

Northeastern Regional

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State Policies for Aquaculture Effluents and Solid Wastes in the Northeast Region

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This publication provides a comparative review of the current status of state policies for disposition of effluents and solid wastes from aquaculture production facilities in the northeastern region. It includes information on federal legislation and technical guidelines for aquaculture discharges and the role of two federal agencies involved with administering water quality programs. Regulatory policies of the twelve states and the District of Columbia, all located within the region served by the Northeastern Regional Aquaculture Center (NRAC) are summarized with regard to effluent discharges to surface waters and disposal of two types of solid waste: settled solids (sludge) and mortalities (dead fish or shellfish). Policies for disposition of offal and other wastes from facilities that process fishery and aquaculture products are beyond the scope of this publication and are not included. Because state policies and regulations are subject to periodic review and revision, this publication is intended to be used as a general introduction and initial source for contacts and other information. Specific requirements for an existing facility or proposed operation must be determined through individual consultation with the lead regulatory agency (or its regional office) within the state.

Introduction

Growth of the aquaculture industry and its use of high quality water resources has attracted the attention of state regulatory agencies responsible for surface water discharges and solid waste disposal. These agencies, primarily engaged in controlling wastes from a wide range of industrial and municipal activities, view aquaculture as a small but developing agricultural industry with a significant potential to degrade water quality. Because commercial aquaculture is in the early stages of development in most states, regulators have tended to classify fish farming as an industrial activity requiring wastewater treatment

different from other forms of agriculture. These factors and a general unfamiliarity with aquaculture production technologies, waste characteristics and their impact on different categories of receiving waters (lakes, rivers, streams, etc.) have precluded development of uniform standards and policies based on technical data and environmental risk assessment.

In states with poorly defined or with no policies for managing aquaculture wastes, identifying and obtaining required permits can be a confusing and time consuming process. Permit requirements are often determined on a case-by-case basis using regulations and technical standards not

originally developed or intended for aquaculture. Fish farms may be subject to the same permits, application procedures, fee structure and monitoring requirements as larger industrial dischargers or municipal wastewater treatment facilities.

Federal and state regulatory programs serve to protect and maintain water quality by setting standards for all receiving waters. On balance, the aquaculture industry benefits from the enforcement of these standards. Compliance with standards set for different classes of water bodies may be an issue of contention between regulators and individual aquaculturists in certain areas or situations. However, it is the absence or technical inconsistency of state discharge policies and procedures for aquaculture that often is cited as one of several important regulatory constraints to regional development.

Research has shown that the relative nutrient load and potential impact of aquaculture operations on water quality tends to be low and highly localized when compared to other industrial and municipal activities. Basic treatment of effluents to remove settleable solids generally improves water quality to levels compatible with State standards. Moreover, aquaculture effluents and solid wastes are ideally suited for integration with other forms of agriculture as plant irrigants, fertilizers or animal feeds. The general consensus of the aquaculture industry is that current regulatory policies in many states are in need of review and revision to reflect these differences.

In the Northeastern Region (Figure 1), some states have begun this process by recognizing the beneficial reuse value of aquaculture effluents and solid wastes for agriculture. States are also developing permit requirements and fees specifically for aquaculture or are developing general permits designed to manage a range of production methods and levels through the use of best management practices (BMPs).

Federal Regulation of Aquaculture Discharges

This discussion of the federal role in aquaculture waste disposal is limited to the principal legislation authorizing federal regulation of surface water discharges and water quality in tidal and non-tidal waters: 1) the Federal Water Pollution Control Act of 1972, reauthorized as the Clean Water Act (CWA) in 1977; and 2) the Rivers and Harbors Act of 1899. The two agencies primarily involved in administering federal law and water quality provisions are the U.S. Environmental Protection Agency (EPA) and the Army Corps of Engineers (ACOE).

Other practices such as ocean dumping, and hazardous waste disposal, covered by various federal statutes under the Clean Water Act, the Resources Conservation and

Recovery Act, and/or the Marine Protection, Research and Sanctuaries Act, are not included in this publication. For a complete discussion and review of federal policies for regulating all classes of waste disposal from aquaculture facilities, see Bastian, 1991 (under References/Suggested Additional Reading on page 8).

U.S. Environmental Protection Agency

Federal regulation of aquaculture effluents falls primarily under the jurisdiction of the U.S. Environmental Protection Agency (EPA). Under the Clean Water Act, the EPA has the authority to regulate all discharges of pollutants from point sources (ie., pipes and other outfalls) and non-point sources (land runoff).

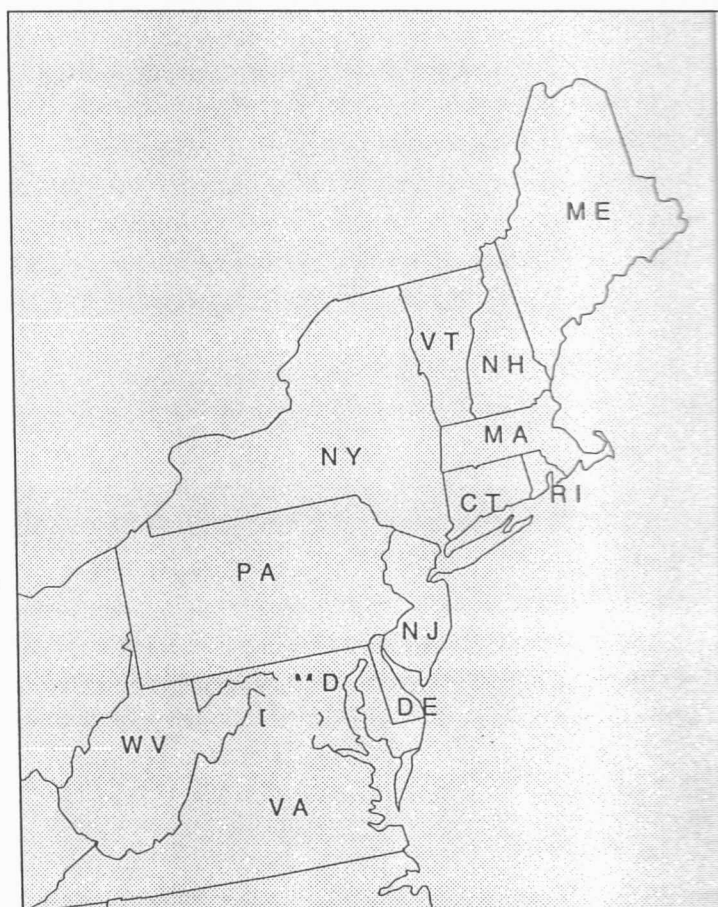


Figure 1. States in the Northeastern Region.

The goals of the legislation are "to restore and maintain the chemical, physical and biological integrity of the nation's waters." To accomplish this, EPA policy supports the use of best available technology (BAT) and/or best management practices (BMPs) to reduce or minimize waste output or recycle waste products as beneficial resources. Examples include the use of effluents as irrigation water and organic solids for soil enrichment, fertilizer and animal feed

supplements. Although EPA regulations indirectly affecting aquaculture wastes are found in a number of federal statutes, the Clean Water Act contains guidelines developed specifically for discharges from aquaculture facilities.

NPDES Permits

The CWA provides for issuance of National Pollution Discharge Elimination Systems (NPDES) permits to control all point source discharge of pollutants to "waters of the United States," unless specifically exempt from regulation. "Pollutant" is defined in the Act as "dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal and agricultural waste discharged into water." Production wastes generated by aquaculture facilities meet this definition and are considered pollutants.

The CWA also established minimum performance standards or technology-based controls for NPDES permits for different categories of discharges. Stricter permit controls or effluent limitations are mandated if these minimum standards and controls will not ensure compliance with established state water quality standards for receiving waters.

A provision under the CWA allows the EPA to transfer or "delegate" its NPDES permit authority to individual states to regulate point-source discharges into waters located within their borders, commonly referred to as "waters of the state." To become a delegated state, resource agencies must submit a regulatory plan to the EPA for approval and demonstrate that state laws provide adequate legal authority to carry out the program described. State programs must be equivalent to the EPA's and may impose more stringent requirements. Of those states receiving delegated status, most choose to incorporate the NPDES permit into their own regulatory program by issuing a joint state/federal permit (for example, RIPDES — Rhode Island Pollution Discharge Elimination System).

Not all states seek delegated status from the EPA; this usually is because insufficient financial resources are available to administer the federal program. Administration of NPDES permits in non-delegated states is the responsibility of an EPA regional office (Table 1). All states in the northeast with the exception of Maine, Massachusetts, New Hampshire and the District of Columbia have delegated status. Non-delegated states still must reg-

ulate discharges not covered by the NPDES program under their own permit programs. Under Section 401 of the CWA, non-delegated states also review and provide water quality certification to the regional EPA offices for all NPDES permits as well as other applicable federal programs with water quality provisions.

Federal Aquaculture Discharge Guidelines

Technical standards for discharges from aquaculture production (unlike many categories of municipal and industrial discharges) have not been established formally by the EPA. NPDES permit regulations under Section 40, Part 122, Subpart B, Section 122.24 and Subpart D, Appendix C of the Code of Federal Regulations (commonly referred to as "40 CFR") consider "concentrated aquatic animal production facilities" to be point sources requiring NPDES permits for discharges into the waters of the United States. Concentrated aquatic animal production facilities, as defined under Appendix C, are hatcheries, fish farms, or other facilities that contain, grow, or hold aquatic animals in either of the following categories:

1. Cold water aquatic animals (including but not limited to the Salmonidae family of fish, e.g., trout and salmon) in

*Table 1
EPA Regional Offices in the Northeast.*

Region I

Permit Contact, Environmental and Economic Impact Office, U.S. Environmental Protection Agency, John F. Kennedy Building, 1 Congress Street, Boston, MA 02203, Telephone: 617-223-4635. States: Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island and Vermont.

Region II

Permit Contact, Permits Administration Branch, Room 432, U.S. Environmental Protection Agency, 26 Federal Plaza, New York, New York 10007, Telephone: 212-264-9880. States: New Jersey, New York, Virgin Islands and Puerto Rico.

