ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 9, 122, 123, 124, and 125

[FRL–6843–5]

RIN 2040–AC23

National Pollutant Discharge Elimination System—Regulations Addressing Cooling Water Intake Structures for New Facilities

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule.

SUMMARY: Today's proposed rule would implement section 316(b) of the Clean Water Act (CWA) for new facilities that use water withdrawn from rivers, streams, lakes, reservoirs, estuaries, oceans or other waters of the U.S. for cooling water purposes. The proposed rule would establish national requirements applicable to the location, design, construction, and capacity of cooling water intake structures at new facilities. The proposed national requirements would minimize the adverse environmental impact associated with the use of these structures.

Today's proposed rule would establish location, design, construction, and capacity requirements that reflect the best technology available for minimizing adverse environmental impact from the cooling water intake structure based on the placement of the intake structure and the water body type. The Environmental Protection Agency (EPA) proposes to group surface water into four categories—freshwater rivers and streams, lakes and reservoirs, estuaries and tidal rivers, and oceans—and to establish requirements for cooling water intake structures located in each water body type. In general, the closer the intake structure is to areas that are most sensitive or biologically productive, the more stringent the requirements proposed to minimize adverse environmental impact. Under this proposal, EPA would set performance requirements and would not mandate the use of specific technologies.

EPA expects that this proposed regulation would reduce impingement and entrainment at new facilities over the next 20 years. Today's proposed rule would establish requirements that would help preserve ecosystems in close proximity to cooling water intake structures at new facilities. EPA has considered the potential benefits of the proposal and the preamble discusses them in qualitative terms. Expected benefits include a decrease in expected mortality or injury to aquatic organisms that would otherwise be subject to entrainment into cooling water systems or impingement against screens or other devices at the entrance of cooling water intake structures. The proposed regulatory requirements also could reduce adverse impact on threatened and endangered species.

DATES: Comments on this proposed rule and Information Collection Request (ICR) must be received or postmarked on or before midnight October 10, 2000.

ADDRESSES: Public comments regarding this proposed rule should be submitted by mail to: Cooling Water Intake Structure (New Facilities) Proposed Rule Comment Clerk—W–00–03, Water Docket, Mail Code 4101, EPA, Ariel Rios Building, 1200 Pennsylvania Avenue, NW., Washington, DC 20460. Comments delivered in person (including overnight mail) should be submitted to the Cooling Water Intake Structure (New Facilities) Proposed Rule Comment Clerk—W–00–03, Water Docket, Room EB 57, 401 M Street, SW., Washington, DC 20460. You also may submit comments electronically to *ow-docket@epa.gov*. Please submit any references cited in your comments. Please submit an original and three copies of your written comments and enclosures. For additional information on how to submit comments, see ''**SUPPLEMENTARY INFORMATION,** How May I Submit Comments?''

EPA has prepared an ICR for this proposed rule (EPA ICR number 1973.01). For further information or a copy of the ICR contact Sandy Farmer by phone at (202)260–2740, e-mail at farmer.sandy@epamail.epa.gov or download off the internet at http://www.epa.gov/icr. Send comments on the Agency's need for this information, the accuracy of the burden estimates, and any suggested methods for minimizing respondent burden (including the use of automated collection techniques) to the following addresses. Please refer to EPA ICR No. 1973.01 in any correspondence.

Ms. Sandy Farmer, U.S. Environmental Protection Agency, OP Regulatory Information Division (2137), 401 M Street, SW., Washington, DC 20460 and

Office of Information and Regulatory Affairs, Office of Management and Budget, Attention: Desk Officer for EPA, 725 17th Street, NW., Washington, DC 20503.

FOR FURTHER INFORMATION CONTACT: For additional technical information contact Deborah G. Nagle at (202) 260–2656 or James T. Morgan at (202) 260–6015. For additional economic information contact Lynne Tudor at (202) 260–5834. The e-mail address for the above contacts is ''rule.316b@epa.gov.''

SUPPLEMENTARY INFORMATION:

What Entities Are Potentially Regulated by This Action?

This proposed rule would apply to new facilities that use cooling water intake structures to withdraw water from waters of the U.S. and that have or require a National Pollutant Discharge Elimination System (NPDES) permit issued under section 402 of the CWA. New facilities subject to this regulation would include those with a design intake flow of greater than two (2) million gallons per day (MGD). If a new facility meets these conditions, it is subject to today's proposed regulations. If a new facility has or requires an NPDES permit but does not meet the 2 MGD intake flow threshold, it would be subject to permit conditions implementing section 316(b) on a case-by-case basis, using best professional judgment. This proposal defines the term ''cooling water intake structure'' to mean the total physical structure and any associated constructed waterways used to withdraw water from waters of the U.S., provided that at least twenty-five (25) percent of the water withdrawn is used for cooling purposes. Generally, facilities that meet these criteria fall into two major groups: new steam electric generating facilities and new manufacturing facilities.

The following table lists the types of entities that are potentially subject to this proposed rule. This table is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be regulated by this action. This table lists the types of entities that EPA is now aware that could potentially be regulated by this action; other types of entities not listed in the table could also be regulated. To determine whether your facility would be regulated by this action, you should carefully examine the applicability criteria proposed at § 125.81 of the rule. If you have questions regarding the applicability of this action to a particular entity, consult one of the persons listed for technical information in the preceding **FOR FURTHER INFORMATION CONTACT** section.

Category	Examples of regulated entities	Standard Industrial Classification Codes	North American Industry Code (NAIC)
Federal, State and local government.	Operators of steam electric generating point source dischargers that employ cooling water intake structures.	4911 and 493	221111, 221112, 221113, 221119, 221121, 221122, 221111, 221112, 221113, 221119, 221121, 221122.
Industry	Operators of industrial point source dischargers that employ cooling water intake structures.	See below	See below.
	Steam electric generating	4911 and 493	221111, 221112, 221113, 221119, 221121, 221122, 221111, 221112, 221113, 221119, 221121, 221122.
	Agricultural production	0133	111991 11193.
	Metal mining	1011	21221.
	Oil and gas extraction	1311, 1321	211111, 211112.
	Mining and quarrying of nonmetallic minerals	1474	212391.
	Food and kindred products	2046, 2061, 2062, 2063, 2075, 2085.	311221, 311311, 311312, 311313, 311222, 311225, 31214.
	Tobacco products	2141	312229, 31221.
	Textile mill products	2211	31321.
	Lumber and wood products, except furniture	2415, 2421, 2436, 2493	321912, 321113, 321918, 321999, 321212, 321219.
	Paper and allied products	2611, 2621, 2631, 2676	3221, 322121, 32213, 322121, 322122, 32213, 322291.
	Chemical and allied products	28 (except 2895, 2893, 2851, and 2879).	325 (except 325182, 32591, 32551, 32532).
	Petroleum refining and related industries	2911, 2999	32411, 324199.
	Rubber and miscellaneous plastics products	3011, 3069	326211, 31332, 326192, 326299.
	Stone, clay, glass, and concrete products	3241	32731.
	Primary metal industries	3312, 3313, 3315, 3316, 3317, 3334, 3339, 3353, 3363, 3365, 3366.	324199, 331111, 331112, 331492, 331222, 332618, 331221, 22121, 331312, 331419, 331315, 331521, 331524, 331525.
	Fabricated metal products, except machinery and transportation equipment.	3421, 3499	332211, 337215, 332117, 332439, 33251, 332919, 339914, 332999.
	Industrial and commercial machinery and computer equipment.	3523, 3531	333111, 332323, 332212, 333922, 22651, 333923, 33312.
	Transportation equipment	3724, 3743, 3764	336412, 333911, 33651, 336416.
	Measuring, analyzing, and controlling instruments; photographic, medical, and optical goods; watches and clocks.	3861	333315, 325992.
	Electric, gas, and sanitary services	4911, 4931, 4939, 4961	221111, 221112, 221113, 221119, 221121, 221122, 22121, 22133.
	Educational services	8221	61131.

How May I Review the Public Record?

The record (including supporting documentation) for this proposed rule is filed under docket number W–00–03 (proposed rule). The record is available for inspection from 9 a.m. to 4 p.m. on Monday through Friday, excluding legal holidays, at the Water Docket, Room EB 57, USEPA Headquarters, 401 M Street, SW, Washington, DC 20460. For access to docket materials, please call (202)260–3027 to schedule an appointment during the hours of operation stated above.

How May I Submit Comments?

To ensure that EPA can read, understand, and therefore properly respond to comments, the Agency requests that you cite, where possible, the paragraph(s) or sections in the preamble, rule, or supporting documents to which each comment refers. You should use a separate paragraph for each issue you discuss.

If you want EPA to acknowledge receipt of your comments, enclose a self-addressed, stamped envelope. No faxes will be accepted. Electronic comments must be submitted as a WordPerfect 5.1, 6.1, or 8 format, or an ASCII file or file avoiding the use of special characters and forms of encryption. Electronic comments must be identified by the docket number W–00–03. EPA will accept comments and data on disks in WordPerfect 5.1, 6.1, or 8 format or in ASCII file format. Electronic comments on this notice may be filed on-line at many Federal depository libraries.

Cooling Water Intake Structures: Section 316(b) New Facility Draft Preamble and Proposed Rule

Table of Contents

I. Legal Authority

Today's proposed rule is issued under the authority of sections 301, 306, 308, 316, 402, and 501 of the Clean Water Act (CWA), 33 U.S.C. 1311, 1316, 1318, 1326, 1342, and 1361. This proposal partially fulfills the obligations of the U.S. Environmental Protection Agency (EPA) under a Consent Decree in *Cronin* v. *Browner*, United States District Court, Southern District of New York, No. 93 Civ 0314 (AGS).

II. Purpose and Summary of Proposed Regulation

A. What Is the Purpose of Today's Proposed Regulation?

Section 316(b) of the CWA provides that any standard established pursuant to section 301 or 306 of the CWA and applicable to a point source must require that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact. Today's proposal would define a cooling water intake structure as the total physical structure and any associated constructed waterways used to withdraw water from waters of the U.S., provided that at least twenty-five (25) percent of the water withdrawn is used for cooling purposes. Cooling water absorbs waste heat rejected from processes employed or from auxiliary operations on a facility's premises. Single cooling water intake structures might have multiple intake bays. Today's proposed rule would establish requirements applicable to the location, design, construction, and capacity of cooling water intake structures at new facilities. The proposal seeks to minimize the adverse environmental impact associated with the use of these structures.

Today's proposed rule partially fulfills EPA's obligation to comply with a Consent Decree entered in the United States District Court, Southern District of New York in *Cronin* v. *Browner,* No. 93 Civ. 0314 (AGS), a case brought against EPA by a coalition of individuals and environmental groups. The Consent Decree as entered on October 10, 1995, provided that EPA propose regulations implementing section 316(b) by July 2, 1999, and take final action with respect to those regulations by August 13, 2001. EPA later moved to amend the Consent Decree by bifurcating the rule into two phases—Phase I addressing new facilities and Phase II addressing existing facilities—and extending the deadlines for proposal and final action. Plaintiffs opposed EPA's motion for an extension of the deadlines. On March 27, 2000, the Court amended the Consent Decree to provide among other things that EPA propose regulations addressing new facilities on or before July 20, 2000, and propose regulations addressing existing facilities on or before July 20, 2001. The Court declined

to specify deadlines for final action with respect to regulations addressing new and existing facilities, stating that the parties should attempt to reach an agreement with respect to the deadlines in the Consent Decree. Today's proposal fulfills EPA's obligation under the Consent Decree to propose regulations addressing new facilities.

This proposed rule would apply to new facilities that use cooling water intake structures to withdraw water from waters of the U.S. and that have or require a National Pollutant Discharge Elimination System (NPDES) permit issued under section 402 of the CWA. New facilities subject to this proposed regulation would be those with a design intake flow of greater than two (2) million gallons per day (MGD).

If a new facility has or requires an NPDES permit and meets the 2 MGD flow threshold, it is subject to today's proposed regulations. The proposal would define the term ''new facility'' as any building, structure, facility, or installation that meets the definition of ''new source'' or ''new discharger'' in 40 CFR 122.2 and 122.29(b)(1), (2), and (4); commences construction after the effective date of this rule; and has a new or modified cooling water intake structure that withdraws cooling water from waters of the U.S.

Today's proposal would add language to EPA's NPDES permitting regulations at 40 CFR part 125, subpart I that establishes requirements applicable to cooling water intake structures for new facilities, and would reserve 40 CFR part 125, subpart J for requirements addressing existing facilities. Today's proposal also would amend EPA's regulations at 40 CFR 122.44(b)(3) to require the inclusion in EPA-issued NPDES permits of requirements applicable to cooling water intake structures at new facilities, in accordance with part 125, subpart I and would amend EPA's regulations establishing requirements for authorized State NPDES programs by reinstating references to 40 CFR part 125, subparts I and J in 40 CFR 123.25(a)(36). This would have the effect of mandating that States have legal authority to implement final regulations addressing cooling water intake structures at new and existing facilities. Subpart I currently reads in its entirety, ''Criteria Applicable to Cooling Water Intake Structures Under section 316(b) of the Act [Reserved].'' Subpart J currently reads in its entirety, ''Reserved.'' References to part 125, subparts I and J were included in § 123.25(a)(36) for many years. Recently, however, EPA's *Amendments to Streamline the National Pollutant Discharge Elimination System Program Regulations: Round Two* deleted the references to subparts I and J from 40 CFR 123.25(a)(36) along other with references to reserved subparts. 65 FR 30886, 30910 (May 15, 2000). Today's proposal would reinsert those references in light of the pending rulemaking proceedings addressing cooling water structures at new and existing facilities.

Proposed section 125.80(c) makes clear that nothing in today's proposal would preclude or deny the authority of States, their political subdivisions, and interstate agencies under section 510 of the CWA. States retain authority under section 510 to adopt or enforce any requirement respecting the control or abatement of pollution that is more stringent than the minimum requirements established in a final rule based on this proposal. Section 502(19) of the CWA defines ''pollution'' as including the man-made or man-induced alteration of the physical and biological integrity of water.

Today's proposed rule would also add proposed regulatory language at 40 CFR 122.2(q) to require that the information required under proposed § 125.86 regarding cooling water intake structure information and requests for alternative requirements under proposed § 125.85 be submitted at the time of permit application. Finally, EPA proposes to amend the public notification requirements at 40 CFR 124.10(d)(1) to require notification that a permit applicant is subject to the cooling water intake structure requirements of part 125 subpart I.

B. What Requirements Would Today's Proposed Regulation Establish?

At § 125.84(a)–(e), today's proposed rule would establish national performance requirements for the location, design, construction, and capacity of cooling water intake structures at new facilities to minimize adverse environmental impact. Under the proposed rule, EPA would establish minimum national location, design, construction, and capacity requirements for minimizing adverse environmental impact from cooling water intake structures based on the placement of the intake structure and the water body type. EPA has grouped surface waters into four categories and is proposing separate requirements for cooling water intake structures in each category. These categories are based on the location of a facility's cooling water intake structure on or within (1) a freshwater river or stream, (2) a lake or reservoir, (3) an estuary or tidal river, or (4) an ocean. Proposed § 125.84(f) provides that in certain circumstances Directors may impose additional site-specific requirements when in their judgment the national requirements are not sufficient to ensure that adverse environmental impact will be minimized. Section 125.84(g) would require the Director to impose any more stringent requirements needed to ensure attainment of water quality standards. Finally, § 125.85 would allow any interested person to request that the Director impose alternative best technology available (BTA) requirements by demonstrating that compliance with the requirements would result in compliance costs wholly out of proportion to the costs EPA considered in establishing the national standards proposed at § 125.84(a)–(e). The term ''Director'' means the State or Tribal Director where there is an approved NPDES State or Tribal program and means the Regional Administrator where EPA administers the NPDES program in the State. See 40 CFR 122.2.

C. How Does Today's Proposed Regulation Affect New Facilities Built Before Today's Proposal Is Finalized and Existing Facilities Subject to Section 316(b)?

In 1977 EPA issued draft guidance for determining the best technology available to minimize adverse environmental impact from cooling water intake structures. In the absence of section 316(b) regulations or final guidance, the 1977 draft guidance has served as applicable guidance for section 316(b) determinations. See *Draft Guidance for Evaluating the Adverse Impact of Cooling Water Intake Structures on the Aquatic Environment: Section 316(b) P.L. 92–500* (U.S. EPA, 1977). Administrative determinations in several permit proceedings also have served as de facto guidance.

Today, EPA proposes a national framework that would establish certain minimum requirements for the design, capacity, and construction of cooling water intake structures for new facilities based on the location of a cooling water intake structure in four categories of water bodies. In doing so, the Agency is proposing to revise the approach adopted in the 1977 draft guidance which was based on the judgment that ''[t]he decision as to best technology available for intake design location, construction, and capacity must be made on a case-by-case basis.'' Other important differences from the 1977 draft Guidance include today's proposed definition of a ''cooling water intake structure'' for new facilities. Today's proposal also would establish a cost test that is different from the

''wholly disproportionate'' test that has been in use since the 1970s (see section VIII C).

Although EPA's judgment is that the requirements proposed today would best implement section 316(b) for new facilities, the Agency is also inviting comment on a broad array of other alternatives, including, for example, a framework under which Directors would continue to evaluate adverse environmental impact and determine the best technology available for minimizing such impact on a wholly site-specific basis. Because the Agency is inviting comment on such a broad range of alternatives for potential promulgation, today's proposal is not intended as guidance for determining the best technology available to minimize the adverse environmental impact of cooling water intake structures at new facilities before the Agency promulgates final regulations based on today's proposal. In the interim, Directors should continue to make section 316(b) determinations, which may be more or less stringent than today's proposal, on a case-by-case basis applying best professional judgment.

Today's proposal does not apply to existing facilities. Although EPA has not yet closely examined the costs of technology options at facilities, the Agency anticipates that existing facilities would have less flexibility in designing and locating their cooling water intake structures than new facilities and that existing facilities might incur higher costs to comply with the proposed requirements than new facilities would incur. For example, existing facilities might need to upgrade or modify existing intake structures and cooling water systems to meet today's proposed requirements, which might impose greater costs than use of the same technologies at a new facility. Retrofitting technologies at an existing facility might also require brief shutdown periods during which the facility would lose both production and revenues, and certain retrofits could decrease the thermal efficiency of an electric generating facility. Existing facilities also might have site limitations, such as lack of undeveloped space, that might make certain technologies infeasible. The Agency anticipates that at the time it promulgates final requirements for cooling water intake structures at new facilities, it will have made substantial progress in its analyses to support section 316(b) regulations for existing facilities employing cooling water intake structures. Upon promulgation of final regulations based on today's proposal, the Agency will address the extent to which the final new facility regulation and preamble should serve as guidance for developing section 316(b) requirements for existing facilities prior to the promulgation of the section 316(b) regulations for existing facilities.

III. Legal Background

A. The Clean Water Act

The Federal Water Pollution Control Act, also known as the Clean Water Act (CWA), seeks to ''restore and maintain the chemical, physical, and biological integrity of the nation's waters.'' 33 U.S.C. section 1251(a). The CWA establishes a comprehensive regulatory program, key elements of which are (1) a prohibition on the discharge of pollutants from point sources to waters of the U.S., except as authorized by the statute; (2) authority for EPA or authorized States or Tribes to issue NPDES permits that regulate the discharge of pollutants; and (3) requirements for EPA to develop effluent limitations guidelines and standards and for States to develop water quality standards that are the basis for the pollutant discharge limits imposed in NPDES permits.

Today's proposed rule implements section 316(b) of the CWA as it applies to new facilities. Section 316(b) addresses the adverse environmental impact caused by the intake of cooling water, not discharges into water. Despite this special focus, the requirements of section 316(b) are closely linked to several of the core elements of the NPDES permit program established under section 402 of the CWA to control discharges of pollutants into navigable waters. For example, section 316(b) applies to facilities that use a cooling water intake structure and have a point source discharge that is NPDES-permitted or requires an NPDES permit. Conditions implementing section 316(b) are included in NPDES permits and would continue to be included in NPDES permits under this proposed rule.

Section 301 of the CWA prohibits the discharge of any pollutant by any person, except in compliance with specified statutory requirements. These requirements include compliance with technology-based effluent limitations guidelines and new source performance standards, water quality standards, NPDES permit requirements, and certain other requirements.

Section 402 of the CWA provides authority for EPA or an authorized State or Tribe to issue an NPDES permit to any person discharging any pollutant from a point source into waters of the U.S. Forty-three States and one U.S. territory are authorized under section 402(b) to administer the NPDES permitting program. NPDES permits restrict the types and amounts of pollutants, including heat, that may be discharged from various industrial, commercial, and other sources of wastewater. These permits control the discharge of pollutants primarily through the imposition of effluent limitations and other permit conditions. Effluent limitations may be based on promulgated effluent limitations guidelines, new source performance standards, or the best professional judgment of the permit writer. Limitations based on these guidelines, standards, or best professional judgment are known as technology-based effluent limits. Where technology-based effluent limits are inadequate to ensure compliance with water quality standards applicable to the receiving water, more stringent effluent limits based on applicable water quality standards are imposed. NPDES permits also routinely include monitoring and reporting requirements, standard conditions, and special conditions.

Sections 301, 304, and 306 of the CWA require that EPA develop technology-based effluent limitations guidelines and new source performance standards that are used as the basis for technology-based minimum discharge requirements in wastewater discharge permits. EPA issues these effluent limitations guidelines and standards for categories of industrial dischargers based on the pollutants of concern discharged by the industry, the degree of control that can be attained using various levels of pollution control technology, the economic achievability of meeting the level of control, and other factors identified in section 304 and 306 of the CWA. EPA has promulgated regulations setting effluent limitations guidelines and standards under sections 301, 304, and 306 of the CWA for more than 50 industries. See 40 CFR parts 405–471. Among these, EPA has established effluent limitations guidelines that apply to most of the industry categories that use cooling water intake structures (*e.g.,* steam electric power generation, iron and steel manufacturing, pulp and paper, petroleum refining, chemical manufacturing).

Section 306 of the CWA requires that EPA establish discharge standards for new sources. For purposes of section 306, new sources include any source that commenced construction after the promulgation of applicable new source performance standards, or after proposal of applicable standards of performance

if the standards are promulgated in accordance with section 306 within 120 days of proposal. CWA section 306; 40 CFR 122.2. New source performance standards are similar to the technology-based limitations established for existing sources, except that new source performance standards are based on the best available demonstrated technology instead of the best available technology economically achievable. New facilities have the opportunity to install the best and most efficient production processes and wastewater treatment technologies. Therefore, Congress directed EPA to consider the best demonstrated process changes, in-plant controls, and end-of-process control and treatment technologies that reduce pollution to the maximum extent feasible. In addition, in establishing new source performance standards, EPA is required to take into consideration the cost of achieving the effluent reduction and any non-water quality environmental impact and energy requirements.

B. What Is Required Under Section 316 of the Clean Water Act?

Section 316(b) seeks to minimize the adverse environmental impact associated with cooling water intake structures. Section 316(b) provides, ''Any standard established pursuant to [CWA section 301] or [CWA section 306] and applicable to a point source shall require that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact.''

Congress included section 316 in the CWA for the express purpose of regulating thermal discharges and addressing the environmental impact of cooling water intake structures. Sections 316(a) and (c) provide for relief in certain circumstances from the thermal effluent standards applicable to point source discharges of pollutants. Section 316(b) does not focus on controlling the discharge of pollutants; rather, it addresses the environmental impact of cooling water intake structures. Section 316(b) is the only provision in the CWA that focuses exclusively on water intake.

Today's proposal would establish requirements that focus on the location, design, construction, and capacity of cooling water intake structures at new facilities. For each of these features, today's proposed rule would establish minimum requirements that constitute the ''best technology available for minimizing adverse environmental impact.'' EPA notes that ''best technology available'' (BTA) is a distinct standard under the CWA. Although it is technology-based and similar to the standards used in the development of effluent limitations guidelines (*i.e.,* best available technology economically achievable), the BTA standard does not explicitly include any consideration of the costs of ensuring that cooling water intake structures reflect the best technology available, although based on legislative history EPA has long done so. In addition, the standards developed under section 316(b) focus on minimizing adverse environmental impact.

Today's proposal also would define a cooling water intake structure as the total physical structure and any associated constructed waterways used to withdraw water from waters of the U.S., provided that at least twenty-five (25) percent of the water withdrawn is used for cooling purposes. New facilities subject to this proposed regulation would be those with a design intake flow of greater than two (2) million gallons per day (MGD).

IV. History

A. Have Prior EPA Regulations Addressed Cooling Water Intake Structures?

In April 1976 EPA published a rule under section 316(b) that addressed cooling water intake structures. 41 FR 17387 (April 26, 1976), proposed at 38 FR 34410 (December 13, 1973). The rule added a new § 401.14 to 40 CFR Chapter I that reiterated the requirements of CWA section 316(b). It also added a new part 402, which included three sections: (1) § 402.10 (Applicability); (2) § 402.11 (Specialized definitions); and (3) § 402.12 (Best technology available for cooling water intake structures). Section 402.10 stated that the provisions of part 402 applied to ''cooling water intake structures for point sources for which effluent limitations are established pursuant to section 301 or standards of performance are established pursuant to section 306 of the Act.'' Section 402.11 defined the terms ''cooling water intake structure,'' ''location,'' ''design,'' ''construction,'' ''capacity,'' and ''Development Document.'' Section 402.12 included the following language:

> The information contained in the Development Document shall be considered in determining whether the location, design, construction and capacity of a cooling water intake structure of a point source subject to standards established under section 301 or 306 reflect the best technology available for minimizing adverse environmental impact.

In 1977 fifty-eight electric utility companies challenged these regulations, arguing that EPA had failed to comply with the requirements of the Administrative Procedure Act (APA) in promulgating the rule. Specifically, the utilities urged that EPA had neither published the Development Document in the **Federal Register** nor properly incorporated the document into the rule by reference. The United States Court of Appeals for the Fourth Circuit agreed and, without reaching the merits of the regulations themselves, remanded the rule. *Appalachian Power Co.* v. *Train,* 566 F.2d 451 (4th Cir. 1977). EPA later withdrew part 402. 44 FR 32956 (June 7, 1979). 40 CFR 401.14 remains in effect.

B. How Is Section 316(b) of the CWA Being Implemented Now?

Since the Fourth Circuit remanded EPA's section 316(b) regulations in 1977, decisions implementing section 316(b) have been made on a case-by-case, site-specific basis. EPA published guidance addressing section 316(b) implementation in 1977. See Draft Guidance for Evaluating the Adverse Impact of Cooling Water Intake Structures on the Aquatic Environment: Section 316(b) P.L. 92–500 (U.S. EPA, 1977). This guidance describes the studies recommended for evaluating the impact of cooling water intake structures on the aquatic environment, and it establishes a basis for determining the best technology available for minimizing adverse environmental impact. The 1977 Section 316(b) Draft Guidance states, ''The environmental-intake interactions in question are highly site-specific and the decision as to best technology available for intake design, location, construction, and capacity must be made on a case-by-case basis.'' (Section 316(b) Draft Guidance, U.S. EPA, 1977, p. 4). This case-by-case approach also is consistent with the approach described in the 1976 Development Document referenced in the remanded regulation.

The 1977 Section 316(b) Draft Guidance suggests the general process for developing information needed to support section 316(b) decisions and presenting that information to the permitting authority. The process involves the development of a site-specific study of the environmental effects associated with each facility that uses one or more cooling water intake structures, as well as consideration of that study by the permitting authority in determining whether the facility must make any changes to minimize adverse environmental impact. Where adverse environmental impact is present, the 1977 Draft Guidance suggests a ''stepwise'' approach that considers screening systems, size, location, capacity, and other factors.

Although the Draft Guidance describes the information that should be developed, key factors that should be considered, and a process for supporting section 316(b) determinations, it does not establish national standards based on the best technology available to minimize adverse environmental impact. Rather, the guidance leaves the decisions on the appropriate location, design, capacity, and construction of each facility to the permitting authority. Under this framework, the Director determines whether appropriate studies have been performed and whether a given facility has minimized adverse environmental impact.

V. Scope and Applicability of the Proposed Rule

A. Who Is Covered Under This Proposed Rule?

Today's proposed rule would apply to you if you are the owner or operator of a facility that meets all of the following criteria:

- Your facility is a new facility;
- Your new facility has a cooling water intake structure or structures;
- Your new facility's cooling water intake structure(s) withdraw(s) water from waters of the U.S. and at least twenty-five (25) percent of the water withdrawn is used for contact or noncontact cooling purposes;
- Your new facility has a design intake flow of greater than two (2) million gallons per day (MGD); and
- Your new facility has an NPDES permit or is required to obtain one.

B. What Is a ''New Facility''?

EPA is proposing to define the term ''new facility'' to mean any building, structure, facility or installation which

- Meets the definition of ''new source'' or ''new discharger'' in 40 CFR 122.2 and 122.29(b)(1), (2), and (4);
- Commences construction after the effective date of this rule; and
- Has a new or modified cooling water intake structure that withdraws water from waters of the U.S.

This proposal covers only ''greenfield'' and ''stand-alone'' facilities. A ''greenfield'' facility is a facility that is constructed at a site at which no other source is located, or that totally replaces the process or production equipment at an existing facility. A ''stand-alone'' facility is a new, separate facility that is constructed on property where an existing facility is located and whose processes are substantially independent of the existing facility at the same site. A modified cooling water intake structure is one that has some part of the intake, including the pumps, changed, replaced, or expanded to accommodate, in whole or in part, a new facility's water usage. Routine maintenance and repair to an intake structure which is currently withdrawing cooling water and does not result in an increase in design capacity is not considered a modification. Facilities that meet the conditions of 40 CFR 122.29(b)(3) would be considered to be undergoing a modification and would not be considered a ''new facility'' under these regulations. Such facilities will be addressed during the forthcoming existing facility rulemaking.

Examples of when a facility would be considered a new facility include, but are not limited to the following:

- Facility A is newly constructed on a property that has never been used for industrial or commercial activity, and a new cooling water intake structure is constructed for Facility A's use.
- Facility B, which produces widgets, is demolished and Facility C is constructed in its place. (Facility C might or might not produce widgets). Facility C uses the cooling water intake structure that Facility B used but modifies it in some way.
- Facility D is in commercial operation. Facility E, a separate and independent industrial operation, is constructed on the property that Facility D owns. The cooling water intake structure that Facility D uses is modified by constructing a new intake bay for Facility E's use.

Modifications to an existing facility would not be covered under this proposed rule. Rather, such modifications will be addressed during the existing facility rulemaking. Examples of when a facility undergoing a change or modification would be considered an existing facility might include the following:

- Facility F is in commercial or industrial operation. Facility F modifies its facility and either continues to use the original cooling water intake structure or a new or modified cooling water intake structure.
- Facility G has an existing intake structure. Facility H, a separate and independent industrial operation, is constructed on the property that Facility G owns and connects to Facility G's cooling water intake structure behind the intake pumps. In this case, the cooling water intake structure has not been modified for Facility H's use. This would remain true even if routine maintenance or repairs were performed on the structure.
- Facility J is in commercial or industrial operation. Facility J adds a new process unit consistent with 40 CFR 122.29(b)(3) that is directed toward the same general activity (*e.g.,* a new peaking unit at an electricity generation station) as facility J's existing operations. Facility J may or may not modify its intake structure to accommodate the new unit.

Today's proposal would define a facility as new based on the date the facility commences construction within the meaning of 40 CFR 122.29(b)(4). Under this approach, any facility that commences construction after the date on which the final rule is effective would have to comply with the new facility requirements. This approach to defining ''new facility'' is generally consistent with the definition of the terms ''new source'' and ''new discharger'' used in the NPDES permitting program (see 40 CFR 122.2 and 122.29), and it should provide adequate notice and time for the planning needed to implement the technological changes necessitated by the requirements.

C. What Is a ''Cooling Water Intake Structure''?

At § 125.83, EPA is proposing to define a ''cooling water intake structure'' as the total physical structure and any associated constructed waterways used to withdraw water from a water of the U.S., provided that at least twenty-five (25) percent of the water withdrawn is used for cooling purposes. The cooling water intake structure extends from the point at which water is withdrawn from the surface water source to the first intake pump or series of pumps. The intended use of the cooling water is to absorb waste heat rejected from processes employed or from auxiliary operations.

This definition differs from the definition included in the 1977 Draft Guidance. First, the proposed definition clarifies that the cooling water intake structure includes the physical structure and technologies that extend up to the first intake pump or series of pumps. This change is intended to define more clearly what EPA considers to constitute the cooling water intake structure. Second, the definition would apply to water being brought in for both contact and noncontact cooling purposes. This clarification is necessary because cooling water intake structures typically bring water into at a facility for numerous purposes, including industrial processes; use as circulating water, service water, or evaporative cooling tower makeup water; dilution of effluent heat content; equipment cooling; and air conditioning. Finally, the proposed definition includes intake structures if a facility uses twenty-five

(25) percent or more of the water drawn through the structure for cooling purposes. This also is a change from the current practice. (The 1976 final rule and 1977 Draft Guidance definition of a ''cooling water intake structure'' included intake structures if a facility used the major portion of water drawn through the structure for cooling purposes. In practice, many permitting authorities have interpreted that definition to apply to intake structures if a facility uses more than 50 percent of the water drawn through the structure for cooling.)

Based on experience since the late 1970s, the Agency included intake structures at new facilities in today's proposal if a facility uses twenty-five (25) percent or more of the withdrawn water for cooling purposes. It is well settled that section 316(b) applies to all categories of point sources. See *United States Steel Corp.* v. *Train*, 556 F.2d 822, 849–50 (7th Cir. 1977). In practice, however, section 316(b) has been implemented at few facilities other than steam electric generating plants, despite the fact that a number of other industries use significant amounts of cooling water. EPA chose twenty-five (25) percent as a reasonable threshold for the percent of flow used for cooling purposes in conjunction with the two MGD total flow threshold discussed at section V.D. below to ensure that almost all cooling water withdrawn from waters of the U.S. are addressed by the requirements in this proposal for minimizing adverse environmental impact. The Agency invites comment on this proposed approach to defining a cooling water intake structure. The Agency also invites comment on whether it should define a cooling water intake structure in a manner similar to the 1976 final rule and 1977 draft guidance. If EPA implemented the latter approach, language such as the following would be included in proposed § 125.83:

> Cooling water intake structure means the total structure used to direct water into the components of the cooling systems wherein the cooling function is designated to take place, provided that the intended use of the major portion of the water so directed is to absorb waste heat rejected from the process or processes employed or from auxiliary operations on the premises, including air conditioning.

The Agency also invites comment on an alternative where the Agency would define a cooling water intake structure to include intake structures if a facility uses five percent or more of the water drawn through the structure for cooling purposes. This alternative would further ensure that almost all cooling water withdrawn from waters of the U.S. is addressed by the requirements of this national regulation. This alternative also might minimize any potential that the proposed 25 percent threshold would discourage recycling of cooling water, or reuse of cooling water for process needs, by facilities that recycle or reuse cooling water at rates above 25 percent, and might choose to reduce their recycling/reuse rates to avoid meeting the requirements of the proposed rule. For similar reasons, the Agency is considering alternative definitions for a cooling water intake structure based on whether 20 percent, 15 percent, or 10 percent of the intake flow drawn through the structure is used for cooling. The Agency also invites comments on these alternative definitions.

D. Must My Facility Withdraw Water From Waters of the U.S.?

The requirements proposed today would apply to cooling water intake structures that withdraw amounts of water greater than the proposed flow threshold from ''waters of the U.S.'' Waters of the U.S. include the broad range of surface waters that meet the regulatory definition at 40 CFR 122.2, which includes lakes, ponds, reservoirs, nontidal rivers or streams, tidal rivers, estuaries, fjords, oceans, bays, and coves. These potential sources of cooling water may be adversely affected by impingement and entrainment.

Some facilities discharge heated water to cooling ponds, then withdraw water from the ponds for cooling purposes. Cooling ponds are considered ''waters of the U.S.'' if they meet the criteria in the definition of ''waters of the U.S.'' at 40 CFR 122.2. Therefore, facilities that withdraw cooling water from cooling ponds that are ''waters of the U.S.'' and that meet today's other proposed criteria for coverage (including the requirement that the facility have or be required to obtain an NPDES permit) would be subject to today's proposed rule. EPA invites comment on the applicability of today's proposal to new facilities that withdraw water from cooling ponds that are considered ''waters of the U.S.''

At § 125.81, EPA is proposing that national BTA requirements would apply to new facilities that have a cooling water intake structure with a design intake capacity of greater than or equal to two (2) MGD of source water. EPA chose the two MGD threshold in conjunction with the proposed threshold discussed in the immediately preceding section, that would define a cooling water intake structure as any structure withdrawing water from a water of the U.S. if more than twenty-five (25) percent of the water withdrawn through the structure is used for cooling purposes. EPA estimates that the two MGD threshold would subject approximately 90 percent of all cooling water flows from new facilities to the proposed rule. EPA based this estimate on: (1) EPA's projected universe of new facilities that would be subject to the proposed rule; and (2) review of a limited set of data on percent of intake flow used for cooling that EPA drew from responses to the detailed questionnaires mailed to existing facilities in January 2000.

EPA believes that cooling water intake structure withdrawals that are at or below a two MGD threshold would generally affect only a very small proportion of a water body or, if the water body is very small, would have a localized impact. EPA believes that facilities, which because of their small quantity of cooling water use, either are unlikely to cause or have limited potential to cause adverse environmental impact need not be subject to national regulation. This is especially so because the Agency has limited information on such facilities with respect to cooling water usage and their potential for adverse impact. The Director may consider whether to address new facilities that use lesser amounts of cooling water on a case-by-case basis using best professional judgment.

In addition to a two MGD flow threshold, the Agency is considering higher flow thresholds including 5, 10, 15, 20, 25, and 30 MGD. To evaluate the amount of cooling water that would be covered under these alternative thresholds, EPA used data from its screener questionnaire sent to existing industries that use the largest amounts of cooling water and made a number of important assumptions. First, EPA assumed that new and existing facilities would use similar amounts of cooling water. The Agency notes this assumption may overestimate the percentage of flows at new electricity generating facilities that would be covered by the proposed rule as many of these facilities, if they intend to use waters of the U.S. for cooling, also intend to use technologies to minimize cooling water flow. For example, only three of the seven specific, planned electricity generating facilities for which EPA has information on cooling water system design would use more than 10 MGD. Second, EPA assumed that data in the screener survey on total intake flow could be used to represent cooling water flows. Finally, the Agency assumed that none of the facilities included in the screener survey used less than 25% of

their total intake flow for cooling. This last assumption should not affect statements about steam electric generating facilities as most of their intake flow is used for cooling. However, as manufacturing facilities in the screener survey may use significant amounts of process water, some portion of these facilities may not use 25% or more of their intake flow for cooling and, if they were new facilities, would not be within the scope of the proposed rule.

For comparison purposes, EPA first analyzed a two MGD threshold and estimated that it would subject up to 99.97 percent of all cooling water flows from these industries to the proposed rule. On an industry-specific basis, the percentage of flows covered by the rule would range from more than 99.99 percent in the electric utility industry to as much as 98 percent in the chemical industry.

