapter 7.

What Are Some Activities That Lead to the Destruction of Wetlands and Riparian Areas ?

Changes to hydrology, geochemistry, substrate, or species composition may impair the ability of a wetland or riparian area to function properly. Such alterations can affect the ability of the wetland or riparian area to act as a filter for excess sedimentation and nutrients, which can result in deteriorated surface water quality. The following are examples of typical activities that often cause such impairment: the drainage of wetlands for additional cropland, overgrazing, construction of highways, channelization of an adjoining waterway, deposition of dredged material, and excavation for ports and marinas.

MANAGEMENT MEASURES SUMMARY

THE PROTECTION OF WETLANDS AND RIPARIAN AREAS—The purpose of this management measure is to maintain the water quality benefits of wetlands and riparian areas and to ensure that they do not in turn become a source of nonpoint pollution due to degradation. Wetlands and riparian zones reduce nonpoint source pollution by filtering out of solution NPS-related contaminants such as phosphorus and nitrogen. The ability of wetlands and riparian zones to perform this function is determined by the vegetative composition, geochemistry, and faunal species composition. Any changes to these characteristics could affect filtering capacities.

THE RESTORATION OF WETLANDS AND RIPARIAN AREAS—This measure promotes the restoration of preexisting wetland and riparian areas where the restoration of such systems will have a significant nonpoint source pollution abatement function. This measure is intended to address the increase in pollutant loadings that can result from degradation or destruction of wetlands and riparian areas. These areas are effective in removing several pollutants from stormwater, such as sediment, nitrogen, and phosphorus. Wetland and riparian areas also help to attenuate flows from higher-than-average storm events, thereby protecting downstream areas from impacts such as channel scour, streambank erosion, and fluctuations in temperature and chemical characteristics. This can be accomplished by reestablishing previous hydrologic dynamics, vegetation, and structural characteristics.

ENGINEERED VEGETATED TREATMENT SYSTEMS—The purpose of vegetated filter strips is to remove sediment and other pollutants from runoff and wastewater by filtration, deposition, infiltration, absorption, adsorption, decomposition, and volatilization, thereby reducing the amount of pollution entering adjacent waterbodies. The ability of a wetland to act as a sink for phosphorus and the ability to convert nitrate to nitrogen gas through denitrification are two examples of the important NPS pollution abatement functions performed by constructed wetlands. This measure promotes the development of artificial wetlands or vegetated treatment systems where these systems will serve a nonpoint source pollution abatement function.