Region III

Permit Contact (3 EN 23), U.S. Environmental Protection Agency, 6th and Walnut Streets, Philadelphia, PA 19106, Telephone: 215-597-8816. States: Delaware, District of Columbia, Maryland, Pennsylvania, Virginia and West Virginia.

ponds, raceways or other similar structures which discharge at least 30 days per year. Facilities which produce less than 9,090 harvest kgs (approximately 20,000 lbs) of aquatic animals per year, or facilities which feed less than 2,272 kgs (approximately 5,000 lbs.) of feed during the calendar month of maximum feeding are not included.

2. Warm water aquatic animals (including but not limited to the Ameiuride, Centrarchidae and Cyprinidae families of fish, e.g., catfish, sunfish and minnows) in ponds, raceways or other similar structures which discharge at least 30 days per year. Closed ponds which discharge only during periods of excess runoff, or facilities which produce less than 45,454 harvest kgs (approximately 100,000 lbs.) of aquatic animals per year are not included.
3. Any such facility which the Director determines is a significant contributor of pollution to waters of the U.S. based on an on-site inspection of the facility.

Guidelines for discharges into "aquaculture projects" are described in Part 122, Subpart B, Section 122.25 and Part 125, Subpart B of Section 40. These guidelines refer to the use of effluents (primarily waste heat, or nutrient-enriched waters) as "source water or influent for production or maintenance of freshwater, estuarine or marine plants and animals."

These guidelines represent the minimum federal standard available to states to determine if a NPDES permit is required for an aquaculture facility. The regional EPA offices, and all of the delegated states in the northeastern region, refer to the "40 CFR" guidelines, especially Section 122.24 (concentrated aquatic animal production facilities) to determine permit eligibility. Each delegated state, at its discretion, also may choose to add additional or more stringent criteria under its own discharge program.

The U.S. Army Corps of Engineers

Federal regulation of aquaculture discharges also involves the Army Corps of Engineers (ACOE). Section 10 of the Rivers and Harbors Act of 1899 gives the ACOE regulatory authority over structures or facilities over or in navigable waters. Siting and operation of net pens, floats, and other forms of off-bottom shellfish culture are included because they may affect water quality and obstruct navigation. Deployment of net pens or other types of production gear in navigable waters requires a public hearing, a technical review, and a siting permit from the appropriate

regional ACOE office (Table 2). The Corps evaluates the proposed activity to assess its impact on other established uses of the waterway and the local environment.

Under Section 404 of the Clean Water Act, the ACOE shares responsibility with the EPA to restore and maintain the chemical, physical and biological integrity of the nation's water, including wetlands protection. The Corps authorization to regulate discharge of dredged or fill material into any waters of the United States under Section 404 potentially affects wetlands use and some types of on-bottom shellfish culture.

As with the EPA, ACOE regional offices rely on the cooperation of state resource agencies to review applications and provide certification of water quality and other applicable state regulations.

Future Trends in Federal Regulatory Policy

Current federal policy toward aquaculture surface water discharges remains based on the general guidelines described under the Clean Water Act in 40 CFR, Section 122.24 and the use of best available technology (BAT) and best management practices (BMPs) to reduce or recycle waste products. It is unlikely that pending reauthorization of the Clean Water Act will affect aquaculture appreciably, from the standpoint of more stringent federal technical guidelines or new discharge criteria. Proposed amendments to the CWA, however, do contain provisions for delegated states to charge permit-application and other "user" fees sufficient to cover their costs for administering the NPDES program.

Of all water quality issues confronting the EPA, aquaculture is expected to remain relatively low on its priority list as a point source discharge. The agency is shifting its emphasis, with state participation, to control storm water, agricultural runoff and other types of non-point source discharges. Despite the point source designation under 40 CFR, aquaculture facilities most likely will be included in area-wide, storm-water management plans now being developed by individual states (using federal guidelines) to control introduction of pollutants into receiving waters from non-point sources. Aquaculture also may be included under nutrient management plans that are mandatory in many states for agriculture. These plans are developed individually and depend on the use of recommended BMPs to reduce the non-point source pollution potential of feedlots and crop production.

Table 2

ACOE District Offices in the Northeast Region

Research and Development Directorate (Civil Works)

U.S. Headquarters

Army Corps of Engineers (CERD-C)

U.S. Department of the Army

20 Massachusetts Ave., N.W.

Washington, DC 20314-1000

Telephone: 202-272-0257

Fax: 202-272-0907

U.S. Army Corps of Engineers

New England, CENED

Division Headquarters

424 Trappelo Road Waltham, MA 02254-9149

Telephone: 617-647-8821

Fax: 617-647-8111

States: Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island and Vermont

U.S. Army Corps of Engineers

North Atlantic, CENAD

Division and District Headquarters

90 Church Street

New York, NY 10007-2979

Telephone: 212-264-7102

Fax: 212-264-9498

States: New Jersey, Delaware, Maryland, Pennsylvania (central and eastern), New York (Hudson River basin), Vermont (western), Connecticut (western) and the District of Columbia

U.S. Army Corps of Engineers

District Headquarters

1776 Niagara Street

Buffalo, NY 14207-3199

Telephone: 716-879-4104

Fax: 716-879-4195

State: New York (western)

U.S. Army Corps of Engineers

District Headquarters

Room 1828 William S. Moorehead Federal Bldg.

1000 Liberty Avenue

Pittsburgh, PA 15222-4186

Telephone: 412-644-6800

States: Pennsylvania (western), West Virginia (northern)

U.S. Army Corps of Engineers

District Headquarters

5028th Street

Huntington, WV 25701-2070

Telephone: 304-529-5395

State: West Virginia (central and southern)

State Regulation of Aquaculture Wastes

Although the EPA has established minimum guidelines for NPDES permits and water quality standards, aquaculture waste disposal policies, i.e. waste classification, permitting, fees and other requirements, are set by the individual states (delegated and non-delegated). The level of development of state policy largely is a function of the amount and scale of industry activity and the experience of regulatory agency staff. Permit and environmental monitoring programs tend to be better organized in states where aquaculture has had a longer history and/or significant economic impact; in these states, regulatory programs have been able to grow with the industry. Resource agency staff responsible for issuing permits evaluate applications for aquaculture discharge permits individually using NPDES guidelines, additional state imposed criteria and state water quality standards (which discharges from all sources must meet). Other state and local government agencies (Department of Agriculture, Public Health, Conservation Districts, County Councils) and/or related programs (Coastal Zone Management, Environmental Boards and Commissions) may have a regulatory role or participate in the review process. Public hearings also may be required.

Regulation of aquaculture effluents and solid wastes for disposal or beneficial reuse at the state level is the responsibility of the surface, groundwater and solid waste management divisions housed within most state environmental or natural resource departments. The principal environmental concern of these agencies with aquaculture facilities centers around the use of open and semi-closed culture systems (net pens, raceways and other high volume flow-through systems for finfish) which are considered to have a high potential for surface and groundwater degradation. Indoor, recirculating systems generally are considered as having a lower pollution potential because they use less water and integrate wastewater treatment into the production process.

Shellfish hatcheries, nurseries and field growout operations often are viewed as activities that improve rather than degrade water quality. However, a distinction often is made between land- and field-based shellfish operations. Effluents from hatchery, nursery or depuration facilities typically are regulated by state discharge programs. Field nursery and growout operations, while not considered as having a discharge, still are subject to environmental

review for leases, siting and harvest limitations based upon local water quality and other public health considerations.

State Water Quality Standards

While the CWA gives each state the option of delegated authority for the NPDES permit program, it mandates that all states develop water quality standards consistent with the goals of the Act. Individual state water-quality standards must equal or exceed minimum federal guidelines, and must be reviewed and updated every three years. Surface and ground water standards generally consist of two components — 1) use classifications or designated uses for the particular water body, and 2) associated water quality criteria that define the characteristics or water quality parameters that must be maintained to protect the designated uses. Designated uses are those that the state determines the waters capable of supporting; they may be either existing uses or uses that could be attained in the future.

States employ a variety of classification schemes but generally include categories equivalent to: protection of public water supply; fish, wildlife and aquatic life; primary contact recreation (swimming); secondary contact recreation (boating); agricultural water supply; and industrial water supply. Most states designate water bodies for multiple uses. Water quality criteria are expressed in narrative form and/or as a list of water quality parameters and aesthetic values such as temperature, pH, dissolved oxygen, nitrogen, phosphorous, sedimentation, coliform bacteria, oil and grease, color, turbidity, slicks, odors, surface floating solids, and radioactive and toxic substances.

State water quality standards also contain an “anti-degradation” statement designed to maintain and protect existing uses. Special provisions, however, may be included for protection of waters of exceptionally high quality or those considered to be high priority waters based upon aesthetic, ecological, recreational or other factors. These waters, identified variously as Outstanding Natural Resource (ONR), Outstanding National Resource Waters (ONRW), Waters of Exceptional Recreational or Ecological Significance (ERES), and Areas of Critical Environmental Concern (ACEC), are subject to a state’s highest standards of environmental protection. This generally means that any approved discharges must be of equal or better quality than the receiving waters or that all new discharges are prohibited.

Another provision common to many state standards describes the use of mixing zones to dissipate waste heat

and other types of pollutants in receiving waters. The size and allowance of mixing zones are based on effluent composition and quality of the receiving waters. Mixing zones also must meet aesthetic criteria, have minimal impact on aquatic communities, allow passage of migrating aquatic species, and not result in toxic accumulations of substances in sediments or food chains. Depending upon the state, certain lakes, streams and other restricted water bodies may be excluded from use. Mixing zones, not normally part of an aquaculture waste management plan, are reviewed on a case-by-case basis and often require a public hearing.

Surface Water Discharges and State/NPDES Permits

All of the northeastern states recognize the EPA guidelines for concentrated aquatic animal production facilities found in 40 CFR, Section 122.24 for NPDES permit determinations (page 4). All delegated states in the region administer the federal permit as part of their state discharge programs which also can include effluents from aquaculture facilities operating below 40 CFR guidelines. In the northeastern region, the Commonwealth of Pennsylvania views aquaculture effluents as facility wastewater. All other states classify effluents as either an industrial, municipal or commercial waste (see Table 3, page 24). Two states, Pennsylvania and West Virginia, currently do not require a state discharge permit for production below 40 CFR guidelines unless there is evidence of water quality degradation. Other states require mandatory applications and individual review of all proposed discharges and may apply additional criteria under the state’s program based upon production level, feed usage, effluent parameters or average discharge volume.

