

Scoping Document:
**Proposed Statewide Policy on
Clean Water Act Section 316(b) Regulations**



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**State Water Resources Control Board
California Environmental Protection Agency**

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APPENDIX

Appendix I: Proposed Statewide Policy on Clean Water Act Section 316(b) Regulations

Appendix II: New York State Department of Environmental Conservation Letter to USEPA

I. DEFINITIONS AND ACRONYMS

BTA – Best Technology Available

CDS – Comprehensive Demonstration Study

Facility – Once through cooled power plant

NPDES – National Pollutant Discharge Elimination System

NYCRR – New York State Codes Rules and Regulations

OTC – Single pass, or “Once Through Cooling”

PIC – Proposal for Information Collection

Policy – Proposed Statewide Policy on Clean Water Act 316(b) Regulations. The proposed Policy is attached to this document in Appendix I.

USEPA – U.S. Environmental Protection Agency

II. BACKGROUND

A. Clean Water Act

Under the federal Clean Water Act (Clean Water Act or Act), 33 U.S.C. §1251 et seq., all point source discharges of pollutants to waters of the United States must be regulated under National Pollutant Discharge Elimination System (NPDES) permits.¹ Permits are issued by the United States Environmental Protection Agency (USEPA) or states, such as California, with approved permit programs.² The permits must require compliance with technology-based effluent limitations and any more stringent limitations necessary to meet water quality standards.³ In addition, permits must implement the requirements of § 316(b) of the Act.⁴

Section 316(b) addresses the adverse environmental impacts caused by cooling water intake structures, rather than discharge impacts. Section 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.

¹ 33 U.S.C. §§1311, 1342.

² See *id.* §1342.

³ *Id.* §§1311, 1342.

⁴ *Id.* §1326(b).

In April 1976 USEPA issued a final rule implementing § 316(b).⁵ Utility companies successfully challenged the rule in court, and USEPA withdrew the relevant portions of the rule in 1977. Since that time, USEPA and states with approved permit programs have implemented § 316(b) on a case-by-case basis.

USEPA has now promulgated new regulations implementing § 316(b) for power plants. USEPA entered into a consent decree to settle litigation filed in 1993 by a coalition of environmental groups and individuals over USEPA's failure to implement § 316(b) and subsequently undertook a phased approach to implementing regulations. USEPA has completed all of three required phases. On November 9, 2001, USEPA took final action on a rule governing cooling water intake structures for new power plants (Phase I).⁶ On July 23, 2004, USEPA promulgated intake regulations for existing power plants (Phase II).⁷ In the new Phase III rule, signed by the USEPA Administrator on June 1, 2006, USEPA set national standards for new offshore oil and gas extraction facilities, but decided to address cooling water intake structures used by smaller-flow power plants and other industrial facilities on a case-by-case basis. Since none of the coastal power plants in California would fall into the Phase III category there will be no further discussion in this scoping document of the Phase III rule.

In the Phase I and II rules, USEPA established national minimum requirements for the design, capacity, and construction of cooling water intake structures at new and existing power plants. The requirements are based on the best technology available to minimize the adverse environmental impacts associated with the use of cooling water intake structures. Under § 510 of the Clean Water Act, the states may impose more stringent requirements than those in the USEPA 316(b) regulations under state law.⁸

B. State Law and Policy

The Porter-Cologne Water Quality Control Act (Porter-Cologne)⁹, enacted in 1969, is the primary water quality law in California. In 1972 the legislature amended Porter-Cologne to provide the state the necessary authority to implement an NPDES permit program in lieu of a USEPA-administered program.¹⁰ To ensure consistency with Clean Water Act requirements, both Porter-Cologne and the State Water Board's implementing regulations require that the Water Boards issue and administer NPDES permits to ensure compliance with all applicable requirements of the Act and USEPA's implementing permit regulations.¹¹ Under existing law, therefore, permits for point sources that use cooling water intake structures must ensure compliance with § 316(b).

⁵ 41 Fed. Reg. 17387 (April 26, 1976).

⁶ 66 Fed. Reg. 65338 (December 18, 2001).

⁷ 69 Fed. Reg. 41683 (July 9, 2004).

⁸ 33 U.S.C. §1370; 40 C.F.R. §125.90(d).

⁹ Wat. Code §13000 et seq.

¹⁰ Wat. Code, div. 7, ch. 5.5.

¹¹ *Id.* §§13372, 13377. EPA's permit regulations are contained in 40 C.F.R. parts 122, 123, and 124.

Porter-Cologne establishes state policies for the coastal marine environment, including a policy similar to that in § 316(b). Specifically, the existing Porter-Cologne policy requires that each “new or expanded powerplant or other industrial installation using seawater for cooling, heating, or industrial processing [use] the best available site, design, technology, and mitigation measures feasible . . . to minimize the intake and mortality of all forms of marine life.”¹² Like § 316(b), this Porter-Cologne policy applies to all industrial facilities that use seawater for cooling. Unlike § 316(b), the Porter-Cologne policy is limited to facilities that draw in seawater; the policy applies to both new and expanded facilities. Many facilities in the latter category are covered under the Phase II rule.

To date, the State Water Board has not adopted any policies or plans specifically to implement the Porter-Cologne policy or § 316(b). In 1975 the State Water Board adopted a plan for temperature control in the state’s coastal and interstate waters and enclosed bays and estuaries (Thermal Plan)¹³ that implements Clean Water Act § 316(a).¹⁴ Section 316(a) allows less stringent thermal effluent limitations, under certain circumstances, when a discharger demonstrates that the limits will assure the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on that body of water. The Thermal Plan does not address § 316(b), however.

In 1975 the State Water Board also adopted a policy on the use and disposal of inland waters for power plant cooling.¹⁵ The 1975 policy favors the use of treated wastewater as cooling water or once-through cooling with seawater in order to conserve freshwater. The 1975 policy does not address § 316(b).

C. Coastal Power Plants in California

In California, 21 power plants rely on OTC for electrical energy production. These plants are situated in ocean, bay, estuary, and river environments and are permitted to use up to 17 billion gallons of once-through cooling water each day (Table 1). The California Energy Commission’s (CEC) June 28, 2005 report¹⁶ indicates that the original environmental impact studies conducted in the 1970s for many of these sites are inadequate and the actual environmental impacts are unknown.

¹² *Id.* §13142.5(b).

¹³ The policy is entitled “Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California.”

¹⁴ 33 U.S.C. §1326(a).

¹⁵ State Water Board Resolution No. 75-58.

¹⁶ California Energy Commission. June 28, 2005. Issues and Environmental Impacts Associated with Once-Through Cooling at California’s Coastal Power Plants. Appendix A: An Assessment of the Studies Used to Detect Impacts to Marine Environments by California’s Coastal Power Plants Using Once-Through Cooling.

Table 1. Information for Existing OTC Power Plants in California

RB^a	Facility Name	Agency	Design Flow (MGD)	Intake Water Body	Receiving Water Body
1	Humboldt Bay Power Plant	PG&E Company	78	Humboldt Bay	Humboldt Bay
2	Hunters Point Power Plant ^b	PG&E Company	413	San Francisco (SF) Bay	SF Bay
2	Pittsburg Power Plant	Mirant Delta, LLC	676	Sacramento/San Joaquin Delta	Sacramento/San Joaquin Delta
2	Potrero Power Plant	Mirant Potrero, LLC	505	San Francisco Bay	San Francisco Bay
3	Diablo Canyon Power Plant	PG&E Company	2670	Ocean	Ocean
3	Morro Bay Power Plant	LS Power	668	Morro Bay Harbor	Ocean
3	Moss Landing Power Plant	LS Power	1226	Moss Landing Harbor	Ocean
4	Alamitos Generating Station	AES Alamitos, LLC	1282	Los Cerritos Channel	San Gabriel River Estuary
4	El Segundo Generating Station	El Segundo Power LLC	607	Ocean (Santa Monica Bay)	Ocean (Santa Monica Bay)
4	Haynes Generating Station	Los Angeles Department of Water and Power (LADWP)	1014	Alamitos Bay	San Gabriel River Estuary
4	Long Beach Generating Station ^c	Long Beach Generation LLC	265	Back Channel, Long Beach Harbor	Long Beach Harbor
4	Harbor Generating Station	LADWP	108	Los Angeles Harbor	Los Angeles Harbor

RB ^a	Facility Name	Agency	Design Flow (MGD)	Intake Water Body	Receiving Water Body
4	Mandalay Generating Station	Reliant Energy Mandalay LLC	255	Channel Islands Harbor	Ocean
4	Ormond Beach Generating Station	Reliant Energy Mandalay LLC	688	Ocean	Ocean
4	Redondo Generating Station	AES Redondo Beach LLC	1146	Ocean (Santa Monica Bay)	Ocean (Santa Monica Bay)
4	Scattergood Generating Station	LADWP	496	Ocean (Santa Monica Bay)	Ocean (Santa Monica Bay)
5S	Contra Costa Power Plant	Mirant Delta LLC	450	Sacramento/San Joaquin Delta	Sacramento/San Joaquin Delta
8	Huntington Beach Generating Station	AES Huntington Beach, LLC	516	Ocean	Ocean
9	Encina Power Plant	Cabrillo Power 1 LLC	860	Agua Hedionda Lagoon	Ocean
9	San Onofre - SONGS Unit 3	Southern California Edison (SCE)	1287	Ocean	Ocean
9	San Onofre - SONGS Unit 2	SCE	1287	Ocean	Ocean
9	San Onofre - SONGS Unit 1 ^d	SCE	14	Ocean	Ocean
9	South Bay Power Plant	LS Power	602	San Diego Bay	San Diego Bay
Total Flow (MGD):			17114		

- a. Regional Water Board
- b. Hunters Point Plant ceased power production on May 15, 2006.
- c. Long Beach Generating Station ceased power production recently.
- d. SONGS Unit 1 ceased power production in 1992 and the NPDES permit will terminate by 2007.

D. Other State Agency Regulatory Authorities and Involvement

Other state agencies have regulatory authority over power plants that use OTC. State agencies in the past have not always worked collaboratively to address the issues associated with the adverse environmental effects of OTC.