Using a similar methodology, EPA estimates that a 10 MGD flow threshold would subject up to 99.67 percent of all cooling water flows in the industries that use the largest volumes of cooling water to the proposed rule. On an industry-specific basis, the percentage of flows covered by the rule would range from 99.95 percent in the electric utility industry to as much as 79 percent in the refining industry. EPA estimates that a twenty-five (25) MGD threshold would subject up to 99.1 percent of all cooling water flows from these industries to the proposed rule. On an industry-specific basis, the percentage of flows covered by the rule would range from 99.8 percent in the electric utility industry to as much as 65 percent in the chemical industry.

The Agency invites comment on the proposed two MGD flow threshold and the alternative flow thresholds discussed above. The Agency also invites comment on whether a higher threshold (such as 25 MGD) might be appropriate for a facility that uses 10 percent or less of a water body at critical low flow periods.

EPA is proposing to set the threshold at 2 MGD to ensure that almost all cooling water withdrawn from waters of the U.S. is covered by a national regulation. However, the Agency recognizes that there is little information currently available regarding the lower bound of withdrawals at which adverse environmental impact is likely to occur. Most case studies documenting impingement and entrainment from cooling water withdrawals in the past have focused on facilities withdrawing very large amounts of water (in most cases greater than 100 MGD). There is less information available on the impacts of withdrawals at any of the levels being considered for the MGD flow threshold. EPA is aware of impingement and entrainment studies at a facility in Michigan with a 20 MGD flow. EPA also is aware of at least one study of impingement and entrainment at a facility in New York State that proposed to withdraw 4.2 MGD. In this case, the Director estimated fish mortalities of 24,500 American Shad, 1.9 million river herring, 1200 striped bass and 23,000 white perch. The Agency invites commenters to provide any data they may have regarding impingement and entrainment rates associated with 2 MGD water withdrawals. The Agency also invites commenters to provide any data they may have regarding impingement and entrainment rates associated with an alternative flow threshold of 5 MGD. The Agency also invites commenters to provide any data they may have regarding impingement and entrainment rates associated with the alternative flow thresholds of 10 MGD, 15 MGD, 20 MGD, 25 MGD, and 30 MGD.

EPA invites comment on all aspects of using these proposed thresholds to establish the universe of facilities that would be subject to the BTA requirements of this proposed regulation.

In addition to the MGD flow threshold discussed above, EPA is considering whether it should add a flow threshold to address the potential for adverse environmental impact posed by facilities that withdraw less than 2 million gallons of water per day but are located on smaller water bodies. To provide an additional measure of protection for these water bodies, the Agency might also include facilities that withdraw less than 2 MGD in this rulemaking if they withdraw more than 1% of the mean annual flow of a freshwater river or stream; the mean annual volume of a lake or reservoir; or the volume of the water column within the area centered about the opening of the intake with a diameter defined by the distance of one tidal excursion at the mean low water level for an estuary or tidal river. If the Agency were to include this additional flow threshold, language such as the following would be added at the end of the proposed § 125.81:

Or a design intake flow of greater than one (1) percent of the waterbody flow or volume (the mean annual flow of a freshwater river or stream; the mean annual volume of a lake or reservoir; or the volume of the water column within the area centered about the opening of the intake with a diameter defined by the distance of one tidal excursion at the mean low water level for tidal rivers and an estuaries.

The Agency invites comment on this alternative flow threshold. The Agency also invites comment on whether it should include a higher threshold based on a facility's withdrawal as a percentage of waterbody flow or volume, such as five percent, 10 percent or 20 percent.

Should EPA decide to include a flow threshold based on a facility's withdrawal as a percentage of waterbody flow or volume, the Agency requests comment on whether it should establish an absolute minimum flow threshold (such as 50,000 or 100,000 gallons of waters of the U.S. used on a daily basis for cooling purposes) in conjunction with the one (1) percent of the water body flow or volume threshold described above. An absolute minimum gallon per day threshold could ensure that very small new facilities located on very small streams are not captured by the national regulation and, instead, are addressed by the Director, as appropriate, using best professional judgment on a case-by-case basis. If EPA added a minimum flow threshold to the part of the applicability criteria that relates to withdrawal of water by the facility, language such as the following would be added at the end of proposed § 125.81, as modified by the alternate regulatory language described in the preceding paragraph: ''and greater than [100,000 gallons] per day.''

E. Must My Facility Have a Point Source Discharge Subject to an NPDES Permit?

Today's proposed rule would apply only to new facilities as defined in § 125.83 that have an NPDES permit or are required to obtain one because they discharge or might discharge pollutants, including storm water, from a point source to waters of the U.S. Requirements for minimizing the adverse environmental impact of cooling water intake structures would continue to be applied through NPDES permits.

Based on the Agency's review of existing facilities that employ cooling water intake structures, the Agency anticipates that most new facilities that would be subject to this rule will control the intake structure that supplies them with cooling water and discharge some combination of their cooling water and wastewater and storm water to a water of the U.S. through a point source regulated by an NPDES permit. In this scenario, the requirements for the cooling water intake structure would be applied in the facility's NPDES permit. In the event

that a new facility's only NPDES permit is a general permit for storm water discharges, the Agency anticipates that the Director would write an individual NPDES permit containing requirements for the facility's cooling water intake structure. The Agency invites comment on this approach for applying cooling water intake structure requirements to the facility. Alternatively, requirements applicable to cooling water intake structures could be incorporated into general permits. The Agency also invites comment on this approach.

In addition to the scenario described above, based on the Agency's review of existing facilities that employ cooling water intake structures, the Agency anticipates that some new facilities that have or are required to have an NPDES permit will not directly control the intake structure that supplies their facility with cooling water. For example, a number of facilities operated by separate entities might be located on the same, adjacent, or nearby property; one of these facilities might take in cooling water and then transfer it to other facilities prior to discharge of the cooling water to a water of the U.S. As another example, some facilities might use municipal water that is withdrawn from a water of the U.S. as their source for cooling water. The Agency invites comment on whether and how to prescribe section 316(b) requirements in these instances. In particular, the Agency invites comment on the proposal to regulate an intake structure if more than one-half of the flow serves new facilities and whether the threshold should be higher or lower. In addition, as in the previous paragraph, the Agency invites comment on a scenario in which the Director would place cooling water intake requirements in the new facility's NPDES permit and in the NPDES permit of the entity that controls the intake to ensure compliance with the cooling water intake requirements proposed today. This scenario is analogous to the Agency's finding of law in General Counsel Opinion No. 43 (June 11, 1976) that industrial users of a privately owned wastewater treatment plant are jointly and severally responsible for compliance with the provisions of the NPDES permit issued for the treatment plant. Alternatively, the Director could place cooling water intake requirements only in the permit of the facility that operates the structure. This would be administratively simpler and would limit permit requirements to the facility with direct operational control of the structure. The Agency also requests comment on this approach. If the new facility or the entity that controls the intake would have or be required to have only a general permit for storm water discharges, the Director would issue individual NPDES permit requirements, unless appropriate cooling water intake requirements were included in the general permit.

Should the requirements proposed today apply to only new facilities that control their intake structure, the Agency recognizes the possibility that some new facilities that have or are required to have an NPDES permit might restructure their operations to place control of the cooling water intake structure in an entity separate from the new facility withdrawing water for cooling purposes. In these situations, the Agency proposes to examine the operation of the new facility and the cooling water intake structure together. Should the Agency determine that the structure would be within the scope of this proposed rule but for the fact that it is not directly controlled by the new facility using the water, the Agency is considering applying the new facility requirements to the cooling water intake structure. The Agency invites comment on the policy merits of this position and how the Agency should prescribe cooling water intake structure requirements in this scenario.

Today's proposal applies only to facilities that are required to have an NPDES permit for direct discharges to surface waters. However, because similar adverse environmental impact can be caused by cooling water intake structures used by new facilities not subject to the NPDES program, the Agency encourages the Director to closely examine scenarios in which a new facility withdraws significant amounts of cooling water but does not have an NPDES permit. As appropriate, the Director should apply other legal requirements, such as section 404 or 401 of the Clean Water Act, the Coastal Zone Management Act, the National Environmental Policy Act, or similar State authorities to address adverse environmental impact caused by cooling water intake structures at those new facilities.

New facilities that EPA does not propose to regulate today, but that might cause similar impact, include the following:

- New facilities that withdraw cooling water from a water of the U.S. and discharge it along with other flows to a POTW for treatment and discharge;
- New facilities that purchase cooling water from a second facility that owns and operates the cooling water intake structure and withdraws the water from a water of the U.S. The new facility discharges the cooling water along with other flows to a POTW for treatment and discharge;
- New facilities that purchase cooling water from a municipal utility. The municipal utility owns and operates the cooling water intake structure and withdraws water from a water of the U.S. The new facility uses a significant amount of the municipal water for cooling purposes and discharges its cooling water to a POTW for treatment and discharge.

The Agency's concern regarding the environmental impact caused by cooling water intake structures at new facilities that would not be regulated by today's proposal is tempered somewhat by the following considerations. In each of the three scenarios just described, cooling water discharges would be sent to a publically owned treatment works. Based on responses to the Agency's section 316(b) screener questionnaire, the Agency estimates that the average cooling water use by a large utility steam electric generating facility is approximately 700 MGD; average water use by a large nonutility steam electric generating facility (*i.e.*, a facility that owns electric generating capacity but typically sells its electricity to a utility for distribution) is approximately 85 MGD. In most circumstances, a POTW would not accept such large volumes of cooling water because the flows from these facilities would likely dilute the waste stream reaching the POTW to the point where the POTW could face significant difficulty meeting its secondary treatment standard requiring removal of a fixed percentage of incoming biological oxygen demand. POTWs also enforce pretreatment requirements to ensure that heat in wastewater discharged does not interfere with biological treatment processes. Such large volumes of cooling water could potentially be too hot for the POTW to accept. In the third scenario presented in the preceding paragraph, the cost of using water treated to meet drinking water standards as cooling water is an additional issue. (The Agency notes that some steam electric generating facilities do use treated municipal *effluent* for cooling water, a distinct practice that has the potential to reduce use of waters of the U.S. for cooling water.) For manufacturing facilities, the potential for indirect discharge of cooling water might be greater. For example, the pulp and paper industry is the largest industrial process water user in the United States. In 1990 EPA surveyed 565 mills that manufacture pulp, paper, and paperboard as part of the Agency's development of effluent limitation

guidelines for this industry. Of the 565 pulp mills, 203 (36 percent) discharge a total volume of 680 MGD indirectly to municipal treatment works.

In order to address the potential concerns with cooling water intake by indirect dischargers, the Agency invites comment on an alternative where the Agency would regulate point sources that supply large volumes of cooling water to indirect dischargers (e.g., municipal utilities or other water suppliers) and place technology requirements to satisfy section 316(b) into the NPDES permit of the utility that controls the intake. The Agency is aware of the practical difficulties in requiring facilities that supply water to large numbers of customers to account for the specific end uses.

VI. Data Collection and Overview of Industries Potentially Subject to Proposed Rule

A. Overview

As discussed above, today's proposed rule would apply to new facilities with cooling water intake structures as defined in § 125.83 that are point sources requiring an NPDES permit. Generally, facilities that meet these criteria fall into two major groups, new steam electric generating facilities and new manufacturing facilities. These would include new facilities in the pulp and paper, chemical, petroleum, iron and steel, and aluminum manufacturing industries, which are known to be major users of cooling water.

B. New Steam Electric Generating Facilities

To identify planned utility and nonutility electric generating facilities that could potentially be affected by the section 316(b) new facility regulation, EPA used the NEWGen database, developed by Resource Data International (RDI). This database provides facility-level data on new power projects, including information on generating technology, plant capacity, electric interconnection, project status, date of initial commercial operation, and other operational details. The Agency evaluated each of the 466 facilities identified in the RDI database for the following criteria: ''new plant'' status, project status, location within the United States, plant type, anticipated date of initial commercial operation, and availability of cooling water intake structure information.

EPA's review identified 305 proposed new utility and nonutility electric generating facilities in the United States. Of these, 188 facilities will generate electricity using steam turbine or combined-cycle prime movers and would be potentially subject to regulation under section 316(b). (The term ''prime mover'' refers to the primary mechanism used by a facility to produce electricity.) To conduct various analyses required by statute and executive order (*e.g.*, Executive Order 12866), EPA examined facilities with a projected operational date of August 13, 2001, or later as potential new facilities that would be subject to this proposal. Ninety-four facilities meet this criterion. Fifty-six of the ninety-four facilities had reported information on their planned source and volume of cooling water to their permitting authorities. EPA based the analyses in support of this proposed regulation partially on those 56 facilities.

Eighty-eight percent of the 56 facilities examined plan to use combined-cycle [1] prime movers to generate electricity. Combined-cycle/cogeneration facilities are the second most common type of new facility, representing approximately 5 percent of the analyzed new facilities. In total, combined-cycle facilities represent more than 91 percent of the new capacity. The 56 facilities EPA identified will account for a total of 40,500 megawatts of additional generation capacity. On the basis of the capacity of these sample facilities and the total electric generation capacity forecasted by the Energy Information Administration (EIA), EPA predicts that 13 new facilities that will incur costs under this proposed regulation will be built over the next 10 years. For the period 2011 to 2020, EPA estimates that an additional 103 new facilities would be built but only 27 of these facilities would be in scope of today's proposed rule.

EPA further analyzed all 56 potential facilities to determine whether they would qualify as ''new facilities'' subject to this regulation as defined in § 125.83. Of the 56 facilities for which the source and volume of cooling water could be determined, only seven meet all of the proposed criteria for new facilities that are within the scope of this proposed regulation. Of these seven, one facility is proposing to locate a cooling water intake structure in a tidal river, four in nontidal rivers, and two in lakes. The remaining 49 facilities will either not withdraw cooling water from waters of the U.S. (45 facilities), will use cooling water withdrawn through an existing intake structure (three facilities), or are not expected to require an NPDES permit (one facility). These 49 facilities therefore would not be subject to the proposed section 316(b) new facility regulation. Forty-one of the 45 facilities that will not withdraw cooling water from a surface water source (approximately 91 percent) will use municipal water, ground water, or treated effluent, or a combination of the three, as a source of cooling water. The remaining four facilities are not expected to have a cooling water intake structure because they are air cooled. Based on the seven facilities that would be affected from the sample of 56 facilities and the Energy Information Administration forecast of total steam electric generation capacity additions, EPA projects 13 facilities would be affected over the next 10 years and an additional 27 facilities over the following 10 years. Therefore, the Agency's cost and regulatory impact analyses for the utility and non-utility electricity-producing industries focused on 40 electricity generating facilities over 20 years.

C. New Manufacturing Facilities

EPA identified prospective new facilities in the other industry sectors affected by today's proposed rule through a consultation process with the respective associations for those industries, review of independent market analyses, and projections based on the *Section 316(b) Industry Screener Questionnaire: Phase I Cooling Water Intake Structures.* EPA contacted the following industry associations: American Forest and Paper Association, American Petroleum Institute, National Petrochemical Refiners Association, American Iron and Steel Institute, Steel Manufacturers Association, Specialty Steel Industry of North America, the Aluminum Association of America, and the Chemical Manufacturers Association. The Agency questioned each of the associations about growth in its industry, including projections about construction of new facilities. EPA also reviewed independent forecasts for the major industry sectors likely to be affected by today's proposed rule to assess the number of new facilities likely to be built in the foreseeable future. Finally, EPA estimated the number of new manufacturing facilities likely to be within the scope of today's rule based on preliminary data addressing existing facilities.

EPA estimates that approximately 70 new manufacturing facilities that would be subject to today's proposed rulemaking will be built over the next 20 years (2001 to 2020). This number is

[1] Most of the electricity in the United States is produced by steam turbine generating units. A combined-cycle facility uses both a combustion turbine prime mover and a steam turbine prime mover to increase the efficiency of the generating unit.

generally consistent with the data EPA reviewed through industry consultations and forecast reviews.

The American Forest and Paper Association (AF&PA) reported the possibility of one new facility being built in the next few years. In addition, AF&PA indicated that a second new facility is under consideration. These are the only prospective new facilities in the pulp and paper industry. AF&PA reports that paper production in the United States has been declining and that if additional production is required, it will most likely come from expansion or full utilization of existing facilities. Review of independent industry projections supports AF&PA's information. EPA is projecting that no new facilities in the pulp and paper industry will be built in the next 20 years that would be within the scope of this rule. EPA requests comment on this projection and any relevant data commenters may have.

In the United States, steel is typically produced by either large integrated mills that convert iron ore into steel or by minimills that employ an electric arc furnace (EAF) process to fabricate scrap steel into new product. The American Iron and Steel Institute (AI&SI) represents primarily the integrated steel producers, and the Steel Manufacturers Association (SMA) represents chiefly the minimills. These associations report that there has been a significant expansion in the number of new minimills in the past few years but that much of the immediate expansion is over. A limited number of new minimills will come on line in the foreseeable future, but new integrated mills are unlikely to be built. Agency review of independent industry projections supports this assessment. According to these projections, new steelmaking capacity soon will result mostly from new minimills coming on line. This is in keeping with long-term industry trends: the EAF share of the U.S. steel market has risen from 12 percent to 50 percent in the past three decades. Although minimills generally require large amounts of cooling water, they typically use closed-cycle recirculating systems with cooling towers. Production increases by integrated producers will most likely occur as a result of capacity expansion or improved efficiencies at existing facilities rather than new construction of integrated mills. EPA estimates that eight new minimills, as well as one cold-rolled steel sheet strip and bar mill, that might incur costs under this proposed rule will be built over the next 20 years.

The Aluminum Association of America (AAA) reports it is unlikely that new primary aluminum smelters will be built in the foreseeable future. The growth area in the aluminum industry is in secondary aluminum manufacturing—facilities that recycle aluminum rather than use aluminum ore. Review of independent aluminum industry projections reveals that significant growth in demand is expected soon, but it is not certain whether this demand will be met through construction of new facilities, expansion of existing plants, or increased capacity utilization at existing facilities. EPA estimates that four new aluminum facilities that might incur costs under this proposed rule will be built over the next 20 years.

The majority of petroleum refiners are represented by two organizations, the American Petroleum Institute (API) and the National Petrochemical Refiners Association (NPRA). API represents many of the large refiners, and NPRA represents some large and many of the small refiners. Both organizations report that it is unlikely that a new refinery will be built in the foreseeable future and note that expansion of refinery capacity will occur exclusively through growth of existing facilities. Moreover, the number of refineries is declining and competitive pressures have led to consolidations and mergers in the petroleum industry. Review of independent industry projections supports this conclusion and shows that during the period between January 1990 and January 1997, the number of operable refineries in the United States declined from 205 to 164. EPA estimates that no new facilities in the petroleum and coal products sector with costs under this regulation will be built over the next 20 years.

The chemical industry is one of the more diverse industry sectors in the U.S. and includes the largest number of individual facilities of the industries subject to today's proposed rule. The Chemical Manufacturers Association (CMA) reports that there is likely to be little expansion or development of new facilities in the chemical industry in the near future. CMA expects that near term growth in industry output will occur through changes in product lines or expansion of existing facilities. Review of independent industry projections discloses that the near term picture is for considerable restructuring and consolidation with moderate growth in the number of new facilities for the longer term. However, because the chemical industry sector is so large, even moderate growth will result in the addition of a considerable number of facilities. Moreover, many of the new facilities are likely to be small businesses as CMA estimates that 40 to 60 percent of its members are small businesses and the expectation is that this ratio will remain approximately the same. EPA expects that 56 new facilities in the chemical industry sectors that are subject to the requirements of this rule will be constructed within the next 20 years.

EPA has estimated that the above industries (including the electricity generating industry) represent approximately 5,000 to 6,000 existing facilities nationwide and are responsible for almost 99 percent of all the cooling water use in the United States. Today's proposed rule would also affect other industry sectors, including textile mill products; lumber and wood products; rubber and miscellaneous plastic products; stone, clay, glass, and concrete products; and transportation equipment. EPA did not undertake outreach to or survey these industry sectors in part because the Agency has determined that all these other industries, although constituting a large number of individual facilities, in aggregate withdraw approximately 1 percent or less of all cooling water used in the United States. As a result, even if there is a substantial increase in the number of new facilities in these industry sectors, EPA projects that few would be subject to today's proposed rule. Based on the Engineering and Economic Analysis document that EPA prepared while developing this proposal, EPA projects it is unlikely that there will be new facilities in any sectors other than electricity generation, primary metals, and chemicals that would be subject to the requirements of this rule over the next 20 years. EPA requests comment on this projection and any relevant data commenters may be able to provide.

VII. Environmental Impact Associated With Cooling Water Intake Structure

A. Overview

Based on estimates cited in the record for the Agency's previous section 316(b) regulations and guidance, power plants and industrial facilities in the United States withdrew approximately 70 trillion gallons of water from U.S. waters each year for cooling water purposes. Power plants alone account for approximately 80 percent of the total cooling water withdrawals, or about 60 trillion gallons of cooling water per year.[2] The withdrawal of such large

[2] EPA anticipates updating these water usage estimates based on its survey questionnaire of

Continued

quantities of cooling water affects vast quantities of aquatic organisms annually, including phytoplankton,[3] zooplankton,[4] fish, shellfish, and many other forms of aquatic life. Aquatic organisms drawn into cooling water intake structures are either impinged on components of the cooling water intake structure or entrained in the cooling water system itself. In either case, a substantial number of these organisms are killed or subjected to significant harm as a result.

Currently, many cooling water intake structures use some type of intake control technology. In most cases these technologies prevent debris from entering the cooling water system but do not protect aquatic organisms. The most common intake devices used in the steam electric generating industry, as well as other industries, are front-end trash racks (generally fixed bars) to prevent large debris from entering the system, followed by single-entry, single-exit vertical traveling screens (conventional traveling screens). It is also noteworthy, however, that between 1955 and 1997 the number of new steam electric generating facilities using closed-cycle recirculating cooling water systems increased from 25 percent to 75 percent, with a corresponding decrease in facilities using once-through systems.[5] Between 1975 and 1984 the number of steam electric generating facilities using closed-cycle recirculating systems increased 31 percent. This trend toward the use of closed-cycle recirculating systems is projected to continue as new facilities are built. Of the seven new generating facilities that would potentially be covered by this proposed rule and for which EPA has planning information, all seven plan to use closed-cycle recirculating cooling water systems. There is also evidence of a trend among new facilities to use less cooling water. All of the seven new facilities in EPA's analysis are projected to use less than 20 MGD.

industrial facilities potentially subject to the section 316(b) regulation for existing facilities.

[3] Phytoplankton are tiny, free-floating photosynthetic organisms suspended in the water column.

[4] Zooplankton are small marine animals that consume phytoplankton and other zooplankton. Ichthyoplankton is a group of plankton composed of fish eggs and larvae.

[5] EPA estimates that 84 percent of existing steam electric generating facilities started operation between 1955 and 1985. An additional 7 percent of these facilities started operation between 1985 and 1997.

B. What Types of Environmental Impacts Are Caused by Cooling Water Intake Structures?

EPA's May 1977 *Draft Guidance for Evaluating the Adverse Impact of Cooling Water Intake Structures on the Aquatic Environment* describes two primary ways in which cooling water intake structures can cause adverse environmental impact. The first is entrainment, which occurs when organisms are drawn through the cooling water intake structure into the cooling system. Organisms that become entrained are normally relatively small benthic,[6] planktonic,[7] and nektonic [8] forms of fish and shellfish species. As entrained organisms pass through a plant's cooling system they are subject to mechanical, thermal, and toxic stress. Sources of such stress include physical impacts in the pumps and condenser tubing, pressure changes caused by diversion of the cooling water into the plant or by the hydraulic effects of the condensers, sheer stress, thermal shock in the condenser and discharge tunnel, and chemical toxemia induced by antifouling agents such as chlorine. The mortality rate of entrained organisms is high.

Another way in which intakes affect aquatic life is through the impingement of fish and other aquatic organisms on devices installed on the cooling water intake structure to prevent debris from entering the facility's cooling system. Organisms are trapped against these screening devices by the force of the water passing through the cooling water intake structure. Impingement can result in starvation and exhaustion (when organisms are trapped against an intake screen or other barrier at the entrance to the cooling water intake structure), asphyxiation (when organisms are forced against an intake screen or other barrier at the entrance to the cooling water intake structure by velocity forces that prevent proper gill movement or when organisms are removed from the water for prolonged periods of time), and descaling (when organisms are removed from an intake screen by a wash system).

[6] Refers to bottom dwellers that are generally small and sessile (non-swimming), but can include certain large motile (able to swim) species. These species can be important members of the food chain.

[7] Refers to free floating microscoic plants and animals, including fish eggs and larval stages with limited ability to swim. Plankton are also an important source of food for other aquatic organisms and an essential components of the food chain in aquatic ecosystems.

[8] Refers to organisms with swimming abilities that permit them to move actively through the water column and to move against currents.

In addition to impingement and entrainment losses associated with the operation of the cooling water intake structure, EPA is concerned about the overall degradation of the aquatic environment as a consequence of multiple intake structures operating in the same watershed or in the same reach or nearby reaches. EPA is also concerned about the potential impacts of cooling water intake structures located in or near habitat areas that support threatened or endangered species. Although limited data document the extent to which threatened or endangered species are harmed or killed due to impingement or entrainment, such impacts do occur. For example, EPA is aware that over a 9-year period more than 1,300 endangered sea turtles entered enclosed cooling water intake structure canals at one power plant [9] and that other plants impinge and entrain threatened delta smelt and endangered runs of chinook salmon and steelhead trout.[10]

Furthermore, EPA is concerned about adverse environmental impact associated with the construction of new cooling water intake structures. Such adverse impacts primarily result from three factors—displacement of populations and habitat resulting from the physical placement of a new cooling waste intake structure in an aquatic environment, the impact on the aquatic environment of increased levels of turbidity, and the effects on aquatic biota and habitat associated with disposal of materials excavated during construction. Unlike operational impacts, adverse impact associated with construction need not be recurring in nature. Even where construction of a new cooling water intake structure takes a number of months, such construction could cause significant adverse impact. For example, the construction of a new intake structure could destroy or harm habitat value through the physical destruction or degradation of submerged lands or banks, or by stirring up sediments. Today's proposed rule includes requirements at § 125.84(f) under which the Director could address these effects in certain circumstances. Moreover, existing programs, such as the CWA section 404 program and programs under State law, include requirements that address many of the environmental impact concerns associated with the construction of new intakes.

[9] The plant developed a capture-and-release program in response to these events. Most entrapped turtles were captured and released alive; however, some mortality has occurred.

[10] For example, Pittsburg and Contra Costa in the San Francisco Bay Delta area of California.

C. What Entrainment and Impingement Impacts Caused by Cooling Water Intake Structures Have Been Documented?

Research of the available literature and section 316(b) demonstration studies obtained from NPDES permit files has identified numerous documented cases of impacts associated with impingement and entrainment and the subsequent effects of these actions on populations of aquatic organisms. For example, specific losses associated with individual steam electric generating facilities include 3 billion to 4 billion larvae and postlarvae per year [11]; 23 tons of fish and shellfish of recreational, commercial, or forage value lost each year [12]; and 1 million fish lost during a 3-week study period.[13] Several studies estimating the impact of entrainment on populations of key commercial or recreational fish have predicted declines in population size. Studies of entrainment at five Hudson River power plants predicted year-class reductions ranging from 6 percent to 79 percent depending on the fish species.[14] A modeling effort looking at the impact of entrainment mortality on the population of a selected species in the Cape Fear estuarine system predicted a 15 to 35 percent reduction in the species' population.[15]

The following are among other more recent documented examples of impacts occurring in existing facilities as a result of cooling water intake structures. Also see the discussion of the benefits of today's proposed rule in Section X.B.

Brayton Point. PG&E Generating's Brayton Point plant (formerly owned by New England Power Company) is located in Mt. Hope Bay, in the northeastern reach of Narragansett Bay, Rhode Island. Due to problems with electric arcing caused by salt drift and lack of fresh water for the closed-cycle recirculating cooling water system, the company switched Unit 4 from a closed-cycle recirculating to a once-through cooling water system in 1985. The modification of Unit 4 resulted in a 45 percent increase in cooling water intake flow at the plant. Studies designed to evaluate whether the cooling water intake structure was affecting fish species abundance trends found that Mt. Hope Bay experienced a progressively steady rate of decline in finfish species of recreational, commercial, and ecological importance.[16] In contrast, species abundance trends were relatively stable in adjacent coastal areas and portions of Narragansett Bay that are not influenced by the cooling water intake structure. Further strengthening the evidence that the intake of cooling water was contributing to the documented declines was the finding that the rate of population decline increased substantially with the full implementation of the once-through cooling mode for Unit 4. The modification of Unit 4 is estimated to have resulted in an 87 percent reduction in finfish abundance based on a time series-intervention model. These impacts were associated with both impingement and entrainment, as well as the thermal discharge of cooling water. Data indicate that annual entrainment at Brayton Point averages 4.9 billion tautog eggs, 0.86 billion windowpane eggs, and 0.89 billion winter flounder larvae each year. Using adult equivalent analyses, the entrainment and impingement of fish eggs and larvae in 1994 translated to a loss of 30,885, 20,146, and 96,507 pounds of adult tautog, windowpane, and winter flounder, respectively.

San Onofre Nuclear Generating Station. The San Onofre Nuclear Generating Station (SONGS) is on the coastline of the Southern California Bight, approximately 2.5 miles southeast of San Clemente, California.[17] The marine portions of Units 2 and 3, which are once-through, open-cycle cooling systems, began commercial operation in August 1983 and April 1984, respectively. Since then, many studies have been completed to evaluate the impact of the SONGS facility on the marine environment.

Studies of kelp beds in nearshore waters in the vicinity of the SONGS facility determined that the operation of cooling water intake structures resulted in a 60 percent (80-hectare) reduction in the area covered by moderate-to high-density kelp.[18] Studies indicated that poor survival and lack of development of early life stages essential to the replenishment of the adult population resulted from increased turbidity of the waters in the vicinity of SONGS due to withdrawal of inshore turbid water for cooling purposes. The loss of kelp was also determined to be detrimental to fish communities associated with the kelp forests. For example, fish living close to the bottom of the San Onofre kelp bed experienced a 70 percent decline in abundance. Fish living in the water column in the impact areas had a 17 percent loss in abundance and a 33 percent decline in biomass relative to control populations. The abundance of large invertebrates in kelp beds also declined for many species, particularly snails.

In a normal (non-El Nino) year, some 110 tons of midwater fish (primarily northern anchovy, queenfish, and white croaker) [19] are entrained at SONGS, of which at least 41 percent are killed during plant passage. The fish lost include approximately 350,000 juveniles of white croaker, a popular sport fish; this number represents 33,000 adult individuals or 3.5 tons of adult fish. Within 3 kilometers of SONGS, the density of queenfish and white croaker in shallow-water samples decreased by 34 and 63 percent, respectively. Queenfish declined by 50 to 70 percent in deepwater samples.

Existing and historical studies like those described in this section provide only a partial picture of the severity of environmental impact associated with cooling water intake structures. Most important, the methodologies for evaluating adverse environmental impact used in the 1970s and 1980s, when most section 316(b) evaluations were performed, were often inconsistent and incomplete. For example, some studies reported only gross fish losses; others reported fish losses based on species and life stage; still others reported percent losses of the associated population or subpopulation (*e.g.*,

[11] EPA, ''Brunswick Nuclear Steam Electric Generating Plant of Carolina Power and Light Company, Historical Summary and Review of Section 316(b) Issues,'' EPA Region IV, September 19, 1979.

[12] EPA, ''Findings and Determination under 33 U.S.C. Section 1326, In the Matter of Florida Power Corporation Crystal River Power Plant Units 1, 2, and 3, NPDES Permit No. FL0000159,'' Environmental Protection Agency Region IV, December 2, 1986.

[13] Nancy J. Thurber, and David J. Jude, ''Impingement Losses at the D.C. Cook Nuclear Power Plant during 1975–1982 with a Discussion of Factors Responsible and Possible Impact on Local Populations,'' Special Report No. 115 of the Great Lakes Research Division, Great Lakes and Marine Waters Center, The University of Michigan, 1985.

[14] John Boreman and Phillip Goodyear, ''Estimates of Entrainment Mortality for Striped Bass and Other Fish Species Inhabiting the Hudson River Estuary,'' *American Fisheries Society Monograph* 4:152–160, 1988.

[15] EPA, Brunswick Nuclear Steam Electric Generating Plant of Carolina Power and Light Company, Historical Summary and Review of Section 316(b) Issues,'' Environmental Protection Agency Region IV, 1979.

[16] Mark Gibson, ''Comparison of Trends in the Finfish Assemblages of Mt. Hope Bay and Narragansett Bay in Relation to Operations of the New England Power Brayton Point Station,'' Rhode Island Division Fish and Wildlife, Marine Fisheries Office, June 1995 and revised August 1996.

[17] Southern California Edison, ''Report on 1987 Data: Marine Environmental Analysis and Interpretation, San Onofre Nuclear Generating Station,'' 1988.

[18] MRC, ''Final Report of the Marine Review Committee to the California Coastal Commission,'' Marine Review Committee, Document No. 89–02, August 1989.

[19] S. Swarbrick and R.F. Ambrose, ''Technical Report C: Entrapment of Juvenile and Adult Fish at SONGS,'' prepared for the Marine Review Committee, 1989.

young-of-year fish). Recent advances in environmental assessment techniques now provide better tools to monitor for impingement and entrainment and to detect impacts associated with the operation of cooling water intake structures.

D. What Constitutes Adverse Environmental Impact Under This Proposed Rule?

As discussed above, the 1977 section 316(b) draft guidance defined the term ''adverse environmental impact.'' It states that ''[a]dverse aquatic environmental impacts occur whenever there would be entrainment or impingement damage as a result of the operation of a specific cooling water intake structure.'' That definition also states, however, that ''[t]he critical question is the magnitude of any adverse impact.'' The guidance lists specific factors relevant for determining the long- and short-term magnitude of any adverse impacts.[20] The 1977 Draft Guidance established a process under which cooling water intake structures were evaluated on a case-by-case basis to determine the level of environmental impact occurring and the appropriate best technology available to minimize adverse environmental impact.[21]

The framework and definitions in the 1977 Draft Guidance recommend that facilities should initially determine the incremental environmental impact of each cooling water intake structure on the populations of affected species or organisms and that BTA be applied only where it is determined that such incremental impacts are deemed to constitute ''adverse environmental impact.'' However, both the decision process and the evaluation criteria contained in the guidance have proven very difficult to apply consistently. The initial determination of environmental impact has often relied on population modeling, which, given its inherent complexity, has yielded ambiguous or debatable results. One result has been that many section 316(b) permitting decisions have predominantly focused on determining whether a cooling water intake structure is causing an adverse environmental impact. Given that both the methods for making such determinations and the standard regarding what constitutes an ''adverse'' environmental impact were not precisely defined, permitting authorities have had to exercise significant judgment and focus significant time and effort to determine what requirements should be imposed under section 316(b).

In developing this proposal, EPA considered several alternatives for defining adverse environmental impact associated with the operation of cooling water intake structures. These alternatives are discussed below. EPA also considered whether a specific definition of adverse environmental impact should be included in the regulation or developed as guidance. The regulatory language in today's proposed rule does not include a definition of adverse environmental impact. However, the Agency is considering promulgating each of the alternatives discussed below as part of the final regulation and, thus, each should be viewed in a regulatory context. The Agency also might ultimately decide to publish one of these alternatives in guidance that supports the final rule. EPA is also considering taking no action regarding the definition of adverse environmental impact.

Though EPA is not proposing a definition of adverse environmental impact, the Agency did consider a number of alternatives for either defining adverse environmental impact or determining a threshold for the level of environmental impact deemed to be adverse. Consistent with this approach, EPA conceptualized adverse environmental impact in a manner that would not characterize the threshold for being considered ''adverse'' as the impingement or entrainment of a single organism, but also would not result in a threshold that is so high that it would allow for the impingement or entrainment of millions of organisms, larvae, or eggs. Thus, EPA considered adverse environmental impact as a level of impingement or entrainment of aquatic organisms that is recurring and nontrivial.

One approach EPA considered would be to define adverse environmental impact as the impingement or entrainment of one (1) percent or more of the aquatic organisms in the near-field area as determined in a 1-year study. Under this approach, the near field would be defined as that area immediately around the intake structure from which organisms are drawn onto the screens or into the cooling system. EPA considers the establishment of a one percent threshold a reasonable means to protect about 99 percent of the organisms in the water column under the influence of the cooling water intake structures. A threshold of one percent represents a reasonable approach for defining adverse impact and is consistent with the approach used by the water quality-based regulatory programs within EPA for developing the necessary levels of protection to safeguard aquatic communities. EPA seeks comment on this alternative. Regulatory language such as the following could be used to implement this approach:

> Adverse environmental impact means the impingement or entrainment of one (1) percent or more of the aquatic organisms from the area around the cooling water intake structure from which organisms are drawn onto screens or other barriers at the entrance to a cooling water intake structure or into the cooling system, as determined in the Source Water Baseline Biological Characterization.

(See Section IX.A.1 for a discussion of the Source Water Baseline Biological Characterization.)

A second alternative for defining adverse environmental impact for purposes of section 316(b) would use the definition of adverse environmental impact provided in the 1977 Draft Guidance, which is discussed above. Under this approach, adverse environmental impact would be defined as impingement and entrainment and the key inquiry would be an assessment of the magnitude of such effects. EPA could clarify through guidance when the magnitude of environmental impact is great enough to be deemed adverse.

Under a third alternative EPA is considering, adverse environmental impact would be deemed to occur whenever aquatic organisms are impinged or entrained as a result of the operation of a cooling water intake. Under this alternative, ''adverse environmental impact'' could be defined as ''any impingement or entrainment of aquatic organisms.'' This approach would be similar to the approach that the State of New York has taken in implementing its section 316(b) program, based on the State's judgment that both impingement and entrainment result in harmful environmental effects that diminish valuable public

[20] Under the 1977 Draft Guidance, the magnitude of any adverse impact should be estimated in terms of both short-term and long-term impact with reference to the following factors: (1) Absolute damage; (2) percent damage; (3) absolute and percentage damage to any endangered species; (4) absolute and percent damage to any critical aquatic organism; (5) absolute and percentage damage to commercially valuable and/or sport fisheries yield; and (6) whether the impact would endager (jeaopardize) the protection and propagation of a balanced population of shellfish and fish in and on the body of water from which the cooling water is withdrawn (long-term impact). (Draft Guidance, U.S. EPA, 1977, Definitions and Concepts p. 15).

[21] For example, the 1977 Draft Guidance states ''[t]he exact point at which adverse aquatic impact occurs at any given plant site or water body segment is highly speculative and can only be estimated on a case-by-case basis by considering the species involved, magnitude of the losses, years of intake operation remaining, ability to reduce losses, etc.'' (Draft Guidance, U.S. EPA, 1977, p. 11).

resources.[22] Such effects could have the potential to reduce the population of indigenous species; change the species mix because some species are more susceptible to impingement and entrainment than others; might increase nuisance species; harm and kill endangered and threatened species; damage critical aquatic organisms, including important elements of the food chain; and reduce commercial and sport fisheries. This approach also would provide a level of protection analogous to the level of protection provided by the Agency's criteria methodology for protecting aquatic life from toxic effects, particularly from acute lethality.[23] [24]

Yet another alternative would be to define adverse environmental impact in relation to reference sites for the type of ecosystem in which the facility proposes to locate the intake structure and then to evaluate the projected impact of the intake structure on the abundance, diversity, and other important characteristics of the aquatic community that would be expected to inhabit the site. This approach would be analogous to the Agency's recommended approach for the adoption of biocriteria into State water quality standards.[25] [26] [27] [28] [29] The Agency invites comment on implementation issues that might be associated with determining the nexus between the projected impacts of the cooling water intake structure and the reference conditions.

