

October 13, 2000

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RE: Permit No. MA0103284. Proposed modifications to MWRA Contingency Plan

Dear Ms. Murphy and Ms O'Donnell:

The 1997 Contingency Plan appended to MWRA's NPDES Discharge Permit as Attachment O reflects the status of the Plan under discussion in 1997. In recognition of the need to incorporate a mechanism to allow the Plan to be updated to reflect current data and scientific thinking, the NPDES permit includes a separate and distinct process for modification of the Contingency Plan, without requiring modification of the rest of the permit. Specifically, Part I. 8.c.of the NPDES Discharge Permit provides:

“By November 15 of each year, the permittee shall submit a list of all proposed modifications to the contingency plan (including any interim modifications which have become effective pursuant to part I.8.d. below) to EPA, MADEP, NMFS, FDA, NOS, OMSAP, and the public, (See: Part I.20.3. of this permit [refers to posting on MWRA’s website and in two repository libraries]), and publish the list in the Environmental Monitor for the purpose of receiving public comment. These modifications shall become effective upon approval by EPA and the MADEP.”

MWRA proposes making changes to its Contingency Plan as described below, in accordance with this process. Although the permit also allows MWRA to propose interim modifications to take effect within thirty days of notice unless there is a written objection from EPA or MADEP (Part I.8.d.), MWRA is not exercising this option at this time so that the proposed changes can be reviewed more fully by interested parties.

Background

In response to concerns that MWRA have a plan in place for responding to unexpected outfall effects, MWRA's Contingency Plan was developed with advice from the Outfall Monitoring Task Force.¹ The Plan was developed over a period of years - 1994-1997; as the plan evolved from its draft form to its current version, it was refined to keep it consistent with the most current science and results of MWRA's baseline monitoring at the time as well as permit limits anticipated at the time. The version of the Contingency Plan attached to MWRA's permit was approved by MWRA's Board of Directors and submitted to regulators and the public in November 1997. When the Plan was submitted, it was expected that the Plan would be subject to full public review as part of the public comment on the draft NPDES permit.

During the nearly three years between submission of the 1997 Contingency Plan and the effective date of MWRA's permit (August 9 2000), the Outfall Monitoring Task Force, and subsequently the Outfall Monitoring Science Advisory Panel², met to discuss Contingency Plan issues and to make recommendations for changes to the Contingency Plan. Since no formal process for modifying the Plan to incorporate their recommendations existed during this time, the MWRA expected that their recommendations would be reviewed and considered for implementation once the modification process set forth in the new permit took effect.

For the Contingency Plan (and the Ambient Monitoring Plan) to be useful and credible, it must incorporate current scientific understanding as much as possible, "to adapt over time in response to incoming data" (Permit Fact Sheet, page 15). This understanding reflects guidance put forth by the National Research Council, the foremost institution on research and standards. The trigger parameters and thresholds that were included in the 1997 Contingency Plan reflected contemporary scientific understanding as it was in the mid-1990's. Now in the year 2000, we have the benefit of several more years of MWRA's baseline monitoring, as well as more scientific knowledge in some areas directly related to Contingency Plan thresholds. Continuous review and improvement and modification of the Contingency Plan reflect the concept that it is a "living document", designed to provide meaningful and credible protections.

¹ A panel comprised of scientists, state and federal agency personnel and environmental interest groups established by the Massachusetts Secretary of Environmental Affairs to provide independent technical and scientific review and support to the State and assist in developing MWRA's outfall monitoring program, now formalized as the Ambient Monitoring Plan.

² A panel of leading scientists and engineers appointed by EPA and MADEP to replace OMTF to advise EPA and DEP on all scientific and technical matters related to the outfall and the effects of the discharge on receiving waters.