The CEC has authority under the Warren-Alquist Act to license thermal power plants with a capacity of 50 megawatts (MW) or more.¹⁷ The California Coastal Commission is required under the California Coastal Act to participate in the CEC licensing process with the goal of protecting coastal resources and preventing potential adverse environmental effects on fish and wildlife and their habitats.¹⁸

On April 17, 2006 the California State Lands Commission (Commission) adopted a Resolution regarding once-through cooling in California power plants. The Resolution states that the Commission shall not approve leases for new power facilities that include once-through cooling technologies; furthermore, the Commission shall not approve new leases for power facilities, or leases for re-powering existing facilities, or extensions or amendments of existing leases for existing power facilities, whose operations include once-through cooling, unless the power plant is in full compliance, or engaged in an agency-directed process to achieve full compliance, with requirements imposed to implement both Clean Water Act § 316(b) and California water quality law as determined by the appropriate agency, and with any additional requirements imposed by state and federal agencies for the purpose of minimizing the impacts of cooling systems on the environment. The Resolution also states that the Commission shall include in any extended lease that includes once-through cooling systems a provision to consider re-opening the lease, if an alternative, environmentally superior technology exists that can be feasibly installed

The California Ocean Protection Council (OPC or Council) has heard testimony on the damaging environmental effects of OTC at power plants. The Council is committed to improving coordination among the various state agencies to ensure that the environmental effects of the use of OTC water are minimized. On April 20, 2006, the Council adopted a Resolution regarding the use of once-through cooling technologies in coastal waters. The Council's Resolution urges the State Water Board to implement protective controls in order to achieve a 90-95 percent reduction in once-through cooling impacts. In addition, the Resolution calls for the following: the formation of a technical review group for reviewing each plant's Clean Water Act § 316(b) study designs, and a 6-month study of the technical feasibility of converting to alternative cooling technologies at coastal power plants.

The State Water Board has and will continue to work collaboratively with other state agencies to protect the environment.

¹⁷ Pub. Resources Code §25500 et seq.

¹⁸ *Id.* §30413(d).

E. Summary of Clean Water Act Section 316(b) Rules

The withdrawal of cooling water removes billions of aquatic organisms including fish, fish larvae and eggs, crustaceans, shellfish, sea turtles, marine mammals, and many other forms of aquatic life from waters of the U.S. Most impacts are to early life stages of fish and shellfish. When the quantity of water withdrawn is large relative to the flow or size of the source waterbody, more organisms will be affected (such as in an enclosed bay).

Clean Water Act § 316(b) requires USEPA to ensure that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impacts. For many years this provision has been implemented without federal regulations in place, on a resource-intensive, site-by-site basis. As stated previously, USEPA has now promulgated regulations that implement § 316(b). The Phase I and II regulations for cooling water intake structures, summarized below, were promulgated in 40 C.F.R. 125, Subparts I (Phase I) and J (Phase II).

1. Phase I Regulations

The Phase I regulations apply to new electric generating plants and manufacturers that withdraw more than two million gallons per day (MGD) from waters of the U.S. that use 25 percent or more of their intake water for cooling. New facilities with smaller cooling water intakes will still be regulated on a site-by-site basis.

For facilities that choose certainty and fast permitting over greater flexibility, the Phase I regulations set standards to limit intake capacity and velocity. Facilities that locate where fisheries need additional protection must use special screens, nets, or similar devices. Facilities withdrawing less than 10 MGD are not required to reduce intake capacity, but must use special screens, nets, or similar devices if they do not. For facilities that choose to perform site-specific studies, Phase I regulations set a framework for demonstrating that alternative approaches provide comparable protection. In addition, all facilities must limit their withdrawals to no more than a defined proportion of their source waterbody.

2. Phase II Regulations

The Phase II regulations apply to existing electric generating plants that are designed to withdraw at least 50 MGD and that use at least 25 percent of their withdrawn water for cooling purposes.

The final regulations establish five compliance alternatives for establishing best technology available for minimizing adverse environmental impacts at existing power plants. The regulations also establish national performance standards to reduce

impingement and entrainment losses. The performance standard for impingement calls for a reduction in the number of organisms pinned against parts of the intake structure of 80 to 95 percent from uncontrolled levels. Similarly, the entrainment standard requires a reduction in the number of aquatic organisms drawn into the cooling system of 60 to 90 percent from uncontrolled levels. The regulations provide large power plants the flexibility to select the most cost-effective technologies or operational measures to achieve the performance standards and to ensure energy reliability.

The compliance alternatives are:

- a. A reduction of intake flow commensurate with a *closed-cycle recirculating system*. A *closed-cycle recirculating system* is defined in 40 C.F.R. §125.93 as “a system designed, using minimized make-up and blowdown flows, to withdraw water from a natural or other water source to support contact and/or noncontact cooling uses within a facility. The water is usually sent to a cooling canal or channel, lake, pond, or tower to allow waste heat to be dissipated to the atmosphere and then is returned to the system. (Some facilities divert the waste heat to other process operations.) New source water (make-up water) is added to the system to replenish losses that have occurred due to blowdown, drift, and evaporation.”
- b. A reduction in the maximum through-screen design intake velocity to 0.5 feet per second (ft/s) or less. In this case, a facility would have met the impingement mortality performance standards in 40 C.F.R. §125.94(b). However, the facility would still be subject to any applicable requirements for entrainment reduction.
- c. A demonstration that the facility’s existing design and construction technologies, operational measures, and/or restoration measures meet the performance standards and/or restoration requirements. A demonstration that selected new design and construction technologies, operational measures, and/or restoration measures, in combination with any existing technologies, operational measures, and/or restoration measures will meet the performance standards and/or restoration requirements.
- d. A demonstration that the facility meets a pre-approved design and construction technology.
- e. A site-specific demonstration, based on cost considerations, of best technology available to minimize adverse environmental impact.

F. New York Cooling Water Intake Policy

1. Summary

There are approximately 30 power plants within the State of New York (NY) that are classified as Clean Water Act §316(b) Phase II facilities. These power plants are situated at rivers, lakes, and estuaries, but not on New York's Atlantic coastline.

To implement §316(b) requirements for Phase II existing facilities, NY is including intake structure requirements in State Pollutant Discharge Elimination System (SPDES) permits (NY equivalent to CA NPDES Permits). The intake requirements included in NY SPDES permits are at least as stringent as those required under Clean Water Act §316(b). In addition to the §316(b) requirements, NY has its own cooling water intake structure regulation at Title 6, New York State Codes Rules and Regulations (NYCRR), Section 704.5, which reads:

“The location, design, construction and capacity of cooling water intake structures, in connection with point source thermal discharges, shall reflect the best technology available for minimizing adverse environmental impact.”

NY's cooling water intake structure regulation gives broad discretion to the permitting agency in the determination of best technology available (BTA). This regulation is NY's basis for intake structure requirements that are more stringent than those required under §316(b). Appendix II is a letter from the New York State Department of Environmental Conservation to the USEPA Office of Water Assistant Administrator that describes in detail how NY will implement Phase II requirements in its SPDES Program. Following is a discussion of how NY's implementation of Phase II requirements differs from direct implementation of federal requirements.

2. 6 NYCRR 704.5 Best Technology Available Determination

The intake requirements included in NY SPDES permits are at least as stringent as those required under Clean Water Act §316(b). Additionally, the following requirements are imposed under 6 NYCRR 704.5:

- a. *Restoration.* Restoration plans are not considered an appropriate or acceptable BTA alternative for any facility, new or existing. NY's permitting agency contends “that restoration measures are inconsistent with the text of CWA §316(b) and 6 NYCRR §704.5 because such measures merely attempt to correct for the adverse environmental impacts of impingement and entrainment; they do not minimize those impacts in the first instance.” (See also *Riverkeeper, Inc. v. USEPA* (2d Cir. 2004) 358 F.3d 174, 189.)
- b. *Site-specific alternative BTA determination.* The Phase II minimum performance standards (i.e. 80 percent reduction in impingement and 60 percent reduction in entrainment) represent the minimum allowed, and the permitting authority (NY) will seek to impose the higher end of these ranges. “Site-specific” alternative BTA determinations, as described by USEPA in the Phase II regulations (compliance alternative e above), are not acceptable. NY State contends that

“site-specific” alternative BTA determinations do not comply with 6 NYCRR §704.5.

3. NY Baseline Flow Determination

To determine whether a facility is meeting or will meet impingement and entrainment reduction standards, NY compares the estimated number of organisms impinged and entrained after deployment of technologic or operational reduction measures with a baseline when the facility is operating at full flow and full generation capacity.

III. ISSUES

A. Calculation Baseline

Prior to promulgation of the Phase II rule, neither USEPA nor the state had a rule on determining the calculation baseline for a §316(b) analysis. The Phase II rule generally defines the term “calculation baseline” as an estimate of impingement mortality and entrainment in the absence of controls to reduce their impacts on aquatic life.

With the exception of facilities that reduce their flow commensurate with a closed-cycle, recirculation system (as defined in 40 C.F.R. §125.93), the § 316(b) regulations require that Phase II facilities submit a Comprehensive Demonstration Study (CDS). The CDS must characterize impingement mortality and entrainment, describe the operation of cooling water intake structures, and confirm that the technologies, operational measures, and/or restoration measures that have been selected and installed, or will be installed, meet the applicable requirements of 40 C.F.R. §125.94.

The CDS must include an Impingement Mortality and/or Entrainment Characterization Study (I/E Study). The purpose of the I/E Study is to provide information to support the development of a calculation baseline for evaluating impingement mortality and entrainment and to characterize current impingement mortality and entrainment.

Federal regulations at 40 C.F.R. §125.93 define the calculation baseline as follows:

“...an estimate of impingement mortality and entrainment that would occur at your site assuming that: the cooling water system has been designed as a once-through system; the opening of the cooling water intake structure is located at, and the face of the standard 3/8-inch mesh traveling screen is oriented parallel to, the shoreline near the surface of the source waterbody; and the baseline practices, procedures, and structural configuration are those that your facility would maintain in the absence of any structural or operational controls, including flow or velocity reductions, implemented in whole or in part for the purposes of reducing impingement mortality and entrainment. You may also choose to use the current level of impingement mortality and entrainment as the calculation baseline. The calculation baseline may be estimated using: historical impingement mortality and entrainment data from your

facility or from another facility with comparable design, operational, and environmental conditions; current biological data collected in the waterbody in the vicinity of your cooling water intake structure; or current impingement mortality and entrainment data collected at your facility. You may request that the calculation baseline be modified to be based on a location of the opening of the cooling water intake structure at a depth other than at or near the surface if you can demonstrate to the Director that the other depth would correspond to a higher baseline level of impingement mortality and/or entrainment.”