The Agency also requests comment on a definition of adverse environmental impact that would focus on (1) the protection of threatened, endangered, or otherwise listed species; (2) protection of socially, recreationally, and commercially important species; and (3) protection of community integrity, including structure and function. EPA is aware that the Utility Water Action Group intends to develop, and submit to EPA following peer review, one or more practical definitions of adverse environmental impact and the measures for assessing when adverse environmental impact is occurring. The measures may vary depending on the waterbody type. EPA will consider the output of this effort, if available in time, and as appropriate, as it develops the final rule.

Each of the preceding definitions of adverse environmental impact addresses impact on the aquatic environment. The Agency invites comment on whether it should define adverse environmental impact more broadly and consider nonaquatic adverse environmental impact as well. For example, some of the technologies that may be used to reduce impingement and entrainment may result in air emissions such as the drift of salts, other minerals or chemicals onto vegetation, potentially with harmful effects. Some technologies may reduce the efficiency of an electricity generating or manufacturing facility, potentially leading to increased energy consumption and increased emission of carbon dioxide or other ''greenhouse'' gases, and increased resource extraction activities that may have a harmful effect on lands and natural resources. Should the Agency decide to consider nonaquatic impact, it could do so in conjunction with any of the potential definitions of adverse environmental impact described above that address impact on the aquatic environment.

Finally, it is important to clarify and invite comment on the Agency's current interpretation of the relationship of adverse environmental impact under section 316(b) and the objective of section 316(a) to ensure protection and propagation of a balanced indigenous population of shellfish, fish, and wildlife. The Agency considers the objective stated in section 316(b) to minimize adverse environmental impact from cooling water intake structures to be distinct from that of section 316(a) to ensure protection and propagation of a balanced indigenous population of shellfish, fish, and wildlife. The Agency has long maintained that adverse environmental impact from cooling water intake structures must be minimized to the fullest extent practicable,[30] even in cases where it can be demonstrated that the standard applicable under section 316(a) is being met.[31] [32] Thus the objective of section 316(b) is more protective than that of section 316(a). However, EPA also requests comment on adapting the section 316(a) standard for purposes of section 316(b) and defining adverse environmental impact as impacts likely to interfere with the protection and propagation of a balanced indigenous population of fish, shellfish, and wildlife.

EPA invites comment on all aspects of these alternatives for defining adverse environmental impact associated with cooling water intake structures and whether such a definition should be included as part of the regulation or stated as guidance.

VIII. Best Technology Available for Minimizing Adverse Environmental Impact at New Facilities

A. What Is the Best Technology Available for Minimizing Adverse Environmental Impact at New Facilities?

1. What Are the Proposed and Alternative Regulatory Frameworks for Today's Proposed Rule?

Today's proposed rule would establish national minimum performance requirements for the location, design, construction, and capacity of cooling water intake structures at new facilities to minimize adverse environmental impact. Under the proposed rule, EPA would establish requirements for minimizing adverse environmental impact from cooling water intake structures based on the type of water body in which the intake structure is located, the location of the intake in the water body, the volume of water withdrawn, and the design intake velocity. EPA would also establish additional requirements or measures for location, design, construction, or capacity that might be necessary to minimize adverse environmental impact. The best technology available to minimize adverse environmental impact might constitute a technology suite, which would vary depending on the type of water body in which a cooling water intake structure is located as well as the location of the cooling water

[22] NYDEC, ''Clean Water Act Section 316(b), statement provided to U.S. EPA at public meeting to discuss adverse environmental impacts resulting from cooling water intake structures,'' New York State Department of Environmental Conservation, Division of Fish, Wildlife, and Marine Resources, June 29, 1998.

[23] EPA, *Technical Support Document for Water Quality-based Toxics Control,* U.S. Environmental Protection Agency, Office of Water, EPA–823–B–94–005a, August 1994.

[24] Advanced Notice of Proposed Rulemaking: Water Quality Standards Program, 63 FR 3672, July 7, 1998.

[25] Michael T. Barbour *et al.*, ''Measuring the attainment of biological integrity in the USA: a critical element of ecological integrity,'' *Hydrobiologia* 422/423:453–464, 2000.

[26] EPA, *Biological Criteria: National Program Guidance for Surface Waters,* U.S. Environmental Protection Agency, Office of Water Regulations and Standards, EPA–440/5–90–004, April 1990.

[27] EPA, *Biological Criteria: Technical Guidance for Streams and Small Rivers,* U.S. Environmental Protection Agency, Office of Water, EPA 822–B–96–001, May 1996.

[28] EPA, *Lakes and Reservoir Bioassessment and Biocriteria: Technical Guidance Document,* U.S. Environmental Protection Agency, Office of Water, EPA 841–B–98–007, August 1998.

[29] EPA, *Draft Estuarine and Coastal Marine Waters Bioassessment and Biocriteria Technical Guidance,* U.S. Environmental Protection Agency, Office of Water, July, 2000.

[30] *In re Brunswick Steam Electric Plant,* Decision of the General Counsel No. 41, June 1, 1976.

[31] *In re Public Service Co. of New Hampshire,* (Seabrook Station Units 1 and 2) (Decision of the Administrator) 10 ERC 1257, 1262 (June 17, 1977).

[32] *In re Central Hudson Gas and Elec. Corp.,* Decision of the General Counsel No. 63, July 29, 1977.

intake structure within the water body. Under this proposal, EPA would set technology-oriented performance requirements; the Agency would not mandate the use of any specific technology.

Exhibit 1 displays the framework for EPA's proposed section 316(b) new facility rule. Previously, EPA solicited public comment on a three-tiered framework for existing facilities. The framework proposed today for new facilities has evolved from Tier 1 of that framework. Under the proposed rule, EPA would group water bodies into four categories: (1) freshwater rivers or streams, (2) lakes or reservoirs, (3) tidal rivers or estuaries; and (4) oceans. The Agency considers location to be the most important factor in addressing adverse environmental impact caused by cooling water intake structures. Today's proposed rule would define the term ''freshwater river or stream'' to mean a lotic (free-flowing) system that does not receive significant inflows of water from oceans or bays due to tidal action (see § 125.83). EPA proposes to define the term ''lake'' to mean any inland body of open water with some minimum surface area free of rooted vegetation and with an average hydraulic retention time of more than 7 days. Lakes may be natural water bodies or impounded streams, usually fresh, surrounded by land or by land and a man-made retainer (*e.g.*, a dam). Lakes may be fed by rivers, streams, springs, and/or local precipitation.

BILLING CODE 6560–50–P

EXHIBIT 1–SECTION 316(B) NEW FACILITY FRAMEWORK

STANDARDS FOR CWISs LOCATED IN A FRESHWATER RIVER OR STREAM

Where CWIS Is Located at Least 50 Meters Outside the Littoral Zone In a Freshwater River or Stream

Total design intake flow of no more than the more stringent of 5% of the source water mean annual flow or 25% of the source water 7Q10
and
Maximum design intake velocity no more than 0.5 ft/s
and
Other requirements as defined by the Director in accordance with § 125.84(f) and (g)

Where CWIS Is Located Less Than 50 Meters Outside the Littoral Zone In a Freshwater River or Stream

Total design intake flow of no more than the more stringent of 5% of the source water mean annual flow or 25% of the source water 7Q10
and
Maximum design intake velocity no more than 0.5 ft/s
and
Reduce intake flow to a level commensurate with that which could be attained by a closed-cycle recirculating cooling water system
and
Other requirements as defined by the Director in accordance with § 125.84(f) and (g)

Where CWIS Is Located Inside the Littoral Zone In a Freshwater River or Stream

Total design intake flow of no more than the more stringent of 5% of the source water mean annual flow or 25% of the source water 7Q10
and
Maximum design intake velocity no more than 0.5 ft/s
and
Reduce intake flow to a level commensurate with that which could be attained by a closed-cycle recirculating cooling water system
and
Implement additional technologies that minimize impingement and entrainment of fish eggs and larvae and maximize survival of impinged adult and juvenile fish
and
Other requirements as defined by the Director in accordance with § 125.84(f) and (g)

STANDARDS FOR CWISs LOCATED IN A LAKE OR RESERVOIR

Where CWIS Is Located at Least 50 Meters Outside the Littoral Zone In a Lake or Reservoir

Total design intake flow must not upset the natural stratification of the source water
and
Other requirements as defined by the Director in accordance with § 125.84(f) and (g)

Where CWIS Is Located Less Than 50 Meters Outside the Littoral Zone In a Lake or Reservoir

Total design intake flow must not upset the natural stratification of the source water
and
Maximum design intake velocity no more than 0.5 ft/s
and
Reduce intake flow to a level commensurate with that which could be attained by a closed-cycle recirculating cooling water system
and
Other requirements as defined by the Director in accordance with § 125.84(f) and (g)

Where CWIS Is Located Inside the Littoral Zone In a Lake or Reservoir

Total design intake flow must not alter the natural stratification of the source water
and
Maximum design intake velocity no more than 0.5 ft/s
and
Reduce intake flow to a level commensurate with that which could be attained by a closed-cycle recirculating cooling water system
and
Implement additional technologies that minimize impingement and entrainment of fish eggs and larvae and maximize survival of impinged adult and juvenile fish
and
Other requirements as defined by the Director in accordance with § 125.84(f) and (g)

STANDARDS FOR CWISs LOCATED IN AN ESTUARY OR TIDAL RIVER

Where CWIS Is Located Anywhere In an Estuary or Tidal River

Total design intake volume must be no more than 1% of the volume of the water column in the area centered about the opening of the intake with a diameter defined by the distance of one tidal excursion at the mean low water
and
Maximum design intake velocity no more than 0.5 ft/s
and
Reduce intake flow to a level commensurate with that which could be attained by a closed-cycle recirculating cooling water system
and
Implement additional technologies that minimize impingement and entrainment of fish eggs and larvae and maximize survival of impinged adult and juvenile fish
and
Other requirements as defined by the Director in accordance with § 125.84(f) and (g)

STANDARDS FOR CWISs LOCATED IN THE OCEAN

Where CWIS Is Located Outside the Littoral Zone In the Ocean

Maximum design intake velocity no more than 0.5 ft/s
and
Other requirements as defined by the Director in accordance with § 125.84(f) and (g)

Where CWIS Is Located Inside the Littoral Zone In the Ocean

Maximum design intake velocity no more than 0.5 ft/s
and
Reduce intake flow to a level commensurate with that which could be attained by a closed-cycle recirculating cooling water system
and
Implement additional technologies that minimize impingement and entrainment of fish eggs and larvae and maximize survival of impinged adult and juvenile fish
and
Other requirements as defined by the Director in accordance with § 125.84(f) and (g)

KEY TERMS

Cooling water intake structure means the total physical structure and any associated constructed waterways used to withdraw water from waters of the U.S., provided that at least 25 percent of the water withdrawn is used for cooling purposes. The cooling water intake structure extends from the point at which water is withdrawn from the surface water source to the first intake pump or series of pumps.

Littoral zone means any nearshore area in a freshwater river or stream, lake or reservoir, or estuary or tidal river extending from the level of highest seasonal water to the deepest point at which submerged aquatic vegetation can be sustained (i.e., the photic zone extending from shore to the substrate receiving one (1) percent of incident light); where there is a significant change in slope that results in changes to habitat and/or community structure; and where there is a significant change in the composition of the substrate (e.g., cobble to sand, sand to mud). In oceans, the littoral zone encompasses the photic zone of the neritic region. The photic zone is that part of the water that receives sufficient sunlight for plants to be able to photosynthesize. The neritic region is the shallow water or nearshore zone over the continental shelf.

BILLING CODE 6560–50–C

EPA is proposing to define the term ''reservoir'' to mean a natural or constructed basin where water is collected and stored (see § 125.83). Consistent with CWA section 104(n)(4), EPA is proposing to define the term ''estuary'' as all or part of the mouth of a river or stream or other body of water having unimpaired natural connection with open sea and within which seawater is measurably diluted with fresh water derived from land. As estuaries are strongly affected by tidal action, EPA's proposing to specify further that the salinity of an estuary exceeds 0.5 part per thousand (by mass), but is less than 30 parts per thousand (by mass) (see § 125.83). EPA is proposing to define the term ''tidal river'' to mean the most seaward reach of a river or stream where the salinity is less than or equal to 0.5 parts per thousand (by mass) at a time of annual low flow and whose a surface elevation responds to the effects of coastal lunar tides (see § 125.83). Finally, EPA proposes to define the term ''ocean'' to mean marine open coastal waters with salinity greater than or equal to 30 parts per thousand (by mass) (see § 125.83).[33] The Agency is not using the definition of ''ocean'' found at CWA 502(10) because that definition refers to the high seas beyond the contiguous zone and the marine environment within the contiguous zone. Impacts from cooling water intake structures are most likely to occur in ocean waters in the near coastal areas.

The design and capacity of the intake structure are important factors that affect the velocity or speed at which the water passes through the screen or other barrier at the entrance to the cooling water intake structure.

Under today's proposed rule, minimum flow and velocity requirements would be applied based on the actual placement of the cooling water intake structure within the particular water body types. Because different water body types have different potential for adverse environmental impact, the requirements proposed to minimize adverse environmental impact would vary by water body type. Some would include minimum requirements in addition to flow and velocity. For example, estuaries and tidal rivers have the highest potential for adverse impact because they contain essential habitat and nursery areas for many species. Therefore, these areas require the most stringent minimum controls including measures in addition to flow and velocity requirements. In contrast to estuaries and tidal rivers, some lakes have low productive areas such as the profundal zone, which would have low potential for adverse environmental impact, thus requiring lesser minimum controls to minimize adverse environmental impact.

Under some scenarios, depending on the type of water body or where the intake structure is located within the water body, EPA is proposing to require additional design and construction technologies that would increase the survival rate of impinged biota or to further reduce the amount of entrained biota.

In general, the capacity requirement would restrict the maximum flow a facility may withdraw to a percentage of the annual mean flow or volume of the water body. For rivers, an additional requirement would limit the capacity of the cooling water intake structure so that it withdraws no more than a certain percentage of the lowest average seven-consecutive-day low flow with an average frequency of once in 10 years (7Q10). In some circumstances, EPA would also restrict the capacity of the cooling water intake structure to a level commensurate with that which could be attained by a closed-cycle recirculating system using minimized make-up and blowdown flows. After location, the flow or capacity of a cooling water intake structure is the primary factor affecting the entrainment of organisms, which is often considered the most difficult impact to control. Organisms entrained include small species of fish and immature life stages (eggs and larvae) of many species that lack sufficient mobility to move away from the area of the intake structure. Limiting the volume of the water withdrawn (flow) from a source can limit the potential for these organisms to be entrained.

Section 316(b) authorizes EPA to impose limitations on the volume of the flow of water withdrawn through a cooling water intake structure as a means of addressing ''capacity.'' *In re Brunswick Steam Electric Plant,* Decision of the General Counsel No. 41 (June 1, 1976). Such limitations on the volume of flow are consistent with the dictionary definition of ''capacity'' [34], the legislative history of the Clean Water Act [35], and the 1976 regulations.[36] *Id.* Indeed, as Decision of the General Counsel No. 41 points out, the major environmental impacts of cooling water intake structures are those affecting aquatic organisms living in the volumes of water withdrawn through the intake structure. Therefore, regulation of the volume of the flow of water withdrawn also advances the objectives of section 316(b).

Today's proposed rule would also establish requirements that address velocity. For most locations, a design intake velocity requirement would restrict the through-screen or through-technology velocity to 0.5 ft/s. Intake velocity is one of the key factors that affects the impingement of fish and other aquatic biota. Velocity is easily addressed during the design and construction phase of a cooling water intake structure. The appropriate design of the intake structure relative to intake flow can minimize velocity. Alternatively, the facility can install certain hard technologies (*e.g.,* wedge wire screens and velocity caps) to change the configuration of the structure so that the effects of velocity on aquatic organisms are minimized. However, EPA is aware that some stakeholders have expressed concern with generally imposing national requirements on velocity and have argued that this may even restrict a facility's flexibility in designing an intake structure that minimizes adverse environmental impact while meeting the needs of the facility. EPA requests comment on its proposed velocity limitation of 0.5 fps, including information on specific situations or technologies for which this limit would pose a problem.

When the intake structure is located within the littoral zone, EPA would broaden the suite of technologies a facility would be required to employ, as well as increase the stringency of the requirements. This would improve the survivability of impinged organisms and reduce the rate of entrained organisms, thus furthering the statutory objective of minimizing adverse environmental impact. In these situations the additional minimal controls are necessary to minimize adverse environmental impact because the littoral zone is generally the area where aquatic organisms are the most abundant and most susceptible to impingement and entrainment.

[33] Salinity values are based on the Venice System, a well-known estuarine zonation system. See EPA, *Draft Estuarine and Coastal Marine Waters Bioassessment and Biocriteria Technical Guidance,* U.S. Environmental Protection Agency, Office of Water, July, 2000.

[34] ''Cubic contents; volume; that which can be contained.'' Random House Dictionary of the English Language, cited in Decision of the General Counsel No. 41.

[35] Legislative History of the Water Pollution Control Act Amendments of 1972, 93d Cong., 1st Sess., at 196–7 (1973).

[36] 40 CFR 402.11(c) (definition of ''capacity''), 41 FR 17390 (April 26, 1976).

Today's proposed rule would provide sound direction to permit writers that specifies minimum technology requirements, targeted to particular types of water bodies, for use in section 316(b) determinations. This would help the Directors implement consistent, protective decisions. The requirements proposed in today's proposed rule are protective on a national level. However, as further discussed at VIII.A.7., EPA recognizes that an individual facility might have a unique or site-specific environmental characteristic such that the national requirements might not achieve the objective of minimizing adverse environmental impact. For example, a migratory species traveling past a particular cooling water intake structure at a facility that does not cause adverse environmental impact in the absence of such migrations.

It is the Agency's intent that permitting authorities familiar with the unique situation in their areas have the flexibility, on a case-by-case basis, to implement additional measures under this proposal to achieve the core requirement of section 316(b), which is to minimize adverse environmental impact. Measures that the Agency deems appropriate would include, but not be limited to, seasonal flow restrictions that result in short term plant shutdowns during spawning or migration periods. Additional control measures also might be needed to address multiple intakes on a water body or the presence of regionally important species (*e.g.*, commercially and recreationally valuable species or aquatic organisms ecologically significant to the structure and function of local aquatic communities). See proposed § 125.84(f). In addition, consistent with existing NPDES program requirements, EPA also proposes that the Director must include permit requirements relating to the location, design, construction or capacity of a cooling water intake structure at a new facility necessary to ensure attainment of water quality standards. See proposed § 125.84(g).

EPA invites comments on all aspects of the proposed regulatory framework to implement section 316(b) so as to ensure that individual permit decisions result in the minimization of adverse environmental impact and attainment of water quality standards.

EPA recognizes that the foregoing approach differs significantly from the site-specific approaches used in the past in implementing section 316(b). For example, EPA has not previously attempted to establish minimum flow or velocity requirements for broad classes of water bodies. However, based in large measure on the Agency's experience in attempting to implement section 316(b) on a wholly site-specific basis, the Agency is today proposing this new approach.

The existing case-by-case approach to section 316(b) decision-making has proven difficult to implement for several reasons. A variety of different types of steam electric generating facilities and many different categories of manufacturing facilities (including pulp and paper manufacturers, chemicals and allied products manufacturers, petroleum and coal products manufacturers, primary metals manufacturers, and 14 additional categories) use cooling water and may potentially have cooling water intake structures.

The historical case-by-case approach requires significant resources on the part of the regulatory authorities that must implement section 316(b) requirements. The historical decision-making process requires that each regulated facility must develop, submit, and refine studies that characterize or estimate potential adverse environmental impact. Such studies can take several years to complete and require the support of a multi-disciplinary team. In addition, given the iterative nature of the assessment process, industry as well as EPA regional and State regulatory authorities must expend significant resources assessing study plans and methods for characterizing the environmental impact occurring at each facility and evaluating those data to determine what constitutes BTA for each specific facility. For example, the assessment of data needs and sufficiency might involve site visits, inspections, follow-up information gathering, and study review and modification. The resource requirements of the historical approach have also served as a disincentive to revisiting section 316(b) permit conditions during each renewal (typically every 5 years). Given that most facilities that use cooling water intake structures became operational before 1980, EPA believes this reluctance to fully reconsider permit conditions in light of new technologies is a significant concern. On the other hand, EPA also recognizes that some stakeholders believe that there are advantages to a site-specific approach. These stakeholders believe that the potential for a cooling water intake structure to cause adverse environmental impact, and the specific technology that would best minimize such impacts at reasonable cost is highly dependent on site-specific factors. These include waterbody characteristics, the specific locations of the structure, which species are present, weather, and other relevant factors. These stakeholders believe a site-specific approach such as that which has been used historically may allow stakeholders and permitting authorities to identify technology options for minimizing adverse environmental impact at a particular site at significantly less cost than would be possible through implementation of consistent requirements, within broad environmental categories, stringent enough to minimize adverse environmental impact at all sites. Many industry stakeholders have indicated that in their view the costs of producing comprehensive site-specific studies in support of 316(b) regulatory compliance, while significant, has been money well spent.

The historical case-by-case approach to section 316(b) decision-making also might result in permitting decisions that are less consistent than they would be if national requirements were in place. The case-by-case approach results in less predictability regarding what is or may be required for a particular facility, which makes planning difficult for industry and leaves regulatory agencies uncertain about the appropriate requirements for particular water bodies or facilities. Without Federal regulations, Directors and States must look to Agency guidance and past permit actions to inform their decisions. Absent national requirements, State officials often lack authoritative guidance for their own regulatory efforts. Only a few NPDES-authorized States have specifically addressed cooling water intake structure technology in statutes or regulations. Some States and EPA regions have required significant section 316(b) studies to be performed by facilities, whereas in other cases determinations have been based on limited actual background and ecological data. Some stakeholders believe that the need for consistency and guidance for State officials need not be addressed only through binding regulations. These stakeholders believe that comprehensive guidance, that provides needed technical and methodological support to permit writers and facilities alike can, to a large extent, fulfill the same function while at the same time preserving flexibility to adopt cost effective approaches to minimize adverse environmental impact at a particular site.

EPA has already received suggestions from Stakeholders that the Agency adopt a more case-by-case approach to this proposed rule. Therefore, the

Agency also invites comment on a rule framework that would resemble the framework the Agency proposed in the 1970s. EPA would implement section 316(b) on a case-by-case, site specific basis, but the Agency would establish specific decision criteria that the Director would have to consider when determining the appropriate BTA for minimizing adverse environmental impact. First the Director would determine whether an adverse environmental impact is or is not occurring. If an impact is occurring, the Director would consider a number of factors in determining what would constitute BTA and whether the facility is minimizing adverse environmental impact from cooling water intake structures. Regulatory language like the following could be used to implement this approach:

The director must determine whether a cooling water intake structure is minimizing adverse environmental impact based on the consideration of:

(1) The composition and vulnerability of the biological communities within the cooling water intake structure's zone of influence;

(2) The importance of the source water body to the surrounding biological community, including the presence of spawning sites, nursery/forage areas, and areas necessary for critical stages in the life cycle of aquatic organisms;

(3) Potential impingement of aquatic organisms based on the design intake velocity;

(4) Potential entrainment of small aquatic organisms based on the intake water flow;

(5) Existing or potential recreational, commercial, and subsistence fishing, including finfishing and shellfishing;

(6) Other factors relating to the adverse environmental impact of the intake, as may be appropriate.

EPA invites comment on the case-by-case approach to determine BTA for minimizing adverse environmental impact.

One variation on this approach that might well balance the need to provide clarity and consistency with the need to allow for some site-specific flexibility would be to establish a rebuttable presumption that the requirements of the proposed rule (or some other set of uniform national requirements based on this proposal) reflect BTA, but then allow a new facility, at its option and with the full burden of proof resting on the facility, to provide a demonstration that due to site-specific conditions at the site some alternative technology or suite of technologies would minimize adverse environmental impact. Under this approach, the facility would be required to demonstrate during the permit proceeding that the facility will minimize adverse environmental impact without complying with some or all of the proposed requirements relating to flow, intake velocity, and additional design and construction technologies. Requests for alternate technology requirements would need to be accompanied by data and information that demonstrate clearly and conclusively that the facility will minimize adverse environmental impact without complying with the proposed requirements. If EPA were to adopt this approach, EPA would provide guidance to facilities and permit writers on available alternative technology requirements and the type of site-specific conditions under which they may be appropriate to minimize adverse environmental impact, and on factors to consider in determining whether a proposed set of alternative requirements would minimize adverse environmental impact. EPA would also address the type of documentation facilities would need to provide in order to support a request for alternative technology requirements based on site-specific conditions.

If EPA adopted such an approach, language such at the following would be added to the regulation:

It shall be presumed that the requirements of § 125.84(a) through (e) reflect the best technology available for minimizing adverse environmental impact for all facilities to which this regulation applies. However, any new facility subject to these regulations may request that alternative technology-based requirements be imposed in the permit based on site-specific conditions. Alternative requirements shall be approved only if:

(1) There is an applicable requirement under § 125.84(a) through (e);

(2) Data and information specific to the facility and the affected environment demonstrate clearly and convincingly that the facility will minimize adverse environmental impact by complying with the alternative requirements; and

(3) The alternative requirements will ensure compliance with sections 208(e) and 301(b)(1)(C) of the Clean Water Act.

The burden is on the facility requesting the alternative requirements to demonstrate clearly and convincingly that they will minimize adverse environmental impact and that the other requirements of (1) through (3) above are met.

This rebuttable presumption framework might also be integrated with components of the other options for site-specific flexibility as suggested by some stakeholders and discussed in this preamble, including the option of allowing some kind of balancing of costs with environmental benefits as part of the demonstration that an alternative technology would minimize adverse environmental impact and/or allow restoration or mitigation as part of a site-specific BTA determination. EPA requests comment on the rebuttable presumption approach and how it might best be implemented. Specifically, EPA requests comment on types of site-specific conditions under which alternative technology requirements may be appropriate to minimize adverse environmental impact, factors that should be considered in determining whether a proposed set of alternative requirements would minimize adverse environmental impact, and specific methodologies for assessing adverse environmental impact.

In addition to today's proposal, EPA is considering an alternative based in whole or in part on a zero-intake flow (or nearly zero, extremely low-flow) requirement commensurate with levels achievable through the use of dry cooling systems. Under this alternative, a zero or nearly zero-intake flow requirement based on the use of dry cooling systems would be the primary regulatory requirement in either (1) all waters of the U.S.; (2) within tidal rivers, estuaries, and the littoral zone of freshwater rivers, lakes reservoirs and oceans; or (3) within tidal rivers, estuaries, and within or near the littoral zone of freshwater rivers, lakes, reservoirs and oceans. The Agency is also considering subcategorizing the new facility regulation based on types or sizes of new facilities and location within regions of the country since climate may be one factor affecting the viability of dry cooling technologies. In this scenario, the Agency would require flow rates commensurate with use of dry cooling systems for certain types or sizes of new facilities, and/or new facilities in certain locations, based on the costs, efficiency, and consumption of energy that may be associated with reducing withdrawals from waters of the U.S. to a level commensurate with those achieved by dry cooling systems.

Dry cooling systems (towers) use either a natural or mechanical air draft to transfer heat from condenser tubes to air. In wet cooling systems that employ conventional wet cooling towers, cooling water that has been used to cool the condensers is pumped to the top of a cooling tower; as the heated water falls, it cools through an evaporative process and warm, most air rises out of the tower, often creating a vapor plume. Hybrid wet-dry cooling towers employ both a wet section and dry section and reduce or eliminate the visible plumes associated with wet cooling towers.

Dry cooling towers have several advantages over wet cooling towers. They do not consume water through evaporation, have no wastewater discharge to affect water quality, do not

cause drift of salt or other minerals, do not require the use and subsequent treatment of water conditioning chemicals or biocides, and do not create a vapor plume. Further, as plants employing dry cooling systems have no cooling water needs, they can be located near or in cities and other areas with great demand for electricity irrespective of the availability of large supplies of cooling water, thereby reducing costs and power losses associated with transmitting electricity over long distances. Dry cooling systems reduce the impingement and entrainment of aquatic organisms associated with cooling water use. For example, the State of New York estimates that compared to a wet/dry hybrid cooling system, use of a dry cooling system at a recently permitted 1,080 MW electricity generating facility would reduce projected annual fish mortality at the facility from 24,500 to 1,000 American Shad, from 1.9 million to 76,000 River Herring, from 1,200 to 50 Striped Bass, and from 23,000 to 950 White Perch.[37]

On the other hand, as dry cooling systems use air rather than water for cooling, dry cooling systems are generally less efficient than wet cooling systems. Dry cooling systems perform most efficiently in colder climates, where the temperature differential is greater between the process water and the air used for cooling, and are generally less efficient in warmer climates, though EPA is aware that such systems are currently operating under desert conditions where air temperatures frequently exceed 100°F for extended periods. Because dry cooling systems exhibit lower cooling efficiencies than wet systems, a dry cooling system would be larger than a wet system with a comparable cooling capacity. For example, a recent application filed with the State of New York for a 1000 MW power plant indicated that two air-cooled condensers would be needed to meet the cooling needs of the proposed project, each one approximately 160 feet by 430 feet and approximately 105 feet tall. For a wet-dry hybrid cooling system, two cooling towers would be needed, each one approximately 50 feet by 300 feet and 60 feet tall.[38]

Dry cooling systems can cost as much as three times more to install than a comparable wet cooling system. Dry cooling system operating costs have been reported to range from less than or comparable to wet systems to two or more times higher. For example, the Astoria Energy LLC Queens application filed with the State of New York indicated that a dry cooling system would cost $32 million more to install than a hybrid wet-dry cooling system and $29 million more than a once-through cooling system for a proposed 1000 MW plant. Operating costs would be $30 million less for the dry cooling system than the hybrid wet-dry system, and $19 million more than for a once-through cooling system.[39] The State of New York estimates that use of a dry cooling system at the recently permitted 1,080 MW Athens Generating Company facility would cost approximately $1.9 million more per year, over 20 years, than a hybrid wet-dry cooling system for a project with a total projected cost of approximately $500 million. In addition, dry systems generally are perceived to impose an energy penalty as compared to wet cooling systems. However, there is some uncertainty regarding the precise energy costs or penalty associated with the different types of cooling systems. For example, at the Athens Generating Company facility, New York State officials estimate a 1.4 to 1.9 percent reduction in overall plant electrical generating capacity as a consequence of using a dry cooling system versus a hybrid wet-dry system.[40] By contrast, the Astoria Energy Queens facility application estimates that a dry cooling system would save approximately 0.5 percent in energy costs as compared to a hybrid wet-dry cooling system. Other factors, including climatic conditions, may affect energy costs associated with a particular type of cooling system. It has been reported that plants using wet cooling systems in warm climates export more power than comparably sized plants using dry cooling systems. Likewise, a study of a pulverized coal plant in Denmark found net heat conversion efficiencies of 45.9 percent and 44.5 percent for the plant configured with a wet cooling tower and dry cooling tower respectively. This corresponds to an average energy penalty of about 3 percent for the dry cooling tower relative to the wet cooling towers.[41] Changes in energy consumption associated with dry cooling would result in changed fuel consumption and therefore may result in changed emissions of greenhouse gases.

The Agency is aware that at this time dry cooling systems are currently in use at over 60 electrical generation facilities world wide; over 50 of these facilities are in North America. Moreover, plants using dry cooling demonstrate a considerable variety in prime mover technology including combined cycle, co-generation, and steam turbine, as well as diversity in fuels used including coal, wood, methanol, natural gas and waste. The operational facilities range in size from 1 MW to a 645 MW facility. In addition, two facilities using dry cooling have been recently permitted but are not yet operational, one with a 580 MW capacity, the other (Athens Generating Company) with a 1,080 MW capacity. Further, EPA has information that applications for nine additional plants using dry cooling systems are pending. These plants range in capacity from 170 MW to 1,100 MW.

At this time the Agency does not have sufficient information to make a decision on whether to implement a zero or near zero intake-flow requirement that would effectively require the use of dry cooling technology. EPA is inviting comment on factors which may favor or disfavor the use of dry cooling systems including any cost information associated with any of these factors. The Agency also invites comment on whether and how dry cooling could be a basis for BTA requirements. In particular, the Agency invites comment on whether the Agency should consider subcategorizing facilities proposed for regulation today and requiring flows based on dry cooling for those facilities of a certain size or in certain locations where dry cooling is a viable technology at an economically practicable cost. For example, for the types and sizes of facilities in areas where dry cooling has been employed at facilities in operation, permitted, or slated for construction, the Agency might determine that dry cooling is the best technology available to minimize adverse environmental impact. EPA also invites comment on regulatory approaches of this type based on hybrid wet-dry cooling rather than dry cooling.

In developing the regulatory framework proposed today, EPA considered an alternative under which

[37] NYDEC, Interim Decision, Athens Generating Company, State of New York Department of Environmental Conservation, No: 4–1922–00055/00001, SPDES No: NY–0261009, June 2, 2000.

[38] Astoria Energy LLC Queens, New York Facility, Application for Certification of a Major Electric Generating Facility Under Article X of the New York State Public Service Law, Volume 1, June 2000.

[39] Astoria Energy LLC Queens Facility Application.

[40] NYDEC, Initial Post Hearing Brief, Athens Generating Company, L.P., State of New York, Department of Environmental Conservation, Case No. 97–F–1563, June 28, 1999.

[41] Gordon R. Couch, ''Coal-fired Power Generation—Trends in the 1990s,'' IEA Coal Research, London, UK, 1997.

facility operators might have the flexibility to ''trade'' among components of BTA to potentially achieve equivalent reductions in adverse environmental impact at lower cost. For example, a facility operator who reduced flow below the requirements specified in today's proposal might then have the opportunity not to reduce velocity as specified, or to install fewer additional design technologies. The Agency invites comment on all aspects of an approach that would allow trading among the components of BTA.

EPA also is considering a regulatory framework that would apply the BTA requirements proposed for estuaries and tidal rivers to all facilities, regardless of their location. This would ensure that the same stringent controls are the nationally applicable minimum for all water body types. In addition, all facilities would have to implement technologies that maximize the survival of impinged adult and juvenile fish and minimize the entrainment of eggs and larvae, and comply with additional requirements established by the Director. Some stakeholders assert that an approach that establishes a uniform, stringent set of national BTA requirements is the only one permissible under section 316(b) as all parts of all waters of the U.S. require stringent BTA requirements in order to minimize adverse environmental impact. These stakeholders believe that section 316(b) is wholly technology-based, that cooling towers are the best technology available for minimizing adverse environmental impact, and that therefore, cooling towers must be the basis for BTA requirements nationally.

EPA invites comment on all aspects of the regulatory framework and the other approaches discussed herein.

Some stakeholders have suggested an alternative regulatory framework in which section 316(b) implementation is accomplished through site-specific examination of the risk of adverse environmental impact and (assuming the cooling water intake structure poses some reasonable risk of adverse environmental impact) site-specific evaluation of potential BTA technologies.

Under one approach, the framework of the site-specific alternative would consist of three tiers. In Tiers 1 and 2, the facility, in consultation with the Director, would assess the potential for risk of adverse environmental impact associated with the proposed cooling water intake structure. Tier 1 would be both a screening and an assessment tier that relies on existing information that is site-specific or relevant to the adverse environmental impact determination. Tier 2 would focus on collection and analysis of additional information collection activities, as necessary, to make the adverse environmental impact determination. In Tier 3, which would assume that the Director has found that the cooling water intake structure is reasonably likely to pose risk of adverse environmental impact, the facility would assess BTA alternatives, including an evaluation of costs and benefits. In each tier, the facility would bear the burden of generating data and analyses.

In Tier 1, the facility would examine the risk of adverse environmental impact using certain types of existing information, such as fisheries management data, multimetric biocriteria results, operational and design specifications for the proposed cooling water intake structure, or other pertinent and reliable information. The initial steps in the Tier 1 analysis would be (1) review of cooling water intake structure design and proposed operations, (2) selection of ''designated important species,'' (3) definition of a study population of designated important species, and (4) identification of existing or readily available information sources.

Selection of designated important species would be site-specific, taking into consideration such factors as the species' likely involvement with the cooling water intake structure and the representativeness of the species in relation to the aquatic community. Selection of designated important species would consider commercially and recreationally important species, listed threatened and endangered species, species otherwise identified for protection or management, and food web species.

Based on existing information (where existing information is scientifically valid and adequate to evaluate the potential effects of the cooling water intake structure), including an assessment of the planned cooling water intake structure's characteristics, its geographic/hydrological setting, the nature of the biological community, or other factors, the facility would make an initial determination as to whether the information is adequate, representative, and indicative of a low risk of adverse environmental impact. If the Director agrees that there is a low risk, the proposed cooling water intake structure would be BTA. If the Director finds the existing information insufficient or finds that the risk of adverse environmental impact is not low, the facility would proceed to Tier 2.

In determining whether there is a risk of adverse environmental impact, the Director would consider the appropriate level of biological significance to the individual species, which would generally be the population level. The Director would consider whether the cooling water intake structure effects pose a risk to the viability of the designated important species populations and their ability to support existing ecosystem functions. This would include adequate protection of (1) the structure and function of the aquatic community, (2) commercially and recreationally important species, and (3) threatened or endangered species.

In Tier 2, the facility would conduct field studies for one of two purposes, following two separate tracks. In Track A, a facility might conduct special studies to provide adequate information to make a Tier 1 determination of its reasonable potential to cause adverse environmental impact. In Track B, the facility might conduct information collection activities (such as population modeling), as necessary, to make a Tier 2 determination as to whether the cooling water intake structure is reasonably likely to cause adverse environmental impact. The facility would have primary responsibility for study design and implementation, subject to securing approval of the Director prior to commencing any study. The facility would have the option of volunteering to perform restoration measures and having those measures taken into account in evaluating the risk of adverse environmental impact.

If a facility completes Tier 2 and the Director determines that the proposed cooling water intake structure is not reasonably likely to cause adverse environmental impact, the cooling water intake structure would reflect BTA. If, on the other hand, a facility completes Tier 2 and the Director determines that the proposed cooling water intake structure is reasonably likely to cause adverse environmental impact, in Tier 3 the facility would assess a reasonable range of BTA alternatives. Facilities would have the opportunity to evaluate potentially feasible cooling water intake structure technologies to address the specific adverse environmental impact, and also would have the opportunity to develop new cooling water intake structure technologies. At its option, a facility could perform a benefit/cost analysis of the BTA candidate technologies. Otherwise, it could decide to offer a cooling water intake structure technology or technologies as BTA based on an initial performance assessment of their characteristics. If a facility proceeds with the cost/benefit analysis, BTA would be determined

through application of a ''reasonably proportional'' standard. Also, the facility could propose restoration measures to address the adverse environmental impact that could be used in place of, or as a supplement to, BTA.

