



# MASSACHUSETTS WATER RESOURCES AUTHORITY

Charlestown Navy Yard  
100 First Avenue, Building 39  
Boston, MA 02129

Telephone: (617) 242-6000  
Fax: (617) 241-6070  
TTY: 617 788-4971

Frederick A. Laskey  
Executive Director

October 25, 2006

Mr. Glenn Haas, Director  
Division of Watershed Management  
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: *Phaeocystis*

Dear Mr. Haas and Ms. Murphy:

One of the nuisance algae that the Massachusetts Water Resources Authority ("MWRA") monitors in its outfall ambient monitoring program is *Phaeocystis*. Reporting on seasonal abundances of *Phaeocystis* in the outfall nearfield area is part of the Contingency Plan.<sup>1</sup> MWRA has received *Phaeocystis* results from samples collected through June, 2006. Three out of four samples collected in the nearfield on May 17, 2006 contained moderate numbers of cells of *Phaeocystis*, apparently the "tail end" of the relatively small *Phaeocystis* bloom that occurred this spring. This observation corresponds to a calculated mean abundance of *Phaeocystis* in that survey of about 90,300 cells/L. No *Phaeocystis* cells were observed in samples collected during MWRA's next survey on June 19-21, 2006. The cells observed on May 17 will result in a seasonal summer mean, which is calculated from average counts from May 1 to August 31, of at least 18,050 cells per liter, even if there are zero *Phaeocystis* in July and August samples. This is above the Caution Level threshold of 357 cells/L, which triggers a notification under the Contingency Plan. This letter constitutes the notification for the threshold exceedance.

Average 2006 *Phaeocystis* data from February through June are summarized in the table below. (Note that the winter/spring data, from the actual bloom period, are well below the threshold.)

**Contingency Plan threshold results for *Phaeocystis* for winter/spring and summer, 2006.**

| Parameter                    | Specific Parameter | Baseline        | Caution Level Threshold | Warning Level Threshold | 2006 Results                                  |
|------------------------------|--------------------|-----------------|-------------------------|-------------------------|-----------------------------------------------|
| <i>Phaeocystis pouchetii</i> | Winter/spring      | 470,000 cells/L | 2,020,000 cells/L       | None                    | 383,000 cells/L                               |
|                              | Summer             | 79 cells/L      | 357 cells/L             |                         | ≥ 18,050 cells /L<br>Caution Level Exceedance |

\* Assumes *Phaeocystis* is absent from all samples collected in July and August, 2006. July and August samples are being processed.

<sup>1</sup> Massachusetts Water Resources Authority Contingency Plan Revision 1. 2001. Report ENQUAD ms-071. <http://www.mwra.state.ma.us/harbor/enquad/trlist.html>

No adverse aesthetic or other impacts were observed from this year's spring *Phaeocystis* bloom. Figure 1 shows that the temporal pattern of the bloom was typical, with the bloom first detected in mid-March, counts peaking in mid-April, dropping to much lower levels by mid-May, and disappearing by mid-June. Figure 2 shows the winter-spring seasonal means, and Figure 3 shows the summer seasonal means, plotted against the corresponding thresholds. There does not appear to be any connection between the 2006 red tide event and this *Phaeocystis* exceedance. There is no obvious association with MWRA's outfall, as the bloom appeared to be region-wide, with highest counts at stations off of Cape Ann. The highest count observed during the winter-spring *Phaeocystis* bloom was 10.5 million cells/liter, at F26, a farfield station 5 km east of Gloucester.

