

121), we want to assist small entities in understanding this proposed rule so that they can better evaluate its effects on them and participate in the rulemaking. If the proposed rule would affect your small business, organization, or governmental jurisdiction and you have questions concerning its provisions or options for compliance, please contact LTJG Heath Hartley at (305) 535-8762 for assistance in understanding and participating in this rulemaking.

### Collection of Information

This proposed rule would call for no new collection of information under the Paperwork Reduction Act of 1995 (44 U.S.C. 3501-3520).

### Federalism

A rule has implications for federalism under Executive Order 13132, Federalism, if it has a substantial direct effect on State and local governments and would either preempt State law or impose a substantial direct cost of compliance on them. We have analyzed this proposed rule under that Order and have determined that it does not have implications for federalism.

### Unfunded Mandates Reform Act

The Unfunded Mandates Reform Act of 1995 (2 U.S.C. 1531-1538) requires Federal agencies to assess the effects of their discretionary regulatory actions. In particular, the Act addresses actions that may result in the expenditure by a State, local, or tribal government, in the aggregate, or by the private sector of \$100,000,000 or more in any one year. Though this proposed rule would not result in such an expenditure, we do discuss the effects of this rule elsewhere in this preamble.

### Taking of Private Property

This proposed rule would not effect a taking of private property or otherwise have taking implications under Executive Order 12630, Governmental Actions and Interference with Constitutionally Protected Property Rights.

### Civil Justice Reform

This proposed rule meets applicable standards in sections 3(a) and 3(b)(2) of Executive Order 12988, Civil Justice Reform, to minimize litigation, eliminate ambiguity, and reduce burden.

### Protection of Children

We have analyzed this proposed rule under Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks. This rule is not an economically

significant rule and does not concern an environmental risk to health or risk to safety that may disproportionately affect children.

### Indian Tribal Governments

This proposed rule does not have tribal implications under Executive Order 13175, Consultation and Coordination with Indian Tribal Governments, because it does not have a substantial direct effect on one or more Indian tribes, on the relationship between the Federal Government and Indian tribes, or on the distribution of power and responsibilities between the Federal Government and Indian tribes.

### Environment

We considered the environmental impact of this proposed rule and concluded that, under, Figure 2-1, paragraph 34(g) of Commandant Instruction M16475.1C, this rule is categorically excluded from further environmental documentation. A "Categorical Exclusion Determination" is available in the docket where indicated under ADDRESSES.

### List of Subjects in 33 CFR Part 165

Harbors, Marine safety, Navigation (water), Reporting and recordkeeping requirements, Security measures, Waterways.

For the reasons discussed in the preamble, the Coast Guard proposes to amend 33 CFR Part 165, as follows:

### PART 165—REGULATED NAVIGATION AREAS AND LIMITED ACCESS AREAS

1. The authority citation for part 165 continues to read as follows:

**Authority:** 33 U.S.C. 1231; 50 U.S.C. 191, 33 CFR 1.05-1(g), 6.04-1, 6.04-6, 160.5; 49 CFR 1.46.

2. In § 165.726 a new paragraph (b)(9) is added to read as follows:

#### § 165.726 Regulated Navigation Areas; Miami River, Miami, Florida.

\* \* \* \* \*

(b) \* \* \*

(9) All vessels greater than 200 gross tons shall be operational and capable of leaving the Miami River and Tamiami Canal within 24 hours of notice during hurricane season from June 1 until November 30 annually.

\* \* \* \* \*

Dated: May 7, 2001.

**G.W. Sutton,**

*Captain, U.S. Coast Guard, Commander, Seventh Coast Guard District, Acting.*

[FR Doc. 01-13285 Filed 5-24-01; 8:45 am]

**BILLING CODE 4910-15-U**

## ENVIRONMENTAL PROTECTION AGENCY

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

[FRL-6981-1]

### Notice of Data Availability; National Pollutant Discharge Elimination System—Regulations Addressing Cooling Water Intake Structures for New Facilities

**AGENCY:** Environmental Protection Agency (EPA).

**ACTION:** Proposed rule; Notice of data availability.

**SUMMARY:** On August 10, 2000, EPA proposed standards for cooling water intake structures at new facilities to implement section 316(b) of the Clean Water Act (CWA) (65 FR 49060). This notice presents a summary of the data EPA has received or collected since proposal, an assessment of the relevance of the data to EPA's analysis, some modified technology options suggested by commenters, and an alternative approach suggested by a trade group representing the utility industry. EPA solicits public comments about any of the information presented in this notice and the record supporting this notice.

**DATES:** Comments on this notice of data availability must be received or postmarked on or before midnight June 25, 2001.

**ADDRESSES:** Mail public comments regarding this notice of data availability 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. Deliver your comments in person (including overnight mail) 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 may also submit comments electronically to [ow-docket@epa.gov](mailto: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?"

**FOR FURTHER INFORMATION CONTACT:** Deborah G. Nagle at (202) 260-2656. The e-mail address for the above contact is [rule.316b@epa.gov](mailto:rule.316b@epa.gov).

### SUPPLEMENTARY INFORMATION:

#### Contents

I. Purpose of this Notice

- II. Data Obtained Since the Proposal
  - A. Regulatory Thresholds
  - B. Industry Profile for Utility and Nonutility Electricity Generators
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  - E. Additional Data and Information Concerning the Impingement and Entrainment Approach and the Population Approach and Biological Assessment Approach to Defining Adverse Environmental Impact
  - F. Additional Data Related to the Specific Technology Limits in the Proposed Regulations
  - G. Revision in Costing and Energy Impact Estimates
  - H. Industry Approach

### I. Purpose of This Notice

On August 10, 2000 (65 FR 49060), EPA proposed standards for cooling water intake structures at new facilities to implement section 316(b) of the Clean Water Act (CWA) (see #2-001 in the Docket). EPA has received numerous comments and data submissions concerning the proposal and has collected additional data. In this notice, EPA is making these new data available for comment and is assessing the relevance of the data to EPA's analysis. Since the end of the comment period, EPA also received an alternative regulatory approach suggested by a trade group representing the utility industry which is discussed in this notice and is included in the record for the rule. EPA has initially reviewed this approach and, in this notice, suggests modifications to the approach that are being considered for the final rule. EPA solicits public comments regarding any of the information presented in this notice and the record supporting this notice.

## II. Data Obtained Since the Proposal

### A. Regulatory Thresholds

EPA proposed that the term "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 twenty-five (25) percent of the water withdrawn is used for cooling purposes (see proposed 40 CFR 125.83, 65 FR 49116). A number of commenters asserted that EPA did not provide a rational basis in its record for proposing that use of 25% of intake flow for cooling should determine whether an intake structure is a "cooling water intake structure." In response to these comments, EPA requests comment on preliminary data the Agency recently gathered from its detailed questionnaire for existing facilities. These data

document the percentage of manufacturing facilities that use the following percentages of water withdrawn from waters of the U.S. for cooling purposes: more than 5% (87% of the manufacturing facilities); more than 10% (82% of manufacturing facilities); more than 15% (77% of manufacturing facilities); more than 20% (74% of manufacturing facilities); more than 25% (68% of manufacturing facilities); and more than 50% (49% of manufacturing facilities). See "Percentages of In-scope Facilities Using Various Proportions of Their Intake Water for Cooling Purposes" (#2-002 in the Docket). EPA will continue refining these data by, as necessary, calling back certain facilities to clarify any data quality concerns. The Agency will use these data to estimate the effect of alternative thresholds on the amount of new cooling water subject to this rulemaking. EPA will determine whether to revise the definition of a cooling water intake structure for the final new facility regulation based on this information, other information noticed today on adverse environmental impact (Section E below), waterbody sensitivity (Section D below) and proposed limitations on intake capacity based on waterbody flow rates (Section F below) and on information already in the record.

To improve the definition in EPA's proposal (65 FR 49066-49067), EPA requests comment on two alternatives:

- New facility intake structures not subject to this rule because of the amount of cooling water they use are not considered cooling water intake structures for regulatory purposes and thus would not be subject to section 316(b) of the CWA; or
- New facility intake structures not subject to this rule because of the amount of cooling water they use may be subject to requirements established by permit authorities under CWA section 316(b) on a case-by-case basis.

EPA's proposed regulations 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) million gallons per day (MGD) of source water. 65 FR 49067-49068. Since proposal, EPA collected preliminary data from its detailed questionnaire for existing facilities. These data document the percentage of existing facilities constructed in the last 10 years that would be covered by national regulation at the following alternative regulatory flow thresholds: 2 MGD, 5 MGD, 10 MGD, 15 MGD, 20 MGD, 25 MGD, 30 MGD, 50 MGD and 100 MGD. The data analysis shows that 58% of the manufacturers, 70% of the

nonutilities and 100% of the utilities built in the last 10 years would be regulated if the threshold was 2 MGD as proposed in the new facility rule. At the 2 MGD threshold 99.7% of the total flow would be covered. At a threshold of 15 MGD, 32% of the manufacturers, 29% of the nonutilities and 50% of the utilities would be covered, as would 97.3% of the total flow. The total flow covered remains relatively high, because the large flows from a small number of utility facilities dominate the total flow. At a threshold of 25 MGD, 18% of the manufacturers, 17% of the nonutilities and 50% of the utilities built in the last 10 years would be regulated, covering 94.9% of the total flow. By industry category, 71.4% of the flows from manufacturers, 74.3% of the flows from nonutilities, and 99.5% of the flows from utilities would be regulated. See "Percentages of In-scope Facilities Meeting Various Design Intake Flow Thresholds" (see #2-003 in the Docket).

The Agency also is considering State of Maryland regulations for cooling water intake structures (see COMAR 26.08.03, #2-004 in the Docket). These regulations exclude cooling water intake structures withdrawing less than 10 MGD if the volume of water is less than 20 percent of the design stream flow for nontidal waters or less than 20 percent of the annual average net flow past the intake which is available for dilution for tidal waters. EPA intends to consider this new information, as well as the information discussed and included in the record at proposal and any other relevant sources of information, to establish a minimum flow threshold in final regulations.

### B. Industry Profile for Utility and Nonutility Electricity Generators

EPA intends to consider basing its estimate of new electricity-generating facilities for the final rule, in part, on a revised Department of Energy (DOE) forecast for growth in demand for electricity over the next twenty years. (See Annual Energy Outlook 2001, DOE, Energy Information Agency DOE/EIA #6383 (2001), #2-005 in the Docket.) At the time of proposal, DOE projected a 1.3% annual increase in growth in demand for electricity over the next twenty years. Now, due in part to a revision in the methodology used by the Department of Commerce to calculate gross domestic product, DOE projects a 1.8% rate of increase in growth in demand for electricity over the next twenty years. DOE also projects that new electricity generating capacity will be needed sooner than previously forecast. Of the new generating capacity needed in the next 20 years, DOE

projects that 22 Gigawatts will be supplied by coal-fired steam electric generating facilities, and that 209 Gigawatts will be supplied by natural gas-fired, combined-cycle facilities.

#### 1. Profile for Combined-Cycle Electric Generating Facilities

DOE does not gather information on specific, planned new electricity-generating facilities and does not estimate the number of facilities that utility and nonutility power producers will build to meet increases in demand. Thus, EPA is considering, as at proposal, using the NEWGen database, a proprietary database owned by Resources Data International, Inc., to estimate the average size of new combined-cycle facilities. (See Engineering and Economic Analyses for the Proposed Section 316(b) New Facility Rule, EPA-821-R-00-019 (#1-5046-PR in the Docket) for more information on the methodology EPA used to project new facilities and their compliance costs at proposal.) To estimate the total number of new combined-cycle facilities that will be built over the next twenty years, EPA is considering dividing DOE's new forecast of demand for new combined-cycle electricity generating capacity over the next twenty years by the average size of new, U.S. combined-cycle facilities in the February 2001 version of the NEWGen database. EPA also may use the February 2001 NEWGen database to estimate the percentage of new combined-cycle facilities that have characteristics that would make them subject to a section 316(b) rule for new facilities (e.g., do they plan to withdraw cooling water from waters of the U.S. in amounts greater than the regulatory threshold). For costing purposes, EPA is considering using the methodology used at proposal (described Chapters 5 and 6 and Appendices A and B of Economic and Engineering Analyses of the Proposed Section 316(b) New Facility Rule, EPA-821-R-00-019, August 2000) using the February 2001 NEWGen database to estimate the baseline of cooling water intake structure technologies that would be in place at new combined-cycle facilities without final regulations.

Following proposal, EPA received comment from the Utility Water Act Group (UWAG), an association of individual electric utilities and three national trade associations of electric utilities (see W-00-03, 316(b) Comments 1.68). UWAG objected to the Agency's use of the NEWGen database to project the number of combined-cycle facilities that would be subject to the

regulations and the baseline of intake structure technologies without making this proprietary database available to the public. On September 25, 2000, EPA added information to the rulemaking record (see #1-6001-AD, Identification of NEWGen Facilities for the Economic Analysis for the proposed section 316(b) New Facility Rule) so that the public could determine which facilities the Agency considered in developing its profile of new combined-cycle facilities and comment on additional facilities that the Agency should have considered. EPA is now reviewing information provided by the Edison Electric Institute (EEI) (see W-00-03, 316(b), Comments 1.69) regarding additional combined-cycle facilities that EEI asserts would be subject to the proposed regulations.

At proposal, the NEWGen database contained information about 94 combined-cycle facilities. EPA is now investigating the 323 combined-cycle facilities documented in the February 2001 NEWGen database. Because the Agency received this information very recently, EPA has not completed its analysis of these combined-cycle facilities. Therefore, EPA cannot provide additional information at this time on:

- The total number of combined-cycle facilities the Agency projects may bear costs to comply with final new facility regulations
- The average size of new combined-cycle facilities
- The intake structure technologies likely to be in place at these facilities absent final regulations.

However, these data appear to indicate that, based on changes in the NEWGen database and DOE's new forecast for electricity from new combined-cycle facilities, more facilities than estimated at proposal would need to bear costs to comply with final regulations similar to the proposal. EPA has provided summary information on the 323 combined-cycle facilities in the February 2001 NEWGen database, so that the interested public can determine which facilities the Agency is considering as it develops a profile of new combined-cycle facilities for final regulations (see #2-006 in the Docket). As at proposal, EPA solicits public comment on any additional facilities that the public believes will be subject to this rule. Specifically, the Agency requests that members of the public provide the Agency with detailed information on specific, new combined-cycle facilities that may be built after the end of calendar year 2001, and may be required to comply with final new

facility regulations. EPA seeks information on facility size (Megawatt output), facility cost, source of cooling water, ownership, location, and any plans for where the cooling water intake structure will be located within the source water body, what the capacity of the cooling water intake structure will be, and what technologies would be used to reduce impingement and entrainment independent of final regulations.