Another site-specific approach suggested by stakeholders would allow new facilities applying for NPDES permits to have the option of performing studies necessary to make a site-specific BTA determination. This approach is comparable to the ''rebuttable presumption'' approach described above. The extent and nature of such studies would be determined by the proposed location of the cooling water intake structure vis-a-vis the location factors EPA has proposed as indicative of sensitivity. Proponents of this approach suggest that general study design requirements appropriate for different types of water bodies (*i.e.*, freshwater rivers, lakes, reservoirs, estuaries and tidal rivers, oceans, and the Great Lakes) and EPA could develop proposed intake structure locations, using information provided by state-of-the-art studies as conducted by the regulated community, research and academic institutions, government agencies, and others.

Under this alternative suggested by stakeholders, studies would be designed to predict likely entrainment and impingement effects, along with other environmental effects associated with a proposed cooling water intake structure configuration. The study would assess whether those predicted effects are of a magnitude such that the Director can conclude, after considering guidance that EPA would prepare, that the effects are not reasonably likely to be ''adverse'' to the affected aquatic population or community. In situations where the Director is unable to conclude, with reasonable certainty, that there is no reasonable likelihood of adverse environmental impact from the proposed cooling water intake structure configuration, he or she would compare the performance of the proposed alternative to the predicted performance of other reasonably available technologies relative to the design, location, construction, and capacity of the cooling water intake structure. The Director would also assess the costs and benefits (including the costs and benefits associated with other environmental effects) of those alternatives whose performance is comparable to that of the proposed alternative and would select as ''BTA'' that technology or technologies whose costs and benefits are reasonably related, taking into account the level of uncertainty in the available data. Consistent with this approach, EPA could develop guidelines for performing cost/benefit analyses that would minimize the need to collect extensive new data to characterize the value of resources for which there is not an existing market. These guidelines would facilitate reasonably consistent, cost-effective decisions under this approach.

This approach is premised on the conclusion that national standards and locational attributes alone cannot properly account for biological factors, which are inherently site-specific and that the best technology available for minimizing adverse environmental impact location also is site-specific. The stakeholders advocating this approach point out that among the factors that differ from site to site are the risk of entrainment and impingement posed by a given cooling water intake structure to different aquatic species and different life stages; site-and species-specific factors that affect the sensitivity of aquatic populations and communities to entrainment and impingement; the need to balance the possible benefits, at the population or community level, of reducing entrainment or impingement of a given species or life stage versus possible adverse effects of the same technology on other species or life stages; the need to consider and balance potential benefits (and costs) of the proposed cooling water intake structure technologies to aquatic resources versus potentially adverse (or beneficial) effects of those technologies on other aspects of the environment; and the possibility that the specific performance requirements imposed by EPA would preclude use of the most environmentally and economically cost-effective technology in some cases. It has also been suggested that today's proposed framework contains unnecessarily redundant measures for minimizing impingement and entrainment, and that in the past, including in previous rules and in guidance, EPA recognized the necessity of considering these factors on a site-specific basis.

Finally, it has been suggested that such an alternative will neither delay permitting of new facilities nor impose an undue burden on State and Federal permit writers, especially if EPA develops national guidance on the key issues (*e.g.*, the nature of adverse environmental impact, the nature and extent of site-specific effects studies, and cost/benefit analytical issues) that will ensure timely decisions and an appropriate level of consistency.

EPA requests comment on all aspects of the foregoing alternatives, and will give full consideration to each as it develops the final rule.

2. Location

EPA has long recognized that the location of a cooling water intake structure is one of the key factors that affects the environmental impact caused by the intake structure. When cooling water is withdrawn from sensitive biological areas, there is a heightened potential for adverse environmental impact and therefore a heightened concern. EPA has attempted in this proposal to identify the areas that are most biologically productive or otherwise sensitive and to ensure that the appropriate suite of technologies is applied to minimize adverse environmental impact in those areas.

The optimal design requirement for location is to place the inlet of the cooling water intake structure in an area of the source water body where impingement and entrainment effects on organisms are minimized (taking into account the location of the shoreline, the depth of the water body, and the presence and quantity of aquatic organisms or sensitive habitat). Although the most effective way to minimize adverse environmental impact associated with cooling water intake structures is to locate intakes away from areas with the potential for high productivity, the Agency recognizes that this is not always possible. Cooling water intake structures at new facilities located inside these sensitive areas would generally require controls to minimize adverse environmental impact.

EPA is proposing to require expansive BTA requirements in tidal rivers, estuaries, and the ''littoral zone'' of freshwater rivers, lakes, and reservoirs. In oceans, EPA is using the term ''littoral zone'' broadly to include the ''euphotic'' areas of ''neritic'' waters. These areas are the most productive of ocean environments. Neritic waters are those over the continental shelf, and they include the areas of marine fish and mammal migration. The euphotic zone of neritic waters includes those areas that are sufficiently shallow and clear to allow for light penetration sufficient to support primary productivity. The Agency proposes to define the term ''littoral zone'' to mean any nearshore area in a freshwater river or stream, lake or reservoir, or estuary or tidal river extending from the level of highest seasonal water to the deepest point at which submerged aquatic vegetation can be sustained (*i.e.*, the photic zone extending from shore to the substrate receiving one (1) percent of incident light); where there is a

significant change in slope that results in changes to habitat and/or community structure; and where there is a significant change in the composition of the substrate (*e.g.*, cobble to sand, sand to mud). In oceans, the littoral zone encompasses the photic zone of the neritic region. The photic zone is that part of the water that receives sufficient sunlight for plants to be able to photosynthesize. The neritic region is the shallow water or nearshore zone over the continental shelf (see § 125.83). In general, the littoral zone defines the area where the physical, chemical, and biological attributes of aquatic systems promote the congregation, growth, and propagation of individual aquatic organisms, including egg, larvae, and juvenile life history stages. Appendix 1 illustrates a littoral zone defined by the deepest point at which submerged aquatic vegetation can be sustained.

Adverse environmental impact from entrainment can for many species be controlled or minimized in part by addressing factors associated with the location of the intake structure. Placement (horizontal and vertical) in the water body to avoid areas where these species or life stages occur would limit the number of organisms taken into the cooling water intake structure. Placing the intake structure where ambient flows or water body volume are sufficiently large in proportion to the proposed cooling water intake structure to minimize impact also addresses these factors.

For freshwater rivers, the littoral zone is the area along the shoreline that serves as the principal spawning and nursery area for many, but not all, species of freshwater fish. The shoreline habitat typically features both living and abiotic structures and a diverse community of invertebrates and fish. Most of the reproductive strategies of shoreline fish populations are similar to those found in the littoral zone of lakes and reservoirs. The fish of this zone typically follow a spawning strategy wherein the eggs are deposited in prepared nests, on the bottom, and attached to submerged substrate, where they incubate and hatch. As the larvae mature into fry and early juveniles, some species disperse to open water, while most others complete their life cycle in the littoral zone. Because these species do not employ a pelagic reproductive strategy, the eggs and larvae are not readily integrated into the drift component of the water column; this reduces the potential for entrainment. To minimize adverse environmental impact, the deepest open-water channel region of a river that is available for location of an intake structure should generally be used as a source of cooling water except where this area intersects with fish migratory routes.

For lakes and reservoirs, the littoral zone is the portion of the body of water extending from the shoreline lakeward to the deepest point at which submerged aquatic vegetation can be sustained (fringe of existing rooted plants). To minimize adverse environmental impact, the deepest open region of a lake that is available for location of an intake structure would often be the optimal location for cooling water intake, and the cooling water intake flow should not alter the natural thermal stratification of the lake. Natural thermal stratification means the naturally occurring division of a waterbody into horizontal layers of differing densities as a result of variations in temperature at different depths.[42] (Note, however, that such location is not the only mechanism for minimizing adverse environmental impact.)

For estuaries and tidal rivers, the most stringent minimum requirements would apply to the entire water body. The abundance and diversity of aquatic life within the estuarine and tidal river environment (composed of protected bays, sounds, and lagoons) are generally richer than those in any other water body type. These areas provide an abundance of habitat, food, and refuge for the development of the early life stages of the inshore and nearshore aquatic communities, including communities of meroplankton and holoplankton. The vast majority of commercially and recreationally important species of finfish and shellfish caught in the United States use and depend on estuaries and tidal rivers for completing their life cycles. Estuaries and tidal rivers are among the most complex of aquatic habitats, especially with respect to the environmental factors that affect the distribution patterns of fish eggs, larvae, and juvenile life stages. Many estuarine species have pelagic or planktonic larvae whose movement in and around the estuary, as well as vertically within the water column, is affected by the hydrodynamic characteristics of the estuary, environmental factors, and the evolved behavior of the organisms. Factors that affect the location and movement of aquatic organisms within estuaries and tidal rivers include tides and currents, salinity, dissolved oxygen, temperature, and suspended solids. Additionally, weather patterns, both short- and long-term, can influence the movement and location of aquatic organisms in estuaries and tidal rivers. As a consequence, the Agency is proposing, at a national level, to establish the most stringent requirements to minimize adverse environmental impact for all areas within estuaries and tidal rivers. The Agency developed cost estimates for this proposal, using the most comprehensive suite of technologies in all parts of tidal rivers and estuaries and, as discussed below, estimated that these costs would be economically practicable.

For oceans, the littoral zone (which is being defined as the photic zone of the neritic region) is the area outward from the shoreline beyond the low tide level including waters over the continental shelf. Where islands occur in the ocean, a littoral zone would extend out from the low tide level of the island shoreline. In the near and offshore areas, aquatic life is concentrated in convergence zones of major oceanic currents, within reefs, rocky bottoms, hard bottom ledges, and kelp beds.

EPA is proposing requirements based on the proximity of the intake structure to the littoral zone. For freshwater rivers (or streams) and lakes (or reservoirs), the Agency would specify three categories of requirements based on location criteria. The first category would establish requirements for a cooling water intake structure located at least 50 meters outside the littoral zone. Cooling water intake structures that meet this location criterion would have to meet the least stringent set of minimum requirements. The second category would establish minimum requirements for a cooling water intake structure located less than 50 meters outside the littoral zone. The third category would establish minimum requirements for a cooling water intake structure located in the littoral zone. EPA would establish only one set of minimum requirements for cooling water intake structures located in estuaries and tidal rivers. As discussed above, all parts of estuaries and tidal rivers have the potential for high biological productivity; therefore, the most stringent set of requirements and broadest suite of technologies would apply to cooling water intake structures located in these sensitive water body types. For oceans, the Agency is proposing two categories of requirements based on location criteria. One category addresses cooling water intake structures located outside the littoral zone; the other category addresses cooling water intake

[42] Extrapolated from *Academic Press Dictionary of Science and Technology*, ed, Christopher Morris, Academic Press, Inc., San Diego, CA, 1992.

structures located inside the littoral zone.

EPA decided to propose at least 50 meters outside the littoral zone as the location in which the least stringent set of requirements would apply. The Agency has concluded this is appropriate because the greatest numbers of aquatic organisms and their habitat are not typically present 50 meters outside the littoral zone and therefore will not be vulnerable to impingement and entrainment. EPA recognizes that some important species have critical life stage areas at various distances outside of a littoral zone, and solicits public comment on how best to deal with this species and site-specific variability. EPA also is considering distance criteria of 200 meters, 100 meters, and just outside the littoral zone. EPA solicits comment on these alternative distance criteria.

To address concerns about potential implementation issues associated with basing the regulatory requirements on site-specific determinations of the littoral zone, the Agency also is considering establishing a fixed distance from the shoreline instead of a fixed distance from the littoral zone to define the area in which the most stringent minimum requirements would be applicable. EPA solicits comment on the following criteria for distance from the shoreline: (1) 30 percent of the distance from shoreline to the opposing shore (*i.e.,* 30 percent of the water body width) for streams, rivers, lakes, and reservoirs and (2) 500 meters offshore for tidal rivers, estuaries, and oceans. Regulatory language such as the following could be used to implement this approach:

Littoral zone in a freshwater river or stream, lake, or reservoir means the nearshore area that extends 30 percent of the distance from one shoreline to the opposite shoreline (*i.e.,* 30 percent of the width of the waterbody at the point of measurement) and in a tidal river, estuary, or ocean means the nearshore area extending 500 meters from the shoreline.

3. Flow and Volume

As stated previously, flow is one component of capacity and capacity includes the maximum volume of water that can be withdrawn through a cooling water intake structure. Flow and volume are parameters that can be regulated to minimize adverse environmental impact. In particular, the magnitude of entrainment impacts is directly related to the capacity or intake flow (or volume) of cooling water intake structures. The adverse impact that results from entrainment of organisms occurs after the organism has entered the cooling water system, where it may be exposed to elevated temperatures, shearing forces, impact from mechanical equipment, swift changes in pressures, lack of dissolved oxygen, and chemicals. Once organisms are entrained, mortality and injury rates can be high.

One way to minimize the adverse environmental impact from entrainment is to minimize the flow or volume a facility withdraws. Therefore, today's proposed rule includes requirements that would limit cooling water intake design flow or volume at new facilities.

a. Flow Requirements for New Facilities With Cooling Water Intake Structures Located in Freshwater Rivers and Streams

Total design intake flow from all cooling water intake structures at a facility located in a freshwater river or stream must be no more than the lower of five (5) percent of the source water body mean annual flow or 25 percent of the source water 7Q10.

New facilities that have cooling water intake structures located in freshwater rivers or streams would have to meet a flow requirement that would limit the proportion of the design intake flow withdrawn by the facility compared to the flow of the water body in which the intake is located. Proposed § 125.84(b). Two proportional requirements are being proposed, and facilities would be required to meet the more stringent of the two.

The first of these requirements would limit the total design intake flow from all cooling water intake structures at the facility to five (5) percent of the annual mean flow of the water body. As previously noted, entrainment impacts of cooling water intake structures are closely linked to the amount of water passing through the intake structure because the eggs and larvae of many aquatic species are free-floating and may be drawn with the flow of cooling water into an intake structure. The five percent requirement would establish a maximum level for entrainment effects that, in all areas within 50 meters of the littoral zone, would be further reduced by additional requirements (such as requirements to reduce cooling water withdrawals, and additional design and construction technologies to further reduce impingement and entrainment). EPA estimates that the combination of these requirements (and the design intake velocity limitation for reducing impingement in almost all waterbody types) should result in protection of greater than 99 percent of the aquatic community from impingement and entrainment. This combination of requirements to establish a minimum level of protection for aquatic communities is analogous to the process employed by EPA's water quality-based regulatory programs for developing the necessary levels of protection to protect aquatic communities within the water body as a whole where impacts may occur. These requirements provide the minimum level of protection for designated uses that reflect the goals in section 101(a) of the CWA, *i.e.,* ''protection and propagation of fish and shellfish and wildlife and recreation in and on the water.'' As described elsewhere, the Director would have authority under this proposal to impose additional requirements on a site-specific basis in certain circumstances should the requirements proposed today not protect aquatic life from adverse environmental impact.

The Agency has considered other design intake flow levels in developing this proposal, including 1 percent, 10 percent, and 15 percent of the mean annual flow of the waterbody. With the exception of the 1 percent level, EPA concludes these levels would result in decreased protection. EPA solicits comment on these alternatives to five percent of the annual mean flow.

The second part of the flow requirement would limit the proportion of the total design intake flow to 25 percent of the source water body's 7Q10 flow. The 7Q10 is the lowest average seven-consecutive-day low flow with an average recurrence frequency of once in 10 years determined hydrologically. EPA estimates that limiting the proportion of a river or stream to 25 percent of the 7Q10, in conjunction with the other requirements proposed today, also should protect more than 99 percent of aquatic communities from adverse environmental impact. As explained above, this flow requirement, in combination with other requirements, would establish a minimum level of protection for aquatic communities analogous to that employed by EPA's water quality-based regulatory programs. The Agency invites comment on the use of other low-flow protection requirements, including a requirement that would limit cooling water intake structure capacity to 10 percent, 15 percent, 25 percent, or 35 percent of the 7Q10 low flow.

EPA has analyzed the potential siting implications of the proposed flow requirements and has determined that within the United States approximately 104,000 river miles have sufficient flow to support the water usage needs of large manufacturing facilities withdrawing up to 18 million gallons of water per day (MGD). Approximately 47,000 river miles could support a large nonutility power-producing facility

withdrawing 85 MGD, and approximately 18,000 river miles could support a large utility plant requiring 700 MGD. Under today's proposed rule, large new facilities needing additional cooling water in other areas would need to supplement withdrawals from waters of the U.S. with other sources of cooling water, or redesign their cooling systems to use less water.

As another gauge of the siting impacts of the proposed flow requirement for new facilities, the Agency determined that 89 percent of existing non-nuclear utility facilities (from a 1997 database of the Energy Information Agency and a 1994 Edison Electric Institute database) would be able to be sited at their current location under today's proposed requirements if they also operated in compliance with the flow reduction requirements proposed today. (Please note that the Agency does not intend to prejudge or signal in any way whether its proposed rule for existing facilities will or will not include capacity limitations commensurate with a level that could be attained by a recirculating cooling water system. The purpose of the analysis was to determine whether today's proposed flow requirements would unreasonably limit siting alternatives for new facilities only.)

Finally, to further examine the potential siting implications of today's proposal for new facilities, the Agency reviewed data on water use by existing facilities in arid regions of the country. The Agency found that 80 percent of the existing facilities in Arizona, California, Nevada, New Mexico, Oklahoma, and Texas do not use waters of the U.S. in their operations, suggesting that new facilities in these areas would similarly use waters other than waters of the U.S. in their operations. Therefore, they would not be affected by today's proposal if they were being constructed as new facilities subject to the rule.

Based on these analyses, the Agency is proposing flow requirements as an economically practicable component of requirements for BTA to minimize adverse environmental impact.

b. Flow Requirements for New Facilities With Cooling Water Intake Structures Located in Lakes and Reservoirs

Total design intake flow from all cooling water intake structures at a facility located in a lake or reservoir must not alter the natural thermal stratification of the water body.

EPA is proposing that cooling water intake structures located in lakes or reservoirs not alter the natural thermal stratification of the water body. Proposed § 125.84(c). Under natural conditions the water in lakes and reservoirs is seasonally stratified: The coldest water is on the bottom, and the warmest water is at the surface. EPA proposes to limit the facility's design intake flow to a threshold below which it will not cause the alteration of the thermal (and hence the dissolved oxygen) structure of the lake or reservoir.

EPA is not proposing a proportional flow requirement for these facilities because the volume of the lakes and reservoirs on which they are located typically must be sufficient to accept their heated discharge and still maintain the efficiency of their cooling system. Because lakes and reservoirs typically do not have a strong current or flow, the volume of the water body must be great enough to dissipate the heat so that it is not recirculated back to the facility in its cooling water intake. However, EPA is proposing a requirement to protect the water body from alteration of the natural stratification, which can be caused by withdrawing large amounts of lower-temperature cooling water generally with low dissolved oxygen during the summer months. This would limit the intake flow of facilities that are located on a lake or reservoir to a capacity appropriate for the size of the water body, thus limiting the number of aquatic organisms impinged or entrained from the same water body.

The flow requirements specified in today's proposal are adequate to protect most lakes and reservoirs. However, EPA recognizes that there are unique situations, such as the Great Lakes, in which there are site-specific factors that may warrant more stringent requirements (as determined by the Director) to minimize adverse environmental impact. One of the primary concerns with lakes and reservoirs is that the withdrawal of cooling water should not alter the natural thermal stratification of the water body. Since the volume of water in the Great Lakes is quite large compared to the amount of water withdrawn for cooling purposes, it is highly unlikely that the thermal structure of these lakes would be influenced by cooling water withdrawals. However, the Great Lakes, like estuaries, have areas of high productivity and sensitive critical habitats that could be adversely affected by cooling water intake structures. The Agency recognizes that new facilities with cooling water intake structures in such water bodies might need more stringent requirements than those generally proposed here for lakes and reservoirs. Section 125.84(f) would provide the Director the authority under this proposal to address important site-specific factors that lead to the need for additional control measures.

c. Flow Requirements for New Facilities With Cooling Water Intake Structures Located in Estuaries and Tidal Rivers

The total design intake flow from all cooling water intake structures at a facility must be no greater than one (1) percent of the volume of the water column in the area centered about the opening of the intake with a diameter defined by the distance of one tidal excursion at the mean low water level.

EPA is proposing a proportional flow requirement for cooling water intake structures located in estuaries and tidal rivers that limits the total design intake flow to no greater than one (1) percent of the volume of the water column in an area centered about the opening of the intake with a diameter defined by the distance of one tidal excursion at the mean low water level. Proposed § 125.84(d).

The basis for this proposal is similar to that underlying the proposed requirements for new facilities with cooling water intake structures located in freshwater rivers and streams. EPA selected a one (1) percent threshold for estuaries and tidal rivers because they are extremely productive and sensitive biological areas. A more conservative approach is necessary to protect these types of water bodies. However, because estuary volumes are very large, allowing a withdrawal of one (1) percent of an entire estuary would potentially allow for the impingement and entrainment of a very large number of aquatic organisms. Limiting the withdrawal to one (1) percent of a volume defined using the tidal excursion is a more appropriate and conservative approach to minimize adverse environmental impact and would protect 99 percent of the organisms in the area influenced by the cooling water intake structure. As noted above, this requirement in combination with the other requirements would establish a minimum level of protection analogous to water quality protection levels in other EPA programs.

In addition, in natural systems species and populations that are impinged and entrained might not inhabit the entire estuary, or different species might inhabit different parts of the estuary. Therefore, EPA is proposing to use a smaller volume that relates more specifically to the cooling water intake structure and the area it influences. The volume being proposed for comparison to the intake volume is determined using the tidal excursion in the area of the cooling water intake structure. Tidal excursion is a measurement of the distance that a particle travels during

one tidal cycle (see proposed definition at § 125.83). It would include the total of the distance upstream of the cooling water intake structure the particle would travel during the flood tide and the distance downstream it would travel during the ebb tide. By defining distances using the tidal excursion, the requirement would allow for a volume to be delineated by using the tidal excursion distance and drawing a radius (using the midpoint of the excursion distance) from one end of the excursion distance to the other. (See Appendix 2 to Preamble.) EPA invites comment on this approach.

d. Flow Requirements for New Facilities With Cooling Water Intake Structures Located in Estuaries and Tidal Rivers or the Littoral Zone in Other Water Body Types

You must reduce your intake flow to a level commensurate with that which could be attained by a closed-cycle recirculating cooling water system.

The reduction of the cooling water intake structure's capacity is one of the most effective means to reduce adverse environmental impact, especially in or near sensitive biological areas. EPA is proposing that facilities with intakes located in tidal rivers and estuaries; in the littoral zone of lakes, freshwater rivers, or oceans; or less than 50 meters outside the littoral zone of lakes, freshwater rivers, or oceans limit their flow to a level commensurate with that which could be attained by a closed-cycle recirculating cooling water system. Proposed §§ 125.84(b) through (e).

EPA concludes these facilities would require this additional level of control because of their proximity to potentially sensitive and highly productive biological areas. Closed-cycle recirculating cooling water systems are known to reduce the amount of cooling water needed and in turn to directly reduce the number of aquatic organisms taken into the cooling water intake structure. For the traditional steam electric utility industry, facilities located in fresh water areas that have closed-cycle recirculating cooling water systems can, depending on the quality of the makeup water, reduce water use by 96 to 98 percent from the amount they would use if they had once-through cooling water systems. Steam electric generating facilities that have closed-cycle recirculating cooling water systems using salt water can reduce water usage by about 70 to 96 percent when makeup and blowdown flows are minimized.[43]

Today's proposal would require that the intake flow withdrawn by a cooling water intake structure be reduced to a level commensurate with that which can be attained by a closed-cycle recirculating cooling water system by all cooling water intake structures at the facility. That level, in conjunction with the other requirements proposed today, would minimize adverse environmental impact and be economically practicable. Such flow reductions are a necessary component of the technology for minimizing adverse environmental impact in highly productive areas. In addition, EPA cost estimates show that this requirement is available to new facilities on a national level. EPA realizes that makeup water would be required because of losses within the system, including blowdown, evaporation, windage, and drift. The Agency invites comment on the use of a flow reduction requirement that requires the reduction of intake flow to level commensurate with that which can be attained by a closed-cycle recirculating cooling water system that has minimized makeup and blowdown flows.

To examine the extent to which new facilities are likely to reuse and recycle cooling water, the Agency reviewed the engineering databases that support the effluent limitations guidelines for several categories of industrial point sources. In general, this review identified extensive use of recycle or reuse of cooling water in documents summarizing industrial practices in the late 1970s and early 1980s, as well as increased recycling and reuse of cooling water in the 1990s. For example, the reuse of cooling water in the manufacturing processes was identified in the pulp and paper and chemicals industries, in some cases as part of the basis for an overall zero discharge requirement (inorganic chemicals). Other facilities reported reuse of a portion of the cooling water that was eventually discharged as process wastewater, with some noncontact cooling water discharged through a separate outfall or after mixing with treated process water.

This review has documented that recycle and reuse of noncontact cooling water is a common industrial practice to reduce both cooling water usage and overall water usage by manufacturing facilities. Facilities that reuse 100 percent of the water withdrawn from waters of the U.S. for cooling purposes would be considered to have achieved the flow reduction requirements (*i.e.,* reduce intake flow to a level commensurate with that which can be attained by a closed-cycle recirculation cooling water system that has minimized makeup and blowdown flows). In implementing today's proposed rule, EPA would consider reuse to be equivalent to a closed-cycle recirculating system. The Agency invites comment on the proposed approach for considering reuse of cooling water at manufacturing plants in lieu of recirculation as an alternative to meet the flow reduction requirement in today's proposal.

4. Velocity

The velocity of water entering a cooling water intake structure exerts a direct physical force against which fish and other organisms must act to avoid impingement or entrainment. EPA considers velocity to be one of the more important factors that can be controlled to minimize adverse environmental impact at cooling water intake structures.

To develop an appropriate, nationally protective minimum velocity requirement at cooling water intake structures, EPA reviewed available literature, State and Federal guidance, and regulatory requirements and found that a velocity of 0.5 ft/s has been used as guidance in at least three Federal documents.[44] [45] [46] The 0.5 ft/s threshold recommended in the Federal documents is based on a study of fish swimming speeds and endurance performed by Sonnichsen et al. (1973).[47] This study concluded that appropriate velocity thresholds should be based on the fishes' swimming speeds (which are

[43] The lower range would be appropriate where State water quality standards limit chloride to a maximum increase of 10 percent over background and therefore require a 1.1 cylce of concentration. The higher range may be attained where cycles of concentration up to 2.0 are used for the design.

[44] John Boreman, *Impacts of Power Plant Intake Velocities on Fish,* Power Plant Team, U.S. Fish and Wildlife Service, 1977.

[45] A.G. Christianson, F.H. Rainwater, M.A. Shirazi, and B.A. Tichenor, *Reviewing Environmental Impact Statements: Power Plant Cooling Systems, Engineering Aspects,* U.S. Environmental Protection Agency (EPA), Pacific Northwest Environmental Research Laboratory, Corvallis, Oregon, Technical Series Report EPA–660/2–73–016, October 1973.

[46] Willis King, ''Instructional Memorandum RB–44: Review of NPDES (National Pollutant Discharge Elimination System) Permit Applications processed by the EPA (Environmental Protection Agency) or by the State with EPA oversight,'' *Navigable Waters Handbook,* U.S. Fish and Wildlife Service, February 1973.

[47] John C. Sonnichsen, Jr., B.W. Bentley, G.F. Bailey, and R.E. Nakatani, *A Review of Thermal Power Plant Intake Structure Designs and Related Environmental Considerations,* Hanford Engineering Development Laboratory, Richland, Washington, HEDL–TME 73–24, UC–12, 1973.

related to the length of the fish) and endurance (which varies seasonally and is related to water quality). The data presented showed that the species and life stages evaluated could endure a velocity of 1.0 ft/s. To develop a threshold that could be applied nationally and would be protective of most species of fish and their different life stages, EPA applied a safety factor of two to the 1.0 ft/s threshold to derive a threshold of 0.5 ft/s. EPA recognizes that there are specific circumstances and species for which the 0.5 ft/s requirement might not be sufficiently protective and is aware that alternative requirements have been developed for these situations. For example, the National Marine Fisheries Service and the California Department of Fish and Game have developed fish screening criteria (velocity requirements) for anadromous salmonids that range from 0.33 ft/s to 0.40 ft/s.[48] [49] [50] There are also species for which a velocity of greater than 0.5 fps would still be protective.

Two velocities are of importance in the design of cooling water intake structures: the approach velocity and the through-screen or through-technology velocity. The approach velocity is the velocity measured just in front of the screen face or at the opening of the cooling water intake structure in the surface water source. This velocity has the most influence on an aquatic organism and its ability to escape from being impinged or entrained by the cooling water intake structure. The through-screen or through-technology velocity is the velocity measured through the screen face or just as the organisms are passing through the opening into another device (*e.g.,* entering the opening of a velocity cap). This velocity is always greater than the approach velocity because the net open area is smaller.

EPA is proposing to use the design intake velocity as a requirement relating to the design and capacity of a cooling water intake structure. The use of a design intake velocity requirement in this manner would ensure that intake structures have a velocity that contributes to minimizing adverse environmental impact. The Agency is proposing that head loss across the screens (or other appropriate measurements for technologies other than intake screens) be monitored and correlated with intake velocity to ensure that the facility is continually maintained and operated to minimize adverse environmental impact. Proposed § 125.87(b).

EPA is proposing to set the velocity requirement at 0.5 ft/s as a design through-screen or through-technology requirement. The Agency is proposing this requirement reflects BTA for the maximum design intake velocity of the cooling water intake structure. The Agency has reviewed the NewGen database and of those facilities potentially in the scope of today's proposed rule, the majority have design intake velocities of 0.5 ft/s or less. Moreover, EPA has determined that a considerable number of facilities that have commenced commercial operation in the past few years have design intake velocities of 0.5 ft/s or less. These currently operating facilities demonstrate that a design intake velocity of 0.5 ft/s is achievable and provides for sufficient cooling water withdrawal. EPA is not proposing the more stringent criteria of 0.33 ft/s and 0.40 ft/s, developed by NMFS and the State of California, respectively, because they would be overly protective for a national BTA requirement; however, they might be appropriate for more sensitive species or if required by the Director for a specific case. The Agency is also concerned that on a national basis a design intake velocity of less than 0.5 ft/s might not be achievable for large-volume withdrawals. In addition to a design intake velocity requirement, EPA would require new facilities to monitor the head loss across the screens or other technology on a quarterly basis. Proposed § 125.87(b). EPA is proposing that head loss across the screens (or other appropriate measurements for technologies other than intake screens) be monitored and correlated with intake velocity once the facility is operating.

The proposed regulation would require that the maximum design intake velocity at each cooling water intake structure at a facility be no more than 0.5 ft/s. Proposed §§ 125.84(b)–(e). The design intake velocity would be defined as the value assigned during the design phase of a cooling water intake structure to the average speed at which intake water passes through the open area of the intake screen or other device against which organisms might be impinged or through which they might be entrained. This is equivalent to the through-screen or through-technology velocity.

Some stakeholders suggest that mandatory, uniform velocity performance requirements are inappropriate as a means of minimizing adverse environmental impact because many site- and species-specific factors influence both the rate at which a given cooling water intake structure impinges aquatic life and the significance of any such impingement.

In particular, these stakeholders suggest that there are sound biological reasons why uniform velocity requirements are not appropriate. For example, these stakeholders point out that fish swim speed varies greatly by species and age of the individual and can also be affected by water temperature. Swimming speed is an important factor in determining the likelihood of impingement because it is a measure of the fishes' ability to escape from the area of the intake. They also point out that vertical and horizontal distribution of organisms in the water column (which might be linked to natural habitat preferences) might influence rates of impingement, as might levels of physiological stress that organisms experience before exposure to the cooling water intake structure.

In addition, stakeholders offer that there are hydrological and locational reasons why uniform velocity performance standards are not appropriate and why velocity standards should be established on a site-specific basis. For example, the risk of impingement at some locations, such as a riverine system, may exhibit a correlation to flow. Moreover, the risk of impingement may vary according to seasonal variations in flow, which may or may not coincide with the spawning/nursery seasons or other times of vulnerability for the potentially affected species. Thus, these stakeholders suggest that case-by-case velocity standards, that take into account the issues identified above, as opposed to mandatory, uniform velocity performance standards, may be a sounder approach for limiting impingement.

The Agency solicits comment on the proposed design intake velocity requirement, as well as on the relationship of swimming speed, other biological factors, and other elements (in addition to velocity) that relate to the risk of impingement. EPA is also considering and requests comment on a less stringent requirement such as 1.0 ft/s, and whether the requirement should be set based on an approach velocity or the through-screen or through-technology velocity. Finally, the Agency requests comment on allowing site-specific determinations of velocity without establishing a uniform national requirement, as discussed above.

[48] NMFS, *Juvenile Fish Screen Criteria,* National Marine Fisheries Service Northwest Region, 1995.

[49] NMFS, *Fish Screening Criteria for Anadromous Salmonids,* National Marine Fisheries Service, Southwest Region, April 14, 1997. Published on the Internet at http://swr.ucsd.edu/hcd/fishscrn.htm.

[50] California Department of Fish and Game, *Fish Screening Criteria,* April 14, 1997.

5. Additional Design and Construction Technologies

EPA is proposing that facilities whose cooling water intake structures are located in the littoral zone implement additional design and construction technologies that minimize impingement and entrainment of fish, eggs, and larvae and maximize survival of impinged adult and juvenile fish. Proposed §§ 125.84(b)–(e). The technologies that would need to be implemented are those that (1) minimize impingement and entrainment of fish, eggs, and larvae and (2) maximize survival of impinged adult and juvenile fish. However, EPA does not propose to mandate the use of any specific technology. Although EPA refers to those technologies as additional design and construction technologies, they are part of the suite of technologies proposed to minimize adverse environmental impact and are additional only in the sense that they would be required in some circumstances in addition to the technologies used to meet the velocity, flow, capacity, or other requirements.

Technologies that maximize survival of impinged organisms include but are not limited to fish-handling systems such as bypass systems, fish buckets, fish baskets, fish troughs, fish elevators, fish pumps, spray wash systems, and fish sills. These technologies either divert organisms away from impingement at the intake structure or collect impinged organisms and protect them from further damage so that they can be transferred back to the source water at a point removed from the facility intake and discharge.

Technologies that minimize impingement and entrainment of fish, eggs, and larvae might include, but are not limited to, technologies that reduce intake velocities so that ambient currents can carry the organisms past the opening of the cooling water intake structure; intake screens, such as fine mesh screens and Gunderbooms, that exclude smaller organisms from entering the cooling water intake structure; passive intake systems such as wedge wire screens, perforated pipes, porous dikes, and artificial filter beds; and diversion and/or avoidance systems that guide fish away from the intake before they are impinged or entrained.

EPA is proposing to require additional design and construction technologies to protect fish, eggs, and larvae when the cooling water intake structure is located inside the littoral zone because this is considered a sensitive area where spawning takes place and critical habitat is present. Such technologies are available to new facilities and further reduce environmental impact resulting from impingement and entrainment.

Because site-specific factors greatly influence the selection among various additional design and construction technologies, EPA proposes that permit applicants subject to this requirement because of the location of their intake structure perform a baseline assessment of the biological community at the proposed location of the cooling water intake structure and submit to the Director for approval a plan for installation and operation of appropriate additional design and construction technologies. Proposed § 125.86(b)(6).

EPA also solicits comment on whether certain minimum technologies might be appropriate in virtually all circumstances and should be required in final section 316(b) regulations. EPA realizes that this approach is a departure from other parts of today's proposal in which the Agency specifically refrains from mandating the use of a specific technology. However, EPA considers comment on this approach to be beneficial. For example, it might be possible to specify that all new facilities install additional design and construction technologies, such as fine-mesh screens, that in conjunction with the proposed velocity requirement would effectively reduce impingement at virtually all locations within or near the littoral zone. Alternatively, the Agency could establish performance standards based on the use of these technologies.

6. What Is the Role of Restoration Measures?

Restoration measures, as used in the context of section 316(b) determinations, include practices that seek to conserve fish or aquatic organisms, compensate for the fish or aquatic organisms killed, or enhance the aquatic habitat harmed or destroyed by the operation of cooling water intake structures. Such measures have been employed in some cases in the past as one of several means of fulfilling the requirements imposed by section 316(b). Examples of restoration measures that have been included as conditions of permits include creating, enhancing, or restoring wetlands; developing or operating fish hatcheries or fish stocking programs; removing impediments to fish migration; enhancing natural resources in an impacted watershed; and other projects designed to replace fish or restore habitat.

Restoration measures have been used, however, on an inconsistent and somewhat limited basis. Their role under section 316(b) has never been explicitly addressed in EPA regulations or guidance. Restoration projects have been undertaken as part of section 316(b) determinations predominantly at existing facilities and in permitting actions where the cost of the proposed technology was considered to be wholly disproportionate to the demonstrated environmental benefits to be achieved. Often such cases have involved situations where retrofitting with a technology such as cooling towers was under consideration.

Given the limits on the ability of direct control technologies (location, flow, velocity, and other requirements) to eliminate environmental harm in all circumstances, EPA is considering a variety of mandatory, discretionary, and voluntary regulatory approaches involving restoration measures. On the other hand, EPA also is considering specifying that restoration measures may not be part of a section 316(b) determination. EPA invites comment on the appropriate role of restoration, in any, under section 316(b).

a. Mandatory Restoration Approaches

Under the first approach that the Agency is considering, the use of restoration measures would be required as an element of a section 316(b) determination in all cases except where a new facility's cooling water intake structure is located at least 50 meters outside the littoral zone in a freshwater river or stream, or outside the littoral zone in a lake or reservoir. Locating cooling water intake structures in these less productive areas, in conjunction with other applicable requirements, generally would minimize adverse environmental impact. All other new facilities with cooling water intake structures would be required to implement some form of restoration measures in addition to implementing direct control technologies to minimize adverse environmental impact. Under this approach, new facilities would first implement the direct control technologies as specified in this proposed rule. They would then develop and implement, in coordination with the Director, a restoration plan that would further reduce and offset unavoidable impacts that remain after the implementation of direct control technologies. This is similar to the mitigation sequence used under CWA section 404, wherein environmental impacts are avoided and minimized prior to consideration of compensatory mitigation measures. The development of restoration measures applicable to a cooling water intake structure would focus on the unique situation faced by each facility and would allow for review

and comment by the permitting agency and the public.

Under this approach, the permit application would define and quantify the need for restoration measures by estimating the adverse environmental impact that would remain after application of the location, design, construction, and capacity requirements specified for the type of water body in which the particular cooling water intake structure would be located. The permit would contain conditions, including a compliance schedule, that would require the permittee to develop and implement the approved restoration plan. Applicants would then assess alternatives for addressing these impacts and develop a draft restoration and monitoring plan for approval by the Director.