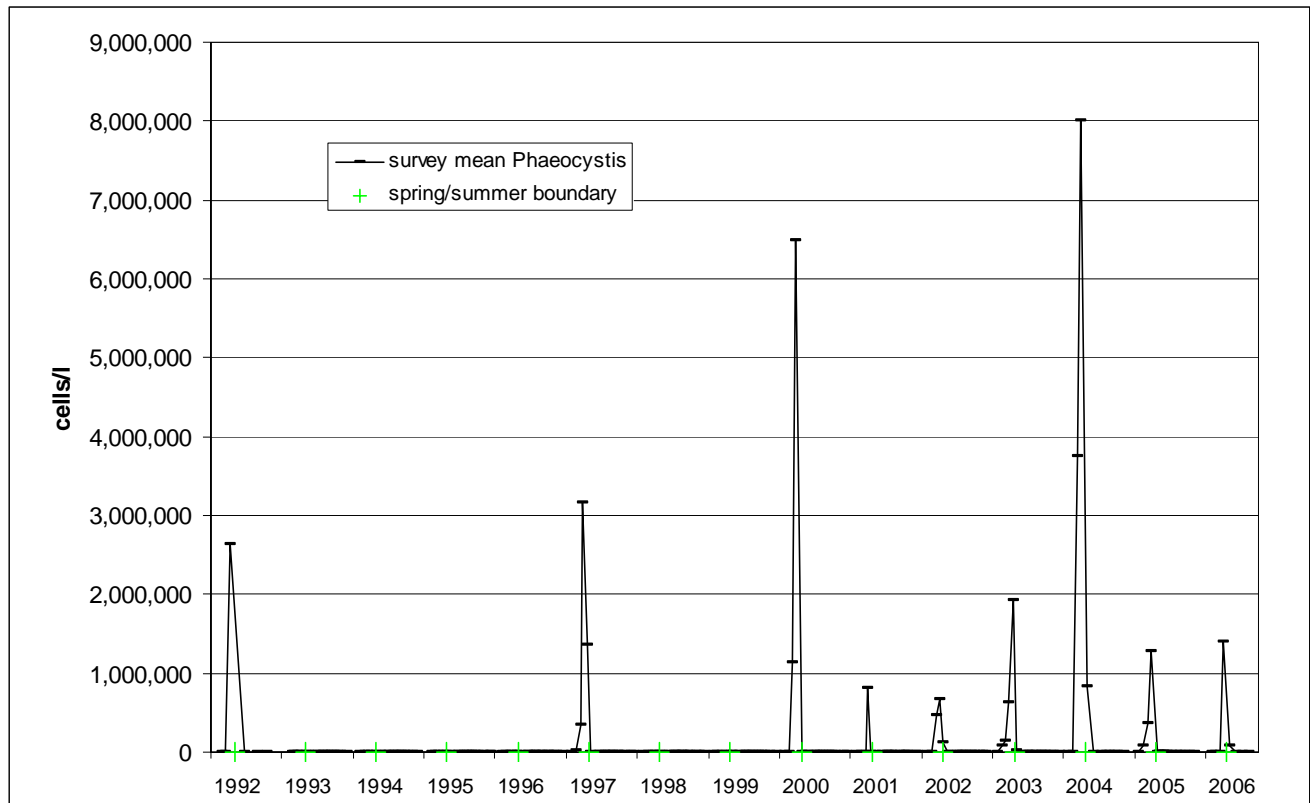


Figure 1. Annual patterns of nearfield mean *Phaeocystis* abundances, 1992-2006

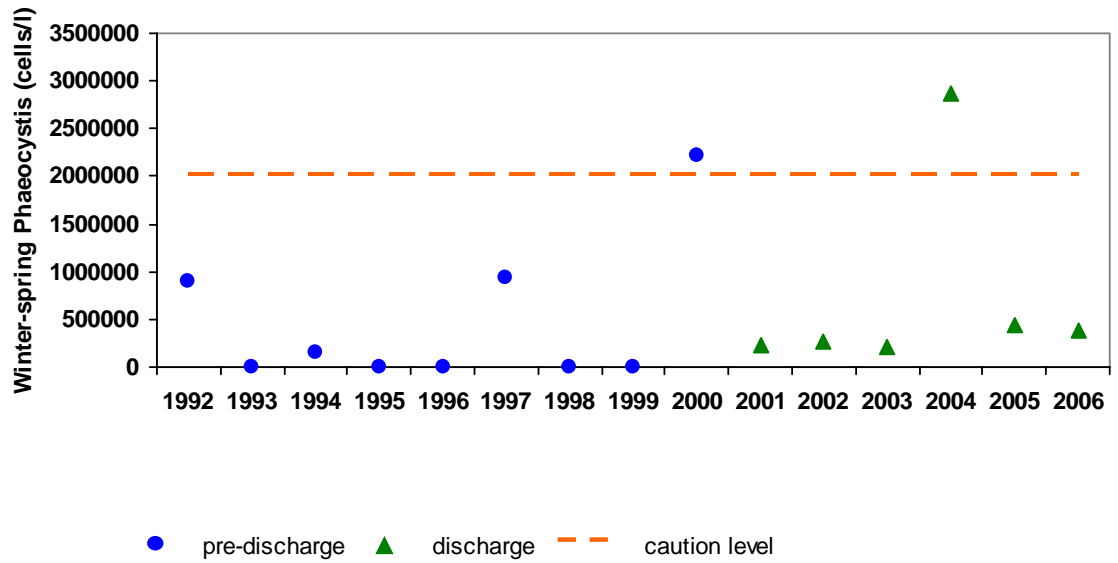


Figure 2. Winter-spring nearfield seasonal mean *Phaeocystis* counts 1992-2006.