Application and/or annual fees charged by individual states usually are based upon the category or volume of discharge, but also may include factors such as type of activity, condition of the receiving waters and potential environmental impact. NPDES permits issued by the regional EPA offices on behalf of the undelegated states are valid for five years and currently have no fee. The Maine Department of Marine Resources regulates finfish and shellfish aquaculture in tidal waters through a special Memorandum of Understanding (MOU) with the EPA Region I office and the ACOE (see pages 12 and 13). Although aquaculture in Maine tidal waters currently is exempt from the NPDES program, freshwater operations are included under NPDES and are administered by the

Region I office. All undelegated states still have responsibility of regulating discharges from aquaculture facilities operating below 40 CFR guidelines. Undelegated states also provide water quality certification for NPDES and other federal permits with water quality provisions.

Solid Waste Reuse and Disposal

Two types of solid wastes, suspended solids and mortalities, are common by-products of finfish aquaculture. The settleable fraction of the suspended solids can be intercepted and removed from effluents using filtration or settling tanks to produce a sludge high in water content (>95%). Because the sludge is a residual of wastewater treatment, several states in the region classify and regulate it as an industrial or municipal waste. Other states consider the sludge to be an agricultural waste because of its composition (manure and unconsumed feed) and value as a non-toxic nutrient source. Mortalities are classified as either an agricultural or non-hazardous category of solid waste.

Land application and composting are the two most common methods used to recycle solid wastes from aquaculture facilities. Most states have guidelines or regulations for the use of manures and other organic wastes (including wastewater) to fertilize agricultural crops. Material suitable for land application must be free of pathogens, heavy metals and other contaminants and must be applied at agronomic rates (based upon nutrient content, soil type and plant nutrient uptake characteristics) to prevent groundwater contamination. Composting of mortalities (and sludge) to produce an inert organic mulch suitable as a soil conditioner is receiving wider regional attention and is preferred by several states as an alternative to land disposal. Other methods for recycling dead fish, such as production of fish meal and silage (liquefaction) or rendering, require sizeable quantities of raw material and are usually limited by economy of scale to large operations with both production and processing wastes.

Policies for disposition of solid wastes by composting, land application or other means vary by state. Four states in the region classify solids from aquaculture facilities as agricultural waste. Pennsylvania and New York consider settled solids and mortalities equivalent to other animal manures, crop residue and farm by-products, which are exempt from solid waste regulation. Connecticut and Delaware require permits for land application. Other states in the region that

classify solids as municipal or non-hazardous waste have provisions requiring permits for land application.

While disposal of mortalities in most states is controlled by the solid waste division, determining which section of the resource agency has regulatory oversight for settled solids (sludge) can be based upon its intended fate. For example, if a state considers solids from a retention basin to be a residual of a wastewater treatment process, its beneficial reuse as a fertilizer or soil amendment may require a permit or approval from the surface or groundwater divisions, but its disposal at a landfill or other approved site is regulated by the solid waste division as a municipal or other category of non-hazardous waste. In those states where composting is regulated, the solid waste division establishes specifications and issues permits for commercial or municipal composting facilities. Small scale, non-commercial operations may be exempt from state solid waste regulations and permit requirements if the final product is used on-site following recommended application guidelines.

Obtaining Permits

A comprehensive site/operational plan, and sufficient knowledge of state surface water standards and regulatory policy, are essential prerequisites for the development or expansion of any production facility. A permit pre-application conference with the lead resource agency or divisions can save time and expense and is recommended. Because most states develop permits on an individual basis, a meeting with agency staff provides an opportunity to discuss general aspects of facility design and operation and to learn about specific regulatory concerns or requirements for your particular project.

Demonstrating that you are proactive and plan to mitigate potential environmental degradation associated with siting, production and waste disposal through the use of sound planning, facility design and management is to your advantage from a business and regulatory standpoint. While there is no guarantee that receiving the necessary permits will be a rapid and problem-free exercise, pre-application meetings can facilitate communication and the permitting process. On the other hand, submitting an application with a poorly defined plan and vague answers to questions about anticipated production, water quality and waste management definitely is not in your best interest and is almost certain to increase the time, cost and technical requirements for obtaining a discharge permit.

State Policies for Aquaculture Wastes

The following individual summaries of state policies for aquaculture discharges and solid waste were compiled using information from each state's water quality standards and from discussions with regulatory agency staff. Collectively, the summaries provide a general profile of the similarities and differences among state policies and procedures in the northeastern region. All state resource agencies contacted during the development of this publication were asked to review and confirm the accuracy of the information listed prior to publication. Water quality standards and discharge policies are subject to change, however; therefore, the information listed for each state *should not* be used as a definitive guide for determining permit requirements for proposed or existing operations. This can be accomplished only by contacting the responsible state agency directly to discuss the specific aspects of a project.

The summary for each state includes the following information: species and production methods; the agency or divisions responsible for regulating surface water discharges and non-hazardous solid wastes (manure, undigested feed and mortalities); general classification of surface, ground water and solid wastes; sources for copies of state water-quality and solid-waste standards and related information; current state classification of effluents, settleable solids and mortalities from aquaculture facilities; dates that delegated states received individual and general NPDES permit authority from the EPA; state/federal discharge permit program policies and fees; mixing-zone and land-application policies; general aquaculture discharge permit status and other relevant information.

References/Suggested Additional Reading

- Bastian, R. K. 1992. Overview of Federal Regulations Pertaining to Aquaculture Waste Management and Effluents. In *Proceedings of the National Livestock, Poultry and Aquaculture Waste Management Workshop*, July 29-31, 1991, Kansas City, Missouri. J. Blake, J. Donald and W. Magette, editors. American Society of Agricultural Engineers, 2950 Niles Road, St. Joseph, Michigan 49085-9659. ASAE Publication 03-92. p. 220-226.
- Guide to Laws Regulating Coastal Water Pollution. 1993. Marine Law Institute, University of Maine School of Law. Maine Sea Grant Publication number MSG-E-93-9. 16 p.

Marine Aquaculture. Opportunities for Growth. 1992. National Academy Press, Washington, D.C. 290 p. (ISBN 0-309-04675-0).

Patrick, R., F. Douglass, D. M. Palavage, and P. M. Stewart. 1992. *Surface Water Quality: Have the Laws Been Successful?* Published by Princeton University Press, Princeton, NJ. 198 p.

Piper, R. G., I. B. McElwain, L. E. Orme, J. P. McCraren, L. G. Fowler, and J. R. Leonard. 1989. *Fish Hatchery Management*. Fourth printing. U.S. Fish and Wildlife Service, Department of the Interior, Washington, D.C. 517 p. (ISBN 0-913235-03-2-04675-0).

Rubino, M. C. and C. A. Wilson. 1993. *Issues in Aquaculture Regulation*. Bluewaters, Inc., 4350 East West Highway, Suite 600, Bethesda, MD 20814. 72 p.

Videos

EPA Water Quality Standards. 1991. U.S. Environmental Protection Agency. Six videos on one long play tape. Individual titles: *Introduction to Water Quality Standards; Development of Water Quality Criteria and Its Relationship to Water Quality Standards; Anti-degradation Policy; A Means to Maintain and Protect Existing Uses and Water Quality; Water Quality Standards and 401 Certification; Water Quality-Based Approach to Pollution Control; Enumeration Methods for E. Coli and Enterococci*. Lengths range from 13 minutes to 30 minutes.

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Species Produced: Oysters, hard clams, trout, bait-fish, salmon, largemouth bass and other species of sportfish.

Production Methods: Bottom culture, ponds, tanks and raceways.

Responsible Agency: Connecticut Department of Environmental Protection (DEP), 79 Elm Street, Hartford, CT 06106, *Telephone:* 203-566-7167, *Fax:* 203-566-8650. The Water Management Bureau has responsibility for regulating discharges to tidal and non-tidal surface waters, and groundwater. The Solid Waste Bureau regulates disposal of solid wastes.

Water Classification: Surface waters are divided into inland (Classes AA, A, B, C, D), lake trophic classifications, and coastal and marine (SA, SB, SC, SD). Class AA is for existing or proposed drinking water supply, fish and wildlife habitat, recreational use, agricultural use, industrial supply; Class A is for fish and wildlife habitat, recreational use, agricultural use, industrial supply, navigation and other uses; Class B is for recreational use, fish and wildlife habitat, agricultural use, industrial supply, navigation and other uses; Class C is for certain fish and wildlife habitat, certain recreational activities, agricultural use, industrial supply, navigation and other uses; Class D is for bathing or other recreational purposes, certain fish and wildlife habitat, industrial supply, navigation and other uses. Lake trophic classifications include: Oligotrophic, Mesotrophic, Eutrophic, and Highly Eutrophic. Class SA is for marine fish, shellfish and wildlife habitat, shellfish harvesting for direct human consumption, recreation, navigation and other uses; Class SB is for marine fish, shellfish and wildlife habitat, shellfish harvesting for depuration or relay, recreation, industrial supply, navigation and other uses; Class SC waters may be suitable for fish, shellfish and wildlife habitat, certain aquaculture operations, recreation, industrial supply, navigation and other uses; Class D waters may be suitable for bathing or other recreational purposes, certain fish and wildlife habitat, industrial supply, navigation and other uses. Surface waters classified as C, D, SC and SD are managed to achieve a minimum goal of Class B or SB respectively. Groundwaters are subdivided into four classes, GAA, GA, GB and GC. Solid wastes are subdivided into hazardous and non-hazardous. Categories of solid wastes include municipal, industrial, construction and demolition, and agricultural.

Copies of Current Standards: Connecticut Department of Environmental Protection (DEP), Water Management Bureau, 79 Elm Street, Hartford, CT 06106. There is no charge for copies of the standards.

Waste Classification: *Effluent* — Industrial Waste; *Settleable Solids and Mortalities* — Agricultural Waste or Solid Waste (See Land Application).

