

STATE OF INDIANA

COASTAL NONPOINT POLLUTION

CONTROL PROGRAM

ENVIRONMENTAL ASSESSMENT

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U.S. DEPARTMENT OF COMMERCE
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National Ocean Service

DESIGNATION: Environmental Assessment

TITLE: State of Indiana Coastal Nonpoint Pollution Control Program

ABSTRACT: This environmental assessment is prepared pursuant to the National Environmental Policy Act (NEPA), 42 U.S.C. 4321 et seq. to assess the environmental impacts associated with the approval and implementation of the Coastal Nonpoint Pollution Control Program (coastal nonpoint program) submitted to NOAA and EPA by the state of Indiana. Section 6217 of the Coastal Zone Act Reauthorization Amendments (CZARA), 16 U.S.C. 1455b, requires states and territories with coastal zone management programs that have received approval under section 306 of the Coastal Zone Management Act to develop and implement coastal nonpoint programs.

For purposes of this environmental assessment, the proposed action is the conditional approval of the Indiana coastal nonpoint program. The Indiana coastal nonpoint program includes the implementation of management measures for agriculture, urban development, marina, and hydromodification nonpoint source categories, and for wetlands, riparian areas, and vegetated treatment systems. The coastal nonpoint program will be implemented in the Indiana 6217 management area, which includes the Little Calumet-Galien watershed.

NOAA and EPA find that the Indiana coastal nonpoint program meets many of the requirements of section 6217 and will approve the program with conditions. To receive final approval of its program, Indiana will need to meet the conditions, which include developing a monitoring plan; developing a process to identify critical coastal areas; and completing development of certain aspects of its program addressing agricultural, urban, marina and hydromodification sources, and wetland and riparian areas. Indiana requested exclusions for the agriculture irrigation water management measure and the forestry source category. NOAA and EPA have found Indiana's submission contains sufficient justification for allowing these exclusions.

NOAA and EPA have determined that the conditional approval of the Indiana coastal nonpoint program will not result in any significant environmental impacts different from those analyzed in the Programmatic Environmental Impact Statement prepared for the 6217 program and will have an overall beneficial effect on the environment.

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LIST OF ACRONYMS

BOD	Biochemical Oxygen Demand
BMPs	Best Management Practices
CAFO	Concentrated Animal Feeding Operation
CMS	Conservation Management System
CWA	Clean Water Act
CZARA	Coastal Zone Act Reauthorization Amendments
CZMA	Coastal Zone Management Act
EA	Environmental Assessment
<i>E. coli</i>	<i>Escherichia coli</i>
EIS	Environmental Impact Statement
EMPC	Environmental Management Policy Committee
FONSI	Finding of No Significant Impact
FOTG	Field Office Technical Guidance
IDEM	Indiana Department of Environmental Management
IDNR	Indiana Department of Natural Resources
ISDH	Indiana State Department of Health
LARE	Indiana's Lake and River Enhancement Program
LTAP	Local Technical Assistance Program
MS4	Municipal Separate Storm Sewer System
NEMO	Nonpoint Education for Municipal Officials
NEPA	National Environmental Policy Act
NIRPC	Northwestern Indiana Regional Planning Commission
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resource Conservation Services
OCRM	Office of Ocean and Coastal Resource Management
OSDS	Onsite Disposal Systems
PCBs	Polychlorinated Biphenyls
PEIS	Programmatic Environmental Impact Statement
POWER	Protecting Our Water and Environmental Resources
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency

TABLE OF CONTENTS

Summary	1
1.	Overview	2
	1.A Background	2
	1.B Purpose and Need for Action.....	2
2.	Alternatives.....	3
	2.A Approval of the Indiana Coastal Nonpoint Program.....	3
	2.B Conditional Approval of the Indiana Coastal Nonpoint Program.....	4
	2.C Deny Approval of the Indiana Coastal Nonpoint Program.....	10
3.	Affected Environment.....	11
	3.A The Physical Environment.....	11
	3.A.1 The Indiana 6217 Management Area.....	11
	3.A.2 Coastal Environment.....	12
	3.A.2.a Natural Communities.....	13
	3.A.2.a.1 Beaches.....	14
	3.A.2.a.2 Dunal and Interdunal Habitats.....	14
	3.A.2.b Fish Communities.....	15
	3.B Social and Economic Activities.....	15
	3.B.1 Land Use.....	16
	3.B.2 Current Economic Trends.....	16
	3.B.3 Water Use.....	17
	3.B.4 Urban.....	17
	3.B.5 Agriculture.....	18
	3.B.6 Forestry.....	19
	3.B.7 Hydromodification.....	20
	3.B.8 Wetlands.....	20
	3.B.9 Marinas.....	20
4.	Environmental Effects.....	21
	4.A Management Measure Implementation.....	21
	4.A.1 Environmental Impacts.....	21
	4.A.1.a Agricultural Nonpoint Pollution Source Category.....	21
	4.A.1.b Urban Nonpoint Pollution Source Category.....	28
	4.A.1.c Forestry Nonpoint Pollution Source Category.....	39
	4.A.1.d Marinas and Recreational Boating Nonpoint Pollution Source Category.....	40
	4.A.1.e Hydromodification Nonpoint Pollution Source Category.....	45
	4.A.1.f Wetlands, Riparian Areas and Vegetated Treatment Systems.....	49
	4.A.2 Socioeconomic Impacts.....	52
	4.B Program Implementation—Environmental Impacts.....	53

4.B.1	Coordination with Existing State Programs.....	54
4.B.2	6217 Management Area.....	54
4.B.3	Implementation of Management Measures in Conformity with (g) Guidance.....	55
4.B.4	Requirements for Implementation of Additional Management Measures.....	56
4.B.5	Technical Assistance.....	56
4.B.6	Public Participation.....	57
4.B.7	Administrative Coordination.....	58
4.B.8	Monitoring.....	58
4.B.9	Enforceable Policies and Mechanisms.....	59
4.C	Program Implementation—Socioeconomic Impacts.....	60
4.D	Environmental/Socioeconomic Impacts of Alternatives.....	61
4.D.1	Approval of Indiana Coastal Nonpoint Program.....	61
4.D.2	Conditional Approval of Indiana Coastal Nonpoint Program.....	62
5.	Irreversible and Irretrievable Commitment of Resources.....	62
6.	List of Preparers.....	62
7.	List of Agencies and Persons Consulted.....	62
8.	Finding of No Significant Impact (FONSI).....	63
	Bibliography.....	67
	Appendix A.....	70

LIST OF TABLES AND CHARTS

Table 1. Population Trends for Indiana Counties, Cities and Towns.....	16
Table 2. Land Use Patterns in Northwest Indiana (acres).....	18
Table 3. Agriculture Land Use Within the Three Count Region (1,000 acres).....	19
Table 4. Agriculture Statistics for Lake, La Porte, and Porter Counties, Indiana...	22
Table 5. Wastewater Disposal Data by County.....	29

SUMMARY

The National Oceanic and Atmospheric Administration (NOAA) has prepared this environmental assessment to assess the environmental impacts associated with the approval and implementation of the coastal nonpoint pollution control program (coastal nonpoint program) submitted to NOAA and the Environmental Protection Agency (EPA) by the State of Indiana. Section 6217 of the Coastal Zone Act Reauthorization Amendments (CZARA), 16 U.S.C. Section 1455b, requires states and territories with coastal zone management programs that have received approval under section 306 of the Coastal Zone Management Act (CZMA) to develop and implement coastal nonpoint programs. Once approved, these programs will be implemented through changes to the state nonpoint source program approved by EPA under section 319 of the Clean Water Act, changes to the state coastal zone management program approved by NOAA under the CZMA, and the involvement of programs under the Indiana Department of Agriculture and Sea Grant.

For purposes of this environmental assessment, the proposed action is the conditional approval of the Indiana coastal nonpoint program. The alternatives to the proposed action are to approve the program or to deny approval of the program.

The Indiana coastal nonpoint program includes, with the exceptions noted in this document, the implementation of management measures for agriculture, urban development, marina, and hydromodification nonpoint source categories, and for wetlands, riparian areas, and vegetated treatment systems. The program excludes the forestry source category and the irrigation management measure for agriculture.

The boundary of the 6217 management area proposed by Indiana conforms with the NOAA/EPA recommendation, and encompasses the Little Calumet-Galien watershed. The Indiana coastal nonpoint program will be implemented throughout the Little Calumet-Galien watershed, encompassing portions of LaPorte, Porter, and Lake Counties Indiana and the Calumet River Basin.

NOAA and EPA find that the Indiana coastal nonpoint program meets many of the requirements of section 6217 and will be approved with conditions. To receive final approval of its program, Indiana will need to meet the conditions, which include developing a monitoring plan; developing a process to identify critical coastal areas; and completing development of certain aspects of its program addressing agricultural, urban, marina and hydromodification sources, and wetland and riparian areas.

NOAA and EPA have determined that the conditional approval of the Indiana coastal nonpoint program will not result in any significant environmental impacts different from those analyzed in the Programmatic Environmental Impact Statement prepared for the 6217 program and that this alternative will have an overall beneficial effect on the environment.

1. OVERVIEW

1.A Background

In 1990, Congress enacted section 6217 of the Coastal Zone Act Reauthorization Amendments (CZARA), entitled “Protecting Coastal Waters,” to help address the problem of nonpoint source pollution and its effect on coastal waters. The purpose of the section is to strengthen the links between Federal and state coastal zone management and water quality programs in order to enhance state and local efforts to manage land use activities that degrade coastal water and habitats. Section 6217 requires states and territories with federally approved coastal management programs to develop coastal nonpoint pollution control programs (coastal nonpoint programs) and submit them to the National Oceanic and Atmospheric Administration (NOAA) and the Environmental Protection Agency (EPA) for approval. Once approved, these programs will be implemented through changes to the state nonpoint pollution program approved by EPA under section 319 of the Clean Water Act (CWA) and the state or territorial coastal zone management program approved by NOAA under the Coastal Zone Management Act (CZMA), as well as other water quality-related state and local programs.

Section 6217 utilizes a two-tiered management approach for the control of nonpoint sources of pollution. The purpose of the first tier is to protect coastal waters generally. It requires that states and territories implement, at a minimum, management measures in conformity with guidance (known as the 6217 (g) guidance, or management measure guidance) that was developed by EPA in consultation with NOAA and other Federal agencies. The management measures developed by EPA address the nonpoint pollution source categories of urban runoff, agricultural runoff, forestry runoff, hydromodification, and marinas. Management measures must also be implemented for wetlands protection, riparian areas, and vegetated filter strips. Once the first tier of management measures is implemented to protect coastal waters generally, the state or territory will need to develop additional management measures to apply, as necessary, to meet water quality standards and protect designated uses.

1.B Purpose and Need for Action

In March 1996, NOAA published a programmatic environmental impact statement (PEIS) that assesses the environmental impacts associated with the approval of state and territory coastal nonpoint programs. The PEIS forms the basis for the environmental documents NOAA is preparing on each state and territorial coastal nonpoint program submitted for approval. In the PEIS, NOAA determined that the approval and conditional approval of coastal nonpoint programs will not result in any significant adverse environmental impacts and that these alternatives will have an overall beneficial effect on the environment. The analyses presented in the PEIS are incorporated by reference into this environmental assessment (EA).

NOAA has prepared this EA to assess the environmental impacts associated with the approval and implementation of the coastal nonpoint program submitted to NOAA and EPA by the State of Indiana on March 22, 2005. The Indiana program will be approved after a joint NOAA/EPA review if it meets all of the requirements of section 6217 as specified in the statute and in the guidance documents for the program. The analysis in this EA also serves to determine whether the impacts associated with program approval are significantly different from those analyzed in the PEIS, so as to require the preparation of an environmental impact statement (EIS).

In September 2002, NOAA prepared a final environmental impact statement (FEIS) on the Indiana coastal management program submitted for approval under the CZMA. The Indiana coastal management program establishes the boundaries of the coastal area within which the program applies; describes the organizational structure to implement the program; and provides a set of statewide policies applicable to all state and Federal agencies which manage resources along the State's coastline. The information in the FEIS is relevant to this analysis because the section 6217 coastal nonpoint program is to be implemented through the Indiana coastal zone management program, as well as its section 319 Clean Water Act program and other state and local water quality related programs. Therefore, the Indiana FEIS is incorporated by reference into this EA.

2. ALTERNATIVES

For purposes of this environmental assessment, the proposed action is the conditional approval of the Indiana coastal nonpoint program. The proposed action, potential alternatives, and a summary of their environmental consequences are described below.

2.A Approval of the Indiana Coastal Nonpoint Program

To assist states and territories in the development of their coastal nonpoint programs, NOAA and EPA jointly published a Program Development and Approval Guidance document (NOAA/EPA, 1993). The state and territory programs will be approved after a joint NOAA/EPA review if they meet all of the requirements of section 6217 as specified in the statute and in the program guidance documents. Specifically, the Indiana coastal nonpoint program must contain the following components:

- Coordination with existing state programs
- Determination of 6217 management area
- Implementation of management measures in conformity with the (g) guidance
- Identification and implementation of Additional Management Measures
- Technical assistance
- Public Participation
- Administrative coordination
- Identification of enforceable policies and mechanisms

The alternative of approving the Indiana coastal nonpoint program would generally be expected to have a beneficial effect on the environment because the program would help to control sources of nonpoint pollution and would result in fewer pollutants reaching the State's coastal waters. For example, the nonpoint program will help to reduce *E.coli* pollution in the Little Calumet-Galien watershed from poorly functioning septic systems. It will also reduce stormwater runoff from existing and new urban development, which contains metals and pesticides, both of which have been identified as major causes of water quality impairment in the Little Calumet-Galien watershed. The nonpoint program will also make existing programs more effective by strengthening the link between Federal and Indiana state coastal zone management and water quality programs.

In their review of the Indiana program, NOAA and EPA found that the program does not meet all of the requirements of section 6217. Therefore, full approval of the Indiana coastal nonpoint program is not a feasible alternative. The rationale for this decision is discussed below under the conditional approval alternative. However, as discussed below, the conditional approval alternative is expected to result in the same environmental benefits as the approval alternative, provided Indiana satisfies the conditions.

2.B Conditional Approval of the Indiana Coastal Nonpoint Program (Preferred Alternative)

While NOAA and EPA expect the coastal nonpoint programs submitted for approval to meet all of the requirements of section 6217, NOAA and EPA realize that in some situations, a program may require changes before final approval can be granted. In these situations, NOAA and EPA will grant conditional approval in order to provide states and territories an opportunity to make necessary changes. Conditional approvals are intended primarily to provide additional time to:

- (1) address identified gaps, including obtaining new statutory or regulatory authority; if necessary;
- (2) demonstrate that existing authorities are adequate for ensuring implementation of the management measures; and
- (3) develop other incomplete program components.

NOAA and EPA will provide up to five years from the time of conditional approval for completion of a coastal nonpoint program. The length of the conditional approval will depend on which program components are subject to conditions and how long it will take to finalize those components.

NOAA and EPA find that the Indiana coastal nonpoint program meets many of the section 6217 requirements and adequately addresses all program components, with the exception of the following components. The State will be able to receive final approval of these components by meeting the conditions described below for each component.

(1) *Agricultural Runoff*

Indiana's program may include management measures in conformity with the 6217(g) guidance, however, additional clarification is needed. The State has identified a backup enforceable authority but has not yet demonstrated the ability of the authority to ensure implementation throughout the 6217 management area by submitting a legal opinion, demonstrating a commitment to use the enforcement mechanisms where necessary describing the laws and a process linking the implementing agencies with the enforcement agency and describing the monitoring and tracking mechanisms the State will employ to ensure that the voluntary programs are being implemented sufficiently. Indiana has presented sufficient justification to grant an exclusion of the irrigation water management measure for irrigated agricultural lands.

In order to receive final approval, the program must meet the following conditions:

- Within five years, Indiana will demonstrate it has programs in place to conform with the 6217(g) guidance. Within five years, Indiana will submit a legal opinion and other supporting documents as described in the *Final Administrative Changes to the Coastal Nonpoint Pollution Control Program Guidance* (October 1998) to demonstrate that it has adequate back-up authority to implement the agricultural management measures throughout the 6217 management area.

(2) *Urban Runoff – New Development and Site Development*

Indiana may have programs in place to implement the site development measure, but additional clarification, with a few examples, is needed. The State does not have programs in place to ensure implementation of the new development management measure outside of urbanized areas subject to National Pollutant Discharge Elimination System (NPDES) Phase II municipal separate storm sewer system (MS4) permits. The State has identified back-up enforceable authority but has not yet demonstrated the ability of the authority to ensure implementation of the new and site development measures throughout the 6217 management area by submitting a legal opinion, demonstrating the authority and commitment to use the enforcement mechanisms where necessary, describing the laws and processes linking the implementing agencies with the enforcement agency, and describing the monitoring and tracking mechanisms the state will employ to ensure that the voluntary programs are being implemented sufficiently.

In order to receive final approval, the program must meet the following conditions:

- Within five years, Indiana will demonstrate it has programs in place to implement the site development management measure throughout the 6217 management area and demonstrate that areas within the 6217(g) management area not subject to NPDES Phase II MS4 permits will implement the new development management measure. Also within five years, Indiana will submit a legal opinion and other supporting documents as described in *Final Administrative Changes to the Coastal Nonpoint*

Pollution Control Program Guidance (October 1998) to demonstrate that it has adequate back-up authority to implement the new and site development management measures throughout the 6217 management area.

(3) *Urban Runoff – Watershed Protection and Existing Development*

Indiana's program has measures in place to address the watershed protection measure and the second two elements of the existing development measure. The State does not have programs to identify priority local and/or regional watershed pollutant reduction opportunities nor does it have a schedule for implementing appropriate controls. Indiana has identified back-up enforceable authorities, but has not yet demonstrated the ability of the authority to ensure implementation of the watershed protection and existing development measures throughout the 6217 management area by submitting a legal opinion, demonstrating the authority and commitment to use the mechanisms where necessary, describing the laws and processes linking the implementing agencies with the enforcement agency, and describing the monitoring and tracking mechanisms the State will employ to ensure that the voluntary programs are being implemented sufficiently.

In order to receive final approval, the program must meet the following conditions:

- Within five years, Indiana will demonstrate it has programs in place to identify priority local and/or regional watershed pollutant reduction opportunities and develop a schedule for implementing appropriate controls. Within five years, Indiana will submit a legal opinion and other supporting documents as described in *Final Administrative Changes to the Coastal Nonpoint Pollution Control Program Guidance* (October 1998) to demonstrate that it has adequate back-up authority to implement the watershed protection and existing development management measures throughout the 6217 management area.

(4) *Urban Runoff – New and Operating Onsite Disposal Systems (OSDS)*

Indiana's program includes management measures and enforceable policies and mechanisms in conformity with the 6217(g) guidance, except that it does not include measures or enforceable policies and mechanisms for: 1) inspection and maintenance of existing OSDS; 2) protective separation distances to groundwater; and 3) use of denitrifying systems in nitrogen sensitive areas for new and existing OSDS.

In order to receive final approval, the program must meet the following conditions:

- Within five years, Indiana will include in its program management measures and enforceable mechanisms and policies for inspection of existing OSDS. Within five years, Indiana will include in its program management measures and enforceable mechanisms and policies for protective separation distances to groundwater in conformity with the 6217 (g) guidance for new OSDS. Within five years, Indiana will include in its program management measures and enforceable mechanisms and policies for denitrifying

systems where nitrogen-limited surface waters may be adversely affected by nitrogen loading from OSDS, in conformity with the 6217(g) guidance for new and operating OSDS.

(5) *Urban Runoff – Planning, Siting and Developing Roads and Highways; Siting, Designing and Maintaining Bridges; Road, Highway and Bridge Operation and Maintenance; Road, Highway and Bridge Runoff Systems*

Indiana’s program may have programs in place to implement the planning, siting and developing measure for roads and highways and the management measure for bridges for state and local roads but additional clarification, with a few examples, is needed. Additionally, the State has not identified enforceable mechanisms and policies for these measures. Although state roads are exempt from the operation and maintenance and runoff management measures because they are subject to NPDES Phase II MS4 permits, Indiana has not demonstrated it has programs or enforceable policies in place to address the operation and maintenance of runoff control measures for local roads throughout the 6217 management area.

In order to receive final approval, the program must meet the following conditions:

- Within five years, Indiana will demonstrate it has programs in place to implement the planning, siting and developing measures for roads, highways and bridges for state and local roads. Also within five years, Indiana will develop programs to address the operation and maintenance and runoff control measures for local roads. Finally, within five years, Indiana will submit a legal opinion and other supporting documents as described in the *Final Administrative Changes to the Coastal Nonpoint Pollution Control Program Guidance* (October 1998) to demonstrate that it has adequate back-up authority to implement all roads, highways and bridges management measures throughout the 6217 management area.

(6) *Marinas – Marina Siting and Design*

Based on the information provided, Indiana’s program does not include programs in full conformity with the 6217(g) guidance for shoreline stabilization, storm water runoff, and fueling station design.

In order to receive final approval, the program must meet the following conditions:

- Within five years, Indiana will demonstrate that it has programs in place to implement the shoreline stabilization, storm water runoff, and fueling station design measure.

(7) *Marinas – Marina Boat Operation and Maintenance*

Indiana’s program includes programs in conformity with the above management measures except for petroleum control and boat cleaning.

In order to receive final approval, the program must meet the following condition:

- Within five years, Indiana will demonstrate that it has programs in place to implement the petroleum control and boat cleaning management measures.

(8) Hydromodification

Indiana's program includes management measures and enforceable policies and mechanisms in conformity with the 6217(g) guidance except for: 1) a process to improve surface water quality and instream and riparian habitat restoration through the operation and maintenance of existing modified channels; 2) the protection of surface water quality and instream and riparian habitat during the operation of dams; and 3) the management measures for eroding streambanks and shorelines. Indiana's program is exempt from the erosion and sediment control and chemical control management measures because these areas are being addressed through the NPDES Phase II Storm Water Program. The State has identified a back-up enforceable policy, but has not yet demonstrated the ability of the authority to ensure widespread implementation through the 6217 management area by submitting a legal opinion, demonstrating the authority and commitment to use the enforcement mechanisms where necessary, describing the laws and processes linking the implementing agencies with the enforcement agency, and describing the monitoring and tracking mechanisms the State will employ to ensure that the voluntary programs are being implemented sufficiently.

In order to receive final approval, the program must meet the following conditions:

- Within five years, Indiana will develop a process to improve surface water quality and instream and riparian habitat through the operation and maintenance of existing modified channels. Also within five years, the State will develop programs for the protection of surface water quality and instream and riparian habitat during the operation of dams, and implement the management measures for eroding streambanks and shorelines. Finally, within five years, Indiana will submit a legal opinion and other supporting documents as described in the *Final Administrative Changes to the Coastal Nonpoint Pollution Control Program Guidance* (October 1998) to demonstrate it that has adequate back-up authority to implement the hydromodification management measures throughout the 6217 management area.