The Phase II rule does not incorporate intake flow volumes or operational parameters into the definition of calculation baseline. New York has chosen to implement the rule with a baseline that assumes that a power plant is operating at full flow and full generation capacity.

The proposed Policy, shown in Appendix I, addresses calculation baseline conditions as follows:

1. Reference Stations

The proposed policy would allow reference stations to be used to identify baseline marine life conditions for the same habitat as the power plant, if determined by the Expert Review Panel. The Expert Review Panel is defined in Section III.J of this document.

The federal definition for calculation baseline does not specifically address the use of reference stations to identify baseline marine life conditions. However, the federal definition does specify that “calculation baseline may be estimated using historical impingement mortality and entrainment data from your facility or from another facility with comparable design, operational, and environmental conditions...”

2. Baseline Flow

The proposed policy would require that baseline flow rates be actual flow rates calculated as a mean of the flow rates provided to the Regional Water Quality Control Board (Regional Water Board) in monitoring reports over the last NPDES permit cycle with credit given for flow reduction measures already implemented to reduce impingement or entrainment.

In order to accurately determine the calculation baseline, the appropriate baseline flow must be used. One option for baseline flow would be the facility’s NPDES permitted maximum flow. Using maximum flow conditions as a baseline could artificially boost the baseline entrainment at a facility that is not actually at maximum flow conditions. Facilities that do not operate at full flow/capacity will essentially get a “built-in” reduction

credit (i.e. cutback in intake flow rate is proportional to a cutback in mass entrained). Facilities that are currently at maximum flow conditions would not get this credit.

To realistically represent baseline conditions, the proposed Policy requires that baseline flow be determined as the average intake flow rate during the last NPDES permit cycle. However, if a facility already began reducing intake flow in an effort to reduce I/E, the baseline would be the average intake flow prior to the implementation of I/E reduction flow controls. Allowing facilities to take credit for existing flow reduction measures, specifically implemented to reduce I/E, is consistent with the federal definition for calculation baseline at 40 C.F.R. 125.93, which states in part that "...baseline practices, procedures, and structural configuration are those that your facility would maintain in the absence of any structural or operational controls, including flow or velocity reductions, implemented in whole or in part for the purposes of reducing impingement mortality and entrainment."

B. Performance Standards for Reductions in Impingement and Entrainment at Phase II Facilities

Prior to the Phase II rule, there were no performance standards for reductions in impingement mortality and entrainment due to intake structures at existing power plants. Rather, USEPA or states with approved permit programs had to determine whether an intake structure reflected BTA on a case-by-case basis. California policy for intake structures at new or expanded coastal power plants is that the best available site, design, technology, and mitigation measures feasible be used to minimize the intake and mortality of all forms of marine life. (Wat. Code §13142.5(b)). This policy has not been implemented to date with specific performance standards.

As described above, the §316(b) regulations provide five compliance alternatives for Phase II facilities. Four of the alternatives are based on meeting the I/E reduction performance standards through existing and/or new technologies, operational measures, and/or restoration projects. Pursuant to 40 C.F.R. 125.94(a)(1)(i-ii) power plants that choose to reduce intake flow to that commensurate with a closed-cycle recirculating system will have complied with the performance standards for impingement and entrainment. Plants that reduce the maximum through screen design intake velocity to 0.5 ft/s or less will have complied with the performance standard for impingement. Power plants that choose alternate compliance strategies must meet the following federal performance standards:

(1) **Impingement mortality performance standards...** you must reduce impingement mortality for all life stages of fish and shellfish by 80 to 95 percent from the calculation baseline, and

(2) **Entrainment performance standards...** you must also reduce entrainment of all life stages of fish and shellfish by 60 to 90 percent from the calculation baseline..." (40 C.F.R. §125.94(b)).

The federal performance standards reflect the best technology available for minimizing adverse environmental impacts determined on a national categorical basis.

The proposed policy would make the §316 performance standards more stringent. Instead of a range for reductions in impingement mortality, the proposed policy would require that an existing power plant achieve the upper end of the range, which is 95 percent. To reduce impingement mortality, the proposed policy would require that existing power plant owners or operators:

- i. Reduce intake flow to that commensurate with a *closed-cycle recirculating system, or*
- ii. Reduce the maximum through screen design intake velocity to 0.5 ft/s or less, or
- iii. Reduce impingement mortality for all life stages of fish and shellfish by 95 percent from the calculated baseline by any combination of operational or structural controls.

For entrainment, the proposed policy would also require that existing power plant owners or operators with a capacity utilization rate of 15 percent or greater achieve the upper end of the range, i.e., a 90 percent reduction in entrainment. The capacity utilization rate is defined in 40 C. F. R 125.93.

If the owner or operator can demonstrate that achieving a 90 percent reduction in entrainment is infeasible, then the owner or operator can use restoration measures to achieve the required 90 percent reduction. The owner or operator must achieve a minimum reduction of 60 percent in all cases. Specifically, the proposed policy would require:

“To reduce entrainment existing power plant owners or operators must either reduce intake flow to that commensurate with a *closed-cycle recirculating system* or reduce entrainment of all life stages of fish and shellfish by 90 percent by any combination of operational or structural controls. Existing power plant owners or operators who satisfactorily demonstrate that no combination of operational and structural controls can feasibly achieve the 90 percent reduction in entrainment, must comply with the following:

- i. The owner or operator must reduce entrainment of all life stages of fish and shellfish by a minimum of 60 percent from the calculated baseline by any combination of operational or structural controls, and
- ii. Restoration measures (i.e., mitigation) must be employed to achieve the remaining percent reduction in entrainment over the minimum achieved in

- i. above, up to 90 percent, of all life stages of fish and shellfish from the calculated baseline. ”

The proposed performance standards are consistent with California policy on intake structures contained in Water Code § 13142.5(b). This policy is more stringent than §316(b) BTA standard because it requires that new and expanded power plants use the best available technology feasible for minimizing the intake and mortality of marine life. Many expanded power plants are considered existing facilities subject to the Phase II rule. Staff believes that existing power plants can feasibly implement controls to achieve a 95% reduction in impingement. In addition, existing power plants should, at a minimum, demonstrate the infeasibility of structural or operational controls to achieve a 90 percent reduction in entrainment before implementing restoration measures. Preferentially, facilities should meet, or get as close as possible, to the upper end of the performance standards using operational and/or structural controls, so that mitigation measures will be a last resort.

Section 13142.5 applies to coastal power plants. OTC power plants located further inland are similar in nature to power plants located immediately adjacent to the Pacific Ocean. For example, they are all steam cycle facilities that employ OTC technology, drawing cooling water from a water body and discharging the elevated temperature water. In order to provide a ‘level playing field’ and consistency in the applicability of regulations for existing OTC power plants, the proposed policy would require that all Phase II facilities meet the upper end of the federal performance standards regardless of where the facility is located.

1. Site-Specific Determination of BTA (40 C.F.R. 125.94(a)(5))

Federal regulations for Phase II facilities allow for site-specific determinations of best technology available to minimize adverse environmental impact in cases where the costs of compliance are significantly greater than those USEPA estimated in the process of adopting the 316(b) regulations. The regulations also allow site-specific determinations of BTA where compliance costs would be significantly greater than the benefits of complying with the performance standards. The proposed policy would not allow a site-specific determination of best technology available. Allowing a site-specific BTA determination based on cost considerations under the circumstances described in the federal regulations is inconsistent with California policy that intake structures for new or expanded power plants use the “best available site, design, technology, and mitigation measures feasible”

2. Nuclear and Conventional Facilities

Federal regulations at 40 C.F.R. 125.94(f) state, “If you demonstrate... based on consultation with the Nuclear Regulatory Commission that compliance with this subpart would result in a conflict with a safety requirement established by the Commission, the

Director must make a site-specific determination of best technology available for minimizing adverse environmental impact that would not result in a conflict with the Nuclear Regulatory Commission's safety requirement." Nuclear power plants have operational safety considerations and requirements that differ from conventional plants.

The proposed policy would give the Regional Water Boards the option to relieve nuclear power plants from meeting the upper end of the I/E performance standards via operational and structural controls alone. Specifically, nuclear power plants could meet the upper end of the performance standards using any combination of operational and structural controls and restoration measures. Specifically, the proposed policy provides:

If an existing nuclear power plant demonstrates that implementation of operational and/or technological measures for the reduction of impingement and entrainment would conflict with safety requirements instituted by the Nuclear Regulatory Commission, the upper end of the performance standards for impingement and entrainment may be met using any combination of operational or structural controls and restoration measures.

C. Restoration Measures

Section 316(b) does not explicitly address the role, if any, of restoration measures in determining BTA to minimize adverse environmental impacts. In the past, USEPA and the states have allowed existing power plants to comply with §316(b), in part, by using restoration measures to address impingement and entrainment losses. California policy on intakes using seawater for cooling at new and expanded power plants specifically references the use of best available mitigation measures feasible, as well as the best available site, location and technology feasible, to minimize intake and mortality of marine life.

The USEPA Phase I rule for new power plants allowed owners or operators to comply with the rule by using restoration measures to compensate for ecosystem losses due to impingement and entrainment. In *Riverkeeper, Inc. v. United States Environmental Protection Agency* (2004) 358 F.3d 174, the Second Circuit Court of Appeals ruled that USEPA exceeded its authority because "restoration measures are inconsistent with Congress' intent that the 'design' of intake structures be regulated directly, based on the best technology available . . ." (358 F.3d at 190.)

The Phase II rule allows an existing facility to demonstrate compliance with the performance standards, in whole or in part, by implementing and adaptively managing restoration measures in the facility's watershed. Restoration measures can be used if a facility demonstrates that technological or operational controls are less feasible, less cost-effective, or less environmentally desirable than meeting the performance standards through restoration measures. In addition, a facility must demonstrate that the proposed restoration measures will produce ecological benefits at a level that is

substantially similar to the level that would be achieved through compliance with the performance standards. The Phase II rule's restoration provisions are also being challenged in the Second Circuit Court of Appeals in a case entitled *Surfrider Foundation v. United States Environmental Protection Agency*. Restoration is opposed by environmental groups but is viewed as one of the most generally available options by power plant officials.

