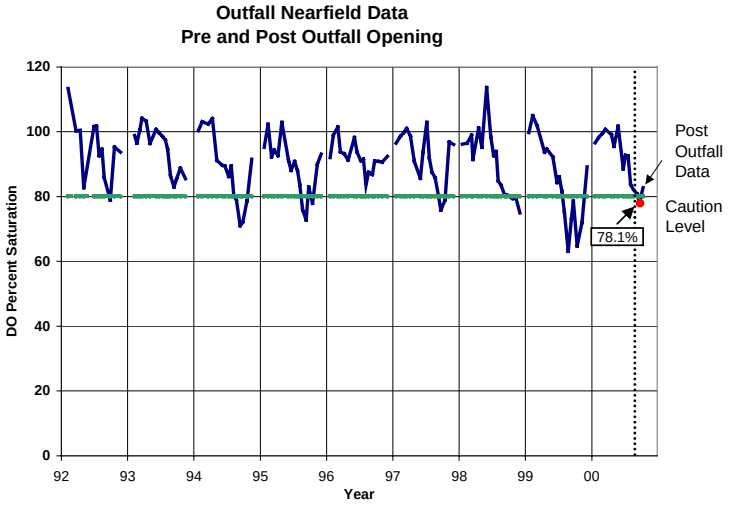
November 10, 2000

Ms. Arleen O'Donnell, 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



Two water quality parameters which MWRA monitors for Contingency Plan purposes in the bottom waters of Massachusetts Bay are (1) the saturation percentage of dissolved oxygen and (2) the concentration of dissolved oxygen. The caution level in the Contingency Plan for the first parameter is not-to-be-below 80%. The caution level for the second parameter is not-to-be-below 6.5 mg/l.

Certain naturally-occurring conditions for dissolved oxygen documented by the baseline monitoring depicted in the figure at the right are well known. In the seasonal period when the water column is stratified (generally June - October), values for percent saturation of dissolved oxygen, for example, will often dip to or below the caution level. As the figure shows, this has occurred many times prior to the opening of the new outfall. Sometimes even the warning level (75%) has been crossed.

Water column monitoring conducted in October has shown that this situation has occurred again this year. The figure displays the data point for the average of the samples for the nearfield stations taken in early October (78.1%). The results for the monitoring stations in Stellwagen Basin were similar. Later sampling in the nearfield area shows that the dissolved oxygen levels have now returned above the caution level. The complete data for both monitoring vicinities is included in Attachment A.

These below-caution level results trigger a notification requirement under the Contingency Plan. This letter and its attachments constitute that notification.

While it is important that this situation is brought to everyone's attention under the Contingency Plan, it is also important for us to advise you and the public that MWRA believes, based on all the available data and information, including the baseline monitoring, that this is a situation caused by the same natural circumstances at work in other years, is not attributable to operation of the outfall, and is not a circumstance of adverse ecological significance.

There are three attachments to this letter:

Attachment A: Data From Certain Water Column Monitoring Surveys

Attachment B: Significance of Caution Levels Findings for Percent Saturation of Dissolved Oxygen Percent Saturation in Early October Survey

Attachment C: Considerations Concerning Contingency Plan Threshold Levels for Dissolved Oxygen

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

This table summarizes the sampling results from water bottom surveys at the nearfield stations and at the Stellwagen Basin farfield stations on October 3, 4 and 5, 2000 (Survey WFOOE) and again at selected nearfield stations on October 24, 2000 (Survey WNOOF). Contingency Plan caution level thresholds were crossed for the dissolved oxygen percent saturation parameter at both nearfield and Stellwagen Basin stations in the early October survey. (Map showing locations of sampling stations can be found at http://www.mwra.state.ma.us/harbor/graphic/all_stat.gif.) Final data for the October 3-5 Survey was received by MWRA on November 7, 2000.

