Cooling Water Intake Structures—CWA §316 (b)

Basic Information

EPA is developing regulations under §316(b) of the Clean Water Act. §316(b) requires that the location, design, construction and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact. More than 1,500 industrial facilities use large volumes of cooling water from lakes, rivers, estuaries or oceans to cool their plants, including steam electric power plants, pulp and paper makers, chemical manufacturers, petroleum refiners, and manufacturers of primary metals like iron and steel and aluminum.

Cooling water intake structures cause adverse environmental impact by pulling large numbers of fish and shellfish or their eggs into a power plant's or factory's cooling system. There, the organisms may be killed or injured by heat, physical stress, or by chemicals used to clean the cooling system. Larger organisms may be killed or injured when they are trapped against screens at the front of an intake structure.

There are three rulemaking phases addressing cooling water intakes:

- Phase I rule, promulgated in 2001, covers new facilities
- Phase II rule, promulgated in 2004, covers large existing electric generating plants
- Phase III rule, promulgated in 2006, covers certain existing facilities and new offshore and coastal oil and gas extraction facilities

Clean Water Act - Sec. 316(b)

Sec. 316. Thermal Discharges.
(b) Any standard established pursuant to section 301 or section 306 of this Act and applicable to a point source shall require that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact.

Phase II—Large Existing Electric Generating Plants

Fact Sheet: Final Regulations

EPA-821-F-04-003; February 2004

On February 16, 2004, EPA established location, design, construction and capacity standards for cooling water intake structures at large power plants. The Clean Water Act calls for EPA to establish the best technology available to protect fish, shellfish and other forms of aquatic life. The final rule sets standards but provides flexibility by offering several alternatives for power plants to comply.

Background

Section 316(b) of the Clean Water Act (CWA) requires EPA to ensure that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available to protect aquatic organisms from being killed or injured by impingement (being pinned against screens or other parts of a cooling water intake structure) or entrainment (being drawn into cooling water systems and subjected to thermal, physical or chemical stresses).

EPA divided this rulemaking into three phases: Phase I for new facilities was completed in December 2001. This rule, Phase II, is for existing electric generating plants that use large amounts of cooling water. Phase II addresses large existing power plants that are designed to withdraw 50 million gallons per day or more and that use at least 25 percent of their withdrawn water for cooling purposes only. Scheduled for proposal in November 2004, Phase III will apply to electric generating plants using smaller amounts of cooling water and for other industrial sectors.

The withdrawal of cooling water removes billions of aquatic organisms from waters of the U.S. each year, including fish, fish larvae and eggs, crustaceans, shellfish, sea turtles, marine mammals, and many other forms of aquatic life. Most impacts are to early life stages of fish and shellfish.

When the quantity of water withdrawn is large relative to the flow of the source waterbody,

more organisms will be affected. Intakes in coastal waters, estuaries, and tidal rivers tend to have greater ecological impacts than those in freshwater lakes and offshore ocean intakes, since these areas are usually more biologically productive and have more aquatic organisms in early life stages.

Summary of the Final Rule

The final rule requires protection against these losses. For example, impingement requirements call for the number of organisms pinned against parts of the intake structure to be reduced by 80 to 95 percent from uncontrolled levels. Entrainment requirements call for the number of aquatic organisms drawn into the cooling system to be reduced by 60 to 90 percent from uncontrolled levels. Large power plants have flexibility to comply and to ensure energy reliability. The rule provides several compliance alternatives, such as using existing technologies, selecting additional fish protection technologies (such as screens with fish return systems), and using restoration measures.

Environmental Benefits and Costs

EPA conducted rigorous scientific and economic analyses to develop this rule. The Agency worked with states, industry groups, and environmental organizations to determine, on a national basis, how best to protect the aquatic life that are critical to the environment and to commercial and recreational activities. EPA considered the costs and financial impacts to industry and its ability to produce energy in developing flexible compliance alternatives. The rule will not interfere with the supply, distribution, or use of energy produced by these power plants.

This rule protects more than 200 million pounds of aquatic organisms annually from death or injury by cooling water intake structures. The impingement and entrainment reduction benefits range from $73 million to $83 million per year. These benefits are primarily from improvements to commercial and recreational fishing. There are likely to be other benefits, for example, more robust and productive aquatic ecosystems, although these are harder to quantify. EPA estimates that this rule affects about 550 facilities and costs about $400 million per year.

How to Get Additional Information

You can also learn more about this final rule and other actions addressing cooling water intake structures by visiting EPA's Internet web site at: http://www.epa.gov/waterscience/316b/.