Effluent Standards: Based upon maintaining the quality of receiving waters.

NPDES Permit: *Criteria* — 40 CFR Part 122.24; *Permit Fee* — See State Discharge Permit; *Individual Permit Authority* — Yes, 9/73; *General Permit Authority* — Yes, 3/92

State Discharge Permit: All discharges to waters of the state are regulated under the state NPDES program. Permit applications are reviewed on a case-by-case basis. Permit fees (which are subject to change) also are determined individually. Consultation with the DEP is necessary to determine all applicable permit requirements and fees for a specific project.

Mixing Zone: (Referred to as a zone of influence in Connecticut). Determined individually based upon characteristics of discharge and quality of receiving waters.

Land Application: Settled solids (sludge) and mortalities that do not constitute a significant disposal problem and are suitable for beneficial reuse are viewed as Agricultural Wastes. Aquaculture facilities may be required to develop an agriculture waste management plan with the Soil Conservation Service. Waste management plans must be reviewed and approved by the DEP on a case-by-case basis. Sludge and mortalities intended for off-site disposal are regulated by the Solid Waste Bureau.

General Discharge Permit: Connecticut is currently evaluating if there is sufficient justification to develop a general NPDES permit for aquaculture facilities.

Other Information: Extensive bottom culture of oysters and hard clams in Long Island Sound is regulated by the Connecticut Department of Agriculture. Connecticut surface water standards allow for the designation of certain high quality waters as Outstanding National Resource Waters (ONRW). No such waters have been designated to date.

Species Produced: Tilapia, hybrid striped bass, striped bass, largemouth bass and other species of sport fish, hard clams, crawfish and crab shedding.

Production Methods: Ponds, closed systems, flow-through tanks, and bottom culture.

Responsible Agency: Delaware Department of Natural Resources and Environmental Control (DNREC), 89 Kings Highway, P.O. Box 1401, Dover, DE 19903 *Telephone:* 302-739-4403; *Fax:* 302-739-6242. The Division of Water Resources has responsibility for regulating discharges to tidal and non-tidal surface waters, and groundwater. The Division of Air and Waste Management regulates solid waste disposal. Individuals developing aquaculture facilities are encouraged to consult with the Department early in the planning process to determine any applicable permit requirements.

Water Classification: Surface waters are classified by segments as Tidal (marine) and Non-Tidal. They are also classified by use into several categories, including: public water supply; industrial water supply; primary and secondary contact recreation; fish, aquatic life and wildlife; cold water fish (put and take); agricultural water supply; harvestable shellfish waters; and ERES waters (Waters of Exceptional Recreational or Ecological Significance).

Groundwater categories include public water supply and recharge protection. Solid wastes are subdivided into hazardous and non-hazardous. Categories of solid wastes include municipal, industrial, construction and demolition, and agricultural.

Copies of Current Standards: Delaware Department of Natural Resources and Environmental Control (DNREC), 89 Kings Highway, P.O. Box 1401, Dover, DE 19903 *Telephone:* 302-739-4403; *Fax:* 302-739-6242. There is a fee for copies of the groundwater standards. Text files of surface water and solid waste standards can also be downloaded from the DNREC On-Line Information System (see Other Information).

Waste Classification: *Effluent* — Industrial Waste; *Settleable Solids* and *Mortalities* — Agricultural Waste.

Effluent Standards: Based upon the use of best available technology (BAT) and quality of the receiving waters.

NPDES Permit: *Criteria* — 40 CFR Part 122.24 (See State Discharge Permit); *Fee* — See State

Discharge Permit; *Individual Permit Authority* — Yes, 4/74; *General Permit Authority* — Yes, 10/92

State Discharge Permit: All discharges to waters of the state are regulated under the state NPDES program. Applications are reviewed on an individual basis (see General Discharge Permit). The fee charged for an individual NPDES permit is based upon the type of activity, effluent composition and volume. Aquaculture effluents are considered to be in the same category as industrial wastewater and would require a "minor industrial permit" with an annual fee of \$2,250.00.

Mixing Zone: Determined individually based upon whether or not a complete mix of effluent with receiving water is expected to occur, taking into account critical flows, outfall configuration and receiving water characteristics (refer to Section 6.1, Delaware SQWS). No mixing zones for aquaculture have been requested.

Land Application: A wastewater facilities construction permit is required to construct, install or use a settling basin or other treatment device to control the discharge of solids from an aquaculture facility. Spray irrigation and/or application of sludge requires an Agricultural Utilization Permit from the DNREC. Composting of mortalities is encouraged as an alternative to disposal at an approved landfill.

General Discharge Permit: Delaware is developing a general permit that will cover discharges from land-based aquaculture facilities. No fee has been established for this general permit.

Other Information: The *Delaware Farmer's Guide to Environmental Programs* is a joint initiative of the DNREC and the Delaware Department of Agriculture (DDA). The guide is designed to provide introductory information about state laws and regulatory programs that may affect farming operations. Copies are available from the DNREC and the DDA, 2320 S. DuPont Hwy., Dover, DE 19901, *Telephone:* 302-739-4811. The Department maintains the "DNREC On-Line Information System", a free computer database of information about Delaware's natural resources, DNREC and the state's environmental regulations and programs. The System can be reached, via modem, at 302-739-3693 and operates at baud rates from 1200 to 9600 bps. Communications software should be set for "N-8-1" (no parity, 8 data bits, 1 stop bit). For best results, select ANSI-BBS terminal emulation.

Species Produced: No commercial production.

Production Methods: None.

Responsible Agency: Department of Consumer and Regulatory Affairs, Environmental Regulation Administration, 2100 Martin Luther King Jr. Avenue, SE, Washington, DC 20020-5732, Telephone: 202-404-1120. Fax: 202-404-1141. The Environmental Regulation Administration has responsibility for regulating discharges to tidal and non-tidal surface waters, groundwater, and solid waste disposal.

Water Classifications: Five categories of surface water use are identified: Class A, primary contact recreation; Class B, secondary contact recreation and aesthetic enjoyment; Class C, protection and propagation of fish, shellfish and wildlife; Class D, protection of human health related to consumption of fish and shellfish; and Class E, navigation.

Groundwater has one classification: Drinking water supply. Solid wastes are not classified.

Copies of Current Standards: Department of Consumer and Regulatory Affairs, Environmental Regulation Administration, 2100 Martin Luther King Jr. Avenue, SE, Washington, DC 20020-5732, Telephone: 202-404-1120. Fax: 202-404-1141. There is no charge for copies of the standards.

Waste Classification: *Effluent, Settleable Solids and Mortalities* — Industrial Waste.

Effluent Standards: Based on quality of receiving waters and best available technology (BAT).

NPDES Permit: The District is not delegated by EPA to issue NPDES permits. Inquiries should be

directed to Permit Contact (3 EN 23), U.S. Environmental Protection Agency, 6th and Walnut Streets, Philadelphia, PA 19106, Telephone: 215-597-8816. The Environmental Regulation Administration provides water quality certification for all NPDES permits; *Criteria* — 40 CFR Part 122.24; *Permit Fee* — The NPDES permit is valid for a period of five years, and has no fee.

State Discharge Permit: Aquaculture discharges falling below 40 CFR guidelines would be covered under the District of Columbia Discharge Permit.

Mixing Zone: Determined individually based on characteristics of discharge and quality of receiving waters.

Land Application: The Environmental Regulation Administration has no policy for land application of effluents and/or wastewater treatment residuals.

General Discharge Permit: The Environmental Regulation Administration has no plans to develop a general discharge permit for aquaculture.

Other Information: The District's Antidegradation Policy identifies two categories of high quality waters: Outstanding National resource waters (ONRW) and Special Waters of the District of Columbia (SWDC). ONRWs are waters in National and District parks and wildlife refuges, and waters of exceptional recreational or ecological significance. SWDCs are any segment or segments of the surface waters of the District which are of water quality better than needed for the current use or have scenic or aesthetic importance.

Species Produced: Salmon/Steelhead, trout, bait-fish, oysters, mussels, clams, and aquatic plants (seaweed).

Production Methods: Net pens, ponds, tanks, raceways, bottom and off-bottom culture, and closed systems.

Responsible Agencies: Two state agencies are involved with the regulation of aquaculture effluent and waste disposal: The Maine Department of Environmental Protection (DEP), Division of Water Resources Regulation, Bureau of Land and Water Quality, State House, Station #17, Augusta, ME 04333, *Telephone:* 207-287-3901, *Fax:* 207-287-7826, and the Maine Department of Marine Resources (DMR), McKown Point Road, West Boothbay Harbor, ME 04575, *Telephone:* 207-633-9500, *Fax:* 207-633-9579.

The DEP, Bureau of Land and Water Quality has responsibility for regulating discharges to tidal and non-tidal surface waters and groundwater and provides water quality certification for all aquaculture operations in the state (see NPDES Permit). The Bureau of Hazardous Material and Solid Waste Control regulates solid waste disposal. The DEP maintains an information line for Maine residents, 1-800-452-1942, to direct inquiries to the appropriate Bureau within the Department.

The Maine DMR has responsibility for issuing and managing finfish and shellfish leases (which contain provisions for water quality and environmental evaluation) in tidal waters, coordination of an aquaculture monitoring program for finfish operations (see NPDES Permit), and administration of a salmon aquaculture monitoring and research fund.

Water Classification: There are four standards for the classification of fresh surface waters. Class AA waters is the highest classification applied to waters considered to be outstanding natural resources because of their ecological, social, scenic or recreational importance. Class A waters are designated for drinking water supply after disinfection, fishing, recreation in and on the water, industrial process and cooling water supply, hydroelectric power generation (limited), navigation and as habitat (natural) for fish and other aquatic life. Class B waters are suit-

able for drinking water supply after treatment, fishing, recreation in and on the water, industrial process and cooling water supply, hydroelectric power generation (limited), navigation and as habitat (unimpaired) for fish and other aquatic life. Class C waters are suitable for drinking water supply after treatment, fishing, recreation in and on the water, industrial process and cooling water supply, hydroelectric power generation (limited), navigation and as habitat for fish and other aquatic life. There is one standard for the classification of great ponds and natural lakes and ponds less than ten acres in size. Class GPA waters may be used for drinking water after disinfection, recreation in and on the water, fishing, industrial process and cooling water supply, hydroelectric power generation, navigation and as habitat (natural) for fish and other aquatic life.

