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Boston Harbor Toxics Project

REPORT ON TOXIC DISCHARGES TO BOSTON HARBOR



SEPTEMBER 1992

**MASSACHUSETTS TOXICS
CAMPAIGN FUND**

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The State of Boston Harbor

Summary

The Boston Harbor has earned the dubious distinction of being one of the country's most polluted harbors. Each day, the Massachusetts Water Resources Authority sewage system (including the Deer Island and Nut Island wastewater treatment plants, and in wet weather three combined sewer overflow treatment facilities, and seven major combined sewer outfalls) discharge over four hundred million gallons of inadequately treated wastewater into the Harbor. On average, 2600 pounds of toxic chemicals, and approximately 9400 pounds of petroleum hydrocarbons are contained in the daily discharge. These figures are substantially unchanged from 1985. (Sources: MWRA NPDES permit application and June 1992 MWRA Discharge monitoring report.)

Industrial discharges to MWRA's two sewage treatment plants comprise the largest contribution of toxics to the Harbor. The contributors of toxic pollutants to the Boston Harbor are:

Industrial discharges to the MWRA system.

Industries which discharge directly to the Harbor or its many tributaries.

Runoff or infiltration from paved areas and contaminated sites.

Hazardous household products and metals from corroding plumbing.

Airborne fallout from industrial air emissions, incinerators, and motor vehicles.

Nearly all industries in the Boston area discharge their chemical wastes into the Deer and Nut island sewage treatment plants. Of the worst fifty industrial polluters of the Boston Harbor, only Monsanto, two Boston Edison plants, and the Plymouth Rubber Company discharge chemical wastes directly into Boston Harbor. Exxon, Mobil Oil, Texaco and a dozen others have minor discharges. Monsanto also has a sewer discharge.

The continued discharge of chemical wastewaters will increase the difficulty and cost of cleaning up the Harbor. Construction of an extended effluent discharge pipe some 9.5 miles into Massachusetts Bay, without simultaneously reducing the inflow of toxic chemical wastes into the wastewater treatment plants, will result only in the faster dispersion of these chemicals into the Bay. The effects of this dispersion of chemicals into the bay, especially into Stillwagen Bank, which is inhabited by North Atlantic Right and Humpback whales (both endangered species), has received insufficient attention. Concern over this extended outfall pipe has centered only on nitrogen loadings, without fully considering toxic chemical discharges.

Although the practice of dumping sewage sludge into the Harbor has ended, there remain serious concerns regarding the accumulation of toxic chemicals in the sludge. These concerns will only increase as secondary treatment systems come on line. The increased pollutant removal efficiency of secondary treatment will concentrate larger quantities of toxic chemicals in the sludge, unless toxic inflows to the system are reduced.

The MWRA continues to resist the inclusion of specific toxic concentration limits in their new NPDES (National Pollution Discharge Elimination System) permit application. This permit is being renewed in 1992 to allow the MWRA to discharge its treated sewage in the Harbor. MWRA instead claims that the current limits are sufficiently protective, given current facilities, and should be maintained. The MWRA has also proposed relaxing its Local Limits Regulations which restrict toxic chemical discharges by industries into the sewer system (see appendix). So long as the MWRA can meet the limits of its NPDES permit (the Authority has argued), industry would be allowed to maximize the amount of toxic chemical waste it can discharge.

These rationalizations are short sighted and unfortunate. Waste reduction efforts, if vigorously pursued, could significantly reduce the amount of most toxic chemicals entering the MWRA system, and consequently, the Harbor.

This report will focus on the following issues:

- Review MWRA Data to determine if Harbor water quality is improving.
- Review the MWRA's NPDES Permit Application and recommend specific measures to ensure that a revised permit will result in a reduction of toxic chemical discharges into Boston Harbor.
- Review MWRA actions to reduce toxic inflows to the sewer system and review the effect of toxic inflows on sludge quality and marketability.
- Show objections to loosening MWRA's Local Limits on toxic inflows.
- Note the fifty most significant toxic discharges to the Boston Harbor and provide basic economic information about these polluters.

Based on the findings of this report, it appears most prudent that the clean-up efforts of the Boston Harbor must focus on the reduction of toxic chemical wastewaters into the Deer and Nut Island Wastewater Treatment Plants. Achievement of this chemical reduction goal, along with the commencement of secondary treatment and the cessation of sludge disposal into the Harbor, will result in a much cleaner Boston Harbor.

Boston Harbor 's 50 Worst Polluters

	Company	City	Toxics (lbs./year)	Petroleum (lbs./year)	
1	Polaroid	Waltham	8079	----	(1)
2	Hollingsworth & Vose	Walpole	6420	4350	
3	Proctor & Gamble	Quincy	2485	----	
4	CPC, Inc.	Randolph	1544	50	
5	Altron	Wilmington	750	826	
6	Millipore	Bedford	563	----	
7	Plymouth Rubber Co.	Canton	550	----	(2)
8	Raytheon	Waltham, Quincy	542	----	(3)
9	Bull HN Info. Systems	Boston	502	----	
10	Boston Edison	Boston, Everett	498	----	(4)
11	Monsanto	Everett	485	170	(5)
12	TRW	Cambridge	471	----	
13	Blue Ribbon Laundry	Boston	466	1985	
14	Standard Thomson	Waltham	437	220	
15	Koch Membrane Systems	Wilmington	415	----	
16	Printed Circuit Corp.	Woburn	396	----	
17	Unifirst	Boston	355	544	
18	Ionpure Technologies	Stoughton	266	----	
19	CFC, Inc.	Waltham	265	----	
20	US Army R&D Command	Natick	242	----	
21	Milligen (Millipore)	Burlington	233	----	
22	Brigham & Wom. Hosp.	Boston	232	----	
23	Stop & Shop	Boston	226	----	
24	Natick Paperboard	Natick	209	498	
25	Perkit Folding Box	Malden	205	74	
26	Alpha Industries	Woburn	185	----	
27	Cambridge Plating	Belmont	176	----	
28	Emtex	Chelsea	170	----	
29	Cliflex Bellows	Boston	164	----	
30	Standard Uniform	Boston	161	770	
31	Modern Electroplating	Boston	152	----	
32	Capitol Circuits	Allston	132	66	
33	Draper Properties	Canton	129	----	
34	Analog Devices	Wilmington	126	----	
35	Federal Metal Finishing	Charlestown	120	50	
36	M/A Com	Burling.Waltham	118	580	
37	Jet Line	Stoughton	117	----	
38	Hopwood/Globe	Malden	114	----	
39	Cintas	Medford	112	549	

40	Patriot Paper	Boston	103	18000	(6)
41	Unitrode	Watertown	95	----	
42	Dennison	Framingham	94	----	
43	Boston Thermal Energy	Boston	77	----	
44	Agfa/Compugraphic	Wilmington	71	----	
45	Mystic Plating	Medford	71	----	
46	M W Carr	Somerville	70	----	
47	Barry Controls	Brighton	66	----	
48	W R Grace	Lexington	63	----	
49	Diamond Uniform	Boston	61	1220	
50	Barcolene	Holbrook	60	359	

Dishonorable Mentions

Worst MWRA Discharge Violations

<u>Chemical</u>	<u>Date</u>	<u>PPM</u>	<u>Company</u>	<u>City</u>
Acids	4/92	1.64 SU	Unitrode	Watertown
Carbon Disulfide	7/91	25.	CFC, Inc.	Waltham
Caustics	4/92	12.5 SU	Colorgraphics	Malden
Copper	7/91	160.	CFC, Inc.	Waltham
Dichloromethane	1/92	80.	Smithkline Beech	Waltham
Formaldehyde	2/92	350.	Dodge Chemical	Cambridge
Lead	11/91	84.	CFC, Inc.	Waltham
Mercury	9/91	1.5	U.S.E.P.A.	Lexington
Petroleum	7/91	580.	Fraen Corp.	Reading
Phthalates	7/91	6.2	Fraen Corp.	Reading
Zinc	4/92	120.	Colorgraphics	Malden