If EPA implemented this approach, it would add language to proposed sections 125.84(b)(2), (b)(3), (c)(2), (c)(3), (d)(1), (e)(1), and (e)(2) specifying, ''You must implement restoration measures''. Language such as the following also would be added to proposed section 125.86:

> Restoration Measures. If you are required to comply with the requirements in § 125.84(b)(2), (b)(3), (c)(2), (c)(3), (d)(1), (e)(1), or (e)(2) to implement a restoration measure, you must develop a plan based on the results of the Source Water Baseline Biological Characterization required by § 125.86(a) and submit the plan to the Director for review and approval. The plan should document how you propose to implement restoration measures to replace organisms or enhance the habitat for the species that will be most susceptible to impingement and entrainment by the cooling water intake structures. The plan must contain the following:
>
> (i) A narrative description of proposed restoration measures, the impacts from impingement and entrainment expected to remain after the measures have been implemented, and the technical basis for choosing those restoration measures. Include a discussion of the nexus between the estimated impingement and entrainment impacts from the cooling water intake structure and the proposed measures.
>
> (ii) Design and engineering calculations, drawings, maps, and costs supporting the proposed restoration measures.

Beyond this framework, EPA invites comment on the process for developing and implementing the restoration plan or the content of a plan. The following example illustrates one possible process and set of substantive contents. The draft plan could be required to include an evaluation component and study that would be submitted to the permitting agency and natural resource agencies, and be made available to the public, before permit issuance. This draft plan would then be distributed to other agencies with relevant expertise for review and comment. The public also would be informed of the availability of the plan for review and comment. After considering comments provided by relevant agencies and the public, the applicant would develop a final plan and a response to comment document, which would be submitted to the Director for approval. Upon approval, the applicant would implement the restoration plan, including providing regular reports to the permitting agency and periodically verifying progress toward achieving the specific restoration goals included in the plan. The duty to develop and implement a restoration plan would be the permit applicant's.

Alternatively, EPA could require facilities to study the extent of impingement and entrainment after the actual implementation of direct control technologies, and require the development of a draft plan that addressed the study results in a manner similar to the approach described above.

b. Discretionary Restoration Approaches

A second approach would provide the Director with the discretion to specify appropriate restoration measures under section 316(b), but would not require that he or she do so. Under one version of this approach, restoration measures would be allowed in permitting new facilities only where the facility could demonstrate that the costs incurred to implement direct controls exceed a specified cost test. (See section VIII.C for discussion of the cost tests that are under consideration.) This approach is consistent with several precedents in which the permitting authority allowed the use of restoration measures where the cost to retrofit an existing facility's cooling water intake structures with control technologies was determined to be wholly disproportionate to the benefits the control technology would provide (*e.g.*, John Sevier, Crystal River, Chalk Point, Salem).[51]

A second version of this approach would allow, but not require, the Director to specify restoration measures to reduce the net level of impingement and entrainment so that adverse environmental impact caused by cooling water intake structures would be minimized. Under this approach, the use of restoration measures would supplement the imposition of performance requirements and direct controls. The performance requirements and direct controls would need to be implemented before restoration measures would be imposed.

c. Voluntary Restoration Approaches

Stakeholders have suggested a third type of restoration approach, under which the Director could consider restoration measures proposed voluntarily by permit applicants in the context of determining the extent to which location, design, and capacity requirements could be modified to reflect site-specific conditions while still ensuring that adverse environmental impact is minimized. Under this alternative, restoration measures could substitute for location, design, and capacity requirements, partially or completely, in appropriate cases. The need for restoration measures would be determined based on the magnitude of the environmental impact associated with the cooling water intake structure and the optimal balance between the use of direct controls and restoration measures to minimize the impact. Appropriate conditions relating to the voluntary restoration measures would be included in the permit. Such an approach would be designed to provide flexibility to the Director, the regulated community, and other interested parties to address the issues posed by cooling water intake structures on a site-specific, priority basis. This approach might result in incentives for permittees to develop more far-reaching projects, potentially providing benefits to a larger portion of a watershed and a broader range of aquatic and other species, and for longer periods of time.

Finally, stakeholders also have suggested that voluntary restoration measures should be applied to mitigate the effects of cooling water intake structures so that there is no basis for a determination of adverse environmental impact. They suggest that likewise, the statute does not preclude the consideration of the anticipated benefits from proposed restoration measures in evaluating the extent to which additional technology may be necessary, nor does it preclude the consideration of benefits associated with restoration measures implemented pursuant to previous permits, together with other relevant data, in evaluating whether adverse environmental impact currently exists.

Under any approach, there would be a nexus between the restoration measures employed and the adverse

[51] In re Tennessee Valley Authority John Sevier Steam Plant, NPDES Permit No. TN0005436 (1986); In re Florida Power Corp. Crystal River Power Plant Units 1, 2 & 3, NPDES Permit FL0000159 (1988); Chalk Point, MDE, State of Maryland, Discharge Permit, Potomac Electric Power Co., State Discharge Permit No. 81–DP–0627B, NPDES Permit No. MD0002658B (1987, modified 1991); Draft NJDEP Permit Renewal Including Section 316(a) Variance Determination and Section 316(b) BTA Decision: NJDEP Permit No. NJ0005622 (1993).

environmental impact caused by a cooling water intake structure. For example, if after implementation of direct control technologies an important species in the vicinity of the cooling water intake structure continues to be adversely affected by a cooling water intake structure, appropriate restoration measures would address the adverse effects on that species, perhaps through enhancement of other factors that affect the target species' ability to thrive or as a last resort, replacement of the fish killed or harmed.

Restoration plans could potentially use a ''banking'' mechanism similar to that used in the CWA section 404 program, that would allow the permittee to meet restoration requirements by purchasing ''credits'' from an approved ''bank.'' For example, should wetlands restoration be an appropriate mechanism for offsetting the adverse impact from the cooling water intake structure, the permittee could purchase credits from an existing wetlands mitigation bank. As in the section 404 program, public or private entities could establish and operate the banks. EPA views the use of ''banking'' for the purposes of this proposed rule as one way to facilitate compliance and reduce the burden on the permit applicant, while at the same time potentially enhancing the ecological effectiveness of the required restoration activities.

EPA also is considering an approach under which the use of restoration measures would not be allowed in section 316(b) permitting for new facilities. Critics of mitigation or restoration measures argue, among other things, that they are not effective in compensating for the specific impingement and entrainment losses caused by cooling water intake structures.

EPA requests comment on all aspects of the restoration approaches described in this notice. The Agency does not intend the foregoing discussion of restoration measures to affect any existing statutory, regulatory, or other legal authorities with respect to the use of restoration measures. The Agency also does not intend the foregoing discussion to affect any ongoing permit proceedings or previously issued permits, which should continue to be governed by existing legal authorities. The Agency will address the issue of restoration further as it develops the final rule.

7. Additional and Alternative BTA Requirements

At § 125.84(f), EPA is proposing that the Director have limited, discretionary authority to examine certain enumerated site-specific or unique characteristics and impose additional section 316(b) requirements. Such site-specific conditions would include location of multiple cooling water intake structures in the same body of water, seasonal variations in the aquatic environment affected by the cooling water intake structure controlled by the permit (*e.g.*, seasonal spawning or migration of anadromous fishes such as west coast salmonids), or the presence of regionally important species (*e.g.*, commercially and recreationally valuable species, and fish ecologically important to the structure and function of local fish assemblage such as important forage species).

At § 125.84(g), EPA is proposing that the Director must include any more stringent requirements relating to the location, design, construction, and capacity of a cooling water intake structure at a new facility that are necessary to ensure attainment of water quality standards, including designated uses, criteria, and antidegradation requirements. This proposal is based on section 301(b)(1)(C) of the CWA.

Finally, in developing the nationally applicable minimum requirements that are being proposed today, EPA has taken into account all the information that it was able to collect, develop, and solicit regarding the location, design, construction, and capacity of cooling water intake structures at new facilities. EPA concludes that these requirements reflect the best technology available for minimizing adverse environmental impact on a national level. In some cases, however, data that could affect these requirements might not have been available or might not have been considered by EPA during the development of this proposal. Therefore, the lack of any provision for deviation from nationally applicable BTA requirements could lead to large numbers of petitions requesting EPA to amend the rule as it applies to individual facilities or classes of facilities. This would be an extremely time consuming process for EPA, the regulated community, and other interested parties. Accordingly, EPA is proposing procedures that would allow for adjustment, during permit proceedings, of the requirements of § 125.84 as they apply to certain cooling water intake structures at new facilities.

Proposed § 125.85 would allow the Director, in the permit development process, to set alternative BTA requirements that are less stringent than the nationally applicable requirements. Under § 125.85(a), any interested person may request that alternative requirements be imposed in the permit. The Director also may propose alternative requirements in the draft permit upon making the findings indicated. Proposed § 125.85(a)(2) provides that alternative requirements that are less stringent than the requirements of § 125.84 would be approved only if compliance with the requirement at issue would result in compliance costs wholly out of proportion to the costs considered during development of the requirement at issue, the request is made in accordance with 40 CFR part 124, the alternative requirement requested is no less stringent than necessary, and the alternative requirement will ensure compliance with sections 208(e) and 301(b)(1)(C) of the Clean Water Act.

Because new facilities have a great degree of flexibility in their siting, in how their cooling water intake structures are otherwise located, and in the design, construction and sizing of the structure, cost is the only factor that would justify the imposition of less stringent requirements as part of the proposed alternative requirements approach. This is because other factors affecting the location, design, construction, and capacity of cooling water intake structures at new facilities can be addressed by modifications that may have cost implications. The Agency notes that in the somewhat analogous case of the new source performance standards that EPA establishes for the discharge of effluent from new facilities in particular industrial categories, alternate discharge standards are not allowed. However, because this proposed rule would establish requirements for cooling water intake structures at any type of facility in any industrial category above the flow threshold proposed today, it might be possible, in some instances, that the costs of complying with today's proposed requirements would be wholly out of proportion to the costs EPA considered and determined to be economically practicable. (See Section VIII.C. below, the economic and technical support document, and the economic and financial portions of the record for this proposal.) As discussed at Section VIII.C., EPA has analyzed the cost of compliance with today's proposed requirements for all facilities projected to be built in the reasonably foreseeable future, as well as other types of facilities that might be built at later dates (such as large base-load steam electric generating facilities that do not use combined-cycle technology) and concludes that these compliance costs would be economically practicable for all types of facilities the Agency

considered. However, should an individual new facility demonstrate that costs of compliance for a new facility would be wholly out of proportion to the costs EPA considered and determined to be economically practicable, the Director would have authority to adjust BTA requirements accordingly.

Under proposed § 125.85(a), alternative requirements would not be granted on any grounds other than the cost of compliance, nor would they be granted based on a particular facility's ability to pay for technologies that would result in compliance with the requirements of § 125.84. Thus, so long as the costs of compliance are not wholly out of proportion to the costs EPA considered and determined to be economically practicable, the ability of an individual facility to pay to attain compliance would not support the imposition of alternative requirements. EPA invites comment on whether other factors should be added to proposed § 125.85(a). EPA also requests comment on an additional basis for establishing alternative, less stringent requirements, namely that the costs of compliance would be wholly disproportionate to projected environmental benefits. The 1977 Draft Guidance includes a similar provision. This wholly disproportionate cost test could be provided either instead of, or in addition to, the cost test being proposed today as part of § 125.85(a) (*i.e.*, costs wholly out of proportion to the costs EPA considered in the rule development).

Proposed § 125.85(a) would specify procedures to be used in the establishment of alternative requirements. The burden is on the person requesting the alternative requirement to demonstrate that alternative requirements should be imposed and that the appropriate requirements of § 125.85(a) have been met. The person requesting the alternative requirements should refer to all relevant information, including the support documents for this rulemaking, all associated data collected for use in developing each requirement, and other relevant information that is kept on public file by EPA.

EPA invites comment on all aspects of this proposal for establishing alternative BTA requirements.

Under an alternative approach, EPA would not provide for any deviation from the nationally applicable requirements. Some stakeholders have stated that the Clean Water Act requires that uniform BTA requirements be applicable nationally. Opponents of deviation from uniform national BTA requirements also believe that alternative requirements are especially inappropriate for new facilities, which they believe can be designed and sited to take the requirements of the new facility rule into account. EPA also invites comment on this alternative approach.

8. Other Approaches Being Considered by EPA

In addition to or in lieu of today's proposal for alternative BTA requirements (discussed above), EPA also is considering an approach that would require the Director to consider whether individual facilities might have site-specific characteristics that make one or more of these national BTA requirements insufficient to minimize adverse environmental impact. Such site-specific characteristics might include location of multiple cooling water intake structures in the same body of water, seasonal variations in the aquatic environment affected by the cooling water intake structure controlled by the permit (such as seasonal spawning or migration), the presence of regionally important aquatic organisms, or other relevant characteristics. If the Director determined that one or more of the national requirements does not minimize adverse environmental impact, the Director would be required to impose such additional measures as might be needed to ensure that the facility employs the best technology available for minimizing adverse environmental impact. Regulatory language such as the following could be used to implement this approach:

> The Director must consider whether individual facilities have site-specific characteristics that make one or more of the cooling water intake structure BTA requirements in § 125.84(a)–(e) insufficient to minimize adverse environmental impact. If the Director finds that the requirements of § 125.84(a)–(e) are insufficient to ensure that adverse environmental impact caused by a cooling water intake structure at a new facility will be minimized, he may impose additional requirements in the permit that are reasonably necessary to minimize adverse environmental impact.

EPA also is considering an approach under which the Director would have broad, discretionary authority to include permit conditions under section 316(b), in addition to the minimum requirements specified in today's proposal, that are reasonably necessary to minimize adverse environmental impact caused by a cooling water intake structure. The Director would not impose additional requirements if none are considered necessary; however, if a Director determines that the minimum requirements described above are not sufficient to minimize the specific adverse environmental impact associated with a particular cooling water intake structure, he or she would be authorized to include appropriate additional conditions in the permit or to deny the permit as warranted. This differs from the previous alternative in that under this alternative the Director would not be required to impose more stringent conditions. Also, in comparison to the proposed § 125.84(f), this approach would not provide a permit applicant with as much information to judge whether the Director is likely to impose additional requirements because the list of conditions the Director could consider would not be limited and enumerated. On the other hand, this approach would provide the Director with authority under this proposed rule to consider other unique and/or site-specific characteristics that might be important at a particular location to ensure that adverse environmental impact is minimized.

Finally, EPA is considering an approach under which the Director would have no section 316(b) authority to examine site-specific conditions and impose additional section 316(b) requirements. The Agency invites comment on each of these approaches to today's proposal and on the characteristics that a Director would consider in determining whether to impose additional section 316(b) requirements.

As discussed in item 7 above, today's proposal would allow the Director to specify alternative BTA requirements in limited circumstances. In addition, EPA is considering a variance alternative based on the use of innovative cooling water intake structure design and operation to minimize adverse environmental impact. The Agency is aware that existing and new facilities are using various designs for cooling water intake structures, which consist of passive and other innovative intake systems that use natural flow, gravity, some type of natural or artificial barrier, or some other feature to reduce impingement and entrainment. Examples include artificial filter beds, radial wells, porous dikes, and perforated pipes. (Because of inherent limitations, these designs might not work effectively at all facilities, such as high-flow facilities.) In some cases facilities that use these types of intakes can minimize their rates of impingement and entrainment to levels commensurate with those achieved under this proposed rule at a lower cost than conventional technologies would

allow, yet these facilities might not meet all of the minimum requirements EPA is proposing. This approach would encourage the use of innovative technologies provided that such technologies minimize adverse environmental impact. If EPA implemented this approach, language such as the following could be added to the regulation:

> In the case of any new facility that proposes to design or operate a cooling water intake structure in an innovative manner (for example, by using natural flow, gravity, a natural or artificial barrier, or other innovative feature to reduce impingement and entrainment), the Director may impose requirements in the permit based on the use of the innovative design feature or method of operation in place of the requirements specified in § 125.84(a)–(e), if the Director determines (1) that the alternative requirements will minimize impingement and entrainment of aquatic organisms to a level commensurate with the level that would be attained if the facility were subject to the requirements specified in § 125.84(a)–(e), and (2) that the innovative design feature or method of operation has the potential for industry-wide operation.

This option could also include a requirement for consultation with, or approval by, the Administrator.

EPA requests comment on these approaches. In particular, EPA requests comment on (1) whether the new facility rule should provide for any type of variance from the national BTA requirements or the proposed, limited opportunity to specify alternative BTA requirements; (2) the factors that should be considered in any such variance; (3) how BTA requirements based on the use of innovative technologies could be structured to encourage technological innovation and ensure that qualifying facilities would minimize adverse environmental impact; and (4) whether there is a design intake volume above which a variance for use of innovative technologies should not be available.

B. What Technologies Can Be Used To Meet the Regulatory Requirements?

EPA has identified a number of intake technologies available for installation at cooling water intake structures to minimize adverse environmental impact. The intake technologies identified include some that are currently in use at facilities with cooling water intake structures in the United States and some that are still being evaluated or simply not in use at any facilities in the United States. The intake technologies can be classified into four categories:

- Intake Screen Systems: single-entry, single-exit vertical traveling screens; modified traveling screens (ristroph screens); single-entry, single-exit inclined traveling screens; single-entry, double-exit vertical traveling screens; double-entry, single-exit vertical traveling screens (dual-flow screens); horizontal traveling screens; fine mesh screens mounted on traveling screens; horizontal drum screens; vertical drum screens; rotating disk screens; and fixed screens.
- Passive Intake Systems: wedge-wire screens, perforated pipes, perforated plates, porous dikes, artificial filter beds, and leaky dams.
- Diversion or Avoidance Systems: louvers, velocity caps, barrier nets, air bubble barriers, electrical barriers, light barriers, sound barriers, cable and chain barriers, and water jet curtains.
- Fish Handling Systems: fish pumps, lift baskets, fish bypasses, fish baskets, fish returns, fish troughs, and screen washes.

Under the proposed rule, facilities would be required to submit a plan that contains information on the technologies they propose to implement based on the result of a *Source Water Baseline Characteristics* study (see Section IX.A.1). Each of the methods identified above is discussed in further detail below. Technologies other than bar racks and traveling screens are typically used only by traditional steam electric utility power plants. For a more detailed description of the following technologies, refer to *Preliminary Regulatory Development Section 316(b) of the Clean Water Act, Background Paper 3: Cooling Water Intake Technologies (April 1994) and Supplement to Background Paper 3: Cooling Water Intake Technologies (September 30, 1996)* in the docket for today's proposed rule.

1. Intake Screen Systems

The technologies classified as intake screen systems are mainly devices that screen debris mechanically. Passive intake systems discussed in the next section, require little or no mechanical activity.

EPA has classified the following intake technologies as intake screen systems: single-entry, single-exit vertical traveling screens; modified traveling screens (ristroph screens); single-entry, single-exit inclined traveling screens; single-entry, double-exit vertical traveling screens; double-entry, single-exit vertical traveling screens (dual-flow screens); horizontal traveling screens; fine mesh screens mounted on traveling screens; horizontal drum screens; vertical drum screens; rotating disk screens; and fixed screens.

Intake screen systems have been found to be limited in their ability to minimize adverse aquatic impact. This does not mean that they do not aid in reducing some impingement and entrainment of adult and juvenile fish. However, conventional traveling screens (the most widely used screening device in the United States) and most of the other types of traveling screens have been installed mainly for their ability to prevent debris from entering the cooling system. Fish impinged on those screens often suffocate or are injured when washed off the screen. They may or may not even be returned to the water body. In many cases, many of the fish are lost; in some cases, all of the fish are lost.

Conventional through-flow traveling screens have been modified so that fish impinged on the screens can be removed with reduced stress and mortality. These modified traveling screens have been shown to be more effective than conventional screens at lowering fish impingement and mortality at several locations. Some facilities have used fine mesh mounted on traveling screens to minimize entrainment. However, the amount of reduction attributable to any of these devices has been found to depend on the species involved, the water body type, and the age or size of the species present.

2. Passive Intake Systems (Physical Exclusion Devices)

Passive intake systems are devices that screen out debris and biota with little or no mechanical activity required. Most of these systems are based on achieving very low withdrawal velocities at the screening media so that all but free-floating organisms avoid the intake altogether.

EPA considers the following intake technologies to be passive intake systems (i.e., physical exclusion devices): wedge-wire screens, perforated pipes, perforated plates, porous dikes, artificial filter beds, Gunderbooms, and leaky dams.

Wedge-wire screens appear to offer a potentially effective means of reducing fish losses. Testing of wedge-wire screens has demonstrated that fish impingement is virtually eliminated and that entrainment of fish eggs and larvae is reduced. However, the application of wedge-wire screens is limited to cooling water intake structures that withdraw lower volumes because of size limitations of the screens themselves. In fact, physical size is the limiting factor of most passive systems, thus requiring the clustering of a number of screening units. Siltation, biofouling, and frazil ice also limit locations where passive intake systems can be used. In addition, most of the research for the reduction of

entrainment has concentrated on the intake of relatively small quantities of water, in the range of 28 to 56 million gallons per day, typical of the make-up water supply of large closed-cycle recirculating cooling water systems and of nuclear power plant service water systems.

3. Diversion or Avoidance Systems

Diversion or avoidance devices are also called behavioral barriers. These devices are designed to take advantage of the natural behavioral patterns of fish so that the fish will not enter an intake structure. Diversion devices either guide aquatic organisms such as fish, crabs, and shrimp away from an intake structure or guide them into a bypass system so that they are directed or physically removed from the intake area. An example of a diversion device is the louver. Avoidance devices, on the other hand, are used to make the intake unattractive to aquatic organisms so that they avoid the area of the intake altogether. Sound barriers are a typical avoidance device. They create sounds that the aquatic organisms do not like, forcing them to avoid the intake area. Unlike the screening and physical exclusion devices already discussed, behavioral barriers are used specifically to keep fish and other motile organisms from entering the intake system. Like the technologies discussed above, these devices are not always used to protect fish and organisms. They might be used to protect equipment at the facility that could become fouled and require more maintenance if aquatic organisms are allowed to enter the intake.

EPA considers the following intake technologies to be fish diversion and avoidance systems: louvers, velocity caps, barrier nets, air bubble barriers, electrical barriers, light barriers, sound barriers, cable and chain barriers, and water jet curtains.

Diversion or avoidance systems do not protect organisms or fish that are nonmotile (i.e., those that are free-floating or cannot move themselves about) or in early life stages because they rely on behavioral characteristics. Therefore, the effectiveness and performance of the devices are species-specific. In addition, many of the diversion or avoidance devices are appropriate only for seasonal entrainment problems. To evaluate the applicability of these technologies, site-specific testing would be required at most sites where these devices are to be used.

4. Fish-Handling Systems and Other Technologies

Fish-handling systems and other technologies are used alone or in conjunction with screening systems for the protection of aquatic life. EPA considers the following intake technologies to be fish-handling systems: fish pumps, lift baskets, fish bypasses, fish baskets, fish returns, fish troughs, and screen washes. These technologies can be used alone or in a series such as fish buckets, fish troughs, and a spray wash system. Fish-handling technologies are used to remove fish that congregate in front of a screen system or to divert them to holding areas. Fish that congregate near screens are removed from the area by fish pumps, lift baskets, fish troughs, and fish returns and are returned to open waters, reducing impacts on the aquatic community.

C. How Is Cost Being Considered in Establishing BTA for New Facilities?

For today's proposed rule, EPA has considered four cost tests that could be used to evaluate the costs that would be associated with this proposal are reasonable in relation to the environmental benefits to be derived. The Agency used one of these tests as a basis for determining on a national level that the proposed requirements would be economically practicable.

Although section 316(b) does not explicitly state that costs must be considered in determining appropriate cooling water intake structure controls, EPA has long recognized that there should be some reasonable relationship between the cost of cooling water intake structure control technology and the environmental benefits associated with its use. As the preamble to the 1976 final rule implementing section 316(b) stated, neither the statute nor the legislative history requires a formal or informal cost-benefit assessment. 41 FR 17387 (April 26, 1976). The 1976 preamble also noted that the legislative history of section 316(b) indicates that the term ''best technology available'' should be interpreted as ''best technology available commercially at an economically practicable cost.'' [52] This position reflects congressional concern that the application of best technology available should not impose an impracticable and unbearable economic burden.

EPA concludes that a formal cost test is appropriate in determining ''best technology available commercially at an economically practicable cost.'' In determining the most appropriate cost test, the Agency considered (1) the wholly disproportionate cost test, (2) the compliance cost/revenue test, (3) the compliance cost/construction cost test, and (4) the compliance cost/discounted cash flow test. EPA also considered two methods for implementing these cost tests: a case-by-case or a national determination.

Under the wholly disproportionate cost test, a cooling water intake structure technology would not be deemed to reflect BTA if the incremental costs of requiring the use of that technology are wholly disproportionate to the environmental benefits to be gained through its use. Several section 316(b) administrative decisions have stated that this test is the most appropriate for determining economic burden.[53] This is also the approach adopted discussed in the 1977 Draft Guidance.

Historically, the cases in which costs have been determined to be wholly disproportionate have involved existing facilities that have been required to retrofit their cooling water intake structures to implement BTA. Given the characteristics of the regulated industries, such retrofitting to meet BTA often meant requiring the installation of cooling towers along with necessary modifications to the plant and significant capital expenditures and down time required for installation. In contrast, new facilities would not incur retrofit costs. Rather, new facilities would incur only the cost of any incremental difference between their planned cooling water intake structure technology and that required under a rule based on today's proposal. Given that many new facilities are designing their cooling water intake structures in a manner consistent with today's proposed BTA requirements, EPA concludes that these incremental costs are unlikely to be large.

A limitation of using the wholly disproportionate test for new facilities, on either a national or case-by-case basis, is that the impingement and entrainment estimated before a facility is built can be very imprecise. There are numerous documented cases among existing facilities in which the rates of

[52] *See* 118 CONG. REC 33,762 (1972), *reprinted in* 1 Legislative History of the Water Pollution Control Act Amendments of 1972, at 264 (1973) (Statement of Representative Don H. Clausen).

[53] See, *In the Matter of Public Service Company of New Hampshire,* 10 MRC 1257 (6/10/77)(The Seabrook II Decision); Brunswick I, Region IV, EPA 3 (Nov. 7, 1977) (Initial Decision re: Permit No. NC007064); *In re* Tennessee Valley Authority, John Sevier Steam Plant: NPDES Permit No. TN0005436 (Jan. 23, 1986); *In re* Florida Power Corp., Crystal River Power Plant Units 1, 2, & 3:NPDES Permit No. FL0000159 (Sept. 1, 1988).

impingement and entrainment rates predicted by the facility were substantially lower than the impingement and entrainment that actually occurred during operation. Brayton Point is an example of the underestimation of impacts that can occur.[54] Because of the difficulty in prospectively estimating impingement and entrainment rates at new facilities, EPA has chosen not to use the wholly disproportionate cost test to estimate the impact of today's proposal.

EPA also considered three economic achievability tests. First, EPA considered a compliance cost/revenue test to assess economic achievability by comparing the magnitude of annualized compliance costs with the revenues the facility is expected to generate. This is an appealing test because it compares the cost of reducing adverse environmental impact from the operation of the facility with the economic value (i.e., revenue) the facility creates. Under this alternative, EPA would establish a threshold to identify when annual compliance costs constitute a disproportionate percentage of projected annual income. This test could be implemented on a national or case-by-case basis because a firm should have an estimate of expected revenues when it applies for a loan to build a new facility.

EPA also considered a compliance cost/construction cost test to assess economic impacts associated with complying with this proposed rule. This test compares compliance costs with the capital costs of building the facility. Compliance costs would include all those costs incurred by new facilities to meet the requirements of the proposed rule. The compliance cost/construction test is appealing because it shows the percentage increase in the total cost of getting the facility operational as a result of the section 316(b) regulations, providing a perspective on the relative magnitude of compliance requirements. Under this alternative EPA would establish standards that identify when initial section 316(b) compliance costs constitute a disproportionate percentage of total facility construction costs. This test has the advantage of being easy to perform on a case-by-case basis because it is based on engineering and construction costs and therefore is more precise than the other tests such as the discounted cash flow test. On the other hand, there are drawbacks to applying this test nationally. Information on average construction costs of new electric generating facilities is available from the Energy Information Administration (EIA), but this information is not available for other industries nor is it transferable across industries. Additional site-specific information on construction costs for planned cooling water intake structure generators is available from public sources. However, there are considerable inconsistencies in what components of capital costs are reported. As with Energy Information Administration-reported average construction costs, this information is generally available only for new steam electric generating facilities, not for other manufacturing facilities.

The final alternative EPA considered is a compliance cost/discounted cash flow test to determine economic achievability. Discounted cash flow is present discounted value of future cash flow. This test is useful because it examines the effects of compliance with today's proposed rule on the facility's cash flow. Although a discounted cash flow test can be performed for existing facilities, on both a national and case-by-case basis, this test is not appropriate for new facilities because of a lack of available data and the analytic requirements it would impose. Because new facilities do not have a cash flow prior to operations, this test would require more estimation and would be far less precise than the other tests.

EPA used the compliance cost/revenue test to determine whether today's proposed section 316(b) requirements are economically practicable. This test uses the ratio of annualized compliance costs to estimated annual revenues to assess impacts on new facilities. The Agency is proposing this as the most appropriate test to evaluate economic practicability for several reasons. First, EPA has extensive experience using this test. For example, under the Regulatory Flexibility Act, the Agency uses this test as a screening tool (along with the number of facilities expected to be affected) to determine whether a detailed analysis of impacts on small entities is necessary. EPA also frequently uses this test to evaluate economic impacts in the effluent guidelines program. Second, the data needed to perform the test are available or can be readily projected, whereas the data required to conduct the compliance cost/construction cost test and the compliance cost/discounted cash flow test are not available or are more difficult to obtain. Third, this test provides a reliable measure of whether costs are ''economically practicable.''

EPA calculated compliance costs for projected new steam electric generating and manufacturing facilities and applied screening tests to assess the impacts of those costs on the economic viability of the new facilities. The results of EPA's economic impact analysis indicate that the compliance costs of this proposal are generally small compared with the estimated revenues of the affected facilities, ranging from 0.1 percent to 4.2 percent of revenues for steam electric generating facilities and less than 0.1 percent to 8.8 percent of revenues for manufacturing facilities. Only two of the 35 projected new manufacturing facilities were estimated to incur annualized compliance costs greater than one percent of annual revenues. For steam electric generating facilities, EPA also found that compliance costs as a percent of construction costs are small. The total capital costs and cost of initial permitting for steam electric generating facilities ranged between less than 0.1 percent to 0.3 percent of the overall cost of plant construction. These results indicate that the proposed requirements are economically practicable, and are achievable by the affected new facilities.

The Agency also has determined that the proposed rule would not have an adverse economic impact on industry as a whole. EPA finds that the proposed rule is economically practicable and achievable nationally because a very small percentage of facilities are expected to be affected by the regulation and the impact on those that would be affected would be small.

The electricity generating industry would not be significantly affected by today's proposal. Today's proposed rule only affects electric generating facilities that generate electricity with a steam prime mover. Although these facilities constitute approximately 75 percent of the total electric generating industry, approximately 88 percent of the new facilities that do have a steam-electric prime mover and for which EPA was able to obtain cooling water information would not be subject to this regulation because they do not withdraw cooling water from waters of the U.S. or because they are not required to have an NPDES permit. In general, the Agency concludes that economic impacts on the electric generating industry from this proposed rule would be economically practicable because facilities required to comply with the proposed requirements would have the opportunity to be redesigned to avoid or minimize costs.

The costs to new manufacturing facilities also would not be significantly

[54] Mark Gibson, ''Comparison of Trends in the Finfish Assemblages of Mt. Hope Bay and Narragansett Bay in Relation to Operations of the New England Power Brayton Point Station,'' Rhode Island Division Fish and Wildlife, Marine Fisheries Office, June 1995 and revised August 1996.

affected by today's proposed regulation also would be economically practicable. An analysis of the data collected using the Agency's section 316(b) Industry Screener Questionnaire indicates that in the industry sectors with at least one new facility that is subject to this proposed rule, only 364 of the 2,037 existing facilities targeted, or 17.8 percent, have an NPDES permit and directly withdraw cooling water from waters of the U.S. Of these 364 facilities, only 232 facilities are estimated to withdraw more than two (2) MGD. In addition, new facilities can be expected to have less costly alternatives for complying with the proposed rule than would existing facilities for which location, design, construction, and capacity decisions have already been made . Existing facilities might require retrofitting if subject to the same requirements proposed today.

As discussed above, the Agency evaluated the costs and impacts of the section 316(b) requirements proposed today on a national level. The Agency has determined that the incremental costs of installing the BTA requirements proposed today are economically practicable at a national level, although EPA recognizes that costs could be significant for individual facilities. EPA believes that evaluating costs and impacts on a national level is most appropriate for a proposed rule that establishes minimum section 316(b) requirements for large numbers of new facilities nationally. This approach at a national level would significantly reduce the burden on permit writers because they would then not be required to implement a cost test when developing appropriate permit conditions to implement the proposed national requirements on a facility-specific basis. However, as noted above, EPA is also requesting comment on several regulatory options under which costs and benefits could be considered on a case-by-case basis in determining BTA.

EPA invites comment on all aspects of the proposed cost test and the Agency's proposal to assess the impact of today's proposed rule on a national level.

IX. Implementation

Under the proposed rule, section 316(b) requirements would be implemented in an NPDES permit. The regulations would establish application, monitoring, recordkeeping, and reporting requirements for new facilities. The proposed rule would also include requirements for Directors in developing NPDES permits for new facilities. The proposed rule states that the Director, at a minimum, must include in the permit the cooling water intake structure requirements at § 125.84, monitoring conditions at § 125.87, and recordkeeping and reporting requirements at § 125.88.

EPA will develop a model permit and permitting guidance to assist Directors in implementing these requirements. In addition, the Agency will develop implementation guidance for owners and operators that will address how to comply with the application requirements, the sampling and monitoring requirements, additional technology plans, and the recordkeeping and reporting requirements in these regulations.

A. What Information Must I Submit to the Director When I Apply for My New or Reissued NPDES Permit?

The NPDES application process under 40 CFR 122.21 requires that facilities submit information and data 180 days prior to the commencement of a discharge. If you are the owner or operator of a facility that meets the new facility definition, you would be required to submit the information required under § 125.86 of today's proposed rule with your initial permit application and with subsequent applications for permit reissuance. The Director would review the information you provide and, based on the approach discussed in Section IX.B, would determine whether your facility is a new facility and establish the appropriate requirements to be applied to the cooling water intake structure(s).

Today's proposal would require you to submit four categories of information when you apply or reapply for your NPDES permit: (1) Results of the Source Water Baseline Biological Characterization study; (2) source water physical data; (3) cooling water intake structure velocity and flow data; and (4) data to show compliance with the flow requirements, velocity requirement, flow reduction requirement, and additional technology requirements. In addition, if you are seeking an alternative requirement under § 125.85, you must submit a fifth item: Data that demonstrate that your compliance costs are wholly out of proportion to the costs considered by EPA in establishing by EPA in establishing the requirements of § 125.84(a) through (e). You must begin to collect data for the Source Water Baseline Biological Characterization study at least 1 year prior to submitting your application to the Director. If you are required to submit a sample plan (*i.e.,* your cooling water intake structure is located inside or less than 50 meters outside the littoral zone of the water body), you must submit your sample plan for review and approval or disapproval to the Director at least 90 days before any sampling activities are scheduled to begin. An example schedule of when the activities associated with a facility's permit application might be performed is provided in Exhibit 2.

EXHIBIT 2.—EXAMPLE OF SCHEDULE FOR PERMIT APPLICATION ACTIVITY

NPDES permit application activity	Days prior to commencement of operation
Submit sampling plan for Source Water Baseline Biological Characterization.	635
Begin sampling for Source Water Baseline Biological Characterization.	545
Submit permit application	180

1. Source Water Baseline Biological Characterization Data

Proposed § 125.86(a) would require baseline ambient biological data in the form of a Source Water Baseline Biological Characterization. This study would establish an initial baseline for evaluating potential impact from the cooling water intake structure before the start of operation. In addition, you would be required to reevaluate the study and perform additional ambient monitoring before submitting an application for the reissuance of the permit to establish or reestablish the baseline for the next permit term. The Director would use the study to identify the species most susceptible to impingement and entrainment, their life stages, their abundance in the source water, and their environmental requirements and habitat.

Proposed § 125.86(a) also would require you to submit the results of a Source Water Baseline Biological Characterization at the time of your NPDES permit application. As part of the Source Water Baseline Biological Characterization, if you must implement additional design and construction technologies, you would be required to collect data over a period of one year. Before you start any sampling for the study, you would be required to submit a sampling plan to the Director for review and approval. The proposed rule would require you to submit the sampling plan 90 days before you intend to start the study. You are encouraged to make the sampling plan available to the following entities for review and comment: Federal agencies such as the U.S. Fish and Wildlife Service, the National Marine Fisheries

Service, and the U.S. Army Corps of Engineers; appropriate State fish and wildlife agencies; local fish and wildlife organizations or advocacy groups; and the public. If such coordination and public involvement is conducted, you should identify and indicate the results of this effort in your application submission to the Director. Public involvement in developing the sampling plan would facilitate the Director's review and approval of the plan.

In addition, § 125.86(a)(3) would require that you identify all threatened and endangered species that might be susceptible to impingement and entrainment. The Director might coordinate a review of your list with the U.S. Fish and Wildlife Service and/or National Marine Fisheries Service staff to ensure that potential impacts to threatened and endangered species have been addressed.

The study would begin with a site-specific, preoperational baseline assessment to determine the presence of fish and shellfish (eggs, larvae, post larvae, juveniles, and adults) in the surface water serving the cooling water intake structure. Their presence during the course of a year would need to be documented in terms of the kinds, numbers, life stages, and duration of occurrence in the source water in close proximity to the proposed location of the cooling water intake structure. This information would identify the community of fish and shellfish that would potentially be subject to impingement and entrainment effects. Information supporting this documentation would likely be derived from new, site-specific studies and possibly from historical records applicable to the water body serving the proposed cooling water intake structure. In all cases, the data to be used would need to be appropriately certified through established quality assurance procedures.

The Source Water Baseline Biological Characterization would serve two purposes. First, the Director would use the study to identify species and their relative numbers potentially subject to intake effects following implementation of the location, flow, and velocity requirements. Then during each permit reissuance cycle, the Director would compare the preoperational ambient data with the post operational data to evaluate the efficacy of the location, flow, and velocity requirements. Second, when the cooling water intake structure is located in the more sensitive area of a water body, the Director would use the findings of the Source Water Baseline Biological Characterization study to define the need for additional design and construction technologies.

One source of information is past entrainment and impingement assessments prepared by other facilities using the same water source for cooling purposes. These studies can potentially provide a wealth of information regarding sampling strategies, species that might already be affected by intake effects, and trends in species mix and relative abundance. In the *Economic and Engineering Analysis of the proposed § 316 New Facility Rule,* EPA has estimated a cost of approximately $32,000 per facility for all activities, including monitoring and capital and O & M costs associated with the Source Water Baseline Biological Characterization. EPA is aware that facilities have typically spent considerably more than this on studies to support site-specific section 316(b) determinations in the past. However, EPA expects that the Baseline Characterization Study required in the proposed rule would generally be less comprehensive (and thus less expensive) that section 316(b) studies that have been conducted in the past because the scope and level of detail required in the Baseline Characterization Study is more limited that studies typically submitted. EPA requests comment on its projected costs for the Baseline Characterization.