There are three standards for the classification of tidal waters. Class SA, SB, and SC. Class SA is applied to waters considered to be outstanding natural resources because of their ecological, social, scenic, economic or recreational importance. Class SB waters are suitable for recreation in and on the water, fishing, aquaculture, propagation and harvesting of shellfish, industrial process and cooling water supply, hydroelectric power generation, navigation and as habitat (unimpaired) for fish and other aquatic life. Class SC waters are designated for recreation in and on the water, fishing, aquaculture, propagation and restricted harvesting of shellfish, industrial process and cooling water supply, hydroelectric power generation, navigation and as habitat for fish and other aquatic life.

Groundwater and designated uses are subdivided to Class GW-A and GW-B. Class GW-A is suitable for public water supplies and Class GW-B is suitable for all uses other than public water supplies.

Copies of Current Standards: All inquiries for finfish and shellfish operations in tidal waters should be directed to the Maine DMR. An application package for shellfish and finfish leases (including fees, water quality standards in tidal waters, and environmental monitoring requirements) is available from the State Aquaculture Coordinator, Maine Department of Marine Resources, McKown Point Road, West

Boothbay Harbor, ME 04575. Rather than requesting copies of the regulations/standards, the Maine DEP prefers individual consultations to provide assistance in completing applications and interpreting applicable regulations.

Waste Classification: *Effluent* and *Settled Solids* (sludge) — Commercial Waste; *Mortalities* — Food and Fish Waste.

Effluent Standards: Based on the quality of the receiving waters.

NPDES Permit: The state of Maine is not delegated by EPA to issue NPDES permits. However, the state has established a joint federal and state effort to facilitate the processing applications to lease submerged lands for finfish and shellfish aquaculture use. Permitting agencies covered by the joint application requirements and procedures include the U.S. Army Corps of Engineers (ACOE); the U.S. Environmental Protection Agency (EPA), Region I Office; and the Maine DEP. The Maine DMR coordinates the program, processes all applications, and administers aquaculture leases for shellfish and net pen operations in tidal waters. Leasing requirements related to discharges and operational wastes include a pre-operational site evaluation and monitoring program for water quality and environmental impact. *Criteria* — 40 CFR Part 122.24. *Permit Fee* — The NPDES permit is valid for five years and has no fee.

State Discharge License: All aquaculture operations discharging to waters of the state and not covered by the state aquaculture leasing program must apply for a waste discharge license. The waste discharge license is valid for five years and has a fee structure based upon daily discharge volume. New facilities discharging more than two thousand GPD are charged \$3,000; and \$1,500 for less than two thousand GPD. Marine aquaculture operations are

exempt from obtaining a Maine waste discharge license when water quality certification is obtained as a condition of procuring a leasehold from the Department of Marine Resources.

Mixing Zone: Mixing zones require a public hearing and approval by the Board of Environmental Protection; they rarely are granted by the DEP and are not particularly encouraged for aquaculture discharges.

Land Application: Spray irrigation of effluent requires a waste discharge license from the Bureau of Land and Water Quality. Land application of settled solids and/or sludge requires a permit from the Bureau of Hazardous Material and Solid Waste Control, unless applied to agricultural land for agricultural purposes. Land application for agricultural purposes shall be done in accordance with the Department of Agriculture's best management practices. Composting is encouraged as the preferred method of recycling mortalities.

General Discharge Permit: The Maine DEP has no plans to develop a general discharge permit for aquaculture at this time.

Other Information: All applications are sent to the Department of Marine Resources (DMR) The DMR, using a procedure referred to as "one stop shopping," provides information to other state and federal agencies. The Maine DEP does not interact directly with the applicant, other than to provide water quality certification for use of non-tidal waters. The state also maintains a Salmon Aquaculture Monitoring and Research Fund for environmental monitoring, processing lease applications and licensing the salmon industry. Payment of a fee of 1 cent per pound of fish harvested is stipulated as a condition of any lease granted by the state for the production of salmon in net pen facilities.

Species Produced: Aquatic plants, ornamental fish, hybrid striped bass, trout, baitfish, tilapia, catfish, largemouth bass and other species of sportfish, oysters, crawfish and crab shedding.

Production Methods: Ponds, tanks, bottom and off-bottom culture, closed systems and net pens.

Responsible Agency: Maryland Department of the Environment (MDE), Water Management Administration, 2500 Broening Highway, Baltimore, MD 21224, Telephone: 410-631-3323; Fax: 410-631-4894. The MDE Water Management Administration is responsible for regulating water quality standards for discharges to tidal and non-tidal surface waters and groundwater. The Waste Management Administration regulates solid waste disposal.

Water Classification: The following water classes are established: Use I - water contact recreation and aquatic life; Use II - shellfish harvesting. Use III - natural trout waters; and Use IV - recreational trout waters. Additional designations I-P, III-P, and IV-P are used to identify public water supplies.

Groundwaters are classified as Type I, II, or III aquifers. Solids are subdivided as hazardous and non-hazardous wastes.

Copies of Current Standards: Rather than requesting copies of the regulations/standards, the MDE prefers individual consultations to provide assistance in completing applications and interpreting applicable regulations.

Waste Classification: *Effluent* — Industrial Waste; *Settleable Solids* — Municipal Waste; *Mortalities* — Non-Hazardous Waste.

Effluent Standards: Based upon quality of the receiving waters and best professional judgement (BPJ).

NPDES Permit: All effluents are regulated under the state's industrial discharge permit. *Criteria* — 40

CFR Part 122.24. **Permit Fee** — See State Discharge Permit; *Individual Permit Authority* — Yes 9/74; *General Permit Authority* — Yes 9/91.

State Discharge Permit: All aquaculture facilities discharging to waters of the state must apply for a state industrial discharge permit. Current state policy is to exempt crab shedding operations and, on a case-by-case basis, *flow-through* systems with monthly average discharges of less than ten thousand gallons per day (GPD). The state permit is issued to all other aquaculture facilities falling below the 40 CFR threshold. Applicants with production above this level are issued both an NPDES and a state permit. The fee for the state/NPDES permit is based upon the monthly average volume of the discharge. There is no fee for aquaculture facilities discharging less than one million GPD. Discharges greater than one million GPD require an application fee of \$2,000 and an annual fee of \$5,000. Facilities requiring only a state industrial discharge permit would be charged a fee if the monthly average discharge exceeds one million GPD.

Mixing Zone: Determined individually based upon characteristics of discharge and quality of receiving waters. No mixing zones for aquaculture have been requested.

Land Application: Spray irrigation requires a permit from the Water Management Administration's Groundwater Discharge Permit Division. Settled solids approved as a soil conditioner by the Department of Agriculture do not require a permit. Composting of dead fish is encouraged as an alternative to land burial.

General Discharge Permit: No. However, the MDE would consider developing a general permit for aquaculture facilities as the volume of applications increases.

Species Produced: Hard clams, oysters, scallops, trout, hybrid striped bass, baitfish and tilapia.

Production Methods: Ponds, tanks, raceways, bottom and off-bottom culture, and closed systems.

Responsible Agency: Massachusetts Department of Environmental Protection (DEP), One Winter Street, Boston, MA 02202, *Telephone:* 617-292-5673. *Fax:* 617-556-1049. The Division of Water Pollution Control has responsibility for regulating water quality standards for discharges to tidal and non-tidal surface waters, and groundwater. The Division of Solid Waste Management regulates disposal of sludge and other solid wastes. The Department maintains "InfoLine," a service that provides information on permitting, compliance and training. *Telephone:* 617-338-2255 or 800-462-0444 (In MA area codes 413 and 508).

Water Classification: Surface waters are divided into inland waters (Classes A, B, and C) and coastal and marine waters (Classes SA, SB, and SC). Class A waters are designated as public water supply. Class B waters are designated for fisheries, wildlife and primary and secondary contact recreation. Class C waters are designated for fisheries, wildlife and secondary contact recreation. Classes SA and SB waters are designated for fisheries, primary and secondary contact recreation, and shellfish harvesting. Class SC waters are restricted to fisheries, wildlife and secondary contact recreation.

Groundwater and designated uses are subdivided to Class I, Class II, and Class III. Solid wastes are subdivided as Hazardous and Non-Hazardous.

Copies of Current Standards: The State Book Store, Room 116, State House, Boston, MA 02133, *Telephone:* 617-727-2834. The book store publishes a catalog listing the availability and cost of all state regulations and standards.

Waste Classification: *Effluent* — Industrial Waste; *Settleable Solids* — Type I Sludge; *Mortalities* — Putrescible Waste (decaying and foul smelling material).

Effluent Standards: Based upon best available technology (BAT) and quality of the receiving waters.

NPDES Permit: Massachusetts is not delegated by EPA to issue NPDES permits. Inquiries should be directed to Aquaculture Permit Coordinator, Programs Operations Section, WCP, U.S. Environmental Protection Agency, Region I Office, 1 Congress Street, P.O. Box 8217, Boston, MA 02114, *Telephone:* 617-565-3420 (general Information). The Massachusetts DEP provides water quality certification for all NPDES permits. *Criteria* — 40 CFR Part 122.24, *Permit Fee* — The NPDES permit is valid for a period five years and has no fee. The Massachusetts DEP charges a fee for water quality certification.

State Discharge Permit: Aquaculture discharges are covered under the state's Surface Pollution Discharge Elimination Systems (SPDES) permit. All aquaculture operations discharging to waters of the state must apply for a SPDES permit or receive water quality certification (as part of an NPDES permit). Facilities with production below the 40 CFR threshold require a SPDES permit from the DEP.

Mixing Zone: Determined individually based upon characteristics of discharge and quality of receiving waters. No mixing zones for aquaculture have been requested.

Land Application: Settleable solids classified as Type I Sludge (no heavy metals and pathogens) by the DEP may be applied with a permit. Mortalities should be taken to an approved landfill. Composting of sludge and mortalities, with certification from the Department of Agriculture that greater than 50% of the material produced will be used on-site, is exempted from having a solid waste disposal facility permit.