Notes

- 1) **Polaroid** facilities in Cambridge & Norwood also included. The total toxic discharge of over four tons per year does not include certain alcohols regulated by EPA but of only moderate toxicity in Boston Harbor. Polaroid's 1991 total hazardous waste generation figure (as reported to EPA) was slightly more than 1,580,000 pounds.
- 2) **Plymouth Rubber Co.** rank is based on Neponset River outfall data provided by the EPA.
- 3) **Raytheon** also has a Charles River outfall in Waltham.
- 4) **Boston Edison's** Mystic River outfall data provided by the EPA.
- 5) **Monsanto's** total is based on MWRA, harborfront landfill, and river outfall data (MWRA, DEP, MWRA respectively). The landfill leachate from Monsanto contains over 400 PPB of polychlorobiphenyls, and is a major source of PCBs into the Harbor.
- 6) **Patriot** is the largest petroleum discharger in the MWRA system
- 7) **Exxon's** Everett outfall was a major source of petroleum and toxic metals discharges, but Federal verifying data was unavailable to rank the company's discharge.
- 8) **Other Harbor Toxics Sources:** Gillette, Mobil, Texaco, Northeast Petroleum, and several other oil terminals have outfalls which discharge to Boston Harbor, but were not significant in this ranking of toxic discharges. Nonpoint sources include the Cabot site in Chelsea, Eastern gas & Fuels in Everett, and others. Specific household product toxics data is available from the Massachusetts Toxics Campaign Fund.
- 9) All data from MWRA with 300 day year unless stated. Data collected between January and June of 1992 was used wherever possible. Some rankings are based on 1991 and 1992 data.
- 10) All flow data used for this report is from MWRA estimates & measurements or from sewer use permit applications as submitted by polluters. Average number of testings days per polluter for ranking is 11 days.
- 11) Independent laboratory testing was used to check data accuracy, but not used in rankings. Testing was done on direct discharges such as **Exxon's**, sewer users such as the **US Army** in Natick, MWRA sludge pellets, and over 100 consumer products, with **Drano** having the highest toxics content.

Economic Data for the 50 Worst Polluters

	Company	Profile
1	Polaroid Corp.	1990 net earnings \$ 151,000,000 on net sales of \$ 1,971,700,000 - 1991 # employees = 11,768 HQ = Cambridge, MA - Chemicals and photographic equipment
2	Hollingsworth & Vose	Employees = 1000, 1990, Located in Walpole - manufactures industrial & specialty papers
3	Proctor & Gamble Co.	1992 second quarter sales = \$7.2 billion, up 6.6 % from 1991. Earnings = \$ 339,000,000 up 12 % from 1991, 107,777 shareholders. HQ = Cincinnati, OH - Laundry, food, and cleaning products. Fined three times by MWRA for total of \$207,350.
4	CPC, Inc.	Located in Randolph - printed circuit board manufacturer - 1989 employees = 100.
5	Altron	1992 first half sales = \$32,680,000 up 4.7 % from 1991 first half. Earnings = \$510,000 with 3,400,000 shares. HQ = Wilmington, MA employees = 688, shareholders = 370, 1991
6	Millipore Corp.	1990 sales = \$ 703,162,000, net income = \$27,801,000 - 1991 # employees = 6132 HQ = Bedford, MA - Filters and mechanical devices
7	Plymouth Rubber Co.	Elastic bands
8	Raytheon	1990 sales = \$ 9,267,666,000 - 1991 # employees = 76,700 - HQ = Lexington, MA - Electric, defense, and electronic goods
9	Bull HN Info. Systems	A joint venture of NEC, Japan; Groupe Bull, France; & Honeywell, US. employees = 18,000 1992. 1991 sales = \$2,200,000,000.
10	Boston Edison	1990 revenue = \$1,258,546,000. employees = 4738, 1991. HQ = Boston, MA. Electrical utility

- | | | |
|----|-----------------------|--|
| 11 | Monsanto | 1990 sales = \$ 8,995,000,000 - 1991 # employees = 41,081 - HQ = St. Louis, MO - Diversified chemicals. Fined five times by MWRA for total of \$164,500 and fined \$1,000,000. by the Commonwealth. |
| 12 | TRW | 1990 sales = \$ 8,169,000,000, 1990 earnings = \$343,000,000. Based in Cleveland, OH - High technology conglomerate. Fined \$95,000 by MWRA. |
| 13 | Blue Ribbon Laundry | Boston - Launderers
Fined \$137,215 by MWRA. |
| 14 | Standard Thomson | Located in Waltham - Manufacturer of auto and truck thermostats and temperature control equipment. 1989 employees = 369. |
| 15 | Koch Membrane Systems | Unit of Koch Industries , Kansas. 1991 sales = \$19,000,000 - employees = 230. Located in Wilmington - Membranes and filters for water and wastewater treatment. |
| 16 | Printed Circuit Corp. | 1991 sales = \$24,000,000, employees = 250. Located in Woburn - Manufacturer of printed circuit boards for industry. Fined \$200,000 by MWRA. |
| 17 | Unifirst | aka Interstate Uniform, located in Boston - Industrial launderers - 1989 employees = 44. |
| 18 | Ionpure Technologies | Located in Stoughton |
| 19 | CFC, inc. | Waltham - Printed circuit board manufacturer
1989 employees = 35. |
| 20 | US Army R&D Command | Nonindustrial - Research & Development facility
Develops food, clothing, and tests materials for the armed services. Under investigation by the Commonwealth for mercury discharges and possible contamination of water supplies. |
| 21 | Milligen | A division of Millipore Corp. |
| 22 | Brigham & Wom. Hosp. | Boston - Medical services - 1989 employees = 3500. |
| 23 | Stop & Shop | HQ = Boston, MA - Food supermarkets |

24	Natick Paperboard	Natick - Manufactures recycled paperboard products 1989 employees = 70.
25	Perkit Folding Box	Malden - cardboard box manufacturer
26	Alpha Industries inc.	First quarter 1991 earnings = \$53,000 HQ = Woburn, MA
27	Cambridge Plating	Belmont - Metal finishing Fined \$682,250 by MWRA, (uncollected due to bankruptcy)
28	Emtex	aka Emerson Textile, Located in Chelsea - brass binding, dyed fabrics - 1989 employees = 80.
29	Cliflex Bellows	Located in Boston - metal bellows manufacturer - 1989 employees = 40.
30	Standard Uniform	Boston - Laundry and uniform rental - 1989 employees = 70. Fined \$60,000 by MWRA
31	Modern Electroplating	Boston - metal plating - 1989 employees = 80. Fined \$22,765 by MWRA.
32	Capitol Circuits	1991 sales = \$16,000,000, employees = 100, Allston - computer peripherals and printers. Fined \$2,648 by MWRA.
33	Draper Properties	aka Draper Brothers, Located in Canton - 1989 employees = 230, maker of paper and felts.
34	Analog Devices	1991 sales =\$485,000,000, employees =5700. HQ = Norwood, MA - Electronic measuring and audio equipment.
35	Federal Metal Finishing	Located in Charlestown - parts metals finishing. 1989 employees = 70.
36	M/A Com	1991 sales = \$374,000,000, employees = 6000. HQ = Burlington, MA - Microwave and digital communications. 1991 - 21 % reduction in force.
37	Jet Line	Located in Stoughton - 1989 employees = 50. Pollution control and waste oil recovery. Fined \$212,425 by MWRA.