As a supplement to the approach described above, EPA intends to consider publicly-available information from the 1998 Annual Electric Generator Reports that utility and nonutility power generators submit to DOE (see data from Forms EIA-860A and EIA-860B, Annual Electric Generator Report-1998, Energy Information Administration (EIA), U.S. Department of Energy, #2-007 in the Docket), as well as data from the section 316(b) Questionnaire EPA sent to existing facilities. Specifically, EPA is evaluating data from the EIA-860 databases for each utility and nonutility power plant that EPA surveyed to estimate the average size of new combined-cycle facilities. To estimate average plant size, EPA also is evaluating EIA's Assumptions to the Annual Energy Outlook 2001, DOE/EIA #0554(2001) (see #2-008 in the Docket), which lists the average size of future combined-cycle and coal units as 400 MW and states that most plants are likely to have more than one unit. EPA also is evaluating the section 316(b) survey responses to estimate the number of new facilities likely to be subject to regulation and the distribution of cooling systems and intake structure technologies likely to be in place at these facilities in the absence of new regulations. (See Newbert, Riley, and Mike Fisher, Abt Associates. Memo on: Analysis of Information Regarding Average Plant Size, In-scope Rate, and Distribution of Baseline Cooling System Types to Lynne Tudor, et.al., USEPA. April 24, 2001, #2-009 in the Docket.) These survey data indicate that, depending on whether one analyzes only the detailed questionnaire data or the detailed questionnaire in combination with the screener questionnaire data, between 44% and 59% of the coal plants constructed in the last 20 years would be covered by the proposed new facility regulations. Of the combined cycle plants surveyed, 15% would be covered by the proposed regulations. Of these facilities, 73% of the coal-fired plants and 100% of the combined-cycle plants built in the last 20 years have a recirculating cooling

system and would meet the proposed requirement to reduce intake capacity to a level commensurate with use of a closed-cycle recirculating cooling system. For coal-fired facilities built in the last 10 years, the percentage of facilities that would be covered that have closed-cycle recirculating cooling systems increases to 88%. Looking at utilities only, these data show that 54% of the coal-fired plants and 15% of the combined-cycle plants built in the last 20 years would be covered by the proposed regulations. Of the 33 utilities built in the last 20 years that would be covered (if they were new facilities), 66% of the coal-fired plants and 100% of the combined-cycle plants have a closed-cycle recirculating cooling system. Seventy-five percent of the utility coal-fired plants built in the last 10 years that would be covered by the proposed regulations have a closed-cycle recirculating cooling system.

## 2. Profile for Coal-Fired Electric Generating Facilities

At proposal, the NEWGen database contained no information on new coal-fired steam electric generating facilities. For the years 2001–2010, DOE's Annual Energy Outlook 2000 projected limited new coal-fired steam electric generating capacity. Thus, EPA did not project any new coal facilities for 2001–2010. For the years 2011–2020, EPA used DOE's projected demand for new capacity from coal-fired facilities and information from the following sources to estimate the number of new coal-fired power plants that had characteristics that would make them subject to the rule and to estimate what cooling water intake structure technology would be in place at these plants absent final regulation:

- Form EIA-767, Steam Electric Plant Operation and Design Report, Energy Information Administration, U.S. Department of Energy, 1994, 1997. This database contains data on air and water quality from steam-electric power plants with generating capacities of 100 megawatts (MW) or greater. A small subset of the data is provided for steam electric power plants with generating capacity between 10 and 100 MW. An electronic copy of this database can be found in #2-010 in the Docket.
- Form EIA-860, Annual Electric Generator Report, Energy Information Administration, U.S. Department of Energy, 1994, 1997. Since EIA-767 contains only detailed information on utility facilities greater than 100 MW, this database was used to provide information on utility facilities less than 10 MW and to provide limited technical data on facilities between 10 and 100

MW. An electronic copy of this database can be found in #2-010 in the Docket.

- Power Statistics Database, Utility Data Institute, McGraw-Hill Company, 1994. This data was combined with data from DOE's Stream Electric Plant Operation and Design Report to provide more specific details on cooling water intake structure, cooling water system, and water body characteristics.

For the final rule, EPA is considering using a similar methodology to project the average size of new coal-fired facilities, the number that would be subject to the rule, and the baseline of intake structure technology that would be in place absent final regulations, but would supplement the DOE data described above with data from the section 316(b) survey of cooling water use by existing facilities. To support such an analysis, EPA is developing profiles as shown in the table "Surveyed Coal Plants, By Age of Oldest Unit and In-Scope Status" in #2-009 in the Docket. The Agency is also examining 17 coal-fired steam electric generating facilities in the February 2001 NEWGen database. EPA is actively seeking information from vendors and other sources of engineering information (see #2-011A–B in the Docket).

2-011A Couch, Gordon. OECD Coal-Fired Power Generation—Trends in the 1990s, IEA Coal Research The Clean Coal Centre, 1997.

2-011B Lammers, Thomas F. Steam Plant Operation, 7th Edition, McGraw-Hill, New York, New York, 1988.

## C. Industry Profile for Manufacturers

Following proposal, EPA received comment from the Department of Energy, the International Association of Drilling Contractors, the Offshore Oil Operators Committee, the American Petroleum Institute, and from individual companies expressing concern that the proposed regulations could adversely impact offshore and coastal oil and gas drilling operations that use cooling water. Among other concerns, these commenters stated that:

- Offshore and coastal oil and gas drilling facilities have much more limited technology options for addressing any adverse environmental impact of cooling water intake than land-based facilities;
- Under current regulations (40 CFR 435.11), existing mobile oil and gas extraction facilities are considered new sources when they operate on new development wells and, could be required to perform costly retrofits in order to comply with the 0.5 ft/s velocity standard if they become subject to the proposed requirements for

cooling water intake structures at new facilities; and

- Higher cooling water intake velocities are necessary in marine waters to control biofouling of cooling water intake structures.

At proposal, EPA had not considered or projected impacts on this industrial category. EPA seeks additional information on cooling water use by offshore and coastal oil and gas extraction facilities (e.g., drill ships, semi-submersibles, jack-ups, tension-leg platforms, spars, etc.). EPA requested additional information from the commenters (see #2-012A–B in the Docket). The Agency has also sought information from the Department of Interior's Minerals Management Service and from the U.S. Coast Guard. This new information suggests that mobile offshore and coastal drilling units use volumes of cooling water that could make them subject to the proposed regulations. However, little information is available about impingement and entrainment associated with this use of cooling water or the costs or achievability of measures to reduce any adverse environmental impact. EPA requests that the public provide peer-reviewed data (e.g., journal articles), operator/drilling contractor field data, and/or design schematics for mobile offshore drilling units to support or dispute assertions made by these commenters. Specifically, EPA would like additional reference data for the following areas:

- Cooling water intake structure capacities (e.g., volumes of water used per unit of time) and velocities (specifically whether measured on a through-screen or approach velocity basis) for various types of offshore and coastal oil and gas extraction facilities;
- Velocity requirements and other preventative measures (e.g., type and amount of chemical treatment, backwashing) for inhibiting growth of marine organisms;
- Potential issues (e.g., hull design implications, load paths, fatigue, risks to divers) related to either: (1) retrofitting sea chests and other cooling water intake structures for existing offshore and coastal oil and gas extraction facilities; or (2) outfitting newly-built offshore and coastal oil and gas extraction facilities with cooling water intake structures consistent with the proposed requirements for new facilities;
- Estimated costs to retrofit existing facilities or to outfit new facilities as described in the preceding bullet, with as much detailed information as possible regarding the basis for the estimates;

- Potential scheduling impacts on new or existing mobile offshore and coastal oil and gas extraction facilities due to section 316(b) requirements for new facilities; and

- What issues or costs, if any, would make technologies for zero use of cooling water unavailable or economically impracticable on offshore and coastal oil and gas extraction facilities.

- Any impingement or entrainment data collected at coastal or offshore oil and gas extraction facilities.

EPA is considering not including within the scope of this Phase I rule offshore and coastal oil and gas operations. Instead of addressing oil and gas operations as part of this rulemaking, EPA is considering addressing oil and gas operations as part of either the Phase II or Phase III rulemaking. Alternatively, if EPA addresses offshore and coastal oil and gas facilities in this Phase I rule, EPA is considering a higher regulatory threshold for these facilities (e.g., 25 or 50 MGD).

2-012A Johnston, Carey A. USEPA. Memo to File RE: Notes from April 4, 2001 Meeting with US Coast Guard. April 23, 2001.

2-012B Johnston, Carey A. USEPA. Memo to File RE: Summary of Email Correspondence with MMS on MODU CWIS. April 2001.

#### *D. New Data and Refinements to the New Facility Framework Based on Waterbody Type*

##### 1. Tidal Rivers and Estuaries

EPA received many comments about its proposal to have the most stringent technology requirements apply in all parts of estuaries and tidal rivers (see proposed 125.84(d), 65 FR 49118). Some commenters assert that adverse environmental impact can be minimized in some, if not all, parts of tidal rivers and estuaries with less protective technologies than EPA proposed. Some of these commenters observe that many of the aquatic organisms that inhabit tidal rivers and estuaries have reproductive strategies that rely on open-water dispersal of a very large number of eggs and larvae and that, even in the absence of impacts from a cooling water intake structure, most of the early life stages of these organisms do not survive to a reproductive age. Further, these commenters assert that increased survival of early life stages of these organisms can lead to increased competition among later-stage juvenile and adult organisms and actually reduce, not increase, populations of these organisms (see also the discussion of options for defining adverse

environmental impact later in this notice). In response to comments, EPA further examined this issue and requests comment on the following documents found in #2-013A-O in the Docket.

These documents include information on larval densities in selected estuaries and tidal rivers, impingement and entrainment rates for facilities located in these areas, conditional mortality rates of organisms in selected estuary and tidal rivers (requires calculation of larval densities), and discussions of the life history and reproductive strategies of marine and estuarine organisms that are relevant to EPA's consideration of whether these locations may be sensitive to impingement and entrainment impacts associated with cooling water intake structures. In the proposed rule EPA asserted that estuaries deserve the most stringent protection because of the abundance and diversity of aquatic life they harbor. Estuaries are also an important habitat for the vast majority of commercial and recreational important species of fin fish. Further, both EPA and commenters noted that the reproductive strategies of many estuarine species include pelagic or planktonic larvae. EPA invites comment on the documents which may support a judgment that the reproductive strategies of tidal river and estuarine species, together with other physical and biological characteristics of those waters, make these ecosystem waters particularly susceptible to cooling water intake structures. In addition to these documents, EPA notes that some of the new data discussed below (at Section E) regarding the assessment of adverse environmental impact, as well as information below regarding the susceptibility of non-tidal freshwater rivers and streams to cooling water intake structure impacts (at Section D.5.), also may be relevant in determining whether tidal rivers and estuaries are more sensitive to cooling water intake structures than some parts of other waterbodies.

2-013A Richkus, W., Versar, Inc. Memo to EPA RE: Vulnerability of Biota of Freshwater (Rivers, Lakes, Reservoirs) versus Marine (Tidal River, Estuary, Ocean) Habitats to Entrainment and Impingement Impacts. April 2, 2001.

2-013B Winemiller, K.O., and K.A. Rose. Patterns of life-history. Diversification in North American Fishes: Implications for Population Regulation. Canadian Journal of Fisheries and Aquatic Sciences 49: 2196-2218. 1992.

2-013C PSE&G. Renewal Application for Salem Generating Station Permit No. NJ00005622. Appendix F, Attachments 1 & 2. Baywide and In Plant Sampling Programs and Sampling Methods; and

Model Methodologies and Common Input Parameters. March 1999.

2-013D PSE&G. Renewal Application for Salem Generating Station Permit No. NJ00005622. Appendix L, Data Sets. March 1999.

2-013E New York Department of Environmental Conservation. Draft Environmental Impact Statement for State Pollutant Discharge Elimination System for Bowline Point, Indian Point 2 & 3, and Roseton Steam Electric Generating Stations. December 1999.

2-013F Kurkel Patricia, NOAA. Letter to Deborah Hammond, EPA Region II RE: Review of Draft Permit (Salem Nuclear Generating Station). February 28, 2001.

2-013G ENSR and Marine Research Inc. for Entergy Nuclear Generation Company. Study of Winter Flounder Transport in Coastal Cape Cod Bay and Entrainment at Pilgrim Nuclear Power Station. 2000.

2-013H Boreman, J. and C.P. Goodyear. Estimates of Entrainment Mortality for Stripped Bass and Other Fish Species Inhabiting the Hudson River Estuary. American Fisheries Monograph 4: 152-160. 1988.

2-013I McHugh, J.L. and J.J.C. Ginter. Fisheries. MESA New York Bight Atlas Monograph. January 16, 1978.

2-013J Dixon, D.A., EPRI. Catalog of Assessment Methods for Evaluating the Effect of Power Plant Operations on Aquatic Communities. 1999.

2-013K Clark, J. and W. Brownell. Electric Power Plants in the Coastal Zone: Environmental Issues. American Littoral Society Special Publication No. 7. 1973.

2-013L Cacula, Dave, Stratus Consulting Inc. Memo to JT Morgan, EPA RE: Planned Analysis of Ambient Larval Densities and I&E. April 20, 2001.

2-013M Patrick, Ruth, Academy of Sciences. Testimony at Public Hearing on PSE&G Nuclear Generating Station Draft NPDES Permit. Pennsville, NJ. January 23, 2001.

2-013N Bigelow, H.B. and W.C. Schroeder. Fishes of the Gulf of Maine. Fishery Bulletin 74 of the US Fish and Wildlife Service. Volume 53. 1953.

2-013O Stratus Consulting, Inc. Memo to Blaine Snyder, Tetra Tech, Inc. RE: Estimation of Entrainment Using Ichthyoplankton Samples.

EPA requests comment on the above documents.

##### 2. Littoral Zone

EPA received many comments on EPA's proposed definition of "littoral zone" and its use of this concept to divide oceans, freshwater streams and rivers, and freshwater lakes and reservoirs, into areas where different suites of technologies are judged to be best technology available for minimizing adverse environmental impact. Many of these comments assert that EPA's proposed definition does not give a rationale for delineating water bodies into parts that are more or less sensitive to impacts of cooling water

intake structures. EPA requests comment on the following data and possible revisions to its approach for delineating more and less sensitive parts of waterbodies.

First, EPA is considering changing the term "littoral zone," which has a relatively precise definition in limnology (the study of lakes) to another term such as "area of potential high impact" or "productivity zone." This measure would avoid confusion with the long-standing use of "littoral zone." On the other hand, EPA might not use a general term for areas with greater potential for adverse impacts and might define these areas on a waterbody-specific basis.

For example, the Agency might continue to define a sensitive area in oceans, as it did at proposal: "the photic zone of the neritic region. The photic zone is that part of the water that receives sufficient sunlight for plants to photosynthesize. The neritic region is the shallow water or nearshore zone over the continental shelf."