The proposed policy would allow the use of restoration measures to achieve the performance standard for entrainment, but under limited circumstances. Restoration measures could be used only if the owner or operator demonstrated that no combination of technological or operational controls could feasibly achieve a 90 percent reduction in entrainment. The plant would have to achieve at least a 60 percent reduction in entrainment using technological or operational controls, or both. Restoration measures could then be used to make up the difference, up to 90 percent. This approach is consistent with §316(b) because it emphasizes minimizing the adverse impacts of intake structures in the first instance, through implementation of feasible technological or operational controls, or both, before allowing restoration measures, which can only address the structures' adverse impacts after they have occurred.

The Phase II rule allows both *in-kind* and *out-of-kind* restoration measures. In-kind restoration will restore the same kinds of fish and shellfish species identified in the I/E Study. Out-of-kind restoration will restore species different from those identified in the above study. The proposed policy would establish a preference for in-kind, on-site restoration measures. Specifically, the policy would require power plant owners or operators to first consider in-kind, on-site restoration and, second, in-kind, off-site restoration.

D. Habitat Production Foregone

In the past, as stated previously, §316(b) was implemented on a case-by-case basis. If restoration measures were authorized as a compliance alternative, neither federal nor state law dictated the methodology that had to be used to develop appropriate measures. The Phase II rule likewise does not specify any particular methodology.

The proposed policy would require use of the habitat production foregone methodology. Habitat production foregone is one of the most promising methodologies for use in assessing entrainment losses and then applying that information to a restoration project. This methodology estimates the amount of habitat (production foregone) it would take to produce the organisms lost to entrainment. Estimates of lost production can be for affected individuals only, or the affected individuals plus the production of progeny that were not produced. This method can address all losses across all habitat types.

Habitat production foregone requires an estimate of the Proportional Mortality (PM) (i.e., the proportion of larvae killed from entrainment to the larvae in the source population). An estimate is also required of the source water body area for the target species' source

population. The product of the average PM and the source water body area is an estimate of habitat production foregone area that is lost to all entrained species. This habitat area can then be restored in a nearby area. For example, if the average PM of estuarine species is 17 percent and the area of the source water estuary is 2000 acres, then the habitat production foregone is equal to $(17\% \times 2000 \text{ acres}) = 340 \text{ acres}$.

Restoration costs will necessarily be site specific. Placing a dollar amount on ecological effects or societal values can be controversial. Use of the Habitat Production Foregone methodology is advantageous because the cost of restoring, enhancing, or protecting a specific amount of habitat (340 acres in the above example) can be readily estimated. Power plants that utilize restoration measures must demonstrate the efficacy of the restoration measures to the Regional Water Board in a bi-annual status report (40 C.F.R. 125.95).

E. New and Existing Power Plants

Section 316(b) requires that all point sources, both new and existing, use BTA for minimizing adverse environmental impacts in the location, design, construction, and capacity of cooling water structures. The state policy expressed in Water Code §13142.5 applies to new and expanded coastal power plants. USEPA has implemented §316(b) by developing separate rules for new power plants, existing power plants, and offshore oil and gas extraction facilities.

The Phase I 316(b) regulations at 40 C.F.R. 125.83 define new facilities as follows:

“New facility means any building, structure, facility, or installation that meets the definition of a “new source” or “new discharger” in 40 C.F.R. 122.2 and 122.29(b)(1), (2), and (4) and is a greenfield or stand-alone facility; commences construction after January 17, 2002; and uses either a newly constructed cooling water intake structure, or an existing cooling water intake structure whose design capacity is increased to accommodate the intake of additional cooling water. New facilities include only “greenfield” and “stand-alone” facilities. A greenfield facility is a facility that is constructed at a site at which no other source is located, or that totally replaces the process or production equipment at an existing facility. A stand-alone facility is a new, separate facility that is constructed on property where an existing facility is located and whose processes are substantially independent of the existing facility at the same site. New facility does not include new units that are added to a facility for purposes of the same general industrial operation (for example, a new peaking unit at an electrical generating station).”

Thus, under the Phase I definition, a new power plant must, at a minimum, be a greenfield or a stand-alone facility, and it must use a new intake structure or an existing structure that has been modified to increase its design capacity to accommodate the intake of additional cooling water.

The Phase II § 316(b) regulations at 40 C.F.R. 125.93 define existing facility primarily by stating that any facility that is not a new facility under the Phase I regulations is an existing facility. The definition provides as follows:

“Existing facility means any facility that commenced construction...on or before January 17, 2002; and any modification of, or any addition of a unit at such a facility that does not meet the definition of a new facility...”

Under the Phase II definition, an existing facility can be modified and still remain an existing facility unless the existing facility is completely demolished and another constructed in its place and the replacement facility either uses a new intake structure or the existing intake structure with an increased design capacity.¹⁹

The proposed policy’s definitions for a new power plant differs from the definition for a new facility in the Phase I §316(b) regulations. The proposed policy’s definition is broader in that it would treat some modifications of an existing power plant as a new power plant in circumstances where the modifications would not rise to the level of a new facility under the Phase I regulations. The proposed Policy defines a new power plant as follows:

New Power Plant – a) Any power plant that is issued an NPDES permit and which commenced construction after January 17, 2002, or b) any power plant that was in operation prior to January 17, 2002 but, as of the effective date of this Policy, has undergone or will undergo a major modification, such that its electrical production capacity will increase and its intake flow rate will increase.”

This definition would capture as a new power plant modifications to the plant that fall short of construction of a greenfield or stand-alone facility as long as the modifications increase both the plant’s electrical production capacity and the design capacity of the existing intake structure.

F. Economics

USEPA conducted an economics and benefits analysis as part of the Clean Water Act § 316(b) rulemaking process. The economics and benefits analyses for the Phase I and Phase II regulations can be found online at: <http://www.epa.gov/waterscience/316b/>. For California, social costs of compliance (pre-tax basis, and including federal, state and local administrative costs) were estimated by USEPA to be \$31.7 million. In California the expected reduction in I/E as a result of the Phase II rule was estimated by USEPA to be 6.1 million pounds of fishery yield and 9.2 million pounds of future biomass production (from being lost). For California, the reductions in I/E were estimated by USEPA to result in a use benefit (based on a 3% discount rate and 2002 dollars) to commercial fisheries of \$0.5 million and to recreational fisheries of \$2.5 million, for a

¹⁹ 69 Fed. Reg. at 41579.

total of \$3 million per year. Unfortunately only use benefits (fisheries) were quantitatively estimated; non-consumptive benefits, such as ecological values, were not monetized.

As a result, USEPA was not able to monetize benefits for about 98% of all species being protected by the Phase II rule. Therefore the use benefits calculated by USEPA only represent consideration of 2 % of species, and USEPA specifically recommended using caution in interpreting this information. While monetary estimates are not available for the non-consumptive marine life resources being protected by reductions in I/E, it is obvious that the use benefits dramatically underestimate the overall ecological benefit of the Phase II rule.

G. Biological and Cumulative Impacts

Impacts associated with OTC include impingement, entrainment, and thermal effects. The biological impacts of OTC may not be adequately known since modern quantitative studies are difficult and costly. Seawater, however, is not just cool water but a highly productive and diverse aquatic habitat.

OTC power plants are generally the largest volume dischargers in the state, ranging from 78 to 2670 million gallons per day (MGD). All but one power plant are above 100 MGD. The largest volumes are associated with the active nuclear generating stations, Diablo Canyon and San Onofre, design flows of 2670 and 2587 MGD respectively. The largest volume for a conventional power plant is for the Alamitos power plant, at 1282 MGD (design flow). Discharges roughly correspond to intake volumes. By comparison, the largest wastewater treatment plant with an ocean discharge is the Hyperion wastewater plant (City of Los Angeles), which has a permitted flow of 420 MGD; most treated sewage ocean dischargers are well below 50 MGD, including the City of San Francisco's Oceanside plant discharge (43 MGD).

The effluent limits for marine and estuarine wastewater discharges under NPDES permits (including power plant discharges) are designed to prevent acute and chronic toxicity to marine aquatic life, thereby protecting fish and other marine life from mortality. When spills and industrial discharges do result in fish kills, in violation of the California Water Code and the Fish and Game Code, enforcement actions are typically taken. Ironically, with all of the limitations and prohibitions placed on discharges, impingement and entrainment essentially have constituted a permitted fish kill for power plant intake systems.

There has been an historical emphasis on commercially or recreationally important species, primarily fish. However the reality is that a power plant cooling system does not discriminate and instead causes mortality to the all members of the water column community. Protection of the entire community is essential for promoting a healthy ecosystem.

San Onofre Nuclear Generating Station (SONGS) represents one example of I/E impacts. Fish enter the SONGS cooling water system through an offshore cooling water intake, with a velocity cap, and then through a screenwell to the fish return system. Those fish that do not enter the fish return system are impinged on traveling screens. An estimated 3,564,433 fish were impinged in 2003 at SONGS. Fish species impinged included northern anchovy, queenfish, Pacific sardine, Pacific pompano, jacksmelt, white seaperch, walleye surfperch, shiner perch, white croaker, bocaccio, jack mackerel, salema, sargo, yellowfin croaker, specklefin midshipman, black perch, California grunion, topsmelt, cabezon, deep body anchovy, and others. This estimate does not include impinged invertebrates. Entrainment of fish larvae alone during a one-year period from August 1979 to July 1980 was estimated to be about 184 million fish larvae. This figure does not include invertebrate plankton, which were also entrained. (Proposal for Information Collection, San Onofre Nuclear Generating Station, Southern California Edison, prepared by Dave Baily, EPRI Solutions Inc., October 2005).

As another example, the Diablo Canyon Nuclear Generating Station draws seawater directly from an intake cove and through the shore-based intake structure. While impingement mortality is less than at SONGS, due to the difference in systems, entrainment is still significant. Diablo Canyon impacts an average source water coastline length of 74 kilometers (46 miles) out to 3 kilometers (2 miles) offshore, an area of roughly 93 square miles, for nine taxa of rocky reef fish. These rocky reef fish included smoothhead sculpin, monkeyface prickleback, clinid kelpfishes, blackeye goby, cabezon, snubnose sculpin, painted greenling, KGB rockfishes, and blue rockfish. In that 93 square mile source water area an average estimated proportional mortality of 10.8% was calculated for these rocky reef taxa. The rocky reef fish species with the largest calculated coastline impact was the smoothhead sculpin, having an estimated proportional mortality of 11.4% over 120 kilometers (75 miles) of coastline during a 1997-98 sampling period. (Diablo Canyon Power Plant Independent Scientist's Recommendations to the Regional Board, Item no. 15 Attachment 1, Sept. 9, 2005 Meeting.)