38	Hopwood/Globe	Located in Malden - Metal finishing - Fined \$489,225 by MWRA. 1989 employees = 57.
39	Cintas	Medford, Laundry and dry cleaning - 1989 emp. = 57.
40	Patriot Paper	Located in Boston - Paper recycling.
41	Unitrode Corp.	1992 first half revenue = \$45,200,000 HQ = Billerica, MA - Electronics and factory automation equipment.
42	Dennison	Framingham - Paper and adhesives manufacturing 1991 employees = 3800, 1991 sales >\$10,000,000.
43	Boston Thermal Energy	Boston - Heating and steam utility.
44	Agfa/Compugraphic	Wilmington - Computerized typesetting & equipment. 1989 employees = 300.
45	Mystic Plating	Medford - Metal finishing and anodizing. 1989 emp. = 16. Fined \$105,000 by MWRA.
46	M. W. Carr	1990 employees = 180. Located in Somerville - wood, metal, acrylic, and ceramic photoframes.
47	Barry Controls	Brighton - Vibration control eqpt. 1989 emp. = 230.
48	W R Grace Co.	1990 revenue = \$6,833,000,000 HQ = New York, NY - Chemicals, energy and consumer products
49	Diamond Uniform	Boston - Rag & uniform cleaners, 1989 emp. = 37.
50	Barcolene	1990 employees = 95, located in Holbrook - soap, detergents, and cleaning products.

Notes: 1) Data from Moody's News Service, MWRA, US S.E.C., & Boston Globe.
Employee data is site specific or corporate-wide.

2) MWRA Fine Totals in \$1000's. (\$1,785,559 or 35.3 % of fines actually collected to date. 1992 data is until May.)

<u>1988</u>	<u>1989</u>	<u>1990</u>	<u>1991</u>	<u>1992</u>
1,488	1,325	638	1,579	314

Sludge Marketability and Toxicity

Many of the toxic materials discharged into the sewer system become part of the sewage sludges remaining after treatment at the Deer and Nut Island plants. Once secondary treatment begins, the percentage of toxics in the sludge versus the discharged effluent will be even higher, (see table below). Treatment processes at the primary or secondary level do not destroy toxics, but only disperse them to the air or to the sludges. To reduce sludge toxics content, and improve sludge marketability, toxics must be kept from entering the system altogether.

A January 1992 MWRA report noted that even the toxic pollutants thought to be of nonindustrial origin, were in fact primarily coming from industrial sources. MWRA was unable to quantify nonindustrial sources for 62 % of copper, 72 % of surfactants, 58 % of zinc, and over 93 % of perchloroethylene. Previous attempts to find nonindustrial sources of many metallic and toxic organic pollutants were found to be flawed by concentrating on only a tiny fraction of pollutant compounds in the sludges, or by choosing highly biased samples. In essence, the studies show that industrial toxics reduction is the clear path for reducing system toxics inflows, and improve sludge quality.

Sludge Pellet Metals Content in PPM Primary vs. Secondary MWRA Sludge (Based on independent testing of 5 samples by MTCF)

	<u>Primary Sludge Pellets (MTCF)</u>	<u>Pilot Study Secondary Sludge Pellets</u>	<u>Primary Sludge (MWRA)</u>
Cadmium	5.5	15.5	14.2
Chromium	594.	247.	158.
Copper	616.	1017.	859.6
Lead	216.	479.	353.3
Nickel	31.1	79.9	66.7
Silver	10.	16.1	----
Zinc	838.	1760.	1160.

The Toxics Reduction and Control unit of the MWRA is responsible for regulation, monitoring, and enforcement of toxic and other industrial discharges into the sewer system. Since 1987 the unit has assessed over 5 million dollars in fines against discharge regulation violators, of which 1.79 million has actually been collected. Current activities of the TRAC unit include:

Sewer Use Discharge Permit generation, inspection, and monitoring of industrial sewer users.

Amending of local limits which regulate toxic discharges. (see appendices)

Working with industry and the Office of Technology Assessment to identify source reduction opportunities.

Coordinating efforts with the Massachusetts Dept. of Environmental Protection.

Evaluating the impacts of septage and water treatment sludges in the system.

Investigating additional system pollution sources.

Despite these activities, the TRAC program needs additional support to achieve its mission. Recommendations by TRAC to relax pollutant discharge limits for industrial sewer users promise to increase toxic discharges to the system. (see Comments on Proposed Local Limits Changes in the appendices.) Additional support is also needed for the development of a two part sewer use permit fee system. The first part would bill the cost of industrial monitoring and enforcement directly to the industrial sewer users, rather than have industrial sewer costs borne by the ratepayers at large. The second tier fee would bill polluters for the actual quantity of toxic materials each discharger actually emits, resulting in a cost savings to the majority of industrial and commercial sewer users, as well as the ratepayers at large.

The MWRA has not been able to document overall reductions in toxics, although MWRA has noted that a subset of toxics, (the metals), have declined if certain base years are chosen for the comparison. This failure to achieve toxics reductions is most obvious in the quality of sewage sludges and sludge pellets produced. Levels of toxic compounds present are high, although not quite high enough to be legally classified as hazardous waste. The high levels of toxics present reduce the ability of the MWRA to market sludges, increase the risk that sludge pellets may be landfilled, result in environmental contamination via groundwater and dusts where sludge pellets are applied, and result in the absorption of toxic materials by crops grown in pellets.

Contributing to the inability of the MWRA to document toxics reduction has been recurring problems in producing and interpreting chemical data on sludge quality. Although 95 percent of all the media and regulatory attention on sludge quality revolves around metals content, metals are a minority fraction of total toxics content. Toxic organics content over shadows metals content in size and possibly also in environmental impact, especially with regard to uptake of toxic chemicals by foods grown on sludges and pellets.

Nonmetallic Toxics in MWRA Deer Island Sludge
(A Partial List from MWRA Data)

Aldrin	Chloroethane	Toluene	Phenols
Endosulfan I	Dichloroethylene	Chlorobenzene	Chloroaniline
Dieldrin	Chloroform	Ethylbenzene	Dibenzofuran
DDT	Carbon Disulfide	Styrene	2-EH Phthalate
Chloromethane	Dichloromethane	Xylenes	Chrysene
Vinyl Chloride	Methyl Chloroform	Benzene	Pyrene
Acetone	Dichloropropane	Naphthalene	Dibutyl Phthalate

Shipments of MWRA Sludge Pellets for Food Crop Production
1st Quarter 1992 - (MWRA data)

Total tonnage = 1,029.1

Ben Hill Grfn., Frostproof, FL	58.6 tons
Harrel's, Lakeland, FL	61.6 tons
Howard Fertilizer, Orlando, FL	56.2 tons
Sunniland, Sanford, FL	55.2 tons
Bag Mor, Inc.	53.7 tons
Subtotal: Polk Co., FL	403.6 tons
Subtotal: Orange Co., FL	224.5 tons

A recent scientific review, (Couillard and Grenier, Water Poll. Res. J. Canada; 1990 - vol. 25, No. 1, 109-130), noted that the diffusion of organic toxics via soil gases and redeposition onto plant surfaces represented a significant source of toxic exposure for crops grown on sludge fertilized soils. The much larger amounts of sludge pellets required for agriculture compared to commercial fertilizers also results in much larger toxic metal loadings to soils than from the commercial products. MWRA pellets are rated at between 3-2-1 and 3-2-0 for N-P-K content. (Turf North, Aug. 1992)

Cadmium uptake by crops generally increases as cadmium soil concentrations increase, and soil pH values decrease, a common local phenomenon. (Chaney USDA, experiments on lettuce) MWRA has also lobbied hard for an apparently successful effort to increase the allowable level of cadmium in sludge pellets land applied in Massachusetts to 14.0 ppm from 2.00 ppm. US background levels of cadmium are 0.26 ppm. (Mass. DEP)

The US EPA has identified 13 exposure routes for humans including direct root intake by plants, atmospheric redeposition on plants, via groundwater, and via dusts. Also, the Massachusetts DEP in its Response to Comments on Proposed Rule Changes for Sludge Land Application (MAY 1992) specifically notes that it believes that environmental loadings of cadmium through sludge disposal could result in high levels of cadmium in leafy vegetables, and that consumption of such plants could lead to human kidney damage. DEP does believe that this risk is acceptable. The market in which sewage sludges from the MWRA competes for buyers may not be so sanguine.