Proposed Contingency Plan Modifications

Because the process for modifying the Contingency Plan was, in effect, delayed for several years awaiting the issuance of the NPDES permit, a number of proposed changes have been presented to OMSAP. The changes supported by OMSAP to date and proposed for approval by EPA and DEP at this time are addressed briefly below; accompanying attachments and supporting documents as presented to OMSAP provide considerably more detail. Reviewers should also note that as envisioned in Section 4 of the Contingency Plan, MWRA expects to continue to propose additional improvements to the Contingency Plan as science advances.

There are two broad categories of changes addressed below. The first group of changes noted below is to correct typographical and apparent errors in the Contingency Plan and/or are proposed to make the Contingency Plan consistent with the permit as issued. These proposed changes reinforce permit requirements, and in some instances, even increase the stringency of the 1997 Contingency Plan thresholds.

The second category of changes is substantive in nature. Following proposals by MWRA staff, OMSAP recommended most of these proposed changes after discussion and review in open forums as prescribed in the NPDES Permit (Discussion of one of the proposed changes, however, predated OMSAP, and was recommended by OMSAP's predecessor, OMTF). The changes reflect new information gathered during baseline monitoring and other new scientific information, as well as information about the newly constructed treatment plant.

In the comments below, table numbers refer to tables appearing in the November 1997 Contingency Plan, as referenced in the Permit.

1. **Proposed Changes to November 1997 Contingency Plan- Category One:**
(Threshold changes to either correct typographical or apparent errors in the 1997 Plan, or to make the 1997 Plan and final Permit consistent)

- a) ***Water Column Nearfield Bottom Oxygen Depletion Rate Threshold***

- Change the wording of Tables 1-1 and 5-1 from: "Caution Level 1.5 x baseline for any one month during stratification" to: "Caution Level 1.5 x baseline"; and from: "Warning Level 2 x baseline for any one month during stratification" to: "Warning Level 2 x baseline."

- This change is to correct an apparent error and to make the threshold consistent with the monitoring plan. The oxygen depletion rate is calculated as an annual regression of bottom water DO against time for the period June through October; therefore it is a done only once a year, not monthly.

b) Effluent Chlorine Threshold

Change the Warning Level for chlorine (Tables 1-1 and 5-2) from: "631 µg/L average daily" to: "631 µg/L maximum daily".

This change would make the Contingency Plan consistent with the final Permit; the change results in a more stringent threshold.

c) Effluent PCBs (as Arochlors) Threshold

Change the Caution Level threshold of PCBs (Tables 5-1 and 5-2) from: "0.0045 µg/L" to "0.000045 µg/L".

The change is to correct a typographical error and would make the Contingency Plan consistent with the final Permit.

d) Effluent Toxicity Threshold

Add acute fish toxicity test to Warning Level thresholds (Tables 1-1 and 5-2).

MWRA proposes this contingency plan change for consistency with the final permit. This proposed change adds a threshold measurement.

e) Effluent Human Pathogens Threshold

Change the Warning Level (Tables 5-1 and 5-4) from: "1400 fecal coliforms/100 ml" to "14,000 fecal coliforms/100 ml".

The change is to correct a typographical error and would make the Contingency Plan consistent with the final Permit.

2. Proposed Changes to November 1997 Contingency Plan- Category Two:

(Changes proposed to the Contingency Plan due to new information since 1997, as recommended by the Outfall Monitoring Task Force or the Outfall Monitoring Science Advisory Panel).

a) Effluent Floatables Threshold

Substitute, for now, for the Warning Level of 5 gallons/day in final collections device (Table 1-1 and 5-6), the alternative measures listed below (with the understanding that monitoring and engineering review may result in the development of a more meaningful threshold to address the floatables concern).