2. Source Water Physical Data

Proposed section 125.86(b)(1) would require you to provide source water information to the Director. The Director would use the source water data to evaluate the potential impact on the water body in which the intake structure is located. Depending on its location in the source water and the source water type, the intake structure would affect different species or life stages. For example, intakes located in the littoral zone are more likely to affect spawning and nursery areas, whereas intakes located offshore are more likely to affect migratory routes. In addition, the proximity of the intake structures to sensitive aquatic ecological areas might result in potential adverse environmental impact. Source water information that you would be required to submit includes a description and a drawing of the physical configurations of the source water body where the cooling water intake structure is located, source water flow or volume data, and documentation delineating the littoral zone, such as submerged vegetation and substrate data, for the water body in relation to each cooling water intake structure.

Your documentation supporting the littoral zone determination should include light penetration and hydromorphological data, submerged aquatic vegetation data, and substrate data. You may measure littoral zones through transects perpendicular to shore to identify the point of transition between the littoral and deeper (e.g., profundal) portions of the waterbody. A minimum of three transects would be established, with one at the proposed intake location, one upstream within the area of influence, and one downstream of the proposed intake in the area of influence. The first, and most important, criterion of the littoral zone boundary is where light penetration is not sufficient to support submerged aquatic vegetation. A photometer to measure incident light or a Secchi disk to make visual observations can provide rapid measurements along the transects. Depth can be readily measured with a fathometer or weighted line calibrated in meters. These two measurements will provide information on whether light reaches the bottom to support vegetation growth and whether the slope of the bottom changes dramatically enough to indicate an abrupt end to the littoral zone. A change in substrate composition sometimes occurs as the littoral zone ends. Therefore, grab samples can be taken along the transects and evaluated for substrate composition (e.g., gravel, sand, silt, clay). After you delineate the littoral zone, the last step in this process is to determine where the cooling water intake structure is located in relation to the littoral zone.

3. Cooling Water Intake Structure Velocity and Flow Data

Proposed section 125.86(b)(2) would require you to submit information on the intake structure and to provide a water balance diagram for your facility. The Director would use this information to evaluate the potential for impingement and entrainment of aquatic organisms. The design of the intake structure and the location in the water column would allow the Director to evaluate which of the requirements in today's proposed rule apply to the facility (for example, design intake velocity, flow rate, and location relative to the littoral zone). The water balance diagram provides the Director with a complete accounting of the flow in and out of the facility. A water balance diagram is the most effective tool to evaluate the water use patterns at a facility and to determine water used for cooling purposes, makeup, and processes.

To demonstrate your design velocity, you would need to provide to the

Director the engineering calculations you used to calculate your velocity.

If your facility is located on a freshwater river or stream, you would need to provide calculations that demonstrate that you meet the flow requirements for both the mean annual flow and the 7Q10 flow. The 7Q10 flow is the lowest average seven-consecutive-day low flow with an average recurrence frequency of once in 10 years determined hydrologically. If your facility is located on an estuary or a tidal river, you would need to calculate the tidal excursion and provide the flow data for your facility and the supporting calculations.

The tidal excursion distance can be computed using three different methods ranging from simple to complex. The simple method involves using available tidal velocities that can be obtained from the Tidal Current Tables formerly published by the National Ocean Service of the National Oceanic and Atmospheric Administration (NOAA) and currently printed and distributed by private companies (available at book stores or marine supply stores). The mid-range method involves computing the tidal excursion distance using the Tidal Prism Method.[55] The complex method involves the use of a 2-dimensional or 3-dimensional hydrodynamic model. The simplest method to use is the following:

(1) Locate the facility on either a NOAA nautical chart or a base map created from the USGS 1:100,000 scale Digital Line Graph (DLG) data available from the USGS Internet web site. These DLG Data can be imported into a computer-aided design (CAD)-based program or geographic information system (GIS). If these tools are unavailable, 1:100,000 scale topographic maps (USGS) can be used.

(2) Obtain maximum flood and ebb velocities (in meters per second) for the water body in the area of the cooling water intake structure from NOAA Tidal Current Tables.

(3) Calculate average flood and ebb velocities (in meters per second) over the entire flood or ebb cycle using the maximum flow and ebb velocities from 2 above.

$$\text{Velocity}_{\text{Average Flood}} = \text{Velocity}_{\text{Maximum Flood}} * {}^{2}\!/_{\pi} \qquad \text{(Equation 1)}$$

$$\text{Velocity}_{\text{Average Ebb}} = \text{Velocity}_{\text{Maximum Ebb}} * {}^{2}\!/_{\pi} \qquad \text{(Equation 2)}$$

(4) Calculate the flood and ebb tidal excursion distance using the average flood and ebb velocities from 3 above.

$$\text{Distance}_{\text{Flood Tidal Excursion}} = \text{Velocity}_{\text{Average Flood}} * 6.2103 * 3600\ {}^{s}\!/_{hr} \qquad \text{(Equation 3)}$$

$$\text{Distance}_{\text{Ebb Tidal Excursion}} = \text{Velocity}_{\text{Average Ebb}} * 6.2103 * 3600\ {}^{s}\!/_{hr} \qquad \text{(Equation 4)}$$

(5) Using the total of the flood and ebb distances from above, define the diameter of a circle that is centered over the opening of the cooling water intake structure.

(6) Define the area of the water body that falls within the area of the circle (see Appendix 3 to Preamble). The area of the water body, if smaller than the total area of the circle might be determined either by using a planimeter or by digitizing the area of the water body using a CAD-based program or GIS.

For cooling water intake structures located offshore in large water bodies, the area of the water body might equal the entire area of the circle (see D in Appendix 3 to Preamble). For cooling water intake structures located flush with the shoreline, the area might be essentially a semicircle (see C in Appendix 3 to Preamble). For cooling water intake structures located in the upper reaches of a tidal river, the area might be some smaller portion of the area of the circle (see A in Appendix 3 to Preamble).

(7) Calculate the average depth of the water body area defined in 6 above. Depths can easily be obtained from bathymetric or nautical charts available from NOAA. In many areas, depths are available in digital form.

(8) Calculate a volume by multiplying the area of the water body defined in 5 by the average depth from 7. Alternatively, the actual volume can be calculated directly with a GIS system using digital bathymetric data for the defined area.

The Director would use the facility's water balance diagram to identify the proportion of intake water used for cooling, makeup, and process water. A simplified water balance diagram that gives a complete picture of the total flow in and out of the facility would allow the Director to evaluate compliance with the flow reduction requirements.

4. Data To Show Compliance With the Flow Requirements, Velocity Requirement, Flow Reduction Requirement, and Additional Design and Construction Technology Requirement

Today's proposal at § 125.86(b) (3) through (6) would require you to provide information on additional operating procedures, technologies, and plans to demonstrate compliance with the applicable requirements set forth in today's proposed rule. You would be required to provide to the Director a plan containing narrative descriptions and engineering design calculations of the technologies the facility proposes to implement to demonstrate compliance with the flow, velocity, flow reduction, and additional design and construction technology requirements. If your facility will meet the flow reduction requirement through reuse of 100 percent of the cooling water withdrawn from a source water, you must provide a demonstration that 100 percent of the cooling water is reused in one or more unit processes at the facility.

EPA requests comment on all aspects of the proposed data provision requirements.

5. Data To Support a Request for Alternative Requirements

If you request an alternative requirement, today's proposal at § 125.86(b)(7) would require that you submit all data showing that your

[55] E. Diana, A.Y. Kuo. B.J. Neilson, C.F. Cerco, and P.V. Hyer. *Tidal Prism Model Manual,* Virginia Institute of Marine Science, Gloucester Point, VA, January 1987.

compliance costs are wholly out of proportion to the costs EPA considered during development of the requirements at issue. Compliance costs that EPA considered were sub-divided into one-time costs and recurring costs. Examples of one-time costs include capital and permit application costs. Examples of recurring costs include operation and maintenance costs, permit renewal costs, and monitoring, recordkeeping and reporting costs.

B. How Would the Director Determine the Appropriate Cooling Water Intake Structure Requirements?

The Director's first step would be to determine whether the facility is covered by the requirements in these proposed regulations for new facilities. If the answer is ''yes'' to all the following questions, the facility would be required to meet the requirements of this proposed regulation:

(1) Is the facility a ''new facility'' as defined in § 125.83?

(2) Does the new facility have a ''cooling water intake structure'' as defined in § 125.83?

- Is at least 25 percent of the water withdrawn by the facility used for cooling purposes?
- Is the cooling water withdrawn from waters of the U.S.?

(3) Does the new facility have a design intake flow of greater than 2 million gallons per day? [56]

(4) Does the new facility discharge pollutants to waters of the U.S., including storm water-only discharges?

If these proposed regulations are applicable to the new facility, the second step would be to determine the locational factors associated with the new facility's cooling water intake structure. The Director would first review the information that the new facility provided to validate the source water body type in which the cooling water intake structure is located (freshwater stream or river, lake or reservoir, estuary or tidal river, or ocean). (As discussed above, the new facility would need to identify the source water body type in the permit application and provide the appropriate documentation to support the water body type classification.) After validating the water body type, the Director's next task would be to verify the facility's delineation of the littoral zone boundaries. The Director would review the supporting material the facility provided in the permit application. The Director would also review the engineering drawings and the locational maps the new facility provided, documenting the physical placement of the cooling water intake structure.

The Director's third step would be to review the design requirements for intake flow and velocity. The proposed velocity requirement is based on the design through-screen or through-technology velocity as defined in § 125.83. The maximum design velocity would always be 0.5 ft/s (except for cooling water intake structures located 50 meters outside the littoral zone in a lake or reservoir). However, pursuant to proposed section 125.84(f) and (g), the Director might determine, based on site-specific characteristics, that a more stringent design velocity (*e.g.,* 0.3 ft/s) is required to minimize adverse environmental impact. To determine whether the new facility meets the maximum design velocity requirement, the Director would review the narrative description of the design, structure, equipment, and operation used to meet the velocity requirement. The Director would also review the design calculations that demonstrate that the maximum design velocity would be met. In reissuing permits, the Director would review velocity monitoring data to confirm that the facility is maintaining the initial design velocity calculated at the start of commercial service.

The proposed flow requirement is based on the water body type and the physical placement of the cooling water intake structure in relation to the littoral zone. To determine whether the new facility meets the proposed flow requirement, the Director would first verify the new facility's determination of the water body flow for the respective water body type (*e.g.,* annual mean flow and low flow for freshwater river or stream). The Director would review the source water flow data the facility provided in the permit application. The Director might want to use available U.S. Geological Survey (USGS) data (for freshwater rivers and streams) to verify the flow data the facility provided in its permit application. Then the Director would review any supporting documentation and engineering calculations that demonstrate that the new facility would meet the proposed flow requirements. To verify the flow data the new facility provides for an estuary or a tidal river, the Director would review the facility's calculation of the tidal excursion. In particular, if the new facility is required to reduce its intake flow to a level commensurate with that which could be attained by a closed-cycle recirculating cooling water system, the Director would review the narrative description or the closed-cycle recirculating cooling water system design and any engineering calculations to ensure that the new facility is complying with the requirement and that the makeup and blowdown flows have been minimized.

The fourth step for the Director would be to review the applicant's Source Water Baseline Biological Characterization study and to determine whether additional design and construction technologies are required. In those instances where additional design and construction technologies (*e.g.,* fish handling devices) are required, the Director would review and approve, approve with comment, or disapprove the applicant's proposed plans to meet these requirements. In some instances, the applicant might assert that its Source Water Baseline Biological Characterization demonstrates that no impingement or entrainment is occurring (*e.g.,* in a shipping canal). The Director would need to carefully evaluate the data and determine whether these additional requirements are appropriate for a facility located in a heavily industrialized water body. During each permit renewal, the Director would then review supporting data to evaluate whether the site-specific conditions have changed such that the facility needs to implement these additional design and construction technologies.

In reviewing the application information, the Director would determine if the new facility meets the appropriate requirements in proposed § 125.84(a) through (e) based on its location on and in the water body, including the flow requirements, intake velocity requirements, and additional design and construction technology requirements. The proposed regulations at § 125.84(f) allow Directors to impose more stringent requirements if it is determined that they are reasonably necessary to minimize adverse environmental impacts. However, the Director may require more stringent requirements under proposed § 125.84(f) only where they are reasonably necessary as a result of the effects of multiple intakes on a waterbody, seasonal variations in the aquatic environment affected by the cooling water intake structure controlled by the permit (such as seasonal migration), or the presence of regionally important species. The proposed regulations at § 125.84(g) require Directors to impose more stringent requirements on cooling water intake structures where they are reasonably necessary to ensure the

[56] If the answer is ''no'' to the flow parameter and the answer is ''yes'' to all the other questions, the Director would use best professional judgment on a case-by-case basis to establish permit conditions that ensure compliance with section 316(b).

attainment of water quality standards, including designated uses, criteria, and antidegredation.

The Agency is aware that the determination of appropriate requirements would require expertise in aquatic biology. The Agency encourages consultation with, and input from, EPA, State, or Tribal staff who have the appropriate expertise. In addition, the Agency encourages coordination with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service.

C. What Would I Be Required To Monitor?

The monitoring requirements in today's proposed rule at § 125.87 include biological monitoring of impingement and entrainment, monitoring of the screen head loss and velocity, and visual inspections.

Impingement and entrainment monitoring would be used to assess the presence, abundance, and life stages (eggs, larvae, post larvae, juveniles, and adults) of aquatic organisms (fish and shellfish) impinged or entrained during operation of the cooling water intake structure. The purpose of the site-specific monitoring is to determine whether the representative species list established in the Source Water Baseline Biological Characterization remains representative of the water body with the operation of the cooling water intake structure and to establish the level of impingement and entrainment. Monitoring would include sampling of organisms trapped on the outer part of intake structures or against screening devices and sampling of organisms entering or passing through the cooling water intake structure and into the cooling water system. Moreover, because ambient water and biological conditions might change over time, sustained monitoring is necessary to identify those species affected post operationally by the cooling water intake structure.

In proposed § 125.87(b), EPA would require monitoring of the head loss across the intake screens to obtain a correlation of those values with the design intake velocity at minimum ambient source water surface elevation and maximum head for each cooling water intake structure. The data collected by monitoring this parameter would provide the Director with additional information after the design and construction of the cooling water intake structure to demonstrate that the facility is operating and maintaining the cooling water intake structure in a manner that the velocity requirement continues to be met. The Agency considers this the most appropriate parameter to monitor because although the facility might be designed to meet the requirement, proper operation and maintenance is necessary to maintain the open area of the screen and intake structure, ensuring that the design intake velocity is maintained. Head loss can easily be monitored by measuring and comparing the height of the water in front of and behind the screen and/or other technology. Facilities that use devices other than screens would be required to measure the actual velocity at the point of entry through the device. Velocity can be measure using velocity meters placed at the entrance into the device.

The Agency considered requiring annual monitoring of either the screen- or through-technology velocity or actual approach velocity at each cooling water intake structure to demonstrate that they are being operated and maintained properly. EPA seeks comment on these and other parameters that could be monitored to ensure that the design intake velocity is not exceeded once the facility is built and operating.

Weekly visual inspections would be required to provide a mechanism for both the new facility and the Director to ensure that any technologies that have been implemented to minimize adverse environmental impact are being maintained and operated in a manner that ensures that they function as designed. EPA has proposed this requirement so that facilities could not develop plans and install technologies only to let them fall into disrepair or to operate them differently so that adverse environmental impact is not minimized to the extent expected. The Director would determine the actual scope and implementation of the visual inspections based on the types of technologies installed at your facility. For example, they could be as simple as observing bypass and other fish handling system to ensure that debris has not clogged the system rendering them inoperable.

The facility would be required to monitor at a frequency specified in proposed § 125.87. For biological monitoring required in proposed § 125.87(a), after two years, the Director may approve a request for less frequent monitoring if the facility desires it and provides data to support the request. The Director would consider a request for reduced frequency in the impingement or entrainment monitoring only if the supporting data show that less frequent monitoring would still allow for the detection of any seasonal and daily variations in the species and numbers of individuals that are impinged or entrained. With each permit renewal, the applicant would continue to monitor individual aquatic organisms that are impinged or entrained. Based on the monitoring results, species might need to be added or removed from the most representative species list. The monitoring results would provide current, site-specific knowledge of impingement/entrainment effects. EPA requests comment on all aspects of the proposed monitoring requirements.

D. How Would Compliance Be Determined?

In today's proposed rule, § 125.89 specifies what the Director must do to comply with the proposed rule. Consistent with these provisions, the Director would determine compliance with the requirements of the proposed rule based on the following:

- Data submitted with the NPDES permit application to show that the facility is in compliance with location, design, construction, and capacity requirements (§ 125.86).
- Compliance monitoring data and records, including impingement and entrainment monitoring, to show that impingement and entrainment impacts are being minimized (§ 125.87(a)).
- Through-screen or through-technology velocity monitoring data and records to show that the facility is being operated and maintained as designed to continue to meet the velocity requirement (§ 125.87(b)).
- Visual inspection to show that technologies installed are being operated properly and function as they were designed (§ 125.87(c)).

Facilities would be required to keep records and report the above information in a yearly status report as proposed in § 125.88. EPA requests comment on this requirement. In addition, Directors may perform their own compliance inspections as deemed appropriate in accordance with 40 CFR 122.41.

E. What Are the Respective Federal, State, and Tribal Roles?

Section 316(b) requirements are implemented through NPDES permits. As discussed in Section II.A., today's proposed regulations would amend 40 CFR 123.25(a)(36) to add a requirements that authorized State programs have sufficient legal authority to implement today's proposed requirements (40 CFR part 125, subpart I). Therefore, today's proposed rule potentially affects authorized State and Tribal NPDES permit programs. Under 40 CFR 123.62(e), any existing approved section 402 permitting program must be revised to be consistent with new program

requirements within one year from the date of promulgation, unless the NPDES-authorized State or Tribe must amend or enact a statute to make the required revisions. If a State or Tribe must amend or enact a statute to conform with today's proposed rule, the revision must be made within two years of promulgation. States and Tribes seeking new EPA authorization to implement the NPDES program must comply with the requirements when authorization is requested.

In addition to updating their programs to be consistent with today's rule, States and Tribes authorized to implement the NPDES program would be required to implement the cooling water intake structure requirements following promulgation of the final regulations. The requirements proposed must be implemented upon permit issuance and reissuance. Duties of an authorized State or Tribe under this regulation would include:

- Verification of a permit applicant's determination of source water body classification and the flow or volume of certain water bodies at the point of the intake;
- Verification that the intake structure maximum flow rate is less than the maximum allowable as a proportion of water body flow for certain water body types;
- Verification that a permit applicant's design intake velocity calculations meet applicable regulatory requirements;
- For certain locations in certain water body types, verification that a permit applicant's intake design and reduction in capacity are commensurate with a level that can be attained by a closed-cycle recirculating cooling water system that has minimized makeup and blowdown flows;
- Review and approval or disapproval of a permit applicant's plan for the required Source Water Baseline Biological Characterization study;
- For certain locations in certain water body types, review and approval or disapproval of a permit applicant's plan for installation of additional design and construction technologies to maximize the survival of impinged fish and minimize entrainment of eggs and larvae;
- Development of draft and final NPDES permit conditions for the applicant implementing applicable section 316(b) requirements pursuant to the proposed regulation; and
- Ensuring compliance with permit conditions based on section 316(b) requirements.

Once the proposed requirements are promulgated as final regulations, EPA will implement them where States or Tribes are not authorized to implement the NPDES program.

F. Are Permits for New Facilities Subject to Requirements Under Other Federal Statutes?

EPA's NPDES permitting regulations at 40 CFR 122.49 contain a list of Federal laws that might apply to federally issued NPDES permits. These include the Wild and Scenic Rivers Act, 16 U.S.C. 1273 *et seq.*; the National Historic Preservation Act of 1966, 16 U.S.C. 470 *et seq.*; the Endangered Species Act, 16 U.S.C. 1531 *et seq.*; the Coastal Zone Management Act, 16 U.S.C. 1451 *et seq.*; and the National Environmental Policy Act, 42 U.S.C. 4321 *et seq.* See 40 CFR 122.49 for a brief description of each of those laws. In addition, the provisions of the Magnuson-Stevens Fishery Conservation and Management Act, 16 U.S.C. 1801 *et seq.*, relating to essential fish habitat might be relevant. Nothing in this proposed rulemaking authorizes activities that are not in compliance with these or other applicable Federal laws.

X. Cost/Benefit Analysis

A. Cost

Total annualized compliance cost of this proposed rule is estimated to be $12.1 million.

Facilities not already meeting section 316(b) requirements would incur several types of costs under the proposed regulation. One-time costs of the rule would include capital technology costs and costs for the initial permit application. Recurring costs would include operating and maintenance costs, permit renewal costs, and costs for monitoring, record keeping, and reporting.

Facilities generally would have several alternatives for complying with the proposed rule's requirements. Alternative compliance responses might include (1) changing the cooling system design so the facility would no longer be subject to the proposed section 316(b) New Facility Rule; (2) changing the facility location, and making alterations to meet requirements based on the new water body type and the distance from the littoral zone; (3) changing the distance from the littoral zone and making alterations to meet requirements based on water body type and the new distance from the littoral zone; and (4) making alterations to facility plans to meet requirements based on the baseline water body type and distance from the littoral zone.

The specific compliance response of each facility would be highly site-specific. For example, it may not be possible for a facility to locate on a different water body type because a suitable site may not be available, or a facility may need to address other cost factors that might support a decision not to relocate despite the opportunity for lower compliance costs. EPA does not have data on which to estimate the potential costs of choosing alternative locations. EPA therefore considered a set of compliance strategies that are most common among existing facilities with cooling water intake structures. Costed compliance actions include widening the intake structure or installing a velocity cap or passive screens to reduce velocity; switching to a recirculating system to reduce intake flow; and implementing additional technologies to reduce impingement and entrainment.

EPA estimated the unit costs associated with these potential regulatory responses. The unit costs were assigned to the 98 new facilities based on their projected baseline characteristics and their requirements under the proposed rule. EPA estimated costs incurred by facilities beginning operations between 2001 and 2020. All capital costs estimates are amortized over 30 years. Since EPA was only able to project new facilities for the first 20 years, the annualized costs based on a 30-year amortization period are somewhat less than they would have been if EPA were able to project new facilities over a long time horizon (30 to 40 years). Moreover, since most of the capital costs for installing closed-cycle recirculating cooling systems are not projected to be incurred until after 2010, these costs are significantly discounted in this analysis.

1. Electric Generation Sector

For the period 2001 through 2010, EPA estimates that 13 new electric generation facilities would be subject to the proposed section 316(b) New Facility Rule.[57] Seven of these facilities are actual planned facilities identified from the NEWGen database. For these facilities, EPA was able to obtain some facility-specific cooling water intake structure information. The remaining six facilities are hypothetical facilities for which no information was available. For the period 2011 through 2020, information on specific, planned facilities is not available. The Agency

[57] See Section VI.B above or Chapter 5 of the *Economic and Engineering Analyses of the Proposed § 316(b) New Facility Rule* for assumptions and methodologies used for this estimate.

used Energy Information Administration forecasts for electric generation capacity for combined-cycle and coal steam electric facilities. Based on this information, EPA projected that an additional 27 facilities would be subject to this proposed rule, for a total of 40 new electric generation facilities over the 20-year period.

For the period 2001 through 2010, EPA estimated facility-level costs for the seven NEWGen facilities found to be within the scope of this regulation. EPA compared each facility's baseline characteristics with the requirements of the rule. If a planned facility already fulfilled any of the applicable requirements, no cost was included in the estimates for meeting that requirement. For example, EPA estimates that 33 of the 40 proposed new generating facilities already plan to build a cooling tower, so 7 facilities are assumed to incur costs for complying with the recirculation requirement of the rule. EPA used the average compliance costs of the seven NEWGen facilities for the six extrapolated facilities. For the period 2011 through 2020, EPA used assumptions described in the *Economic and Engineering Analyses of the Proposed § 316(b) New Facility Rule* to project which facilities would be subject to this proposed rule and whether they would be required to install a cooling tower. For example, based on Energy Information Administration information on the proportion of new generating facilities employing cooling towers in recent years, the Agency estimated that four coal steam electric generating facilities and three combined-cycle facilities would be required to install cooling towers.

Total annualized costs for the 40 new electric generators are estimated to be $6.4 million using a seven percent discount rate and a 30-year analysis period. The lowest annual compliance cost for any electric generator is estimated to be approximately $73,000 or $97 per megawatt of generating capacity; the highest cost is estimated to be $4.1 million or $5,088 per megawatt of generating capacity. Thirty-three facilities are expected to have relatively low compliance costs while 7 facilities will have relatively high costs.[58]

2. Manufacturing Sector

For the period 2001 through 2020, EPA projected that 58 new manufacturing facilities with costs under the proposed rule would begin operation during the next 20 years.[59] All of these facilities are hypothetical facilities estimated based on industry growth rates and responses to the Section 316(b) Industry Screener Questionnaire. Facility-specific operational characteristics of cooling water intake structures and economic and financial characteristics of the projected new facilities were not available. Therefore, EPA used information from screener respondents to project economic and technical characteristics of the new manufacturing facilities.

Based on the projected facility characteristics, EPA estimated facility-level compliance costs using the same unit costs and methodology as for new electric generators. Total annualized costs for the 58 new manufacturing facilities are estimated to be $5.7 million. The lowest annual compliance cost for any facility was approximately $73,000; the highest cost was $0.6 million.

Exhibit 3 provides a summary of the compliance costs for the rule. Details on methods, assumptions and unit costs used to develop engineering compliance costs for steam electric generating and manufacturing facilities are presented in Chapter 6 of the *Economic and Engineering Analyses of the Proposed § 316(b) New Facility Rule.*

EXHIBIT 3.—NATIONAL PRE-TAX COSTS OF COMPLIANCE WITH THE SECTION 316(B) NEW FACILITY REGULATION

Industry category (number of facilities affected)	One-time costs		Recurring costs			Total
	Capital	Permit application	O&M	Permit renewal	Monitoring, record keeping & reporting	
Total Compliance Costs (present value, in millions $1999)						
Electric Generators (40)	$22.5	$1.0	$39.9	$1.5	$15.3	$79.6
Manufacturing Facilities (58)	12.2	1.4	34.3	2.1	20.7	70.7
Total (98)	34.7	2.4	73.6	3.6	36.0	150.9
Annualized Compliance Costs (in $1999)						
Electric Generators (40)	1,809,266	84,401	3,169,779	123,526	1,239,345	6,426,317
Manufacturing Facilities (58)	984,524	111,383	2,761,176	172,307	1,671,369	5,700,759
Total (98)	2,793,790	195,784	5,930,955	295,833	2,910,714	12,127,076

3. Cost Impacts

Exhibit 4 shows that the estimated compliance costs would represent a small portion of the estimated revenues for most of the facilities. Costs as a percentage of baseline revenues would be less than one percent for all the facilities with the exception of eight facilities.[60]

In addition to low impacts at the facility level, impacts at the industry level are expected to be very limited because the projected number and total size of the new facilities that would be within the scope of the proposed rule are generally small compared to the industry as a whole. EPA therefore does not expect the proposed rule to cause significant changes in industry productivity, competition, prices, output, foreign trade, or employment.

In summation, the proposed rule is expected to be economically practicable

[58] The higher costs facilities are expected to come on line in the years 2011, 2014, 2015, 2018, 2019.

[59] See Section VI.B above or Chapter 5 of the *Economic and Engineering Analyses of the Proposed § 316(b) New Facility Rule* for information on assumptions and methodologies used for this estimate.

[60] One steel works facility and one industrial gases facility would have annualized costs equal to 8.8 and 2.4 percent of revenues, respectively. Three electric generators would have annualized costs equal to 4.2% of revenues and another 3 would have annualized costs equal to 1.0% of revenues.

at both the facility and national level for all sectors. Only a small percent of the total number of facilities in each of the manufacturing sectors would be affected by the proposed rule. EPA, therefore, concludes that this rule would not result in a significant impact on industries or the economy.

EXHIBIT 4.—PRE-TAX COMPLIANCE COSTS AND ECONOMIC IMPACTS BY SECTOR

Sector	Number of projected in-scope facilities	Total annualized compliance costs ($mill 1999)	Annualized compliance cost as a percent of facility revenues	
			Lowest	Highest
SIC 49 Steam electric generating	40	6.4	0.07	4.2
SIC 26 Pulp & paper	0	0	NA	NA
SIC 28 Chemicals	48	4.5	0.01	2.4
SIC 29 Petroleum	0	0	NA	NA
SIC 331 Iron & steel	8	1.1	0.01	8.8
SIC 333/335 Aluminum	2	0.07	0.02	0.02
Total	98	12.1		

4. Cost Impacts of Other Alternatives

In addition to today's proposed rule, EPA costed the impacts of two alternative regulatory options. The first alternative option that EPA considered is to apply the BTA requirements proposed for estuaries and tidal rivers to all facilities, regardless of location. Under this option, the definition and number of new facilities subject to the rule would not change, but some facilities would incur more stringent compliance requirements. EPA estimates the total annualized compliance costs for this alternative would be $16.4 million. The second alternative option considered by EPA would impose more stringent compliance requirements on the electric generating segment of the industry. It is based in whole or in part on a zero intake-flow (or nearly zero, extremely low-flow) requirement commensurate with levels achievable through the use of dry cooling systems. New manufacturing facilities would not be subject to these stricter requirements but would have to comply with the standards of the proposed rule. EPA estimated costs for this alternative assuming that the dry cooling standard would apply to electric generators on all waters of the U.S. The costs of this option is estimated to be $193 million per year.

Both alternative regulatory options considered by EPA would have higher total costs than this proposed rule. A regulatory framework based on dry cooling towers for some or all electric generators is the most expensive option. Compared to the proposed rule, this option would impose an additional cost of $181 million, or $20,720 per megawatt of generating capacity, on the electric generating sector. As with the proposed option, the majority of capital costs for these options are projected to occur after 2010, and so are significantly discounted in the analysis.

B. Discussion of Cooling Water Intake Structure Impacts and Potential Benefits

To provide an indication of the potential benefits of adopting BTA for cooling water intake structures, this section presents information from existing sources on impingement and entrainment losses associated with cooling water intake structures, and the economic benefits associated with reducing these losses. Examples are drawn from existing sources because the information needed to quantify and value potential reductions in losses at new facilities is not yet available. In most cases, there is only general information about facility locations, and details of intake characteristics and the ecology of the surrounding water body are unavailable. Such information is critical because studies at existing facilities demonstrate that benefits are highly variable across facilities and locations. Even similar facilities on the same water body can have very different impacts depending on the aquatic ecosystem in the vicinity of the facility, and intake-specific characteristics such as location, design, construction, and capacity.

In general, the probability of impingement and entrainment depends on intake and species characteristics that influence the intensity, time, and spatial extent of interactions of aquatic organisms with a facility's cooling water intake structure and the physical, chemical, and biological characteristics of the source water body. Closed-cycle cooling systems (which are one part of the basis for BTA for all but the least sensitive areas) withdraw water from a natural water body, circulate the water through the condensers, and then send it to a cooling tower or cooling pond before recirculating it back through the condensers. Because cooling water is recirculated, closed-cycle systems generally reduce the water flow from 72 percent to 98 percent, thereby using only 2 percent to 28 percent of the water used by once-through systems. It is generally assumed that this would result in a comparable reduction in impingement and entrainment.

Fish species with free-floating, early life stages are those most susceptible to CWIS impacts. Such planktonic organisms lack the swimming ability to avoid being drawn into intake flows. Species that spawn in nearshore areas, have planktonic eggs and larvae, and are small as adults experience even greater impacts because both new recruits and reproducing adults are affected (*e.g.*, bay anchovy in estuaries and oceans). In general, higher impingement and entrainment are observed in estuaries and near coastal waters due to the presence of spawning and nursery areas. Additionally, tidal currents in estuaries can carry organisms past intakes multiple times, increasing their probability of impingement and entrainment. These observations would tend to support EPA's decision to establish requirements for minimizing adverse environmental impact according to water body type and the placement of the intake structure in relation to biologically productive zones.

The proposed regulatory framework also recognizes that for any given species and cooling water intake structure location, the proportion of the source water flow supplied to the cooling water intake structure is a major factor affecting the potential for impingement and entrainment. In general, if the quantity of water withdrawn is large relative to the flow of the source water body, water

withdrawal would tend to concentrate organisms and increase numbers impinged and entrained. Thus, the proposed flow requirements seek to minimize impingement and entrainment by limiting the proportion of the water body flow that can be withdrawn.

The following five examples from studies at existing facilities offer some indication of the relative magnitude of monetary damages associated with cooling water intake structures at some existing facilities. These examples exhibit the magnitude of impingement and entrainment, on a per facility basis, that could be significantly reduced in the future for similar steam electric facilities under this proposed rule. In the following discussion, the potential benefits of lowering intake flows to a level commensurate with closed-cycle recirculating cooling water system (for the projected 25 percent of facilities not already planning to use such systems) is illustrated by comparisons of once-through and closed-cycle cooling systems (*e.g.*, the Brayton Point and Hudson River facilities). The potential benefits of additional requirements defined by regional permit directors is demonstrated by operational changes implemented to reduce impingement and entrainment (*e.g.*, the Pittsburg and Contra Costa facilities). The Ludington example demonstrates how impingement and entrainment losses of forage species can lead to reductions in economically valuable species. Finally, the potential benefits of implementing additional design and construction technologies to increase survival of organisms impinged or entrained is illustrated by the application of modified intake screens and fish return systems (*e.g.*, the Salem Nuclear Generating Station).

The first example of the potential benefits of minimizing intake flow and associated impingement and entrainment is provided by data for the Brayton Point facility, located on Mt. Hope Bay in Massachusetts.[61] [62] In the mid-1980s, the operation of Unit 4 was changed from closed-cycle to once-through cooling. Although conversion to once-through cooling increased intake flow by 45%, the facility requested the change because of electrical problems associated with salt contamination from Unit 4's salt water spray cooling system. The lower losses expected under closed-cycle operation can be estimated by comparing losses before and after this modification. On this basis, EPA estimates that the average annual reduction in entrainment losses of adult-equivalents of catchable fish resulting from closed cycle operation of a single unit at Brayton Point (reducing the flow of that unit from 1,045 MGD to 703 MGD) ranges from 207,254 Atlantic menhaden (*Brevoortia tyrannus*) and 155,139 winter flounder (*Pleuronectes americanus*) to 20,198 tautog (*Tautoga onitis*) and 7,250 weakfish (*Cynoscion regalis*) per year. Assuming a proportional change in harvest, the lower losses associated with a closed cycle system may be expected to result in an increase of 330,000 to 2 million pounds per year in commercial landings and 42,000 to 128,000 pounds per year in recreational landings.

The second example of the potential benefits of low intake flow is provided by an analysis of impingement and entrainment losses at five Hudson River power plants. Estimated fishery losses under once-through compared to closed-cycle cooling indicate that an average reduction in intake flow of about 95 percent at the three facilities responsible for the greatest impacts would result in a 30 percent to 80 percent reduction in fish losses depending on the species involved.[63] An economic analysis estimated monetary damages under once-through cooling based on the assumption that annual percent reductions in year classes of fish result in proportional reductions in fish stocks and harvest rates.[64] A low estimate of damages was based on losses at all five facilities, and a high estimate was based on losses at the three facilities that account for most of the impacts. Damage estimates under once-through cooling ranged from about $1.3 million to $6.1 million annually in 1999 dollars. Over the next 20 years, EPA projects that seven out of 40 new power plants would be built without recirculating systems in the absence of this rule. Most of the costs projected for the proposed rule are associated with installing recirculating systems as a result of this proposed rule.

The third example demonstrates how impingement and entrainment losses of forage species can lead to reductions in economically valued species. A random utility model (RUM) was used to estimate fishery impacts of impingement and entrainment by the Ludington Pumped-Storage plant on Lake Michigan.[65] [66] This method estimates changes in demand as a function of changes in catch rates. The Ludington facility is responsible for the loss of about 1 percent to 3 percent of the total Lake Michigan production of alewife, a forage species that supports valuable trout and salmon fisheries. It was estimated that losses of alewife result in a loss of nearly 6 percent of the angler catch of trout and salmon each year. On the basis of RUM analysis, the study estimated that if Ludington operations ceased, catch rates of trout and salmon species would increase by 3.3 to 13.7 percent annually, amounting to an estimated recreational angling benefit of $0.95 million per year (in 1999 dollars) for these species alone.

The fourth example indicates the potential benefits of operational BTA that might be required by regional permit Directors. Two plants in the San Francisco Bay/Delta, Pittsburg and Contra Costa in California have made changes to their intake operations to reduce impingement and entrainment of striped bass (*Morone saxatilis*). These operational changes have also reduced incidental take of several threatened and endangered fish species, including the delta smelt (*Hypomesus transpacificus*) and several runs of chinook salmon (*Oncorhynchus tshawytscha*) and steelhead trout (*Oncorhynchus mykiss*). According to technical reports by the facilities, operational BTA reduced striped bass losses by 78 percent to 94 percent, representing an increase in striped bass recreational landings of about 15,000 fish each year. A local study estimated that the consumer surplus of an additional striped bass caught by a recreational angler is $8.87 to $13.77.[67] This implies a benefit to the recreational fishery, from reduced impingement and entrainment of striped

[61] New England Power Company and Marine Research, Inc., *Final Environmental Impact Report and Section 316(a) and 316(b) Demonstrations Made in Connection with the Proposed Conversion of Generating Unit No. 4 from Closed-Cycle Cooling to Once-Through Cooling.* 1981.

[62] Gibson, M. *Comparison of Trends in the Finfish Assemblages of Mt. Hope Bay and Narragansett Bay in Relation to Operations of the New England Power Brayton Point Station.* Rhode Island Division Fish and Wildlife, Marine Fisheries Office, June 1995 and revised August 1996.

[63] Boreman, J. and C.P. Goodyear. ''Estimates of entrainment mortality for striped bass and other fish species inhabiting the Hudson River Estuary.'' *American Fisheries Society Monograph* 4:152–160. 1988.

[64] Rowe, R.D., C.M. Lang, L.G. Chestnut, D.A. Latimer, D.A. Rae, S.M. Bernow, and D.E. White. *The New York Electricity Externality Study, Volume 1.* Empire State Electric Energy Research Corporation. 1995.

[65] Jones, C.A., and Y.D. Sung. *Valuation of Environmental Quality at Michigan Recreational Fishing Sites: Methodological Issues and Policy Applications.* Prepared under EPA Contract No. CR–816247 for the U.S. EPA, Washington, DC. 1993.

[66] Pumped storage facilities do not use cooling water and are therefore would not subject to this proposed rule. However, the concept of economic valuation of losses in forage species is transferable to other types of stressors, including cooling water intake structures.

[67] Huppert D.H. ''Measuring the value of fish to anglers: application to central California anadromous species.'' *Marine Resource Economics* 6:89–107. 1989.

bass alone, in the range of $131,000 to $204,000 annually. The monetary benefit of reduced impingement and entrainment of threatened and endangered species might be substantially greater.