Appendices

Reviews, Recommendations, and Comments

The State of the Boston Harbor Reports

A significant amount of information exists regarding environmental pollution in Boston Harbor. Much of this information has been compiled by the Massachusetts Water Resources Authority (MWRA) each of the past two years in a report detailing the status of Harbor water quality, summarizing the Harbors' condition in a report card. This information offers the public a tool through which to measure the progress of the massive Boston Harbor cleanup. However, it is extremely difficult to draw definitive conclusions regarding the overall quality of the Harbor based upon this information. This is primarily on account of scientific information on the ramifications of environmental pollution are extremely difficult to qualify due to the largely unknown effects of the many toxic chemicals which have been, and continue to be discharged daily into the Harbor.

Regardless, as noted in the MWRA Harbor Reports for 1990 and 1991, it is reasonable to conclude that overall, the Harbor has begun to exhibit improvement. This improvement can be most attributed to the cessation of the practice of dumping sewage sludge from the Deer and Nut Island Wastewater Treatment Plants (WWTP) directly into the Harbor. According to MWRA, this measure, which commenced in January 1992, reduced toxic and pathogen loadings into the Harbor by 30 percent. As commendable as this action appears, serious questions remain as to the overall merit of eliminating sludge dumping into the Harbor without simultaneously reducing the discharge of toxic chemicals into the two WWTPs. This is because most toxic chemicals will accumulate in sludge. Ironically, as future improvements are made at the Deer Island WWTP (e.g. more efficient suspended solids removal), the amount of toxic chemicals accumulating in the sludge will likely increase. (It is known that many toxic chemicals, particularly heavy metals and organics, tend to adhere to suspended solids.) Not discharging the sludge into the Harbor and dumping it instead into a landfill, or processing it into pellets to be used as a soil enhancer, corresponds with transferring an environmental pollution problem from one media to another (e.g. A water pollution problem to a land and/or groundwater pollution problem.).

A similar concern should be raised regarding the MWRA's plan to extend the Deer Island WWTP outfall pipe 9.5 miles out into Massachusetts Bay in order to attain a greater dilution rate, and thereby improve the water quality in the Harbor. Without a significant decrease in the amount of toxic chemicals dumped into the WWTP, it is likely that the discharge of the resulting effluent, albeit with a greater dilution, will adversely affect the Massachusetts Bay ecosystem. However, due to the difficulty in quantifying the adverse effects from such pollution, in all likelihood, the ramifications will not be realized until such a time when the problem can only be corrected by a large expenditure of time and resources. Based upon this information, it is far more prudent to ensure that all discharges of toxic chemicals into the Boston Harbor/Massachusetts Bay are reduced to the greatest extent feasible at its source.

In the two "State of the Boston Harbor Reports", the MWRA indicates that while toxic chemicals have been found in the water, sediments and living organisms (mussels, lobsters, and fish) in the Boston Harbor, the levels are typical of comparable urban environments and are typically below governmental standards. While this may be the case, such rationalization should not be used to condone the continued discharge of toxic chemicals and other pollutants into the Harbor in the levels presently allowed. Unfortunately, this is the reasoning being used by the MWRA in negotiations with the Federal and State environmental agencies responsible for issuing the new wastewater discharge permit.

As more information becomes available through studies on environmental pollution, particularly the fate of toxic chemical discharges, it is becoming increasingly clear that much is not known about the environmental fate of these chemicals and what constitutes a safe/acceptable level of exposure. In fact, it is not uncommon for scientists to conclude there are no safe levels of exposure to toxic chemicals. The field of toxicology is inexact and dynamic. What was thought to be safe one day may suddenly be found to be harmful, as the latency period of many of these chemicals is not known. The toxic chemical levels in fish, lobster, and mussels, established by the Food and Drug Administration and the Environmental Protection Agency (EPA) and referenced in the MWRA reports as being safe, do not consider cumulative and synergistic effects of exposure to such chemicals. An unfortunate example of this phenomenon appears to be evident in the Harbor's larger/older finfish which, being exposed to chemical pollutants for longer periods of time, have exhibited more severe lesions than smaller/younger fish.

Perhaps the extent of chemical contamination in the Boston Harbor can be most appreciated by the observation made by the MWRA that due to the extremely large reservoir of contamination accumulated in the sediments, contamination of living organisms will continue, possibly for decades. This statement is even more perplexing considering: the discharge of sludge into the harbor has been eliminated; most of the Harbor water exchanges with Massachusetts Bay in about 9 days; reductions in Combined Sewer Overflows (CSO) have been made; and by 1995, the discharge of effluent into the harbor is set to cease (due to the construction of the 9.5 mile outfall pipe).

Clearly, prudence dictates that discharges of toxic chemicals into the Harbor should be reduced to the greatest extent possible. Due to the large dilution from the volume of waste waters entering the Deer and Nut Island facilities, and the fairly quick exchange rate between Harbor and Bay waters, reliance on effluent limitations utilizing water quality criteria standards will continue to allow large amounts of chemicals to be discharged into the Harbor/Bay. To ensure that the discharge from these two treatment plants do not continue to adversely impact the environment, efforts must focus on reducing and eliminating the discharge of toxic chemicals into the sewage treatment plants. However, caution must be exercised to ensure that any toxic reduction in waste water does not result in a transference of this waste to another media (e.g. air or landfill).

Review of the Deer and Nut Island NPDES Permit Application

In September 1991, the MWRA submitted their application to the USEPA to renew their NPDES (National Pollutant Discharge Elimination System) permit for discharging waste water to the Harbor. Throughout this application MWRA recommends that revisions to this permit should not contain new effluent limitations on toxic chemicals (MWRA's present permit also does not contain any specific limitations on toxic chemicals.). Instead, MWRA recommends that this permit period be used to gather discharge information to be used in preparation for establishing limitations for the next permit, when full secondary treatment commences. MWRA's rationale is that the Deer and Nut Island treatment plants are operating as effectively as can be expected, water quality standards have generally been met, the discharge of sludge into the Harbor has ended, and any further expectation of these facilities to meet stricter, secondary treatment limitations is unrealistic.

MWRA's allegation that the treatment plants are operating as effectively as can be expected is reasonable when considering primary discharge parameters such as biological oxygen demand (BOD) and suspended solids (SS), however, the same should not be said for toxic chemical discharges. Due to their origin, stricter standards for primary discharge parameters will not be conceivable until the new secondary treatment facility begins operation. It is not feasible to significantly reduce the inflow of these types of wastes as most sources are typical domestic sewage. Conversely, reduction of toxic chemical discharges is most effectively attained through better management practices at the source - reducing the influx of these chemicals prior to entering the treatment plants. In fact, regardless of secondary treatment, if the amount of toxic chemicals discharged into the treatment plants is not greatly reduced, there will not be an associated reduction in their discharge into the environment. This is because secondary waste water treatment plants as planned for Boston Harbor are not equipped to treat toxic chemicals. Instead, when these chemicals enter the treatment plant they typically evaporate into the air during mixing, adhere to solids and become part of the sludge, or get diluted and discharged.

MWRA's review of the typical composition of waste water volume to the Deer and Nut Island treatment plants revealed that industrial process waste waters comprise approximately fourteen (14) million gallons a day, or four (4) percent of total daily flow. Considering this information and realizing that there are other sources of toxic chemical discharges to the sewer system, it is apparent that there exists a large dilution of these industrial chemical wastes. This dilution is likely the reason that the existing "primary level" waste water treatment plants at Deer and Nut Island are able to release an

effluent which according to MWRA, does not exceed water quality standards or appear toxic when tested. In this regard, it is important to realize that although discharged in oftentimes minute concentrations, toxic chemicals have been found to accumulate in the environment and adversely affect living organisms.