As an example of a conventional power plant, the South Bay Power Plant in San Diego Bay, assuming full operation, has an estimated annual impingement of 385,588 fish, 93% of which were anchovies. In this case impingement of certain invertebrates was considered; an estimated 9,019 crustaceans (shrimps, lobsters, crabs) and cephalopods (octopus and squid) were impinged annually. Annual estimated entrainment for 2003 was 1.55 billion larvae of five fish (CIQ gobies, anchovy, combtooth blennies, longjaw mudsuckers, and silversides) taxa (Tenera, South Bay Power Plant PIC, 2005).

A study performed by MBC and Tenera in 2005 estimated that for 12 coastal power plants in the Southern California Bight, there is an overall cumulative entrainment mortality of 1.4 percent. In the same study, for eleven coastal power plants in the Southern California Bight the estimated cumulative impingement was approximately 3.6 million fish. Considering only recreational fish species, impingement was somewhere between 8-30 percent of the number of fish caught in the Southern California Bight

(CEC, Issues and Environmental Impacts Associated with Once-Through Cooling at California's Coastal Power Plants, 2005).

The Phase II rule does not specifically address the cumulative effects of closely situated power plants withdrawing cooling water from a water body. The proposed policy would require that the owners or operators of any plants in close proximity perform a cumulative ecological study. Plant-specific impacts associated with the use of OTC occur in conjunction with other anthropogenic impacts in a regional area. A cumulative impact analysis will consider the presence and impacts of other power plants in a regional area. This is especially important in the Southern California bight where many power plants are situated within several miles from each other. Closely situated facilities may wish to coordinate their CDS designs in order to better evaluate broader cumulative effects. Generally, individual effects of several power plants can be expected to be additive. However, multiple reductions in the population of a sensitive species may produce population declines greater than the simple sum of each facility's impact.

As an example, a reduction in the numbers of a particular aquatic fish species due to mortality at a single power plant may be small. A nearby power plant may also cause a small mortality. The combined effect of mortality at both plants may exceed a threshold needed for sustained, long-term populations of the species.

H. Threatened, Endangered, and Protected Species

Threatened, endangered and protected species in the source water body of a power plant pose special considerations. Fish and wildlife agencies, such as the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS), US Fish and Wildlife (US F&W), and the California Department of Fish and Game, often participate in the permitting process and attempt to determine if the facility will cause or contribute to an adverse impact on essential habitat for threatened or endangered species.

Under the Endangered Species Act (ESA), the term "take" is defined to mean harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Under the Marine Mammal Protection Act (MMPA), the term "take" means to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal. Incidental Taking is defined as an unintentional, but not unexpected, taking. Harassment under the 1994 Amendments to the MMPA, is statutorily defined as, any act of pursuit, torment, or annoyance which (*Level A Harassment*) has the potential to injure a marine mammal or marine mammal stock in the wild; or, (*Level B Harassment*) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering but which does not have the potential to injure a marine mammal or marine mammal stock in the wild.

Marine mammals such as sea otters, sea lions, and harbor seals, and even marine reptiles (endangered sea turtles), have become trapped in power plant intake structures. After extraction, marine mammals do not always survive. For this reason some power plants have applied for incidental take permits from the US F&W and NMFS.

Impingement at power plants has the potential to directly cause mortality or takes of endangered fish species. As an example, the Contra Costa Power Plant has been known to entrain Chinook salmon and Delta smelt (316b PIC for Mirant Contra Costa Power Plant, Tenera Environmental, April 2006). Site-specific impacts such as these must be minimized and ultimately mitigated for, possibly using a habitat equivalency methodology such as the habitat production foregone method. All Phase II facilities proposing to use restoration to meet the applicable 316(b) requirements must address species of concern in consultation with fish and wildlife management agencies.

I. PICs, CDS and Monitoring

The Phase II rule requires that existing facilities complete a Comprehensive Demonstration Study (CDS) to characterize impingement mortality and entrainment, to describe the operation of their cooling water intake structures and to confirm that the technologies or measures selected will meet one of the five compliance alternatives for establishing BTA for minimizing adverse environmental impacts. A Proposal for Information Collection (PIC) is also required prior to the start of information collection activities. The PIC must include a detailed description of the technologies or measures to be evaluated during the CDS, a description of historical entrainment and impingement studies, a summary of past or ongoing consultations with wildlife agencies, and a detailed sampling plan for any new studies proposed.

Impingement sampling methods are usually straightforward: organisms caught on the power plant intake screens are identified and counted. Studies are designed to produce an accurate estimate of all fishes and invertebrates impinged during a typical year, and repeated, especially if source populations change. The impacts are expressed as the number of individuals of each species killed.

The estimation of impacts from entrainment is complex and technical, requiring comprehensive field sampling and laboratory analyses, life history information on the species entrained, and a variety of analytical procedures. The goal is to provide an accurate estimate of the species composition, number, and size of larvae available in the water that are potentially subject to entrainment (samples from water away from the intake), and the species composition, number and size of larvae actually entrained (samples from water very near the intake).

J. Expert Review Panel

At its April 20, 2006 meeting, the OPC adopted a “Resolution of the California Ocean Protection Council Regarding the Use of Once-Through Cooling Technologies in Coastal Waters.” In that resolution, the OPC resolved “to encourage the State Water Resources Control Board’s formation of a technical review group to ensure the required technical expertise is available to review each power plant’s data collection proposals, analyses and impact reductions, and fairly implement statewide data collection standards needed to comply with § 316(b).”

Thermal, impingement, and especially entrainment impacts from OTC are often difficult to accurately define. For example an analysis of entrainment impacts, controls, and mitigation measures requires very specialized technical expertise in certain areas of physical oceanographic processes, coastal marine biology, ecological modeling, restoration ecology, and engineering.

The State Water Board is considering establishing a 316(b) Expert Review Panel, by early Fall 2006. The group is proposed to be facilitated by State Water Board, Division of Water Quality (DWQ) staff and would include membership from academic (3) and consulting (1) scientists, technical experts representing industry (2) and environmentalists (2). The panel may be funded through NPDES permit fees or other appropriate mechanisms.

K. Sewage Treatment Plant Wastewater Used as Cooling Water

The proposed policy would require power plant owners or operators to consider the use of treated wastewater as a cooling medium when the plant is co-located in close proximity to a publicly-owned treatment works. As stated previously, the State Water Board’s 1975 “Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Powerplant Cooling” promotes the use of treated wastewater as cooling water at coastal power plants. In fact, that resolution states that wastewater destined for ocean disposal is the first preference for cooling water at power plants.

The use of wastewater as a direct cooling water medium (i.e., a direct substitution for ocean or estuarine waters) is limited by geographic, business, and regulatory constraints. This potential strategy is dependent on local conditions, including the relative locations of the sewage treatment and power plant, the land use between the treatment plant and the power plant, the quantity and quality of the treated wastewater, and the location, depth and structural attributes of the outfall. The movement of treated wastewater to a power plant would require significant engineering and construction pipelines. In most cases, where candidate wastewater and power plants are not adjacent, the intervening land use is also a consideration. Heavily urbanized areas may require underground pipes to connect the treatment plant to the power plant. If deep-water ocean discharge would be necessary, then pipelines in both directions would be required.

Cooling water flows are typically much larger than treated wastewater volumes. In addition, wastewater may not be as cold as ocean or bay water, thereby reducing the efficiency of heat transfer. Therefore, there are likely only limited or no situations in which wastewater could completely substitute for ocean water, but there may be some cases where treated wastewater may be used to reduce the amount of water withdrawn for OTC.

Power plant outfalls are often in shallow water. If treated wastewater is used for cooling at a power plant, a discharge of heated, treated waste water from a beach or even shallow outfall may pose unacceptable risks to beneficial uses such as contact recreation or marine aquatic life (e.g., kelp forests). There is also the question of who is ultimately responsible for the discharge quality, the wastewater plant or the power plant, when they share contact with the process water. If wastewater is used for cooling and then returned to a wastewater plant for deeper water disposal, and there are violations of an Ocean Plan water quality objective or effluent limit, which is the responsible party?

A nearly ideal situation would be one in which a wastewater treatment plant is located in very close proximity to a power generating facility, and in which both facilities are owned or operated by the same municipality. One example of such a circumstance is the City of Los Angeles Hyperion Wastewater Treatment Plant and the Scattergood generating facility, operated by the Los Angeles City Department of Water and Power. Hyperion discharges approximately 420 million gallon per day (mgd) of secondary treated wastewater, while Scattergood's flow is approximately 496 mgd, so the volumes are roughly similar. Hyperion discharges its wastewater far from shore in 187' depth, while Scattergood discharges in only 15' depth very near shore. If treated wastewater were used to partially substitute or even replace OTC marine water, the wastewater would need to be returned to Hyperion for deep-water discharge. Heating the wastewater would increase the buoyancy of the plume, thereby modifying the initial dilution characteristics.

According to the California Energy Commission's 2005 report "Issues and Environmental Impacts Associated with Once-through Cooling at California's Coastal Power Plants," a re-powering project was proposed and approved by the Energy Commission for the El Segundo generating plant site in Los Angeles County. The El Segundo power plant is located within 1.25 miles of the Hyperion Wastewater Treatment Plant. The Energy Commission staff estimated the Hyperion plant as having a capacity of 450 mgd, whereas the El Segundo re-powering facility proposed to use 207 mgd ocean water for cooling. Due to concerns about entrainment impacts of once-through cooling, Energy Commission staff proposed that the El Segundo power plant use the Hyperion wastewater for cooling and return the water to the waste treatment facility after use. Capital costs were estimated to be \$12 million. Operation cost was expected to be slightly greater due to efficiency loss, at a cost of \$1 - 2 million dollars per year. It was expected that some cost would also be incurred to purchase the wastewater, but this was not negotiated with the City of Los Angeles. Apparently the City did not indicate a willingness to sell the treatment plant wastewater to the power plant at that time.

The use of treated wastewater may also have a potential application as feed water for alternative cooling by evaporative cooling towers. The reduced volume requirements of a cooling tower system may make wastewater effluent more feasible. Again, this would be especially true in the situations where the sewage plant is in close proximity and costs of a pipeline are not exorbitant. In such cases the wastewater would need to be of sufficient quality (in accordance with California Title 22), chlorinated and possibly tertiary treated, to ensure plant safety and prevent aerial contamination. Any concentrated chemical constituents or solids would likely need to be disposed at permitted land disposal sites.