	Dissolved Oxygen Concentration		Dissolved Oxygen Percent Saturation	
Survey	Nearfield	Stellwagen Basin	Nearfield	Stellwagen Basin
Early October (WF00E)	7.08 mg/l	7.31 mg/l	78.1% ✔	77.9% ✔
Late October (WN00F)	7.41 mg/l	Not surveyed	82.7%	Not surveyed

✔ Falls below caution level threshold of 80%. All other values are on the proper side of the applicable caution level thresholds

Cc:
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See Attachments A- C (PDF)

Attachment A

Data From Certain Water Column Monitoring Surveys

Nearfield Bottom Water Dissolved Oxygen (DO) Data October 5, 2000						
Event ID Identifier	**Station Identifier**	**Date and time**	**Depth (meters)**	**DO (mg/l)**	**DO (% saturation)**	**Salinity (ppt)**
WF00E	N01	10/05/2000 8:03	26.44	6.6	72.5	32.3
WF00E	N02	10/05/2000 8:27	33.4	6.7	72.8	32.4
WF00E	N03	10/05/2000 8:47	40.91	7.1	76.9	32.5
WF00E	N04	10/05/2000 9:10	45.54	7.3	79.9	32.6
WF00E	N05	10/05/2000 12:59	48.83	7.3	79.5	32.5
WF00E	N06	10/05/2000 12:38	47.43	7.3	78.6	32.5
WF00E	N07	10/05/2000 12:16	42.01	7.1	76.0	32.4
WF00E	N08	10/05/2000 11:52	25.8	7.4	82.1	32.2
WF00E	N09	10/05/2000 15:25	31.92	6.9	75.2	32.2
WF00E	N10	10/05/2000 15:50	22.28	6.6	73.7	32.2
WF00E	N11	10/05/2000 14:49	26.94	6.3	69.7	32.2
WF00E	N12	10/05/2000 14:12	20.94	7.4	84.5	32.0
WF00E	N13	10/05/2000 13:57	26.38	7.2	81.5	32.0
WF00E	N14	10/05/2000 13:39	27.95	7.4	83.0	32.1
WF00E	N15	10/05/2000 9:48	39.12	7.1	76.5	32.6
WF00E	N16	10/05/2000 13:20	38.14	6.8	73.8	32.5
WF00E	N17	10/05/2000 11:28	33.96	6.9	74.4	32.3
WF00E	N18	10/05/2000 10:23	18.91	7.6	87.4	32.0
WF00E	N19	10/05/2000 15:07	21.24	7.5	85.8	32.1
WF00E	N20	10/05/2000 14:31	27.97	7.2	79.7	32.2
WF00E	N21	10/05/2000 10:06	27.53	7.0	77.1	32.0
			Average	**7.1**	**78.1**	**32.3**

Dissolved Oxygen Data October 3-4, 2000						
Event ID Identifier	**Station Identifier**	**Date and time**	**Depth (meters)**	**DO (mg/l)**	**DO (% saturation)**	**Salinity (ppt)**
WF00E	F12	10/04/2000 12:25	86.37	7.2	77.1	32.6
WF00E	F17	10/03/2000 11:58	74.78	7.5	79.9	32.4
WF00E	F19	10/04/2000 8:33	74.51	7.2	76.7	32.6
WF00E	F22	10/03/2000 12:53	75.94	7.3	77.9	32.5
			Average	**7.3**	**77.9**	**32.6**

Attachment A

Nearfield Bottom Water Dissolved Oxygen Data October 24, 2000						
Event ID Identifier	**Station Identifier**	**Date and time**	**Depth (meters)**	**DO (mg/l)**	**DO (% saturation)**	**Salinity (ppt)**
WN00F	N01	10/24/00 7:58	28.25	6.4	71.4	32.1
WN00F	N03	10/24/00 8:43	41.05	6.8	74.9	32.4
WN00F	N04	10/24/00 9:02	47.53	7.2	78.3	32.4
WN00F	N05	10/24/00 12:49	48.81	6.7	73.3	32.4
WN00F	N06	10/24/00 12:30	46.57	6.8	74.3	32.4
WN00F	N07	10/24/00 12:10	45.75	6.3	68.8	32.4
WN00F	N09	10/24/00 14:34	29.25	6.9	76.6	32.2
WN00F	N10	10/24/00 14:51	19.4	8.4	95.0	31.8
WN00F	N12	10/24/00 13:49	19.08	8.5	97.0	31.9
WN00F	N13	10/24/00 13:34	26	7.0	78.3	32.1
WN00F	N16	10/24/00 13:09	33.91	7.9	88.7	32.1
WN00F	N17	10/24/00 11:50	34.9	7.3	81.7	32.2
WN00F	N18	10/24/00 10:50	23.15	8.2	93.0	32.0
WN00F	N19	10/24/00 14:19	19.49	7.8	88.8	32.0
WN00F	N20	10/24/00 14:04	26.32	8.3	94.1	32.0
WN00F	N21	10/24/00 9:47	31.73	7.9	88.9	32.1