The MWRA has indicated that they are concerned with any activity which may affect the logistics of the construction operations presently occurring at Deer Island (to build the secondary treatment plant). Fortunately, the inclusion of strict limitations on toxic chemical discharges in the MWRA's new NPDES permit should not require measures which adversely affect these construction activities. Compliance with strict toxic chemical discharge limitations could be achieved through waste reduction activities at specific industry sites, away from the treatment facilities. Further, the inclusion of toxic chemical effluent limitations in these permits would provide additional support to the MWRA's TRAC Department (Toxic Reduction and Control) enabling the MWRA to more effectively work with specific industry dischargers on reducing toxic chemical loadings to the treatment plants.

The MWRA describes the present discharges from Deer and Nut Island as not exceptionally high in toxic chemicals, stating that many of these chemicals are below the levels of detection, and the effluent has consistently passed toxicity tests when exposed to test organisms (mysidopsis and ceriodaphnia). However, it is important to realize that these toxicity tests are only conducted for relatively short periods of time, utilizing diluted effluent. Such tests, while valid for some situations, do not consider long term cumulative effects of exposure. In addition, as indicated earlier, chemical discharges into the Deer and Nut Island are subjected to extremely high volumes of other wastewaters due to the large area serviced by these facilities. Such dilution inevitably aids in disguising the presence of many chemicals along with the overall toxicity of the discharge.

Regardless, as the following table indicates, there are significant quantities of toxic chemicals discharged from the Deer and Nut Island WWTPs. Many of the chemicals which comprise these totals are known to accumulate in the environment and could adversely affect living organisms in a multitude of ways (from degrading water quality to the point that the environment cannot support living organisms, to causing cancer, mutagens and other deleterious effects in these organisms, and conceivably, in humans who consume contaminated organisms).

Priority Pollutants Discharged from the Deer and Nut Island WWTPs

<u>Pollutant Category</u>	<u>Deer Island WWTP (Avg. Flow 266 MGD) Daily Discharge (lbs.)</u>	<u>Nut Island WWTP (Avg. Flow 130 MGD) Daily Discharge (lbs.)</u>	<u>Total Yearly Loading (lbs.)</u>
Metals	1034.20	509.24	563,355
Cyanide	64.33	31.44	34,956
Phenols	77.65	37.94	42,190
OrganoChl. Pests./PCBs	3.23	4.90	2,967
SemiVolatile Organics	224.05	70.47	107,499
Volatile Organics	505.81	286.17	289,072
Total (lbs.)	1909.27	940.16	1,040,042

In addition to these daily discharge totals of toxic chemicals, Deer Island effluent contains approximately 6389 lbs. of Petroleum Hydrocarbons (PHC) and the Nut Island effluent contains approximately 3036 lbs. of PHCs.

(Source: MWRA NPDES Permit Application Package, Attachments 2C-2 and 2C-3, Priority Pollutant Scans from January 1989 - June 1991.)

The following table is based upon toxic chemical discharge information for June 12, 1992 from the Deer and Nut Island WWTP effluent. This information was derived by Energy and Environmental Engineering, Inc. for the MWRA, to be submitted to EPA as required in the MWRA's Interim Order.

<u>Pollutant Category</u>	<u>Deer Island WWTP (Avg. Flow 266 MGD) Daily Discharge (lbs.)</u>	<u>Nut Island WWTP (Avg. Flow 130 MGD) Daily Discharge (lbs.)</u>	<u>Total Yearly Loading (lbs.)</u>
Metals	1198.62	392.49	580,755
Phenol	44.37	29.27	26,878
OrganoChl. Pests/PCBs	0.76	0.27	376
Volatile Organics	468.07	354.52	300,245
Total (lbs.)	1711.82	776.55	908,247

Note: Monitoring data did not include Petroleum Hydrocarbons and Semi-Volatile Organics. Cyanide concentrations were below 10 PPB detection level.

Additional toxic chemical discharge loading data is contained in the MWRA's February 1991 Technical Report #91-4 (Boston Harbor: Estimates of Loadings, Table 3-1). The following Table summarizes the MWRA's yearly toxic pollutant loadings to the Harbor:

<u>Pollutant</u>	<u>Quantity (lbs.)</u>
Metals	336,664
Poly-aromatic hydrocarbons	44,092
Phthalates	15,432
Polychlorinated biphenyls	550 (less than)
Benzene	<u>5,952</u>
Total	402,690

Although the MWRA Technical Report #91-4 data does not include as many parameters as the information presented in the two prior tables of this report, a comparison of the numbers indicates that the total toxic chemical loadings (especially for metals and various organics) to the Harbor from the Deer and Nut Island WWTPs are extremely large.

In addition to the discharge data presented for the Deer and Nut Island WWTP, a series of Combined Sewer Outfalls (CSO) operating throughout the metropolitan area are responsible for discharging more toxic chemicals to the Boston Harbor. The following information was tabulated based on the CSO Composite Priority Pollutant data (for the period January 1989 - June 1991) provided by MWRA in their NPDES permit application to EPA.

<u>Pollutant Category</u>	<u>Combined Sewer Overflow* (Avg. Flow 14.0 MGD) Daily Discharge (lbs.)</u>
Metals	39.25
Cyanide	2.40
Phenol	0.69
OrganoChlorine Pesticides/PCBs	0.06
Chlorinated Hydrocarbons	1.00
Volatile Organics	18.45
Polyaromatic Hydrocarbons	<u>6.80</u>
Total	68.59

- * Monitoring data was derived from only three CSO treatment facilities: Somerville Marginal, Cottage Farm, and Prison Point. Monitoring data for four other CSO discharges, Outfall #s 023, 025, 207, and 209, which have a combined average flow of 29.1 MGD was not available.

By design, CSOs route waste water away from the WWTP allowing such waters to be discharged into the receiving waterway, offering absolutely no treatment of toxic chemicals. These CSO discharges are several orders of magnitude greater during wet weather.

Conclusions:

The CSO discharge information combined with the daily discharge data from the Deer and Nut Island WWTPs further indicates the pressing need to reduce the discharge of toxic chemicals at their source before they enter into the sewer system. As stated in the previous section, reliance on water quality standards and "end of the pipe treatment" will allow the continued daily discharge of literally thousands of pounds of toxic chemicals into the Harbor and eventually Massachusetts Bay. Additionally, these chemicals accumulate in the sewage sludge, possibly rendering the sludge unfit for use as fertilizer, and/or necessitating further treatment of the sludge.

Recommendations:

- o Specific toxic chemical limitations stipulated in total loadings and concentrations should be included in the MWRA's NPDES permit for Deer and Nut Island. These limitations will need to be met within 18 months from the permit's effective date. To meet these levels, MWRA's Toxic Reduction and Control Dept. should require toxic chemical dischargers to develop and submit toxic chemical discharge reduction plans. These plans should be required to be submitted to MWRA within 12 months of the permit effective date, allowing a 6 month lag time to MWRA in anticipation of potential delays. A provision requiring that industries develop and submit toxic chemical reduction plans should be included in the NPDES permit.

In furtherance of the Massachusetts Toxics Use Reduction Act, the MWRA should also require that dischargers demonstrate that they have reduced their toxics usage to the full extent economically feasible. The volume of all waste waters from each industry should likewise be reduced to the greatest extent possible. Industry should not be allowed to discharge toxic chemicals into the MWRA WWTPs unless they have satisfied these requirements. MWRA should create disincentives (high sewer rates and fines) for industries not complying with these requirements.

Toxic reduction should be encouraged for many reasons. Economically, it is more advantageous, as less waste generation typically means that raw materials are being utilized more efficiently, and there are less pretreatment, ensuing disposal and regulatory compliance costs. Of particular significance, is the fact that toxic waste reduction benefits society as well, eliminating future environmental contamination problems, subsequent clean up costs, and depletion of various raw materials.