### 3. Revised definition of estuary and ocean

A number of commenters objected to EPA's proposal to define estuaries based, in part, on salinity concentrations (see "estuary" at proposed 40 CFR 125.83). In response to these comments, EPA requests comment on new data it has gathered (as described and compiled in #2-015A-G in the Docket) which provides methods for delineating estuaries. EPA is considering revising its definition of estuary to incorporate elements of the information described in these documents and requests comment on use of these data to revise the definition of estuary. EPA also requests comment on a revised definition of estuary based largely on the definition of estuary at proposed 40 CFR 125.83 that would read as follows: "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 oceans 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)."

Finally, EPA is considering and requests comment on a revised definition of oceans at proposed 40 CFR 125.83 to read as follows: "ocean means marine waters seaward of the mean low tide mark or seaward of the waters defined as estuary waters."

2-015A Dunham, Ray, California State Water Control Board. Memo to USEPA Office of Water, Office of Science and

Technology RE: Methods for Delineating Estuary Boundaries. April 2000.

2-015B Shalowitz, A.L. and Michael W. Reed. Shore and Sea Boundaries: Internal Waters. Volume 3, Part 2, Chapter 6, page 222. 2000. (Available at: [http://chartmaker.ncd.noaa.gov:80/hsd/shalowitz/part\\_two.pdf](http://chartmaker.ncd.noaa.gov:80/hsd/shalowitz/part_two.pdf))

2-015C Shalowitz, A.L. and Michael W. Reed. Shore and Sea Boundaries: The Estuarine Ecosystem: Ecology of the Intertidal and Subtidal Area. Volume 2, Part 3, Chapter 1, pp. 259-293. 2000. (Available at: <http://www.csc.noaa.gov:80/otter/htmls/ecosys/ecology/estuary.htm>)

2-015D National Oceanographic and Atmospheric Administration. Coastal Change Analysis Program (C-CAP): Guidance for Regional Implementation. 2001. (Available at: <http://www.csc.noaa.gov:80/products/sf/html/proto.htm>)

2-015E National Oceanographic and Atmospheric Administration. Coastal Change Analysis Program (C-CAP): Guidance for Regional Implementation. Appendix 3. Description of Cowardin et al. Systems and Classes. 1979. (Available at: <http://www.csc.noaa.gov:80/products/sf/html/proto.htm#app3>)

2-015F USEPA. Salinity. (Available at: <http://www.epa.gov/owow/estuaries/monitor/chptr14.htm>)

2-015G National Oceanographic and Atmospheric Administration. The Estuarine Ecosystem-Ecology of Tidal and Subtidal Areas. (Available at: <http://www.csc.noaa.gov:80/otter/htmls/ecosys/ecology/estuary.htm>)

### 4. Great Lakes

At 65 FR 49086, the Agency noted that the Great Lakes, like estuaries, have areas of high productivity and sensitive critical habitat that may need more stringent requirements than those proposed for lakes and reservoirs. One commenter asserted that there is no biological basis for treating the Great Lakes separately and further asserted that the communities in these lakes are probably less sensitive than those in other lakes. Since proposal, EPA has gathered additional information on the susceptibility of the Great Lakes system to impact from cooling water intake structures and may provide protections for the Great Lakes beyond those proposed for lakes and reservoirs. In #2-016A-C in the Docket, EPA has made available for comment information that supports the idea that the Great Lakes are a unique system that may deserve additional protection from the impact of cooling water intake structures. The Agency requests comment on this information and the position that the Great Lakes should be protected to a greater extent than other lakes and reservoirs.

2-016A Herdendorf, C.E. Great Lakes estuaries. *Estuaries*, 13(4): 493-503. 1990.

2-016B EPA. The Conservation of Biological Diversity in the Great Lakes Ecosystem: Issues and Opportunities. Prepared by The Nature Conservancy, EPA Great Lakes Program, Chicago, IL. 1999. (Available at <http://www.epa.gov/glnpo/ecopage/issues.html>)

2-016C EPA. Water Quality Guidance for the Great Lakes System: Supplementary Information Document (SID). EPA-820-B-95-001. 1995.

### 5. Freshwater Rivers and Streams

EPA is considering data that may support the proposition that the aquatic species predominant in freshwater rivers and streams have reproductive and life history strategies that generally make them less susceptible to the impact of cooling water intake structures. These data may demonstrate that the species in these systems are primarily demersal (bottom) and adhesive egg-laying or nest-building organisms. These species do not exhibit the planktonic (free-floating) egg- and larval-dispersal behaviors that may expose early life stages to impact from cooling water intake structures. One of these documents also contains assertions that freshwater fish populations are not harvested as extensively as marine fish, and that management practices for marine fish are slow to respond to over-exploitation. EPA invites comment on the following documents:

2-017A Wright, Jim, TVA. Memo to File RE: Ecological Reasons Why Freshwater River and Reservoir Systems Do Not Normally Experience Substantive Impact as a Result of Impingement and Entrainment.

2-017B Dixon, Doug, EPRI. Memo to File RE: Ecological Reasons Why Freshwater River and Reservoir Systems Do Not Normally Experience Measurable Environmental Impact as a Result of Impingement and Entrainment.

2-017C Karr, James R., et al., EPA. Habitat Preservation for Midwest Stream Fishes: Principles and Guidelines. 1983.

2-017D Lohner, Timothy W., American Electric Power. Letter to Tom Wall, EPA et al. RE: Final Report-Modeling of Possible 316(b) Effects on Selected Ohio River Fishes. April 20, 2001.

2-013A Richkus, W., Versar, Inc. Memo to EPA RE: Vulnerability of Biota of Freshwater (Rivers, Lakes, Reservoirs) versus Marine (Tidal River, Estuary, Ocean) Habitats to Entrainment and Impingement Impacts. April 2, 2001.

2-013B Winemiller, K.O., and K.A. Rose. Patterns of life-history. Diversification in North American Fishes: Implications for Population Regulation. *Canadian Journal of Fisheries and Aquatic Sciences* 49: 2196-2218. 1992.

EPA is considering whether these data would support a modification to its proposed regulatory requirements for

freshwater streams and rivers. Such a modification would: (1) Eliminate the proposed requirement for facilities to reduce intake capacity to a level commensurate with use of a closed-cycle cooling system for intakes located inside or within 50 meters of the littoral zone; and (2) require implementation of additional design and construction technologies that minimize impingement and entrainment of fish, eggs, and larvae and maximize survival of impinged adult and juvenile fish (such as extremely fine-mesh screens, or fish return systems that significantly increase the survival of impinged organisms) in all parts of freshwater rivers and streams rather than only within the littoral zone. The approach would retain the proposed requirements for a design intake flow of  $\leq 5\%$  of the source water mean annual flow and  $\leq 25\%$  of the source water 7Q10 low flow, and a design intake velocity of  $\leq 0.5$  ft/s in all parts of freshwater rivers and streams. This approach would potentially have lower costs than the proposed requirements. EPA invites comment on this potential modification.

#### 6. Exception for Areas Not Designated To Support an Aquatic Life Use

Several commenters asserted that the proposed regulations would require use of protective and costly technologies in areas that are not particularly susceptible to impact from cooling water intake structures because they do not support aquatic life. EPA is evaluating these comments and, in response, may identify other less costly technologies as best technology available for minimizing adverse environmental impact in waterbodies a State or Tribe designates as having no use supporting the propagation or maintenance of aquatic life in accordance with 40 CFR part 131 (e.g., the State or Tribe has conducted a Use Attainability Analysis and EPA has approved the revised use). EPA recognizes that this would be a very small set of water bodies and that including such a provision would have little practical effect on the regulatory requirements for most new facilities. EPA requests comment on other ways of identifying or defining waters with low susceptibility to impact from cooling water intake structures because of limited potential for aquatic life support even in the absence of the facility.

#### *E. Additional Data and Information Concerning the Impingement and Entrainment Approach and the Population Approach and Biological Assessment Approach to Defining Adverse Environmental Impact*

##### 1. Additional Impingement, Entrainment, and Mortality Data

Although EPA's proposed regulatory text did not include a definition of the term "adverse environmental impact" in the preamble to these regulations, the Agency invited comment on a number of alternatives for either defining adverse environmental impact or determining a threshold for the level of environmental impact deemed to be adverse. 65 FR 49074–49075.

EPA received numerous comments on its proposed rule asserting that the proper endpoint for defining adverse environmental impact (AEI) is at the population level, that some of EPA's proposed alternative definitions of adverse environmental impact would essentially protect "one fish," and that EPA's alternative for defining adverse environmental impact as recurring and nontrivial impingement and entrainment was vague or would lead to excessive and costly efforts to protect a very few fish that would not result in ecologically relevant benefits. While EPA's record at proposal demonstrates that cooling water intake structures do not kill, impinge, or entrain just "one fish," or even a few aquatic organisms, today's Notice invites comment on additional information that provides further examples of cooling water intake structures that kill or injure large numbers of aquatic organisms. For example, in #2–013 in the Docket, EPA provides information on aquatic organism conditional mortality rates for the Hudson and Delaware rivers which demonstrate the degree of mortality due to cooling water intake structures. EPA is considering this information, as well as information (at Section E.2 below) on impingement and entrainment survival and impact, as it deliberates on options for the final rule and how it should define adverse environmental impact. If EPA decides to include a definition of AEI in the final rule, it is considering whether to define adverse environmental impact using a population endpoint or an alternative that relies upon counts of impinged and entrained organisms.

Further, EPA is considering documents that discuss potential consequences associated with the loss of large numbers of aquatic organisms. These include impacts on the stocks of various species, including any loss of compensatory reserve due to the deaths

of these organisms, and the overall health of ecosystems. EPA invites comments on the following documents:

- 2–018A Boreman, J. Surplus Production, Compensation, and Impact Assessments of Power Plants. Environmental Science & Policy. (31) 445–449. 2000.
- 2–018B Richkus, W., Versar Inc. Memo to EPA RE: Primer on Entrainment and Impingement Conditional Mortality Rate. March 30, 2001.
- 2–018C EPA. Memo to File RE: Impingement Values for Plants with Flows Less Than 100 MGD. August 2000.
- 2–018D Loveridge, T., Chief Industrial Permits Section, NYDEC. Transmittal of Impingement and Entrainment Study for Charles Point Resource Recovery Facility to A. Bromberg, Chief Water Quality Evaluation Section, NYDEC. January 14, 1987.
- 2–018E Richkus, W.A. and Richard McLean. Historical Overview of Two Decades of Power Plant Fisheries Impact Assessment Activities in Chesapeake Bay. Environmental Science and Policy. (31) 283–293. 2000.

EPA also invites commenters to submit for consideration additional studies that document either significant impacts or lack of significant impacts from cooling water intake structures. In addition, EPA invites comment on the following documents:

- 2–013C PSE&G. Renewal Application for Salem Generating Station Permit No. NJ00005622. Appendix F, Attachments 1 & 2. Baywide and In Plant Sampling Programs and Sampling Methods; and Model Methodologies and Common Input Parameters. March 1999.
- 2–013E New York Department of Environmental Conservation. Draft Environmental Impact Statement for State Pollutant Discharge Elimination System for Bowline Point, Indian Point 2 & 3, and Roseton Steam Electric Generating Stations. December 1999.

##### 2. Assessment of Population Modeling Approach

Some commenters assert that impact on individual organisms, large numbers of individual organisms, or subpopulations are not ecologically relevant and recommend that EPA define adverse environmental impact as follows: "Adverse environment impact is a reduction in one or more representative indicator species that (1) creates an unacceptable risk to the populations's ability to sustain itself, to support reasonably anticipated commercial or recreational harvests, or to perform its normal ecological function, and (2) is attributable to the operation of the cooling water intake structure." Under this approach, EPA would define unacceptable risk using a variety of methods that fisheries scientists have developed for estimating



(1) the level of mortality that can be imposed on a fish population without threatening its capacity to provide "maximum sustainable yield," as developed under the Magnuson-Stevens Fishery Conservation and Management Act, on a long-term basis, and (2) the optimum population size for maintaining maximum sustainable yield. (See W-00-03, 316(b), Comments 1.68).

In response to comments, EPA has included in the record for comment a memorandum providing a list of references that EPA intends to review to assess the merits of using a population modeling approach to define adverse environmental impact. EPA also intends to evaluate and seeks comment on how and whether it is possible to use such models, which have historically been used to perform single species assessments, to assess impacts on multiple species as is often necessary in evaluating impingement and entrainment by cooling water intake structures. EPA invites comment on the following documents found in #2-019A-B in the Docket.

- 2-019A Strange, Liz, Stratus Consulting, Inc. Memo to File RE: Scientific Literature on Population Modeling. April 2001.
- 2-019B ESSA. Review of Portions of Salem Permit—Final Report for New Jersey Department of Environmental Protection. June 2000.

Further, EPA has included information addressing the issue of compensation and its application relative to the section 316(b) rulemaking. In particular, EPA is seeking comment on a memorandum titled, "Compensation" in #2-020C in the Docket. This document states that the use of compensation factors is typically limited to those cases where fishery managers have extensive data on a fish population and that specific, numerical compensation values generally are not used in the absence of a robust data sets with a minimum of 15-20 years of data suggested. Moreover, fish stocks for which these robust data sets exist are generally the highly exploited commercial and recreational stocks and it is unlikely the data exists for the non-harvested species. This memorandum also notes that in the absence of sufficient data, various proxies are typically used in order to side-step the need for quantitatively determining compensation. EPA invites comment on each of the following documents in #2-020A-D in the Docket:

- 2-020A National Marine Fisheries Service. Our Living Oceans. Report on the Status of U.S. Living Marine Resources. NOAA

Technical Memo #NMFS-F/SPO-41. 1999. (Available at: <http://spo.nwr.noaa.gov/unit17.pdf>)

- 2-020B Christensen, S.W., W.V. Winkle, L. W. Barnhouse, and D.S. Vaughan. Science and Law: Confluence and Conflict on the Hudson River. Environmental Impact Assessment Review, V.2, N.1. 1981.
- 2-020C Vaughan, Doug, NMFS. Memo to JT Morgan, EPA RE: Compensation and follow-up memo. April 19, 2001.
- 2-020D EPA. Guidelines for Ecological Risk Assessment. Risk Assessment Forum, U.S. Environmental Protection Agency, Washington, DC. EPA/630/R-95/002F. 1998.

EPA is also evaluating information submitted by the Utility Water Act Group (UWAG) and the Electric Power Research Institute (EPRI), both in their comments and in studies provided to the Agency after the comment period. (See UWAG original comments at W-00-03, 316(b), Comments 1.68; EPRI original comments at W-00-03, 316(b), Comments 1.58, EPRI documents submitted after November 9, 2000 at W-00-03, 316(b), Comments 2.11; EPRI meeting material, January 24, 2001 (see #2-021A in the Docket); and UWAG meeting material, January 25, 2001 (see #2-021B in the Docket)). In summary, these comments and documents assert or are intended to support the assertion that entrainment of very large numbers of eggs, larvae, and early juvenile-stage fish does not necessarily meaningfully affect populations of the entrained species and that substantial percentages of the organisms of many species may survive entrainment. Further, these comments and documents assert or are intended to support the assertion that impingement survival is high for many species and that impingement often impacts low-value, forage species when they are naturally prone to seasonal die-off regardless of cooling water intake structures. One of these comments asserts that EPRI and some of the best fishery scientists in the world have never identified a site where definitive or conclusive aquatic population or community level impacts have occurred from operation of cooling water intake structures. EPA invites comment on each of these documents.