(9) Wetlands, Riparian Areas and Vegetated Treatment Systems

Indiana has identified several federal and state programs that have the potential to implement the management measures for protection and restoration of wetland and riparian areas but has not yet demonstrated the ability of these programs to ensure implementation of the measures within the 6217 management area. The State's program includes management measures for vegetated treatment systems. The State has identified a back-up enforceable policy and mechanism, but has not yet demonstrated the ability of the authority to ensure widespread implementation throughout the 6217 management area by submitting a legal opinion, demonstrating a commitment to use the enforcement

authority where necessary, describing the laws and processes linking the implementing agencies with the enforcement agency, and describing the monitoring and tracking mechanisms the State will employ to ensure that the voluntary programs are being implemented sufficiently.

In order to receive final approval, the program must meet the following conditions:

- Within five years, Indiana will demonstrate that it has programs in place for the protection and restoration of wetland and riparian areas. Also within five years, Indiana will submit a legal opinion and other supporting documents as described in the *Final Administrative Changes to the Coastal Nonpoint Pollution Control Program Guidance* (October 1998) to demonstrate that it has adequate back-up authority to implement the wetland, riparian and vegetated treatment system management measures throughout the 6217 management area.

(10) *Critical Coastal Areas, Additional Management Measures, and Technical Assistance*

Indiana's program does not include processes for the identification of critical coastal areas or for the development and continuing revision of management measures applicable to critical coastal areas and cases where the 6217(g) measures are fully implemented but water quality threats or impairments persist. The program does not describe efforts to provide technical assistance to agencies and the public for implementing additional management measures.

In order to receive final approval, the program must meet the following conditions:

- Within five years, Indiana will develop a process for the identification of critical coastal areas and a process for developing and revising management measures to be applied in critical coastal areas and in areas where necessary to attain and maintain water quality standards. Within five years, Indiana will also develop a program to provide technical assistance in the implementation of additional management measures.

(11) *Monitoring*

Indiana's program does not yet include a plan to assess over time the success of the management measures in reducing pollution loads and improving water quality.

In order to receive final approval, the program must meet the following condition:

- Within five years, Indiana will develop a plan that enables the State to assess over time the extent to which implementation of management measures is reducing pollution loads and improving water quality.

The alternative of conditionally approving the Indiana coastal nonpoint program is expected to have the same beneficial results as would full approval and will avoid the adverse impacts associated with denial of approval, provided Indiana satisfies the

conditions. The immediate implementation of the completed portions of the program will begin to fulfill the intent of section 6217 by helping to control sources of nonpoint pollution, thus resulting in a reduction of pollution reaching coastal waters. Positive socioeconomic benefits will accrue as improvements in coastal water quality resulting from controlling nonpoint pollution increase the aesthetic value of coastal areas, thereby benefiting tourism and providing enhanced opportunities for boating and swimming and other water related activities. Improvements in water quality are also likely to improve shellfish harvesting and fisheries. There may be some slight and localized socioeconomic impacts from implementation of management measures due to restrictions that may result from the designation of critical coastal areas and associated additional management measures, in addition to those already applied in the designated critical coastal areas.

2.C Deny Approval of the Indiana Coastal Nonpoint Program (No Action)

The decision to deny approval of a coastal nonpoint program has the same effect as the “no action” alternative under NEPA. Although section 6217 requires states to develop and implement coastal nonpoint programs, approval of the programs is not assured until NOAA and EPA find that all the requirements of section 6217 have been met. Denial of approval of a program will have the effect of relying on existing nonpoint control efforts and levying financial penalties on both the State’s coastal zone management program under the CZMA and the State’s nonpoint pollution program under section 319 of the CWA. The schedules for such penalties are stipulated in section 6217(c) of the CZARA. The denial of program approval and the imposition of financial penalties may have an adverse environmental effect because it may cause Indiana not to implement management measures that are meant to control coastal nonpoint pollution, restore degraded waters, and protect critical coastal areas. In addition, penalties on state CZMA and CWA funding would reduce the state’s ability to fully implement its coastal management program and water quality program. Since both of these programs currently provide environmental benefits to the state’s coastal area and water quality, any reduction in their funding is likely to result in a reduction in environmental protection for these resources.

There are many examples of how nonpoint pollution has caused significant water quality problems in Indiana’s 6217 management area. Indiana identifies nonpoint source pollution as the state’s leading source of surface water and ground water quality impairment. In 2004 the Indiana Department of Environmental Management assessed over 99 percent of Indiana's rivers and streams for their ability to support fish, shellfish, and other aquatic life, and it was found that only 64 percent of those waterways were able to completely support all aquatic life. In addition, only 59 percent of 8,660 miles of streams surveyed were found to be safe for recreation such as swimming and boating. In over 3,500 stream miles, the amount of *E. coli* bacteria signified unsafe recreation levels. (http://www.bsu.edu/web/landandlit/Environment/Issues/Water_Pollution.html) Animal waste from factory farms is also a problem; in 1996, the Center for Disease Control established a link between high nitrate levels in Indiana drinking water wells located

close to feedlots and pregnancy miscarriages. ("Facts about Pollution from Livestock Farms")

NOAA and EPA have reviewed the Indiana coastal nonpoint program and found that the program meets many of the requirements of section 6217. Therefore, denying approval of the program is not the preferred alternative.

3. AFFECTED ENVIRONMENT

As required by section 6217(a) of the CZARA, the geographic scope of each coastal nonpoint program must be sufficient to ensure implementation of management measures to “restore and protect coastal waters.” Pursuant to section 6217(e), NOAA, in consultation with EPA, made recommendations to each state and territory on the geographic scope of its program (also known as the “6217 management area”). This recommendation was based on the extent of coastal watersheds in each state and territory. States and territories were not required to adopt NOAA’s exact boundary recommendation; they could propose an alternative 6217 management area at the time of program submission. Indiana’s proposed 6217 management area consists of the Little Calumet-Galien watershed.

Because the actual geographic scope of each coastal nonpoint program was unknown during the preparation of the PEIS, that document uses NOAA’s original recommendation – coastal watersheds – for purposes of generally describing the environment to be affected. The description of the environment in the PEIS was of a general nature because of the widely diverse areas encountered across all of the 29 states and territories that were expected to submit coastal nonpoint programs at that time. The following is a more specific description of the environment in the Indiana 6217 management area, based on the PEIS, the EIS prepared by NOAA during approval of Indiana’s coastal zone management program, and the Indiana coastal nonpoint program submission.

3.A The Physical Environment

3.A.1 The Indiana 6217 Management Area

Indiana’s Great Lakes watersheds are connected to waters of Illinois, Michigan and Ohio. The term “coastal waters” in Indiana refers to the lakes, rivers, and wetlands that drain into the Great Lakes. Indiana’s coastal waters drain to both Lake Michigan and Lake Erie, and fall into Region 04—the Great Lakes Region—of the U.S. Geological Survey’s hydrologic drainage Basin classification.

Three river basins are included in Indiana’s Great Lakes Region: the Calumet River, St. Joseph River, and the Maumee River Basins. Indiana’s proposed 6217 management area encompasses the southern portion of Lake Michigan as defined by the Little Calumet-Galien watershed. The boundary for the Indiana coastal nonpoint

program includes portions of Lake, Porter, and LaPorte Counties within the Calumet River Basin. Approximately 80 percent of the Calumet River Basin drains directly into the Indiana portion of Lake Michigan. The remaining portion drains into Lake Michigan from either Illinois or Michigan. Most of the streamflow leaving Indiana to enter Michigan eventually reaches Lake Michigan. However, little if any of the streamflow entering Illinois reaches Lake Michigan; instead it is diverted to the Mississippi River Basin. The Calumet River Basin drains 604 square miles in Indiana and includes portions of Lake, Porter, and LaPorte Counties. The Grand Calumet River, Little Calumet River, Trail Creek, and the Galena River form the principal drainage network in the Calumet River Basin.

The St. Joseph River Basin drains 1,699 square miles in Indiana and includes portions of Dekalb, Elkhart, Kosciusko, LaGrange, Noble, St. Joseph and Steuben Counties. Indiana's drainage area represents approximately 40 percent of the entire Basin. The streamflow originates in Michigan, flows through Indiana, then re-enters Michigan and flows into Lake Michigan. The Indiana Lake Michigan Coastal Program also developed program boundaries based on this watershed. Streamflow from Indiana's Maumee River Basin enters the State of Ohio and eventually reaches Lake Erie. Indiana's Maumee River Basin is approximately 1,283 square miles and includes portions of Adams, Allen, Dekalb, Noble, Steuben, and Wells Counties. The Indiana portion of the Maumee River Basin represents 19.4 percent of the entire Basin, which spans Michigan, Indiana, and Ohio. The Maumee River Basin is hydrologically connected to western Lake Erie, which lies in the State of Ohio. Ohio's 6217 management area boundary includes those counties adjacent to northeast Indiana.

Indiana has determined that based on the hydrology in each of the coastal watersheds, the Little Calumet-Galien Watershed has the greatest impact on Indiana's coastal waters. Indiana's proposal to exclude both the St. Joseph River Basin and the Maumee River Basin from its 6217 management area is based in part on their coverage under the Michigan's and Ohio's coastal nonpoint programs and Indiana's State Nonpoint Management Plan. After evaluating all coastal watersheds in Indiana for significant indicators of pollution, NOAA and EPA have determined that Indiana's proposed 6217 management area boundary is sufficient to control the land and water uses that have or are reasonably expected to have a significant impact on the coastal waters of Indiana. This boundary aligns with the State's coastal management boundary and Michigan's already approved 6217 management area to the north. Illinois is still in the process of developing its federally-approved coastal management program.

3.A.2 Coastal Environment

The Calumet-Galien hydrologic unit is approximately 187,000 hectares. It covers the entire Lake Michigan coast line of Indiana, and extends to the northeast into Michigan and west into Illinois. The portion of the watershed within the state of Indiana includes approximately 139,000 acres (Little Calumet-Galien Watershed Diagnostic Study).

The Little Calumet-Galien Watershed includes several smaller subwatersheds. The major streams and rivers of the watershed include the Grand Calumet River, Little Calumet River, Trail Creek, and the Galena River. These form the principle drainage network in the Calumet River Basin. The present hydrology of the Lake Michigan coastal area in Indiana is significantly changed from what existed before development. The industrialization and urbanization, which began in northwest Indiana during the late nineteenth century, altered the natural landscape and drainage patterns. Today, the Grand Calumet River begins at the Marquette Park lagoons and flows west to the Indiana Harbor Ship Canal. The majority of streamflow from the east enters the Indiana Harbor Ship Canal and flows to Lake Michigan. West of the Indiana Harbor Ship Canal, the Grand Calumet River flows west into Illinois where it joins the Little Calumet River.

The Little Calumet River is divided into the East and West Arms. The East Arm of the Little Calumet River begins in Coolspring Township in LaPorte County and flows west to Porter County and the Portage Burns Waterway. Excavation of Burns Waterway in 1926 caused flow from the eastern part of the Little Calumet River to be diverted directly into Lake Michigan. The streamflow of the West Arm of the Little Calumet River diverges at Hart Ditch. Part of the Little Calumet River flows east from Hart Ditch to Burns Ditch where it flows north through Portage Burns Waterway into Lake Michigan. The remaining portion of the West Arm of the Little Calumet River flows west from Hart Ditch into Illinois. In Illinois, the Little Calumet River is diverted to the Mississippi River Basin.

Trail Creek is also divided into two branches. The East Branch begins in Springfield Township and flows west to Michigan City where it joins the West Branch. The West Branch begins in Coolspring Township and flows northeast to Michigan City. The combined branches of Trail Creek then flow north into Lake Michigan. The mouth of Trail Creek was dredged to create a harbor and federal navigation channel used from 1836 to 1910.

The Galena River begins in Springfield Township in LaPorte County and flows northeast into Michigan. The Galen River in Indiana has not been significantly impacted by human influence. (IN 6217 Program Submission)

3.A.2.a Natural Communities

The Little Calumet-Galien watershed is ecologically complex. The watershed's close proximity to Lake Michigan to the north and the (now drained) Kankakee swamp to the south allows for the co-existence of highly diverse habitats, including beaches, dunes, wetlands, forest and rivers—all within a space of just slightly more than 900 square miles. This juxtaposition of highly disparate habitat types makes this region globally significant. Indiana Dunes National Lakeshore contains over 1,400 vascular plant species, over 90 of which are on Indiana's threatened or endangered list. According to the U.S. Park Service, Indiana Dunes National Lakeshore ranks seventh among national parks for overall native plant diversity.

3.A.2.a.1 Beaches

Beaches (or “strand-plains” throughout Lake Michigan can be found in association with both lakes and rivers. By far the most significant of these features are the vast expanses associated with Lake Michigan’s shoreline. Approximately 45 miles of Lake Michigan’s shoreline are located within Indiana. Prior to European settlement this undeveloped region consisted mostly of sand and cobble beaches. With the increasing urbanization of the area during the 19th and 20th centuries, a substantial portion of the shoreline was filled. To date, approximately 10 square miles of fill have been installed along the shoreline.

Lake Michigan’s beaches are notoriously harsh places for vegetation to become established. On calm, summer days when the waves are low, the loose, sand or gravel substrate is well drained and, at least in the top few inches, very dry. During storm surges, these same areas may be inundated to a depth of several feet. Highly variable moisture regimes, combined with wave action, greatly limit the type and amount of vegetation present. Despite the paucity of plant species, these environments provide critical habitat for a wide variety of shorebirds and the invertebrates upon which they feed. Beach-reliant avian species found along Indiana’s lakeshore include: Willet, Whimbrel, Marbled Godwit, Ruddy Turnstone, Semipalmated Sandpiper, Least Sandpiper, Baird’s Sandpiper, Pectoral Sandpiper, Purple Sandpiper, Dunlin and Buff-breasted Sandpiper.

3.A.2.a.2 Dunal and Interdunal Habitats

Indiana’s dune and swale region extends southward from Lake Michigan’s shoreline for a distance of between 10 and 15 miles. This region consists of four bands corresponding to Lake Michigan’s contemporary and prehistoric strand-plain limits. The dunes that make up Lake Michigan’s strand-plain vary from just a few feet in height, to as much as 200 feet in height, based in large part on when they were geologically formed.

Comparisons between the foredunes, backdunes and the paleo dunes provide a clear window into ecological succession. The foredunes and, in some cases even portions of the beach, are dominated by low-growing, herbaceous species that are able to tolerate frequent disturbances, including, but not limited to, highly variable soil moisture, erosion and fires. With the exception of the eastern cottonwood, trees are not typically found in this area. The backdunes are generally more stable than the foredunes and beaches. Plants within these areas, although historically subject to fire, are not subjected to the erosive forces associated with the foredunes, or the extraordinarily variable moisture regimes of the beach region. One of the most prominent differences between the foredunes and the backdunes is the relative abundance and diversity of tree species. Whereas trees within the foredunes are primarily restricted to a few scattered cottonwoods, the backdunes often contain a substantial number of trees and other woody species.

The interdunal regions contain a wide variety of wetland types. The most distinctive of these in terms of species composition are interdunal ponds, bogs, marshes, and swamps. Interdunal ponds are complexes of open water and emergent wetland. The edges of these ponds are generally dominated by emergent vegetation, while the centers, or areas which have been cleared out through muskrat activity, consist of open water or aquatic beds. The water in interdunal ponds is filtered through sand. These ponds and many of their species are highly sensitive to pollution. Addition of nutrients to these waters tends to enhance the viability of blue-green algae and non-natives at the expense of native species. Bogs within Lake Michigan's southern rim formed as a consequence of glaciations. Over time, these ponds became filled with continually saturated, decomposing vegetation, which leads to acidic conditions and low nutrient availability. An example of a bog within the Little Calumet-Galien Watershed is the "Pinhook bog," which is preserved as part of Dunes National Lakeshore. The Pinhook bog contains 22 threatened and endangered plant species. The Little Calumet-Lacustrine Plain contains over 30 miles of forested wetlands, or swamps. These consist of floodplains and bottomlands dominated by relatively low quality species, as well as forested fens and tamarack-dominated bogs. Non-tidal, palustrine wetlands compose the vast majority of the wetlands within the Little Calumet-Galien watershed. The largest of these features is known as the "Great Marsh," which at one time encompassed an area equivalent to nearly 13 square miles, extending from Gary to Michigan City. Currently, the Great Marsh consists of approximately 1,500 acres of mostly cattail-dominated emergent wetlands.

3.A.2.b. Fish Communities

The Little Calumet-Galien Watershed once supported fish fauna as rich as its terrestrial communities. However, the health of streams and its associated fauna depends on the health of the contributing watershed. Fish habitat within the Little Calumet-Galien watershed has been impaired by a variety of factors including channelization, water quality degradation, toxins and agrichemicals, sedimentation, wetland drainage and filling, deforestation, and the introduction of exotic species (e.g., lamprey, alewife, carp). Spawning and nursery areas have been altered or destroyed. Extensive habitat restoration will be necessary to reduce the loss of native species. This includes the restoration of in-stream habitat, as well as the restoration of habitat and wise land use in upland and wetland areas within the contributing watershed.

3.B Social and Economic Activities

The Calumet-Galien Basin encompasses a land area of 604 square miles within the northern halves of Lake and Porter Counties and the northern third of LaPorte County. The Basin is densely populated and includes most of the urbanized communities within Lake, Porter and LaPorte counties. The northwestern part of the Basin is one of the major industrial centers of the United States. Economic development and the sustainability of northwest Indiana were primarily dependent upon steel, petrochemical, energy generation, and other ancillary industrial development. Historically, northwest Indiana's most densely populated areas were near the industrial cores along Lake Michigan.

Based on U.S. Department of Commerce, Bureau of the Census data, a Purdue University study has documented population trends for Lake, LaPorte, and Porter Counties and local communities. The study, as shown in Table 1, entitled “Population Trends for Indiana Counties, Cities and Town, 1970—2000 reveals the following population trends:

Table 1. Population Trends for Indiana Counties, Cities and Towns

County	Population 2000	Population 1990	Population Difference	Percent Change	Percent Rural
Lake	484,564	475,594	8,970	1.89	8.37
LaPorte	110,105	107,066	3,039	2.84	41.46
Porter	146,798	128,932	17,866	13.86	41.77

Source: United States Department of Commerce, Bureau of the Census

From 1990 to 1996, Porter County's population grew more than ten percent—13,421, two thirds of the region's total increase. In fact, Porter County is the 21st fastest growing county in Indiana. Lake County, on the other hand, grew less than one percent in those six years. Differences within the counties are even more striking. Gary shrank by nearly five percent between 1990 and 1996, while Schererville experienced a 14 percent boom. In LaPorte County, all cities and towns lost population, but unincorporated areas grew by 12 percent. (<http://www.savedunes.org/html/ArchivedNews/99janfebnews.html>)

3.B.1. Land Use

Urban and industrial areas in northern Lake and Porter Counties and agricultural land in LaPorte County dominate the current landscape of the Calumet-Galien Basin. Remnants of natural prairies and wetland landscapes occur in isolated parcels in the Basin. The Indiana Dunes National Lakeshore and the Indiana Dunes State Park in northern Lake and Porter counties contain the largest expanse of natural forest in the Calumet-Galien Basin. In the Calumet-Galien Basin, urban areas form an almost continuous complex across northern Lake county and northwestern Porter county. Other developed land areas in the Basin include Crown Point in Lake County, Michigan City in LaPorte County, and Valparaiso, Chesterton, Portage, Porter, Dune Acres, Beverly Shores, Pines, Long Beach, Trail Creek, Burns Harbor, and Ogden Dunes in Porter County.

3.B.2 Current Economic Trends

Economic trends have affected northwest Indiana. The area was hit hard in 2003 when LTV, National, and Bethlehem Steel Companies filed for bankruptcy. Some of these companies were bought out; communities in the region began to consider diversifying their industrial bases. Northwest Indiana’s industrial base also is affected by the lower costs of doing business overseas. Several companies have closed their doors and moved their operations outside of the country, leaving vacant buildings and an

unemployed workforce. These trends continue as the industrial base continues to change and population growth continues to shift away from urban areas.

3.B.3 Water Use

The demand for water in the Calumet-Galien Basin is influenced by a variety of factors, including socioeconomic characteristics, the physical environment, and hydrologic systems. However, urban and industrial uses are more influential in the northern portion of the Basin. A total of 80 significant water-withdrawal facilities representing 108 surface water intakes and 112 wells in the Calumet-Galien Basin were registered in 1990. These facilities accounted for 2,185 billion gallons of water removed from surface and groundwater in 1990. Ninety-nine percent of the total water withdrawals in the Basin are from surface water. Sixty percent of the registered water users in the Basin are industrial, followed by energy production at 36.5 percent. Public supply water-use was less than three percent of the total water use in 1990. Registered water withdrawals for agricultural and miscellaneous purposes constituted approximately 0.2 percent of the total water withdrawals. However, the number of facilities grouped into either category represents 40 percent of all registered facilities in the Basin. The total daily average of registered water use in the Basin for 1990 was 3,089 million gallons.

Instream uses include water-based recreation activities such as fishing, swimming, and boating. Instream uses in Lake Michigan and the surface drainage networks also include commercial transportation and waste discharge. The waterbodies also provide wetland flora and fauna habitat. Few high quality wetlands remain as remnants of former wetland complexes within the Calumet-Galien Basin.

3.B.4 Urban

The total land area for the three-county region is 968,532 acres. As Table 2 demonstrates, 272,512 acres (28 percent) are considered urban developed land. Urbanized land contains a mixture of residential, commercial and industrial development and transportation networks. The highest percentage of urbanized land lies in Lake County followed by Porter County and LaPorte County. Heavy industrial development primarily occurred along the coast of Lake Michigan. Steel mills, oil refineries, and specialized industry have historically located on or near the Indiana Coast. Lake County has the highest density of industrial development. New development is occurring away from urban areas and it is projected to continue. Given the current growth and population shift trends and projections, new development appears to be moving south and east in this region, which will potentially put additional stress on the undeveloped portions of the watershed.

Table 2. Land Use Patterns in Northwest Indiana (acres)

County	Urban Developed	Land in Farms	Remainder (e.g., vacant undeveloped, woodland, open space)	Land Area Total
Lake	154,176(48.5%)	127,782(40.2%)	36,112	318,070
Porter	77,312(28.9%)	145,779(54.5%)	44,499	267,590
LaPorte	41,024(10.7%)	243,447(63.6%)	98,401	382,872
Totals	272,512(28.1%)	517,008(53.4%)	179,012	968,583

Sources: Bureau of the Census, Census 2000, Urbanized Areas and Urban Clusters. Northwestern Indiana Regional Planning Commission (NIRPC), Connections 2030 Regional Transportation Plan. U.S. Department of Agriculture, 2002 Census of Agriculture

The extensive urban and industrial development has had detrimental effects on the environment and surface water resources within the Basin, including Lake Michigan. There are 77 NPDES (21 municipal, 56 industrial) permitted facilities in the Calumet-Galien Basin that fall within Lake, Porter, and LaPorte Counties. Aquatic ecosystems have suffered from the chronic effects of contaminated sediments and air deposition. In the early and mid-1960s, most streams in northwestern Lake County were affected by pollution. Water quality currently is characterized within the Basin by low dissolved oxygen, high biochemical oxygen demand (BOD), pollutant tolerant aquatic biota that has replaced native species in the northern reaches of the Basin, and fish consumption advisories. Oil, grease, floating debris and offensive odors have made most portions of the Grand Calumet and Little Calumet rivers unappealing to recreational boaters and fishermen. High bacteria counts also have made them unfit for full body contact. Causes of such pollution include a history of unregulated and poorly regulated discharges from industries and sewage treatment plans, combined sewer overflows, urban runoff carrying pesticides, nutrients and heavy metals, and sedimentation.