The Federal Pollution Prevention Act of 1990 and EPA's formal classification of pollution prevention and source reduction as priority waste control strategies should empower MWRA to influence industries dumping toxic chemicals into the sewage treatment plants to switching from treatment to prevention.

Toxic reduction techniques available to industry include:

1. Substituting toxic chemicals used in production processes with non-toxic or less toxic alternatives.
2. Changing the end product so that its production becomes less toxics-intensive.
3. Modifying or modernizing the production line with more efficient equipment.
4. Better housekeeping such as improved monitoring and cleanup procedures.
5. Recycling materials within production processes.

- o As a last resort, if it is determined that source reduction cannot eliminate/reduce a particular toxic chemical from an industrial discharge, pretreatment effluent limitation(s) will need to be established by MWRA specifically for that discharger. This limitation will need to be based upon scientific understanding of the MWRA's biological wastewater treatment systems' capabilities with treating that chemical discharge. If it is determined that the discharge of a particular chemical will: 1) harm the WWTP, 2) exceed the pretreatment limitation, or 3) contribute to the degradation of the receiving water body, MWRA should have the authority to prohibit the discharge of that chemical(s) into the WWTP.
- o MWRA should be required to conduct long term (six months to one year) toxicity and bioaccumulation studies using the sewage effluent utilizing different dilution mixtures. Such studies would provide a better indication of the chronic toxicity of these chemicals and give some indication of the biological effects due to uptake of the chemicals in this effluent.

Comments on Proposed Massachusetts Water Resources Authority Changes to Local Discharge Limits

By The Massachusetts Toxics Campaign

Summary of MWRA Proposal

MWRA has proposed to allow industrial and commercial sewer users to increase the concentrations of eight pollutants discharged into the sewage system. The allowable discharge concentrations of three pollutants would be reduced. One pollutant will be limited for the first time.

The MWRA limits toxic discharges into the sewage system for the following reasons:

- 1) To prevent toxics which pass through the MWRA's facilities from reaching concentrations that would violate the MWRA's Federal discharge permits
- 2) To prevent toxic pollutants from interfering with sewage treatment
- 3) To reduce toxic build-up in sludges that would restrict disposal options
- 4) To prevent the formation of hazardous vapors in the sewer system

MWRA bases its new limits on State and Federal criteria include pollutant concentration limits for air, water, sludge disposal, sewage treatment inhibition, and vapor toxicity and explosivity.

Of the dozens of toxic chemicals found in MWRA sewage, the Authority believes that copper, lead, molybdenum, and surfactants have substantial nonindustrial sources. Regardless, the Authority chooses to lower lead and molybdenum limits for industry to improve the marketability of its sludge pellets.

Cadmium levels in sludge pellets greatly exceed historical Massachusetts standards for unrestricted disposal. The MWRA has worked tirelessly and successfully to have Massachusetts cadmium disposal restrictions loosened.

The Authority is likewise working to loosen Massachusetts limits on molybdenum disposal. Current limits have the effect of protecting ruminant animals such as deer. Commercial users of cooling equipment may be affected by this new limit.

The primary beneficiaries of loosened restrictions will be the metal finishing and printed circuit board manufacturing industries. The MWRA believes that they can substantially increase sludge toxics content and toxic inflows without violating State and Federal regulations. Thus MWRA's changes will help maximize Industry's ability to use the sewers for toxics disposal.

Proposed MWRA Local Limits Changes

Table I - MWRA Pretreatment Limits Being Raised
All Limits are in Parts Per Million (PPM)

Pollutant	Current Limit	Proposed Limit
Antimony	10.	95.
Boron	5.	20.
Chromium	1.	5.
Chromium (VI)	0.1	0.5
Nickel	1.	3.
Selenium	5.	11.
Zinc	1.	1.5
Oil & Grease	100.	300.

Table II - MWRA Pretreatment Limits Being Lowered
All Limits are in Parts Per Million (PPM)

Pollutant	Current Limit	Proposed Limit
Lead	0.4	0.2
Phenanthrene	1.0	0.
Trichloroethene	1.00	0.07

Table II - Newly Proposed MWRA Pretreatment Limits
All Limits are in Parts Per Million (PPM)

Pollutant	Newly Proposed Limit
Molybdenum	0.2

Objections to Loosening Local Limits

General Objections

- 1) Loosening local limits sends the wrong message to polluters and financially stressed ratepayers. At a time when the MWRA has been prematurely touting its reductions in toxic discharges to Boston Harbor, the new limits allow substantially more toxic materials to enter the sewer system.
- 2) Given that between 30 and 40 percent of all toxic metals in the system are captured in the sludge, and that as secondary treatment comes on line these percentages will increase, raising local limits will increase the amount of contamination in the sludge pellets. This will be a detriment to marketing efforts. Even if MWRA can meet minimum legal standards, it will still face competitive pressures from other sewer districts marketing efforts.
- 3) Loosening local limits will penalize industries which have made good faith efforts to meet existing standards, and reward companies which delayed or avoided meeting past standards.
- 4) Loosening local limits provides all companies with a disincentive to reduce toxics output, as well as promoting the idea that environmental problems can be solved by loosening regulations, rather than through cleaner toxic materials handling.
- 5) The TRAC monitoring program follows only a subset of the priority pollutants. By allowing procedures that increase allowable levels of targeted compounds, potentially toxic nonregulated chemical discharges are likely to increase as well.
- 6) Increased sewer toxic levels represent not only an environmental hazard in Boston harbor and in areas slated for sludge disposal, but also increase risks to MWRA and industrial personnel, and raise the danger of water supply contamination due to exfiltration of sewage in Zone II aquifers. The passage of sewage bearing increased levels of toxic metals would endanger the water supplies of several communities in the MWRA Water Service Area.
- 7) Loosening local limits based on the ability to increase sludge toxicity while technically remaining below some state's toxic material regulations, represents a decision to maximize industrial toxic waste disposal into the MWRA system. This is contrary to the intent of MWRA's enabling legislation, and further increases the subsidy provided by ratepayers and those impacted by sludge disposal, to polluting industries.

Specific Objections

8) Hexavalent chromium, slated for a 400 % increase in allowable discharge levels, is among the most 25 most potent carcinogens studied by EPA's Carcinogen Assessment Group.

9) Trivalent chromium, associated with metal plating and slated for a 400 % limit increase, has been shown to induce immune system disorders. (Novey et al. 1983)

10) Despite MWRA's assertions that surfactants, copper, and molybdenum are primarily nonindustrial in origin and should thus be regulated loosely; a January 1992 MWRA report found that only 28 %, 37 %, and 2 % respectively of these pollutants could be traced to nonindustrial sources. Between 90 and 58 % of all of the metals slated for loosened limits were found by the MWRA to be of industrial origin or nonquantifiable.

10) Although tetrachloroethylene and trichloroethylene have the same EPA drinking water standard, and tetrachloroethylene is the more prevalent Zone II aquifer and industrial contaminant in the MWRA service area, (see objection 6), tetrachloroethylene will be allowed into the system at a level 14 times higher than trichloroethylene.

11) According to a 1989 GAO study (GAO/RCED-89-101) 20 % of large wastewater treatment plants experienced significant pass-through violations, 28 % experienced interference with treatment processes, and 4 % experienced worker health and safety problems. The report stated that the most important reason for these problems was the prevalence of pretreatment discharge violations, (41 % of all industrial sewer users every year).

If 41 % of all industrial users discharge levels of toxic chemical discharges higher than predicted, MWRA will have underestimated the danger of pass through, all would experience a failure of its already problem-plagued sludge operations to meet regulations.

A total of 30 % of all treatment plants exceeded their wastewater discharge permits due to excessive industrial discharges tied to pretreatment violations, due to both pass-through and plant upsets and inhibitions.

MWRA should take note of these facts and consider the high probability that raising limits would raise the actual discharge levels even more than anticipated due to pretreatment violations.