### 3. Biological Assessment Approach

Biological assessments and criteria are recognized as important methods for gathering relevant ecological data for addressing attainment of biological integrity and designated aquatic life uses (see #1-5038-PR, #2-022A, #2-022C, and #2-022F in the Docket). EPA invites comment on the following discussion and documents that identify potential constraints on using these methods to determine adverse

environmental impact from the operation of cooling water intake structures.

First, biological assessment and criteria methods are still being developed for large rivers and the Great Lakes, two large water body types where many cooling water intake structure are located. Secondly, although biological assessment and criteria methods have been published by EPA for small streams and wadeable rivers (see #2-022A and #2-022D in the Docket), lakes and reservoirs (see #2-022C in the Docket), and estuaries and coastal marine waters (see #1-5044-PR in the Docket), many States have yet to implement these methods in the largest of these water bodies (reservoirs, lakes, estuaries and coastal water (see #2-022B and #2-022E in the Docket).) where cooling water intake structure would be located. Most work to date by the States (see #2-022B, #2-022D and #2-022E in the Docket) to use these methods has been applied to small streams and wadeable rivers where few cooling water intake structures are located.

In addition, although bioassessments and criteria are a valuable tool for determining the biological condition of a water body, in complex situations where multiple stressors are present (point source discharges, non-point source discharges, harvesting, runoff, hydromodifications, habitat loss, cooling water intake structures, etc.), it is not well understood at this time how to identify all the different stressors impacting the biology in a water body and how best to apportion the relative contribution to the biological impairment of the stressors from each source within a watershed (see #2-022E in the Docket). Although ecological risk assessment methods have been successfully used to identify and attribute causation of biological impairment in some water bodies (see #2-022F in the Docket), the application of these approaches to cooling water intake structures has not been tested.

EPRI has also developed a document that examines the suitability of multimetric bioassessment for regulating cooling water intake structures under Section 316(b) of the CWA (see #2-022E in the Docket). In its conclusion, EPRI states that biocriteria are well suited for assessing community-level effects but are not designed as indices to measure population-level effects without additional analyses; that assumptions about the structure and function of ecosystems embedded in the biocriteria approach appear to conflict with current understanding of ecosystems as dynamic, nonequilibrium systems



structured on multiple time and space scales; and that issues such as significant uncertainty in reference conditions due to unaddressed sources of natural variability among reference sites may be of particular importance for large, open systems such as estuaries and coastal marine waters. EPA invites comment on this document and on the documents listed below, which may be found in #2-022A-F in the Docket:

- 2-022A EPA. Biological Criteria: Technical Guidance for Streams and Small Rivers. USEPA, Office of Science and Technology, Washington, DC. EPA 822-B-96-001. 1996.
- 2-022B EPA. Summary of State Biological Assessment Programs for Rivers and Streams. USEPA, Office of Policy Planning and Evaluation, Washington, DC. EPA 230-R-96-007. 1996.
- 2-022C EPA. Lake and Reservoir Bioassessment and Biocriteria. Technical guidance document. Office of Water, USEPA, Washington, DC. EPA 841-B-98-007. 1998.
- 2-022D EPA. Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers. Second Edition. Office of Water, USEPA, Washington, DC. EPA 841-B-99-002. 1999.
- 2-022E Jacobson, P. Evaluation of Biocriteria as a Concept, Approach, and Tool for Assessing Impacts of Impingement and Entrainment Under § 316(b) of the Clean Water Act, EPRI, Palo Alto, CA. TR-114007. 2000.
- 2-022F EPA. Stressor Identification Guidance Document. Office of Water, USEPA, Washington, DC. EPA-822-B-00-025. 2000.

EPA also invites comment on the following documents made available at proposal on August 10, 2000:

- 1-5038-PR EPA. Estuarine and Coastal Marine Waters : Bioassessment and Biocriteria Technical Guidance. USEPA, Office of Water Regulations and Standards, Washington, DC. EPA 822-B-00-024. 2000.
- 1-5044-PR EPA. Biological Criteria: National Program Guidance for Surface Waters. USEPA, Office of Water Regulations and Standards, Washington, DC. EPA 440-5-90-004. 1990.

#### 4. Additional Information Supporting That Impingement and Entrainment May Be a Non-Trivial Stress on a Waterbody

In addition to reviewing the merits of a population approach to assessing adverse environmental impact, EPA is also considering additional information suggesting that impingement and entrainment, in combination with other factors, may be a non-trivial stress on a waterbody. EPA recognizes that cooling water intake structures are not the only source of human-induced stress on aquatic communities. These stresses

include, but are not limited to, nutrient loadings, toxics loadings, low dissolved oxygen content of waters, sediment loadings, stormwater runoff, and habitat loss. While recognizing that a nexus between a particular stressor and adverse environmental impact may be difficult to establish with certainty, the Agency has identified methods for evaluating more generally the stresses on aquatic communities from human-induced perturbations other than fishing. Of particular importance is the recognition that stressors that cause or contribute to the loss of aquatic organisms and habitat may incrementally impact the viability of aquatic resources. EPA is examining whether waters meet their designated uses, whether fisheries are in stress, and whether waters would have higher water quality or better support their designated uses if EPA established additional requirements for new cooling water intake structures. EPA is considering use of this type of information as one approach for evaluating adverse environmental impact and requests comment on this approach.

EPA has prepared a brief memorandum (Dabolt, Thomas, EPA. Memo to File RE: 316(b) Analysis—Relationship of Location to Cooling Water Intake Structures to Impaired Waters. April 18, 2001.) documenting that about 35% of existing cooling water intake structures at facilities that completed EPA's detailed section 316(b) questionnaire are located within two miles of locations within waterbodies identified as impaired and listed by a State as needing development of a Total Maximum Daily Load to restore the waterbody to its designated use. EPA recognizes, however, that these data do not establish that cooling water intake structures are the cause of adverse environmental impact in any particular case and that there may be other reasons for the presence of impaired waters near cooling water intake structures, such as the frequent location of facilities with cooling water intake structures near other potential sources of impairment (e.g., industrial point sources, urban stormwater). EPA requests comment on the relevance of these data to adverse environmental impact determinations for cooling water intake structures (see #2-023 in the Docket).

EPA has also summarized information from a number of sources indicating overutilization of about 46% of the fishery stocks of known status tracked by and under NOAA purview (73 out of 158 stock groups), and which rely on tidal rivers, estuaries, and oceans for spawning, nursery, or adult habitat. An

additional 45 stocks under NOAA purview are of unknown status (about 22% of the fishery). In addition, NOAA documents in a number of their Fishery Management Plans that cooling water intake structures, and in particular once-through cooling water systems that withdraw large volumes of water, cause adverse environmental impacts due to significant impingement of juveniles and entrainment of eggs and larvae. EPA recognizes that stress due to overutilization may not be directly relevant to adverse environmental impact, but believes that it may be relevant to assessing cumulative impacts of multiple stressors, including cooling water intake structures. EPA requests comment on the potential use of these data for this purpose.

EPA invites comment on the following documents and information the Agency is considering as it evaluates possible definitions of adverse environmental impact and concerns associated with assessing multiple stressors and their impacts on aquatic communities (see #2-024A-O in Docket).

- 2-024A Angermeier, P.L. and J.E. Williams. Conservation of Imperiled Species and Reauthorization of the Endangered Species Act of 1973. Fisheries. 19(1): 26-29. 1994.
- 2-024B Gulf of Mexico SPR Management Strategy Committee. An Evaluation of the Use of SPR Levels as the Basis for Overfishing Definitions in Gulf of Mexico Finfish Fishery Management Plans: Final Report. Gulf of Mexico Fishery Management Council, Tampa, FL. 1996.
- 2-024C Branstetter, S. Bycatch and its Reduction in the Gulf of Mexico and South Atlantic Shrimp Fisheries. Gulf & South Atlantic Fisheries Development Foundation, Inc., Tampa, FL. 1997.
- 2-024D Crowder, L.B., and S.A. Murawski. Fisheries Bycatch: Implications for Management. Fisheries. 23(6): 8-17. 1998.
- 2-024E Weeks, H. and S. Berkeley. Uncertainty and Precautionary Management of Marine Fisheries: Can the Old Methods Fit the New Mandates? Fisheries Management, Vol 25, No.12. 2000.
- 2-024F Boreman, J. Methods for Comparing the Impacts of Pollution and Fishing on Fish Populations. Transactions of the American Fisheries Society. 126: 506-513. 1997.
- 2-024G Schaaf, W.E. et al. Fish Population Responses to Chronic and Acute Pollution: The Influence of Life History Strategies. Estuaries. Vol. 10, No.3, page 267-275. September 1987.
- 2-024H Schaaf, W.E. et al. A Simulation Model of How Life History Strategies Mediate Pollution Effects on Fish Populations. Estuaries. Vol. 16, No.4, page 697-702. December 1993.
- 2-024I Vaughan, D. S., R. M. Yoshiyama, J. E. Breck, and D. L. DeAngelis. Modeling Approaches for Assessing the Effects of Stress on Fish Populations in Contaminant

- Effects on Fisheries. John Wiley & Sons, New York. p. 259–278. 1984.
- 2–024J National Marine Fisheries Service. Scientific Review of Definitions of Overfishing in US Fishery Management Plans. August 1994.
- 2–024K National Marine Fisheries Service. Scientific Review of Definitions of Overfishing in US Fishery Management Plans—Supplemental Report. March 1996.
- 2–024L Restrepo, Victor R., Pamela M. Mace and Fredric M. Serchuk. The Precautionary Approach: A New Paradigm or Business as Usual? Our Living Oceans. 1998.
- 2–024M National Marine Fisheries Service. Atlantic Mackerel, Squid, and Butterfish Fishery Management Plan—Amendment 8. August 1998.
- 2–024N National Marine Fisheries Service. The Coastal Pelagic Species Fishery Management Plan—Amendment 8. December 1998.
- 2–024O National Marine Fisheries Service. New England Fishery Management Council. Essential Fish Habitat Amendment. October 1998.

In addition, EPA invites comment on the following documents:

- 2–020A National Marine Fisheries Service. Our Living Oceans. Report on the Status of U.S. Living Marine Resources. NOAA Technical Memo #NMFS–F/SPO–41. 1999. (Available at: <http://spo.nwr.noaa.gov/unit17.pdf>)
- 2–018A Boreman, J. Surplus Production, Compensation, and Impact Assessments of Power Plants. Environmental Science & Policy. (31) 445–449. 2000.

EPA has gathered new data on adverse environmental impact determinations made in connection with State and Federal NPDES Permit decisions. EPA invites comment on the following documents compiled in #2–025A–W in the Docket.

- 2–025A State of California, California Regional Water Quality Control Board, Central Coast Region. Staff Report for Regular Meeting of October 27, 2000. Supplemental Sheet, Item Number 23, Subject: Diablo Canyon Nuclear Power Plant, Resolution of Thermal Discharge and Entrainment/Impingement Impacts. October 2000.
- 2–025B California Regional Water Quality Control Board, Central Coast Region. Waste Discharge Requirements Order No. 00–041, NPDES No. CA00062554 for Duke Energy North America, Moss Landing Power Plant, Units 1, 2, 6, and 7 Monterey County. October 27, 2000.
- 2–025C New Jersey Department of Environmental Protection and Energy Wastewater Facilities Regulation Program. In the Matter of NJDEP Public Hearing on Draft Permit No. NJ 0005652 for the Salem Nuclear Generating Station, Transcript Proceedings. Thursday, September 9, 1993.
- 2–025D New Jersey Department of Environmental Protection and Energy Wastewater Facilities Regulation Program, Bureau of Standard Permitting. Public

Notice, Consideration of Section 316 Variance Request, Intent to Renew Existing New Jersey Pollutant Discharge Elimination System/Discharge to Surface Water (NPDES/DSW) Permit NJ0005622, and Notice of Public Hearing. June 24, 1993.

- 2–025E State of New Jersey Department of Environmental Protection, Division of Environmental Protection, Division of Water Quality. Fact Sheet for NPDES Permit Including Section 316(a) Determination and Section 316(b) Decision, Permit No. NJ0005622. July 1994.
- 2–025F State of New Jersey Department of Environmental Protection, Division of Environmental Protection, Division of Water Quality. Response to Comments Document PSE&G Salem Generating Station, NPDES/DSW Draft Permit NJ0005622. July 1994.
- 2–025G State of New Jersey Department of Environmental Protection, Division of Environmental Protection, Division of Water Quality. PSE&G Salem Nuclear Generating Station NPDES Permit #NJ0005622. 1994.
- 2–025H EPA Region IV. Record of Decision on Tampa Electric Company Big Bend Unit 4, NPDES Permit No. FL0037044. April 7, 1982.
- 2–025I EPA Region IV. Finding of Fact for TVA John Sevier Station. October 23, 1978.
- 2–025J EPA Region IV. 316 Determinations, John Sevier Steam Plant, NPDES No. TN0005436. April 15, 1986.
- 2–025K EPA Region IV and Florida Department of Environmental Regulation. Joint Public Notice, No. 78FL0080. Notice of Proposed Modification of National Pollutant Discharge Elimination System Permit and Notice of Consideration for State Certification, Crystal River Power Plant Units 1, 2, and 3, NPDES No. FL0000159. January 8, 1978.
- 2–025L EPA Region IV. Public Hearing Statement, Florida Power Corporation Crystal River Units 1, 2, and 3. February 3, 1987.
- 2–025M EPA Region IV. Biological Assessment, Florida Power Corporation Crystal River Power Plant, 316A & B Demonstration. Date Unknown.
- 2–025N EPA Region IV. In the Matter of Florida Power Corporation Crystal River Power Plant Units 1, 2, and 3, Citrus County Florida, NPDES Permit No. FL0000159, Findings and Determinations Pursuant to 33 U.S.C. Section 1326. September 1988.
- 2–025O EPA Region IV and Florida Department of Environmental Regulation. Joint Public Notice, No. 88FL036, Notice of Proposed Reissuance of National Pollutant Discharge Elimination System Permit, Tentative Determination of Substantial Damage, Tentative Section 316 Findings and Determinations, Notice of Consideration for State Certification, and Notice of Public Hearing, Crystal River Power Plant Units 1, 2, and 3, NPDES No. FL0000159. May 19, 1988.
- 2–025P EPA Region IV. Florida Power Corporation, Crystal River Power Plant Units 1, 2, and 3, NPDES No. FL0000159, Public Hearing. February 4, 1987.

2–025Q EPA Region IV. Fact Sheet, Application for National Pollutant Discharge Eliminations System Permit to Discharge Treated Wastewater to U.S. Waters, Application No. FL0000159, Florida Power Corporation, Crystal River Power Plant Units 1, 2, and 3. September 1, 1988.

