

February 22, 2001

Mr. Glen Haas, Acting Assistant Commissioner
Bureau of Resources Protection
Department of Environmental Protection
1 Winter Street
Boston, MA 02108

Ms. Linda Murphy, Director
Office of Ecosystem Protection
U.S. Environmental Protection Agency
Water Technical Unit "SEW"
P.O. Box 8127
Boston, MA 02114

Re: Massachusetts Water Resources Authority, Permit Number MA0103284
Notification Pursuant to Part I.8. Contingency Plan

Dear Mr. Haas and Ms. Murphy:

MWRA's NPDES Permit and Contingency Plan specify that four tests for Deer Island effluent toxicity be conducted every month. On February 20, 2001, MWRA received results for one of these four tests, the chronic toxicity *Arbacia* (sea urchin) fertilization test, that indicated that samples collected January 9-10, 2001 did not meet the Contingency Plan Warning threshold and permit limit.¹ Effluent from the January sample did, however, meet the acute toxicity tests for mysid (shrimp) and *Menidia* (minnow) tests and the chronic *Menidia* test. All other requirements of the permit were met on January 9-10, and there were no operational upsets during this period that would have caused the Deer Island Treatment Plant to violate other parameters within the permit. This letter of notification, prepared pursuant to Contingency Plan notification requirements, describes the actions MWRA is taking to address the *Arbacia* toxicity test failure.

The Deer Island permit toxicity limits are set to be highly protective, with the limits based on minimum dilution conditions. During January 2001, because the water column was well-mixed, maximum dilution was available at the Deer Island outfall, which would tend to mitigate any actual toxic discharges.

Toxicity testing, because it involves live organisms, can be variable (EPA's DMR-QA Performance Evaluation Studies). Results can vary according to the source and condition of the organisms used in the testing. Therefore, toxicity test failure does not necessarily translate into an environmental impact. The *Arbacia* test involves exposing sperm to effluent, combining the sperm with egg, and then measuring fertilization success. The purpose of the test is to measure the potential for chronic (long-term, sub-lethal) effects of the effluent.

¹ MWRA notified the Federal District Court on July 17, 2000 that until full secondary treatment was on-line, and during the full secondary start-up period of six months, there would be several permit limits that Deer Island could have difficulty meeting. The toxicity tests were identified to the Court as permit limits that could be problematic during start-up. See MWRA Monthly Compliance Report for June 2000 and Progress Report as of July 17, 2000.

Unlike other toxicity tests that have been employed for a longer period of time, the scientific understanding of the *Arbacia* test is not very well developed. Less is known about the sensitivity of the *Arbacia* test to the universe of toxicants. This increases the complexity of investigating the problem. MWRA is taking prompt action to investigate if the test failure is in part attributable to technical difficulties of this test in the laboratory, and/or what the source of the problem in the waste stream or the sample may be. Because some studies have shown that the *Arbacia* test has a sensitivity to metals, MWRA's investigation will include looking at metals chemistry in the waste stream and exploring the interaction of metals with the chlorination and dechlorination processes. Other factors being explored include:

- Location of sample collection
- Effect of chlorination on bioavailability of metals
- Effect of the chlorination and dechlorination on toxicity
- Laboratory testing conditions

On the basis of the findings of these investigations, MWRA will evaluate any potential remedial actions that may be required. MWRA will present the toxicity testing result and any additional findings to date at the next Outfall Monitoring Science Advisory Panel meeting on April 4, 2001.

Please let me know if any of MWRA's staff can give you additional assistance regarding this notification.

Sincerely,

Michael J. Hornbrook
Chief Operating Officer

Cc:

Environmental Protection Agency, Region I (EPA)

Matthew Liebman
Janet Labonte-Deshais
Eric Hall

Massachusetts Department of Environmental Protection (DEP)

Steve Lipman
Cathy Coniaris

Outfall Monitoring Science Advisory Panel

Andrew Solow
Robert Beardsley
Norb Jaworski
Scott Nixon
Judy Pederson
Michael Shiaris
James Shine
Juanita Urban-Rich
Robert Kenney

National Marine Fisheries Service

Salvatore Testaverde

Stellwagen Bank National Marine Sanctuary

Craig MacDonald

EOEA

Mark Smith

Hyannis Library

Ann-Louise Harries

MWRA Library

Mary Lydon

Cape Cod Commission

Steve Tucker