12) The Federal Government encourages localities to set limits more strict or more inclusive than Federal standards to promote environmental safety. Given this mandate, as well as the concerns expressed by the GAO, (see objection 11), the climate clearly exists to improve rather than weaken the MWRA pretreatment program.

13) Despite the unproven ability of MWRA to meet water quality regulations, the

bioaccumulative and persistent nature of toxics whose limits are being raised, guarantees that human exposures through consuming contaminated seafood, groundwater, or crops will increase.

14) The Boston area includes a large number of metal finishers, printed circuit manufacturers, and related industries. Nickel, zinc, hexavalent chromium, and chromium are discharged from nearly all of these facilities. The new local limits propose an average 260 % increase in permitted discharges for these metals. The increase will surely increase total environmental loadings of these pollutants.

15) The antimony standard of 95 ppm encourages the production of wastewaters which would contain levels of this known renally toxic compound that would represent a substantial danger to wastewater personnel.

16) Boron limits are slated to rise 300 %. However, based on maximum allowable MWRA headworks loadings, which is the basis for many other proposed pretreatment limits, boron levels should be reduced to zero discharge to protect sludge quality. The implied rationale is that since the current 5.0 ppm limit should result in contaminated sludge, but due to some postulated data error does not, why not raise the boron limit to 20.0 ppm?

Summary

Increases in the loading of toxic pollutants to the MWRA system will have the following detrimental environmental and safety effects:

- 1) Sludge toxics loadings will increase, limiting disposal options.
- 2) Worker health and safety are endangered due to increased exposure to toxics in wastewater and sludge.
- 3) Treatment plant inhibitions may increase.
- 4) Groundwater from sewage leaks or sludge disposal will increase.
- 5) Increased toxicity may inhibit sludge marketing, increasing dependence on more environmentally unsound alternatives.

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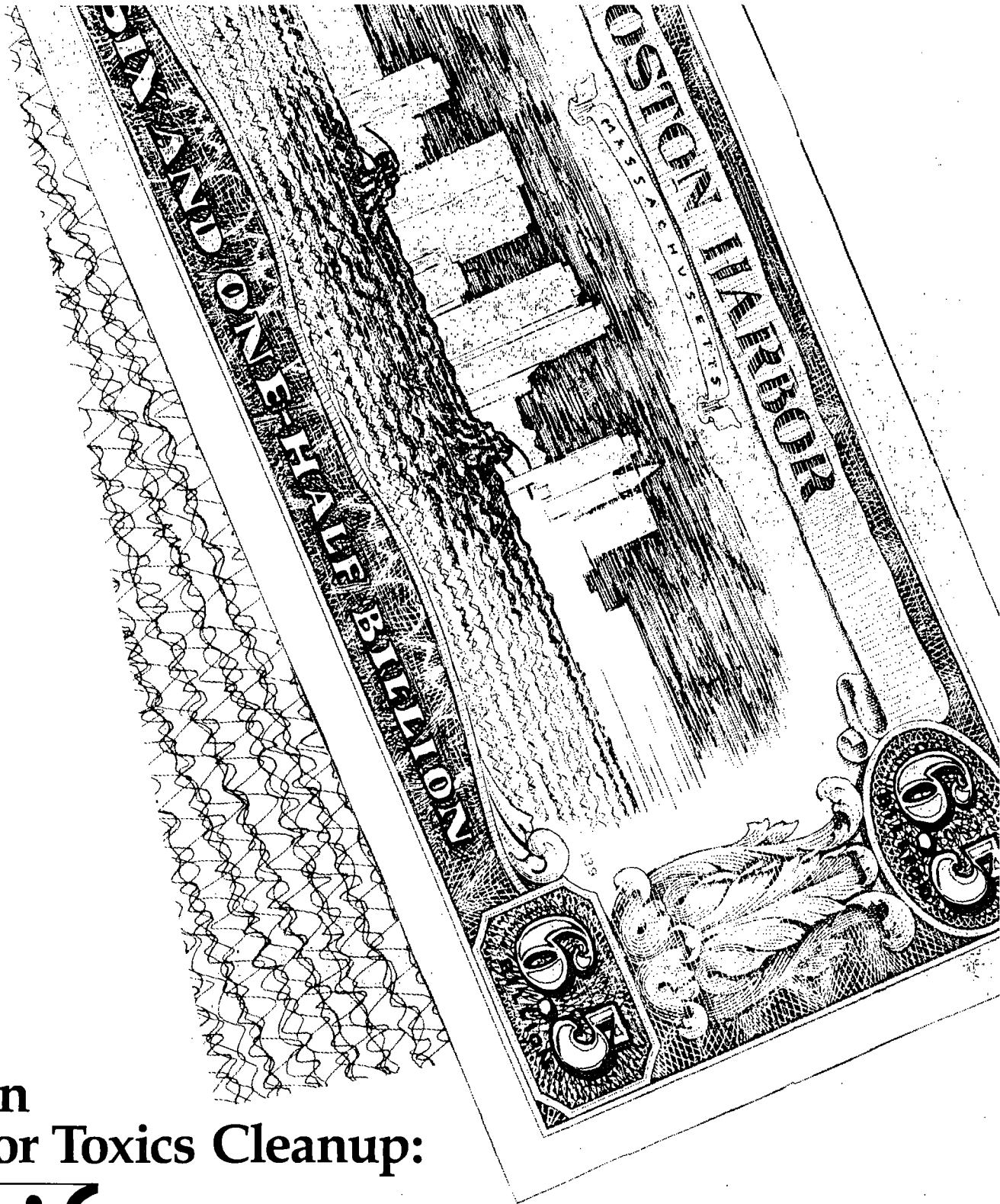
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**Boston
Harbor Toxics Cleanup:**

WHO SHOULD PAY?

Written by
Sanford J. Lewis
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National Toxics Campaign Fund



COALITION FOR ALTERNATIVE WASTEWATER TREATMENT

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A PROPOSED COMPREHENSIVE WATER QUALITY ACT

Proposal: a block grant/loan to the States for wastewater treatment, conservation and reuse, and drinking water quality projects, modelled on the Intermodal Surface Transportation Efficiency Act (ISTEA). Each State would be required to conduct a multiyear assessment of water quality and supply conditions, and with public input, to develop a comprehensive water quality plan.

The Act would pool funding from the existing Clean Water Act, Safe Drinking Water Act, Coastal Zone Management Act, Farmers' Home Administration, Soil Conservation Service, and Army Corps of Engineers budgets, or at a minimum require the non-EPA agencies to adhere to plans and priorities set by each of the States.

The Problem: While the Clean Water and Safe Drinking Water Acts have been successful in upgrading centralized sewer treatment and water filtration plants, rigidities in funding have created major problems, including the following:

- misplaced priorities -- while over half of remaining water pollution is caused by nonpoint sources, the bulk of the federal subsidies are for point source treatment plants;

- over-reliance on costly, conventional central sewers and treatment -- while on-site and cluster systems would be far cheaper and environmentally more sound in remaining areas, the regulatory, management and funding structures have not been established to implement these approaches;

- insufficient technological advance -- rigidities in the regulations and funding remove any incentive for private investments by innovators in new technologies, and the level of federal funding for research in wastewater treatment is insignificant. A single community can spend tens of millions of dollars for sewers for only a few thousand homes. In contrast, the proposed federal research budget in the Senate Clean Water Act draft is \$20 million.

- failure to consider water as a single resource -- while the interrelationships of water pollution, water supply and drinking water quality are ever more apparent across the country, funding is still balkanized. The proposed shifting of San Diego's efforts from unnecessary secondary treatment into necessary water reclamation is an example of the benefits

of greater integration. Similarly, New York State could cheaply remediate polluting on-site septic systems surrounding reservoirs rather than invest in massive new drinking water filtration plants for New York City.