3.B.5 Agriculture

Fifty-three percent of the 968,800 acres of land that comprise Lake, Porter and LaPorte counties is farmland. Of that, 90 percent is cropland (harvested crops, orchards, vineyards, nurseries and greenhouses), four percent is woodland (woodlots, timber production and Christmas tree production), and six percent is other (house lots, barn lots, ponds, roads and wasteland). The remaining 42 percent of land use is forest land, wetlands and urban development.

The majority of the agricultural land is in LaPorte County. The primary agricultural land use is row cropland which includes corn and soybean production. The balance of the land described as agricultural is primarily in hay and pasture which includes land used for recreational horses, perennial grass and legume cover, enrolled in the Conservation Reserve Program; or year-round vegetative cover while waiting to be developed.

Table 3. Agriculture Land Use Within the Three-County Region (1,000 acres)

Category	Lake	Porter	LaPorte	Total
Corn	62	65.4	117	244.4
Soybean	53.4	54.5	82.6	190.5
Winter Wheat	3.7	3	5.8	12.5
Hay	3.3	4.3	9	16.6
Cattle	2.7	5.2	15.9	23.8

Source: Natural Resource Conservation Services (NRCS) (www.nass.usda.gov.in; 9/2/05)

3.B.6 Forestry

Of Indiana's nearly 23 million acres, 4.5 million are forestland. Most forests are located in the southern half of the state. The northern section of Indiana, extending from Lake Michigan and the Michigan border south to Indianapolis and Richmond, part of the nation's "breadbasket," has the lowest percentage (less than 10 percent) of forestland in the state. In 1950, Indiana timberland totaled 4.1 million acres. By 1998, the amount of timberland increased by 200,000 acres to slightly more than 4.3 million acres. The state total decreased from 1950 to 1967, although the amount of timberland in southern Indiana increased. The loss, which was concentrated in the north-central part of the state, may be attributed to increased farming and the evolution from small family-run farms to larger agricultural operations.

(<http://www.bsu.edu/web/landandlit/Environment/Issues/Deforestation.html>).

In general, the soils throughout Lake Michigan's southern rim region are droughty and rated as "poor" for the growth of trees. Despite this, microhabitat conditions, such as streams, remnant dunes, or high soil moisture content frequently offered sufficient protection from the annual prairie fires to allow for the development of moderate densities of trees. Although "forests" are not particularly uncommon in this area, they are principally an artifact of fire suppression. Historically, trees would assume sparser, fire-mediated "savanna" configuration. Then, as now, black oak, and to a lesser extent white oak were the predominant oak species. Although black oak is substantially less resistant to hot ground fires than Burr Oak, its ability to resprout damaged or burned limbs makes it particularly adept at surviving crown fires. Other species likely to occur in association with these woodlands included jack pine, only extremely close to Lake Michigan, particularly where fires were intense enough to top kill the competing oaks, as well as shade tolerant understory species such as black cherry, sassafras, tulip poplar and black walnut.

Lake Michigan coastal watershed commercial forestry activities are minimal. No large tracts of commercial forest exist within Indiana's Lake Michigan Coastal Program boundaries. Only two known sawmills operate in the watershed, supplied by logs hauled in from outside the watershed. These mills are upstream in the watershed inland from the immediate coast. No comprehensive list of woodland owners in the coastal program area exists. Forest ownership is becoming increasingly fragmented due to increased

residential development. Fractured, small and discontinuous tracts of trees in an urbanizing area describes much of the woodland in the 6217 management area not contained in parks or other preserved areas. These urban forests are not viable logging areas for commercial forestry interests due to the proximity to significant urban areas with large urban populations, and the proximity of home dwellings. Much of the remaining public timberland owned by the State of Indiana, counties, municipalities, and the U.S. government is already protected from harvesting activities.

3.B.7 Hydromodification

The hydrology of the Little Calumet-Galien watershed has been severely altered from pre-settlement conditions due to channelization, diversions, dredging, and drainage of large expanses of marshland. The changes along Lake Michigan have come mainly from development for residential, industrial, commercial and marine uses along the coastline. The current Grant Calumet and Little Calumet River systems have a long history of channel modifications, flow reversals, and diversions. Industrialization and urbanization of the Little Calumet-Galien watershed during the 20th century have altered the Basin including the constant threat of destruction from excavation and sand mining of the dunes, while the beaches along Lake Michigan were threatened with filling. Ten square miles of land have been transformed in this manner. At the same time, the region's hydrology also has been impacted by channelization, construction of drainage canals, and the draining and filling of wetlands. Specific impacts include channelization of the Little Calumet River and other tributaries to Lake Michigan, and the construction of drainage canals, in particular of the Indiana Harbor Canal. Additional changes include drainage and filling of vast acreages of wetlands while native soil surfaces have been replaced with impermeable, urban surfaces. As discussed above, current development trends show population shifts away from urban areas, bringing new development further south and east into land that was previously open or used for agricultural purposes.

3.B.8 Wetlands

The Lake Michigan area of northwestern Indiana in the counties of Lake, Porter, and LaPorte contain the most concentrated areas of remaining wetlands in Indiana. Historical wetlands estimates based on NRCS hydric soils determinations for Lake, Porter, and LaPorte Counties place one-time wetlands acreage at approximately 360,000 acres. 1986 inventories place the current amount of wetlands at approximately 63,000, or about 82.5 percent loss of previous wetlands acreage in the region. In the total land area of the Little Calumet-Galien watershed, approximately 11 percent, or 65 to 68 square miles is covered by 7,242 wetlands. Of that, about 40 percent are one acre or smaller; 48 percent are one acre to ten acres; ten percent range from ten to 40 acres; and two percent are greater than 40 acres.

3.B.9 Marinas

On Indiana's 45 miles of coast, 21 marina facilities provide boating access to Lake Michigan with approximately 2,850 existing boat slips and more planned. A new

condo/marina/retail area planned for Portage, Indiana will add 300 new slips. With over 700,000 people in the 6217 management area, a lakeshore that attracts visitors from several states and over 400,000 recreational boats on Lake Michigan, the demand for boating access to Lake Michigan remains high.

4. ENVIRONMENTAL EFFECTS

Management measures are defined in section 6217 as economically achievable measures to control the addition of pollution to coastal waters, 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. As required by the statute, EPA developed guidance (USEPA, 1993), specifying management measures for the following nonpoint pollution source categories: agricultural runoff, urban runoff, forestry runoff, marinas, hydromodification, and wetlands, riparian areas, and vegetated treatment systems. Coastal nonpoint programs must provide for the implementation of management measures that are in conformity with this guidance. The guidance also lists and describes management practices that EPA has found to be representative of the types of practices that can be applied successfully to achieve the management measures. State and territory programs are not required to specify practices, but must include a process for selection of practices that will achieve the measures.

NOAA's PEIS discussed the 56 management measures and their function in preventing environmental degradation caused by the pollutants associated with each nonpoint source category. Each coastal nonpoint program must address each of the management measures by either: (1) providing for the implementation of that measure or an alternative as effective; or (2) justifying why the management measure is not included in the program. States and territories may exclude nonpoint source categories or subcategories where the sources do not exist or do not, individually or cumulatively, present significant impacts to coastal waters.

4.A. Management Measure Implementation

4.A.1 Environmental Impacts

The Indiana coastal nonpoint program provides for the implementation of management measures for many aspects of the agriculture, urban development, marinas, and hydromodification nonpoint source categories, and for the protection of wetlands, riparian areas, and vegetated treatment systems. In some cases, NOAA and EPA have attached conditions to ensure that the state's program will conform to the guidance documents published by EPA and NOAA. Indiana requested exclusions for the agriculture irrigation water management measure and the forestry source category. NOAA and EPA find that the state has provided sufficient justification for these exclusions. The full text of all management measures and a statement of their applicability can be found in Appendix A.

4.A.1.a Agricultural Nonpoint Pollution Source Category

Although the amount of land suitable for intensive agriculture in Indiana’s Little Calumet-Galien watershed is limited, agriculture is of critical importance to the State’s economy and is a source of nonpoint source pollution to coastal waters. In 2002, the market value of agricultural products sold for the three counties in the Little Calumet-Galien watershed totaled over \$150 million. (USDA 2002 Census of Agriculture, Vol. I Geographic Area Series, Census, State-County Data) Based on 1990 land use data, approximately 35 percent of Lake Michigan’s entire coastal region is identified as agricultural land. (DNR “Agricultural Conservation) As mentioned above, 53 percent, or 517,008 acres of the 968,800 acres of land that comprise Lake, Porter and LaPorte counties is farmland. Of that, 90 percent is cropland (harvested crops, orchards, vineyards, nurseries and greenhouses), four percent is woodland (woodlots, timber production and Christmas tree production), and six percent is “other” (house lots, barn lots, ponds, roads and wasteland). (Watershed Mgmt Plan for Lake, Porter and LaPorte Counties).

Table 4: Agriculture Statistics for Lake, La Porte, and Porter Counties, Indiana

Agriculture Statistic Parameter	Lake County	La Porte County	Porter County
Land in Farms (acres)	127,782	243,447	145,779
Number of Farms	482	817	606
Farms by Size: 1-9 Acres	55	91	82
10-49 Acres	194	246	218
50-179 Acres	88	205	127
180-499 Acres	69	131	82
500-999 Acres	39	79	57
1,000+ Acres	37	65	40
Total Cropland (acres)	117,465	221,809	133,231
Total Harvest Cropland (acres)	112,505	208,829	126,847
Irrigated Land (acres)	6,902	32,400	8,066
Livestock (cattle and calves) #farms	79	196	131
Livestock (cattle and calves) total	72,279	16,732	4,488
Livestock (hogs and pigs) #farms	13	39	38
Livestock (hogs and pigs) total	2,767	17,395	10,742
Livestock (sheep and lambs) #farms	482	817	606
Livestock (sheep and lambs) total	639	856	1,393
Livestock (layers—20 wks old) #farms	17	21	23
Livestock (layers—20 wks old) total	272	605	332
Corn for grain (#farms)	188	393	273

Corn for grain (acres)	53,801	103,414	60,283
Corn for silage or green chop (#farms)	10	40	23
Corn for silage or green chop (acres)	626	3,841	829
Wheat for grain (#farms)	36	73	52
Wheat for grain (acres)	1,381	2,341	1,962
Winter Wheat for grain (#farms)	36	73	52
Winter Wheat for grain (acres)	1,381	2,341	1,962
Oats for grain (#farms)	7	18	14
Oats for grain (acres)	115	193	267
Soybeans for beans (#farms)	195	372	249
Soybeans for beans (acres)	51,155	85,796	57,399
Tobacco (#farms)	0	20	0
Forage (land used for all hay, grass sillage and green chop) (#farms)	156	221	188
Forage (land used for all hay, grass sillage and green chop) (acres)	3,354	9,298	4,623
Vegetables harvested for sale (#farms)	33	24	17
Vegetables harvested for sale (acres)	1,827	2,976	944
Land in orchards (#farms)	10	19	4

Source: USDA 2002 Census of Agriculture, Vol. I Geographic Area Series, Census, State-County Data

USDS website (http://151.121.3.33:8080/Census/Create_Census_US_CNTY.jsp#top)

As indicated in Table 4, LaPorte County contains the greatest number of farms, followed by Porter and Lake Counties. The majority of farms in the three counties are between ten and 179 acres. Very little of the total cropland is irrigated; approximately ten percent. Primary crops include corn, wheat, soybeans, and land used for forage crops. Livestock raised in the 6217 management area include cattle and calves, hogs and pigs, sheep and lambs, and chicken. The largest number of livestock in the three counties is hogs and pigs, followed closely by cattle and calves. The fewest number of livestock is chickens.

Land devoted to agricultural production within the Indiana 6217 management area itself totals 118,498 acres, or approximately 35 percent of the land area. The primary agricultural land use is row cropland, which totals nearly 75,770 acres or 64 percent of the agricultural land use in the watershed. The balance of the land described as agricultural is primarily in hay and pasture totaling 42,538 acres, which includes land used for recreational horses, perennial grass and legume cover, enrolled in the Conservation Reserve Program, or year-round vegetative cover waiting to be developed.

The most significant concern with cropland in the Little Calumet-Galien watershed is off-site sediment from crop fields related to sheet and rill erosion and gully

erosion. Sediment that originates from cropland has a higher pollution potential than from other agricultural land uses because the top soil is usually richer in nutrients and other chemicals due to fertilizer and pesticide applications. Unprotected cropland with slopes greater than two percent may be the most susceptible to the erosive effects of rainfall and subsequent water movement over its surface. There are an estimated 43,591 acres of cropland within the 6217 management area with slopes of two percent or greater; approximately 54 percent of all the cropland. (Indiana Coastal Nonpoint Pollution Control Program, February 2005). In the entire state of Indiana, thousands of fish are killed each year in an average of 35 separate incidents, usually from fertilizer or animal waste runoff from far fields, sewer overflows or discharges of waste from livestock feeding operations. (“Clean Water Act—30 Years Later,” October 13, 2002)

Management measures for the following five subcategories of sources of agricultural nonpoint pollution that affect Indiana’s coastal waters will be implemented as part of the State’s coastal nonpoint program:

- Erosion and sediment control
- Confined animal facilities
- Application of nutrients
- Application of pesticides
- Grazing management

Indiana requested an exclusion for the irrigation water management measure. The State was able to demonstrate that only 14 irrigation systems identified by local agricultural agency personnel are used seasonally on an estimated 380 acres of cropland out of a total of 75,770 acres of row cropland in that watershed. NOAA and EPA found the State had provided sufficient justification for the exclusion, and it was approved.

The Environmental Consequences section of the PEIS contains a description of the primary pollutants in agricultural runoff and an analysis of the impacts of these pollutants on water quality. The management measures are designed to prevent the environmental degradation caused by these pollutants.

The implementation of agricultural management measures will reduce the generation of nonpoint source pollutants from agricultural activities and minimize the delivery of pollutants from agricultural land to surface and ground waters. Agricultural management measures emphasize the control and removal of sediment, nutrients, and pesticides entrained in runoff before they enter coastal waters. The management measures for confined animal facilities are intended to eliminate the pollutants leaving a facility by storing runoff and reducing the amount of facility wastewater and manure reaching a waterbody. The nutrient and pesticide management measures will promote a more efficient use of fertilizers and pesticides by limiting the amount of nitrogen, phosphorus, and chemicals applied to agricultural lands thereby reducing their runoff and leaching into surface and ground waters. Management measures for grazing and irrigation will protect sensitive areas such as streambanks and wetlands from damage by grazing of domestic livestock and promote the more efficient use of irrigation water.

This will improve aquatic habitat and reduce the total pollutant discharge from irrigation systems.

The implementation of agricultural management measures in conformity with the 6217(g) guidance throughout the 6217 management area based on the existing state programs listed below will result in a more consistent, widespread implementation of Indiana's programs with the resulting environmental benefits associated with reduction in agricultural nonpoint pollution. Additional benefits will be attained by fulfillment of the conditions: (1) to demonstrate Indiana has programs in place to conform with the 6217(g) guidance; and (2) submit a legal opinion and other supporting documents as described in the *Final Administrative Changes to the Coastal Nonpoint Pollution Control Program Guidance* (October 1998) to demonstrate that the state has adequate back-up authority to implement the agricultural management measures throughout the 6217 management area.

Management Measures for Agricultural Sources

The management measures for agricultural sources are discussed together because the State intends to implement them using the following existing authority and programs. Subject to the conditions noted, Indiana intends to rely on the following authorities and programs for implementation of the agricultural management measures:

- Indiana intends to apply the practices in its Natural Resource Conservation Services Field Office Technical Guide (FOTG) which implement several of the management measures. For example, the erosion control component of a Conservation Management System (CMS) minimizes delivery of sediment from agricultural lands to surface waters and/or design and install a combination of management and physical practices to settle and filter solids and associated pollutants in runoff delivered from the contributing area for storms of up to and including a 10-year, 24-hour frequency. Other erosion and sediment control practices include filter strips, field borders, grassed waterways, diversion, and grade stabilization structures. For managing facility wastewater and runoff from confined feeding operations, the FOTG includes approved animal waste management practices such as diversions, roof runoff, waste storage ponds, waste storage structures, and waste treatment lagoons. Nutrient management practices in the FOTG include managing the amount, source, placement, form and timing of the application of nutrients, as well as conservation practices for erosion and sediment control such as conservation tillage, cover crops, filter strips, and other conservation buffers. Pesticide management practices include implementing integrated crop management systems that inventory current and historical pest problems, crop rotation, and past and current use of pesticides; evaluating the soil and physical characteristics of the field; and maintaining detailed records of application of all pesticides. In addition, the pesticide management practices include recalibrating spray equipment each spray season and using anti-backflow devices on hoses used for tank mixing and filling. FOTG grazing management practices include establishing a planned grazing system, as well as prescribed grazing, pasture and hay planting and management, and brush and weed management. They also include providing water and salt supplement facilities away

from streams, and minimizing livestock access to streambanks, ponds or lakeshore and riparian zones.

As of 2005, approximately 52 percent of cropland within the 6217 management area is under conservation tillage. The State also sponsors technical assistance, education, training and financial incentive programs through the Purdue University Cooperative Extension Service, local Soil and Water Conservation Districts and Department of Agriculture and the Division of Soil Conservation. These programs are supported by federal assistance programs such as Section 319, USDA's conservation Reserve and Environmental Quality Incentives Programs, and Indiana's Lake and River Enhancement Program (LARE).

- District Law IC 14-32 governs soil and water conservation districts located in each county, and charges Soil and Water Conservation Districts with the responsibility of identifying and prioritizing soil and water conservation problems, and establishing or enlisting programs and partners to address them. The State Conservation Board, which is authorized by this law, develops policy and is authorized to develop a state wide regulatory program when all reasonable voluntary approaches to erosion and sedimentation have been exhausted.

- Indiana has proposed that their Water Quality Standards (327 IAC-2) can be used to require implementation of the FOTG management measures, as the state's back-up enforceable policy. The State Water Pollution Control Board and the Indiana Department of Environmental Management have the responsibility to enforce the State Water Quality Standards.

In order for the agricultural management measures to be approved, the State must meet the following conditions:

- Within five years, Indiana will demonstrate that it has programs in place to conform with the 6217(g) guidance. Within five years, Indiana will submit a legal opinion and other supporting documents as described in the *Final Administrative Changes to the Coastal Nonpoint Pollution Control Program Guidance* (October 1998) to demonstrate that it has adequate back-up authority to implement the agricultural management measures throughout the 6217 management area.

1. *Erosion and Sediment Control Management Measure*

This management measure is intended to be applied to activities that cause erosion on agricultural lands and lands converted from other uses to agricultural lands. This includes cropland; irrigated cropland; range and pasture; orchards; permanent hayland; specialty crop production; and nursery crop production. Application of this management measure will reduce the mass load of sediment and associated pollutants (e.g., nitrogen, pesticides) reaching a waterbody.

2. Management Measure for Facility Wastewater and Runoff from Confined Animal Facility Management

These management measures are intended to be applied to confined animal facilities. Application of these measures will reduce the volume of runoff, manure, and facility wastewater reaching a waterbody.

In addition to the authorities described above, Indiana intends to rely on the following program to implement the facility wastewater and runoff from confined animal facility management measure:

- Significant changes to Indiana's Law 327 IAC 15-15-12 (Section 3) have been proposed. Under the proposed revisions, all Concentrated Animal Feeding Operations (CAFO) are considered point sources that require National Pollutant Discharge Elimination System (NPDES) permits for discharges or potential discharges. Under the proposed rule, all large, medium and small CAFO owners or operators must seek coverage under either an individual NPDES permit or a general NPDES permit. In addition, any animal feeding operation regardless of size will come under the requirements of this law as amended if it is detected discharging pollutants in state waters.

3. Nutrient Management Measure

This management measure is intended to be applied to activities associated with the application of nutrients to agricultural lands. Application of this measure will reduce the amount of nutrients entering both ground and surface waters.

4. Pesticide Management Measure

This management measure is intended to be applied to activities associated with the application of pesticides to agricultural lands. This measure will reduce contamination of surface and ground water by fostering effective and safe use of pesticides without causing environmental degradation.

In addition to the authorities described above, Indiana intends to rely on the following authority to implement the pesticide management measure:

- Under the Indiana Registration Law (IC 15-3-3-5) and the Indiana Pesticide Use and Application Law (IC 15-3-3-6), all commercial pesticide applicators are required to have training and continuing education hours to obtain and retain a commercial applicators license. In addition, farmers and other private applicators are required to have training and continuing education to hold a private applicators permit. A full time field staff performs inspections, samples pesticide procedures and investigates complaints

concerning the use or alleged misuse of pesticide products. The pesticide section of the Office of the Indiana State Chemist is charged with the administration of these laws.

5. *Grazing Management Measure*

This management measure is intended to be applied to activities on range, irrigated, and non-irrigated pasture, and other grazing lands used by domestic livestock. Its focus is on the riparian zone, but this measure also encourages the control of erosion from range, pasture, and other grazing lands above the riparian zone. Application of this management measure will improve aquatic habitat by reducing the amount of pollutants entering waters through proper livestock management.

4.A.1.b Urban Nonpoint Pollution Source Category

The Little Calumet-Galien watershed drains 343,124 total acres of land. In the watershed, 82,601 acres (24 percent) are considered urban land. Urbanized land contains a mixture of residential, commercial and industrial development and transportation networks. Approximately 23,423 acres are considered high-density urban land and 21,923 acres are considered low-density urban land. Commercial/industrial/transportation land use accounts for 26,938 acres. The remaining 10,317 acres are comprised of maintained urban grasslands.