- 2–025R EPA Region IV and Florida Department of Environmental Regulation. Joint Public Notice, No. 86FL100, Notice of Proposed Reissuance of National Pollutant Discharge Elimination System Permit, Tentative Determination of Substantial Damage, Tentative Section 316 Findings and Determinations, Notice of Consideration for State Certification, Crystal River Power Plant Units 1, 2, and 3, NPDES No. FL0000159. December 18, 1986.
- 2–025S Kaplan, Charles, EPA Region IV. Letter to Dr. Patsy Y. Baynard, Director Environmental and Licensing Affairs, Florida Power Corporation, RE: Crystal River Power Plant Units 1–3, NPDES No. FL0000159, 316(a & b) Demonstration Meeting—September 18, 1985 and Attachments. August 23, 1985
- 2–025T White, John C., EPA Region IV. Letter to Honorable Lawton Chiles, June 8, 1978.
- 2–025U Hart, Dennis. State of New Jersey Department of Environmental Protection, Division of Environmental Protection, Division of Water Quality. Letter to Richard L. Caspe, EPA Region II RE: PSE&G Salem Nuclear Generating Station, NPDES #NJ0005622. January 31, 1994.
- 2–025V Caspe, Richard L, EPA Region II. Letter to John Weigart, State of New Jersey Department of Environmental Protection, Division of Water Quality RE: Response to Dennis Hart Letter of January 31, 1994. 1994
- 2–025W Hicks, Delbert B., EPA Region IV. Letter to Charles Kaplan, EPA RE: Crystal River 316(b) Findings. Date Unknown.

In addition, EPA invites comment on the following documents:

- 2–013F Kurkel Patricia, NOAA. Letter to Deborah Hammond, EPA Region RE: Review of Draft Permit (Salem Nuclear Generating Station) II. February 28, 2001

## 5. Other Options for Interpreting Adverse Environmental Impact

In the proposed rule preamble, EPA discussed several other option for interpreting adverse environmental impact. One option would be to look to section 316(a) of the Clean Water Act for guidance in assessing adverse environmental impact from cooling water intake structures. Section 316(a) addresses requirements for thermal discharge and provides that effluent limitations associated with such discharge should generally not be more stringent than necessary to “assure the protection and propagation of a balanced indigenous population of shellfish, fish, and wildlife in and on that body of water.” The same language

is repeated in section 303(d) with reference to Total Maximum Daily Load listing requirements for waters impaired by thermal discharge. These statutory provisions show that Congress intended this standard to be used in evaluating the environmental impacts of thermal discharges. Some have suggested that since thermal discharges are usually paired with cooling water intake, it may be reasonable to interpret the Clean Water Act to apply this standard in evaluating adverse environmental impact from cooling water intake structures as well.

Another option would be to define adverse environmental impact as a level of impingement and entrainment that is "recurring and non trivial." 65 FR 49074. EPA is considering refining that idea by interpreting "recurring and non trivial" impacts as the degree of impingement and entrainment that would have resulted from the use of the traditional technologies in use at the time the Clean Water Act (including section 316(b)) was enacted in 1972. EPA believes that the traditional technology in use at that time would have been a once-through cooling system with a simple bar rack screen to minimize entrainment of large debris items and a simple mesh screen to minimize entrainment of small debris items into the condenser. Under this approach, EPA would define the common performance of the traditional technologies as having an adverse environmental impact and then consider reasonable requirements to improve over that performance. EPA recognizes that the statutory phrase "minimize adverse environmental impact" could be interpreted in a way that focuses on the environmental impacts of cooling water intake structures to determine whether and to what extent these impacts are "adverse," perhaps using a population approach, as suggested by some. However, EPA believes that the phrase "best technology available to minimize adverse environmental impact" could also reasonably be interpreted in a way that focuses on the technology, rather than the impact, in a manner analogous to the technology-based standards applicable to point source dischargers under Clean Water Act sections 301, 304, and 306. EPA requests comment on these alternative approaches for interpreting adverse environmental impact.

EPA also notes that a number of other options for interpreting or defining adverse environmental impact were discussed in the proposal (65 FR 49074), and does not intend in this notice to suggest that they are not still under

active consideration. EPA is still considering all of the options for interpreting and defining adverse environmental impact that were discussed in the proposal as options for the final rule and invites further comment on any of them.

#### *F. Additional Data Related to the Specific Technology Limits in the Proposed Regulations*

##### 1. Proportional Flow Limits for Freshwater Streams and Rivers and Tidal Rivers, Estuaries

EPA proposed specific flow limits of 5% of mean annual flow of freshwater streams and rivers because the Agency determined this would be the best way to protect 95% of the aquatic life in these water bodies from entrainment. EPA also proposed to limit withdrawals from estuaries and tidal rivers to 1% of the tidal excursion. The proposed limit is based on the concept that withdrawal of a unit volume of water from a water body will result in the impingement and/or entrainment of an equivalent unit of aquatic life (particularly eggs and larval organisms) suspended in that volume of the water column. This, in turn, is related to the idea that the density of aquatic organisms withdrawn by a cooling water intake structure is equivalent to the density of the organisms in the water column. Thus, if 5% of the mean annual flow (or alternative proposed levels of 10% and 15% for freshwater bodies) is withdrawn, it will result in the impingement and/or entrainment of 5% (or alternative) of the aquatic life in that water body.

Some commenters asserted that this assumption is not valid. They argued that aquatic organisms are not uniformly distributed within the water column and that patchy distribution of aquatic organisms invalidates the assumption that withdrawal of a certain percentage of a water body would correlate to an equivalent withdrawal of aquatic life. Since proposal, EPA received new information concerning the distribution and density of organisms in natural waters. In #2-013 D and E in the Docket, EPA is providing for comment information on the density of organisms in the Hudson and Delaware rivers as well as in Mt. Hope Bay. In #2-013J in the Docket, the Agency is also providing for comment information on models identified by EPRI that may be used to estimate and/or evaluate aquatic organism densities in order to estimate entrainment rates. EPA believes the use of these data and modeling approaches is supportable because assessments of aquatic organism densities are the basis

for calculations for the empirical transport model which is, in turn, the basis for calculating conditional mortality rates. Both of these methods are widely used by industry and regulatory agencies to estimate losses related to cooling water intake structures.

The Agency has identified information from other State and Federal agencies that supports the need for flow-based standards to protect aquatic organisms. This information includes methodologies for determining the limiting flow conditions for a waterbody for the protection and propagation of aquatic life and wildlife in stream environments (see #2-026B, #2-026C, and #2-026D in the Docket). EPA invites comment on the following documents:

- 2-026A Goodyear, C.P. Mathematical Methods to Evaluate Entrainment of Aquatic Organisms by Power Plants. U.S. Fish and Wildlife Service National Power Plant Team. FWS/OBS-76/20.3. 1977.
- 2-026B Lang, Vernon. Questions and Answers on the New England Flow Policy. U.S. Fish and Wildlife Service. Concord, New Hampshire. May 11, 1999.
- 2-026C Kulik, Brandon. A Method to Refine the New England Aquatic Base Flow Policy. Rivers. Volume 1, Number 1. Pages 8-22.
- 2-026D Washington State, Department of Ecology. Questions and Answers—An Overview of the Instream Flow Incremental Methodology. QWR-95-1-4. August 1995.
- 2-013J Dixon, D.A., EPRI. Catalog of Assessment Methods for Evaluating the Effect of Power Plant Operations on Aquatic Communities. 1999.
- 2-013L Cacula, Dave, Stratus Consulting Inc. Memo to JT Morgan, EPA RE: Planned Analysis of Ambient Larval Densities and I&E. April 20, 2001.

EPA also invites comment on the following supplement to the discussion at proposal of the proposed limitations on intake flow as a proportion of waterbody flow (see 65 FR 49085-49087). EPA is considering whether a proportional flow limitation would have the effect of reducing or minimizing adverse environmental impact that may be associated with withdrawal of large volumes of cooling water from relatively small water bodies. EPA is considering and seeks comment, in particular, about the efficacy of the proposed limitation associated with the mean annual flow of freshwater streams and rivers. These limitations could be effective because large-volume withdrawals occurring on a year-round basis may affect all aspects of the life cycles of the organisms susceptible to entrainment. Inasmuch as some commenters have asserted that aquatic organisms are not uniformly distributed within the water column

(i.e., exhibit “patchy” distribution), the withdrawal of large volumes of water may, over the course of the year, smooth out the “patchiness” and subject a portion of the biota commensurate with intake flow to entrainment. The Agency is considering and seeks comment on whether a proportional flow standard based on mean annual flow proposed at 40 CFR 125.84(b) will effectively protect smaller freshwater rivers and streams from levels of impingement and entrainment proportional to the volume of water withdrawn from these waterbodies.

## 2. Limitation on Altering Stratification in Lakes and Reservoirs

At least one commenter asserted that the regulation as proposed can be interpreted to require that no alteration of the natural thermal stratification is allowed, regardless of the size, limit, or location relative to the intake structure. They further asserted that this standard is unachievable and should not be included in the final rule.

The Agency continues to consider whether these regulations should limit withdrawals of large quantities of cooling water from lakes which are naturally stratified. In particular, EPA is considering whether the withdrawal of large quantities of subsurface water may negatively affect a lake's thermal stratification and seasonal turnover dynamics. EPA is also considering whether cooling water withdrawals from deeper, colder areas within lakes, followed by discharge of used cooling water either at, or where it may rise to, the lake's surface, may bring nutrient-rich, hypolimnion<sup>1</sup> water to the surface where it may stimulate the growth and respiration of harmful levels of algae and other biological assemblages within a lake. EPA is considering and invites comment on whether such concerns are appropriately addressed in regulation for cooling water intake structures or should be addressed by a permitting agency when it establishes any limitations on the discharge of the cooling water.

EPA is also considering whether the proposed limitation to “not alter” and “not upset” natural stratification may be subject to considerable interpretation such that the intent of that portion of the proposed regulation is not sufficiently clear. Thus, the Agency solicits public comments on the information contained in “Cumulative

Impacts of Power Plant Cooling Systems on Lake TMDLs” (see #2–027A in the Docket) which supports the idea of maintaining natural stratification. EPA also requests comment on the use of the phrase “not disrupt the natural stratification and turnover pattern of the source water body” and invites commenters to suggest other alternatives to the terms “not alter the natural stratification of the source water body” or “not upset the natural stratification of the source water body” as used at 65 FR 49077 and 49118.

2–027A Chen, C.W., L.H. Ziemelis, J. Herr and R.A. Goldstein. Cumulative Impacts of Power Plant Cooling Systems on Lake TMDLs. Proceedings of an EPRI Conference : Power generation Impacts on Aquatic Resources. Atlanta, Georgia. April 12–15, 1999.

## 3. Velocity

EPA proposed 0.5 ft/sec as a velocity limit in all waters except those 50 meters beyond the littoral zone in lakes and reservoirs. Since proposal, EPA has gathered or received data on the swimming speed of fish of various species from EPRI (see W–00–03, 316(b) Comments 2.11), from the University of Washington studies that support the current National Marine Fisheries Service velocity standard for intake structures and from references included in comments from the Riverkeeper (see Turnpenny, 1988, referenced in W–00–03, 316(b) Comments 2.06. Document found in #2–028B in the Docket). All of the swim speed data used is contained in #2–028 in the Docket. Also located in #2–028 in the Docket, is new data EPA received from the National Marine Fisheries Service on screen design consideration for approach velocities to protect juvenile salmonids.

2–028A EPRI. Technical Evaluation of the Utility of Intake Approach Velocity as an Indicator of Potential Adverse Environmental Impact Under Clean Water Act Section 316(b). Technical Report. 1000731. 2001.

2–028B Turnpenny, A.W. H. The Behavioral Basis of Fish Exclusion from Coastal Power Station Cooling Water Intakes. Central Electricity Generating Board Research Report, RD/L/3301/R88. 1988.

2–028C Smith, L.S., L.T. Carpenter. Salmonid Fry Swimming Stamina Data for Diversion Screen Criteria. Prepared by Fisheries Research Institute, University of Washington, Seattle, WA for Washington State Department of Fisheries and Washington State Department of Wildlife. 1987.

2–028D Pearce, Robert O. and Randall T. Lee. Some Design Considerations for Approach Velocities at Juvenile Salmonid Screening Facilities. American Fisheries Symposium. 1991.

The Graph (Swim Speed Data, #2–029 in the Docket), is a compilation of the data EPA received on fish swimming speeds as it varies with the length of the tested fish and with water temperature. These data show that, not accounting for any safety margin to address screen fouling (which increases velocity in screen areas that remain open), a 1.0 ft/s velocity standard would protect 78% of the tested fish, and a 0.5 ft/s velocity would protect 96% of these fish. EPA is evaluating these data and considering whether to maintain or modify the proposed velocity limitation. To estimate the extent to which a low-velocity performance standard might affect new facilities, EPA also is evaluating preliminary data on the design intake velocity of existing facilities from the Agency's section 316(b) survey questionnaire (see Percentage Distribution of Intake Velocities for Recently Constructed In-Scope Cooling Water Structures, #2–030 in the Docket). These preliminary data indicate that 73% of the manufacturing facilities and 62% of the electricity generating facilities built in the last 15 years meet the proposed velocity limitation of no more than 0.5 feet/second.

EPA is evaluating a number of other issues that could cause it to modify the proposed velocity limitation. As discussed at Section A.3 above, EPA received comments asserting that offshore and coastal oil and gas platforms might be subject to the rule and face difficulties meeting the proposed velocity limitation due to biofouling concerns in marine waters and engineering/technical issues associated with drilling platforms. EPA is evaluating these assertions and seeking additional information on this topic. Should EPA include new offshore and coastal oil and gas platforms within the scope of the final regulations, the Agency will decide whether subcategorization and a different velocity limitation may be appropriate for these facilities. EPA is also investigating whether biofouling is an issue for cooling water intake structures at land-based facilities.

In response to comments, EPA is evaluating whether the 0.5 ft/s velocity limitation is appropriate or necessary for offshore intakes equipped with velocity caps. Velocity caps work by changing vertical flows, which fish do not avoid because they can not detect, to horizontal flows, which fish detect and avoid. Commenters suggested that offshore intakes with velocity caps designed with velocities greater than 0.5 ft./s would be more effective in reducing biofouling than those with lower

<sup>1</sup> Hypolimnion: The deep, cold, and relatively undisturbed region below the thermocline. From: Hutchinson, G.E. 1975. A Treatise on Limnology. Volume 1, Part 1—Geography and Physics of Lakes. John Wiley & Sons, New York. (See #2–027B in the Docket).

velocities and would be more effective in protecting fish located in waterbodies with higher flow velocities. Commenters also raised issues associated with the effects of tidal and long-shore currents on velocities in the vicinity of velocity caps. EPA identified documentation (see Turnpenny, 1988, W-00-03, 316(b) Comments 2.06 in #2-028B in the Docket; Mussalli, Taft, Larson, 1980; and Schlenker 2001 in #2-031B in the Docket) that may substantiate commenters' concerns with the influence of tidal and current velocities on velocities at a velocity cap. However, the documentation also provides design solutions to minimize the influence of water body currents on velocity caps. EPA identified documents indicating that, in these circumstances, limiting velocities at intakes with velocity caps may afford some additional protection, but that the entrainment reduction may be small. One of the documents states that the location of the submerged intake structure may be the most important factor in limiting the impact from the intake structure. EPA requests comment on the following documents.