General Discharge Permit: The Massachusetts DEP has no plans to develop a general discharge permit for aquaculture at this time.

Other Information: Massachusetts water quality standards also include a separate section on a program which identifies selected coastal and inland sites or regions as Areas of Critical Environmental Concern (ACEC).

Species Produced: Trout, baitfish and salmon smolts.

Production Methods: Ponds, tanks, and raceways.

Responsible Agency: New Hampshire Department of Environmental Services (DES), 6 Hazen Drive, P.O. Box 95, Concord, NH 03302-0095, *Telephone:* 603-271-3503, *Fax:* 603-271-2867. The Water Supply and Pollution Control Division has responsibility for regulating discharges to tidal and non-tidal surface waters, groundwater, and residuals (sludge) reuse. The Waste Management Division regulates solid waste disposal. Aquaculture facilities under development should first contact the DES to determine any approval and/or permit requirements.

Water Classifications: Surface waters are assigned two classifications: Class A and Class B. Class A waters (fresh) are of the highest quality and are potentially acceptable for water supply uses after adequate treatment. No discharge of sewage or wastes to Class A waters is allowed. Class B waters (fresh and tidal) are of the second highest quality and are acceptable for swimming and other recreation, fish habitat, and for use as water supply following treatment. The standards also prohibit any new or increased discharge of phosphorous into lakes and ponds.

Groundwater is subdivided into four classes; Class GAA, GA1, GA2, and GB. Solids are subdivided into Hazardous and Non-Hazardous Wastes.

Copies of Current Standards: New Hampshire Department of Environmental Services, Public Information and Permits Office (PIP), 6 Hazen Drive, P.O. Box 95, Concord, NH 03301, *Telephone:* 603-271-2975, *Fax:* 603-271-2867. The PIP produces a catalog of publications (with price list) that includes all state regulations and standards.

Waste Classification: *Effluent* — Industrial/Municipal Waste; *Settleable Solids* — Sludge (Industrial/Municipal); *Mortalities* — Non-Hazardous Waste.

Effluent Standards: Based upon quality of the receiving waters, but technical standards also can be used when appropriate.

NPDES Permit: New Hampshire is not delegated by the EPA to issue NPDES permits. Inquiries should be directed to the Aquaculture Permit

Coordinator, Programs Operations Section, WCP, U.S. Environmental Protection Agency, Region I Office, 1 Congress Street, P.O. Box 8217, Boston, MA 02114, *Telephone:* 617-565-3420 (general information). New Hampshire DES provides water quality approval (401 certification) for all NPDES permits and often recognizes the NPDES permit under the state program in place of separate state approval. *Criteria* — 40 CFR Part 122.24; *Permit Fee* — The NPDES permit issued by EPA is valid for a period of five years and has no fee. The New Hampshire DES does not charge a fee for 401 (water quality) certification.

State Discharge Permit: Discharge approval rather than a formal permit usually is provided by the DES for facilities operating below 40 CFR guidelines, and no fee is charged. All surface water discharges which do not receive an NPDES permit and are regulated solely under the state program must, however, first receive 401 certification from the state. In some instances, permit approval from the State Wetlands Board, which does charge a fee, is also required.

Mixing Zone: Determined individually based upon characteristics of discharge and quality of receiving waters. No mixing zones for aquaculture have been requested.

Land Application: Effluent and settleable solids (sludge) may be applied to agricultural land with a permit from the Water Supply and Pollution Control Division. Sludge and mortalities intended for disposal must be taken to an approved landfill. Land application of mortalities requires a permit from the Waste Management Division.

General Discharge Permit: No. However the DES would consider developing a general permit for aquaculture facilities if warranted by a higher rate of applications.

Other Information: New Hampshire water quality standards also include separate sections on Protected Waters, Designated Waters and Outstanding Resource Waters (ORW), which are subject to increasingly higher standards of environmental protection, respectively. ONRs include waters of National Forests and waters designated under the state's Rivers Management and Protection program.

Species Produced: Hard clams, oysters, baitfish, trout, hybrid striped bass, and tilapia.

Production Methods: Bottom culture, ponds, tanks, raceways and closed systems.

Responsible Agency: New Jersey Department of Environmental Protection and Energy (DEPE), 401 East State Street, Trenton, NJ 08625-0029.

Telephone: 609-633-7020; *Fax:* 609-984-7938. The Division of Water Quality has responsibility for regulating discharges to tidal and non-tidal surface waters, and groundwater. The Division of Solid Waste Management regulates solid waste disposal.

Individuals developing aquaculture facilities are encouraged to consult with the Department early in the planning process to determine permit requirements. The New Jersey Department of Agriculture (609-984-6757) is an additional source for information and guidance on state discharge and waste disposal regulations.

Water Classifications: Fresh waters have three classifications: FW1 (Nondegradation Waters), PL (Pinelands Waters) and FW2. FW1 designated uses include waters set aside for posterity to represent the natural aquatic environment and its associated biota; primary and secondary contact recreation; maintenance, migration and propagation of the natural and established aquatic biota ; and any other reasonable uses. PL designated uses include cranberry bog water supply and other agricultural uses; maintenance, migration and propagation of the natural and established biota indigenous to this unique ecological system; public potable water supply after such treatment as required by law or regulation; primary and secondary contact recreation; and any other reasonable uses. FW2 designated uses include maintenance, migration and propagation of the natural and established aquatic biota; primary and secondary contact recreation; industrial and agricultural water supply; public potable water supply after such treatment as required by law or regulation; and any other reasonable uses.

Estuarine (E) and coastal (C) waters have four classifications: SE1, SE2, SE3 and SC. SE1 desig-

nated uses include shellfish harvesting, maintenance, migration and propagation of the natural and established aquatic biota; primary and secondary contact recreation; and any other reasonable uses. SE2 designated uses include maintenance, migration and propagation of the natural and established aquatic biota; migration of diadromous fish; maintenance of wildlife; secondary contact recreation; and any other reasonable uses. SE3 designated uses include secondary contact recreation; maintenance and migration of fish populations; migration of diadromous fish; maintenance of wildlife; and any other reasonable uses. SC designated uses include shellfish harvesting, maintenance, migration and propagation of the natural and established aquatic biota; primary and secondary contact recreation; and any other reasonable uses.

Groundwater is subdivided into three categories: Class 1, 2 and 3. Class 1 is designated for ecologically sensitive waters. Class 2 is suitable for potable water supplies and Class 3 is designated for all uses other than public water supplies.

Solid wastes are identified as Municipal (household, commercial and industrial); Dry Sewage Sludge; Bulky Waste; Vegetative Waste; Animal and Food Processing Wastes; and Dry Industrial Waste.

Copies of Current Standards: New Jersey Department of Environmental Protection and Energy, 401 East State Street, Trenton, NJ 08625-0029. Surface water and groundwater standards are developed and distributed by the Office of Land and Water Planning. The DEPE recommends using technical manuals prepared for wastewater permit applicants and individual consultations to provide assistance in completing applications and interpreting applicable regulations. The Maps and Publications Sales Office, Bureau of Revenue, Carroll Building, 428 East State Street, Trenton, NJ 08625. *Telephone:* 609-777-1038 produces a catalog (with price list) of all technical manuals and other publications (excluding standards).

Waste Classification: *Effluent* — Industrial Waste. *Settleable Solids* and *Mortalities* — Animal and Food Processing Wastes (identified as ID # 25).

Effluent Standards: Based upon quality of the receiving waters, best available technology (BAT), and best professional judgement (BPJ).

NPDES Permit: See State Discharge Permit.

Criteria — 40 CFR Part 122.24 guidelines plus quality of discharge (see State Discharge Permit).

Permit Fee — See State Discharge Permit.

Individual Permit Authority — Yes, 4/82. **General**

Permit Authority — Yes, 4/82.

State Discharge Permit: All discharges to waters of the state are regulated under the NJPDES program. Applications are reviewed on a case-by-case basis. An annual fee is charged for an individual NJPDES permit which is valid for five years. The permit fee is determined individually using a formula that assigns values for effluent composition, volume, condition of the receiving body and potential environmental impact.

Mixing Zone: Determined individually based upon characteristics of discharge and quality of receiving waters. No mixing zones for aquaculture have been requested.

Land Application: Effluent and settled solids (identified as ID # 25) may be used on agricultural land with a permit from the DEPE. Settled solids and mortalities intended for disposal must be taken to an approved disposal site. All retention ponds and other unlined ponds in contact with the water table require a groundwater discharge permit. Fees for land application and groundwater discharge permits are calculated in a similar manner as those for surface water discharges.

General Discharge Permit: The DEPE intends to issue general permits for management of sludges generated by the food processing industry. Additionally, the DEPE is considering development of a general permit for specific demonstration projects. For more information contact the Bureau of Pretreatment and Residuals (609-633-3823).

Other Information: New Jersey water quality standards also identify Trout Maintenance and Trout Production Waters and Outstanding National Resource Waters — high quality waters found in National/State parks and Wildlife Refuges and other waters of exceptional recreational or ecological significance.

Species: Oysters, hard clams, trout, baitfish and salmon smolts.

Production Methods: Bottom culture, ponds, tanks, and raceways.

Responsible Agency: New York Department of Environmental Conservation (DEC), 50 Wolf Road, Albany, NY 12233-1750, *Telephone:* 518-457-5430, *Fax:* 518-485-5827. The Division of Water Resources has responsibility for regulating discharges to tidal and non-tidal surface waters, and groundwater. The Division of Solid Waste regulates solid waste disposal. The regulatory system in New York is decentralized, and the state is subdivided into 9 regions. The DEC, Division of Regulatory Affairs maintains regional offices with staff available to answer questions, review applications and issue required permits. A pre-application conference at the appropriate Regulatory Affairs regional office is recommended.