Urban sprawl continues to be an important issue in the coastal management area. Statistics for Lake County show that during the 1990s, 18,000 new housing units were created, while 11,000 were vacant or demolished. (Our Land, Our Literature—Urban Sprawl; <http://www.bus.edu/ourlandourlit/Environment/Issues>, last viewed 1/10/2006) In a 1999 report, the Open Lands Project identified the amount of land in each of the three counties that is “at risk” for development over the course of the next ten years. The estimates range from a low of 12.35 percent in LaPorte County to a high of 21.86 percent in Lake County. In contrast, the amount of land that has been permanently allocated to green spaces is 2.4 percent in Lake County, 2.72 for LaPorte County, and 5.05 percent in Porter County. (Quality of Life Indicators Report, Northwest Quality of Life Council, September 2004). Currently, the highest percentage of urbanized land lies in Lake County (48.5 percent) followed by Porter County at 28.9 percent and LaPorte at 10.7 percent). Lake County has the highest density of industrial development. (Regional Watershed Management Plan for Lake, Porter, and LaPorte Counties) Today, most new development in the coastal region is occurring inland, away from the Lake Michigan coastline. A number of cities and towns within the coastal region are pursuing redevelopment of areas within their communities. (Indiana 6217 Management Program, 2005)

According to Indiana’s 2004 305(b) report, out of 59 miles of Great Lakes shoreline assessed, 98 percent fully support aquatic life, but only two percent (one mile) support primary recreation such as swimming. PCBs, pathogens, and toxic metals are the primary causes of impairment along the Great Lakes shoreline. Pollution sources include urban runoff and land disposal. (NRDC, Testing the Waters,

<http://www.nrdc.org/water/oceans/ttw/sumind.pdf>) Indiana reports that urban runoff/storm sewers are the second greatest cause of known stream impairments, degrading 649 stream miles in 2004. To put this in perspective, urban runoff/storm sewers in Indiana result in fewer stream mile impairments than agriculture (770 miles), but more than municipal point sources (572 miles). (“Weathering the Storm: Controlling Storm Water Pollution in the Great Lakes,” Environmental Integrity Project, September 2004)

In addition, contaminated water is coming from septic systems in Indiana, where 70 to 80 percent of soils are considered unsuitable for septic systems. Property owners frequently drain water from failed septic systems into nearby ditches and rivers. (http://www.lakemichigan.org/conservation/beach_indiana.asp) In the 1990 Census, the number of septic systems was 18,274 or 11 percent in Lake County; 18,002 or 18 percent in LaPorte County; and 14,444 or 32 percent in Porter County. Unfortunately, the Census no longer tracks septic systems leaving a gap in local data. (<http://www.nwiqlc.org/indicators/Chapt05.pdf>)

The inherent properties of soils in Indiana also are limited with regard to supporting on-site sewage disposal systems. Severe limitations as described in the table below do not necessarily restrict the use of an on-site sewage disposal system, but it is an indication that the soil conditions may not necessarily support a system without modification to the design.

Table 5. Wastewater Disposal Data by County

County	Percent of Households w/ OSDS	Number of Households w/ OSDS	County Area (acres)	Density of Septic Systems (acres/septic system)	Percent of Area w/ Soils having “Severe Limitations” for Septic Systems
Lake	10.0%	18,274	396,962	21.7	96.0%
LaPorte	43.0%	18,002	389,865	21.7	74.0%
Porter	31.0%	14,444	334,267	23.1	83.0%

Sources: 1990 U.S. Census
 Natural Resources Conservation Service Soil Survey

Management measures have been developed for the following six subcategories of sources of urban nonpoint pollution that affect Indiana’s coastal waters:

- Runoff from developing areas
- Runoff from construction sites
- Runoff from existing development
- On-site disposal systems
- General sources (households, commercial, and landscaping)
- Roads, highways, and bridges

The Environmental Consequences section of the PEIS contains a description of the primary pollutants in urban runoff and an analysis of the impacts on water quality. The management measures are designed to prevent the environmental degradation caused by these pollutants.

The implementation of management measures for urban runoff will reduce the generation of nonpoint source pollutants from existing development and control runoff and treat pollutants associated with new development and redevelopment. The measures emphasize the control and removal of sediment and other suspended solids and pollutants entrained in runoff. The measures will minimize the transport of sediment and other pollutants (pesticides, fertilizers, petrochemicals, road salt, wood, garbage, paints and sealers) from new and existing development. The management measures pertaining to new and existing OSDS will reduce nutrient and pathogen loadings by preventing the installation of conventional OSDS in areas where soil absorption systems will not provide adequate treatment of effluents; and requiring that existing OSDS be modified, operated, repaired, and maintained to reduce pollutant loadings. The measures will require that roads, highways, and bridges are sited, constructed, operated, and maintained in order to protect sensitive ecosystems and reduce the generation and runoff of sediment, road salt, and other pollutants.

The implementation of management measures for urban runoff using the State programs and authorities discussed below will result in more consistent and widespread implementation of existing programs. The requirements for Indiana to demonstrate that it has programs in place throughout the 6217 management area to implement the site development, watershed protection and existing development, and the planning, siting and developing measures for roads and highways and the management measures for bridges on state and local roads will provide an increased level of environmental protection by reducing loadings of sediment, suspended solids, road salt, and petrochemicals to coastal waters. Indiana must demonstrate that areas within the 6217 management area not subject to NPDES Phase II MS4 permits will implement the Section 6217(g) new development management measure. The requirements for Indiana to include in its 6217 program management measures for ensuring adequate separation distance between new OSDS and the seasonal high water table, and enforceable mechanisms and policies for denitrifying systems where nitrogen-limited surface waters may be adversely affected by nitrogen loading from OSDS will provide an increased level of environmental protection by reducing loadings of nitrogen and bacteria to coastal waters. Environmental benefits will be enhanced by Indiana meeting the conditions described below.

In order for the urban management measures to be approved, the State must meet the following conditions:

- Within five years, Indiana will include in its program a legal opinion and other supporting documents as described in *Final Administrative Changes to the Coastal Nonpoint Pollution Control Program Guidance* (October 1998) to demonstrate it has adequate back-up authority to implement: (1) the new and site development management

measures; (2) watershed protection and existing development management measures; (3) new and existing OSDS management measures; and (4) roads, highways and bridges management measures throughout the 6217 management area.

Management Measures for Urban Areas

1. New Development and Site Development

These two management measures are discussed together because the State intends to implement them using the same state programs.

The New Development management measure is intended to be applied to control urban runoff and treat associated pollutants generated from new development and redevelopment. The net result of this management measure will be increased watershed protection and a reduction in the erosion, flooding, and pollutants associated with poorly planned development. The Site Development management measure is intended to be applied to all site development activities. Application of this management measure will reduce the generation of nonpoint source pollution and mitigate the impacts of urban runoff through proper design and development of individual sites.

Indiana proposes to address these management measures through a combination of regulatory authorities and voluntary mechanisms backed by enforceable authorities. Subject to the conditions noted, Indiana intends to rely on the following authorities and programs for implementation of the new development and site development management measures:

- 327 IAC 15-5 regulates erosion and sedimentation associated with construction and/or land-disturbing activities. State revisions to 327 IAC 15-5, effective November 2003, met the requirements of Phase II. The Indiana Department of Environmental Management Office of Water Quality, Indiana Department of Natural Resources Soil and Water Conservation Division of Soil Conservation, and Indiana's Soil and Water Conservation Districts cooperatively administer the state's regulation of the NPDES Phase II. In general, urbanized areas subject to NPDES Phase II permits are no longer required to include the new development management measure per NOAA and EPA's 2002 memorandum, Policy Clarification on Overlay of 6217 Coastal Nonpoint Programs with Phase I and II Storm Water Regulations. Currently all three counties and 18 individual cities and towns within the area are designated MS4s subject to the NPDES Phase II storm water program. However, according to a new rule 327 IAC 15-13 (Rule 13), which regulates most MS4 entities, MS4s are able to designate only a portion of their legal boundaries for permit coverage. Therefore, the entire designated MS4 may not have to comply with NPDES Phase II. In addition, within a mapped urbanized area, a community that has a population under 1,000 people is conditionally exempt, as long as the exempted community is not contributing to an impairment in water quality. Currently 23 municipalities in the coastal zone and portions of Lake, Porter and LaPorte counties have been designated MS4s and will be regulated under the program.

- Indiana has several education, public outreach and technical and financial assistance programs which encourage the use of storm water best management practices (BMPs) that are consistent with the new development and site development management measures. For example, Planning with Protecting our Water and Environmental Resources (POWER) follows the Nonpoint Education for Municipal Officials (NEMO) model. Planning with POWER provides technical assistance to local decision makers and educates them on how land use and site development decisions can impact water quality through hands-on workshops and presentations. Several Planning with POWER publications emphasize the need to minimize impervious surface and land disturbance, preserve natural drainage patterns and vegetation and protect areas that provide important water quality benefits. Other efforts include Indiana Department of Natural Resource's (IDNR) Indiana Handbook for Erosion Control in Developing Areas, the Indiana Local Technical Assistance Program, and 327 IAC 15-13's public education and outreach requirements, applicable in MS4s.

- Indiana has proposed that their Water Quality Standards (327 IAC-2) can be used to require implementation of the management measures, as the state's back-up enforceable policy. The State Water Pollution Control Board and the Indiana Department of Environmental Management (IDEM) have the responsibility to enforce the State Water Quality Standards. IDEM has the authority to issue citations or initiate enforcement actions for documented violations of the state water quality standards (327 IAC 2-1). State water quality standards also apply to sites smaller than one acre regardless of whether or not they are required to have a NPDES permit.

Conditions

- Within five years, Indiana will demonstrate it has programs in place to implement the site development measure throughout the 6217 management area and demonstrate that areas within the 6217(g) management area not subject to NPDES Phase II MS4 permits will implement the new development management measure. Also within five years, Indiana will submit a legal opinion and other supporting documents as described in the *Final Administrative Changes to the Coastal Nonpoint Pollution Control Program Guidance* (October 1998) to demonstrate that it has adequate back-up authority to implement the new and site development management measures throughout the 6217 management area.

2. Watershed Protection and Existing Development Management Measures

These two management measures are discussed together because the State intends to implement them using the same state programs.

The Watershed Protection management measure is intended to be applied to new development or redevelopment that generates nonpoint source pollutants. Application of this management measure will reduce the generation of nonpoint source pollutants and mitigate the impacts of urban runoff. The Existing Development management measure is intended to be applied to all urban areas and existing development in order to reduce

surface water runoff pollutant loadings from such areas. Application of this measure will protect or improve surface water quality by developing and implementing watershed management programs.

Subject to the conditions noted, Indiana intends to rely on the following programs and authorities for implementation of the watershed protection and existing development management measures:

- Planning with POWER (see general description of program under New Development and Site Development section above) provides information and technical assistance to decision makers and planners within the coastal community through their outreach program so that they are able to make informed decisions. Planning with POWER is a member of NIRPC's Environmental Management Policy Committee and Watershed Technical Team. Through the technical assistance POWER provides, and other guidance documents, POWER successfully promotes the preservation of natural drainage ways, riparian buffers and other areas that provide water quality benefits, the avoidance of erosion-prone areas and minimization of impervious surfaces. The program has provided 70,000 educational pamphlets for distribution in a major newspaper in the coastal community. Finally, Planning with POWER has been working within Porter County to provide information on developing conservation design ordinances that include minimum open space requirements for major subdivisions, increased open space requirements for areas that are adjacent to sensitive areas, and minimum and maximum lot sizes.

- IDEM operates a Watershed Management Section to assist with voluntary watershed planning efforts throughout the state. To help watershed groups develop watershed plans, IDEM published the *Indiana Watershed Planning Guide* in 2003. The *Guide* lays out the requirements for a watershed plan and how to conduct a watershed assessment, identify goals and opportunities to improve water quality impairments, prioritize problem areas, and establish an implementation plan and schedule for achieving the watershed plan goals.

- Indiana has focused, and will continue to target section 319 and Lake and River Enhancement Program (LARE) projects that occur in the 6217 management area. Section 319(h) provides for watershed assessments and development and implementation of TMDLs and watershed management plans. For example, NIRPC recently developed a watershed management plan for the Calumet-Galien watershed, and submitted the plan to IDEM. NIRPC's watershed plan shares many commonalities with Indiana's coastal nonpoint program. In 2007 the state will focus more watershed management efforts in the 6217 management area during solicitations for 319 proposals in 2007. Priority areas are highlighted on IDEM's website for areas listed with approved Total Maximum Daily Loads (TMDL) and with water bodies listed on the 303(d) list. Much of Indiana's coastal zone falls in these priority areas. IDEM's nonpoint source section 319 grant application requires projects to identify if the proposed activities would occur in Indiana's coastal area. In addition, state coastal program staff will make an effort to work with LARE staff to target projects within the 6217 management area.

- Enforcement and implementation of the voluntary programs discussed above will be through evaluation and assessment of local MS4 Stormwater Quality Programs by IDEM and specific permit requirements that are assigned to projects under the jurisdiction of the IDEM and IDNR. Pursuant to NOAA and EPA's 2002 NPDES Phase II Memo, Indiana is exempt from implementing the existing development measure in designated MS4 areas subject to the NPDES Phase II regulations. Currently 23 municipalities within the coastal nonpoint boundary and portions of several unincorporated portions of the three counties must comply with MS4 requirements. Therefore, NOAA and EPA cannot exempt any areas from the existing development and site development management measures, until the state has completed its NPDES Phase II boundary.

- The State has proposed using their Water Quality Standards (327 IAC-2) to require implementation of the watershed protection and existing development management measures. IDEM has the authority to issue citations or initiate enforcement actions for documented violations of the State Water Quality Standards (327 IAC 2-1). State water quality standards also apply to sites smaller than one acre regardless of whether or not they are required to have an NPDES permit.

Conditions

- Within five years, Indiana will demonstrate that it has programs in place to identify priority local and/or regional watershed pollutant reduction opportunities and develop a schedule for implementing appropriate controls. Within five years, Indiana will submit a legal opinion and other supporting documents as described in the *Final Administrative Changes to the Coastal Nonpoint Pollution Control Program Guidance* (October 1998) to demonstrate that it has adequate back-up authority to implement the watershed protection and existing development management measures throughout the 6217 management area.

3. Construction Site Erosion and Sediment Control and Construction Site Chemical Control

These two management measures are discussed together because the State intends to implement them using the same state programs.

The Construction Site Erosion and Sediment Control management measure is intended to be applied to all construction activities on sites less than five acres in areas that do not have an NPDES permit in order to control erosion and sediment loss from those sites. The Construction Site Chemical Control management measure is intended to be applied to all construction sites less than five acres in area. This measure does not apply to: (1) construction of a detached single family home on a site of one-half acre or more; (2) construction that does not disturb over 5,000 square feet of land on a site. Application of the Construction Site Erosion and Sediment Control management measure will minimize the sediment being transported outside the perimeter of a construction site

by reducing erosion and retaining sediment onsite. Application of the Construction Site Chemical Control management measure will prevent the generation of pollutants at construction sites due to improper handling and usage, and prevent their movement from the construction site.

Effective December 20, 2002, NOAA and EPA have determined that the activities covered by the Construction Site Erosion and Sediment Control and Construction Site Chemical Control management measures are no longer subject to the requirements of the CZARA Section 6217 Coastal Nonpoint Pollution Control Program due to their coverage in the NPDES storm water permit program (Phases I and II). NPDES storm water regulations for industrial activities on construction sites apply nationwide and therefore throughout the coastal management areas of states and territories.

4. New Onsite Disposal Systems Management Measure and Operating Onsite Disposal Systems Management Measure

These two management measures are discussed together because the State intends to implement them using the same state programs.

The New Onsite Disposal System (OSDS) management measure is intended to be applied to all new OSDS including package plants and small-scale or regional treatment facilities not covered by NPDES regulations in order to manage the siting, design, installation, and operation and maintenance of all such OSDS. Application of this measure will prevent the installation of conventional OSDS in areas where soil absorption systems will not provide adequate treatment of effluents prior to entry into surface or ground waters.

The Operating Onsite Disposal Systems management measure is intended to be applied to all operating OSDS. This measure will minimize pollutant loadings from operating OSDS by requiring that they be modified, operated, repaired, and maintained to reduce nutrient and pathogen loadings in order to protect and enhance surface waters.

Subject to the conditions noted, Indiana intends to rely on the following programs and authorities for implementation of the New and Operating Onsite Disposal Systems management measures:

- Indiana's regulations for Residential Sewage Disposal (410 IAC 6-8.1) and Commercial Sewage Disposal (410 IAC 6-10) establish a permitting program for the construction and installation of OSDS. The regulations and standards require site investigations prior to construction and minimum separation distances between OSDS and wells, water supplies, lakes, streams, drainage tiles, buildings, and property lines. The rules specify that soil absorption fields will be sized in relation to soil permeability and the number of bedrooms. However, the regulations and standards do not establish minimum vertical separation distances to the groundwater table for conventional residential systems. Other design considerations include specific setbacks associated with the location of the system. The Indiana State Department of Health (ISDH) and

local health departments are responsible for the inspection of OSDS. Agents of the ISDH and local health departments have the authority to enter all properties to determine compliance with 410 IAC 6-8.1.

- ISDH provides training sessions for local health officials on state requirements, systems design, and soil evaluation. Training is also provided for OSDS installers and designers.

- The State has proposed using their Water Quality Standards (327 IAC-2) to require implementation of the New and Existing OSDS management measures. IDEM has the authority to issue citations or initiate enforcement actions for documented violations of the State Water Quality Standards (327 IAC 2-1). State water quality standards also apply to sites smaller than one acre regardless of whether or not they are required to have an NPDES permit.

Condition

- Within five years, Indiana will include in its program management measures and enforceable mechanisms and policies for inspection of existing OSDS. Within five years, Indiana will include in its program management measures and enforceable mechanisms and policies for protective separation distances to groundwater in conformity with the 6217 (g) guidance for new OSDS. Within five years, Indiana will include in its program management measures and enforceable mechanisms and policies for denitrifying systems where nitrogen-limited surface waters may be adversely affected by nitrogen loading from OSDS, in conformity with the 6217(g) guidance for new and operating OSDS.

5. Pollution Prevention Management Measure

This management measure is intended to be applied to reduce the generation of nonpoint source pollution throughout the section 6217 management area by preventing and reducing pollutant loadings generated from a variety of activities within urban areas not addressed by other management measures in this source category. It is meant to ensure that communities implement solutions that may result in behavioral changes that reduce the generation of pollutants, thus reducing water quality impacts from these sources.

This measure does not require enforceable policies. Indiana has several education efforts underway to implement this management measure. These efforts include Planning with POWER, the Household Hazardous Waste Collection Program, and Perdue University Cooperative Extension Service programs addressing turf management and OSDS among other topics. Indiana's Office of Pollution Prevention and Technical Assistance also offers grant programs and guidance in pollution prevention. For example, the Office has produced brochures on pollution prevention BMPs for several types of small businesses including landscapers, marinas, and service stations. Many of the BMPs included in these brochures are designed to minimize nonpoint source

pollution. In addition, under IC 13-21-3, Lake, LaPorte, and Porter Counties have all formed and are independently operating their own Solid Waste Management Districts.

6. Management Measures for Roads, Highways and Bridges: Planning, Siting and Developing Roads and Highways; Siting, Designing and Maintaining Bridges; Roads, Highway and Bridge Operation and Maintenance; Road Highway and Bridge Runoff Systems

These four management measures pertaining to roads, highways, and bridges are discussed together because the State intends to implement them using the same state program authorities.

The management measure for Planning, Siting, and Developing Roads and Highways is intended to be applied to site development and land disturbing activities for new, relocated, and reconstructed roads and highways in order to reduce the generation of nonpoint source pollutants and to mitigate the impacts of urban runoff from such activities.

The management measure for Designing and Maintaining Bridges is intended to be applied to new, relocated, and rehabilitated bridge structures in order to control erosion, streambed scouring, and surface runoff from such activities. This will ensure that bridges will not be sited over sensitive waters and tributaries in the coastal zone.

The management measure for Operation and Maintenance is intended to be applied to existing, restored, and rehabilitated roads, highways, and bridges. This measure will ensure that pollutants generated by operation and maintenance procedures for roads, highways, and bridges and from sparsely vegetated areas, cracked pavement, potholes, and poorly operating urban runoff control structures, are minimized through the development and implementation of a program that includes standard operating procedures and maintenance guidelines.

The management measure for Road, Highway, and Bridge Runoff Systems is intended to be applied to existing, resurfaced, restored, and rehabilitated roads, highways, and bridges that contribute to adverse impacts to surface waters. Surface waters will be protected through the use of runoff management systems such as vegetated filter strips, grassed swales, detention basins, constructed wetlands and infiltration trenches.

Subject to the conditions noted, Indiana intends to rely on the following programs and authorities for implementation of the roads, highways and bridges management measures.

- The Indiana Department of Transportation and many municipalities within the 6217 management area are designated MS4s under the NPDES Phase II storm water management program. Effective December 20, 2002, NOAA and EPA have determined that in designated MS4 areas, the road highway and bridge operation and maintenance and runoff system management measures are no longer subject to requirements of

CZARA due to their coverage in NPDES storm water permit program (Phase I and II). Therefore, Indiana is exempt from implementing the road, highway and bridge operation and maintenance and runoff system measures for state roads and local roads with designated MS4s.

- Under 327 IAC 2-6, IDEM regulates spills.

- The State has proposed using their Water Quality Standards (327 IAC-2) to require implementation of the road, highway and bridge management measures. IDEM has the authority to issue citations or initiate enforcement actions for documented violations of the State Water Quality Standards (327 IAC 2-1). State water quality standards also apply to sites smaller than one acre regardless of whether or not they are required to have an NPDES permit.

- Indiana proposes to use several non-regulatory methods to implement the roads, highways, and bridges management measures. They include Planning with POWER, which promotes land use and site development decisions to protect water quality through conducting presentations and workshops to local decision makers. Planning with POWER is a member of NIRPC's Environmental Management Policy Committee (EMPC). The EMPC reports/provides information to the NIRPC commissioners. NIRPC has been designated the Metropolitan Planning Organization for northwestern Indiana and is responsible together with state departments of transportation and public transit operators for carrying out the transportation planning process for urbanized areas. Indiana also uses guidance documents such as the *Indiana Handbook for Erosion Control for Developing Areas* and "The Relationship between Land Use Decision and the Impacts on our Water and Natural Resources." Both of these documents promote siting and design principles that are consistent with the planning, siting, and development management measures. The erosion control handbook can address the operation and maintenance and runoff measures for local roads.

Indiana is also proposing to use the Local Technical Assistance Program (LTAP), which provides technical assistance and training to the highway, road and street departments of all counties, cities and towns in Indiana through Purdue University. LTAP provides topical workshops and seminars on subject pertaining to roads and streets, regular newsletters, and other periodic publications. Although the current workshop topics listed on LTAP's do not specifically address the 6217(g) requirements for roads, highways and bridges, the State may use this opportunity to address measures from a public outreach and education standpoint.

Conditions

- Within five years, Indiana will demonstrate it has programs in place to implement the planning, siting and developing management measure for roads and highways and bridges for state and local roads. Also within five years, Indiana will develop programs to address the operation and maintenance and runoff control measures for local roads. Finally, within five years, Indiana will submit a legal opinion and other

supporting documents as described in the *Final Administrative Changes to the Coastal Nonpoint Pollution Control Program Guidance* (October 1998) to demonstrate it has adequate back-up authority to implement all roads, highways and bridge management measures throughout the 6217 management area.

7. *Management Measures for Roads, Highways and Bridges: Road, Highway and Bridge Construction Projects and Road Highway and Bridge Construction Site Chemical Control*

The management measure for Construction Projects is intended to be applied to new, replaced, restored, and rehabilitated road, highway, and bridge construction projects in order to control erosion and offsite movement of sediment from such projects sites. This measure emphasized the importance of erosion and sediment control plans as effective methods in mitigating erosion problems at construction sites before any land-disturbing activity begins.

The management measure for Construction Site Chemical Control is intended to be applied to new, resurfaced, restored, and rehabilitated road, highway, and bridge construction projects in order to reduce toxic and nutrient loadings from such project sites. The objective of this measure is to safeguard surface and ground waters from toxic spills and hazardous loadings at construction sites from equipment and fuel storage, and also from road sale, fertilizers and pesticides stored at maintenance areas.