2-031A Mussalli, Yusuf, et al. Offshore Water Intakes Designed to Protect Fish. In: Journal of the Hydraulics Division, Proceedings of the American Society of Civil Engineers, Vol. 106, No. HY11. 1980.

2-031B Schlenker, Stephen J, Army Corps of Engineers. Email on: Section 316(b) Rulemaking (Velocity) to Kelly Meadows, Tetra Tech, Inc. April 18, 2001.

2-028B Turnpenny, A.W.H. The Behavioral Basis of Fish Exclusion from Coastal Power Station Cooling Water Intakes. Central Electricity Generating Board Research Report, RD/L/3301/R88. 1988.

EPA also requests comment on the American Society of Engineers' Design of Water Intake Structures for Fish Protection (see #2-032 in the Docket) which suggests that design velocities should range from 0.5 ft/s to 1.5 ft/s. Based on comments and these documents, the Agency requests comment on allowing velocities of up to 1.5 ft/s at offshore intake structures with velocity caps in all types of waterbodies.

2-032 American Society of Engineers. Design of Water Intake Structures for Fish Protection. Section III. Engineering Factors Influencing Intake Design and Parts of Section VI. Practical Fish Protection Methods (Velocity Cap for Offshore Water Withdrawals). New York. pp. 13-23 and 66. 1982.

Finally, EPA is considering comments on where velocity should be measured. Some commenters assert that velocity should be measured on the basis of "approach-velocity" rather than the proposed design intake velocity (also known as through-screen or through-

technology velocity). Other commenters assert that velocity should be measured where its value is highest, which might be at the screen face or at another location in front of the screen (for example, at a narrow constriction in an intake canal or at a narrow opening in a curtain wall placed in front of the screen). (See W-00-03, 316(b) Comments 2.06 (River Keeper) and 1.56 (EPRI). EPA is also providing for comment, the document contained in #2-033 in the Docket.

2-033 Ray, S.S., R.L. Snipes, and D.A. Tomljanovich. A State of the Art Report on Intake Technologies. Environmental Protection Agency Office of Research and Development, Office of Energy, Minerals, and Industry. EPA 600/7-76-020; TVA PRS-16. 1976.

#### 4. Rulemaking Framework—Burden on States To Implement Section 316(b) on a Case-by-Case Basis

One objective of EPA's proposed rule was to develop section 316(b) requirements applicable to broad classes of waterbodies in order to minimize the permitting burden on the States (which, for the most part, are the permit authorities responsible for implementing section 316(b)). Some States have expressed concern about adopting a site-specific approach for new facilities which, in their view, would require a burdensome expenditure of resources to develop section 316(b) requirements for each new facility. States that commented on the proposed regulations, including Michigan, New York, New Jersey, and Alaska, generally supported the adoption of minimum technology requirements. Michigan and New Jersey specifically expressed concern about the existing case-by-case approach. Only Louisiana specifically opposed adoption of the proposed regulations, stating that any requirements for cooling water intake structures should be implemented under the CWA section 404 program or under section 10 of the Rivers and Harbors Act.

EPA invites comment on additional information documenting resources that several States have devoted to implementing section 316(b) on a case-by-case basis (see #2-034A-B in the Docket). EPA will consider this information as the Agency evaluates the practicality of various alternatives for the final rule. EPA invites commenters to submit any other data on the workload associated with implementing section 316(b) under the current case-by-case approach. EPA also invites comment on the need for nationally applicable regulations, as opposed to a site-specific approach, in order to

minimize the burden on States for permitting new facilities. EPA invites comment again on its estimates of the cost to States to implement the proposed requirements (See #1-5067-PR, Information Collection Request for Cooling Water Intake Structures New Facility Proposed Rule, Chapter 6), and acknowledges that these costs may change based on any changes in the final regulations.

2-034A Sarbello, Bill, NYDEC. Memo to J.T. Morgan, EPA RE: Costs Associated with 316(b) Permitting Activities in NY State. February 26, 2001.

2-034B Reading, Jeffrey, NJDEP. Letter to Sheila Frace, EPA RE: Request for Information Regarding Staffing and Resources Required in Applying Section 316(b). April 24, 2001.

#### 5. Recently-Constructed Facilities Already Implementing the Proposed New Facility Requirements

To estimate the percentage of manufacturers, utilities and nonutilities constructed in the last fifteen (15) years that meet various proposed requirements for cooling water intake structure technology, EPA performed an analysis using detailed questionnaire data. These preliminary data indicate that 47% of the recently-constructed manufacturers, 42% of the recently-constructed nonutilities, and 53% of the recently-constructed utilities meet the proposed requirement to install additional design and construction technologies such as a traveling screen with a fish return system, a wedge wire screen, or a fine mesh screen with a fish return system. (see #2-035A in the Docket).

EPA performed a similar analysis of the detailed questionnaire data to estimate what percentage of in-scope facilities constructed during the last 15 years meet the proposed requirement for reducing intake flow to a level commensurate with use of a recirculating cooling water system. These preliminary data show that 38% of the manufacturing facilities, 66% of the nonutility facilities, and 70% of the utility facilities have closed-cycle, recirculating cooling systems. (see #2-035B in the Docket). EPA is now working to verify the accuracy of these estimates as they appear to be lower than the estimated percentages in the record at proposal based on information from DOE's Energy Information Agency and RDI's NEWGen database.

Finally, EPA analyzed the detailed questionnaire data to estimate what percentage of the in-scope manufacturing, utility and nonutility facilities constructed in the last 15 years meet all three of the proposed

requirements for: (1) Reducing intake capacity to a level commensurate with use of a closed-cycle recirculating cooling system; (2) reducing intake velocity to no more than 0.5 ft/sec; and (3) developing a plan and installing additional design and construction technologies. The analysis shows that 16% of these manufacturers, 31% of these nonutilities, and 44% of these utilities meet all three performance and technology standards. (see #2-035C in the Docket). Based on these data, EPA is considering and invites comment on whether it is reasonable for new facilities to meet these proposed standards.

### *G. Revision in Costing and Energy Impacts Estimates*

#### 1. Energy Consumption Associated With Alternative Cooling Systems

At proposal, EPA invited comment on a regulatory alternative that would require zero or extremely low intake flow commensurate with levels achievable through the use of dry-cooling systems. EPA discussed and invited comment on a number of issues including any potential energy penalty at new facilities using dry-cooling systems.

Alternatives to conventional wet cooling towers or once-through systems are often described as dry cooling systems but, in fact, may include hybrid wet-dry cooling systems. These alternative cooling systems may be less efficient in rejecting heat than conventional wet cooling towers or once-through systems. Alternative cooling systems generally have higher parasitic (fan) electrical loads and can create a higher pressure (temperature) in the steam turbine condenser. Both of these factors can decrease the thermal efficiency and power output of the plant. Estimating the nature of this penalty is difficult given that the facility could be designed and operated in a variety of ways using one of these alternative cooling technologies. As discussed at proposal, climactic conditions may significantly influence the efficiency of alternative cooling systems (see 65 FR 49081). For instance, dry cooling systems can be less efficient during warmer periods than during cooler periods.

At proposal, EPA's discussion of energy inefficiency due to cooling requirements focused on energy penalties associated with the operation of dry cooling systems. Since proposal, EPA has sought out information measuring and/or estimating comparable efficiencies of cooling towers (wet, dry, and hybrid) to once-

through cooling systems. EPA discovered some additional information comparing dry and hybrid cooling towers to wet cooling towers and obtained a limited amount of information on the topic through public comment. EPA invites comments on the following new data (see #2-036A-D in the Docket):

- 2-036A Pryor, Marc. "Supplemental Testimony to the La Paloma Generating Project (98-AFC-2) Final Staff Assessment. California Energy Commission. April 20, 1999.
- 2-036B Western Area Power Administration Sierra Nevada Region Sutter Power Plant. "Summary of the Presiding Members Proposed Decision on Other Commission Decisions", Chapter 3. April 1999.
- 2-036C SAIC. Memo to File RE: Steam Plant Energy Penalty Evaluation. April 20, 2001.
- 2-036D Edison Electric Institute. Environmental Directory of Power Plants. 1996

EPA intends to revise the operation and maintenance costs of its estimates for wet and dry cooling towers to include the marginal cost of energy penalties. EPA intends to estimate any energy penalties as compared to cooling systems that new facilities would be likely to install absent final regulations. When EPA projects that a facility would switch from a once-through cooling system to a closed-cycle cooling system employing a wet cooling tower to comply with final regulations, EPA will estimate the energy penalty based on values derived from documents already in the record, the new materials referenced above, and similar sources of information. To project the energy penalty of dry cooling systems compared to once-through cooling systems, EPA will use its estimate of the energy penalty of a closed-cycle cooling system employing a wet cooling tower, then estimate any additional energy penalty imposed by use of a dry cooling system based on documents already in the record, the new materials referenced above, and similar sources of information. To project the energy penalty of dry cooling towers compared to a closed-cycle cooling system employing a wet cooling tower, EPA will estimate the energy penalty based on documents already in the record, the new materials referenced, and other relevant sources of information.

#### 2. Specific Revisions to Inputs to Costing Model for Wet Cooling Towers and Dry Cooling Systems

Some public comments on the proposed regulations assert that EPA's annual cost estimates for wet cooling towers did not include essential components such as wiring,

foundations, condenser pumps, and noise attenuation treatment. EPA did not separately identify these items in the estimates presented at the time of proposal because the Agency used empirical models based on actual construction project costs to verify its costing estimates. These empirical models represent the cost to the plant and include all essential components. However, to further document the annual costs that EPA used in its cost estimates for wet cooling towers, EPA requests comment on the new data in EPA's April 23, 2001 memorandum titled, "Supporting Documentation for Unit Costs" contained in #2-037 of the Docket.

Since proposal, EPA collected additional project cost information to verify its empirical cost models. EPA requests comment on the capital cost information contained in #2-037 of the Docket.

Based on literature and vendor information, EPA's proposal estimated a 10 degree Fahrenheit design approach value for wet cooling towers. EPA requests comment on information contained in #2-037 of the Docket in support of this value.

EPA proposed that operation and maintenance (O&M) costs of wet cooling towers reflect an "economy of scale" with increasing size. Therefore, in some cases, as the size of the cooling tower increases, O&M costs decrease per unit of water cooled. EPA is supplementing the record to support its assumption that there are "economies of scale" based on comments received on the proposal. EPA has placed information in the record to support EPA's methodology for calculating O&M costs for wet cooling towers (see #2-037 in the Docket).

At proposal, EPA assumed that some new facilities would use once-through cooling systems absent final regulations and would switch to a closed-cycle cooling system employing a wet cooling tower. In these cases, EPA costed the water flow used in the recirculating cooling tower as 15 percent of the original flow. EPA acknowledges that this assumption does not match standard industry design practice. EPA intends to revise its estimates of recirculating flow upward based on the entire flow of cooling water through the cooling tower and will size and cost the recirculating pumps accordingly.

EPA's proposed wet cooling tower costs may have included elevated capital costs due to a design estimate that plume abatement would be applied at a large proportion of the cooling towers built as a result of the regulations. Since proposal, EPA sought

additional information regarding industry practice for wet cooling tower construction and the use of plume abatement. Through vendor contact, EPA learned that wet cooling towers generally do not incorporate plume abatement technologies. Therefore, EPA intends to revise its wet cooling tower estimates to reflect a reduced implementation of plume abatement techniques. EPA also intends to study the sensitivity of costs with respect to this aspect of its cost estimates. (See #2-037 in the Docket.)

At proposal, EPA estimated the marginal annual cost of dry cooling towers over once-through cooling systems but did not explain its methodology for estimating the capital and O&M costs of dry cooling towers. EPA invites comment on the information the Agency used to estimate annual costs of dry cooling towers placed in the record. (See #2-037 in the Docket.)

EPA obtained further information relating to the capital cost of dry cooling towers since proposal. The Agency invited comment on the following information:

2-037 EPA. Memo to File RE: Supporting Documentation for Unit Cost Analysis. April 23, 2001.

In addition, EPA invites comment on the following documents:

2-036A Pryor, Marc. Supplemental Testimony to the La Paloma Generating Project (98-AFC-2) Final Staff Assessment. California Energy Commission. April 20, 1999.

2-036B Western Area Power Administration Sierra Nevada Region Sutter Power Plant. Summary of the Presiding Members Proposed Decision on Other Commission Decisions, Chapter 3. April 1999.

EPA also obtained information on the cost of dry cooling systems through public comment. Cost information, as well as general comments received on dry cooling are included in the public record. (See #2-038A-B in the Docket.)

2-038A Dougherty, Bill. Comments on the EPA's Proposed Regulations on Cooling Water Intake Structures for New Facilities. Tellus Institute. November 8, 2000.

2-038B Burns Engineering Services, Inc. and Wayne C. Micheletti, Inc. Comparison of Wet and Dry Cooling Systems for Combined Cycle Power Plants. November 4, 2000.

2-038C Public Comments on Dry Cooling in Response to Proposed Rule of August 10, 2000.

### 3. Other Environmental Impacts

EPA discussed the water quality and non-water quality impacts of cooling towers (both wet and dry) at proposal

(see 65 FR 49075 and 65 FR 49081). However, EPA did not quantify all impacts that may result from implementation of the rule. For the final rule, EPA intends to estimate, to the extent possible, the marginal increases in emissions of air pollutants associated with wet and dry cooling towers. The Agency intends to compare projected emissions under the rule to projected emissions absent the rule. (At proposal, EPA projected that, regardless of the outcome of the rule (that is, absent these regulations) a majority of units would have wet cooling towers and a minority would have once-through or dry cooling systems.)

EPA may estimate air emissions using the permit application calculations required by the Colorado Department of Public Health and Environment (CDPHE), Colorado Air Pollution Control Division, Stationary Sources Program. This program requires emissions estimates for new power generating permits according to the codified guidance at 40 CFR chapter 1, appendix W to part 51 (July 1, 1999). The technique would use emissions factors from the Compilation of Air Pollutant Emission Factors, Volume I (AP-42) for stationary turbines and derive estimates of pollutant emissions for each type of unit. EPA would adjust the emissions estimates, when appropriate, to reflect a marginal comparison by using energy penalty estimates. For example, in the case where EPA examines any increase in emissions of air pollutants due to dry cooling, it would base this estimate on a calculation of any energy penalty associated with dry cooling as compared to energy use at plants projected to install wet closed-cycle cooling systems or once-through cooling systems absent these regulations. EPA expects that a small fraction of facilities would not experience any increased air pollutant emissions because that they are projected to use dry cooling, regardless of the outcome of the rule.