L. Alternatives to OTC

Alternative technologies are available that can reduce or eliminate the impacts of OTC. The CEC evaluated alternatives to once through cooling in Chapter 6 of its June 28, 2005 report. The CEC identifies the following alternative technologies:

- Dry Cooling
- Cooling Towers
- Using alternative cooling water sources – recycled wastewater

Details regarding the above alternative technologies can be found in the CEC's June 28, 2005 report, which is available at: <http://www.energy.ca.gov/2005publications/CEC-700-2005-013/CEC-700-2005-013.PDF>.

M. Flow Reduction

There are currently no federal or state requirements that intake flow be reduced during periods in which electrical energy is not being produced. The Phase II rule does not address this issue.

In addition to requiring that facilities meet the upper range of the I/E performance standards, the proposed policy would require that flow be reduced to ten percent of the average daily flow during periods when electrical energy is not being produced for a period of two or more consecutive days. Flow reduction is an alternative that will reliably reduce the I/E impacts of once-through cooling.

There is a variety of options to reduce intake flows, including re-powering to combined-cycle combustion technology, seasonal outages and variable speed pumps. The Moss Landing Power Plant has employed combined cycle combustion technology, which requires less cooling water per MW of energy production. Another example of flow reduction is at the Contra Costa Power Plant, which currently employs variable speed pumps and seasonal reductions to avoid entrainment of striped bass larvae. The CEC discusses these intake flow reduction options in Chapter 6 of its June 28, 2005 report.

The reader is referred to the CEC report for further information regarding flow reduction options.

N. Desalination and Power Plants

Seawater desalination increasingly supplements water supply needs in coastal California communities. New desalination technologies have made desalination more feasible. Desalination, however, requires a great amount of electricity and creates waste brine. Disposal of waste brine is problematic because the salinity can be twice the salinity of the ocean. Waste brine is denser than seawater and has the potential to sink to the ocean bottom, adversely impacting sensitive benthic organisms.

Because of the energy and waste disposal needs, desalination facilities are increasingly being proposed at or near existing coastal power plants. Co-location allows the desalination facility to utilize the power plant's seawater cooling system to co-mingle with its brine wastes as well as directly use electrical power produced at the power plant.

Environmental advocates have argued that the co-location of a desalination facility near a power plant will ensure the continued existence of the power plant, possibly prolonging the lifetime of an out-dated power plant and its associated environmental impacts. Power plant officials recognize that their main business is to generate electric power, not to provide water, and the co-location of a desalination facility near a power plant must have community support and not hinder the power plant's current or future operations. A stand-alone desalination facility will be required to apply for an NPDES permit to discharge waste brine.

Typically, desalination plants co-located with power plants draw water off of the system after thermal exchange and, therefore, should not increase the intake volumes. This subject is outside of the scope of the Clean Water Act § 316(b) issues and would be more appropriately addressed through the other water quality control plans (e.g., California Ocean Plan, State Water Board Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California).

IV. APPROPRIATE LOCATION FOR PROPOSED STATE POLICY

A. California Ocean Plan (COP)

A statewide policy for implementing controls on OTC at coastal power plants could be included in the COP. However, this is not recommended because the COP is only applicable to the near coastal ocean waters of the state and not to enclosed bays and estuaries. While some coastal power plants are located on the open coast, many are located in bays, harbors, and estuarine areas not subject to the COP. In addition, some

power plants draw water from bays, harbors, or associated channels and then discharge to the ocean, adding another layer of complexity.

B. Stand-Alone Policy

Another alternative is to adopt a stand-alone policy to specifically address the intakes of OTC systems and implementation of the § 316(b) regulations. This approach would be fairly straightforward. The policy would be limited to implementation of §316(b) and would not address other water quality aspects of power plant discharges, such as thermal impacts on receiving waters. However, the regulation of intakes has extremely complex implications with other aspects of OTC discharges. Such implications may best be served in a comprehensive manner.

C. Thermal Plan

A third alternative would be to incorporate § 316(b) provisions in the existing Thermal Plan. The Thermal Plan applies to the elevated temperature waste discharges from all coastal power plants, regardless of their location on the open coast or in enclosed marine or estuarine waters. Control of intakes may result in some necessary adjustments in the thermal waste requirements, and the placement of the § 316(b) policy in the Thermal Plan would allow for that.

APPENDIX I

Proposed Statewide Policy on Clean Water Act Section 316(b) Regulations

Proposed Statewide Policy on Clean Water Act Section 316(b) Regulations

Power Plant Cooling Water Intake Provisions

1. Owners or operators of new Power Plants, as defined in this policy, that meet the threshold criteria in 40 C.F.R. §125.81(a), revised as of July 1, 2005, must comply with the requirements in 40 C.F.R. Part 125 Subpart I, revised as of July 1, 2005.
2. Owners or operators of existing Power Plants, as defined in this policy, that meet the threshold criteria in 40 C.F.R. §125.91(a), must comply with 40 C.F.R. Part 125, Subpart J, revised as of July 1, 2005. However, the following additional requirements shall apply:
 - a) Existing power plant owners or operators must do one of the following to reduce impingement mortality:
 - i. Reduce intake flow to that commensurate with a closed-cycle recirculating system, or
 - ii. Reduce the maximum through-screen design intake velocity to 0.5 feet per second (ft/s) or less, or
 - iii. Reduce impingement mortality for all life stages of fish and shellfish by 95 percent from the calculated baseline by any combination of operational or structural controls.
 - b) Existing power plant owners or operators must do one of the following to reduce entrainment:
 - i. Reduce intake flow to that commensurate with a closed-cycle recirculating system, or
 - ii. If the power plant has a capacity utilization rate of 15 percent or greater, reduce entrainment of all life stages of fish and shellfish by 90 percent of the calculated baseline by any combination of operational or structural controls.
 - iii. Existing power plant owners or operators who satisfactorily demonstrate to the Regional Water Board that no combination of operational and structural controls can feasibly achieve the 90 percent reduction in entrainment must comply with the following:
 - a. The owner or operator must reduce entrainment of all life stages of fish and shellfish by a minimum of 60 percent from the calculated baseline by any combination of operational or structural controls, and

- b. Restoration measures must be employed to achieve the remaining percent reduction in entrainment over the minimum achieved in a (above), up to 90 percent, of all life stages of fish and shellfish from the calculated baseline.
- c) If the owner or operator of an existing nuclear power plant demonstrates that implementation of operational and/or technological measures for the reduction of impingement and entrainment will conflict with safety requirements instituted by the Nuclear Regulatory Commission, the required 95 percent reduction for impingement and 90 percent reduction in entrainment may be met using any combination of operational or structural controls and restoration measures.
- d) If electrical energy will not be produced for a period of two or more consecutive days, the owner or operator must minimize entrainment by reducing intake flow to ten percent of the baseline flow rate. This measure will be allowed to count as an operational control to assist in meeting the required entrainment reductions. This requirement shall be implemented in the National Pollutant Discharge Elimination System (NPDES) permit for the power plant through an appropriate maximum intake flow limitation that applies during these periods.
- e) The calculation baseline shall be determined using actual flow rates calculated as a mean of the flow rates provided to the Regional Water Board in monitoring reports over the last NPDES permit cycle.
- f) Credit shall be allowed for flow reduction and other control measures already implemented, or required under an existing NPDES permit, to reduce impingement or entrainment.
- g) Owners or operators of power plants with overlapping intake water source areas must conduct a cumulative ecological study. Owners or operators of power plants located in the jurisdictions of different Regional Water Boards with overlapping intake water sources areas must also conduct a cumulative ecological study.
- h) Restoration measures to meet 2(b) and 2(c) above must be in the same water body or watershed, and must be considered in the following order of preference:
1. *in-kind, on-site* (within the same water body in close proximity to the plant)
 2. *in-kind, off-site* (preferably within the same Regional Water Board's jurisdiction)
 3. *out-of-kind, on-site* (within the same water body in close proximity to the plant)
 4. *out-of-kind, off-site* (preferably within the same Regional Water Board's jurisdiction)

- i) When designing a restoration program the methodology used to assess the area to be restored shall be “habitat production foregone.”
 - j) Power plant owners and operators may not use 40 C.F.R. §125.94(a)(5), revised as of July 1, 2005, to demonstrate compliance with best technology available for minimizing adverse environmental impacts at the facility.
3. Owners or operators of power plants must consider the use of treated wastewater as a cooling medium when co-located in close proximity to a publicly-owned treatment works.
 4. An Expert Review Panel will be selected by the State Water Board, and will be funded through NPDES permit fees or other appropriate funding mechanism. The role of the Expert Review Panel is to review entrainment and impingement impact study designs or reasons for not doing these studies, the results of those studies, and interpretation of the results, and to advise the Regional Water Board accordingly.
 5. Reference stations may be used to identify baseline marine life conditions for the same habitat as the power plant, if determined by the Expert Review Panel.
 6. Any assessment of environmental impacts from entrainment and impingement must consider the ecological impacts to all species and the marine community, not just commercially or recreationally important species.
 7. The Regional Water Boards shall implement this policy when a permit for an existing power plant is first reissued after [the effective date of the policy] or when the permit is reopened, whichever occurs first.

Definitions:

Adult Equivalent Losses (AEL) is a measurement of the resulting reduction in adults of a species due to larval losses from entrainment.

Capacity Utilization Rate is defined in 40 C. F. R 125.93 as the ratio between the average annual net generation of power by the facility (in Megawatt-hours) and the total net capability of the facility to generate power (in Megawatts) multiplied by the number of hours during a year.

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

Empirical Transport Model (ETM) is a mode that uses as input data AEL, FH, and physical oceanographic data to determine proportional larval mortality (what percent of larvae are lost) over a quantified source water area.

Existing Power Plant - Any power plant that is not a new Power Plant.

Feasible means capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors.

Fecundity Hindcasting (FH) is a measurement of how many adult females would be needed to replace the larval losses from entrainment.

Habitat Production Foregone requires an estimate of the Proportional Mortality (PM) (i.e., the proportion of larvae killed from entrainment to the larvae in the source population). An estimate is also required of the water body area for the target species' source population. The product of the average PM and the average area is an estimate of habitat area production that is lost to all entrained species. For example, if the average PM of estuarine species is 17 percent and the area of the source water estuary is 2000 Acres, then the area of habitat production foregone is equal to (17% x 2000 Acres) = 340 Acres.