Water Classification: Fresh waters are classified into eight categories: Class N, Class AA-Special (AA-S), Class A-Special (A-S), Class AA, Class A, Class B, Class C, and Class D. Class N waters are suitable for enjoyment (in its natural condition), and as a source for drinking and culinary purposes, bathing, fishing, and recreation. Class AA-S, A-S and AA and A waters are suitable for drinking, culinary or food processing purposes, primary and secondary contact recreation, and fishing. Class A-S (International Boundary) and AA and A waters require pre-treatment of drinking water. Class B waters are suitable for primary and secondary contact recreation, and fishing. Class C waters are suitable for fishing, and limited use for primary and secondary contact recreation. Class D waters are suitable for fishing, and limited use for primary and secondary contact recreation.

Saline waters are segregated into five categories: Class SA, Class SB, Class SC, Class I and Class SD. Class SA waters are designated for shellfishing for market purposes, primary and secondary contact recreation, and fishing. Class SB waters are suitable for primary and secondary contact recreation, and fishing. Class SC waters are suitable for fishing, and limited use for primary and secondary contact recreation. Class I waters are designated for secondary contact recreation, and fishing. Class D waters are designated for fishing.

Groundwaters are divided into three classes: Class GA (fresh), Class GSA and Class GSB (saline).

Copies of Current Standards: New York Department of Environmental Conservation, Division of Division of Water Resources, 50 Wolf Road, Albany, NY 12233-1750 or any of the nine DEC regional offices located throughout the state. There is no charge for copies of the standards. The DEC also produces an applicant's guide

to the State Pollutant Discharge Elimination System (SPDES) permit program.

Waste Classification: *Effluent* — Industrial Waste. *Settleable Solids and Mortalities* — Agricultural Waste.

Effluent Standards: Based upon quality of the receiving waters.

NPDES Permit: All discharges are regulated by SPDES (pronounced "speedies"), the state discharge permit program (see below). *Criteria* — 40 CFR Part 122.24. *Permit Fee* — There is no separate NPDES permit. All fees are charged under the SPDES permit program. *Individual Permit Authority* — Yes, 10/75. *General Permit Authority* — Yes, 1987.

State Discharge Permit: Aquaculture discharges are covered under the SPDES permit which is mandatory for all facilities. All operations discharging to waters of the state, regardless of production level, are required to notify the DEC, Division of Regulatory Affairs at one of its 9 regional offices. The regional offices operate independently from one another and may use additional criteria other than state water quality standards to develop permits. The SPDES permit has both an application and annual fee and is valid for five years. Fees are based upon the discharge volume in gallons per day (GPD) and category of discharge. At current rates, an aquaculture facility (classified industrial) with a daily discharge volume between 10,001-100,000 GPD would be charged an application fee of \$75.00 and an annual fee of \$200.00.

Mixing Zone: Determined individually based upon characteristics of discharge and quality of receiving waters. No mixing zones for aquaculture have been requested.

Land Application: Solid wastes from aquaculture facilities are classified as having an agricultural beneficial use under Section 6, NYCRR, Part 360. Under Section 6, "disposal areas located within the property boundaries of a farm for crop residuals, animal and aquacultural manure, animal and aquacultural carcasses and parts generated from a farm and other similar solid waste generated by farm activities are exempt from regulations covering solid waste facilities."

General Discharge Permit: Because of a relatively low number of applicants, the Department of Environmental Conservation has no plans to develop a general permit at this time.

Other Information: Discharge permit applications may be subject to review by other state or local agencies under the State Environmental Quality Review Act (SEQR). Operations located within the jurisdiction of the Adirondack Park Agency (APA) may be subject to additional regulatory requirements and stricter water quality standards.

Species: Trout, ornamental fish, hybrid striped bass, catfish, baitfish, and other species of sport fish.

Production Methods: Ponds, tanks, raceways and closed systems.

Responsible Agency: Pennsylvania Department of Environmental Resources (DER), Bureau of Water Quality Management, Division of Permits and Compliance, P.O. Box 8466, Harrisburg, PA 17105-8466, *Telephone:* 717-787-8184, *Fax:* 717-772-5156. The DER has responsibility for regulating discharges to surface waters, groundwater, and solid waste disposal through six regional offices.

Water Classification: Pennsylvania surface waters are divided into five categories based upon protected use. Each category is subdivided in accordance with different activities and designated uses. The major categories and their subdivisions are: *Aquatic-Life:* Cold Water Fishes (CWF), Warm Water Fishes (WWF), Migratory Fishes (MF), and Trout Stocking (TSF); *Water Supply:* Potable Water Supply (PWS), Industrial Water Supply (IWS), Livestock Water Supply (LWS), Wildlife Water Supply (AWS), and Irrigation (IRS); *Recreation:* Boating (B), Fishing (F), Water Contact Sports (WC), and Esthetics (E); *Special Protection:* High Quality Waters (HQ), and Exceptional Value Waters (EV); and *Other:* Navigation (N). Water uses vary by stream segment, zone limits, and exceptions to standard water uses.

Groundwater is not classified. Solid waste is classified as Hazardous, Municipal and Residual.

Copies of Current Standards: Pennsylvania DER, Bureau of Water Quality Management, Division of Permits and Compliance, P.O. Box 8466, Harrisburg, PA 17105-8466. There is no charge for copies of the standards.

Waste Classification: *Effluent* — Wastewater, *Settleable Solids* and *Mortalities* — Agricultural Waste.

Effluent Standards: Based upon a combination of the most stringent best available technology (BAT) and quality of the receiving waters.

NPDES Permit: Pennsylvania regulates all discharges under the National Pollutant Discharge Elimination System (NPDES) program. Aquaculture facilities operating above the 40 CFR threshold are required to have a NPDES permit. *Criteria* — 40 CFR Part 122.24. *Permit Fee* — An application filing fee of \$500 is charged for an individual NPDES permit. The filing fee for a proposed general NPDES permit is \$100. Permits are valid for five years. *Individual Permit Authority* — Yes, 6/78. *General Permit Authority* — Yes, 8/91.

State Discharge Permit: Aquaculture facilities that fall below the 40 CFR threshold are not required to have a NPDES permit unless the DER determines that the discharge degrades the quality of the receiving waters.

Mixing Zone: Pennsylvania water quality standards do not contain mixing-zone descriptions.

Land Application: Settled solids may be applied to agricultural land without a permit, provided that state manure management guidelines are followed. Composting of mortalities is encouraged as an alternative to disposal at an approved landfill.

General Discharge Permit: Pennsylvania is developing a general NPDES permit for aquaculture that will cover discharges from aquaculture facilities at or above the 40 CFR threshold using the BMP approach.

Other Information: Exceptional Value Waters and High Quality Waters are currently excluded from the proposed General NPDES aquaculture permit.

Species: Trout, oysters and hard clams.

Production Methods: Ponds, tanks, raceways, bottom and off-bottom culture.

Responsible Agency: Rhode Island Department of Environmental Management (DEM), 291 Promenade Street, Providence, RI 02908, *Telephone:* 401-277-6519; *Fax:* 401-521-4230. The DEM has responsibility for regulating water quality standards for discharges to tidal and non-tidal surface waters, groundwater, and solid waste disposal. The Division of Environmental Coordination (401-277-3434) provides general information and refers enquiries to the appropriate regulatory Division within the Department.

Water Classification: Surface waters are divided into freshwaters (Classes A, B, C D, and E) and sea waters (Classes SA, SB, SC, SD, and SE). Class A waters are designated for (drinking) water supply. Class B waters are suitable for public water supply with appropriate treatment, agricultural uses, bathing and other primary contact recreational activities, and fish and wildlife habitat. Class C waters are designated for boating and other secondary contact recreational activities, fish and wildlife habitat, and industrial processes and cooling. Class D waters are limited to migration of fish and good aesthetic value. Class E waters are unsuitable for most uses and are considered nuisance waters limited to certain industrial processes and cooling, power, and navigation.

Class SA waters are suitable for bathing and contact recreation, shellfish harvesting for direct human consumption, and fish and wildlife habitat. Class SB waters are designated for shellfish harvesting for human consumption after depuration, bathing and other primary contact recreational activities, and fish and wildlife habitat. Class SC waters are designated for boating and other secondary contact recreational activities, fish and wildlife habitat, industrial cooling, and good aesthetic value.

Groundwater and designated uses are subdivided into 4 classes GAA, GA, GB, and GC. Solid wastes are subdivided as Solid and Special Solid Waste.

Copies of Current Standards: Rhode Island DEM, Division of Water Resources (surface water standards); Division of Groundwater (groundwater standards) and the Division of Waste Management (solid waste and septage standards) 291 Promenade Street, Providence, RI 02908. No fee is charged for copies of the surface-water standards.

Waste Classification: *Effluent* — Industrial Waste Water; *Settleable Solids* and *Mortalities* — Solid Waste.

Effluent Standards: Based upon quality of the receiving waters and best available technology (BAT).

NPDES Permit: All discharges are regulated under the state discharge permit program. *Criteria* — 40 CFR Part 122.24 (Rule 28 lists equivalent criteria under the state discharge program). *Permit Fee* — See State Discharge permit. *Individual Permit Authority* — Yes, 9/84. *General Permit Authority* — Yes, 9/84.

State Discharge Permit: Aquaculture discharges are covered under the Rhode Island Pollutant Discharge Elimination Systems (RIPDES) permit (pronounced "rip-dees"). All operations discharging to waters of the state, regardless of production level, are required to notify the DEM, Division of Water Resources. A RIPDES permit is mandatory for all facilities with production above the 40 CFR threshold. A case-by-case determination is made for facilities below this level. The RIPDES permit is valid for five years, and covers two discharge categories: Minor (\$462) and Major (\$4043). Quality of the receiving waters, composition of the discharge, and discharge volume are factors used to determine the appropriate category.

Mixing Zone: Determined individually based upon characteristics of discharge and quality of receiving waters. One proposed facility has requested a mixing zone.

Land Application: Effluents and settled solids may be used on agricultural land with a permit from the DEM. Commercial composting facilities are an alternative to land disposal. Settled solids and mortalities intended for disposal must be taken to an approved landfill.

General Discharge Permit: The Rhode Island DEM has no plans to develop a general discharge permit for aquaculture at this time.

Other Information: Rhode Island water quality standards also include a separate section on Outstanding Natural Resource Waters (ONR). These include all waters in State Parks, and other waters identified by the state legislature.

Species: Trout, and baitfish.

Production Methods: Ponds, tanks, raceways and closed systems.