Alternatively, EPA may estimate air emissions using the Emissions & Generation Resource Integrated Database (E-GRID2000). This database integrates data from 18 different federal sources and provides emissions and resource mix data for every plant, electric generating company, state and region in the country. From E-Grid 2000, EPA may generate an emission rate per MWh or loaded hour for NO<sub>x</sub>, SO<sub>2</sub>, CO<sub>2</sub>, and Hg to estimate increased emissions at plants that consume additional fuel because they install a wet or dry cooling tower to comply with final regulations. Such an analysis would presume that an individual plant

increase its loading in order to meet this energy cost as opposed to delivering less power to the grid which in turn would be made up by a different plant.

The following references are included in the record for public review. (See #2-039A-C in the Docket.)

2-039A Kendal, Ashley L. Technical Review Document Operating Permit 960PMR153. March 16, 1998.

2-039B 40 CFR Ch.1 (7-1-99 Edition). Pt. 51, App. W. Pages 390-481.

2-039C EPA. AP-42, Fifth Edition, Volume 1 [Section 3.1]. April 2000. (Available at: <http://www.epa.gov/ttn/chief/ap42>.)

### 4. Baseline Biological Characterization Study and Impingement and Entrainment Monitoring During the Permit Term

EPA's proposed regulations would require a permit applicant to complete a "source water baseline biological characterization" based on at least one year of pre-operational biological monitoring (proposed 40 CFR. 125.86). The applicant would use this information to develop a plan for installing additional design and construction technologies (such as screens, or barrier nets, or well-designed return systems for impinged fish). This information would also support the permitting agency (in most cases, a State) in considering whether site-specific conditions warrant more than the baseline regulatory protections (see proposed 40 CFR 125.84(f) and (g)). The proposed regulations would also require permittees to conduct impingement monitoring over a 24-hour period once per month during the first two years of the permit and to conduct entrainment monitoring over a 24-hour period no less than biweekly during the period of peak reproduction and larval abundance. After two years, the permitting agency could reduce impingement and entrainment monitoring frequency in the remaining permit term and when the permit is reissued (proposed 40 CFR 125.87).

The July 2000 "Information Collection Request for Cooling Water Intake Structures New Facility Proposed Rule" (ICR) estimated costs for the Sourcewater Baseline Characterization Activities and for entrainment and impingement monitoring based on Bureau of Labor Statistics base wage rates multiplied by time spent in each labor category. Direct Labor Costs and Operation and Maintenance Costs were added to estimate the burden and costs per facility. The ICR states that the Sourcewater Baseline Characterization costs would include \$19,500 for contracted laboratory assistance with monitoring, taxonomy and data



tabulation (plus \$500 for other direct costs (ODCs)). Similarly, text in the ICR states that contracted lab costs for entrainment and impingement monitoring would amount to \$19,500 and \$4,580, respectively (plus \$500 in ODCs). Tables 7 and 8 of the ICR indicate that the Sourcewater Baseline Characterization would cost each facility \$11,655 in labor and \$750 in ODCs; entrainment monitoring would cost \$14,675 in labor and \$4,000 for ODCs; and impingement monitoring would cost \$6,736 labor plus \$2,000 ODCs. However, the contracted laboratory costs discussed in the text of the ICR are not included in these tables. Thus, to eliminate confusion about EPA's estimated costs for biological monitoring in the ICR, the Agency states that it used the following cost estimates at proposal: approximately \$32,000 for Sourcewater Baseline Characterization per facility; approximately \$38,000 annually for entrainment monitoring per facility; and approximately \$13,000 annually for impingement monitoring per facility. These costs were considered an average cost for all types of waterbodies combined.

EPA received comment from several commenters, including UWAG and EPRI, asserting that EPA's proposal underestimated the costs of biological monitoring (see UWAG comments at W-00-03, 316(b) Comments 1.68 and EPRI's comments at W-00-03, 316(b) Comments 1.56). As discussed in the memorandum, "316(b) Monitoring Cost Estimates for New Facilities," EPA has refined its cost estimates and believes it should use cost ranges that, for the sourcewater baseline characterization and entrainment monitoring, vary for different types of waterbodies. EPA invites comment on the following revised cost estimates. (See #2-040 in the Docket.)

- Sourcewater Baseline Characterization: \$8,000 to 25,000 for a freshwater stream/river; \$8,000 to 35,000 for a lake/reservoir; \$8,000 to 50,000 for an estuary/tidal river; and \$8,000 to 70,000 for an ocean.

- Biological Monitoring—Entrainment: \$15,000 to 40,000 for a freshwater stream/river; \$15,000 to 40,000 for a lake/reservoir; \$20,000 to 50,000 for an estuary/tidal river; and \$20,000 to 50,000 for an ocean.

- Biological Monitoring—Impingement: \$10,000 to 25,000 for a freshwater stream/river, a lake/reservoir, an estuary/tidal river and an ocean. To develop these cost estimates, the Agency consulted biological monitoring practitioners who conduct impingement, entrainment and other

types of biological monitoring studies. These revised estimates reflect that the equipment, effort and expertise needed to sample an ocean facility, for example, would be more costly than that needed to monitor a facility located on a stream or small river.

EPA received comment asserting that a one-year sourcewater biological characterization would provide information of limited utility, particularly in estuarine and coastal areas where fish populations exhibit tremendous inter-annual variability (see EPRI comments at W-00-03, 316(b) Comments 1.56 in the Docket). Among other concerns, this commenter asserted that the baseline year may not represent average population characteristics. In response to these comments, EPA invites comment on the documents located in #2-041 in the Docket. This information generally supports the assertion that a multi-year baseline reduces the confounding effect of year-related phenomenon on assessments and (see EPA 1990, referenced below) provides a better basis for evaluating management actions:

2-041A Meador, M.R., T.F. Cuffney and M.E., Gurtz. Methods for sampling fish communities as a part of the National Water Quality Assessment Program. U.S. Geological Survey Open-File Report 93-104. Raleigh, North Carolina. 40p. 1993.

2-041B Leahy, P.P., J.S. Rosenshein, and D.S. Knopman. Implementation plan for the National Water Quality Assessment Program. U.S. Geological Society. Open-File Report 90-174, 10 p. 1990.

2-041C Holland, A.F. (ed.), EPA. Environmental Monitoring and Assessment Program-Near Coastal Program Plan for 1990: Estuaries, Chapter 2. 1990.

EPA is considering and invites comment on whether it should extend the time period for the baseline biological characterization study for tidal rivers, estuaries, and oceans to address inter-annual variability of fish populations in these areas.

#### H. Industry Approach

##### • Fast-Track Alternative

In comments on the proposed regulations and in other materials EPA recently received, the Utility Water Act Group (UWAG), an industry trade association, has suggested that EPA consider an alternative based on several of the regulatory alternatives EPA described at proposal (see UWAG. Email to EPA RE: Brief Description of a Two-track Process. April 12, 2001, in #2-042 in the Docket). Under this approach, a company seeking to build a new facility could pursue one of two tracks: either (1) to commit to one or more of a number of specified technologies

deemed to represent highly protective technology at the outset or (2) to engage in a site-specific study to determine the best technology available (BTA) for the site.

Under Track 1 (the "fast track"), an applicant would commit to install highly protective technologies in return for expedited permitting without the need for pre-operational or operational studies in the source waterbody. Such fast-track technologies might include:

1. Any technologies that limit intake flow to the flow that would be required by wet closed-cycle cooling at that site and that has an average approach velocity (measured in front of the cooling screens or the opening to the cooling water intake structure) of no more than 0.5 fps; or

2. Any technologies that will achieve a level of protection from impingement and/or entrainment that is within the range expected under Option 1 for closed-cycle cooling (with 0.5 fps approach velocity) on the type of waterbody where the facility is to be located. This option is intended to allow facilities to use either standard technologies, or new ones, that have been demonstrated to be effective for the species, type of waterbody, and flow volume of the cooling water intake structure proposed for their use. Examples of candidate technologies would include:

- a. Wedgewire screens where there is constant flow, as in rivers;

- b. Traveling fine mesh screens with a fish return system designed to minimize entrainment and impingement mortality; and

- c. Gunderbooms at sites where they would not be rendered ineffective by high flows or fouling.

If the operator of a new facility chose to install such highly protective intake technologies and validated their performance, as necessary, the permitting agency would not require additional section 316(b) protective measures for the life of the facility, unless EPA established different technology requirements by rulemaking.

UWAG believes that the record developed to date indicates that the combination of flows associated with closed-cycle cooling and low intake velocity reduce entrainment and impingement mortality to such low levels that adverse environmental impact ("AEI") is avoided thereby not just meeting, but exceeding the section 316(b) standard of protection. UWAG also believes that information in the record and additional materials described in Section H.2. below demonstrates that other technologies,

including those above, when used properly, may provide a level of protection within the same range and thus would also be highly protective of aquatic resources.

Closed-cycle cooling and extremely low approach velocities have been used to avoid levels of entrainment and impingement mortality that could cause adverse environmental impact. Nevertheless, UWAG states that some interested parties have argued that EPA cannot support a finding that such technologies constitute BTA due to factors such as very high capital and other costs compared to environmental benefits, cross-media effects, site-specific factors (such as land constraints or habitat or air emissions concerns), or jurisdictional issues regarding cooling towers (which some commenters argue are part of the cooling system, not "intake structure" technologies). These stakeholders argued that such low flows and velocities are far more conservative than needed to meet the statutory standard of "best technology available to minimize adverse environmental impact." This objection would be beside the point under this alternative, because EPA would not define these technologies as BTA for "minimizing" adverse environmental impact but instead determine that they avoid adverse environmental impact altogether. Using this approach, the final rule would reflect EPA's determination that, where the permittee proposes to use a demonstrated technology that meets the above criteria, the technology would, in almost every case, avoid adverse environmental impact and exceed the requirements of section 316(b). UWAG believes that financing issues associated with uncertainty and delay during periods of pre-permitting biological study (described in Section H.3 below) would make the fast-track option highly desirable for many new facility applicants who otherwise might face significant difficulties that are building new facilities that are urgently needed to meet increased demand for electricity.

UWAG also suggested that, in conjunction with its fast-track alternative, EPA should use a similar approach to encourage rather than foreclose alternative or innovative intake structure technologies that provide a level of protection reasonably consistent with the criteria established above. If a proponent of a new facility knows of an alternative technology but cannot try it without extensive pre-operational site-specific studies, he or she may not be inclined to take the risk of developing the new technology. To

remove this disincentive, EPA could allow expedited permitting when an applicant can demonstrate, as part of its permit application, that the intake structure technology it proposes will achieve a level of protection reasonably consistent with the criteria established in Option 1 above. Such a demonstration would not require source waterbody studies. It might instead be based on successful use of the innovative technology at a comparable site or successful testing in a laboratory or a pilot-scale trial. Some monitoring after the facility begins operating may be appropriate to validate the design performance of alternative technologies.

In addition, UWAG suggests that, as part of this approach, EPA could in the future approve additional, alternative "fast-track" technologies based on accumulated experience. There could potentially be unusual species-specific circumstances in which fast-track technologies meeting the above criteria would not be sufficient to avoid adverse environmental impact. While, in UWAG's view, the number of such sites will be very small, the rule could nevertheless give permit writers the authority to require additional protective technology if the permitting agency has information that exceptional conditions exist such that, even with fast-track technology, the proposed facility would adversely impact a representative indicator species in a way that other federal or state requirements, such as the Endangered Species Act, would not prevent. EPA invites comments on those proposals as well.

Track 2 of the industry approach would be for facilities and sites for which the applicant does not want to commit to any of the above technology options but believes that a close look at site characteristics, including the local biology, would justify another intake technology, such as once-through cooling. For these situations, the applicant could demonstrate to the permitting agency, based on site-specific studies, either that the proposed intake would not create an appreciable risk of adverse environmental impact or, if it would create an appreciable risk of adverse environmental impact, that the applicant would install technology to "minimize" adverse environmental impact. Such demonstrations would recognize that some entrainment and impingement mortality can occur without creating "adverse environmental impact," but, where there was an appreciable risk of adverse environmental impact, the technology that would "minimize" it would also be the technology that maximized net

benefits. If the proposed intake created an appreciable risk of adverse environmental impact, the applicant would have to identify all reasonably available intake structure technologies that would reduce the impact to the aquatic community and that would be feasible for the site. The applicant would also estimate both the costs and benefits of each such technology, including the impacts of the cooling water intake structure on aquatic biota, as well as the monetary costs of construction and operation, energy costs, and environmental costs such as air pollution, aesthetics, and land use. Summing the costs and benefits for each "available" technology, the permittee would choose as "best" the one that had the highest net benefit. Industry asserts that efficient methods for assessing costs and benefits, based on a variety of federal precedents, might be developed to determine the net benefits without undue delay or uncertainty. Industry did not specify what federal precedents or methods for assessing benefits would be applied.

Under the industry approach, the second track would not require the same type or intensity of study for every site or every proposed plant design. In designing a Track 2 study to determine whether there is an appreciable risk of adverse environmental impact and, if so, what will "minimize" it, the applicant and permitting agency could apply a series of tests to focus the study. First, no further study would be necessary if the intake draws its water from an area not designated for protection of fish or aquatic life (in accordance with the requirements of 40 CFR part 131) or an area that does not support or could not support vulnerable life stages of representative indicator species due to lack of dissolved oxygen or for other reasons. Second, an intake structure would not have to be assessed for entrainment if it withdraws an amount no greater than a given percentage of the source waterbody that has proven to be extremely conservative. (UWAG asserts that some interested parties have suggested a value of 5% or less of the 90% exceedance flow of a river<sup>2</sup> or 5% or less of the volume of the biological zone of influence in a lake or reservoir, measured when entrainable life stages of representative indicator species are present.) Third, the proposed facility would not have to be assessed for entrainment if it were designed to

<sup>2</sup> In this case, a facility would not require entrainment assessment if it withdrew 5% or less of the low flow condition that is exceeded in a river at least 90% of the time.

ensure that entrainment losses of equivalent adults would be less than a value that has generally proven to be highly conservative or not inconsistent with fishery management plans. (Some interested parties, UWAG asserts, have suggested values equal to or less than 1% of the population of any commercially or recreationally important species and equal to or less than 5% of the population of non-harvested species.) The permitting agency would consider survival rates for entrained representative indicator species in applying this test.

Under the industry-suggested Track 2 approach, some proposed new facilities might be able to use the Track 2 tests to show that they would not cause adverse environmental impact and, therefore, would need no further analysis. Others might find that the Track 2 tests eliminated from concern some risks (entrainment, for example) or some species. For these proposed facilities, once the necessary studies had been focused by the Track 2 tests, the applicant would assess the likelihood that the intake would cause an appreciable risk of adverse environmental impact. They would use a process like that outlined in EPA's Ecological Risk Assessment Guidelines (see #2-020D in the docket), using biological, locational, design, and operational data from the site. If the study showed an appreciable risk of adverse environmental impact, then the applicant would be obligated to identify all reasonably available technologies that would be feasible at the site. It would then perform the cost-benefit analysis described above to determine which technology would maximize net benefits. EPA requests comment on this approach.

