

Commonwealth of Massachusetts
**EXECUTIVE OFFICE OF
ENERGY and ENVIRONMENTAL AFFAIRS**

DESALINATION POLICY

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DESALINATION POLICY

Policy Statement

This document is a draft of the Massachusetts Executive Office of Energy and Environmental Affairs' (EOEEA) first Desalination Policy. This Policy was developed in response to the recent emergence of desalination as a possible source of water supply in the Commonwealth and applies to all new projects seeking to use desalination to meet water needs.

This statewide desalination policy recognizes that under certain conditions desalinated water can be used as a potential source of water supply. This policy also seeks to provide guidance for the use of desalinated water in a way that ensures sound resource management policies, including conservation and long-term planning; protects aquatic resources and their ecological integrity; and provides greater predictability of process and permitting requirements.

The Massachusetts Water Policy of 2004 asks all water users to live within their water budgets, use water in the most efficient manner, and ensure that any additional water is generated first through efficient use and conservation of current supplies. If more water is required as an alternative to, or to diversify or augment, current sources, desalinated water may be considered as a source. Environmental protection and energy conservation must be assured during the location, design, construction, sizing, and operation of desalination facilities.

All EOEEA agencies and offices, including the Massachusetts Environmental Policy Act (MEPA) Office, will take note of this policy and apply it as appropriate in the course of their comment, review, and permitting procedures.

Policy Need

Massachusetts is facing pressures related to growth, including the need for sustainable water supply and the need to maintain aquatic ecosystems. The Commonwealth is also gaining an understanding of the environmental impacts associated with development and the use of existing water supply sources. In that context, as desalination technology continues to improve and become more cost-effective, desalination is being considered a realistic alternative for water supply.

We also recognize that Massachusetts's coastal and estuarine waters contain highly productive and ecologically important spawning and nursery grounds for numerous species. At the same time, we note that production of water using current desalination technology consumes significantly more energy than traditional methods. To ensure protection of commercially and recreationally important natural resources and consideration of the substantial energy consumption associated with desalination, the following should occur prior to the development and operation of desalination facilities:

- a. alternatives analysis of environmental and energy impacts to ensure that desalinated water is in fact the best and most desirable alternative;
- b. collection of adequate data to establish existing conditions so that reliable predictions of potential impacts can be evaluated and sensitive receptors can be avoided;
- c. implementation of technological and operational measures to avoid or minimize environmental impacts; and,

- d. collection of adequate data to document that impacts to the environment, such as aquatic organisms, habitat, water quality and sediment quality, are avoided or minimized during construction and operation.

A proponent must also meet all other applicable permitting requirements, including but not limited to the state's Water Conservation Standards.

In accordance with this policy, all EOEEA agencies will coordinate with each other and with the project proponent early in the planning process in order to ensure that: 1) environmentally sensitive sites are avoided; 2) a full range of alternatives is evaluated; 3) projects are sized appropriately for site-specific characteristics; and 4) the permitting process is well defined.

Policy Audience

This policy is intended for use by proponents of new desalination facilities as well as by municipalities, consultants, and environmental organizations during all stages of desalination facility development – from feasibility assessment to operation. This policy is also intended for use by federal, state, and local agencies that have input into and oversight of the desalination facility permitting process.

General Principles of the Policy

The following general principles highlight EOEEA's desire to strike a balance among using salt water for water supply; maintaining the commercial, recreational, and ecological uses of coastal and estuarine resources; and sustainable economic growth. Proponents should:

1. Minimize potable water use and maximize water supply alternatives

Current water supplies should be used wisely through long-term planning and conservation. Prior to seeking desalinated water, proponents and communities needing additional water should first achieve savings through efficient use and conservation of existing water resources by demonstrating compliance with the state's Water Conservation Standards¹. Proponents should also show that the community has maximized water supply opportunities through wastewater reuse, stormwater recharge, and infiltration and inflow removal. Additionally, any growth that may occur as a result of the availability of desalinated water should be consistent with the Commonwealth's Smart Growth Principles².

2. Assess all other viable sources

Following water conservation, a desalination facility proponent should demonstrate the need for an additional or alternative water supply after first assessing currently available water resources and then demonstrating water savings found through water conservation measures implemented throughout the water supply system. Project proponents should explore all viable sources prior to exploration of desalination as an alternative.

For the purposes of this policy, a viable source means a source that can provide drinking water which meets the current water quality standards at a production cost considered reasonable

¹ For the Massachusetts Water Conservation Standards see http://www.mass.gov/envir/mwrc/pdf/Conservation_Standards.pdf

² For the Massachusetts Smart Growth Principles see http://www.mass.gov/envir/smart_growth_toolkit/pages/intro-to-SG.html

relative to costs recently incurred elsewhere in the Commonwealth, and that can be used while not causing environmental damage and while preserving reasonable instream flow and aquatic habitat. A viable source can also mean water quantity savings generated from current uses – such as conservation measures as outlined in the Massachusetts Water Conservation Standards, reuse of wastewater for non-potable needs, stormwater recharge, infrastructure fixes, or additional storage capacity.