Responsible Agency: Department of Environmental Conservation (DEC), Vermont Agency of Natural Resources, 103 South Main Street, Waterbury, VT 05671-0405, *Telephone:* 802-241-3822, *Fax:* 244-5141. The Wastewater Management Division has responsibility for regulating discharges to surface waters, and groundwater. The Division of Solid Waste Management regulates solid waste disposal.

Water Classification: Surface waters are designated by class on the basis of maintaining water quality that is compatible with beneficial values and uses. There are three classes: Class A - high quality waters with significant ecological value and for use as public water supply with disinfection as necessary; Class B - high quality habitat for aquatic biota, fish and wildlife; public water supply with filtration and disinfection; irrigation and other agricultural uses; swimming and recreation; Class C - habitat suitable for aquatic biota, fish and wildlife; recreational boating and any recreation or other water uses where contact with the water is minimal and where ingestion of the water is not probable; irrigation of crops not used for human consumption without cooking; and compatible industrial uses.

Groundwater is subdivided into four classes with designated uses: Class I - Suitable for public water supply, no exposure to activities which pose a risk to its current or potential use as public water supply; Class II - Suitable for public water supply, exposed to activities which pose a risk to its current or potential use as public water supply; Class III - Suitable as a source of water for individual domestic water supply, irrigation, agricultural use and general industrial and commercial use; and Class IV - Not suitable as a source of potable water but suitable for some agricultural, industrial and commercial use.

Solids are subdivided into Hazardous and Non-Hazardous wastes.

Copies of Current Standards: Department of Environmental Conservation (DEC), Vermont

Agency of Natural Resources, 103 South Main Street, Waterbury, VT 05676, *Telephone:* 802-241-3822, *Fax:* 802-244-5141. There is no charge for copies of the standards.

Waste Classification: *Effluent* — Industrial Waste; *Settleable Solids* — Municipal Sludge; *Mortalities* — Non-Hazardous Waste.

Effluent Standards: Based upon quality of the receiving waters and best available technology (BAT).

NPDES Permit: There is no separate NPDES permit. All discharges are regulated under the state discharge permit program (see below). A NPDES number is assigned to facilities that meet or surpass 40 CFR guidelines. *Criteria* — 40 CFR Part 122.24. *Permit Fee* — See State Discharge Permit. *Individual Permit Authority* — Yes, 11/74. *General Permit Authority* — Yes, 8/93.

State Discharge Permit: A state discharge permit is required for all facilities producing more than 5,000 pounds of fish per year. Permit fees are based upon discharge volume (Gallons Per Day - GPD) at a rate of \$.002 for each gallon of design flow.

Mixing Zone: Determined individually based upon characteristics of discharge and quality of receiving waters. No mixing zones for aquaculture have been requested.

Land Application: Wastewater and settleable solids may be used on agricultural land with a permit from the DEC. Beneficial reuse of solid waste by composting is encouraged but may require a permit depending upon the size of the composting facility. Sludge and mortalities intended for disposal must be taken to an approved landfill.

General Discharge Permit: No. The DEC, however, would consider developing a general permit for aquaculture facilities as the volume of applications increases.

Other Information: Vermont water quality standards also include a section on Outstanding Resource Waters (ORWs), which are subject to higher standards of environmental protection.

Species: Trout, baitfish and hybrid striped bass.

Production Methods: Ponds, tanks, raceways and closed systems.

Responsible Agency: West Virginia Division of Environmental Protection (DEP), Division of Natural Resources, Office of Water Resources (NPDES permits), 1201 Greenbrier Street, Charleston, WV 25311, *Telephone:* 304-558-0375 and 8855, *Fax:* 304-558-5903; and the Section of Waste Management (solid waste disposal), 1356 Hansford Street, Charleston, WV 25301, *Telephone:* 304-558-2108. The DEP has responsibility for regulating discharges to surface waters, groundwater, and solid waste disposal.

Water Classification: West Virginia has 5 categories of water use: Category A - public water supply, Category B - propagation and maintenance of fish and other aquatic life (B1 - warm water fishery streams; B2 - trout waters; B3 - small non-fishable streams; B4 - wetlands), Category C - water contact recreation, Category D - agriculture and wildlife uses (D1 - irrigation; D2 - livestock watering; D3 - wildlife), Category E - water supply industrial (E1 - water transport; E2 - cooling water; E3 - power production; E4 - industrial).

Groundwaters and solid wastes are not classified.

Copies of Current Standards: West Virginia Office of the Secretary of State, Building 1, Suite 157-K, 1900 Kanawha Blvd., East, Charleston, WV 25305-0770, *Telephone:* 304-558-6000, *Fax:* 304-558-0900. The Office of the Secretary of State publishes a catalog listing the availability and cost for copies of all state regulations and standards.

Waste Classification: *Effluent* — Industrial Waste; *Settleable Solids* — Sewage Sludge; *Mortalities* — Non-Hazardous Waste.

Effluent Standards: Based upon best available technology (BAT) and quality of the receiving waters.

NPDES Permit: See state discharge permit. *Criteria* — 40 CFR Part 122.24. *Permit Fee* — See State

Discharge Permit; *Individual Permit Authority* — Yes, 5/82; *General Permit Authority* — Yes, 5/82.

State Discharge Permit: All discharges are covered under the West Virginia/National Pollutant Discharge Elimination System (WV/NPDES) permit program. Aquaculture facilities operating above the 40 CFR threshold are required to have a WV/NPDES permit. Facilities that fall below the 40 CFR threshold do not need a permit unless the DEP determines that the discharge degrades the quality of the receiving waters. The WV/NPDES permit, which is valid for 5 years, has an application fee of \$250.00 and the annual fee varies based upon pounds of feed used per month. For example, at current rates, the annual fee for using 5,000 pounds of feed per month is \$250.00; the fee for using more than 30,000 pounds of feed per month is \$1750.00.

Mixing Zone: Determined individually based upon characteristics of discharge and quality of receiving waters. No mixing zones for aquaculture have been requested.

Land Application: Effluents and settled solids (sludge) may be used on agricultural land with a permit from the DEP. Beneficial reuse of solid waste by composting is encouraged as an alternative to land disposal. Settled solids and mortalities intended for disposal at an approved landfill must have a minimum solid fraction of 20%.

General Discharge Permit: No. However, the DEP would consider developing a general permit for aquaculture facilities if warranted by an increasing rate of applications.

Other Information: West Virginia water quality standards also include a separate section on High Quality Waters (HQW), which are designated as special waters of the state and are subject to the highest standards of environmental protection. HQWs include naturally producing trout streams, all waters in State and National Forests and Recreation Areas, and other waters identified by the state legislature.

TABLE 3.

SUMMARY OF STATE POLICIES FOR SURFACE WATER DISCHARGES AND SOLID WASTES FROM AQUACULTURE FACILITIES.

State	EPA Region	Delegated State	Individual NPDES	General NPDES	NPDES Criteria	NPDES Fee	State Fee	Effluent Standards	Effluent Class.	Set. Solids Class.	Mortalities Class.	Solids Reuse/ Disposal	General Permit
Connecticut	II	Yes	09/26/73	3/10/92	40 CFR	No (SF)	Yes (DI)	WQ	I	AW/SW	AW/SW	LP, LF	Yes*
Delaware	III	Yes	04/01/74	10/15/92	40 CFR	No (SF)	Yes (AF, E, DV)	T, WQ	I	AW	AW	LP, LF, C	Yes**
District of Columbia	III	No	—	—	40 CFR	No	—	WQ, T	I	I	I	NP	No
Maine	I	No	—	—	40 CFR	No	Yes (DV)	WQ	CW	CW	FW	C, LP	No
Maryland	III	Yes	09/05/74	09/30/91	40 CFR	No (SF)	Yes (A, AF, DV)	WQ, B	I	M	NH	LP, LF, C	No
Massachusetts	I	No	—	—	40 CFR	No	Yes (WQC)	T, WQ	I	(Sludge)	PW	LP, LF, C	No
New Hampshire	I	No	—	—	40 CFR	No	No	WQ, T	I/M	I/M	NH	LP, LF	No
New Jersey	II	Yes	04/13/82	04/13/82	40 CFR	No (SF)	Yes (DI)	WQ, T, B	I	A/F	A/F	LP, LF	Yes** (SW)
New York	II	Yes	10/28/75	1987	40 CFR (R)	No (SF)	Yes (A, AF, DV, CD)	WQ	I	AW	AW	L	No
Pennsylvania	III	Yes	06/30/78	08/02/91	40 CFR	No (SF)	Yes (A)	T, WQ	W	AW	AW	L, C	Yes**
Rhode Island	I	Yes	09/17/84	09/17/84	40 CFR	No (SF)	Yes (CD)	WQ	I	SW	SW	LP, F, C	No
Vermont	I	Yes	03/11/74	08/93	40 CFR	No (SF)	Yes (P, DV)	WQ, T	I	(Sludge)	NH	LP, LF, C	No
West Virginia	III	Yes	05/10/82	05/10/82	40 CFR	No (SF)	Yes (A, AF, F)	T, WQ	I	M	NH	LP, LF, C	No

Notations for NPDES and State Fees: A — Application Fee; AF — Annual Fee; CD — Cat. of Discharge; DI — Determined Individually; DV — Discharge Volume; E — Effluent Quality/Composition; F — Amount of Feed Used; P — Production Level; R — Regional Authority; SF — State Fee; WQC — Water Quality Certification.

Notations for Effluent Standards, Effluent Certification, Set. Solids Classification, Mortalities, Solids Disposal and General Permit: A/F — Animal and Food Processing Wastes; AM — Agricultural Manure; AW — Agricultural Waste; B — Best Professional Judgment (BPJ); C — Composting; CW — Commercial Waste; FW — Food and Fish Waste; I — Industrial Waste; L — Land Application (w/o permit); LP — Approved Landfill; LP — Application (w/ permit); M — Municipal Waste; NH — Non-Hazardous Waste; NP — No Policy; PW — Putrescible Waste; SW — Solid Waste; T — Best Available Technology (BAT); WQ — Water Quality Based; W — Wastewater.

*Under Evaluation **Under Development