Ichthyoplankton are the planktonic early life stages of fish (i.e., the pelagic eggs and larval forms of fishes).

New Power Plant – a) Any power plant which commenced construction after January 17, 2002, or b) any power plant that was in operation prior to January 17, 2002 but, as of [the effective date of this policy], has undergone or will undergo a major modification. A major modification is a modification of the facility that increases electrical production capacity and increases the intake flow rate.

Planktonic Organism – Includes phytoplankton, zooplankton, and ichthyoplankton.

Zooplankton are those planktonic invertebrates larger than 200 microns (including invertebrates that are planktonic for their entire life cycle, and the pelagic larvae and eggs of benthic invertebrates).

Monitoring Provisions

Impingement Impacts

1. Prior to permit issuance or renewal, impingement must be measured on-site at the traveling screens and must include sampling for all species impinged.

- i. The study period must be at least one year.
- ii. Impingement must be measured during different seasons and over 24-hour sampling periods.
- iii. Impingement must be sampled under differing representative operational conditions (e.g., differing levels of power production, heat treatments, etc.).

The impingement study must be designed to accurately characterize the species impinged and their seasonal abundance, over the permit period, to the satisfaction of the Regional Water Board.

2. After the permit is effective, periodic impingement sampling must be performed and reported to the Regional Water Board.
3. The need for new impingement studies must be evaluated at the end of the permit period. Impingement studies must be required when changing operational or environmental conditions indicate new studies are needed.

Entrainment Impacts

1. Entrainment studies shall be performed once per permit cycle, unless the permittee demonstrates that prior studies accurately reflect current impacts. Sampling must be performed to determine larval composition and abundance in the source water (source water sampling) and entrained water (entrainment sampling). The source water must be determined based on oceanographic conditions reasonably expected during the permit cycle of the power plant. Entrainment sampling must provide an unbiased estimate of larvae entrained at the intake.
2. Entrainment impacts must be based on sampling for all ichthyoplankton and zooplankton species. Individuals collected must be identified to the lowest taxonomical level practicable. Sampling must provide the data necessary to make reasonably accurate estimates of Adult Equivalent Losses (AEL) and Fecundity Hindcasting (FH), and to use in the Empirical Transport Model (ETM). When feasible, genetic identification through molecular biological techniques may be used to assist in compliance with this requirement. Samples must be preserved and archived such that genetic identification is possible at a later date.
3. AEL and FH must be determined as accurately as reasonably possible using current scientifically acceptable methods.
4. An ETM and other oceanographic and life history information must be used, for each species possible (given available data), to estimate proportional mortality and the source water area over which mortality occurs, using current, scientifically acceptable methods. The source water area must be determined based on oceanographic conditions reasonably expected during the permit period.

5. The study period must be at least one year, and sampling designed to account for variation in oceanographic conditions and larval abundance and behavior such that abundance estimates are reasonably accurate.

APPENDIX II

New York State Department of Environmental Conservation

Letter to USEPA

New York State Department of Environmental Conservation

Deputy Commissioner

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Phone: (518) 402-8560 • FAX: (518) 402-9016
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Erin M. Crotty
Commissioner

January 24, 2005

BENJAMIN H. GRUMBLES

Assistant Administrator
United States Environmental Protection Agency
Office of Water
1200 Pennsylvania Ave. N.W.
Mailcode 4101M
Washington, DC 20460

Re: Determination of Best Technology Available for "Existing Facilities" in New York

Dear Mr. Grumbles:

Since 1975, the Department of Environmental Conservation ("Department") has been the Environmental Protection Agency-approved agency responsible for issuing State Pollutant Discharge Elimination System ("SPDES") permits in lieu of NPDES permits in New York. 40 *Fed. Reg.* 54,462-63 (Nov. 24, 1975). In light of the recent promulgation of *Final Regulations to Establish Requirements for Cooling Water Intake Structures at Phase II Existing Facilities* ("Phase II rule") [69 *Fed. Reg.* 41576 (July 9, 2004) – to be codified at 40 CFR Parts 9, 122-25], and in order to inform EPA as to how the Department will generally implement Phase II rule requirements in its SPDES permit program, the Department provides this outline.¹ The outline is organized into the following five major sections:

- A.) Collection of background information;
- B.) Collection of new or updated information (if necessary);
- C.) Review of all feasible technologies and operational measures;
- D.) Determination of best technology available ("BTA"); and
- E.) Verification and monitoring of the selected BTA measures.

To allow comparison between requirements imposed by the Department under New York's own cooling water intake structure regulation at 6 NYCRR §704.5 and the requirements of the Phase II rule's Comprehensive Demonstration Study, the Department has included a reference in brackets to the relevant *Code of Federal Regulations* ("CFR") section of the Phase II

¹ While this outline is intended to describe, in general, how primary elements of the Phase II rule requirements will be implemented by the Department at existing facilities in New York, it is by no means exhaustive nor completely detailed. As part of the SPDES permit process, the Department should be consulted in every instance as to the specific Phase II rule provisions which will be required for a particular facility.

rule for each requirement, where applicable.²

A. Collection of Background Information

Permittees for “existing facilities” (as those terms are used in the Phase II rule) with cooling water intake structures will be required to submit a report on existing data and background information to the Department. At a minimum, this report will include the following:

1. A description of the facility and the existing cooling water intake structure and cooling system, including design intake velocity [Proposal for Information Collection, 40 CFR §125.95(b)(1)(i) and Design and Construction Technology Plan, 40 CFR §125.95(b)(4)(i,ii)];
2. The average net generation of the facility in MWhr measured over the last 5 years, and net capacity of the facility in MW. Both of these parameters must be summarized monthly and annually [Design and Construction Technology Plan, 40 CFR §125.95(b)(4)(i)];
3. Taxonomic identification of all fish and shellfish that are in the vicinity of the intake (including threatened or endangered species) and natural history information on each of these species [Impingement Mortality and/or Entrainment Characterization Study, 40 CFR §125.95(b)(3)(i, ii)];
4. A description of the physical and biological conditions in the vicinity of the cooling water intake [Proposal for Information Collection, 40 CFR §125.95(b)(1)(ii)];
5. A comprehensive list of all historical studies (with a short description of each study) that document impingement, entrainment, and/or thermal impacts at the facility. The report should discuss the relevance of these historical studies to existing facility or source waterbody conditions [Proposal for Information Collection, 40 CFR §125.95(b)(1)(ii)];
6. An estimate of impingement and entrainment under current operation, as well as an estimate of baseline and impingement and entrainment when the station is operating at full flow and full capacity [Impingement Mortality and/or Entrainment Characterization Study, 40 CFR §125.95(b)(3)(iii)];
7. The mean annual flow and lowest mean monthly flow of the source waterbody, each averaged over the last 10-year period. This information is only necessary if the facility is located on a freshwater stream or river not influenced by tides [Source Waterbody Flow Information, 40 CFR §125.95(b)(2)(i)];
8. Information on natural thermal stratification or turnover pattern of the source waterbody and a discussion of whether the facility’s current operation has an

² 6 NYCRR section 704.5, enacted by the Department in 1974 as a water quality standard regulation, provides: “*The location, design, construction and capacity of cooling water intake structures, in connection with point source thermal discharges, shall reflect the best technology available for minimizing adverse environmental impact.*” This provision, while similar to CWA section 316(b), is not identical to that section.

impact on these parameters. This information is only necessary if the facility is located on a lake (other than a Great Lake) or a reservoir [Source Waterbody Flow Information, 40 CFR §125.95(b)(2)(ii)];

9. A summary of past or ongoing consultations with appropriate Federal and/or State fish and wildlife agencies with copies of any written comments received from such consultations [Proposal for Information Collection, 40 CFR §125.95(b)(1)(iii)].

The Department will review this report and determine if additional study or information is necessary to document the numbers and type of aquatic organisms impinged and/or entrained at the facility. Additional studies may not be necessary if Department staff determine that previous monitoring of impingement and/or entrainment sufficiently describes current levels of impact. However, if previous studies do not sufficiently describe the current impact, the permittee may be required to collect data on the numbers of fish, shellfish, and other selected aquatic organisms impinged and/or entrained at the facility.

B. Collection of New or Updated Information

If the Department concludes that additional data on impingement and/or entrainment are necessary (as determined above), the permittee will be required to conduct studies to document impacts on aquatic organisms. If additional impingement and/or entrainment monitoring is necessary, the permittee will be required to submit, for Department review and approval, a scope of work that is generally consistent with the following guidelines [Proposal for Information Collection, 40 CFR §125.95(b)(1)(iv) and Impingement Mortality and/or Entrainment Characterization Study, 40 CFR §125.95(b)(3)(iii)]:

Impingement Abundance Monitoring

1. Impingement studies must collect data for a minimum of two years at facilities with no previous impingement monitoring and for a minimum of one year at facilities with previous impingement monitoring.
2. The scope of work must include the methods for sample processing, quality control, quality assurance, subsampling, and for evaluating collection efficiency.
3. At a minimum, one continuous 24-hour collection must be made in every calendar week for a continuous 12-month or 24-month period, depending on the extent of previous monitoring at the facility as discussed in item "1" above.
4. A summary report must be included as a requirement in the scope of work. This report must include a summary table that estimates the total numbers of fishes and shellfishes impinged, by species, for the study period based upon continuous operation of all pumps at full rated flow as well as actual operational and flow data for the study period. The information must be submitted in tabular, graphic, and electronic (*e.g.* Excel or similar) formats.

Entrainment Abundance Monitoring

1. Entrainment studies must collect data for a minimum of two years at facilities with no previous entrainment monitoring and for a minimum of one year at

- facilities with previous entrainment monitoring.
2. The scope of work must include the methods for sample processing, quality control, quality assurance, and subsampling.
 3. All entrainment samples must be analyzed for ichthyoplankton, juvenile fish, and shellfish.
 4. At a minimum, one entrainment sample during every 6-hour interval over a continuous 24-hr collection period will be made in every seven-day calendar period when entrainment is likely to occur (periods when spawning occurs near the plant) for a continuous 12-month or 24-month period, depending on the extent of previous monitoring at the facility as discussed in item "1" above.
 5. A summary report must be included as a requirement in the scope of work. This report must include a summary table that estimates the total numbers of fishes and shellfishes entrained for the study period based upon continuous operation of all pumps at full rated flow as well as actual operational and flow data for the study period. Estimates of entrainment must be made for each life stage and where appropriate, by each species. The information must be submitted in tabular, graphic, and electronic (e.g. Excel or similar) formats.