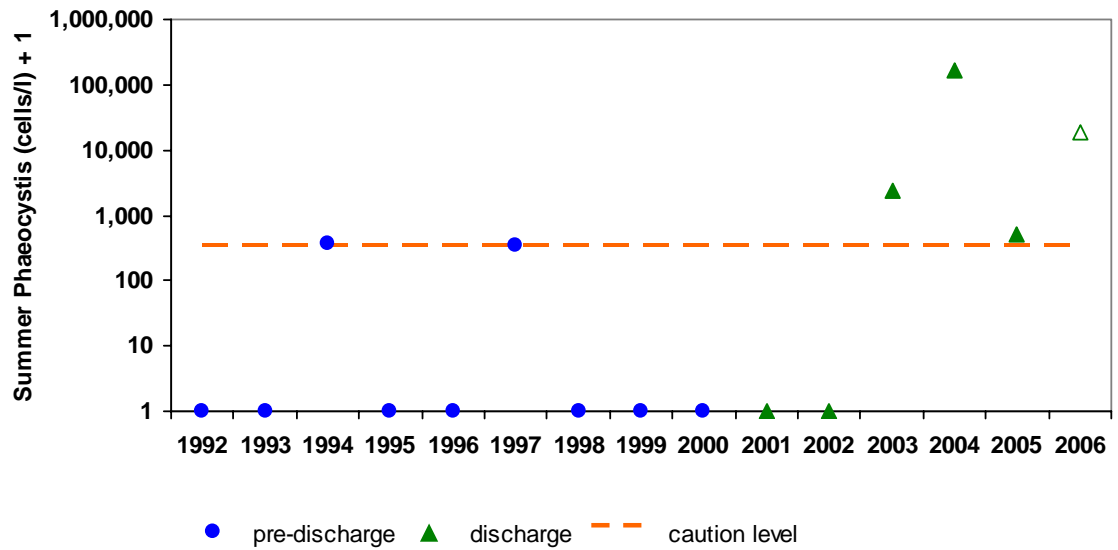


Figure 3. Summer nearfield seasonal mean *Phaeocystis* counts 1992-2006 (note logarithmic scale)

*Phaeocystis* was only rarely observed after May 1 in baseline years during which it bloomed, which accounts for the extremely low May-August threshold of 357 cells per liter. However, cells have been observed in May or June samples during each of the last few years.

MWRA evaluated possible causes for this change in the water column annual report for 2004.<sup>2</sup> The termination of *Phaeocystis* blooms appears to be related to how quickly the surface waters warm in spring. Scientists believe that *Phaeocystis* cannot grow when water temperatures are higher than 14°C. If the water warms up relatively early, in late April or early May, few or no *Phaeocystis* cells are observed in MWRA's May or June surveys. When warming is delayed until late May or into June, and there is a winter/spring *Phaeocystis* bloom, appreciable numbers of *Phaeocystis* are often seen later than May 1. In 2006, the water again warmed relatively late, with the first recording of 14°C water (by the NOAA weather buoy) on May 27.

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**

Matthew Liebman  
Todd Borci  
**Sanctuary**  
Roger Janson

**National Marine Fisheries Service**

Chris Mantzaris  
**Stellwagen Bank National Marine**

Craig MacDonald

**MA Department of Environmental Protection**

Cathy Vakalopoulos

**EOEA**

Kathy Baskin

**Outfall Monitoring Science Advisory Panel**

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

**Hyannis Library**

Ann-Louise Harries

**MWRA Library**

Mary Lydon

**Cape Cod Commission**

Steve Tucker

---

<sup>2</sup> See section 3.4.7 and Appendix D of Libby PS, Geyer WR, Keller AA, Mansfield AD, Turner JT, Borkman D, Oviatt CA. 2006. **2004 Annual Water Column Monitoring Report**. Boston: Massachusetts Water Resources Authority. Report ENQUAD 2006-15. 177 p.