Indiana's program is exempt from the Road, Highway and Bridges Construction Projects and Construction Site Chemical Control management measures because these areas are being addressed through the NPDES Phase II Storm Water Program. Effective December 20, 2002, NOAA and EPA determined that these activities are no longer subject to requirements of CZARA Section 6217 Coastal Nonpoint Pollution Control Program due to their coverage in the NPDES storm water permit program (Phase I and II). NPDES storm water regulations for industrial activities on construction sites apply nationwide and therefore throughout the coastal management areas of states and territories.

4.A.1.c Forestry Nonpoint Pollution Source Category

Indiana has provided sufficient justification to support a categorical exclusion of forestry from the coastal nonpoint program. Section 3.B of this EA discusses forestry activities in Indiana.

The forestry source category was excluded because the State has demonstrated that while forestry activities in Indiana's 6217 management area do occur, they do not and are not expected to cause significant adverse effects to either human health or living coastal resources. Commercial timber harvesting is rare. No major tracks of commercial forest land exist within the 6217 boundary. Most of the forest land is owned by individuals in low-density suburban settings that have no desire to log. The two small sawmills within this management area receive all of their timber from outside of the

coastal nonpoint management area. In addition, forestry is not identified as a source of impairment for waters within the 6217 boundary in the state's recent 305(b) report findings.

4.A.1.d Marinas and Recreational Boating Nonpoint Pollution Source Category

Section 3.B of this EA provides information on the extent of marina activities in Indiana. While the number of marinas in Indiana is relatively small, the extent of recreational boating activities poses a threat to coastal waters in certain areas. Potential nonpoint source problems can be attributed to poor marina siting and design, maintenance dredging, routine marina operation, and boat operations. Pollutants from the operation and maintenance of marinas can also combine with other upland sources such as stormwater runoff and leachate from septic systems to cause significant water quality problems in localized areas. Pollutants such as heavy metals, toxins, hydrocarbons, bacteria, and nutrients can enter coastal waters as a result of marina and boating activities.

The recently released second National Coastal Condition Report found that “the highest percentage of beaches closed or under advisory occurred in Indiana.” Seventy-one percent of Indiana's Lake Michigan beaches reported at least one beach notification due to elevated bacteria levels. The report found that boats accounted for five percent of the beach advisories/closures for all of the Great Lakes. In 2000, over 1.7 million people used Indiana's Lake Michigan beaches, which are compressed into 45 miles of coast.

Management measures have been developed for the following five subcategories of sources of nonpoint pollution from marinas and recreational boating that affect Indiana's waters:

- Poorly flushed waterways where dissolved oxygen deficiencies exist;
- Pollutants discharged from boats;
- Pollutants transported in storm water runoff from parking lots, roofs, and other impervious surfaces;
- The physical alternation or destruction of wetlands and of shellfish and other bottom dwelling communities during the construction of marinas, ramps, and related facilities; and
- Pollutants generated from boat maintenance activities on land and in the water.

Fifteen management measures specified for this source category are grouped under two broad headings: (1) siting and design, and (2) operation and maintenance. Effective implementation of these measures will avoid impacts associated with marina siting and prevent the introduction of nonpoint source pollutants.

The six main impacts from the pollutants associated with marina and boating activities that affect water quality include: toxicity in the water column; increased pollutant levels in aquatic organisms; increased pollutant levels in sediments; increased

levels of pathogen indicators; disruption of sediment and habitat; and shoaling and shoreline erosion. The Environmental Consequences section of the PEIS contains an analysis of the impacts of these pollutants on water quality. The management measures are designed to prevent the environmental degradation caused by these pollutants.

The implementation of management measures for marinas and recreational boating will reduce the runoff of pollutants to marine waters and mitigate the impacts associated with the siting and design and the operation and maintenance of new and expanding marinas. Management measures for siting and design will control stormwater runoff from marina parking lots and hull maintenance areas thereby reducing the amount of suspended solids, oil, and grease entering marina waters. The measures will protect wetlands, shellfish beds and submerged aquatic vegetation during marina construction; will provide for water quality assessments to determine whether the marina design will affect water quality; will ensure proper circulation for flushing of the marina basin; and will reduce turbidity and shoaling by protecting against shoreline erosion. The measures for operation and maintenance emphasize the proper disposal of antifreeze, solvents, and paints. Restrictions on boating activities in shallow non-marina waters will protect shallow-water habitats and prevent resuspension of sediments and damage to submerged aquatic vegetation.

The environmental benefits that result from the implementation of management measures based on the existing state programs and authorities are discussed below.

Management Measures for Marinas and Recreational Boating

Siting and Design

1. Marina Flushing Management Measure

This management measure is intended to be applied to new and expanding marinas. Initial site selection is the most important factor influencing the long-term impact a marina will have on water quality within the immediate vicinity of the marina.

2. Water Quality Assessment Management Measure

This management measure is intended to be applied to new and expanding marinas. Water quality assessments such as modeling of flushing rates, measuring water quality characteristics, and monitoring may be used to determine whether a proposed marina design will adversely affect water quality.

3. Habitat Assessment Management Measure

This management measure is intended to be applied to new and expanding marinas where site changes may impact on wetlands, shellfish beds, submerged aquatic vegetation, or other important habitats. Proper siting and design can reduce short-term

impacts (habitat destruction during construction) and long-term impacts (water quality, sedimentation, circulation) on the surrounding environment.

4. *Shoreline Stabilization Management Measure*

This management measure is intended to be applied to new and expanding marinas where site changes may result in shoreline erosion. This measure has been shown to be effective in mitigating shoreline erosion and the resulting turbidity and shoaling.

5. *Storm Water Runoff Management Measure*

This management measure is intended to be applied to new and expanding marinas, and to existing marinas for at least the hull maintenance areas. Pollutants can be controlled through three techniques: filtration/infiltration; retention/detention; and physical separation.

6. *Fueling Station Design Management Measure*

This management measure is intended to be applied to new and expanding marinas where fueling stations are to be added or moved. Marinas should be located and designed and a spill contingency plan developed so that pollutants released during fueling operations can be contained in a limited area to minimize spread through and out of the marina.

7. *Sewage Facility Management Measure*

This management measure is intended to be applied to new and expanding marinas in areas where adequate marine sewage collection facilities do not exist. The availability and use of these systems will reduce discharges of sanitary wastes to coastal waters.

Subject to the condition noted, Indiana intends to rely on the following programs and authorities for implementation of the marina siting and design management measures.

- Indiana addresses the marina siting and design, habitat assessment and marina flushing measures through the Navigable Waters Regulations (312 IAC 6-4). Under this regulation, the State requires that all new and expanding marinas obtain a license from the Natural Resources Commission. The Navigable Waterways Permit Program reviews marina plans to ensure the marina does not cause significant harm to the environment. The Division of Fish and Wildlife and Division of Natural Preserves review the proposed plans for adverse impacts to habitat and aquatic resources. The Division of Water evaluates the project for physical and hydrologic impacts, including adequate marina flushing. All Divisions can place Special Provisions on the permit to address any environmental concerns identified during the permit review process.

- Indiana addresses the water quality assessment measure through the Section 401 water quality certification review process. Under 312 IAC 2, the IDEM reviews marina plans for consistency with state water quality standards. IDEM may condition the projects, including requiring additional monitoring or water quality studies, to ensure that water quality impairments do not occur.

- The Indiana State Fire Marshal's Office regulates marine fueling facilities under 627 IAC 22-23, including facility construction, fuel storage, handling, and dispensing.

- Indiana satisfies the sewage facility management measure through its Navigable Waters Regulations (312 IAC 6-4-3). Under the regulations, all new or expanding marinas must provide an operating sewage pumpout facility for their patrons. Marinas can be exempted from this requirement only if they enter into a binding agreement with a nearby marina to provide pumpout services to their patrons and the nearby marina's pumpout has the capacity to accept additional users.

In order for the Marina Siting and Design management measures to be approved, the State must meet the following condition:

Condition

- Within five years, Indiana will demonstrate that it has programs in place to implement the shoreline stabilization, storm water runoff, and fueling station design management measures.

Operation and Maintenance

1. Solid Waste Management Measure

This management measure is intended to be applied to new and expanding marinas. If adequate disposal facilities are available there is less likelihood for disposal of solid waste in surface waters or on shore where the material may wash into the waters.

2. Fish Waste Management Measure

This management measure is intended to be applied to marinas where fish waste is determined to be a source of water pollution. Marina patrons and employees are more likely to properly dispose of fish waste if told of potential environmental effects and provided adequate and convenient disposal facilities.

3. Liquid Material Management Measure

This management measure is intended to be applied to marinas where liquid materials used in the maintenance, repair, or operation of boats are stored. This measure minimizes

entry of potentially harmful liquid materials into marina and surface waters through proper storage and disposal.

4. *Petroleum Control Management Measure*

This management measure is intended to be applied to boats that have inboard fuel tanks. The amount of fuel and oil entering marina and surface waters can be reduced by using devices such as automatic shut-off nozzles, fuel/air separators, and oil-absorbing bilge pads.

5. *Boat Cleaning Management Measure*

This management measure is intended to be applied to marinas where boat topsides are cleaned and marinas where hull scrubbing in the water has been shown to result in water quality problems. This measure minimizes the use and release of potentially harmful cleaners and bottom paints to marina and surface waters.

6. *Public Education Management Measure*

This management measure is intended to be applied to all environmental control authorities in areas where marinas are located. The best method of preventing pollution from marinas and boating activities is to educate the public about the causes and effects of pollution and methods to prevent it.

7. *Maintenance of Sewage Facilities Management Measure*

This management measure is intended to be applied to marinas where marine sewage disposal facilities exist. This measure is effective in preventing failure of pumpouts and discourages improper disposal of sanitary wastes thus reducing the release of untreated sewage into marina and surface waters.

8. *Boat Operation Management Measure (applies to boating only)*

This management measure is intended to be applied in non-marina surface water where evidence indicates that boating activities are impacting shallow-water habitats. Boat operation in shallow water can resuspend bottom sediment, increase turbidity, and damage submerged aquatic vegetation. This management measure will minimize damage to sensitive habitats by excluding boats from shallow-water areas not suitable for boat traffic because of their ecological importance. Establishing no-wake zones will minimize the indirect impacts of increased turbidity.

Subject to the condition noted, Indiana intends to rely on the following programs and authorities for implementation of the Boat Operation and Maintenance management measures.

- Under Indiana law IC 14-15-2-8, it is illegal to discharge waste, oil, trash or other toxic substances into Indiana state waters. Disposal of fish waste consistent with the (g) guidance is specifically regulated under IC 14-22-9-6 which states that any wastes occurring from the catching, curing, cleaning or shipping of fish shall be done in such a manner as to not pollute the water.

- Under State law 312 IAC-6-4-3, all new or expanding marinas must provide a sewage pumpout unless they have a binding agreement with a nearby marina to provide pumpout services to their patrons as well.

- The DNR Division of Law Enforcement offers a boater education program that will help the state meet the public education measure and several other operation and maintenance measures. The program, which is offered both on-line and in classrooms instructs boaters on proper boat operation and maintenance. The program contains an entire chapter dedicated to boaters' and personal watercraft operators' responsibility to the environment, including solid and liquid wastes, trash, and use of petroleum products such as promptly cleaning up any oil or other hazard material spills, and recycling when possible. In addition, IDEM's Office of Pollution Prevention and Technical Assistance has published a BMP brochure for marina owners that discusses boat cleaning and fueling practices, as well as many other BMPs consistent with the (g) guidance.

- Under Indiana State Law IC 14-15-3-17, boat speeds are restricted to idle within 200 feet of the Lake Michigan shore. The only boat operations permitted in the near-shore zone are trolling and entering or leaving a dock, pier or wharf. In addition, the DNR Division of Law Enforcement boater education courses specifically advise personal watercraft operators not to operate in waters less than 24 inches deep or in submerged grassbeds, reeds, or other sensitive habitats, and to avoid creating a wake at all times to prevent shoreline erosion.

In order for the Boat Operation and Maintenance management measures to be approved, the State must meet the following condition:

Condition

- Within five years, Indiana will demonstrate that it has programs in place to implement the petroleum control and boat cleaning management measures.

4.A.1.e Hydromodification Nonpoint Pollution Source Category

Any physical alteration of a stream, altering flow is "hydromodification." Examples include channelization, damming, dredging, changing floodplain functions, increasing impervious surface in the watershed, removing riparian vegetation and modifying stream banks. Hydromodification includes short and long term water quality degradation, accelerated erosion and sedimentation, destruction of aquatic habitat, and impairment or elimination of certain beneficial functions performed by Indiana's waters.

Lake Michigan waters are affected by changes to natural tributaries and by man-made drainage and commercial channels. Historically, agricultural activities were the most prevalent source of hydromodification, however, as urbanization has occurred this has begun to change. Currently, development trends show populations shifts away from urban areas bringing new development further south and east into land that was previously open or used for agricultural purposes. (Watershed Management Plan for Lake, Porter, and LaPorte Counties, October 2005) According to Indiana's most recent *Section 305 Integrated Water Quality Monitoring and Assessment Report*, hydromodification activities contribute to 300 miles of impaired streams in 2004. The largest impact was from channelization at 222 stream miles, distantly followed by flow regulation/modification (63 stream miles), dredging (46 stream miles), dam construction (16 stream miles), and upstream impoundment (6 stream miles). There are a total of 33 dams in the Little Calumet-Galien Watershed. The operation of dams can generate nonpoint pollution from the controlled release of water including increased loads of organic materials, phosphorus, and nitrogen; changes in pH; increased erosion of streambeds by scouring the channel below the dam; and changes in water temperature downstream.

Management measures have been developed for the following three subcategories of sources of nonpoint pollution from hydromodification activities that affect Indiana's coastal waters:

- Channelization and channel modification
- Dams
- Streambank and shoreline erosion

The main effects of the pollutants associated with hydromodification activities that affect water quality include: changed sediment supply, reduced availability of fresh water, accelerated delivery of pollutants, loss of surface water contact with overbank areas, loss or alteration of wetlands and instream and riparian habitats, blocked or impeded migration routes of fish, and increased sediment and nutrient levels. The Environmental Consequences section of the PEIS contains an analysis of the impacts of these pollutants on water quality. The management measures are designed to prevent the environmental degradation caused by these pollutants.

The implementation of management measures for hydromodification activities are intended to prevent degradation of the physical and chemical characteristics of surface waters and detrimental changes to instream and riparian habitat resulting from the transport of pollutants and from alternations in the supply of sediment and freshwater. The measures will minimize erosion, control sediment runoff, prevent downstream contamination from pesticides, petrochemicals, fertilizers, lime, cement, and construction chemicals, and protect the quality of water and aquatic habitat in reservoirs. The measures will also protect eroding streambanks and shorelines that constitute a nonpoint pollution source that contributes to increased turbidity and nutrient levels in coastal waters.

The implementation of management measures for hydromodification activities using the State programs and authorities discussed below will result in more consistent and widespread implementation of the existing programs through fulfillment of the requirement for Indiana to include in its program management measures in conformity with the 6217(g) guidance and to develop a strategy to implement the measures throughout the management area.

These management measures are discussed together because the State intends to implement them using the following programs and authorities:

Management Measures for Hydromodification

Channelization and Channel Modification

1. Management Measures for Physical and Chemical Characteristics of Surface Waters and Instream and Riparian Habitat Restoration

The management measure for Physical and Chemical Characteristics of Surface Waters is intended to be applied to public and private channelization and channel modification activities in order to prevent the degradation of physical and chemical characteristics of surface waters from such activities. The purpose of this management measure is to ensure that the planning process for new hydromodification projects addresses changes to physical and chemical characteristics of surface waters that may occur as a result of the proposed work.

The management measure for Instream and Riparian Habitat Restoration pertains to surface waters where channelization and channel modification have altered or have the potential to alter instream and riparian habitat such that historically present fish or wildlife are adversely affected. The purpose of this management measure is to correct or prevent detrimental changes to instream and riparian habitat from the impacts of channelization and channel modification projects.

Streambank and Shoreline Erosion

1. Management Measure for Eroding Streambanks and Shorelines

This management measure is intended to be applied to eroding shorelines in coastal bays, and to eroding streambanks in coastal rivers and creeks. This measure applies only to eroding shorelines and streambanks that constitute a nonpoint source pollution problem in surface waters. The application of vegetative or engineering stabilization techniques is effective in controlling coastal erosion. These techniques also serve to halt the destruction of wetlands and riparian areas.

Dams

1. Management Measures for Erosion and Sediment Control, Chemical and Pollutant Control, and Protection of Surface Water Quality and Instream and Riparian Habitat

The management measure for Erosion and Sediment Control is intended to be applied to the construction of new dams, as well as to construction activities associated with the maintenance of dams. The purpose of this measure is to prevent sediment from entering surface waters during the construction or maintenance of dams by minimizing erosion and maximizing sediment retention onsite to reduce impacts on surface water quality.

The management measure for Chemical and Pollutant Control is intended to be applied to the construction of new dams, as well as to construction activities associated with the maintenance of dams. The purpose of this management measure is to prevent downstream construction from pollutants such as pesticides, petrochemicals, fertilizers, lime, cement, and construction chemicals. This measure will provide for retention onsite of the soluble pollutants that are not easily controlled by erosion and sediment control practices.

The management measure for Protection of Surface Water Quality and Instream and Riparian Habitat is intended to be applied to dam operations that result in the loss of desirable surface water quality, and of desirable instream and riparian habitat. The purpose of this management measure is to protect the quality of surface waters and aquatic habitat in reservoirs and in the downstream portions of river and streams that are influenced by the quality of water contained in the releases (tailwaters) from reservoir impoundments.

- Several regulatory programs, including the Indiana Navigable Waters Act (IC-14-29-1), Construction of Channels Act (IC-14-29-4), and 401 Water Quality Certification can be used to implement the channelization and channel modification measures. Under the first two authorities, the Indiana DNR reviews channelization, dam, and other hydromodification projects for potential environmental impacts. The Division of Fish and Wildlife and Division of Natural Preserves review the proposed plans for adverse impacts to habitat and aquatic resources. The Division of Water evaluates the project for physical and hydrologic impacts. All Divisions are able to place Special Provisions on the permit to address any environmental concerns they may have to ensure that potential impacts to water quality and instream and riparian habitat are minimized. IDEM, through its 401 Water Quality Certification process, also assesses potential instream water quality impacts.

- The IDNR Division of Water has produced the *Indiana Drainage Handbook* which recommends best management practices for channel modification projects. The Handbook is intended to guide contractors in designing and constructing hydromodification projects. IDNR agency staff also consults the *Handbook* when

reviewing projects. Practices listed in the *Handbook* include stabilizing shoreline erosion through vegetative means, controlling sedimentation in the streambed, and preserving instream and riparian habitat.

Effective December 20, 2002, NOAA and EPA have determined that the dam management measures for erosion and sediment control and chemical and pollutant control are no longer subject to requirements of CZARA due to their coverage in the NPDES storm water permit program (Phases I and II). State coastal nonpoint control programs are no longer required to include these management measures because the NPDES storm water regulations for industrial activities on construction sites apply nationwide and therefore throughout the 6217 management areas of States and Territories.

Conditions

- Within five years, Indiana will develop a process to improve surface water quality and instream and riparian habitat through the operation and maintenance of existing modified channels. Also with five years, the State will develop programs for the protection of surface water quality and in instream and riparian habitat during the operation of dams and implement the management measure for eroding streambanks and shorelines. Finally, within five years Indiana will submit a legal opinion and other supporting documents as described in the *Final Administrative Changes to the Coastal Nonpoint Pollution Control Program Guidance* (October 1998) to demonstrate that it has adequate back-up authority to implement the hydromodification management measures throughout the 6217 management area.

4.A.1.f Wetlands, Riparian Areas, and Vegetated Treatment Systems

In the late 1700s, 24 percent of Indiana was covered by wetlands. In 1985, IDNR and the U.S. Fish and Wildlife Service sponsored the mapping of all wetlands statewide. By the mid-1980s, wetlands had been reduced to approximately 3.5 percent of the state's total surface area. (<http://www.nwiqlc.org/indicators/Chapt05.pdf>) According to a 1991 analysis of these maps, Indiana retained 813,000 acres of wetland habitat, or approximately 15 percent of the wetlands that existed prior to settlement. Historical wetlands estimates based on NRCS hydric soils determinations for Lake, Porter, and LaPorte Counties place one-time wetlands acreage at approximately 360,000 acres. The 1986 inventory places the current amount of wetlands at approximately 63,000 acres, or about 82.5 percent loss of previous wetlands acreages in the region. In the overall Little Calumet-Galien Watershed, 11 percent, or 65-68 square miles of the total land area is covered by 7,242 wetlands. Of that, about 40 percent are one acre or smaller; 48 percent are one acre to 10 acres; 10 percent range from 10 to 40 acres; and 2 percent are greater than 40 acres. Wetland loss in the counties due to hydromodifications and urban development is significant. (Watershed Management Plan for Lake, Porter, and LaPorte Counties, October 2005).

When hydrologic changes or pollutants exceed the natural assimilative capacity of wetlands and riparian areas, the systems become stressed and may be degraded or destroyed to the point that the wetlands and riparian areas themselves become sources of nonpoint pollution in coastal waters. A degraded wetland has less ability to remove pollutants and can deliver increased amounts of sediment, nutrients, and other pollutants to the adjoining waterbody. Indiana's 2004 305(b) Water Quality Assessment Report did not identify the drainage and filling of wetlands as the source of impairment to any waters in the state.

Management measures for wetlands, riparian areas, and vegetated treatment systems address multiple categories of nonpoint source pollution that affect coastal waters, including the five specific categories of sources previously addressed in this chapter. These measures promote the protection and restoration of wetlands and riparian areas and the use of vegetated treatment systems as means to control the nonpoint pollution emanating from such sources. Management measures are provided for three categories:

- Protection of wetlands and riparian areas
- Restoration of wetlands and riparian areas
- Promoting the use of vegetated treatment systems, such as constructed wetlands and vegetated filter systems

The Environmental Consequences section of the PEIS contains a discussion of the functions and importance of wetlands, riparian areas, vegetated buffers, and vegetated treatments systems.

The intent of the management measures for wetlands, riparian areas and vegetated treatment systems is to ensure that the nonpoint source pollution benefits of protecting and restoring wetlands and riparian areas, and of constructing vegetated treatment systems, will be considered in all coastal watershed water pollution control activities. The implementation of management measures will protect and restore the full range of functions for wetlands and riparian areas serving a nonpoint source abatement function and ensure that they do not become a significant nonpoint source due to degradation.

The environmental benefits that result from the implementation of management measures for wetlands, riparian areas, and vegetated treatment systems using the existing programs and authorities discussed below will include more protection and restoration for wetlands and riparian areas and a more consistent and widespread implementation of the existing programs through fulfillment of the requirement for Indiana to demonstrate its ability to implement the management measures throughout the 6217 management area.

Management Measures for Wetlands, Riparian Areas and Vegetated Treatment Systems

1. Management Measure for Protection of Wetlands and Riparian Areas

This management measure is intended to be applied to protect wetlands and riparian areas from adverse nonpoint source pollution impacts. The purpose is to protect the existing water quality improvement functions of wetlands and riparian areas as a component of nonpoint source programs. The overall approach is to establish a set of practices that maintains functions of wetlands and riparian areas and prevents adverse impacts to areas serving a nonpoint source pollution abatement function. These pollution abatement functions are most effective as part of an integrated land management system that combines nutrient, sediment, and soil erosion control.