Attachment B

Significance of Caution Levels Findings for Percent Saturation of Dissolved Oxygen

Percent Saturation in Early October Survey

Baseline Monitoring:

In 1994 and 1995, when work began on establishing caution level and warning level thresholds for the Contingency Plan, caution level thresholds were set at 6.5 mg/l and 80% saturation so as to be more conservative than the standards set for Class SA waters in the Massachusetts Water Quality Standards, 6.0 mg/l and 75%, respectively. These water quality standards were used to set the warning levels. At that time, outfall siting and early baseline monitoring results had documented natural excursions below the caution threshold (and also below the warning levels) at both the nearfield and Stellwagen Basin areas, for example in 1994. No information was then available, however, on the frequency of such natural excursions.

Further baseline monitoring established that during the period (generally June through October) when the Bay is stratified, bottom water dissolved oxygen saturation in the nearfield and in Stellwagen Basin regularly falls below the Contingency Plan threshold levels. These below-threshold natural excursions were observed, in fact, in 7 of the 8 baseline years.

The baseline data shows, then, that natural excursions (often taking the measures to levels much lower than the early October instances found by MWRA in 2000) regularly occur in these areas. According to the baseline information, natural events cause the dissolved oxygen to rise again after.

The early October 2000 sampling shows that this natural pattern has occurred again this year in the nearfield and in Stellwagen Basin. Following the cycle of the natural pattern, additional sampling conducted later in October showed an average dissolved oxygen saturation of about 82.7% in the nearfield. The levels of percent saturation of dissolved oxygen observed earlier, therefore, appear to be attributable to naturally-occurring phenomenon.

The levels of dissolved oxygen in Massachusetts Bay during the baseline monitoring and after the outfall went on-line in September 2000 have been well above levels that support a healthy marine ecosystem. This is discussed further in Attachment C.

During the time that the below-caution level excursions were observed, the treatment plant itself was performing in an excellent fashion. The cBOD monthly average for September was 13 mg/l and for October was 9.6 mg/l (preliminary data), well under permit limit of 25 mg/l established in the Deer Island NPDES permit.

Attachment C
Considerations Concerning
Contingency Plan Threshold Levels for Dissolved Oxygen

In 1997, the Outfall Monitoring Task Force recommended that the dissolved oxygen percent saturation parameter in the Contingency Plan should be deleted. This recommendation was made for two reasons: (1) percent saturation, which depends on variables like temperature and salinity, is not the parameter upon which living organisms depend—rather it is the actual concentration of dissolved oxygen present that is the limiting factor, and (2) the accumulating evidence from baseline monitoring was that below threshold levels were so frequently observed from natural conditions as to make it likely that, through no relation or circumstance involving the outfall, the thresholds could be frequently triggered.

It is also important that EPA has recently issued ***Draft*** *Ambient Water Quality Criteria for Dissolved Oxygen (Saltwater): Cape Cod to Cape Hatteras (Jan. 2000).* EPA's draft reflects broad scientific consensus that the percent saturation dissolved oxygen parameter is not material by omitting it from the criteria. The criteria also sets criteria for concentration of dissolved oxygen at a level based on current scientific knowledge. EPA describes its proposed criteria as follows: "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."

In December, 1997, the Outfall Monitoring Task Force commented that "the DO thresholds appear to be overly sensitive," and requested a modification of the concentration threshold. Based on this recommendation, and on the new EPA draft criteria, in February, 2000, MWRA briefed OMSAP on these changes, and suggested changing the existing Contingency Plan dissolved oxygen threshold to reflect EPA's draft criteria, as follows:

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".

(1) MWRA requests that OMSAP consider recommending a change in the warning level from a monthly average of 6 mg/L to a survey average of 4.8 mg/L to reflect the chronic limit in the recent assessment (EPA 1999).

(2) MWRA requests that OMSAP consider recommending a change in the caution level from "6.5 mg/L averaged over a month" to "6.0 mg/L for two consecutive surveys" to provide a threshold that has not yet been exceeded. Such an event would be substantial enough to warrant triggering the Contingency Plan notification process.

OMSAP agreed that the issue needed to be reviewed, but has determined to wait until the draft EPA criteria were finalized, and to learn whether EPA would extend the new criteria to waters north of Cape Cod, before considering the matter further. This is an example of how the Contingency Plan will continue to evolve together with new scientific information and regulatory changes.