The floatables Warning Level threshold in the 1997 Contingency Plan, "5 gallons/day in the final collection device," was predicated on the assumption that

it would be possible to turn off the mechanical collection device to collect and measure the contents. This was not intended to be a measure of what actually went out the outfall, but a measure indicating that relatively small amounts of collectable floatables were remaining in the effluent. Unfortunately, operation of the treatment plant does not enable the practical collection and measurement of the contents of the final collection device. Therefore, MWRA is proposing the following alternative measures:

- (1) monthly reports of scum removal and fats oil and grease removal at the treatment plant,
- (2) recording and reporting in the shift-supervisors daily log any observations of floatables, followed by review and correction of problems by operators, and
- (3) observations and recording of contents of net tows, complemented by visual inspection of the water recorded in field logs at the nearfield outfall location in Massachusetts Bay during the 17 annual nearfield surveys. Field sampling for floatables has been ongoing since November 1999. See attachments A2 and A3 for description of MWRA's sampling plan in the nearfield and for some sample results before and after the outfall became operational.

MWRA's proposed change was discussed and unanimously approved by OMSAP at the March 2000 OMSAP meeting. (See Attachment A1-July, 2000 letter from OMSAP to DEP and EPA and Attachments A4 and A5).

MWRA proposes to report the results of these observations and measurements in its annual Outfall Monitoring Overview.

b) Sediment Benthic Opportunists Threshold

Add sediment benthic opportunist Caution Level and Warning Level thresholds to Tables 1-1 and 5-5, as these thresholds were inadvertently omitted from the 1997 Contingency Plan, although they were included in the Ambient Monitoring Plan. In addition, change the Caution Level benthic opportunist threshold, as described in MWRA's Ambient Monitoring Plan from: "25% of nearfield fauna" to: "10% of nearfield fauna" and change the Warning Level from: "50% of nearfield fauna" to: "25% of nearfield fauna".

MWRA proposes these additions to the Contingency Plan based on results of baseline monitoring, which indicate that more stringent thresholds for benthic opportunists are appropriate.

Taxa present in the Massachusetts Bay samples which can be confidently identified from the scientific literature as contaminant - and/or enrichment tolerant opportunists include the polychaetes (small worms) *Capitella* spp.,

Polydora cornuta, and *Streblospio benedicti*; the amphipods (tiny crustaceans) *Ampelisca abdita* and *Ampelisca vadorum*; and the bivalve mollusk *Mulinia lateralis*. Relatively high numbers of these species are indicative of a degraded environment. Baseline monitoring showed that the relative abundances of these animals in the nearfield and farfield sediments were extremely low. The existing Ambient Monitoring Plan thresholds for pollution- or enrichment- tolerant opportunistic species include a caution level set at 25% of mean nearfield faunal abundance and a warning level set at 50%. Originally, the opportunistic species threshold levels were set at levels then considered an indication of an appreciable change outside expected impacts of the outfall. However, based on 1992-1999 data, these opportunistic taxa are at such consistently low abundances in the offshore fauna that MWRA no longer believes the existing thresholds are sufficiently protective. The proposed change was recommended by OMSAP in July 2000. See Attachments B1 and B2 for related documents.

c) Water Column Nearfield Bottom and Stellwagen Bottom Dissolved Oxygen

Change the wording in Tables 1-1 and 5-1 from: "Caution Level 6.5 mg/L, 80% saturation for any one month during stratification (June-Oct.)" to: "Caution Level 6.5 mg/L for any survey during stratification (June-Oct.)" and "Warning Level 6.0 mg/L, 75% saturation for any one month during stratification, to: "Warning Level 6.0 mg/L for any survey during stratification".

MWRA proposes deleting the percent saturation thresholds to reflect the Outfall Monitoring Task Force recommendations in December 1997 (See Attachment C-1). The rationale for this change is that these thresholds as written in the Contingency Plan were exceeded during the baseline period long before the new outfall was on-line, indicating that future exceedences could reoccur unrelated to the outfall.

The Dissolved Oxygen (DO) threshold adopted in the 1997 Contingency Plan is a simplification of the state standard. It incorporates the numeric (6 mg/L and 75% saturation) part of the state standard, but does not consider the role of background conditions nor the merit of site-specific criteria which we now know from the results of baseline monitoring. Individual measurements as low as 4.8 mg/L and 55.6% saturation were observed in October 1994 at a nearfield station. According to MADEP, the development of the state standard was based on best professional judgement and likely relied in part on national freshwater criteria (R. Isaac, personal communication). Currently, there are no national criteria for DO in saltwater. The state standard for DO may be overly protective for marine waters

as it appears to be based on studies of fresh waters and on the very sensitive salmonids which are not found in local waters. In 1997, the OMTF agreed that the DO thresholds appear to be overly sensitive and recommended deletion of these DO saturation thresholds (see Attachment C1).