2. Management Measure for Restoration of Wetlands and Riparian Areas

This management measure is intended to be applied to restore the full range of wetlands and riparian functions in areas where the systems have been degraded and destroyed and where they can serve a significant nonpoint source abatement function. This management measure should be used in conjunction with other measures addressing the adjacent land and water use activities in order to protect coastal water quality.

3. Management Measure for Vegetated Treatment Systems

This management measure is intended to be applied in cases where engineered systems of wetlands or vegetated treatment systems can treat nonpoint source pollution. Construction wetlands and vegetated filter strips can serve a significant nonpoint source pollution abatement function. Vegetated filter strips can improve water quality by removing nutrients, sediment, suspended solids, and pesticides. Constructed wetlands can provide limited ecological benefits in addition to their nonpoint source control functions.

The management measures are discussed together because the State intends to implement them using the following programs and authorities, subject to the conditions noted:

- Indiana DNR has the authority to review projects that generally have the potential to impact wetland and riparian areas under the Indiana Flood Control Act (IC 14-28-1), the Lakes Preservation Act (IC 14-26-2), the Lowering of Ten Acre Lakes Act (IC-14-26-5), and the Indiana Navigable Waterways Act (IC 14-29-1). The language is not specific with regard to the preservation or restoration of wetland or riparian lands, but in general prohibits structures that are detrimental to botanical resources or otherwise cause harm to the environment.

- IDEM is able to review projects for wetland and riparian impacts as it performs water quality certifications under Section 401 of the Clean Water Act (327 IAC 2-1). When water quality certification is granted, IDEM requires mitigation if wetlands are lost; typically at a 3:1 ratio.

- Indiana has several voluntary and incentive programs such as the broad-scale Calumet-Galien watershed plan which will serve as the foundation for developing more

specific subwatershed plans and incorporate the wetland and riparian areas management measures. The State has provided descriptions of existing subwatershed plans, such as the one for Coffee Creek, demonstrating that the plan has identified and resulted in several riparian and watershed planning efforts within the 6217 management area.

- The State has several publications, best management practice manuals and outreach/technical assistance programs that promote vegetated swales, constructed wetlands, buffer strips and other vegetated treatment methods to control polluted runoff. Indiana's Planning with POWER program has developed several publications that demonstrate how vegetated treatment systems like rain gardens and constructed wetlands can reduce nonpoint source pollution. NRCS's FOTG for agricultural land also incorporates best management practices consistent with the vegetated treatment system (g) measure.

Conditions

- Within five years, Indiana will demonstrate that it has programs in place for the protection and restoration of wetland and riparian areas. Also, within five years, Indiana will submit a legal opinion and other supporting documents as described in the *Final Administrative Changes to the Coastal Nonpoint Pollution Control Program Guidance* (October 1998) to demonstrate that it has adequate back-up authority to implement the wetland, riparian and vegetated treatment system management measures throughout the 6217 management area.

4.A.2 Socioeconomic Impacts

Section 4.A.2 of the PEIS provides a summary of the economic implications of the management measures guidance as described in the Regulatory Impact Analysis prepared by EPA (USEPA, 1992c). The section also summarizes the economic achievability analyses performed for all nonpoint source categories (USEPA, 1992b; Ogg, 1992; DPRG, 1992; Research Triangle Institute, 1992, 1992a, 1992b, 1992c). These analyses provided a relative sense of the economic impacts of the management measures on affected households, municipalities, and commercial enterprises. EPA determined from these studies that all the management measures specified in its guidance document are economically achievable.

In developing the (g) guidance document, EPA adopted a flexible approach that emphasized broad principles or standards for nonpoint source pollution control that can be applied nationally. This allows states to develop more specific programs that reflect the most cost-effective approaches in response to local conditions.

While the implementation of management measures will entail some economic costs to Indiana, the flexibility embodied in the (g) guidance and in the NOAA EPA Program Development Approval Guidance will help to reduce the economic impacts associated with implementing the coastal nonpoint program. For example, Indiana will have until the year 2010 to fully implement the (g) management measures and until 2019

to fully implement its coastal nonpoint program, including additional management measures where necessary. This ability to phase in program implementation over several years allows economic impacts to be absorbed over a longer time period. Another aspect of the flexibility in the program is that states may also exclude categories, subcategories, or individual nonpoint sources where the sources do not exist or are not anticipated to exist, or do not present a threat to coastal waters. This allows states to adapt their programs to local conditions thus implementing their programs in a more cost-effective manner. For example, Indiana has excluded forestry as a category of nonpoint source pollution that does not exist and is not anticipated to exist as a threat to coastal waters.

States may also adopt voluntary, education, and market-based incentive systems in addition to regulatory programs as a means of management measure implementation. Indiana has existing programs that implement agricultural management measures through prevention and education programs. For example, the State sponsors technical assistance, education, training and financial incentive programs through the Purdue University Cooperative Extension Service, local Soil and Water Conservation Districts and Department of Agriculture and the Division of Soil Conservation to conduct best management practices that follow the State Field Operation Technical Guidance, which is in compliance with the 6217(g) management measures.

The implementation of management measures will also produce positive socioeconomic benefits for Indiana. For example, since many of Indiana's coastal water quality problems are linked to urban sources of pollutants, the urban management measures will help to reduce urban nonpoint sources such as stormwater runoff from highways and developed areas and leachate from septic systems. In addition, because of the significant amount of hydromodification activities in coastal Indiana, nonpoint pollution from hydromodification activities such as channelization, damming, dredging, increasing impervious surface in the watershed, removing riparian vegetation, and modifying stream banks can be expected to adversely affect coastal resources in certain areas. Management measures that result in improved site practices during hydromodification activities can reduce impacts associated with this nonpoint source. Implementation of management measures will improve water quality, enhance recreational opportunities, increase property values, provide ground water protection, benefit commercial fisheries, and reduce the risk to human health from water contact activities and consumption of contaminated shellfish. Improved water quality will also increase the aesthetic value of coastal areas and thus benefit tourism.

4B. Program Implementation—Environmental Impacts

Section 6217 requires that state and territory coastal nonpoint programs contain a number of specific components to be used in developing and implementing their programs. These components are:

- Coordination with Existing State Programs
- Determination of the 6217 Management area
- Implementation of Management Measures in Conformity with (g) Guidance

- Identification and Implementation of Additional Management Measures
- Technical Assistance
- Public Participation
- Administrative Coordination
- Identification of Enforceable Policies and Mechanisms

The environmental consequences of these components are discussed below.

4.B.1 Coordination with Existing State Programs

The statute requires that coastal nonpoint programs be closely coordinated with state and local water quality plans and programs and with state coastal zone management programs. This requirement is necessary to ensure that the new coastal nonpoint program can build upon and be integrated into existing state programs upon approval. States should develop their programs to complement and strengthen existing coastal management and nonpoint source authorities. This should produce a positive environmental consequence by minimizing unnecessary duplication and conflicts at the Federal, state, or local levels. It will also fulfill what the statute and legislative history indicate is the central purpose of section 6217, i.e., to strengthen the links between Federal and state coastal zone management and water quality programs in order to enhance state and local efforts to manage land use activities that degrade coastal waters.

Indiana's control of nonpoint source pollution is achieved through a combination of federal, state, regional and local government programs and authorities. State agencies include the Indiana Department of Natural Resources, Indiana Department of Environmental Management, and the Indiana Departments of Health and Transportation. Nonpoint source pollution control efforts at the local level are the responsibility of the local units of government that are involved in health, highways, land use, local water planning, planning and zoning, and soil and water conservation. In addition, the Northwestern Indiana Regional Planning Commission participates as a Regional partner. Most cooperation takes the form of inter-agency agreements and memoranda of understanding and technical, financial and educational assistance to private landowners.

The State of Indiana cooperates with neighboring states in the management of the Lake Michigan watershed area. Indiana Department of Environmental Management, Indiana Department of Natural Resources, the Office of the Commissioner of Agriculture, and Indiana agency wetlands protection partners cooperatively maintain the Hoosier Wetlands newsletter and web sites; and the Indiana Department of Natural Resources, USDA-Natural Resources Conservation Service, and local Soil and Water Conservation Districts cooperatively maintain technical, financial, and educational programs to encourage wetlands and riparian area protection, enhancement, and creation.

4.B.2 6217 Management Area

As directed by section 6217, NOAA, in consultation with EPA, reviewed each state's existing coastal zone boundary established under the CZMA, and made

recommendations to the states on the geographic scope of their programs, i.e., the 6217 management area. This boundary recommendation, which was based on coastal watersheds, is a guide for states to use during program development. States may propose an alternative 6217 management area at the time of program submission. This proposal will then be evaluated by NOAA and EPA as part of the program review and approval process.

This provision has a positive environmental effect because it recognizes that land and water uses both within and outside of the existing coastal zone have the potential to degrade coastal waters. Evaluating coastal watersheds, whether or not those watersheds are completely encompassed within a state's existing coastal zone, ensures that all potential sources of nonpoint pollution that significantly affect coastal waters are included in the coastal nonpoint programs.

Indiana proposed using the Calumet-Galien watershed to define the 6217 management area. NOAA and EPA find that Indiana's proposed boundary is sufficient to control the land and water uses that have or are reasonably expected to have significant impact on the waters along Indiana's Lake Michigan coast. This boundary aligns with the State's coastal management boundary and the neighboring coastal state, Michigan's already-approved 6217 management area to the north.

4.B.3 Implementation of Management Measures in Conformity with (g) Guidance

For program approval, each coastal nonpoint program must provide for the implementation, at a minimum, of management measures in conformity with the guidance published by EPA under section 6217(g). As discussed in section 4.A, this guidance addresses five categories of nonpoint pollution: agricultural runoff, urban runoff, forestry runoff, marinas, and hydromodification. Guidance is also provided for wetlands, riparian areas, and vegetated filter strips. The environmental consequences of implementing each of these management measures are discussed above in section 4.A.1. In order to satisfy statutory requirements, state programs must identify the nonpoint source categories that will be addressed; management measures for those categories; and the process by which the state will ensure the implementation of the management measures. Each coastal nonpoint program must address each of the management measures by either implementing that measure (or an equally effective alternative) or justifying why the management measure is not included in the program.

The requirement that states implement the appropriate measures should have a positive environmental effect because the management measures are designed to reduce pollution from categories and sources of nonpoint pollution that can adversely impact a state's coastal waters. In addition, a state may include management measures for sources not identified in the 6217(g) guidance, if it determines such measures are necessary to protect coastal waters.

Upon fulfillment of the conditions listed in Section 2.B of the environmental assessment, the Indiana program will provide for implementation of management measures for agricultural, urban, marinas, and hydromodification nonpoint source categories, and for wetlands, riparian areas, and vegetated treatment systems. Indiana requested an exclusion for the forestry source category. NOAA and EPA found that there was sufficient justification to allow Indiana to exclude forestry activities on the basis that they do not cause an existing or potential future threat to coastal waters.

4.B.4 Requirements for Implementation of Additional Management Measures

For program approval, coastal nonpoint programs must provide for the implementation of additional management measures where coastal water quality is impaired or threatened even after the implementation of the management measures specified in the (g) guidance. These additional management measures are to be applied both to existing land and water uses that are found to cause or contribute to water quality impairment and to new or substantially expanding land uses within critical coastal areas adjacent to impaired or threatened coastal waters.

This requirement should have a beneficial environmental effect because it will provide a second tier of protection, where necessary, to attain and maintain water quality standards and protect critical areas against future pollution problems.

As discussed in Section 2.B(10) of this EA, the Indiana program submission does not include processes for implementation of additional management measures for critical coastal areas or where coastal water quality is impaired or threatened even after the implementation of management measures specified in the (g) guidance. In order to receive final program approval, within five years, the State will develop a process for the identification of critical coastal areas and a process for developing and revising management measures to be applied in critical coastal areas and in areas where necessary to attain and maintain water quality standards. Within five years, Indiana will also develop a program to provide technical assistance in the implementation of additional management measures.

4.B.5 Technical Assistance

For program approval, coastal nonpoint programs are required to provide for technical and other assistance to local governments and the public for implementing the additional management measures. States are also encouraged to provide assistance to local governments and the public for implementation of the (g) guidance measures. Assistance may be provided in developing ordinances and regulations, technical guidance, training, financial incentives, or demonstration projects.

This requirement will be environmentally beneficial because the technical assistance will enable the management measures to be better implemented at the regional or local level. The assistance will address local needs with respect to implementation and

will provide a better understanding of what the measures are trying to accomplish and how to best accomplish it. EPA has assembled a great deal of technical information during the development of its guidance document. This information will be available to the states in a variety of formats, including bibliographies and summaries, and by electronic bulletin boards.

Indiana has a number of technical assistance programs available to the public through local governments, nonprofit organizations, and state agencies responsible for implementing the State's coastal nonpoint pollution control program. The State's submittal provided listings of the key nonpoint source-related technical assistance programs, the targeted user groups, and the agencies responsible for implementation of the programs for each of the categories. For example, following adoption of the Indiana Wetlands Conservation Plan in 1996 by the Indiana Natural Resources Council, several technical assistance projects envisioned by the plan have been implemented, including: (1) financial support for model local efforts to develop techniques and a handbook for wetland acquisition and restoration; (2) expansion of an Adopt-A-Wetland education curriculum and hosting of several regional workshops on wetland ecology; and (3) development of outreach materials (videos, brochures, and displays) on wetland conservation and regulation. Other technical assistance efforts are described under each nonpoint source category above. For example, to address nonpoint source pollution from marinas, the DNR Division of Law Enforcement offers a boater education program that instructs boaters on proper boat operation and maintenance. The program contains an entire chapter dedicated to boaters' and personal watercraft operators' responsibility to the environment, including solid and liquid wastes, trash, and use of petroleum products such as promptly cleaning up any oil or other hazard material spills, and recycling when possible.

4.B.6 Public Participation

For program approval, states must provide opportunities for public participation in all aspects of the coastal nonpoint program. Congress intended that the public be involved in the development and implementation of the program, calling not only for public participation, but also for public education.

Involving the public early in the development of the program should help improve acceptance of the program and promote and maintain the public's long-term commitment to support the goals of section 6217. Specifically providing opportunities for public comment, especially by those regulated or affected by the program, prior to program development and implementation can ensure that the program will be accepted, and therefore more effective in controlling nonpoint pollution. The public education aspect of the requirement will be beneficial by making individuals more aware of the impact of their actions on coastal waters and by generating support for pollution control efforts at the state and local level.

Indiana has a variety of methods and programs to meet the (g) management measures for public education and participation. Indiana solicited public involvement in

the program by recruiting representatives of key state, regional and local agencies and organizations that govern the nonpoint source pollution land categories to serve on the 6217 Workgroup Committee. The Committee was further broken down into sub-workgroups for agriculture, urban, marinas, and wetlands/hydromodification. Indiana also provided several 30-day public comment periods throughout the development of their Coastal Nonpoint Program.

4.B.7 Administrative Coordination

For program approval, the coastal nonpoint program must include administrative coordination mechanisms. At a minimum, the program must include a list of state, regional and local agencies and the role that they will play in developing and implementing the program.

This requirement will be environmentally beneficial because it will help avoid conflicts and duplication of effort among the agencies involved in the coastal nonpoint program and ensure that the various agencies are fulfilling their responsibilities to implement the program. In recognizing their specific responsibilities, agencies will be able to refine policies and procedures and maximize limited resources to more effectively support the goals of section 6217.

As discussed in section 4.B.1 above, the primary mechanisms for implementation of the Indiana coastal nonpoint program will be administered through existing state regulatory agencies. Indiana established a 6217 Workgroup to develop and implement its Coastal Nonpoint Program. The Workgroup is comprised of representatives of numerous state agencies, and regional and local planning and soil conservation groups that play a role in nonpoint source pollution management, within the 6217 management area. The Workgroup and sub-workgroups focusing on the agriculture, urban, marina, and wetlands/hydromodification measures meet on a regular basis to identify goals, objectives, lead agencies and timelines for developing and implementing Indiana's Coastal Nonpoint Program.

4.B.8 Monitoring

For program approval, the coastal nonpoint program must contain a description of any necessary monitoring techniques to accompany the management measures to assess over time the success of the measures in reducing pollution loads and improving water quality. The EPA (g) guidance provides guidance for measuring changes in pollution loads and in water quality that may result from the implementation of management measures and for ensuring that the measures are implemented, inspected, and maintained properly.

This requirement should have a beneficial environmental effect because water quality monitoring is the most direct and defensible tool available to evaluate water quality and its response to management measures and other factors. By tracking management measures and water quality simultaneously, states will be able to evaluate

the performance of the management measures and determine the need for additional management measures to meet water quality objectives.

As discussed in Section 2.B(11) of this EA, the Indiana program submission does not include a monitoring plan. In order to receive final program approval, the State must finalize a plan and include it in its program within five years. Indiana states that information on its monitoring and tracking programs was not available at the time of submittal. The submittal did note that the Indiana Geologic Survey at the Indiana University are working with IDEM to compile information on how the State will monitor and assesses over time the success of its Coastal Nonpoint Program. NOAA and EPA have encouraged the State to proceed with developing a monitoring and tracking program strategy for its 6217 program.

4.B.9 Enforceable Policies and Mechanisms

For program approval, the coastal nonpoint program must contain enforceable policies and mechanisms to implement the applicable requirements of section 6217, i.e., the (g) measures and additional management measures. The term “enforceable policy” is defined in the CZMA to mean state policies which are legally binding through constitutional provisions, laws, regulations, land use plans, ordinances, or judicial or administrative decisions, by which a state exerts control over private and public land and water uses and natural resources in the coastal zone. Voluntary approaches, including economic incentives, may be used to implement management measures as long as they are backed by enforceable authorities.

This requirement will be environmentally beneficial because states will be able to use a variety of regulatory and/or non-regulatory approaches in order to ensure implementation of the management measures. In addition, the selection and design of enforceable policies can be tailored to specific state or local circumstances. The success of the implementation of the policies can also be enhanced through public education and technical assistance programs.

The Indiana Department of Natural Resources, Indiana Lake Michigan Coastal Program is the lead state agency responsible for developing and implementing the coastal nonpoint program.

Management measures for agricultural runoff will be implemented through the Environmental Quality Incentive Program, Soil and Water Conservation (Indiana Code 14-32), State Water Quality Standards (Indiana Code IC 13-18), Indiana Administrative Code-Rule 3 for Concentrated Animal Feeding Operations, the Safe Drinking Water Act, Indiana Pesticide Application Certification Program (Indiana Code IC 14-25 Surface and Groundwater Protection), and Source Water Protection.

Management measures for urban runoff will be implemented through the Clean Water Act (NPDES), Material Handling and Storage, Solid Hazardous Waste, Solid

Waste Management Districts, Lakes Permit Act, Lowering of 10 Acre Lakes Act, Flood Control Act, and Residential and Commercial On-Site Sewage Disposal.

Management measures for marinas will be implemented through the Archaeological Resources Preservation Act, the Endangered Species Act, the Fish and Wildlife Conservation Act, the Navigable Waterways Permit Program, Section 401 Water Quality Certification Program, Natural Resource Commission Rules, IDNR, Department of Works Administrative Rule regarding sanitary device disposal facilities, Underground Storage Tank Program, IDEM authority over discharges, Navigable Waters Act, Sand and Gravel Permits, Construction of Channels Act, Lake and River Enhancement Program, and Regulated Drains.

Management measures for hydromodification will be implemented through Section 319 and 401 of the Clean Water Act, Flood Control Act, Dam Regulations, Fish Migration, Litter/Contaminants Enforcement; Dam Construction, Navigable Waters Act, Sand and Gravel Permits, Construction of Channels Act, Regulated Drains, Indiana Code for Lakes and Reservoirs, and Indiana Code for Rivers Streams and Waterways.

Management measures for wetlands, riparian areas, and vegetated treatments systems will be implemented through the Indiana Code 14-26 which includes several programs, including the Lake Preservation Act, Lowering of Ten-Acre Lakes Act, Construction of Channels Act, Navigable Waterways Act, and Sand and Gravel Permits Act. Other implementation mechanisms include the Federal Water Pollution Control Act—Clean Water Act of 1977 Sections 401 and 404, which are implemented by IDEM and IDNR.

4.C Program Implementation—Socioeconomic Impacts

There should not be any significant socioeconomic impacts associated with the specific components required to be used in developing and implementing the Indiana coastal nonpoint program. However, some localized impacts may result from efforts to protect and restore coastal waters.

The designation of critical coastal areas and the implementation of additional management measures may prohibit development and certain land and water uses in some areas. Indiana has not yet designated or mapped any critical coastal areas, and must respond to a condition to do so within five years.

Additional technical assistance may be required by local governments and the public in applying the (g) measures and additional management measures. However, because Indiana currently has a number of technical assistance programs, no significant additional socioeconomic impacts should result. These technical assistance programs will be used to assist municipalities and the general public with implementation of the (g) measures and additional management measures.

A positive impact will be attained through Indiana's existing and planned public participation efforts. These efforts give the public the opportunity to participate in the development of the program and help to improve public acceptance of the program. These efforts should also lead to attitude and behavior changes as people become more aware of the environmentally beneficial goals of the coastal nonpoint program. This will produce an increased public awareness of the potential impacts of their activities on the environment and lead to less pollution and lower socioeconomic costs.

4.D Environmental/Socioeconomic Impacts of Alternatives

4.D.1 Approval of Indiana Coastal Nonpoint Program

As discussed in the preceding sections, the approval of the Indiana coastal nonpoint program would have a beneficial effect on the environment because the program would help to control sources of nonpoint pollution and would result in fewer pollutants reaching coastal waters. Development and land use in urban and rural areas in the Little Calumet-Galien Watershed are tied to many of the water quality impairments facing the region. According to the IDEM and USEPA approved 2004 Water Quality Impairments (303(d) list) these include impaired biotic communities, fish consumption advisories for PCBs and/or mercury, *Escherichia coli* (*E. coli*) bacteria, cyanide, oil and grease, and ammonia. The program could ensure implementation of best management practices to address these sources of nonpoint pollution. In addition, the coastal nonpoint program would make existing programs more effective by strengthening the links between Federal and Indiana state coastal zone management and water quality programs, thereby improving state and local efforts to manage land use activities that degrade coastal waters and habitats.

The requirement for the program to develop additional management measures, to identify critical coastal areas and coastal waters that are not attaining water quality standards, and to identify the land uses that cause or threaten those coastal waters would have a positive environmental effect by focusing attention on existing or potential problem areas that could degrade coastal waters. Indiana's 305(b) Report, the nonpoint source assessment of surface waters, identifies the state's waterbodies that do not support designated uses. A number of watershed efforts (e.g., the Watershed Management Plan for Lake, Porter and La Porte Counties) are underway to prevent and mitigate nonpoint sources of pollution to these identified areas where nonpoint pollution impacts are known to exist or threaten water quality.

The approval of the Indiana coastal nonpoint program would also have positive socioeconomic benefits. The improvements in coastal water quality that would result from controlling nonpoint source pollution would increase the aesthetic value of coastal areas, and would help ensure that beaches and shellfishing areas remain open, thus benefiting tourism and providing opportunities for boating, swimming, and other water-related activities.

