Statement of Andrea Rex, Ph. D. Director of Environmental Quality, Massachusetts Water Resources Authority

April 8, 2013
To: Metropolitan Beaches Commission

My name is Andrea Rex. I received my doctorate in Environmental Sciences and my specific field of expertise is waterborne diseases. I have been involved in beach monitoring for more than 20 years through my work in environmental quality at MWRA and have been an author on numerous technical reports on water quality in Boston Harbor, including its beaches, as well as in published papers in professional journals. I want to speak to some issues involved in the way swimmers advisories are posted at DCR beaches.

EPA in its new recreational water quality criteria document notes 3 important components to beach management:

1) Regular water quality monitoring for indicator bacteria to determine if overall the beach meets recreational criteria
2) The sanitary survey and follow-up to eliminate known pollution sources
3) Predictive modeling of water quality based on factors that are known in real-time

To protect public health, the goal of daily beach management is to post swimmers' advisories when indicator bacteria counts exceed water quality standards. To maximize public access, the goal is to allow swimming when water quality meets standards.

Because there is at least a 24-hour lag time between when a water sample is collected and when sampling results are available, advisories based on bacteria counts always reflect water quality for the previous day. However, in the interim, water quality has usually changed, especially on the Massachusetts coast which has very vigorous tidal flushing. The monitoring data show that only about 1% of the time do harbor samples have high bacteria counts for more than one day in a row. This means that, when based only on lab data only, the postings are virtually always wrong-having missed the date the water was poor, and being posted on the date the water is fine.

Daily monitoring at Boston Harbor beaches has been ongoing now for 15 years, and we have developed a good understanding of the major factors that lead to high bacteria levels at the beaches, and have learned that the best predictor of whether swimmers advisories should be posted is antecedent rainfall over a certain amount. These threshold amounts of rain differ for different beaches. DCR is now using this simple model to proactively post beaches based on rainfall amounts. This is a method that is recommended by EPA in its new recreational criteria document because it is real-time. Unfortunately, MassDPH regulations appear to require DCR to post beaches based on the previous day's bacteria results as well, which means that beaches are frequently posted unnecessarily, especially where sampling occurs every day.

Our view, based on the data, is that bacteria monitoring should be used on an ongoing basis to assess water quality, but for those beaches where a model has been developed, the most accurate method of posting swimmer's advisories is to use data available in real- time, and for these beaches rainfall is the best real-time predictor, and should be used for daily beach management.