In considering the industry approach, EPA also solicits comment on the following potential modifications. EPA is considering a fast-track approach that would be based on a commitment by the facility to employ a suite of technologies that would be determined to represent BTA for the fast-track option. The technologies under consideration are: reduction in capacity commensurate with that achievable by use of a closed-cycle cooling system; a velocity limitation of less than or equal to 0.5 ft/sec; and location where intake capacity would be no more 5% of the mean annual flow or 25% of the 7Q10 flow of a freshwater stream or river, no more than 1% of the tidal excursion volume of a tidal river or estuary, or where the intake capacity would not disrupt the natural stratification and turnover patterns of a lake or reservoir. EPA is also considering designating the

following two additional design and construction technologies as part of a fast-track, BTA suite of technologies: a fine mesh traveling screen with a fish return system, variable speed pumps and a low pressure spray; or a submerged wedgewire fine mesh screen. (By contrast, industry's suggested approach would be that in order to qualify for fast track permitting, facilities would commit to either low velocity, closed-cycle cooling or a once-through cooling system with an intake equipped with one of a number of other technologies, e.g., wedge wire screens, fine mesh traveling screens with a fish return system, or Gunderbooms, based on a determination in the final rule that these other technologies may be as effective as closed-cycle cooling with a velocity limit of 0.5 ft/sec for purposes of reducing impingement and entrainment for the species, type of waterbody, and flow volume of the cooling water intake structure proposed for their use.)

Under the modification EPA is considering, the fast-track technologies and performance standards would reflect levels that some newer facilities have achieved. Based on data on existing facilities in the record at proposal, EPA estimates that almost all new facilities are likely to meet the proposed proportional flow standard for freshwater rivers (total intake flow less than 5% of mean annual flow or 25% of the low flow that occurs over a one-week period no more than once every 10 years) and for estuaries and tidal rivers (total intake flow no greater than one 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). As discussed at Section F.5 above, 16% of the manufacturing, 31% of the nonutility and 44% of the utility facilities constructed in the last 15 years meet all three of the proposed requirements for: (1) Reducing intake capacity to a level commensurate with use of a closed-cycle recirculating cooling system; (2) reducing intake velocity to no more than 0.5 ft/sec; and (3) developing a plan and installing additional design and construction technologies. (See #2-035C in the Docket). Under this approach, EPA would define these technologies as BTA for the fast-track option.

Other alternatives for fast-track technologies include:

- Dry cooling, either at all locations or in certain waterbodies determined to be particularly sensitive to impacts from cooling water intake structures, or in certain regions in the country where dry

cooling is demonstrated, or at certain sizes of facilities where dry cooling is particularly well-demonstrated;

- Differing suites of "fast-track" technologies based on the type of waterbody or the facility's location within a waterbody (e.g., adding additional fast-track technologies in tidal rivers and estuaries over those required in the parts of oceans, freshwater rivers and streams, and lakes and reservoirs that may be designated as less sensitive than other parts of these areas).

EPA also invites comment on other possible modifications to the industry fast-track option:

- EPA is considering a modification where limited pre-operational monitoring would be required. Under this approach, the planned facility would be required to monitor at the proposed site during the time of year of highest egg and larval abundance, which should correspond to the peak period for impingement and entrainment vulnerability. To the extent that the proposed year-long timeframe for pre-operational monitoring could result in significant delay in building a new facility, this modification might reduce those delays for some or many facilities. However, EPA recognizes that, depending on construction schedules and how they relate to the time of year when monitoring would be required this modification could limit the usefulness of the fast track approach for some new facilities.

- EPA is considering a modification where the permit would contain some or all of the proposed operational monitoring requirements at proposed 40 CFR 125.87, 65 FR 49121 or a reduced frequency of operational monitoring requirements.

- EPA is considering a modification where the permitting authority (most often a State) would retain authority to revisit section 316(b) requirements at permit renewal based on the facility's impingement and entrainment monitoring data or other new information (see proposed 40 CFR 125.84(f) and 40 CFR 125.84(g)).

- EPA is considering a modification where the Director (usually, a State official) could require pre-operational studies under circumstances similar to those described in proposed 40 CFR 125.84(f), 65 FR 49119, and/or proposed 40 CFR 125.84(g), 65 FR 49119 or at the Director's discretion. For example, the Director might require pre-operational monitoring if he or she determines it is reasonably necessary as a result of the effects of multiple cooling water intake structures in the same body of water (40 CFR 125.84(f) or it is reasonably

necessary to ensure attainment of water quality standards (40 CFR 125.84(g)).

EPA is also considering and invites comment on the following modifications to the industry's Track 2 option:

- EPA is considering a modification where, in all but exceptional or unusual circumstances (e.g., where a State or Tribe has designated a waterbody as having no use for supporting the propagation or maintenance of aquatic life and EPA has approved the revised use). A Track 2 facility would need to conduct a site-specific study that, at a minimum, meets the proposed requirements for a one-year source water baseline biological characterization at proposed 40 CFR 125.86 or, alternatively, for oceans, tidal rivers and estuaries, a longer study period might be required as discussed at Section G.4.

- Under the industry approach, an intake structure would not have to be assessed for entrainment if it withdraws an amount no greater than a given percentage of the source waterbody. The industry approach suggests a value of 5% or less of the 90% exceedance flow of a river or 5% or less of the volume of the biological zone of influence in a lake or reservoir, measured when entrainable life stages of representative indicator species are present. EPA is analyzing these proposed screening criteria at one location. As discussed in an EPA Memorandum to the Record titled "Utilities Proposal Re: Assessment for Entrainment," April 19 2001 (see Docket #2-043 in the Docket), at one location for which data are readily available, the threshold proposed by industry for entrainment assessment in rivers would equal about 40% of the maximum allowable intake flow that EPA proposed. EPA is considering the industry approach and a modification where an applicant would not have to assess potential entrainment impact if an intake structure withdrew a proportion of waterbody flow or volume significantly less than any final limitations for proportional flow, such as those at proposed 40 CFR 125.84. (EPA proposed that a facility withdraw no more than 5% of the mean annual flow or 25% of the 7Q10 flow of a freshwater river or stream. For tidal rivers and estuaries, a facility could withdraw no more than 1% 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.) EPA invites comment on potential screening levels for entrainment assessment. EPA is currently considering screening levels

between 1% and 50% of any final proportional flow limitations, but invites comment on other levels as well. To address concerns that a very large facility on a large waterbody might entrain a large number of aquatic organisms, EPA also invites comment on a possible screening level for entrainment assessment based on the total intake flow at a facility. EPA is currently considering a range of 2 MGD (equivalent to EPA's proposed regulatory threshold) to 15 or 25 MGD, but invites comments on other levels. Section A above provides perspective on the percentage of facilities and flows that would require entrainment assessment at these thresholds. EPA has not yet analyzed industry's suggested screening threshold for entrainment assessment in lakes and reservoirs. The Agency invites comment on whether this is a reasonable threshold, and on other potential screening thresholds for lakes and reservoirs, or other waterbodies such as estuaries, tidal rivers and oceans.

- Under the industry approach, a proposed facility would not be assessed for entrainment unless it exceeded both a flow-based threshold and a population-based threshold (see previous bullet for discussion of the flow-based threshold). The population-based threshold would be designed to ensure that entrainment losses of equivalent adults would be less than a value that, in industry's view, has generally proven to be highly conservative or not inconsistent with fishery management plans. Industry states that some interested parties have suggested values equal to or less than 1% of the population of any commercially or recreationally important species and equal to or less than 5% of the population of non-harvested species. EPA requests comment on a modification that would require that entrainment should be assessed if it exceeds *either* a flow-based threshold, or a threshold based on equivalent-adult losses. EPA is also considering a modification that would require entrainment assessment above a threshold as low as 1% or as high as 50% of those organisms that occupy or pass-through the area from which source water moves into the intake. Alternatively, EPA might use concepts from the 1977 Draft Guidance for Evaluating the Adverse Impact of Cooling Water Intake Structures on the Aquatic Environment to focus entrainment assessment on potential impact on organisms in the "primary study area," "the secondary study area," or the "zone of potential involvement."

(These are areas where biota may be drawn into or affected by a cooling water intake structure.) EPA requests comment on the use of any of these definitions from its 1977 Guidance to define areas for which entrainment assessments would be required. EPA is currently considering a range of 1% to 5% as a quantitative screening requirement in conjunction with any of these definitions, but invites comment on percentages outside of this range.

- Under the industry approach, if a Track 2 site-specific study showed an appreciable risk of adverse environmental impact, the applicant would have to identify all reasonably available technologies that would be feasible at the site. It would then perform the cost-benefit analysis to determine which technology would "maximize net benefits." The industry approach does not define how to maximize net benefits. However, industry comments suggest an approach that would involve determining applicable fish protection alternatives, assessing their incremental monetary costs and benefits to the extent feasible, major uncertainties in the analysis, and whether relevant costs or benefits have not been quantified. The applicant would then develop a BTA choice that is likely to maximize net benefits in that particular case. EPA invites comment on whether it would be appropriate to ensure that such site-specific cost-benefit studies include assessment of the following categories of data and ecological risks and benefits: numbers of individuals of various species and age-classes impinged and entrained for each technology alternative; commercial or recreational fishing opportunities enhanced or foregone; and/or other categories of benefits such as impact on other recreational opportunities (e.g., birding related to bird populations that are in part dependent on fish populations). EPA also invites comment on whether such studies should be based upon a single-year or multiple-year baseline. Finally, EPA is considering other economic analyses that could support a Track 2 decision on appropriate technologies and/or performance standards. The Agency invites comment on whether it should use the "wholly disproportionate" cost-benefit test that has been previously used in many case-by-case section 316(b) decisions or one of the economic affordability tests described at proposal.

## 2. Documentation for the Assertion That Appropriately Applied Existing Technologies Can Reduce Fish Losses to Levels Reasonably Consistent With Wet Cooling Towers With Low-Velocity

UWAG asserts that, at certain sites and under certain conditions, technologies such as wedge wire screens, fine mesh traveling screens with a fish return system, and Gunderbooms can be used at intakes with a capacity commensurate with once-through cooling and can reduce losses from entrainment and impingement to levels reasonably consistent with those of an intake structure with a capacity commensurate with use of a wet, closed-cycle cooling system and an intake velocity of no more than 0.5 feet per second. In the document, "Existing Technologies Which, Appropriately Applied, Can Reduce Fish Losses to Levels Reasonably Consistent with Wet Cooling Towers," April 18, 2001 (see #2-044A in the Docket), UWAG provides data that it asserts supports this position. UWAG also discusses this assertion in the document "Reasonably Consistent," April 20, 2001 (see #2-044B in the Docket). These data and information are intended to support the alternative industry approach discussed in section H.1. of this Notice. EPA is evaluating the UWAG assertions and will consider any public comments on them.

## 3. Financial Issues That Necessitate Minimal or No Pre-Permit Biological Study

As discussed in the document, "Financial Ramifications of Pre-operational Biological Monitoring Requirements" (see #2-045 in Docket), UWAG asserts that delays associated with EPA's proposed requirements for pre-operational biological monitoring could have significant costs for the facilities required to conduct such monitoring. These costs would include the replacement value for electricity not generated because new facilities did not enter the market as quickly as they might have without the requirement. UWAG also asserts that these delays will increase the costs of financing for a new facility because the lender will be taking a greater risk over a longer term for a facility that does not yet have a permit. EPA solicits comment on specifically how much the cost of financing would increase for a new facility based on such delay and uncertainty. UWAG further asserts that the pre-operational biological monitoring requirement will create an incentive to build plants that are not subject to this requirement and its

associated delays and produce more expensive electricity. These data and information are intended to support the alternative industry approach discussed in Section H.1. of this Notice. EPA is evaluating and invites public comment on the UWAG assertions. EPA is very interested in evaluating any impact these regulations may have on new facility construction. EPA invites the public to provide detailed information on the extent to which a year-long, pre-operational biological monitoring program might lengthen the timeframes for new facility development beyond those normally associated with, for example, site selection, financing, construction, local permitting, and environmental assessments conducted under other federal, state or local requirements.

### III. General Solicitation of Comment

EPA encourages public participation in this rulemaking and requests comments on this notice of data availability supporting the proposed rule for cooling water intake structures for new facilities.

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).

Dated: May 16, 2001.

**Diane C. Regas,**

*Acting Assistant Administrator, Office of Water.*

[FR Doc. 01-13187 Filed 5-24-01; 8:45 am]

**BILLING CODE 6560-50-P**

## ENVIRONMENTAL PROTECTION AGENCY

### 40 CFR Part 52

[Docket No. AK-01-003a; FRL-6986-5]

### Clean Air Act Attainment Extension for the Fairbanks North Star Borough Carbon Monoxide Nonattainment Area: Alaska

**AGENCY:** Environmental Protection Agency (EPA).

**ACTION:** Proposed rule.

**SUMMARY:** We propose to grant the one (1) year attainment date extension request for the Fairbanks North Star Borough carbon monoxide (CO) nonattainment area submitted by the State of Alaska on March 29, 2001. In the Final Rules section of this **Federal Register**, we are approving the State's extension request as a direct final rule without prior proposal because we view this as a noncontroversial action and anticipate no adverse comments. A detailed rationale for the approval is set forth in the direct final rule. If no adverse comments are received in response to this action, no further activity is contemplated in relation to this rule. If we receive adverse comments, the direct final rule will be withdrawn and all public comments received will be addressed in a subsequent final rule based on this proposed rule. We will not institute a second comment period on this action. Any parties interested in commenting on this action should do so at this time.

**DATES:** Written comments on this proposed rule must be received on or before June 25, 2001.

**ADDRESSES:** Written comments should be addressed to: Connie Robinson, EPA, Region 10, Office of Air Quality (OAQ-107), 1200 Sixth Avenue, Seattle, WA 98101. Copies of documents relevant to this action are available for public review during normal business hours (8:00 a.m. to 4:30 p.m.) at this same address.

### FOR FURTHER INFORMATION CONTACT:

Connie Robinson, EPA, Region 10, Office of Air Quality, (OAQ-107), 1200 Sixth Avenue, Seattle, WA 98101, (206) 553-1086.

**SUPPLEMENTARY INFORMATION:** See the information provided in the Direct Final action of the same title which is located in the Rules and Regulations section of this **Federal Register**.

Dated: May 16, 2001.

**Charles Findley,**

*Acting Regional Administrator, Region 10.*

[FR Doc. 01-13274 Filed 5-24-01; 8:45 am]

**BILLING CODE 6560-50-P**

## ENVIRONMENTAL PROTECTION AGENCY

### 40 CFR Part 81

[Docket No. AK-01-002; FRL-6986-6]

### Finding of Attainment for Carbon Monoxide; Anchorage CO Nonattainment Area, Alaska

**AGENCY:** Environmental Protection Agency (EPA).