4.D.2 Conditional Approval of Indiana Coastal Nonpoint Program

The conditional approval of the Indiana coastal nonpoint program will have a positive effect on the environment because it will produce the same beneficial results as approval, provided Indiana satisfies the conditions, and will at least temporarily avoid the adverse impacts of denying approval. The implementation of portions of a conditionally approved program will begin to fulfill the intent of section 6217 by helping to control human practices that result in nonpoint source pollution of the environment and may reduce long-term productivity. Some short-term uses of the environment may have to be modified in response to implementation of management measures. This may result in short-term costs to users, but will result in long-term benefits to the environment through cleaner coastal waters, protected resources, and increased productivity.

5. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

NOAA does not anticipate any irreversible or irretrievable commitment of resources as a result of the conditional approval of the Indiana coastal nonpoint program. However, the section 6217 requirements for states and territories to establish a 6217 management area, to implement management measures in this area, and to identify and map critical coastal areas that need additional measures to protect them against present and future nonpoint pollution problems, may have the effect of reallocating resources for an indefinite period of time. The identification of critical areas may also have the effect of restricting development or other activities in the critical coastal areas and concentrating these activities in other locations. Although development activity results in the affected site being committed to the new use for an indefinite period of time, and can practically be considered an irretrievable commitment of resources, the amount of resources is expected to be minimal. Also, although critical areas may need special controls such as setbacks and low density zoning to protect coastal waters, these designations may change in the future.

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7. LIST OF AGENCIES AND PERSONS CONSULTED

The following Federal and Indiana agencies were consulted during the preparation of the EA and during the review of the Indiana coastal nonpoint program. These agencies also received a copy of the EA.

Don Waye, USEPA, Headquarters
Allison Castellan, NOAA
Tom Davenport, USEPA, Region 5
Mike Molnar, Indiana DNR
Joe Exl, Indiana DNR

8. FINDING OF NO SIGNIFICANT IMPACT (FONSI)

NOAA Administrative Order (NAO) 216-6 (revised May 20, 1999) provides eleven criteria for determining the significance of the impacts of a proposed action. These criteria are discussed below with respect to the proposed action (Alternative 1):

1. Impacts may be both beneficial and adverse—a significant effect may exist even if the federal agency believes that on balance the effect will be beneficial.

Neither the beneficial nor the adverse effects of the proposed action are expected to be significant. As anticipated by the PEIS, the proposed action will result in improved water quality in the coastal area and watersheds of the State of Indiana through application and administration of an established set of nonpoint program management measures that have been determined by EPA and NOAA to reduce nonpoint sources of pollution. If application of the initial set of management measures does not sufficiently improve water quality, the coastal nonpoint program will provide a second tier of protection, where necessary, to attain and maintain water quality standards and protect critical areas against future pollution problems. Positive socioeconomic benefits associated with controlling nonpoint source pollution include possibly increasing the aesthetic value of coastal areas, which would help ensure that beaches and shellfishing areas remain open, thus benefiting tourism and providing opportunities for boating, swimming, and other water-related activities.

2. What is the proposed degree to which public health or safety is affected by the proposed action?

Public health and safety will be positively affected by the proposed action. The implementation of management measures for the four source categories covered by Indiana's coastal nonpoint program will reduce the generation of nonpoint source pollutants from agriculture, urban, marinas, and hydromodification activities as well as wetlands and vegetated treatment systems, and minimize the delivery of pollutants into Indiana's land to surface and ground waters sufficient to meet the levels identified in EPA's *Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters*.

3. Are there unique characteristics of the geographic area in which the proposed action is to take place?

As part of the coastal nonpoint program development process, states are required to identify and map "critical coastal areas" that need additional measures to protect

against current and anticipated nonpoint pollution problems. The establishment of critical coastal areas is intended to focus on those areas in the 6217 management area in which new or substantially expanding land uses may cause or contribute to the impairment of coastal water quality. States were encouraged to consider including other previously designated areas such as areas of particular concern designated as part of state coastal management program boundaries, National Estuarine Research Reserves, and significant watershed areas within National Estuaries designated by EPA. States were allowed flexibility in their approach to delineating critical coastal areas. Indiana has not identified either critical coastal areas or a process for identifying these areas in the future, and is under a two year condition to develop this process.

4. What is the degree to which effects on the human environment are likely to be highly controversial?

It is unlikely that there will be controversy associated with the effects of the proposed action. The first state coastal nonpoint program was preliminarily approved in 1997, and since then, 18 states have since achieved full approval. All of these programs have been integrated into, and implemented by existing state coastal and water quality programs without controversy. It is anticipated that Indiana will experience the same effects.

5. What is the degree to which effects are highly uncertain or involve unique or unknown risks?

There are no uncertain, unique, or unknown risks associated with the proposed action. OCRM is not proposing any new actions in the state. All of the actions described in the EA will occur through existing or proposed state and local laws, regulations, and voluntary participation and educational activities. None of the activities associated with implementation of the Indiana coastal nonpoint program involve risk.

6. What is the degree to which the action establishes a precedent for future actions with significant effects or represents a decision in principle about a future consideration?

To date, OCRM has conditionally approved 33 coastal nonpoint programs prior to conditionally approving Indiana's coastal nonpoint program. This action follows, rather than establishes a precedent for future actions taken by this Agency. Therefore conditional approval of the Indiana coastal nonpoint program is unlikely to have a significant effect or represent a decision in principle about a future decision or consideration.

7. Does the proposed action have individually insignificant but cumulatively significant impacts?

The proposed action; conditional approval of Indiana's coastal nonpoint program, does not have any individually insignificant but cumulatively significant impacts. OCRM will continue to work with Indiana to achieve full approval of the State's coastal

nonpoint program, and then monitor the State's implementation of the management measures. All of these activities will result in positive environmental effects in the state's coastal nonpoint area.

8. What is the degree to which the action adversely affects entities listed in or eligible for listing in the National Register of Historic Places, or may cause loss or destruction of significant scientific, cultural, or historic resources?

The proposed action will not adversely affect any entity listed in or eligible for listing in the National Register of Historic Places, and the proposed action will not cause the loss of or destroy any significant scientific, cultural, or historic resources. Approval of Indiana's coastal nonpoint program should result in implementation of best management practices for areas experiencing water quality issues. None of the 6217 management measures specifically target areas that are scientifically, culturally, or historically important in a way that would result in adverse impacts.

9. What is the degree to which endangered or threatened species, or their critical habitat as defined under the Endangered Species Act of 1973, are adversely affected?

The proposed action will not result in any adverse effects to endangered or threatened species or their critical habitat as defined under the Endangered Species Act of 1973. The purpose of Indiana's coastal nonpoint program will be to improve water quality, which is more likely to result in beneficial improvement to threatened or endangered species habitats and ecosystems. The purposes of several of the management measures include such things as reducing turbidity in streams, protecting wetlands that serve as nonpoint source drainage sources, decreasing the amount of impermeable surfaces created by development, etc. The majority of these actions will improve habitat and environment through improved water quality and land use planning techniques that decrease nonpoint source pollution.

10. Is a violation of federal, state, or local law for environmental protection threatened?

OCRM's approval of Indiana's coastal nonpoint program relies in large part on implementation of laws and regulations at the state and local levels. No violations of federal, state, or local law are anticipated through conditional approval of this program.

11. Will the proposed action result in the introduction or spread of a nonindigenous species?

The proposed action does not involve any physical activity that could result in the introduction or spread of a nonindigenous species. Conditional approval of the Indiana coastal nonpoint program will not weaken any existing State laws in the coastal area related to regulating nonindigenous species.

FONSI STATEMENT

In view of the information presented in this document, and the analysis contained in the supporting EA prepared for conditional approval of the State of Indiana's Coastal Nonpoint Pollution Control Program (CNPCP), it is hereby determined that conditionally approving the Indiana CNPCP will not significantly impact the quality of the human environment as described above and in the supporting EA. In addition, all beneficial and adverse impacts of the proposed action have been addressed to reach the conclusion of no significant impacts. Accordingly, preparation of an Environmental Impact Statement for this action is not necessary.

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Date

Bibliography

- Bureau of the Census. Census 2000, Urbanized Areas and Urban Clusters.
- 2002. Wetlands; WaterQuality. 2002 State of the Environment Report.
<http://www.in.gov/idem/soe2002/water/wetlands/html>. Last viewed: 1/10/2006.
- Environmental Integrity Project. September 2004. Weathering the Storm:
Controlling Storm Water Pollution in the Great Lakes.
- http://www.lakemichigan.org/conservation/beach_indiana.asp)
- <http://www.nwiqlc.org/indicators/Chapt05.pdf>
- <http://www.saveddunes.org/html/ArchivedNews/99janfebnews.html>.
- Indiana Department of Environmental Management. Environmental Permit Guide.
Stormwater Runoff Associated with Construction Activities.
<http://www.state.in.us/idem/guides/permit/water/stormwaterconstruction.html>.
Last viewed 1/10/2006.
- Indiana Department of Environmental Management. 2004. Indiana Integrated Water
Quality Monitoring and Assessment Report. Indianapolis, IN.
- Indiana Department of Environmental Management. Revised September 2001. Fact
Sheet: IDEM's Surface Water Quality Assessment Program, IDEM
32/01/016/1998.
- Indiana Department of Natural Resources. Coastal Dynamics.
http://www.state.in.us/nrc_dnr/lakmichigan/coadyn/coadyna.html; last viewed
1/10/2006.
- Indiana Department of Natural Resources. Commercialization of Northwest Indiana.
http://www.state.in.us/nrc_dnr/lakmichigan/econdevt/econdevt1.html; last viewed
1/10/2006.
- Indiana Department of Natural Resources. Common Water Quality Issues/Nonpoint
Source Issues. [http://www.state.in.us/nrc_dnr/lake
michigan.watqual/watqual2b.html](http://www.state.in.us/nrc_dnr/lake_michigan.watqual/watqual2b.html); last viewed 1/10/2006.
- Indiana Department of Natural Resources. Conditions Along the Indiana Coastline.
http://www.state.in.us/nrc_dnr/lakmichigan/coadyn/coadync.html; last viewed
1/10/2006.
- Indiana Department of Natural Resources. Historical Perspective on Water Quality
Legislation and Application to Northwest Indiana.

- http://www.state.in.us/nrc_dnr/lakmichigan/watqual/watqual2a.html; last viewed 1/10/2006.
- Indiana Department of Natural Resources. June 1996. Indiana Wetlands Conservation Plan, Executive Summary.
- Indiana Department of Natural Resources. June 1999. Lakeshore Protection in Indiana Division of Soil Conservation, Lake & River Enhancement Program. Indianapolis, IN.
- Indiana Department of Natural Resources Lake Michigan Coastal Program in conjunction with Indiana Department of Environmental Management, Indiana Department of Natural Resources, Division of Soil Conservation, Purdue University, Agriculture Extension. Indiana Lake Michigan Coastal Program. February 2005. Indiana Coastal Nonpoint Pollution Control Program.
- Indiana Department of Natural Resources. Particular Issues of Indiana's Lake Michigan Region. http://www.state.in.us/nrc_dnr/lakmichigan/watqual/watqual2c.html; last viewed 1/10/2006.
- Indiana Department of Natural Resources. Water Quality: Recent Efforts. http://www.state.in.us/nrc_dnr/lakmichigan/watqual/watqual2f.html; last viewed 1/10/2006.
- Indiana Water Resource Research Center. Annual Technical Report FY2002.
- Infrastructure Report Card 2005, Indiana. <http://www.asce.org/reportcard/2005/page.cfm?id=54>, last viewed 1/10/2006.
- Mark O'Leary, et.al., Applied Ecological Services. September 2001. Watershed Diagnostic Study of the Little Calumet-Galien River Watershed. West Dundee, IL.
- Natural Resource Conservation Service. www.nass.usda.gov.in; last viewed 9/2/05.
- Northwestern Indiana Regional Planning Commission. Connections 2030 Regional Transportation Plan
- Northwestern Indiana Regional Planning Commission. October 2005. Watershed Management Plan for Lake, Porter, and LaPorte Counties.
- Northwest Quality of Life Council. September 2004. Quality of Life Indicators Report.
- NRDC. July 2005. Testing the Waters; A Guide to Water Quality at Vacation Beaches. <http://www.nrdc.org/water/oceans/ttw/sumind.pdf>
- Our Land, Our Literature—Urban Sprawl. <http://www.bus.edu/ourlandourlit/Environment/Issues>, last viewed 1/20/2006.

- San Diego Earth Times. August 1997. Pollution Caused 2,596 Beaches Closures in 1996. <http://www.sdearthtimes.com/et0897/et0897s1.html>. Last viewed 1/10/2006.
- Union of Concerned Scientists. Great Lakes Indiana Agriculture; Climate Change in Indiana. http://www.ucsusa.org/greatlakes/glregionind_agr.html. Last viewed 1/10/2006.
- Union of Concerned Scientists. Great Lakes Indiana Water Supply and Population; Climate Change in Indiana. http://www.ucsusa.org/greatlakes/glregionind_wat.html. Last viewed 1/10/2006.
- U.S. Department of Agriculture. 2002 Census of Agriculture.
- USDA. 2002. Census of Agriculture, Vol. I, Geographic Area Series, Census, State-County Data.
- U.S. Department of Commerce, National Oceanic and Atmospheric Administration, and U.S. Environmental Protection Agency. January 1993. Coastal Nonpoint Pollution Control Program; Program Development and Approval Guidance. Washington, D.C.
- U.S. Environmental Protection Agency. Section 303(d) List Fact Sheet for Watershed Little Calumet-Galien (interactive website).
- Wittman Hydro Planning Associates, Inc. Watershed Restoration Action Strategy for the Little Calumet-Galien Watershed. Bloomington, IN.

APPENDIX A.

MANAGEMENT MEASURES FOR SOURCES OF NONPOINT POLLUTION IN COASTAL WATERS

1. Management Measures for Agricultural Sources

1. Erosion and Sediment Control Management Measure

Apply the erosion component of a Conservation Management System (CMS) as defined in the Field Office Technical Guide of the U.S. Department of Agriculture Natural Resources Conservation Service to minimize the deliver of sediment from agricultural lands to surface waters, or

Design and install a combination of management and physical practices to settle the settleable solids and associated pollutants in runoff delivery from the contributing area for storms of up to and include a 10-year, 24-hour frequency.

2a. Management Measure for Facility Wastewater and Runoff from Confined Animal Facility Management (Large Units).

Limit the discharge from the confined animal facility to surface water by:

(1) Storing both the facility wastewater and the runoff from confined animal facilities that is caused by storms up to and including a 25-year, 24-hour frequency storm. Storage structures should:

(a) Have an earthen lining or plastic membrane lining, or

(b) Be constructed with concrete, or

(c) Be a storage tank; and

(2) Managing stored runoff and accumulated solids from the facility through an appropriate waste utilization systems.

This management measure is intended to be applied to al new facilities regardless of size and to all new or existing confined animal facilities that contain the following number of head or more:

	<u>Head</u>	<u>Animal Units</u>
Beef Feedlots	300	300
Stables (horses)	200	400
Dairies	70	98
Layers	15,000	150
		495
Broilers	15,000	150

		495
Turkeys	13,750	2,475
Swine	200	80

This measure does not apply to those facilities that are defined as concentrated animal feeding operations by Federal regulation 40 CFR 122 and are required to obtain NPDES discharge permits. This regulation allows the Director of a NPDES discharge program to designate any animal feeding operation as a concentrated animal feeding operation (thus subjecting the operation to NPDES program requirements) upon determining that it is a significant contributor of pollution. If an NPDES permit is issued, the terms of the permit apply and this management measure is not required.

A confined animal facility is a lot or facility (other than an aquatic animal production facility) where the following conditions are met:

- Animals (other than aquatic animals) have been, are, or will be stabled or confined and fed or maintained for a total of 45 days or more in any 12-month period, and
- Crops, vegetation forage growth, or post-harvest residues are not sustained in the normal growing season over any portion of the lot or facility.

2b. Management Measure for Facility Wastewater and Runoff from Confined Animal Facility Management (Small Units)

Design and implement systems that collect solids, reduce containment concentrations, and reduce runoff to minimize the discharge of contaminants in both facility wastewater and in runoff that is caused by storms up to and including a 25-year, 24-hour frequency storm. Implement these systems to substantially reduce significant increases in pollutant loadings to ground water.

Manage stored runoff and accumulated solids from the facility through an appropriate waste utilization system.

This management measure is intended to be applied to all existing confined animal facilities that contain the following number of head:

	<u>Head</u>	<u>Animal Units</u>
Beef Feedlots	50-299	50-299 lb
Stables (horses)	100-199	200-399
Dairies	20-69	28-97
Layers	5000-14,999	50-149 165-494
Broilers	5,000-14,999	165-494
Turkeys	5,000-13,749	900-2,474
Swine	100-199	40-79

This measure is subject to the same NPDES designation criteria mentioned for large unit animal facilities. Facilities containing few than the number of head listed above are not subject to this management measure. Existing facilities that meet the requirements of management measures for large units are in compliance with the requirements of this measure. Existing and new facilities that already minimize the discharge of contaminants to surface waters, protect against contamination of ground water, and have an appropriate waste utilization system may already meet the requirements of this measure. Such facilities may not need additional controls for the purposes of this measure.

2. Nutrient Management Measure

Develop, implement, and periodically update a nutrient management plan to: (1) apply nutrients at rates necessary to achieve realistic crop yields; (2) improve the timing of nutrient application, and (3) use agronomic crop production technology to increase nutrient use efficiency. When the source of the nutrients is other than commercial fertilizer, determine the nutrient value and the rate of availability of the nutrients. Determine and credit the nitrogen contribution of any legume crop. Soil and plant tissue testing should be used routinely.

Nutrient management plans contain the following core components:

- (1) Farm and field maps showing acreage, crops, soils, and waterbodies.*
- (2) Realistic yield expectations for the crop(s) to be grown, based primarily on the producer's actual yield history, State Land Grant University yield expectations for the soil series, or SCS Soils-5 information for the soil series.*
- (3) A summary of the nutrient resources available to the producer, which at a minimum include:*
 - Soil test results for pH, phosphorus, nitrogen, and potassium;*
 - Nutrient analysis of manure, sludge, mortality compost or effluent;*
 - Nitrogen contributions to the soil from legumes grown in the rotation;*
 - Other significant nutrient sources (e.g., irrigation water).*
- (4) An evaluation of field limitations based on environmental hazards or concerns, such as,*
 - Sinkholes, shallow soils over fractured bedrock, and soils with high leaching potential,*
 - Lands near surface water,*
 - Highly erodible soils, and*
 - Shallow aquifers.*
- (5) Use of the limiting nutrient concept to establish the mix of nutrient sources and requirements for the crop based on a realistic yield expectation.*
- (6) Identification of timing and application methods for nutrients to: provide nutrients at rates necessary to achieve realistic crop yields; reduce losses to the environment; and avoid applications as much as possible to frozen soil and during periods of leaching and runoff.*
- (7) Provisions for the proper calibration and operation of nutrient application equipment.*

4. Pesticide Management Measure

To reduce contamination of surface water and ground water from pesticides:

- (1) Evaluate the pest problems, previous pest control measures, and crop history;*
- (2) Evaluate the soil and physical characteristics of the site including mixing, loading, and storage areas for potential leaching or runoff of pesticides. If leaching or runoff is found to occur, steps should be taken to prevent further contamination;*
- (3) Use integrated pest management (IPM) strategies that:*
 - a. Apply pesticides only when an economic benefit to the producer will be achieved (i.e., applications based on economic thresholds); and*
 - b. Apply pesticides efficiently and at times when runoff are unlikely.*
- (4) When pesticide applications are necessary and a choice of registered materials exists, consider the persistence, toxicity, runoff potential, and leaching potential of products in making a selection;*
- (5) Periodically calibrate pesticide spray equipment; and*
- (6) Use anti-backflow devices on hoses used for filling tank mixtures.*

5. Grazing Management Measures

Protect range, pasture and other grazing lands:

- (1) By implementing one or more of the following to protect sensitive areas (such as streambanks, wetlands, estuaries, ponds, lake shores, and riparian zones):*
 - (a) Exclude livestock;*
 - (b) Provide stream crossing or hardened watering access for drinking;*
 - (c) Provide alternative drinking water locations;*
 - (d) Locate salt and additional shade, if needed, away from sensitive areas; or*
 - (e) Use improved grazing management (e.g., herding) to reduce the physical disturbance and reduce direct loading of animal waste and sediment caused by livestock; and*
- (2) By achieving either of the following on all range, pasture, and other grazing lands not addressed under 1:*
 - (a) Implement the range and pasture components of a Conservation Management System (CMS) as defined in the Field Office Technical Guide of the USDS_SCS by applying the progressive planning approach of the USDS Soil Conservation Service (SCS) to reduce erosion, or*

- (b) *Maintain range, pasture, and other grazing lands in accordance with activity plans established by either the Bureau of Land Management of the U.S. Department of the Interior or the Forest Service of the USDA.*

6. Irrigation Water Management Measure

To reduce nonpoint source pollution of surface waters caused by irrigation:

- (1) *Operate the irrigation system so that the timing and amount of irrigation water applied match crop water needs. This will require, as a minimum: (a) the accurate measurement of soil-water depletion volume and the volume of irrigation water applied, and (b) uniform application of water;*
- (2) *When chemigation is used, include backflow preventers for wells, minimize the harmful amounts of chemigated waters that discharge from the edge of the field, and control deep percolation. In cases where chemigation is performed with furrow irrigation systems, a tailwater management system may be needed.*

The following limitations and special consideration apply:

- (1) *In some locations, irrigation return flows are subject to other water rights or are required to maintain stream flow. In these special cases, on-site reuse could be precluded and would not be considered part of the management measure for such locations.*
- (2) *By increasing the water use efficiency, the discharge volume from the system will usually be reduced. While the total pollutant load may be reduced somewhat, there is the potential for an increase in the concentration of pollutants in the discharge. In these special cases, where living resources or human health may be adversely affected and where other management measures (nutrients and pesticides) do not reduce concentrations in the discharge, increasing water use efficiency would not be considered part of the management measure.*
- (3) *In some irrigation districts, the time interval between the order for and the delivery of irrigation water to the farm may limit the irrigator's ability to achieve the maximum on-farm application efficiencies that are otherwise possible.*
- (4) *In some locations, leaching is necessary to control salt in the soil profile. Leaching for salt control should be limited to the leaching requirement for the root zone.*
- (5) *Where leakage from delivery systems or return flows supports wetlands or wildlife refuges, it may be preferable to modify the system to achieve a high level of efficiency and then divert the "saved water" to the wetland or wildlife refuge. This will improve the quality of water delivered to wetlands or wildlife refuges by preventing the introduction of pollutants from irrigated lands to such diverted water.*
- (6) *In some locations, sprinkler irrigation is used for frost or freeze protection, or for crop cooling. In these special cases, applications should be limited to the amount necessary for crop protection, and applied water should remain on site.*

2. Management Measures for Urban Areas

1. New Development Management Measure

- (1) *By design or performance:*

(a) After construction has been completed and the site is permanent stabilized, reduce the average annual total suspended solid (TSS) loadings by 80 percent. For the purposes of this measure, an 80 percent TSS reduction is to be determined on an average annual basis,* or

(b) Reduce the postdevelopment loadings of TSS so that the average annual TSS loadings are no greater than predevelopment loadings, and

(2) To the extent practicable, maintain postdevelopment peak runoff rate and average volume at levels that are similar to predevelopment levels.