The final example indicates the benefits of technologies that can be applied to maximize survival. At the Salem Nuclear Generating Station in Delaware Bay, the facility's original intake screens were replaced with modified screens and improved fish return baskets that reduce impingement stress and increase survival of impinged fish.[68] The changes resulted in an estimated 51 percent reduction in losses of weakfish. Assuming similar reductions in losses of other recreational and commercial species, this represents an increase in recreational landings of 13,000 to 65,000 fish per year and an increase in angler consumer surplus of as much as $269,000 annually in 1999 dollars. The estimated increase in commercial landings of 700 to 28,000 pounds per year represents an increase in producer surplus of up to $25,000 annually. Assuming that nonuse benefits are at least 50 percent of recreational use benefits, nonuse benefits associated with the screens might be expected to amount to up to $134,000 per year.

A more detailed discussion of cooling water intake structure impacts and potential benefits can be found Chapter 11 of the *Economic and Engineering Analyses of the Proposed § 316(b) New Facility Rule.*

The Agency recognizes that limited data, if any, are available on impingement and entrainment rates at facilities with intake flows at or near the flow threshold proposed today or the alternative flow thresholds discussed in Section V.D. above. The Agency specifically invites commenters to provide any data they may have on impingement and/or entrainment rates at facilities with total intake flows at or below 30 MGD.

XI. Administrative Requirements

A. Paperwork Reduction Act

The information collection requirements in this proposed rule have been submitted for approval to the Office of Management and Budget (OMB) under the Paperwork Reduction Act, 44 U.S.C. 3501 *et seq.* EPA has prepared an Information Collection Request (ICR) document (ICR No. 1973.01) and you may obtain a copy from Sandy Farmer by mail at Collection Strategies Division; U.S. Environmental Protection Agency (2822); 1200 Pennsylvania Ave., NW., Washington, DC 20007, by e-mail at farmer.sandy@epamail.epa.gov, or by calling (202) 260–2740. You also can download a copy off the Internet at http://www.epa.gov/icr.

The total burden of the information collection requirements associated with today's rule is estimated at 46,849 hours. The corresponding cost for costs other than labor (labor costs are included in the total cost of the rule discussed in section X of this preamble) is estimated at $1.03 million for 22 facilities and 44 States and Territories for the first three years after promulgation of the rule. Non-labor costs, include activities such as laboratory services, photocopying, and the purchase of supplies. The burden and costs are for the information collection, reporting, and record keeping requirements for the three-year period beginning with the assumed effective date of today's rule. Additional information collection requirements will occur after this initial three-year period and will be counted in a subsequent information collection request. EPA does not consider the specific data that would be collected under this proposed rule to be confidential business information. However, if a respondent does consider this information to be confidential, the respondent may request that such information be treated as confidential. All confidential data will be handled in accordance with 40 CFR 122.7, 40 CFR part 2, and EPA's Security Manual Part III, Chapter 9, dated August 9, 1976.

Compliance with the applicable information collection requirements imposed under this proposed rule (see §§ 125.86,125.87, and 125.88) is mandatory. Before new facilities can begin operation, they would be required first to perform several data-gathering activities as part of the permit application process. Today's proposal would require several distinct types of information collection as part of the NPDES application. In general, the information would be used to identify which of the requirements in today's proposed rule apply to the new facility, how the new facility would meet those requirements, and whether the new facility's cooling water intake structure reflects the best technology available for minimizing adverse environmental impact. Specific data requirements proposed are the following:

- Source water data for evaluation of potential impacts to the water body in which the intake structure is placed.
- Intake structure data, consisting of intake structure design and facility water balance diagram, to evaluate the potential for impingement and entrainment of aquatic organisms.
- Baseline ambient biological data, in the form of a Source Water Baseline Biological Characterization study, for evaluating potential impacts from the cooling water intake structure prior to the start of operation.
- Information on additional design and construction technologies implemented to ensure compliance with the applicable requirements set forth in today's proposed rule.

In addition to the information requirements of the NPDES permit application, NPDES permits normally specify monitoring and reporting requirements to be met by the permitted entity. New facilities that fall within the scope of this rule would be required to perform biological monitoring of impingement and entrainment, monitoring of the screen or through-technology velocity, and visual inspections of the cooling water intake structure and any additional technologies. Additional ambient water quality monitoring may also be required of facilities depending on the specifications of their permit. The facility would be expected to analyze the results its monitoring efforts and then provide these results in an annual status report to the permitting authority. Finally, facilities would be required to maintain records of all submitted documents, supporting materials, and monitoring results for at least three years (the director may require that records be kept for a longer period to coincide with the life of the NPDES permit) .

All the impacted facilities would have to carry out the specific activities necessary to fulfill the general information requirements. The estimated burden to comply with these requirements is associated with describing and drawing the physical configurations of the source water body where the cooling water intake structures are located and documenting the delineation of the littoral zone, submerged vegetation, and substrate characteristics of the water body in relation to each cooling water intake structure. The activities costed out also include sampling, analyzing, and reporting the results in a Source Water Baseline Biological Characterization Study before the operation of the cooling water intake structures and developing a water balance diagram that

[68] Ronafalvy, J.P., R.R. Cheesman, and W.M. Matejek. ''Circulating water traveling screen modifications to improve impinged fish survival and debris handling at Salem Generating Station.'' Presentation at Power Generation Impacts on Aquatic Resources Conference, Atlanta Georgia, April 12–15, 1999.

can be used to identify the proportion of intake water used for cooling, make-up, and process water. Some of the facilities would need to perform additional activities in relation to velocity and flow reduction requirements. The estimates also incorporate the cost of preparing a narrative description of the design, structure, equipment, and operation to meet the velocity, flow, and flow reduction requirements.

In addition to the activities mentioned above, some facilities would need to prepare and submit a plan describing the design and characteristics of additional technologies to be installed to maximize the survival of aquatic organisms, and to minimize the impingement and entrainment of organisms. The estimates for some facilities also incorporate the cost of the sampling, analyzing, and reporting of the impinged and entrained organisms during a biological cycle, and velocity monitoring and biweekly inspections of the operation of the installed technologies.

Exhibit 5 presents a summary of the maximum burden estimates for a facility to prepare a permit application, along with the monitoring and reporting of cooling water intake structures operations.

EXHIBIT 5.—MAXIMUM BURDEN AND COSTS PER FACILITY FOR NPDES PERMIT APPLICATION AND MONITORING AND REPORTING ACTIVITIES

Activities	Burden (hr)	Labor cost	Other direct costs [a]
Start-up activities	43	$1,330	$50
General information activities	252	6,512	500
Source water baseline biological characterization activities [b]	404	11,655	1,250
Flow standard activities	104	2,495	100
Velocity standard activities	138	3,690	1,000
Flow reduction commensurate with closed-cycle recirculating	98	2,478	400
Additional design and construction technology implementation plan	85	2,372	50
Subtotal	1,124	30,532	3,350
Maximum Burden and Costs per Facility for Annual Monitoring and Reporting Activities			
Biological monitoring (impingement)	238	$6,736	$2,000
Biological monitoring (entrainment)	530	14,675	4,000
Velocity monitoring	163	4,169	100
Visual inspection	253	6,831	100
Yearly status report activities	340	10,634	750
Subtotal	1,524	43,045	6,950

[a] Cost of supplies, filing cabinets, photocopying, boat renting, etc.
[b] The Source Water Baseline Biological Characterization Study also has contracted service costs associated with it.

The proposed changes to the NPDES permit process would require States to devote time and resources to reviewing and responding to the NPDES permit applications, implementation plans, and annual status reports submitted to them. EPA assumed that all 43 States and one territory with NPDES permitting authority will undergo start-up activities in preparation for administering the provisions of the New Facility Rule. As part of these start-up activities States are expected to train junior technical staff on how to review materials submitted by facilities, and then use these materials to determine the specific conditions of each facility's NPDES permit with regard to the facility's cooling water intake structure.

Each State's actual burden associated with reviewing submitted materials, writing permits, and tracking compliance depends on the number of new in-scope facilities that will be built in the State during the ICR approval period. EPA expects that State senior technical, junior technical, and clerical staff will spend time gathering, preparing, and submitting the various documents. EPA's burden estimates reflect the general staffing and level of expertise that is typical in States that administer the NPDES permitting program. EPA considered the time and qualifications necessary to complete various tasks such as reviewing submitted documents and supporting materials, verifying data sources, planning responses, determining specific permit requirements, writing the actual permit, and conferring with facilities and the interested public. Exhibit 6 provides a summary of the burden estimates for States performing various activities associated with the proposed rule.

EXHIBIT 6.—ESTIMATING STATE BURDEN AND COSTS FOR ACTIVITIES

Activities	Burden (hrs)	Labor cost	ODC ($)
State start-up activities (per State)	100	$3,004	$50
State permit issuance activities (per facility)	116	3,182	300
Annual State activities (per facility)	50	1,419	50

Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing procedures to comply with any previously applicable instructions and requirements; train personnel to be able

to respond to a collection of information; search data sources; complete and review the collection of information; and transmit or otherwise disclose the information.

An Agency may not conduct or sponsor, and a person is not required to respond to a collection of information, unless it displays a currently valid OMB control number. The OMB control numbers for EPA's regulations are listed in 40 CFR part 9 and 48 CFR Chapter 15.

EPA requests comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques. Send comments on the ICR to the Director, Collection Strategies Division; U.S. Environmental Protection Agency (2822); 1200 Pennsylvania Ave., NW.; Washington, DC 20460; and to the Office of Information and Regulatory Affairs; Office of Management and Budget; 725 17th Street; NW., Washington, DC 20503, marked ''Attention: Desk Officer for EPA.'' Include the ICR number in any correspondence. Because OMB is required to make a decision concerning the ICR between 30 and 60 days after August 10, 2000, a comment is most likely to have its full effect if OMB receives it by September 11, 2000. The final rule will respond to any OMB or public comments on the information collection requirements contained in this proposal.

B. Unfunded Mandates Reform Act

Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), Pub. L. 104–4, establishes requirements for Federal agencies to assess the effects of their regulatory actions on State, local, and Tribal governments and the private sector. Under section 202 of UMRA, EPA generally must prepare a written statement, including a cost-benefit analysis, for proposed and final rules with ''Federal mandates'' that might result in expenditures to State, local, and Tribal governments, in the aggregate, or to the private sector, of $100 million or more in any one year. Before promulgating an EPA rule for which a written statement is needed, section 205 of UMRA generally requires EPA to identify and consider a reasonable number of regulatory alternatives and adopt the least costly, most cost-effective, or least burdensome alternative that achieves the objectives of the rule. The provisions of section 205 do not apply when they are inconsistent with applicable law. Moreover, section 205 allows EPA to adopt an alternative other than the least costly, most cost-effective, or least burdensome alternative if the Administrator publishes with the final rule an explanation why that alternative was not adopted. Before EPA establishes any regulatory requirements that might significantly or uniquely affect small governments, including Tribal governments, it must have developed under section 203 of the UMRA a small government agency plan. The plan must provide for notifying potentially affected small governments, enabling officials of affected small governments to have meaningful and timely input in the development of EPA regulatory proposals with significant intergovernmental mandates, and informing, educating, and advising small governments on compliance with regulatory requirements.

EPA has determined that this rule does not contain a Federal mandate that might result in expenditures of $100 million or more for State, local, and Tribal governments, in the aggregate, or the private sector in any one year. Total annualized compliance and implementation costs are estimated to be $12.2 million. Of the total, the private sector accounts for $11.9 million and the government sector (includes direct compliance costs for facilities owned by government entities) accounts for $0.26 million. EPA calculated annualized costs by estimating initial and annual expenditures by facilities and regulatory authorities over the 30-year period (2001–2031), calculating the present value of that stream of expenditures using a 7 percent discount rate. EPA estimates that the highest undiscounted costs incurred by the private sector and government sector in any one year are approximately $36.2 million and $0.29 million, respectively. Thus, today's rule is not subject to the requirements of sections 202 and 205 of UMRA.

This rule is not expected to impact small governments. A municipality that owns or operates a electric generation facility is the primary category of small government operations that might be affected by a rule, regulating cooling water intake structures. Existing data indicates that no new municipal electric generation facilities are going to be constructed in the next ten years. In addition, to minimize cost, this proposed rule excludes facilities that take in less than two (2) million gallons per day. Details and methodologies used for these estimations are included in the *Economic and Engineering Analysis of the Proposed Section 316(b) New Facility Rule,* which is in the docket for today's proposal.

EPA has determined that this proposed rule contains no regulatory requirements that might significantly or uniquely affect small governments. The proposal, if promulgated, would not establish requirements that would affect small governments. Thus, today's proposed rule is not subject to the requirements of section 203 of UMRA.

C. Regulatory Flexibility Act (RFA) as Amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), 5 U.S.C. 601 et seq.

The RFA generally requires an agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedure Act or any other statute unless the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small organizations, and small governmental jurisdictions.

Today's proposed rule is intended to minimize the adverse environmental impact from cooling water intake structures and regulates industries that use cooling water withdrawn directly from waters of the U.S. The primary impact would be on steam electric generating facilities (SIC 4911); however, a number of other industries might also be regulated, including but not limited to paper and allied products (primary SIC 26), chemical and allied products (primary SIC 28), petroleum and coal products (primary SIC 29), and primary metals (primary SIC 33).

For the purposes of assessing the impacts of today's rule on small entities, small entity is defined as: (1) A small business according to SBA size standards; (2) a small governmental jurisdiction that is a government of a city, county; town, school district or special district with a population of less than 50,000; and (3) a small organization that is not-for-profit enterprise which is independently owned and operated and is not dominant in its field. This proposed rule is expected to regulate only a small absolute number of facilities owned by small entities, that represent a very small percentage of all facilities owned by small entities in their respective industries. EPA has estimated that 20 facilities owned by small entities would be regulated by this proposed rule. Of the 20 facilities owned by small entities, 14 are projected to be steam electric generating facilities and 6 to be manufacturing facilities. EPA does not anticipate that today's proposed rule would regulate any small governments or nonprofit entities.

After considering the economic impacts of today's proposed rule on small entities, the Agency certifies that this action will not have a significant economic impact on a substantial number of small entities for reasons explained below.

1. Electric Generation Sector

EPA has described the process by which prospective new steam electricity generating facilities were identified and how EPA determined whether such facilities are subject to today's proposed rule elsewhere in this preamble and in Chapter 5 of the *Economic and Engineering Analysis of the Proposed § 316(b) New Facility Rule.* As described in Chapter 8 of the economic and engineering support document, EPA then identified those facilities subject to the rule whose parent firm or government owner would qualify as a small entity pursuant to the SBA size standard for electrical utilities. The Small Business Administration defines a small steam electric generator as a firm whose facilities generated 4 million megawatt-hours output or less in the proceeding year. From that analysis, EPA has determined that 14 facilities owned by small businesses within the steam electric generating industry are likely to be regulated by today's proposed rule. The only government-owned facility that met the SBA criteria was owned by a State and States are not considered small governments.

The estimated annualized compliance costs that facilities owned by small entities would likely incur represent between 0.07 to 0.15 percent of estimated facility annual sales revenue.[69] In addition, EPA was able to assess impacts based on the ratio of initial costs to plant construction costs. The results of both screening analyses indicated very low impacts at the facility level. Consequently, the costs to the parent small entity would be even lower.

The absolute number of small entities potentially subject to this rule is low. This is not unexpected since the total number of facilities subject to this rule is also low. This is the case, even though the electric power industry is currently experiencing a rapid expansion and transition due to deregulation and new Clean Air Act requirements for emissions controls, and a large number of generating plants are under construction or planned for the early years after promulgation of the proposed rule. First, there is a trend toward construction of combined-cycle technologies using natural gas, which use substantially less cooling water than other technologies. Second, there has been a decline in the use of surface water as the source of cooling water. The NEWGen sample data shows a trend away from the use of surface cooling water. It is indicated that 80 percent of the sampled facilities use alternative sources of cooling water (e.g., grey water, ground water, and municipal water). EPA believes this trend reflects the increased competition for water, an increasing awareness of the need for water conservation, and increased local opposition to the use of surface water for power generation. Taken together, the trend toward combined-cycle generating technologies, which have small cooling water requirements per unit of output, and the trend away from the use of surface cooling water result in a low projected number of regulated facilities, despite the expected expansion in new generating capacity.

2. Manufacturing Sector

Chapter 5 of the *Economic and Engineering Analysis of the Proposed § 316 (b) New Facility Rule* shows that 58 new manufacturing facilities are expected to incur compliance costs under the proposed section 316(b) New Facility Rule. Since EPA's estimate of new manufacturing facilities is based on industry growth forecasts and not on specific planned facilities, actual parent firm information was not available. EPA therefore developed profiles of representative facilities based on the characteristics of existing facilities identified in the screener survey EPA used to identify an appropriate sample of existing facilities for detailed analysis as part of § 316(b) rulemaking for existing facilities. [70]

On the basis of the comparison of each representative facility's parent firm employment with the SBA small entity size standard for the firm's SIC code (the small entity size standards are expressed in terms of employees (500 to 1000 employees)), only 6 of the 58 new manufacturing facilities are projected to be owned by a small entity. Four of the 6 facilities are in the chemicals sector and 2 are in the metals sector. EPA used annualized costs as a percentage of annual sales revenue to assess impacts for manufacturing firms. Again, the test was applied at the facility rather than the firm level, which provides a conservative estimate of the impacts because the ratio of costs to revenues generally would be lower at the firm level than at the individual facility level. Once again, the impact analysis showed a negligible impact on small entities, because the effect on facility sales revenue was so low (0.02 to 0.31 percent). Although EPA was able to assess impacts for only a limited number of plants owned by small entities, the Agency believes that the results for these plants would be representative of other plants owned by small entities.

EPA has conducted extensive outreach to industry associations and organizations representing small government jurisdictions to identify small-entity manufacturing facilities. Based on the outreach effort and a review of the relevant industry trade literature, EPA concludes that although the exact number of facilities owned by small entities that would be subject to the proposed rule is difficult to quantify, it is evident that for the foreseeable future few, if any, small entities would be affected. EPA estimates that only 1.9 percent of all future facilities owned by small entities will use cooling water at levels that would bring them within the scope of this regulation.

The small number of small entities subject to this rule in the manufacturing sector is not surprising because the facilities likely to be subject to the proposed rule are large industrial facilities that are not generally owned by small entities. There are multiple reasons for the limited projected number of in-scope new facilities owned by small entities. The major factors responsible, depending on which

[69] In addition to 7 known planned facilities, EPA estimated that additional hypothetical facilities potentially regulated by this proposed rule will begin operating during the next 20 years. Based on information on the known facilities and expected characteristics of the projected facilities, EPA estimates that impacts on other facilities owned by small firms would also be low.

[70] For each SIC code that included one projected new facility, EPA sorted screener respondents in that SIC code by the number of employees at a facility. EPA selected the facility with the median employment value as the representative facility and used that facility's reported firm characteristics (employment and sales revenues) for this small entity analysis. Data from the Dun & Bradstreet database were used where information on the firm was not available in the screener. In cases where more than one new facility is projected in an SIC code, EPA again sorted the screener respondents by number of employees at a facility. EPA then divided the screener respondents into as many subcategories as the projected number of new facilities in the SIC code. Finally, EPA used employment and sales revenue data from the median employment facility in each subcategory to represent the projected new facility for this small entity analysis. Data from the Dun & Bradstreet database were used where information on the firm was not available in the screener survey. The document, *Economic and Engineering Analysis of the Proposed § 316(b) New Facility Rule,* provides more detailed information on how facility and firm characteristics for the 58 new manufacturing facilities were determined.

industry sector is considered, include industry downsizing; expansion of capacity at existing facilities as a means of meeting increased demand; mergers and acquisitions that reduce the overall number of firms; and addition of a significant number of new facilities in at least one industry sector as part of a recently completed expansion cycle so that additional new facilities are not expected for the foreseeable future. The segments of the industries that are the primary users of cooling water are mostly large, capital intensive enterprises with few, if any, small businesses within their ranks. Moreover, these industries are particularly subject to the impacts of globalization, including competitive pressures from low-cost foreign producers, providing a strong incentive for domestic industry to consolidate to secure the market share and realize production efficiencies. In addition, startup or expansion of the type of industrial facilities subject to today's proposed rule requires significant capital, which small businesses cannot easily secure. The nature of manufacturing enterprises using cooling water at the levels addressed by today's proposed rule is generally inconsistent with small business activity.

Finally, a minimum flow cutoff of 2 MGD is likely to exempt a significant number of small facilities from the requirements of the proposed rule. Therefore, EPA believes it is reasonable to conclude that in the foreseeable future there will be a negligible increase in the number of in-scope small facilities in these manufacturing industries.

Exhibit 7 summarizes the results of Regulatory Flexibility Act/Small Business Regulatory Enforcement Fairness Act analysis. From the small absolute number of facilities owned by small entities that would be affected by the proposed rule, and the very low impacts at the facility level, EPA concludes that the proposed rule will not have a significant economic impact on a substantial number of small entities.

EXHIBIT 7.—SUMMARY OF RFA/SBREFA ANALYSIS

Type of facility	Number of facilities owned by small entities	Annual compliance costs/annual sales revenue	Initial compliance cost/ construction cost
Steam electric generating facilities	14	0.07% to 0.15%.	0.01% to 0.01%.
Manufacturing facilities	6	0.02% to 0.31%.	Data not available.
Total	20	0.02% to 0.31%.	0.01% to 0.01%.

One reason why this proposed rule would not have a significant economic impact on a substantial number of small entities is that EPA has established a flow level of greater than 2 MGD as the level below which facilities would be exempt from the requirements of the proposed rule. This minimum flow level exempts many facilities using small amounts of water, including facilities owned by small entities, while covering approximately 90% of the total cooling water withdrawn from the waters of the U.S. EPA also conducted extensive outreach to industry associations and organizations that represent small entities, to determine how this rule would affect their small entity constituents.

We continue to be interested in the potential impacts of the proposed rule on small entities and welcomes comments on issues related to such impacts.

D. Executive Order 12866: Regulatory Planning and Review

Under Executive Order 12866, (58 FR 51735, October 4, 1993) the Agency must determine whether the regulatory action is ''significant'' and therefore subject to OMB review and the requirements of the Executive Order. The order defines a ''significant regulatory action'' as one that is likely to result in a rule that may:

- Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or Tribal governments or communities;
- Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;
- Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or
- Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

Pursuant to the terms of Executive Order 12866, it has been determined that this proposed rule is a ''significant regulatory action.'' As such, this action was submitted to OMB for review. Changes made in response to OMB suggestions or recommendations will be documented in the public record.

E. Executive Order 13132: Federalism

Executive Order 13132 (64 FR 43255, August 10, 1999) requires EPA to develop an accountable process to ensure ''meaningful and timely input by State and local officials in the development of regulatory policies that have federalism implications.'' ''Policies that have federalism implications'' is defined in the Executive Order to include regulations that have ''substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.''

Under section 6 of Executive Order 13132, EPA may not issue a regulation that has federalism implications, that imposes substantial direct compliance costs, and that is not required by statute unless the Federal government provides the funds necessary to pay the direct compliance costs incurred by State and local governments or EPA consults with State and local officials early in the process of developing the proposed regulation. EPA also may not issue a regulation that has federalism implications and that preempts State law, unless the Agency consults with State and local officials early in the

process of developing the proposed regulation.

This proposed rule does not have federalism implications. It will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132. Rather, this proposed rule would result in minimal administrative costs on States that have an authorized NPDES program. EPA expects an annual burden of 2,339 hours with an annual cost of $3,200 (non-labor costs) for States to collectively administer this proposed rule. Also, based on meetings and subsequent discussions with local government representatives from municipal utilities, EPA believes that the proposed new facility rule may affect, at most, only two large municipalities that own steam electric generating facilities. The annual impacts on these facilities is not expected to exceed 1,304 burden hours and $36,106 (non-labor costs) per facility.

The proposed national cooling water intake structure requirements would be implemented through permits issued under the NPDES program. Forty-three States and the Virgin Islands are currently authorized pursuant to section 402(b) of the CWA to implement the NPDES program. In States not authorized to implement the NPDES program, EPA issues NPDES permits. Under the CWA, States are not required to become authorized to administer the NPDES program. Rather, such authorization is available to States if they operate their programs in a manner consistent with section 402(b) and applicable regulations. Generally, these provisions require that State NPDES programs include requirements that are as stringent as Federal program requirements. States retain the ability to implement requirements that are broader in scope or more stringent than Federal requirements. (See section 510 of the CWA.)

Today's proposed rule would not have substantial direct effects on either authorized or nonauthorized States or on local governments because it would not change how EPA and the States and local governments interact or their respective authority or responsibilities for implementing the NPDES program. Today's proposed rule establishes national requirements for new facilities with cooling water intake structures. NPDES-authorized States that currently do not comply with the final regulations based on today's proposal might need to amend their regulations or statutes to ensure that their NPDES programs are consistent with Federal section 316(b) requirements. See 40 CFR 123.62(e). For purposes of this proposed rule, the relationship and distribution of power and responsibilities between the Federal government and the States and local governments are established under the CWA (*e.g.*, sections 402(b) and 510); nothing in this proposed rule would alter that. Thus, the requirements of section 6 of the Executive Order do not apply to this rule.

Although section 6 of Executive Order 13132 does not apply to this rule, EPA did consult with State governments and representatives of local governments in developing the proposed rule. During the development of the proposed Section 316(b) rule for new facilities, EPA conducted several outreach activities through which State and local officials were informed about this proposal and they provided information and comments to the Agency. The outreach activities were intended to provide EPA with feedback on issues such as adverse environmental impact, BTA, and the potential cost associated with various regulatory alternatives.

EPA held two public meetings in the summer of 1998 to discuss issues related to the section 316(b) rulemaking effort. Representatives from New York and Maryland attended the meetings and provided input to the Agency. The 316(b) workgroup also contacted Pennsylvania and Virginia to exchange information on this issue. In addition, EPA Regions 1, 3, 4, and 9 served as conduits for transmittal of section 316(b) information between the Agency and several States. More recently, EPA met with industry, environmental, and State and Federal government representatives, during May, June, and July of this year to discuss regulatory alternatives for the new facility proposal. Comments from these meetings helped EPA to evaluate and revise draft regulatory framework alternatives.

In the spirit of this Executive Order and consistent with EPA policy to promote communications between EPA and State and local governments, EPA specifically solicits comment on this proposed rule from State and local officials.

F. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations

Executive Order 12898 requires that, to the greatest extent practicable and permitted by law, each Federal agency must make achieving environmental justice part of its mission. E.O. 12898 provides that each Federal agency must conduct its programs, policies, and activities that substantially affect human health or the environment in a manner that ensures that such programs, policies, and activities do not have the effect of excluding persons (including populations) from participation in, denying persons (including populations) the benefits of, or subjecting persons (including populations) to discrimination under such programs, policies, and activities because of their race, color, or national origin.

Today's proposed rule would require that the location, design, construction, and capacity of cooling water intake structures at new facilities reflect the best technology available for minimizing adverse environmental impact. For several reasons, EPA does not expect that this proposed rule would have an exclusionary effect, deny persons the benefits of the NPDES program, or subject persons to discrimination because of their race, color, or national origin. The proposed rule applies only to new facilities with cooling water intake structures that withdraw waters of the U.S. As discussed previously, EPA anticipates that this proposed rule would not affect a large number of new facilities; therefore, any impacts of the proposed rule would be limited. The proposed rule does include location criteria that would affect siting decisions made by new facilities, these criteria are intended to prevent deterioration of our nation's aquatic resources. EPA expects that this proposed rule would preserve the health of aquatic ecosystems located in reasonable proximity to new cooling water intake structures and that all populations, including minority and low-income populations, would benefit from such improved environmental conditions. In addition, because the proposed rule would help prevent decreases in populations of fish and other aquatic species, it is likely to help maintain the welfare of subsistence and other low-income fishermen or minority low-income populations.

G. Executive Order 13045: Protection of Children From Environmental Health Risks and Safety Risks

Executive Order 13045 (62 FR 19885, April 23, 1997) applies to any rule that (1) is determined to be ''economically significant'' as defined under Executive Order 12866, and (2) concerns an environmental health or safety risk that EPA has reason to believe might have a disproportionate effect on children. If the regulatory action meets both criteria, the Agency must evaluate the

environmental health and safety effects of the planned rule on children, and explain why the planned regulation is preferable to other potentially effective and reasonably feasible alternatives considered by the Agency. This proposed rule is not an economically significant rule as defined under Executive Order 12866 and does not involve an environmental health or safety risk that would have a disproportionate effect on children. Therefore, it is not subject to Executive Order 13045. Further, this rule does not concern an environmental health or safety risk that EPA has reason to believe may disproportionately affect children.

H. Executive Order 13084: Consultation and Coordination With Indian Tribal Governments

Under Executive Order 13084, EPA may not issue a regulation that is not required by statute, that significantly or uniquely affects the communities of Indian Tribal governments, and that imposes substantial direct compliance costs on those communities unless the Federal government provides the funds necessary to pay the direct compliance costs incurred by the Tribal governments or EPA consults with those governments. If EPA complies by consulting, Executive Order 13084 requires EPA to provide to the Office of Management and Budget, in a separately identified section of the preamble to the rule, a description of the extent of EPA's prior consultation with representatives of affected Tribal governments, a summary of the nature of their concerns, and a statement supporting the need to issue the regulation. In addition, Executive Order 13084 requires EPA to develop an effective process permitting elected and other representatives of Indian Tribal governments ''to provide meaningful and timely input in the development of regulatory policies on matters that significantly or uniquely affect their communities.''

Today's proposed rule does not significantly or uniquely affect the communities of Indian Tribal governments. Given the available data on new facilities and the applicability thresholds in the proposed rule, EPA estimates that no new facilities subject to the rule will be owned by Tribal governments. This rule does not affect Tribes in anyway in the foreseeable future. Accordingly, the requirements of section 3(b) of Executive Order 13084 do not apply to this rule.

I. National Technology Transfer and Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act (NTTAA) of 1995, Pub L. No. 104–113, Sec. 12(d) directs EPA to use voluntary consensus standards in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (*e.g.*, materials specifications, test methods, sampling procedures, and business practices that are developed or adopted by voluntary consensus standard bodies. The NTTAA directs EPA to provide Congress, through the Office of Management and Budget (OMB), explanations when the Agency decides not to use available and applicable voluntary consensus standards.

This proposed rule does not involve such technical standards. Therefore, EPA is not considering the use of any voluntary consensus standards. EPA welcomes comments on this aspect of the proposed rule and , specifically, invites the public to identify potentially applicable voluntary consensus standards and to explain why such standards should be used in this proposed rule.

J. Plain Language Directive

Executive Order 12866 and the President's memorandum of June 1, 1998, require each agency to write all rules in plain language. We invite your comments on how to make this proposed rule easier to understand. For example: Have we organized the material to suit your needs? Are the requirements in the rule clearly stated? Does the rule contain technical language or jargon that isn't clear? Would a different format (grouping and order of sections, use of headings, paragraphing) make the rule easier to understand? Would more (but shorter) sections be better? Could we improve clarity by adding tables, lists, or diagrams? What else could we do to make the rule easier to understand?

K. Executive Order 13158: Marine Protected Areas

Executive Order 13158 (65 FR 34909, May 31, 2000) requires EPA to ''expeditiously propose new science-based regulations, as necessary, to ensure appropriate levels of protection for the marine environment.'' EPA may take action to enhance or expand protection of existing marine protected areas and to establish or recommend, as appropriate, new marine protected areas. The purpose of the executive order is to protect the significant natural and cultural resources within the marine environment, which means ''those areas of coastal and ocean waters, the Great Lakes and their connecting waters, and submerged lands thereunder, over which the United States exercises jurisdiction, consistent with international law.''

This proposed rule recognizes that there are sensitive biological areas within tidal rivers, estuaries, oceans, and the Great Lakes that are more susceptible to adverse environmental impact from cooling water intake structures. The location of cooling water intake structures is a key factor in minimizing adverse environmental impact. This proposal provides incentives for facilities to locate their cooling water intake structures outside these sensitive biological areas. In those cases where a facility does locate a cooling water intake structure inside these sensitive areas, EPA is proposing that the facility meet the most stringent requirements to minimize adverse environmental impact. This proposed rule would improve the survivability of impinged organisms and reduce the rate of entrained organisms. Therefore, EPA expects this proposal will advance the objective of the executive order to protect marine areas. However, because Executive Order 13158 is new as of May 26, 2000 and EPA has not yet developed implementing regulations, it may be necessary to change the requirements for marine protected areas under this proposal to comply with any future EPA regulations developed to further the objectives of this executive order (*e.g.*, it may be necessary to prohibit or severely limit cooling water withdrawals from marine protected areas).

XII. Solicitation of Comments and Data

A. Specific Solicitation of Comment and Data

As noted in the above sections, EPA solicits comments and data on many individual topics throughout this preamble. The Agency incorporates all such requests for comment here and reiterates its interest in receiving comments and data on the issues addressed by those requests. In addition, EPA particularly requests comments and data on the following issues:

1. EPA solicits comment on the proposed section 316(b) requirements and the methods used to determine the benefit and cost impact values supporting this proposed regulation.

2. EPA solicits comment on the potential impact of the proposed rule on

small entities and on issues related to such impacts.

3. EPA solicits comment on the scope and applicability of the proposed rule, including how EPA has proposed to define ''new facility,'' ''cooling water intake structure,'' the various thresholds that determine the scope of the rule, and the alternative BTA provisions considered by the Agency.

4. EPA solicits data and comment on the number and types of new facilities potentially subject to today's proposed rule.

5. EPA solicits data and comment on the environmental impacts caused by cooling water intake structures at new facilities.

6. EPA solicits comment on appropriate definitions of ''adverse environmental impact'' for purposes of the proposed rule, including whether EPA should include a definition of adverse environmental impact in the final rule or guidance.

7. EPA solicits comment on the frameworks proposed and considered for BTA, including but not limited to the proposed requirements for flow, velocity, location (distance from the littoral zone), and use of additional design and construction technologies.

8. EPA solicits comment on whether it should allow site-specific flexibility in the determination of BTA, and if so, under which of the regulatory approaches discussed in this preamble.

9. EPA solicits comment on the possible use of restoration measures.

10. EPA solicits comment on how the Agency has considered the cost for new facilities to comply with the proposed BTA requirements.

11. EPA solicits comment on how the proposed cooling water intake structure requirements would be implemented, including the need for and burden associated with monitoring, recordkeeping, reporting, and study requirements.

12. EPA solicits comment on how endangered and threatened species are considered under the proposed rule.

13. EPA solicits comment on the monitoring requirement and other approaches that could be used to ensure that the design intake velocity is not exceeded once the facility is built and operating.

14. EPA solicits comment on whether additional procedural provisions are necessary to establish or clarify the permitting process for new facilities employing cooling water intake structures.

B. General Solicitation of Comment

EPA encourages public participation in this rulemaking. EPA asks that comments address any perceived deficiencies in the record supporting this proposal and that suggested revisions or corrections be supported by data.

EPA invites all parties to coordinate their data collection activities with the Agency to facilitate mutually beneficial and cost-effective data submissions. Please refer to the **FOR FURTHER INFORMATION** section at the beginning of this preamble for technical contacts at EPA.

To ensure that EPA can properly respond to comments, the Agency prefers that commenters cite, where possible, the paragraph(s) or sections in the document or supporting documents to which each comment refers. Please submit an original and two copies of your comments and enclosures (including references).

List of Subjects

40 CFR Part 9

Environmental protection, Reporting and recordkeeping requirements.

40 CFR Part 122

Administrative practice and procedure, Confidential business information, Hazardous substances, Reporting and recordkeeping requirements, Water pollution control.

40 CFR Part 123

Administrative practice and procedure, Confidential business information, Hazardous substances, Indians-lands, Intergovernmental relations, Penalties, Reporting and recordkeeping requirements, Water pollution control, .

40 CFR Part 124

Administrative practice and procedure, Air pollution control, Hazardous waste, Indians-lands, Reporting and recordkeeping requirements, Water pollution control, Water supply.

40 CFR Part 125

Cooling water intake structures, Reporting and recordkeeping requirements, Waste treatment and disposal, Water pollution control.

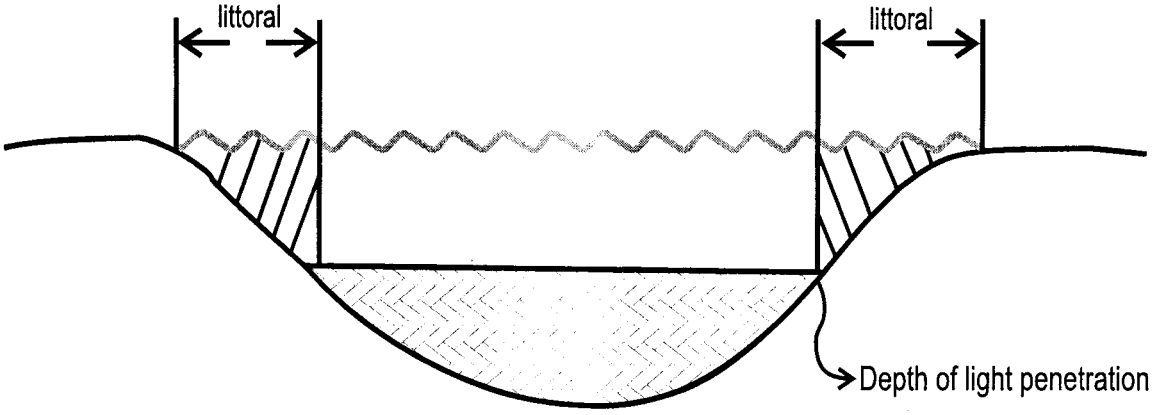
Dated: July 20, 2000.