In this context, it is also relevant to note that EPA has recently issued "*DRAFT Ambient Water Quality Criteria for Dissolved Oxygen (Saltwater): Cape Cod to Cape Hatteras*" (January 2000):

Draft dissolved oxygen criteria apply to both continuous (i.e., persistent) and cyclic (i.e., diel, tidal, or episodic) low DO conditions. If the DO conditions are persistently above the chronic criterion for growth (4.8 mg/L), then the site would meet objectives for protection. If the DO conditions at a site are below the juvenile/adult survival criterion (2.3 mg/L), then the site would not meet objectives for protection. When the DO conditions are between these two values, the site would require evaluation of duration and intensity of low DO to determine if the objectives for protection are met.

See Attachments C1 and C2.

d) Water Column Nuisance Algae Threshold

MWRA proposes deletion of the 95th percentile Caution Level threshold for *Alexandrium* (Table 5-1), one of three species included in this threshold. The other two are *Pseudo-nitzschia* and *Phaeocystis*. MWRA proposes deleting the *Alexandrium* threshold because the distribution and low incidence of *Alexandrium* in MWRA's baseline sampling render the threshold meaningless.

The 1997 Contingency Plan threshold is based on the 95th percentile of the baseline seasonal means of phytoplankton species abundance in the nearfield. Calculation of a theoretical 95th percentile requires fitting the data to a distribution. The *Alexandrium* data are characterized by a large number of zero values, reflecting instances where the species were not seen in samples. Therefore, the data do not fit any conventional distribution and it is impossible to calculate the 95th percentile. *Alexandrium* is nearly absent during some seasons.

The following change was recommended by OMSAP in July 2000 (See Attachment A-1).

Recommendation: There is convincing evidence that *Alexandrium* is extremely variable and patchy in terms of occurrence. It is unclear whether it is more important to document abundances in areas where

it is found infrequently or where it has never been found. Given all of these uncertainties, and the fact that there is a better, more integrated measure under development, OMSAP recommends deletion of the current *Alexandrium* cell count threshold. OMSAP is interested in evaluating the new paralytic shellfish toxicity threshold being developed by WHOI [Woods Hole Oceanographic Institution] that uses the long-term shellfish monitoring.

As noted above by OMSAP, there is a paralytic shellfish poisoning (PSP) threshold in the 1997 Contingency Plan: a Caution Level of “new incidence” (Tables 1-1 and 5-1). MWRA proposes refining and quantifying this existing threshold for *Alexandrium* based on recommendations forthcoming from the Woods Hole Oceanographic Institute and sampling conducted by MDFW. See Attachments D1 and D2 for further documentation of this issue.

e) Water Column Nearfield Zooplankton Threshold

Delete the Caution Level threshold of “shift toward inshore community.”

MWRA proposes this change because new scientific information does not support the hypothesis that the proposed indicator inshore community species (*Acartia*) is controlled by nutrient availability. Studies support the hypothesis that inshore species require lower salinity. In 1991 Tester and Turner found the salinity tolerance of *Acartia tonsa* naupliar (juvenile) stages was a major factor restricting this species to estuarine waters. It appears that parameters relating to naupliar survival restrict *Acartia tonsa* to waters of low salinities and warm temperatures in the summer and fall. Thus, it is unlikely that the higher salinity in Massachusetts Bay will allow this species to respond even if food were highly abundant, making *Acartia* an inappropriate indicator of nutrient effects as was originally intended when the threshold was devised.