Sound watershed management requires that both structural and nonstructural measures be employed to mitigate the adverse impacts of storm water. Nonstructural Management Measures 11.B and 11.C can be effectively used in conjunction with Management Measure 11.A to reduce both the short-and-long term costs of meeting the treatment goals of this management measure.

*Based on the average annual TSS loadings from all storms less than or equal to the 2-year/24 hour storm. TSS loadings from storms greater than the 2-year/24 hour storm are not expected to be included in the calculation of the average annual TSS loadings.

2. **Watershed Protection Management Measure**

Develop a watershed protection program to:

- (1) Avoid conversion, to the extent practicable, of areas that are particularly susceptible to erosion and sediment loss;
- (2) Preserve areas that provide important water quality benefits and/or are necessary to maintain riparian and aquatic biota; and
- (3) Site development, including roads, highways, and bridges, to protect to the extent practicable the natural integrity of waterbodies and natural drainage systems.

3. **Site Development Management Measure**

Plan, design, and develop sites to:

- (1) Protect areas that provide important water quality benefits and/or are particularly susceptible to erosion and sediment loss;
- (2) Limit increases of impervious areas, except where necessary;
- (3) Limit land disturbance activities such as clearing and grading, and cut and fill to reduce erosion and sediment loss; and
- (4) Limit disturbance of natural drainage features and vegetation.

4. **Construction Site Erosion and Sediment Control Management Measure**

(1) Reduce erosion and, to the extent practicable, retain sediment onsite during and after construction, and

(2) Prior to land disturbance, prepare and implement an approved erosion and sediment control plan or similar administrative document that contains erosion and sediment control provisions.

5. **Construction Site Chemical Control Management Measure**

(1) Limit application, generation, and migration of toxic substances;

(2) Ensure the proper storage and disposal of toxic materials; and

(3) Apply nutrients at rates necessary to establish and maintain vegetation without causing significant nutrient runoff to surface waters.

6. **Existing Development Management Measures**

Develop and implement watershed management programs to reduce runoff pollutant concentrations and volumes from existing development:

(1) Identify priority local and/or regional watershed pollutant reduction opportunities, e.g., improvements to existing urban runoff control structures;

(2) Contain a schedule for implementing appropriate controls;

(3) Limit destruction of natural conveyance systems; and

(4) Where appropriate, preserve, enhance, or establish buffers along surface waterbodies and their tributaries.

7. **New Onsite Disposal Systems Management Measures**

(1) Ensure that new Onsite Disposal Systems (OSDS) are located, designed, installed, operated, inspected, and maintained to prevent the discharge of pollutants to the surface of the ground and to the extent practicable reduce the discharge of pollutants into ground waters that are closely hydrologically connected to surface waters. Where necessary to meet these objectives (a) discourage the installation of garbage disposals to reduce hydraulic and nutrient loadings; and (b) where low-volume plumbing fixtures have not been installed in new development or redevelopments, reduce total hydraulic loadings to the OSDS by 25 percent. Implement OSDS inspection schedules for preconstruction, construction, and postconstruction.

(2) Direct placement of OSDS away from unsuitable areas. Where OSDS placement in unsuitable areas is not practicable, ensure that the OSDS designed or sited at a density so as not to adversely affect surface waters or ground water that is closely hydrologically connected to surface water. Unsuitable areas include, but are not limited to, areas with poorly or excessively drained soils; areas with shallow water table or areas with high seasonal water tables; areas overlaying fractured bedrock that drain directly to ground water; areas with floodplains; or areas where nutrient and/or pathogen concentrations in the effluent cannot be sufficiently treated or reduced before the effluent reaches sensitive waterbodies;

(3) Establish protective setbacks from surface waters, wetlands, and floodplains for conventional as well as alternative OSDS. The lateral setbacks should be based on soil type, slope, hydrologic factors, and type of OSDS. Where uniform protective setbacks cannot be achieved, site development with OSDS so as not to adversely affect waterbodies and/or contribute to a public health nuisance.

(4) Establish protective separation distances between OSDS system components and groundwater which is closely hydrologically connected to surface waters. The separation distances should be based on soil type, distance to ground water, hydrologic factors, and type of OSDS;

(5) Where conditions indicate that nitrogen-limited surface waters may be adversely affected by excess nitrogen loadings from round water, require the installation of OSDS that reduce total nitrogen loadings by 50 percent to ground water that is closely hydrologically connected to surface water.

8. **Operating Onsite Disposal Systems Management Measure**

(1) Establish and implement policies and systems to ensure that existing OSDS are operated and maintained to prevent the discharge of pollutants to the surface of the ground and to the extent practicable reduce the discharge pollutants into ground waters that are closely hydrologically connected to surface waters. Where necessary to meet these objectives, encourage the reduced use of garbage disposals, encourage the use of low-volume plumbing fixtures, and reduce total phosphorus loadings to the OSDS by 15 percent (if the use of low-level phosphate detergents has not been required or widely adopted by OSDS users). Establish and implement policies that require an OSDS to be repaired, replaced, or modified where the OSDS fails, or threatens or impairs surface waters.

(2) Inspect OSDS at a frequency adequate to ascertain whether OSDS are failing:

(3) Consider replacing or upgrading OSDS to treat effluent so that total nitrogen loadings in the effluent are reduced by 50 percent. This provision applies only:

(a) where conditions indicate that nitrogen-limited surface waters may be adversely affected by significant ground water nitrogen loadings from OSDS;

(b) where nitrogen loadings from OSDS are delivered to ground water that is closely hydrologically connected to surface water.

9. **Pollution Prevention Management Measure**

Implement pollution prevention and education programs to reduce nonpoint source pollutants generated from the following activities, where applicable:

- The improper storage, use and disposal of household hazardous chemicals, including automobile fluids, pesticides, paints, solvents, etc.;
- Lawn and garden activities, including the application and disposal of lawn and garden care products, and the improper disposal of leaves and yard trimmings;
- Turf management on golf courses, parks, and recreational areas;
- Improper operation and maintenance of onsite disposal systems;
- Discharge of pollutants into storm drains including floatables, waste oil, and litter;
- Commercial activities including parking lots, gas stations, and other entities not under NPDES purview; and
- Improper disposal of pet excrement.

9. **Management Measure for Planning, Siting, and Developing Roads and Highways**

Plan, site, and develop roads and highways to:

(1) Protect areas that provide important water quality benefits or are particularly susceptible to erosion or sediment loss; and

(2) Limit land disturbance such as clearing and grading and cut and fill to reduce erosion and sediment loss; and

(3) Limit disturbance of natural drainage features and vegetation.

11. **Management Measure for Bridges**

Site, design, and maintain bridge structures so that sensitive and valuable aquatic ecosystems and areas providing important water quality benefits are protected from adverse effects.

12. **Management Measure for Construction Projects**

(1) Reduce erosion and, to the extent practicable, retain sediment onsite during and after construction; and

(2) Prior to land disturbance, prepare and implement an approved erosion control plan or similar administrative document that contains erosion and sediment control provisions.

13. **Management Measure for Construction Site Chemical Control**

(1) Limit the application, generation, and migration of toxic substances;

(2) Ensure the proper storage and disposal of toxic materials; and

(3) Apply nutrients at rates necessary to establish and maintain vegetation without causing significant nutrient runoff to surface water.

14. **Management Measure for Operation and Maintenance**

Incorporate pollution prevention procedures into the operation and maintenance of roads, highways, and bridges to reduce pollutant loadings to surface waters.

15. **Management Measure for Road, Highway and Bridge Runoff Systems**

Develop and implement runoff management systems for existing roads, highways, and bridges to reduce runoff pollutant concentrations and volumes entering surface waters.

(1) Identify priority and watershed pollutant reduction opportunities (e.g., improvements to existing urban runoff control structures; and

(2) Establish schedules for implementing appropriate controls.

3. **Management Measures for Forestry**

1. **Preharvest Planning**

Perform advance planning for forest harvesting that includes the following elements where appropriate:

- (1) Identify the area to be harvested including location of waterbodies and sensitive areas such as wetlands, threatened or endangered aquatic species habitat areas, or high-erosion-hazard areas (landslide-prone areas) within the harvest unit.*
- (2) Time the activity for the season or moisture conditions when the least impact occurs.*
- (3) Consider potential water quality impacts and erosion and sedimentation control in the selection of silvicultural and regeneration systems, especially for harvesting and site preparation.*
- (4) Reduce the risk of occurrence of landslides and severe erosion by identifying high-erosion-hazard areas and avoiding harvesting in such areas to the extent practicable.*
- (5) Consider additional contributions from harvesting or roads to any known existing water quality impairments or problems in watersheds of concern.*

Perform advance planning for forest road systems that includes the following elements where appropriate:

- (1) Locate and design road systems to minimize, to the extent practicable, potential sediment generation and delivery to surface waters. Key components are:*
 - locate roads, landings, and skid trails to avoid to the extent practicable steep grades and steep hillslope areas, and to decrease the number of stream crossings;*
 - avoid to the extent practicable locating new roads and landings in Streamside Management Areas (SMAs)); and*
 - determine road usage and select the appropriate road standard.*
- (2) Locate and design temporary and permanent stream crossings to prevent failure and control impacts from the road system. Key components are:*
 - size and site crossing structures to prevent failure;*
 - for fish-bearing streams, design crossings to facilitate fish passage.*
- (3) Ensure that the design of road prism and the road surface drainage are appropriate to the terrain and that road surface design is consistent with the road drainage structures.*
- (4) Use suitable materials to surface roads planned for all-weather use to support truck traffic.*
- (5) Design road systems to avoid high erosion or landslide hazard areas. Identify these areas and consult a qualified specialist for design of any roads that must be constructed through these areas.*

Each state should develop a process (or utilize an existing process) that ensures that the management measures in the chapter are implemented. Such a process should include

appropriate notification, compliance audits, or other mechanisms for forestry activities with the potential for significant adverse nonpoint effects based on the type and size of operation and the presence of stream crossings or SMAs.

2. **Streamside Management Areas (SMAs)**

Establish and maintain a streamside management area along surface waters, which is sufficiently wide and which includes a sufficient number of canopy species to buffer against detrimental changes in the temperature regime of the waterbody, to provide bank stability, and to withstand wind damage. Manage the SMA in such a way as to protect against soil disturbance in the SMA and delivery to the stream of sediments and nutrients generated by forestry activities, including harvesting. Manage the SMA canopy species to provide a sustainable source of large woody debris needed for instream channel structure and aquatic species habitat.

3. **Road Construction/Reconstruction**

- (1) Follow preharvest planning (as described under Management Measure 1) when constructing or reconstructing the roadway.*
- (2) Follow designs planned under Management Measure 1 for road surfacing and shaping.*
- (3) Install road drainage structures according to designs planned under Management Measure 1 and regional storm return period and installation specifications. Match these drainage structures with terrain features and with road surface and prism designs.*
- (4) Guard against the production of sediment when installing stream crossings.*
- (5) Protect surface waters from slash and debris material from roadway clearing.*
- (6) Use straw bales, silt fences, mulching, or other favorable practices on disturbed soils on unstable cuts, fills, etc.*
- (7) Avoid constructing new roads in SMAs to the extent practicable.*

4. **Road Management**

- (1) Avoid using roads where possible for timber hauling or heavy traffic during wet or thaw periods on roads not designed and constructed for these conditions.*
- (2) Evaluate the future need for a road and close roads that will not be needed. Leave closed roads and drainage channels in a stable condition to withstand storms.*
- (3) Remove drainage crossings and culverts if there is a reasonable risk of plugging or failure from lack of maintenance.*
- (4) Following completion of harvesting, close and stabilize temporary spur roads and seasonal roads to control and direct water away from the roadway. Remove all temporary stream crossings.*
- (5) Inspect roads to determine the need for structural maintenance. Conduct maintenance practices, when conditions warrant, including cleaning and replacement of deteriorated structures and erosion controls, grading or seeding of*

road surfaces, and, in extreme cases, slope stabilization or removal of road fills where necessary to maintain structural integrity.

- (6) Conduct maintenance activities, such as dust abatement, so that chemical contaminants or pollutants are not introduced into surface waters to the extent practicable.
- (7) Properly maintain permanent stream crossings and associated fills and approaches to reduce the likelihood (a) that stream overflow with divert onto roads, and (b) that fill erosion will occur if the drainage structures become obstructed.

5. **Timber Harvesting**

The timber harvesting management measure consists of implementing the following:

- (1) Timber harvesting operations with skid trails or cable yarding follow layouts determined under Management Measure 1.
- (2) Install landing drainage structures to avoid sedimentation to the extent practicable. Disperse landing drainage over sideslopes.
- (3) Construct landings away from steep slopes and reduce the likelihood of fill slope failures. Protect landing surfaces used during wet period. Locate landings outside of SMAs.
- (4) Protect stream channels and significant ephemeral drainages from logging debris and slash material.
- (5) Use appropriate areas for petroleum storage, draining, dispensing. Establish procedures to contain and treat spills. Recycle or properly dispose of all waste materials.

For cable yarding:

- (1) Limit yarding corridor gouge or soil plowing by properly locating cable yarding landings.
- (2) Locate corridors for SMAs following Management Measure 2.

For groundskidding:

- (1) Within SMAs, operate groundskidding equipment only at stream crossings to the extent practicable. In SMAs, fell and endline trees to avoid sedimentation.
- (2) Use improved stream crossings for skid trails which cross flowing drainages. Construct skid trails to disperse runoff and with adequate drainage structures.
- (3) On steep slopes, use cable systems rather than groundskidding where groundskidding may cause excessive sedimentation.

6. **Site Preparation and Forest Regeneration**

Confine on-site potential NPS pollution and erosion resulting from site preparation and the regeneration of forest stands. The components of the management measure for site preparation and regeneration are:

- (1) *Select a method of site preparation and regeneration suitable for the site conditions.*
- (2) *Conduct mechanical tree planting and ground-disturbing site preparation activities on the contour of sloping terrain.*
- (3) *Do not conduct mechanical site preparation and mechanical tree planting in streamside management areas.*
- (4) *Protect surface waters from logging debris and slash material.*
- (5) *Suspend operations during wet periods if equipment used begins to cause excessive soil disturbance that will increase erosion.*
- (6) *Locate windrows at a safe distance from drainages and SMAs to control movement of the material during high runoff conditions.*
- (7) *Conduct bedding operations in high-water-table areas during dry periods of the year. Conduct bedding in sloping areas on the contour.*
- (8) *Protect small ephemeral drainages when conducting mechanical tree planting.*

7. **Fire Management**

Prescribe fire for site preparation and control or suppress wildfire in a manner which reduces potential nonpoint source pollution of surface waters:

- (1) *Intense prescribed fire should not cause excessive sedimentation due to the combined effect of removal of canopy species and the loss of soil-binding ability of subcanopy and herbaceous vegetation roots, especially in SMAs, in streamside vegetation for small ephemeral drainages, or on very steep slopes.*
- (2) *Prescriptions for prescribed fire and wildfire, should protect against excessive erosion or sedimentation to the extent practicable.*
- (3) *All bladed firelines, for prescribed fire and wildfire, should be plowed on contour or stabilized with water bars and/or other appropriate techniques if needed to control excessive sedimentation or erosion of the fireline.*
- (4) *Wildfire suppression and rehabilitation should consider possible NPS pollution of watercourses, while recognizing the safety and operational priorities of fighting wildfires.*

8. **Revegetation of Disturbed Areas**

Reduce erosion and sedimentation by rapid vegetation of areas disturbed by harvesting operation or road construction.

- (1) *Revegetate disturbed areas (using seeding or planting) promptly after completion of the earth-disturbing activity. Local growing conditions will dictate the timing for establishment of vegetative cover.*
- (2) *Uses mixes of species and treatments developed and tailored for successful vegetation establishment for the region or area.*

(3) *Concentrate revegetation efforts initially on priority areas such as disturbed areas in SMAs or the steepest areas of disturbance near drainages.*

9. **Forest Chemical Management**

Use chemical when necessary for forest management in accordance with the following to reduce nonpoint source pollution impacts due to the movement of forest chemicals off-site during and after application:

- (1) *Conduct applications by skilled, and, where required, licensed applicators according to the registered use, with special consideration given to impacts to nearby surface waters.*
- (2) *Carefully prescribe the type and amount of pesticides appropriate for the insect, fungus, or herbaceous species.*
- (3) *Prior to applications of pesticides and fertilizers, inspect the mixing and loading process and the calibration of equipment, and identify the appropriate weather conditions the spray area, and buffer areas for surface waters.*
- (4) *Establish and identify buffer areas for surface waters. (This is especially important for area applications.)*
- (5) *Immediately report accidental spills of pesticides or fertilizers into surface waters to the appropriate State agency. Develop an effective spill contingency plan to contain spills.*

10. **Wetlands Forest**

Plan, operate, and manage normal, ongoing forestry activities (including harvesting, road design and construction, site preparation and regeneration, and chemical management) to adequately protect the aquatic functions of forested wetlands.

4. **Management Measures for Marinas and Recreational Boating**

Siting and Design

1. **Marina Flushing Management Measure**

Site and design marinas such that tides and/or currents will aid in flushing of the site or renew its water regularly.

2. **Water Quality Assessment Management Measure**

Assess water quality as part of marina siting and design

3. **Habitat Assessment Management Measure**

Site and design marinas to protect against adverse effects on shellfish resources, wetlands, submerged aquatic vegetation, or other important riparian and aquatic habitat areas as designated by local, State or Federal governments.

4. **Shoreline Stabilization Management Measures**

Where shoreline erosion is a nonpoint source pollution problem, shorelines should be stabilized. Vegetated methods are strongly preferred unless structural methods are more cost effective, considering the severity of wave and wind erosion, offshore bathymetry, and the potential adverse impact on other shorelines and offshore areas.

5. **Storm Water Runoff Management Measure**

Implement effective runoff control strategies which include the use of pollution prevent activities and the proper design of hull maintenance areas. Reduce the average annual loadings of total suspended solids (TSS) in runoff from hull maintenance areas by 80 percent. For the purposes of this measure, an 80 percent reduction of TSS is to be determined on an average annual basis.

6. **Fueling Station Design Management Measure**

Design fueling stations to allow for ease in cleanup of spills.

7. **Sewage Facility Management Measure**

Install pumpout, dump station, and restroom facilities where needed at new and expanding marinas to reduce the release of sewage to surface waters. Design these facilities to allow ease of access and post signage to promote use by the boating public.

Operation and Maintenance

1. **Solid Waste Management Measure**

Properly dispose of solid wastes produced by the operation, cleaning, maintenance, and repair of boats to limit entry of solid wastes to surface waters.

2. **Fish Waste Management Measure**

Promote sound fish waste management through a combination of fish-cleaning restrictions, public education, and proper disposal of fish waste.

3. **Liquid Material Management Measure**

Provide and maintain appropriate storage, transfer, containment, and disposal facilities for liquid material, such as oil, harmful solvents, antifreeze, and paints, and encourage recycling of these materials.

4. **Petroleum Control Management Measure**

Reduce the amount of fuel and oil from boat bilges and fuel tank air vents entering marina and surface waters.

5. **Boat Cleaning Management Measure**

For boats that are in the water, perform cleaning operations to minimize, to the extent practicable, the release to surface waters of (1) harmful cleaners and solvents; and (b) paint from in-water hull cleaning.

6. **Public Education Management Measure**

Public education/outreach/training programs should be instituted for boaters, as well as marina owners and operators, to prevent improper disposal of polluting material.

7. Maintenance of Sewage Facilities Management Measure

Ensure that sewage pumpout facilities are maintained in operational condition and encourage their use.

8. Boat Operation Management Measure (applies to boating only)

Restrict boating activities where necessary to decrease turbidity and physical destruction of shallow-water habitat.

5. Management Measures for Hydromodification

Channelization and Channel Modification

1. Management Measure for Physical and Chemical Characteristics of Surface Waters

- (1) Evaluate the potential effects of proposed channelization and channel modification on the physical and chemical characteristics of surface waters in coastal areas:*
- (2) Plan and design channelization and channel modification to reduce undesirable impacts;; and*
- (3) Develop an operation and maintenance program for existing modified channels that includes identification and implementation of opportunities to improve physical and chemical characteristics of surface waters in those channels.*

2. Instream and Riparian Habitat Restoration Management Measure

- (1) Evaluate the potential effects of proposed channelization and channel modification on instream and riparian habitat in coastal areas;*
- (2) Plan and design channelization and channel modification to reduce undesirable impacts; and*
- (3) Develop an operation and maintenance program with specific timetables for existing modified channels that includes identification of opportunities to restore instream and riparian habitat in those channels.*

Dams

1. Management Measure for Erosion and Sediment Control

- (1) Reduce erosion, and, to the extent practicable, retain sediment onsite during and after construction, and*
- (2) Prior to land disturbance, prepare and implement an approved erosion and sediment control plan or similar administrative document that contains erosion and sediment controls provisions.*

2. Management Measure for Chemical and Pollutant Control

- (1) Limit application, generation, and migration of toxic substances;*

- (2) *Ensure the proper storage and disposal of toxic materials; and,*
- (3) *Apply nutrients at rates necessary to establish and maintain vegetation without causing significant nutrient runoff to surface waters.*

3. Management Measure for Protection of Surface Water Quality and Instream and Riparian Habitat

Develop and implement a program to manage the operation of dams in coastal areas that includes an assessment of:

- (1) *Surface water quality and instream and riparian habitat and potential for improvement and*
- (2) *Significant nonpoint source pollution problems that result from excessive surface water withdrawal.*

Streambank and Shoreline Erosion

1. Management Measure for Eroding Streambanks and Shorelines

- (1) *Where streambank or shoreline erosion is a nonpoint source pollution problem, streambanks and shorelines should be stabilized. Vegetative methods are strongly preferred unless structural methods are more cost-effective, considering the severity of wave and wind erosion, offshore bathymetry, and the potential adverse impact on other streambanks, shorelines, and offshore areas.*
- (2) *Protect streambank and shoreline features with the potential to reduce NPS pollution.*
- (3) *Protect streambanks and shorelines from erosion due to uses of either the shorelands or adjacent surface waters.*

6. Management Measures for Wetlands, Riparian Areas and Vegetated Treatment Systems

1. Management Measure for Protection of Wetlands and Riparian Areas

Protect from adverse effects wetlands and riparian areas that are serving a significant NPS abatement function and maintain this function while protecting the other existing functions of these wetlands and riparian areas as measured by characteristics such as vegetative composition and cover, hydrology of surface water and ground water, geochemistry of the substrate, and species composition.

2. Management Measure for Restoration of Wetland and Riparian Areas

Promote the restoration of the preexisting functions in damaged and destroyed wetlands and riparian systems in areas where the systems will serve a significant NPS pollution abatement function.

3. Management Measure for Vegetated Treatment Systems

Promote the use of engineered vegetative treatment systems such as constructed wetlands or vegetated filter strips where these systems will serve a significant NPS pollution abatement function.