A proponent should conduct a thorough water supply alternatives analysis and selection process for the best environmental alternative, including meeting MassDEP New Source Approval requirements. Where applicable under the Massachusetts Environmental Policy Act (MEPA), the proponent should use the Environmental Impact Report (EIR) to evaluate the water supply alternatives. Reason(s) for the rejection of any alternatives should be clearly stated.

3. Minimize environmental impacts

Environmental impacts resulting from desalination plants should be avoided or minimized, in part through appropriate siting. To avoid and minimize environmental impact, as required by Massachusetts Environmental Policy Act (MEPA) regulations, the preferred location of the desalination intake is beneath coastal sediments and in open, well-circulated, marine waters. Please note that there could be some restrictions imposed by the Oceans Sanctuaries Act.

Desalination plants should also aim to minimize energy consumption. Projects undergoing review by the Massachusetts Environmental Policy Act (MEPA) Office that are subject to EOEEA's Greenhouse Gas Emissions Policy must quantify the greenhouse gas (GHG) emissions generated by proposed projects, and identify measures to avoid, minimize, or mitigate such emissions.

In addition, desalination intakes and discharges should not adversely impact the natural hydrological regime (both ground water and surface water) and streamflow. It is preferred that intakes and discharges be located outside of estuaries, Areas of Critical Environmental Concern (ACECs), Outstanding Resource Waters (ORWs), areas of fish passage, land containing shellfish, and fish and shellfish spawning and nursery habitat.

- **Estuaries:** These are highly productive and ecologically important spawning and nursery grounds for numerous commercial and recreationally important species. The withdrawal of estuarine waters by desalination plants, therefore, involves extra scrutiny as to the location and operation of intakes and discharges.
- **Areas of Critical and Environmental Concern (ACECs):** MEPA regulations (301 CMR 11.00) require closer scrutiny of projects within ACECs when state permits, funding, or actions are involved. ACEC regulations (301 CMR 12.00) recognize ACECs as "unique clusters of natural and human resources...which are worthy of a high level of concern and protection." Fish habitats (including fish runs, spawning areas, nursery areas, shellfish beds) and estuaries are two areas specifically mentioned in the ACEC regulations.
- **Outstanding Resource Waters (ORWs):** Outstanding Resource Waters (314 CMR 4.04 (3)) "constitute an outstanding resource as determined by their outstanding socio-economic, recreational, ecological and/or aesthetic values." New or increased discharges to an ORW are prohibited except under strict circumstances.

- **Fish and Shellfish Habitat:** Areas of fish passage; land containing shellfish, fish and shellfish spawning; and nursery habitat are all habitats for "fish, other aquatic life and wildlife" as stated in the Massachusetts Water Quality Standards (314 CMR 4.05). These areas are also explicitly protected under the Massachusetts Wetlands Protection Act (310 CMR 10.00). Because of their roles as important habitats that maintain fisheries, these habitats are all afforded increased scrutiny under the desalination policy.

Projects proposed within these areas will be held to a very high standard with respect to the avoidance, minimization, and mitigation of environmental impacts. Siting and operating a desalination facility outside of these critical areas will result in streamlined requirements and a more predictable permitting outcome. A proponent should also provide a comprehensive analysis of siting alternatives.

4. Encourage co-location of desalination plants with power or wastewater treatment plants

Heated discharges from once-through cooling represent an opportunity for use as feed for desalination. Water that is heated above ambient temperatures may offer economic benefits at desalination plants because it requires less energy to pass through the reverse osmosis membranes than does water at ambient temperatures. Co-location of desalination plants with other facilities may offer an opportunity to add control structures to existing facilities to minimize entrainment and impingement. In addition, in some instances, treated wastewater effluent, cooling water discharges, or other similar discharges may be useful for diluting concentrated brine discharges prior to discharge back to the coastal zone.

5. Consider regionalization of desalination facilities

EOEEA recognizes that regional desalination facilities offer economies of scale and minimize the potentially widespread distribution of environmental impacts associated with the siting and operation of numerous satellite desalination facilities. EOEEA also recognizes that regionalization will likely lead to larger intakes and discharges and that regional facilities may be limited by siting and operation considerations. While EOEEA encourages consideration of regional desalination facilities, the merits of a regional plant will be evaluated on a case-by-case basis and may require approval under the Interbasin Transfer Act.

6. Plan for Growth

Proponents and communities seeking to provide or acquire desalinated water to meet current demand and attract new homes and businesses should carefully plan and regulate the growth they are encouraging. Where and how new growth occurs has profound fiscal, environmental, and social impacts. In order to maximize the benefits and minimize the burdens of development, Proponents and project communities are encouraged to follow the tenets of sustainable development including:

- Complete and adopt a Master or Community Development Plan to guide growth;
- Update zoning, subdivision, and other land use regulations to conform to Plan goals;
- Complete a capital infrastructure plan to determine where the water service will be provided, and minimize system expansion as much as possible in order to discourage inappropriate growth;
- Avoid development of sites with critical natural resources, and encourage reuse of previously developed sites and buildings;

- Encourage high density mixed-use development instead of land consumptive low-density single-use projects;
- Use low impact development techniques that limit site disturbance, maximize groundwater recharge, and reduce polluted runoff to water bodies.

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