MWRA has tried to develop alternative zooplankton thresholds, but has not been successful to date. Scientists have been unable to agree on defining a scientifically sound, biologically meaningful numerical zooplankton threshold. The selection of an appropriate zooplankton threshold for the outfall is difficult for several reasons. First, what type of change in the zooplankton would be considered bad? Second, how much of a change would be considered bad, and how would it be quantified? It is not possible to answer these questions based on present knowledge.

OMSAP has agreed with our findings and recommended further work on this important indicator using a system-wide approach (See Attachment A-1).

Recommendation: OMSAP does not support the current narrative zooplankton threshold as it is currently formulated and recommends its deletion from the Contingency Plan. However, OMSAP believes that continued zooplankton monitoring is extremely important and requests that MWRA present a plan to OMSAP for analyzing zooplankton data using a system-wide approach. Since the Massachusetts and Cape Cod Bays system flows like a “conveyor belt” from north to south, MWRA should develop a method for analyzing the current data spatially and temporally to contrast differences between the northern boundary stations and Cape Cod Bay. If changes in the zooplankton communities in Massachusetts and Cape Cod Bays were, in fact, due to variations in input from the Gulf of Maine, then this should not raise an alarm about the effect of the outfall. On the other hand, changes in Cape Cod Bay that cannot be explained by changes in input from the north would be of greater concern. MWRA may also propose an alternative to this suggested method of analysis.

In response, MWRA proposes that it design a study to measure whether the zooplankton community changes significantly after passing by the outfall area. MWRA is in the process of preparing a plan for such a zooplankton study for OMSAP approval; our intention is to diligently pursue a meaningful alternative for this threshold that can be implemented as soon as possible. This change was recommended by OMSAP in February 2000. (For further documentation, see Attachments E1 and A5).

Closing

MWRA’s Contingency Plan is the first attempt by any municipal discharger to directly relate potential impacts of a discharge, environmental monitoring results, and subsequent management action. MWRA, regulatory agencies, the Outfall Monitoring Science Advisory Panel and its regulatory and public advisory committees, and other interested members of the public have embarked on a pioneering effort to connect environmental management to scientific data gathering; flexibility and the ability to incorporate up-to-date information are critical to success. In light of this, as well as the extensive monitoring and scientific inquiry that have occurred since the adoption of the 1997 Contingency Plan, MWRA proposes the Contingency Plan modifications noted above.

Should you desire additional information or have any questions, please feel free to contact Andrea Rex at 788-4708.

Yours truly,

Richard P. Trubiano, Director
Field Operations Department

cc: Matt Liebman, EPA
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Attachments

Attachment A: Floatables

- [A1](#) July 2000 OMSAP letter.
- [A2](#) Final survey report for baseline nearfield survey on September 1, 2000
- [A3](#) Survey summary for Ambient Monitoring nearfield survey on September 22, 2000
- [A4](#) MWRA briefing document for February 23, 2000 OMSAP meeting
- [A5](#) Final minutes from February 23, 2000 OMSAP meeting; also referenced in Section "E"

Attachment B: Benthic Opportunist Thresholds

- [B1](#) MWRA benthic thresholds briefing document for June 21, 2000 OMSAP meeting
- [B2](#) Summary of OMSAP benthic threshold action items from June 21, 2000. (Minutes not yet available, summary prepared by MWRA staff and reviewed by OMSAP liaison).

Attachment C: Dissolved Oxygen Thresholds

- [C1](#) Final minutes for December 18, 1997 OMTF meeting.
- [C2](#) MWRA Dissolved Oxygen briefing document for December 18, 1997 OMTF meeting.

Attachment D: *Alexandrium* Threshold

- [D1](#) Final Minutes for March 28, 2000 OMSAP meeting.
- [D2](#) MWRA nuisance algae thresholds briefing document for March 28, 2000 OMSAP meeting

Attachment E: Zooplankton Threshold

- [E1](#) MWRA zooplankton threshold briefing document for February 23, 2000 OMSAP Meeting.
- [E2](#) See attachment A5, final minutes from February 23, 2000 OMSAP meeting