Carol M. Browner,

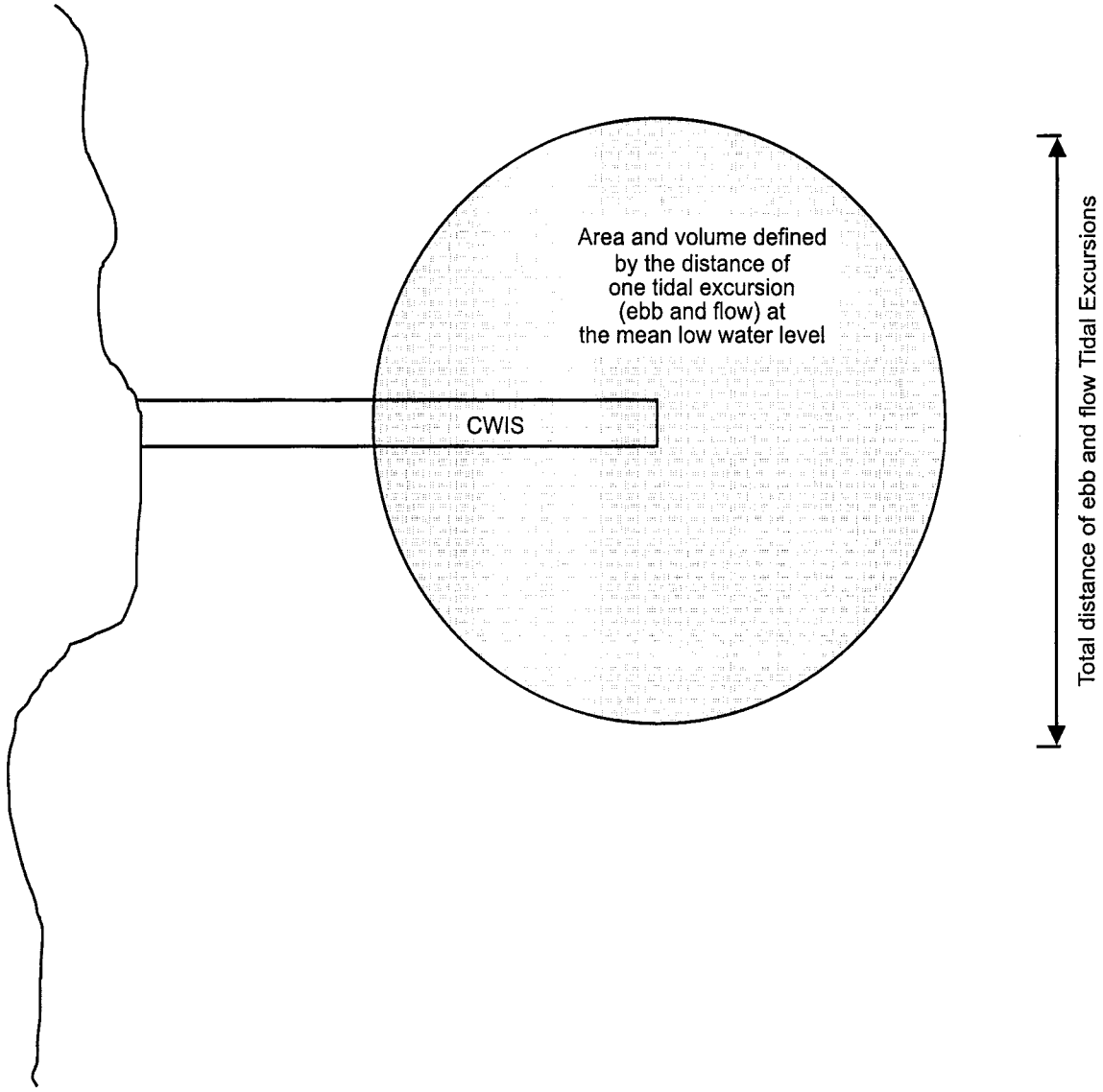
Adminstrator.

BILLING CODE 6560–50–P

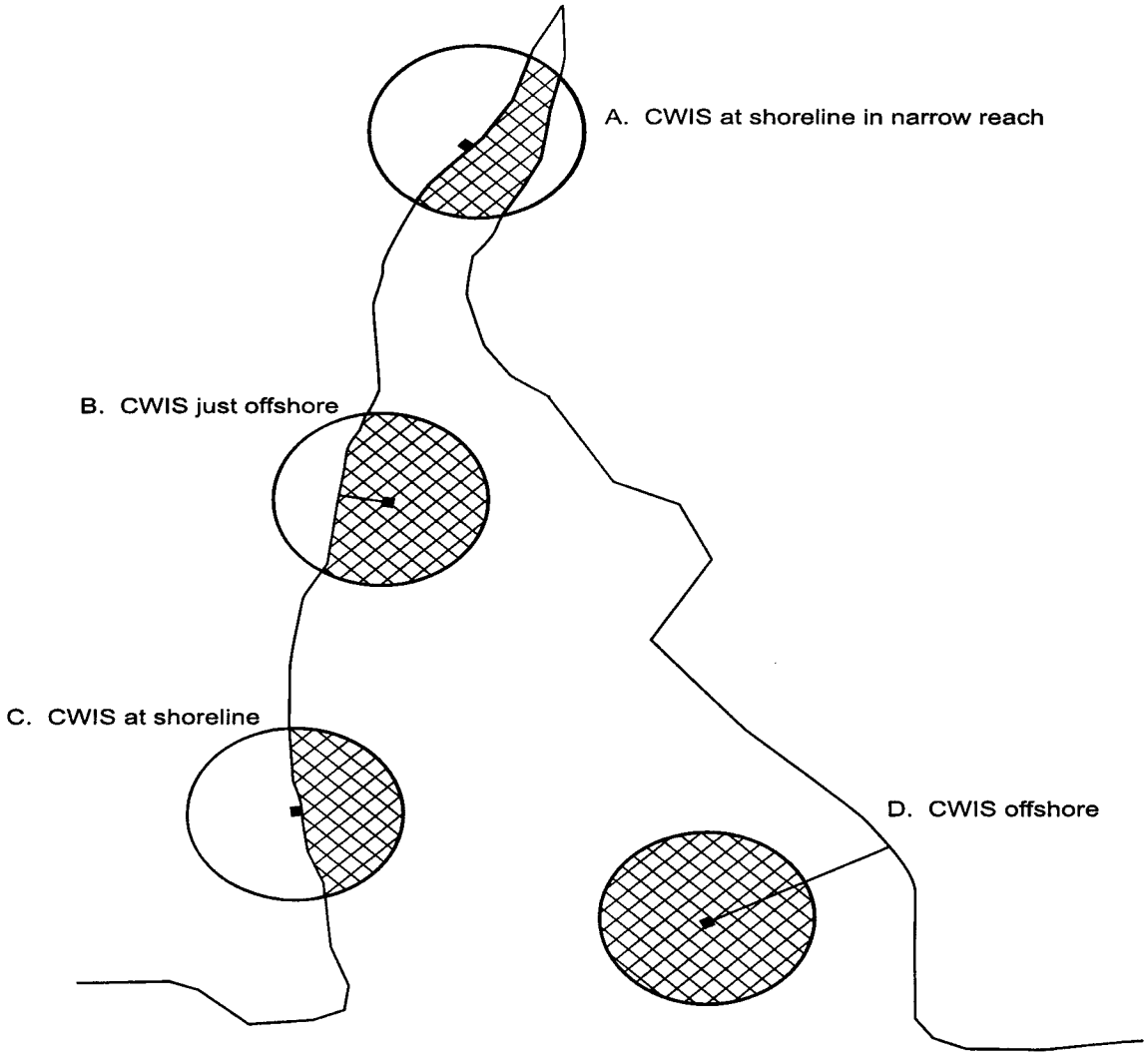
Appendix 1 to Preamble—Littoral Zone Example



APPENDIX 2 TO PREAMBLE—ILLUSTRATION OF FLOW REQUIREMENT FOR ESTUARIES AND TIDAL RIVERS



APPENDIX 3 TO PREAMBLE—EXAMPLES OF AREAS AND VOLUMES DEFINED IN ESTUARIES OR TIDAL RIVERS BY THE TIDAL EXCURSION DISTANCE



CWIS = Cooling Water Intake Structure

BILLING CODE 6560–50–C

For the reasons set forth in the preamble, chapter I of title 40 of the Code of Federal Regulations is proposed to be amended as follows:

PART 9—OMB APPROVALS UNDER THE PAPERWORK REDUCTION ACT

1. The authority citation for part 9 continues to read as follows:

Authority: 7 U.S.C. 135 *et seq.*, 136–1136y; 15 U.S.C. 2001, 2003, 2005, 2006, 2601–2671, 21 U.S.C. 331j, 346a, 348; 31 U.S.C. 9701; 33 U.S.C. 1251 *et seq.*, 1311, 1313d, 1314, 1318, 1321, 1326, 1330, 1342, 1344, 11345 (d) and (e), 1361; E.O. 11735, 38 FR 21243, 3 CFR, 1971–1975 Comp. p. 973; 42 U.S.C. 241, 242b, 243, 246, 300f, 300g, 300g–1, 300g–2, 300g–3, 300g–4, 300g–5, 300g–6, 300j–1, 300j–2, 300j–3, 300j–4, 300j–9, 1857 *et seq.*, 6901–6992k, 7401–7671q, 7542, 9601–9657, 11023, 11048.

2. In § 9.1 the table is amended by adding entries in numerical order under the indicated heading to read as follows:

§ 9.1 OMB approvals under the Paper Work Reduction Act.

* * * * *

40 CFR citation	OMB control no.
* * * * *	
Criteria and Standards for the National Pollutant Discharge Elimination System	
* * * * *	
125.85	2040–
125.87	2040–
* * * * *	

PART 122—EPA ADMINISTERED PERMIT PROGRAMS: THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

1. The authority citation for part 122 continues to read as follows:

Authority: The Clean Water Act, 33 U.S.C. 1251 *et seq.*

2. Amend § 122.21 by adding a new paragraph (r)(1) to read as follows:

§ 122.21 Application for a permit (applicable to State programs, see § 123.25)

* * * * *

(r) *Applications for facilities with cooling water intake structures*—(1) *New facilities with new or modified cooling water intake structures.* New facilities with cooling water intake structures as defined in part 125, subpart I of this chapter must report the information required under § 125.86 of this chapter. Requests for alternative requirements under § 125.85 of this chapter must be submitted with your permit application.

(2) [Reserved].

3. Amend § 122.44 to add paragraph (b)(3) to read as follows:

§ 122.44 Establishing limitations, standards, and other permit conditions (applicable to State NPDES programs, see § 123.25).

* * * * *

(b) * * *

(3) Requirements applicable to cooling water intake structures at new facilities under section 316(b) of the CWA, in accordance with part 125, subpart I of this chapter.

* * * * *

PART 123—STATE PROGRAM REQUIREMENTS

1. The authority citation for part 123 continues to read as follows:

Authority: The Clean Water Act, 33 U.S.C. 1251 *et seq.*

2. Amend § 123.25 to revise paragraph (a)(36) to read as follows:

§ 123.25 Requirements for permitting.

(a) * * *

(36) Subparts A, B, D, H, and I of part 125 of this chapter.

* * * * *

PART 124—PROCEDURES FOR DECISIONMAKING

1. The authority citation for part 124 continues to read as follows:

Authority: Resource Conservation and Recovery Act, 42 U.S.C. 6901 *et seq.*; Clean Water Act, 33 U.S.C. 1251 *et seq.*; and Clean Air Act, 42 U.S.C. 1857 *et seq.*

2. Amend § 124.10 to redesignate paragraph (d)(1)(ix) as paragraph (d)(1)(x) and to add a new paragraph (d)(1)(ix) to read as follows:

§ 124.10 Public notice of permit actions and public comment period.

* * * * *

(d) * * *

(1) * * *

(ix) Requirements applicable to cooling water intake structures at new facilities under section 316(b) of the CWA, in accordance with part 125, subpart I of this chapter.

* * * * *

PART 125—CRITERIA AND STANDARDS FOR THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

1. The authority citation for part 125 continues to read as follows:

Authority: Clean Water Act, as amended by the Clean Water Act of 1977, 33 U.S.C. 1251 *et seq.*, unless otherwise noted.

2. Add subpart I to part 125 to read as follows:

Subpart I—Requirements Applicable to Cooling Water Intake Structures for New Facilities under Section 316(b) of the Act

Sec.

Subpart I—Requirements Applicable to Cooling Water Intake Structures for New Facilities under Section 316(b) of the Act

§ 125.80 What are the purpose and scope of this subpart?

(a) This subpart establishes requirements that apply to the location, design, construction, and capacity of cooling water intake structures at new facilities. The purpose of these requirements is to minimize adverse environmental impact associated with the use of cooling water intake structures. These requirements must be implemented through National Pollutant Discharge Elimination System (NPDES) permits issued under section 402 of the Clean Water Act (CWA).

(b) This subpart implements section 316(b) of the CWA for new facilities. Section 316(b) of the CWA provides that any standard established pursuant to sections 301 or 306 of the CWA and applicable to a point source shall require that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact.

(c) Nothing in this subpart shall be construed to preclude or deny the right of any State or political subdivision of a State or any interstate agency under section 510 of the CWA to adopt or enforce any requirement with respect to control or abatement of pollution that is

more stringent than those required by Federal law.

§ 125.81 Who is subject to this subpart?

This subpart applies to all new facilities that propose to use a cooling water intake structure; that are, or will be, subject to a National Pollutant Discharge Elimination System (NPDES) permit; and that have a design intake flow of greater than two (2) million gallons per day (MGD).

§ 125.82 When must I comply with this subpart?

New facilities subject to this subpart must comply with this subpart before they begin to withdraw cooling water.

§ 125.83 What special definitions apply to this subpart?

When used in this subpart:

7Q10 means the lowest average seven-consecutive-day low flow with an average recurrence frequency of once in 10 years determined hydrologically.

Annual mean flow means the average of daily flows over a calendar year. Historical data (up to 10 years) should be used where available.

Closed-cycle recirculating system means a system designed, using minimized makeup and blowdown flows, to withdraw water from a natural or other water source to support contact and noncontact cooling uses within a facility. The water is usually sent to a cooling canal or channel, lake, pond, or tower to allow waste heat to be dissipated and then is returned to the system. (Some facilities divert the waste heat to other process operations.) New source water (makeup water) is added to the system to replenish losses that have occurred due to blowdown, drift, and evaporation.

Cooling water means water used for contact or noncontact cooling, including water used for air conditioning, equipment cooling, evaporative cooling tower makeup, and dilution of effluent heat content. The intended use of the cooling water is to absorb waste heat rejected from the process or processes used, or from auxiliary operations on the facility's premises.

Cooling water intake structure means the total physical structure and any associated constructed waterways used to withdraw water from waters of the U.S., provided that at least 25 percent of the water withdrawn is used for cooling purposes. The cooling water intake structure extends from the point at which water is withdrawn from the surface water source to the first intake pump or series of pumps.

Design intake flow means the value assigned (during the facility's design) to the total volume of water withdrawn from a source water body over a specific time period.

Design intake velocity means the value assigned (during the design of a cooling water intake structure) to the average speed at which intake water passes through the open area of the intake screen (or other device) against which organisms might be impinged or through which they might be entrained.

Entrainment means the incorporation of fish, eggs, larvae, and other plankton with intake water flow entering and passing through a cooling water intake structure and into a cooling water system.

Estuary means all or part of the mouth of a river or stream or other body of water having an unimpaired natural connection with open seas and within which the seawater is measurably diluted with fresh water derived from land drainage. The salinity of an estuary exceeds 0.5 parts per thousand (by mass) but is less than 30 parts per thousand (by mass).

Existing facility means any facility that is not a new facility.

Freshwater river or stream means a lotic (free-flowing) system that does not receive significant inflows of water from oceans or bays due to tidal action.

Impingement means the entrapment of aquatic organisms on the outer part of an intake structure or against a screening device during periods of intake water withdrawal.

Lake means any inland body of open water with some minimum surface area free of rooted vegetation and with an average hydraulic retention time of more than 7 days. Lakes might be natural water bodies or impounded streams, usually fresh, surrounded by land or by land and a man-made retainer (*e.g.,* a dam). Lakes might be fed by rivers, streams, springs, and/or local precipitation.

Littoral zone means any nearshore area in a freshwater river or stream, lake or reservoir, or estuary or tidal river extending from the level of highest seasonal water to the deepest point at which submerged aquatic vegetation can be sustained (*i.e.,* the photic zone extending from shore to the substrate receiving one (1) percent of incident light); where there is a significant change in slope that results in changes to habitat and/or community structure; and where there is a significant change in the composition of the substrate (*e.g.,* cobble to sand, sand to mud). In oceans, the littoral zone encompasses the photic zone of the neritic region. The photic zone is that part of the water that receives sufficient sunlight for plants to be able to photosynthesize. The neritic region is the shallow water or nearshore zone over the continental shelf.

Maximize means to increase to the greatest possible amount, extent, or degree.

Minimize means to reduce to the smallest possible amount, extent, or degree.

Natural thermal stratification means the naturally occurring division of a waterbody into horizontal layers of differing densities as a result of variations in temperature at different depths.

New facility means any building, structure, facility, or installation that meets the definition of a ''new source'' or ''new discharger;'' in 40 CFR 122.2 and 122.29(b)(1), (2), and (4); commences construction after [the effective date of the final rule]; and has a new or modified cooling water intake structure.

Ocean means marine open coastal waters with a salinity greater than or equal to 30 parts per thousand (by mass).

Reservoir means any natural or constructed basin where water is collected and stored.

Source water means the water body (waters of the U.S.) from which the cooling water is withdrawn.

Tidal excursion means the horizontal distance along the estuary that a particle moves during one tidal cycle of ebb and flow.

Tidal river means the most seaward reach of a river or stream where the salinity is less than or equal to 0.5 parts per thousand (by mass) at a time of annual low flow and whose surface elevation responds to the effects of coastal lunar tides.

§ 125.84 As an owner or operator of a new facility, what must I do to comply with this subpart?

(a) If your new facility's cooling water intake structure is located in any of the types of water bodies in the first column of the following table, you must comply with the requirements in the second column.

If your cooling water intake structure is located in a[n] . . .	Then . . .
(1) Freshwater river or stream.	You must comply with paragraphs (b), (f), and (g) of this section and applicable requirements in § 125.86 (application requirements), § 125.87 (monitoring requirements), and § 125.88 (recordkeeping requirements).
(2) Lake or reservoir	You must comply with paragraphs (c), (f), and (g) of this section and applicable requirements in § 125.86 (application requirements), § 125.87 (monitoring requirements), and § 125.88 (recordkeeping requirements).
(3) Estuary or tidal river.	You must comply with paragraphs (d), (f), and (g) of this section and applicable requirements in § 125.86 (application requirements), § 125.87 (monitoring requirements), and § 125.88 (recordkeeping requirements).
(4) Ocean	You must comply with paragraphs (e), (f), and (g) of this section and applicable requirements in § 125.86 (application requirements), § 125.87 (monitoring requirements), and § 125.88 (recordkeeping requirements).

(b) If your new facility has one or more cooling water intake structures located in a freshwater river or stream, you must comply with the requirements of paragraphs (b)(1), (b)(2), or (b)(3) of this section. A table summarizing the applicable requirements follows.

TABLE-SUMMARY OF REQUIREMENTS FOR FRESHWATER RIVERS OR STREAMS BASED ON THE LOCATION OF THE COOLING WATER INTAKE STRUCTURE

Requirements	Location of Cooling Water Intake Structure Opening		
	≧ 50 Meters Outside Littoral Zone [§ 125.84(b)(1)]	< 50 Meters Outside Littoral Zone [§ 125.84(b)(2)]	Inside Littoral Zone [§ 125.84(b)(3)]
1. Design intake flow ≦5% source water annual mean flow or ≦25% of source water 7q10	✔	✔	✔
2. Design intake velocity ≦0.5 ft/s	✔	✔	✔
3. Reduce intake flow to a level commensurate with a closed cycle recirculating cooling water system		✔	✔
4. Implement additional design and construction technologies			✔

(1) If the opening to your cooling water intake structure is located at least 50 meters outside the littoral zone in a freshwater river or stream, you must meet all of the following requirements:

(i) The total design intake flow from all cooling water intake structures at your facility must be no more than the more stringent of 5 percent of the source water annual mean flow or 25 percent of the source water 7Q10;

(ii) The maximum design intake velocity at each cooling water intake structure at your facility must be no more than 0.5 ft/s.

(2) If the opening to your cooling water intake structure is located less than 50 meters outside the littoral zone in a freshwater river or stream, you must meet all of the following requirements:

(i) The total design intake flow from all cooling water intake structures at your facility must be no more than the more stringent of 5 percent of the source water annual mean flow or 25 percent of the source water 7Q10;

(ii) The maximum design intake velocity at each cooling water intake structure at your facility must be no more than 0.5 ft/s;

(iii) You must reduce your intake flow to a level commensurate with that which can be attained by a closed-cycle recirculating cooling water system;

(3) If the opening to your cooling water intake structure is located inside the littoral zone in a freshwater river or stream, you must meet all of the following requirements:

(i) The total design intake flow from all cooling water intake structures at your facility must be no more than the more stringent of 5 percent of the source water annual mean flow or 25 percent of the source water 7Q10;

(ii) The maximum design intake velocity at all cooling water intake structures at your facility must be no more than 0.5 ft/s;

(iii) You must reduce your intake flow to a level commensurate with that which can be attained by a closed-cycle recirculating cooling water system;

(iv) You must implement additional design and construction technologies that minimize impingement and

entrainment of fish, eggs, and larvae and maximize survival of impinged adult and juvenile fish;

(c) If your new facility has one or more cooling water intake structures located in a lake or reservoir, you must comply with the requirements of paragraphs (c)(1), (c)(2), or (c)(3) of this section. A table summarizing the applicable requirements follows.

TABLE-SUMMARY OF REQUIREMENTS FOR LAKES OR RESERVOIRS BASED ON THE LOCATION OF THE COOLING WATER INTAKE STRUCTURE

Requirements	Location of Cooling Water Intake Structure Opening		
	≧50 Meters Outside Littoral Zone [§ 125.84(c)(1)]	≦50 Meters Outside Littoral Zone [§ 125.84(c)(2)]	Inside Littoral Zone [§ 125.84(c)(3)]
1. Design intake flow must not alter the natural thermal stratification	✔	✔	✔
2. Design intake velocity ≦0.5 ft/s		✔	✔
3. Reduce intake flow to a level commensurate with a closed cycle recirculating cooling water system		✔	✔
4. Implement additional design and construction technologies			✔

(1) If the opening to your cooling water intake structure is located at least 50 meters outside the littoral zone in a lake or reservoir, you must meet all of the following requirements: The total design intake flow at your facility must not alter the natural thermal stratification of the source water.

(2) If the opening to your cooling water intake structure is located less than 50 meters outside the littoral zone in a lake or reservoir, you must meet all of the following requirements:

(i) The total design intake flow at your facility must not alter the natural thermal stratification of the source water;

(ii) The maximum design intake velocity at each cooling water intake structure at your facility must be no more than 0.5 ft/s;

(iii) You must reduce your intake flow to a level commensurate with that which can be attained by a closed-cycle recirculating cooling water system;

(3) If the opening to your cooling water intake structure is located inside the littoral zone in a lake or reservoir, you must meet all of the following requirements:

(i) The total design intake flow at your facility must not alter the natural thermal stratification of the source water;

(ii) The maximum design intake velocity at each cooling water intake structure at your facility must be no more than 0.5 ft/s;

(iii) You must reduce your intake flow to a level commensurate with that which can be attained by a closed-cycle recirculating cooling water system;

(iv) You must implement additional design and construction technologies that minimize impingement and entrainment of fish, eggs, and larvae and maximize survival of impinged adult and juvenile fish;

(d) If your new facility has one or more cooling water intake structures located in an estuary or a tidal river, you must comply with the requirements of paragraph (d)(1) of this section. A table summarizing the applicable requirements follows.

TABLE-SUMMARY OF REQUIREMENTS FOR ESTUARIES OR TIDAL RIVERS BASED ON THE LOCATION OF THE COOLING WATER INTAKE STRUCTURE

Requirements for estuaries or tidal rivers	Location of Cooling Water Intake Structure Opening
	Anywhere in Estuary or Tidal River [§ 125.84(d)(1)]
1. Design intake flow ≦1% of the volume of the water column (see 125.84(d)(1))	✔
2. Design intake velocity ≦0.5 ft/s	✔
3. Reduce intake flow to a level commensurate with a closed cycle recirculating cooling water system	✔
4. Implement additional design and construction technologies	✔

(1) If the opening to your cooling water intake structure is located anywhere in an estuary or a tidal river, you must meet all of the following requirements:

(i) The total design intake flow from all cooling water intake structures at your facility must be no greater than one (1) percent of the volume of the water column within the area centered about the opening of the intake with a diameter defined by the distance of one tidal excursion at the mean low water level;

(ii) The maximum design intake velocity at all cooling water intake structures at your facility must be no more than 0.5 ft/s;

(iii) You must reduce your intake flow to a level commensurate with that which can be attained by a closed-cycle recirculating cooling water system;

(iv) You must implement additional design and construction technologies that minimize impingement and entrainment of fish, eggs, and larvae and maximize survival of impinged adult and juvenile fish;

(e) If your new facility has one or more cooling water intake structures located in an ocean, you must comply with the requirements of paragraphs (e)(1) or (2) of this section. A table summarizing the applicable requirements follows.

TABLE-SUMMARY OF REQUIREMENTS FOR OCEANS BASED ON THE LOCATION OF THE COOLING WATER INTAKE STRUCTURE

Requirements	Location of cooling water intake structure opening	
	Outside littoral zone [§ 125.84(e)(1)]	Inside littoral zone [§ 125.84(e)(2)]
1. Design intake velocity ≤ 0.5 ft/s	✔	✔
2. Reduce intake flow to a level commensurate with a closed cycle recirculating cooling water system		✔
3. Implement additional design and construction technologies		✔

(1) If the opening to your cooling water intake structure is located outside the littoral zone in an ocean, you must meet all of the following requirements:

(i) The maximum design intake velocity at each cooling water intake structure at your facility must be no more than 0.5 ft/s.

(2) If the opening to your cooling water intake structure is located inside the littoral zone in an ocean, you must meet all of the following requirements:

(i) The maximum design intake velocity at each cooling water intake structure at your facility must be no more than 0.5 ft/s;

(ii) You must reduce your intake flow to a level commensurate with that which can be attained by a closed-cycle recirculating cooling water system;

(iii) You must implement additional design and construction technologies that minimize impingement and entrainment of fish, eggs, and larvae and maximize survival of impinged adult and juvenile fish;

(f) The Director may include more stringent requirements in the permit than those specified in paragraphs (a) through (e) of this section if he or she determines that they are reasonably necessary to minimize impingement and entrainment as a result of the effects of multiple cooling water intake structures in the same body of water; seasonal variations in the aquatic environment affected by the cooling water intake structures controlled by the permit; or the presence of regionally important species.

(g) The Director must include any more stringent requirements relating to the location, design, construction, and capacity of a cooling water intake structure at a new facility that are reasonably necessary to ensure attainment of water quality standards, including designated uses, criteria, and antidegradation requirements.

§ 125.85 May alternative requirements be imposed?

(a) Any interested person may request that alternative requirements less stringent than those specified in § 125.84(a) through (e) be imposed in the permit. The Director also may propose alternative requirements in the draft permit. A request for the establishment of alternative requirements less stringent than the requirements of § 125.84(a) through (e) may be approved only if:

(1) There is an applicable requirement under § 125.84(a) through (e);

(2) Data specific to the facility indicate that compliance with the requirement at issue would result in compliance costs wholly out of proportion to the costs EPA considered in establishing the requirement at issue;

(3) The alternative requirement requested is no less stringent than justified by the wholly out of proportion cost; and

(4) The alternative requirement will ensure compliance with sections 208(e) and 301(b)(1)(C) of the Clean Water Act.

(b) The burden is on the person requesting the alternative requirement to demonstrate that alternative requirements should be imposed. The requester should refer to all relevant information, including the support documents for this rulemaking, all associated data collected for use in developing each requirement, and other relevant information that is kept on public file by EPA to demonstrate that the appropriate requirements of paragraph (a) of this section have been met.

§ 125.86 As an owner or operator of a new facility, what must I collect and submit when I apply for my new or reissued NPDES permit to show that I am complying with this subpart?

(a) *Source water baseline biological characterization.* As an owner or operator of a new facility, you must begin to collect source water baseline biological characterization data at least 1 year before you must submit your permit application to the Director.

(1) This information is required to evaluate the condition of the biological community and to identify potential (and/or to minimize actual) entrainment and impingement impacts from each cooling water intake structure. The Director will use the information to determine compliance with requirements involving additional design and construction technology requirements and the need for more stringent requirements under § 125.84(f) and (g). As part of this evaluation, you must collect data on both nekton and meroplankton to determine the abundance of relevant species or taxa, and life stages in the water column in the vicinity of each proposed or actual cooling water intake structure. Based on the available life history information and collected data, you also must determine which species and life stages would be most susceptible to impingement or entrainment. With the Director's approval, you may use existing data instead of actual field studies. You must comply with the following requirements and document them in a report submitted to the Director.

(2)(i) If you are required to comply with the requirements in § 125.84(b)(3), (c)(3), (d)(1), or (e)(2), you must develop a sampling plan that documents all methods and quality assurance procedures for data collection, sampling, and analysis. You must submit this plan to the Director for review and approval before any sampling activities begin.

(ii) If you are required to comply with the requirements in § 125.84(b)(1), (b)(2), (c)(1), (c)(2), or (e)(1), you must develop a sampling plan that documents all methods and quality assurance procedures for data collection, sampling, and analysis and maintain the plan at your facility. You are *not* required to submit this plan to the Director.

(iii) The sampling and data analysis methods you propose must be appropriate for a quantitative survey and based on a consideration of methods used in other biological studies performed in the source water body. The study area should include, at a minimum, the area of influence of the cooling water intake structure. The sampling plan must include a

description of the study area (which must include the area of influence of the cooling water intake structure and at least 100 meters beyond); a list and description of other relevant studies; a proposal to use data in lieu of actual sampling (if applicable); identification of the biological assemblages to be sampled (both nekton and meroplankton); data collection, sampling, and analysis methods; and any public participation or consultation with Federal or State agencies undertaken in development of the plan.

(3) All owners or operators of new facilities must comply with the following requirements:

(i) Identify up to ten (10) species most important in terms of significance to commercial and recreational fisheries and the forage base.

(ii) Identify all threatened and endangered species that might be susceptible to impingement and entrainment.

(iii) Conduct a sampling program covering at least a 1-year cycle of biological activity in the vicinity of the cooling water intake structure. If you are required to submit a sampling plan to the director in paragraph (a) (2)(i) of this section, the sampling must be based on the Director's approved sampling plan.

(iv) Determine which species are most susceptible to impingement or entrainment based on the information collected and the primary period of reproduction, larval recruitment, and peak meroplankton abundance.

(b) As an owner or operator of a new facility, you must submit the following information to the Director when you apply for a new or reissued NPDES permit in accordance with 40 CFR 122.21:

(1) *Source water physical data.* As an owner or operator of a new facility, you must submit the following source water information that demonstrates and supports a determination of the appropriate requirements to apply to your cooling water intake structures.

(i) A narrative description and scaled drawings showing the physical configuration of all source water bodies, including areal dimensions, depths, salinity regimes, and other documentation that supports your determination of the water body type where each cooling water intake structure is located;

(ii) A narrative description of the configuration of each cooling water intake structure and where it is located in the water body and in the water column;

(iii) Documentation delineating the littoral zone of the water body in the vicinity of each cooling water intake structure, including light penetration and hydromorphological data, submerged aquatic vegetation, substrate data, and a demonstration of where the cooling water intake structure is located in relation to the littoral zone; and

(iv) Latitude and longitude in degrees, minutes, and seconds for each of your cooling water intake structures;

(v) Engineering drawings and locational maps to illustrate the information required by paragraphs (b)(1)(i), (ii), and (iii) of this section.

(vi) A report documenting the results of the Source Water Baseline Characterization required in paragraph (a) of this section.

(2) *Cooling water intake structure flow data.* As an owner or operator of a new facility, you must submit the following information that demonstrates and supports a determination of the appropriate requirements to apply to your cooling water intake structures.

(i) A narrative description of the operation of all cooling water intake structures, including design intake flows, daily hours of operation, and seasonal changes, if applicable; and

(ii) A flow distribution and water balance diagram that includes all sources of water to the facility, recirculating flows, and discharges.

(3) *Flow requirements.* If you must comply with the cooling water intake structure flow requirements in § 125.84(b)(2)(iii), (b)(3)(iii), (c)(2)(iii), (c)(3)(iii), (d)(1)(iii), (e)(1)(ii), or (e)(2)(iii), you must submit the following information to the Director:

(i) If your cooling water intake structure is located in a freshwater river or stream, you must provide the annual mean and 7Q10 flows and any supporting documentation and engineering calculations to show that your cooling water intake structure meets the flow requirements.

(ii) If your cooling water intake structure is located in an estuary or tidal river, you must provide the mean low water tidal excursion distance and any supporting documentation and engineering calculations to show that your cooling water intake structure facility meets the flow requirements.

(iii) If your cooling water intake structure is located in a lake or reservoir, you must provide a narrative description of the water body stratification, and any supporting documentation and engineering calculations to show that the stratification will not be upset by the design intake flow.

(4) *Velocity requirement.* If you must comply with the cooling water intake structure velocity requirement in § 125.84(b)(1)(ii), (b)(2)(ii), (b)(3)(ii), (c)(2)(ii), (c)(3)(ii), (d)(1)(ii), (e)(1)(i), or (e)(2)(i), you must submit the following information to the Director:

(i) A narrative description of the design, structure, equipment, and operation used to meet the velocity requirement; and

(ii) Design calculations showing that the velocity requirement will be met at minimum ambient source water surface elevation and maximum head loss across the screens or other device.

(5) *Flow reduction requirement.* If you must comply with the requirement to reduce your flow to a level commensurate with that which can be attained by a closed-cycle recirculating cooling water system in § 125.84(b)(2)(iii), (b)(3)(iii), (c)(2)(iii), (c)(3)(iii), (d)(1)(iii), (e)(1)(ii), or (e)(2)(ii), you must submit a narrative description of the closed-cycle recirculating cooling water system design and any engineering calculations, including documentation demonstrating that your make-up and blowdown have been minimized. If you meet the flow reduction requirement by reusing 100 percent of the cooling water withdrawn from a source water, you must provide a demonstration that 100 percent of the cooling water is reused in one or more unit processes at the facility.

(6) *Additional design and construction technology requirement.* If you must comply with the requirement in § 125.84(b)(3)(iv), (c)(3)(iv), (d)(2)(iv), or (e)(2)(iii) to implement additional design and construction technologies that maximize the survival of impinged adult and juvenile fish and minimize the entrainment of fish, eggs, and larvae, you must submit to the Director for review and approval a plan that contains information on the technologies you propose to implement based on the results of the Source Water Baseline Biological Characterization required by § 125.86(a). The plan must contain the following information:

(i) A narrative description of the design and operation of any additional design and construction technologies, including fish-handling and return systems, that you will use to maximize the survival of those species expected to be most susceptible to impingement. Provide species-specific information that demonstrates the efficacy of the technology.

(ii) A narrative description of the design and operation of any additional design and construction technologies that you will use to minimize entrainment of those species expected to be the most susceptible to entrainment. Provide species-specific information

that demonstrates the efficacy of the technology.

(iii) Design calculations, drawings, and estimates to support the descriptions provided in paragraphs (b)(6)(i) and (ii) of this section.

(7) *Data to support alternative requirements.* If you are seeking alternative requirements under § 125.85, you must submit data that demonstrate that your compliance costs are wholly out of proportion to the costs considered by EPA in establishing the requirements in § 125.84 (a) through (e).

(8) *Other data.* As an owner or operator you must submit other information required by the Director to determine appropriate requirements and other permit conditions to minimize adverse environmental impact.

§ 125.87 As an owner or operator of a new facility, must I perform monitoring?

As an owner or operator of a new facility, you will be required to perform monitoring to demonstrate your compliance with the velocity requirement specified in § 125.84, perform visual inspection of the technologies installed, and assess the need for additional design and construction technologies to minimize entrainment and maximize impingement survival. This section contains monitoring requirements, including how often you must monitor.

(a) *Biological monitoring.* You must monitor both impingement and entrainment of the commercial and recreational fisheries and the forage base species identified in the Source Water Baseline Biological Characterization required by § 125.86(a). The monitoring methods used must be consistent with those used for the Source Water Baseline Biological Characterization required under § 125.86(a). You must follow the monitoring frequencies identified below for at least two (2) years after the initial permit issuance. After that time, the Director may approve a request for less frequent sampling in the remaining years of the permit term and when the permit is reissued, if supporting data show that less frequent monitoring would still allow for the detection of any seasonal and daily variations in the species and numbers of individuals that are impinged or entrained.

(1) *Impingement.* You must collect samples to monitor impingement rates for each species over a 24-hour period and no less than once per month.

(2) *Entrainment.* You must collect samples to monitor entrainment rates for each species over a 24-hour period and no less than biweekly during the primary period of reproduction, larval recruitment, and peak meroplankton abundance identified during the Source Water Baseline Biological Characterization required by § 125.86(a).

(b) *Velocity monitoring.* If your facility uses intake screen systems, you must monitor head loss across the screens and correlate the measured value with the design intake velocity. The head loss across the intake screen must be measured at the minimum ambient source water surface elevation and maximum head loss for each cooling water intake structure. If your facility uses devices other than intake screens, you must monitor velocity at the point of entry through the device. You must monitor head loss or velocity during initial facility startup, and thereafter, at the frequency specified in your NPDES permit, but no less than once per quarter.

(c) *Visual inspections.* You must conduct visual inspections at least weekly to ensure that any additional design and construction technologies implemented under the plan required by § 125.86(b)(6), and other technologies to minimize entrainment and maximize impingement survival are maintained and operated so as to ensure that they will continue to function as designed.

§ 125.88 As an owner or operator of a new facility, must I keep records and report?

As an owner or operator of a new facility you are required to keep records and to report information and data to the Director as follows:

(a) You must keep records of all the data used to complete the permit application and show compliance with the requirements, any supplemental information developed under § 125.86, and any compliance monitoring data submitted under § 125.87, for a period of at least three (3) years from the date of permit issuance. The Director may require that these records be kept for a longer period.

(b) You must provide the following to the Director in a yearly status report:

(1) Biological monitoring records for each cooling water intake structure as required by § 125.87(a);

(2) Velocity and head loss monitoring records for each cooling water intake structure as required by § 125.87(b); and

(3) Records of visual inspections as required in § 125.87(c).

§ 125.89 As the Director, what must I do to comply with the requirements of this subpart?

(a) *Sampling plan for source water baseline biological characterization.* As the Director, you must review and approve, approve with comments, or disapprove, the sampling plan required by § 125.86(a)(2)(i) within 90 days.

(b) *Permit application.* As the Director, you must review materials submitted by the applicant under § 125.86(b) at the time of the initial permit application and before each permit renewal or reissuance to determine whether there have been any changes in facility operations or physical and biological attributes of the source water body. You must evaluate any changes to determine the need for additional or more stringent conditions in the permit.

(c) *Permitting requirements.* Section 316(b) requirements are imposed on facilities through NPDES permits. As the Director, you must determine, based on the information submitted by the new facility in its permit application, the appropriate requirements and conditions to include in the permit based on the location of the cooling water intake structure and the water body type. You must also review and approve, approve with comments, or disapprove any plan submitted under § 125.86(a) or (b)(6). The following requirements must be included in each permit:

(1) *Cooling water intake structure requirements.* At a minimum, the permit conditions must include conditions that implement the requirements of § 125.84. In addition, you must consider whether more stringent conditions are reasonably necessary in accordance with § 125.84(f) and (g).

(2) *Monitoring conditions.* At a minimum, the permit must require the permittee to perform the monitoring required by § 125.87. You may modify the monitoring program when the permit is reissued and during the term of the permit based on changes in physical or biological conditions in the vicinity of the cooling water intake structure.

(3) *Recordkeeping and reporting.* At a minimum, the permit must require the permittee to report and keep records as required by § 128.88.

3. Revise the subpart heading for subpart J to read as follows:

Subpart J—Criteria and Standards Applicable to Cooling Water Intake Structures for Existing Facilities Under Section 316(b) of the Act—[Reserved]

[FR Doc. 00–19373 Filed 8–9–00; 8:45 am]
BILLING CODE 6560–50–P