C. Review of Technologies and Operational Measures

Once the Department determines that there is sufficient information to document the nature and amount of adverse environmental impact from the cooling water intake structure at an existing facility, the Department will request that the permittee provide, for review and approval, a complete technology review that evaluates all *feasible* intake technologies, operational measures, or combination of technologies and operational measures that can reduce, either individually or in combination, impingement by no less than 80-95% and entrainment by no less than 60-90%. These minimum percent reductions will be based upon the absolute number of organisms impinged or entrained compared with a baseline when the facility is operating at full flow and full capacity [Technology and Compliance Assessment Information, 40 CFR §125.95 (b)(4)].

Feasible for purposes of the Department's technology review means "capable of being done" with respect to the physical characteristics of the facility site but does not involve consideration of cost. However, for all feasible alternatives (as defined above), the Department will require that the cost of implementing each alternative be included as part of the technology review. The Department will require that the permittee explore the feasibility of closed-cycle cooling at each existing facility as part of this technology review. For each technology or operational measure assessed, the Department will require that the technology review report also include the following:

1. A detailed description of the alternative (including preliminary drawings and sketch maps, if appropriate);
2. A discussion of the engineering feasibility of the alternative;
3. An assessment of the mitigative benefits, in reducing impingement mortality and entrainment abundance, through utilization of the alternative;

4. A breakdown of all applicable costs including costs associated with capital improvements, operation and maintenance, and construction downtime;
5. An estimate of the time required to implement the alternative; and
6. An evaluation of any adverse environmental impacts to aquatic biota, habitat, or water quality that may result from construction, installation, and use of the alternative.

Additionally, as part of the technology review report, and based on the alternatives presented in the report, the permittee must propose the technology or operational measure (or combination of technologies and/or operational measures) that it contends will achieve compliance with 6 NYCRR §704.5 and 40 CFR §§125.90-125.99 at the facility. If the Department agrees with the permittee, it will approve the selection. If the Department disagrees with the permittee, the Department will require either a revised technology report from the permittee or will incorporate other measures into the facility's SPDES permit in order to achieve BTA at the facility [Technology and Compliance Assessment Information, 40 CFR §125.95(b)(4)]. Under the Department's regulations, if a disagreement between the permittee and Department staff relates to a substantial term or condition of a permit, the permittee may request an administrative hearing to adjudicate the issue. See 6 NYCRR Part 624 *et seq.*

D. Determination of BTA

The selection and determination of BTA under New York's cooling water structure regulation (6 NYCRR §704.5) for existing facilities in New York will continue to be made by Department staff utilizing Phase II rule performance standard requirements on a site-specific, case-by-case basis as previously established by EPA in determining BTA under CWA §316(b) in *In re Brunswick Steam Electric Plant*, Region 4, EPA (Nov. 7, 1977), and later upheld in *Seacoast Anti-Pollution League v. Costle*, 597 F.2d 306 (1st Cir. 1979). This site-specific, case-by-case approach for determining BTA has been routinely applied, in conjunction with the Department's own cooling water intake structure regulation (6 NYCRR §704.5), for SPDES permits issued to electric generating facilities in New York. SPDES permits for two such Hudson River facilities resulted in adjudication and subsequent written Commissioner Decisions outlining the same four-step analysis for the Department's determination of BTA:

- (1) whether the facility's cooling water intake structure may result in adverse environmental impact;
- (2) if so, whether the 'location, design, construction and capacity of the cooling water intake structure reflects best technology available for minimizing adverse environmental impact';
- (3) whether practicable alternate technologies are available to minimize the adverse environmental effects; and
- (4) whether the costs of practicable technologies are wholly disproportionate to

the environmental benefits conferred by such measures.³

In keeping with the Department's established, stringent BTA requirements for facilities with cooling water intake structures in New York (as determined by 6 NYCRR §704.5), the Phase II rule minimum stated performance standards (*i.e.*, 80% reduction in impingement and 60% reduction in entrainment) represent the minimum "floor" and the Department will seek to impose the higher end of these ranges (*i.e.*, 95% reduction in impingement and 90% reduction in entrainment) in its SPDES permit process for existing facilities.

Further, in keeping with the holding of recent federal litigation in the Second Circuit construing EPA's Phase I rule, the Department will not consider restoration plans [40 CFR §125.95(b)(5)] as an appropriate or acceptable BTA alternative for any facility, new or existing, in New York. *See Riverkeeper, Inc. v. U.S. Enytl. Protect. Agency*, 358 F.3d 174, 189-92 (2nd Cir. 2004). The Department contends that restoration measures are inconsistent with the text of CWA §316(b) and 6 NYCRR §704.5 because such measures merely attempt to correct for the adverse environmental impacts of impingement and entrainment; they do not minimize those impacts in the first instance. Similarly, the Department will not consider a "site-specific" alternative BTA determination, as the term "site-specific" is used by EPA in its Phase II rule [40 CFR §§125.94(a)(5) and 125.95(b)(6), *i.e.*, measures that achieve an efficacy as close as practicable to the applicable % reduction performance standards considering cost calculations], as an appropriate or acceptable BTA alternative. Neither of these BTA alternatives complies with New York's own water quality standards and regulatory criteria relating to cooling water intake structures in connection with point source thermal discharges.

It is important to note that the Department is specifically authorized to impose more stringent limitations and requirements in SPDES permits in order for facilities to meet New York's water quality standards, treatment standards or schedules of compliance, established pursuant to State law or regulation consistent with §510 of the Clean Water Act ("CWA").⁴ Both the Phase I and Phase II rules expressly affirm this fundamental principle of the CWA. *See* 40 CFR §§125.80(d) and 125.90(d); *see also PUD No. 1 of Jefferson County v. Wash. Dep't of Ecology*, 511 U.S. 700, 705, 711-13, 114 S.Ct. 1900, 128 L.Ed.2d 716 (1994), and *Riverkeeper, Inc. v. U.S. Enytl. Protect. Agency*, 358 F.3d 174, 201 (2nd Cir. 2004). Moreover, recently in your August 30, 2004 letter to certain States Attorneys General, including New York's, regarding Phase II rule implementation, you stated:

"Section 125.90(d) of the Phase II rule is included as a reminder to States that this Clean Water Act provision [§510] continues to apply

³ *See Matter of Athens Generating Co., L.P.*, Interim Decision of the Commissioner, June 2, 2000 (new facility - dry cooling as BTA); and *Matter of Mirant Bowline, LLC*, Decision of the Commissioner, March 19, 2002 (new facility - closed cycle cooling plus wedgewire screens and marine life exclusion system as BTA).

⁴ *See, e.g.*, 6 NYCRR §§704.5 and 750-1.11(a)(5)(i).

as recognized by the U.S. Court of Appeals for the Second Circuit in Riverkeeper, Inc. v. EPA (358 F.3d 174, 201 (2nd Cir. 2004)) (“[t]he Clean Water Act expressly allows states to set standards even higher than EPA’s).” Neither section 510 of the Clean Water Act nor §125.90(d) of the Phase II rule requires a state to adopt more stringent *programs* or to seek EPA approval of more stringent NPDES programs before exercising its authority under section 510 to adopt or enforce more stringent *requirements* in a particular permit. ... In addition, §125.94(e) of the Phase II rule provides that the Director of a state-administered or EPA-administered permit program may establish ‘more stringent requirements as best technology available for minimizing adverse environmental impact’ if the Director determines that compliance with the Phase II rule would not meet requirements of applicable State and tribal law or other Federal law.”

See p. 4 of Acting Administrator Grumbles’ August 30, 2004 letter (copy enclosed) (*emphasis in original*).

E. Verification and Monitoring of Selected BTA Measures

Once BTA has been determined by Department staff, the permittee will be required to produce a plan to verify that the technologies and/or operational measures selected as BTA will meet the required reductions in aquatic impact. The permittee will be required to submit, for Department review and approval, a scope of work that includes the following:

1. At a minimum, two years of monitoring to verify the full-scale performance of BTA measures. However, additional time may be required to demonstrate to the Department that the facility is meeting BTA requirements [Verification Monitoring Plan, 40 CFR Part 125.95(b)(7)].
2. A description of the frequency and duration of monitoring, the parameters to be monitored, and the basis for determining the parameters and the frequency and duration for monitoring [Verification Monitoring Plan, 40 CFR Part 125.95(b)(7)(i)].
3. If applicable to the individual facility, a proposal on how naturally moribund fish and shellfish that enter the cooling water intake structure would be identified and taken into account in meeting BTA requirements [Verification Monitoring Plan, 40 CFR Part 125.95(b)(7)(ii)].
4. A requirement for bi-annual status reports and a description of the information to be included in these reports [Verification Monitoring Plan, 40 CFR Part 125.95(b)(7)(iii) and 125.97(b)].

The timing and submission of these information requirements will be administered in accordance with the provisions of 40 CFR §§122.21(d)(2) and 125.95(a)(2)(ii), where appropriate, and the Department’s environmental benefit permit strategy (“EBPS”) for individual SPDES permits found in Environmental Conservation Law (“ECL”) §17-0817(4) and 6 NYCRR

Benjamin H. Grumbles

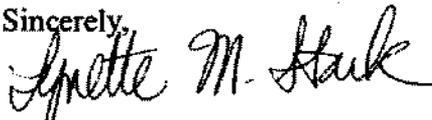
January 24, 2005

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§750-1.19(c)⁵, as well as the Department's Uniform Procedures found in ECL Article 70 [ECL §70-0101 *et seq.*] and 6 NYCRR Part 621 [§621.1 *et seq.*].

Thank you for the opportunity to provide you with the Department's procedure for implementing the Phase II rule in New York's SPDES program.

Sincerely,



Lynette M. Stark

Deputy Commissioner

Enc.

c w/enc.: Cathy Callahan, Acting Regional Administrator - USEPA R2

EDMS#83343

⁵ *See also* Department's Technical & Operational Guidance Series ("TOGS") 1.2.2 - Administrative Procedures and the Environmental Benefit Permit Strategy for Individual SPDES Permits on the Department's website at <http://www.dec.state.ny.us/website/dow/togs/togs122.pdf>.