--growing political resistance to wastewater and drinking water quality projects. While the removal of federal grants was necessary for deficit reduction and did serve to lay bare the waste and inefficiency in the system, it has also created a ratepayers and municipal revolt of sorts. In Gloucester, Massachusetts, for example, citizens are in an uproar at having to spend twenty thousand dollars per home for a sewer extension that they believe is totally unnecessary. Debt payments for the project also threaten to put the City into receivership. Similar cases across the country are fueling radical proposals in Congress to gut federal environmental legislation.

Benefits of a Block Grant: flexible funding and a requirement for serious assessment and planning would achieve the following:

--the reintroduction of science and research into the design and targetting of environmental projects;

--opportunities for large savings to the States in achieving environmental protection;

--a substantial incentive to researchers and innovators to move into this new comprehensive, integrated approach;

--a political solution for States and municipalities (less funding than in the past but more flexibility and control) and for citizens (a more rational and targetted approach which convinces people that government is only doing what is necessary and is spending wisely. In Gloucester, for example, a shellfish warden's program of dye-testing and enforced remediation of only those on-site systems which are polluting is achieving widespread compliance and political support.);

--development of technologies which can be exported to other countries (researchers are currently having more success in implementing their technologies in China, Mexico and Canada than they are in the U.S., where outmoded regulations are inhibiting their use);

--professional upgrading of the wastewater treatment field, in particular of on-site designers, installers and managers, with attendant increases in wage levels.



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A COMPREHENSIVE MASSACHUSETTS INITIATIVE TO PROMOTE ALTERNATIVE WASTEWATER TREATMENT POLICIES, PLANNING AND TECHNOLOGIES

This proposal is for the Commonwealth of Massachusetts to undertake a comprehensive set of measures to promote alternatives to conventional sewerage policies and technologies. It is increasingly clear that a realignment away from big-city sewer collection and central treatment plants and into non-point source, decentralized approaches is necessary, but this shift will only happen if the Commonwealth takes a pro-active initiative to make it happen.

While the 1972 Clean Water Act, with its uniform national standards for point-source discharges and its hefty federal subsidies, achieved some dramatic improvements in water quality, it has led to a system in Massachusetts and across the country with many serious pitfalls. These problems began to develop over time, but became painfully apparent when the federal grants were ended and local communities were left with the burden of remediation.

Specifically, the uniform national standards, funding and enforcement provisions of the Clean Water Act have created the following:

--the Commonwealth functions in an adversarial, risk-averse enforcement mode rather than a pro-active problem-solving mode. DEP regulators and the Attorney General's Office, with EPA approval, sue municipalities and industries over permit violations, with "best available technology" standards as guidelines. While these technologies may be overly-expensive, the state does not assist communities in identifying cheaper and better alternatives;

--a conventional approach is promoted which will entail massive increases in costs in future years. Deep-pipe, gravity sewers, central treatment plants and outfall pipes are not only extremely expensive to install initially, but they also will require substantial expenditures in coming years for operation and maintenance, replacement of treatment plants every twenty years or so, and high-cost combined sewer overflow remediation;

--a disconnect has emerged between identification of the problem (assessment) and remediation measures. While the Clean Water Act initially required a serious assessment and priority-setting process, over time this function was utilized less and less by those who determined enforcement

priorities. Non-point source pollution is increasingly understood to be the bulk of the remaining problem, but State funding and enforcement continues to focus almost exclusively on point-source treatment plants and sewers, for example.

--innovative technologies are stifled. Mainstream engineering and construction companies exclusively recommend centralized treatment solutions to municipalities. Entrepreneurs with innovative technologies cannot get their systems permitted in the State, outmoded regulations drive costs of alternatives unnecessarily high, and citizens receive no assistance when they try to identify cheaper alternatives;

--coastal outfall pipes are constructed, which concentrate pollutants and overwhelm assimilative capacities. Such outfall pipes are now prohibited in Marine Sanctuary areas;

--big cities are given the greatest attention and financial subsidies, while small and rural communities face higher costs and less financial aid;

--treatment approaches focus on public health concerns while ignoring environmental impacts more broadly;

--activities of other federal agencies than EPA, such as Farmer's Home Administration, HUD and Army Corps of Engineers, are uncoordinated with DEP funding and enforcement;

--similarly, problems of wastewater treatment are segregated from drinking water, water conservation, and pre-treatment projects and solutions, when integration of these programs could lead to substantial cost-savings.

PROPOSED INITIATIVE:

The following steps constitute a pro-active initiative in wastewater treatment, with the goal of achieving maximum environmental protection at minimal cost. Some of these measures have been taken by other states, although none has yet adopted a comprehensive approach.

Alternatives to conventional treatment include: development of inspection and training programs to guarantee that traditional septic systems perform over the long-term; production of high-quality, water-tight septic tanks; the addition of pre-treatment systems such as sand filters in between the septic tank and leaching field, including de-nitrifying systems where necessary; downsizing of the leaching field through pressure dosing and chambers; cluster dispersal fields for liquid effluent in densely-developed neighborhoods or areas with poor soils; constructed wetlands; small-diameter, pressurized collection pipes for liquid effluent to the plant;

water conservation to reduce loads; and others.

A comprehensive set of measures is necessary, because alternative treatment modes are being held back by multiple impediments. Efforts to promote permitting of new technologies will not have much impact unless homeowners also have an incentive to utilize them, for example.

1. Maximum encouragement of demonstration projects within the state.

A number of communities in the Commonwealth have on their own initiative sought to identify and test alternative technologies, management districts, etc. While state staff have been unable to assist in these efforts to any great extent, it is important that whatever proposals are generated be given a serious response.

Regulators need to be flexible about outmoded requirements and, in the interest of generating lessons and models for the state, these proposals need to be given the benefit of the doubt. If necessary, home rule petitions with reasonable waivers on regulations should be supported in the Legislature. Without directing these projects, state staff should also be available to coordinate and disseminate knowledge gained from these demonstrations

Sites: Gloucester, Waquoit Bay, Plymouth, Buttermilk Bay

2. Development of alternatives on state properties.

The Clean State Program, an agreement on behalf of the Commonwealth to remediate pollution on state properties, should be utilized to promote alternatives. A Task Force of DEP, CZM, DEM and other staff needs to be appointed to develop and implement a plan for maximum experimentation and use of alternative technologies and approaches.

3. Develop targetted enforcement requirements in Title V.

While strict enforcement of remediation of all 600,000 on-site systems in the State is unlikely to be included in the revised Title V regulations this Spring, such uniform enforcement is essential, however.

Provision for selective enforcement and remediation in "Sensitive Zones" around coastal embayments, rivers, reservoirs or aquifers is essential. Title V should include provisions requiring municipalities to undertake remediation and inspection programs on a short timetable. (Minnesota has a policy of strict enforcement around lakes.)

State action to move municipalities to enforce on-site remediation is necessary to improve water quality. Local

Boards of Health have been lax in enforcement, largely because they lack financial resources to assist the homeowner (see 5 below) and because they cannot recommend innovative technologies for non-conforming lots.

State enforcement in sensitive zones is also important because "demand" for innovative approaches must be increased if the "supply" side of equipment suppliers, installers, engineers, etc. are to respond. Without State enforcement, municipalities will move only very slowly to implement enforcement, management and inspection programs.

4. Revive a serious assessment and planning effort.

Section 319 funds need to be reallocated to monitoring and assessment projects, and enforcement and funding need to be reallocated according to the severity of problems identified. The notion that serious research and planning will generate substantial savings has been advanced by the National Academy of Sciences in their recommendation for "Integrated Coastal Management". Maximum benefits will be achieved, however, if research is applied statewide, to rural, inland problems as well as to coastal problems.

5. Develop sources of financial assistance for on-site projects.

A number of funding sources need to be developed for on-site, nonpoint source remediation, including: passage of the "Betterment Bill" by the Legislature, which authorizes municipalities to borrow for homeowner on-site upgrades; a substantial increase in the set-aside for on-sites in the State Revolving Fund (now only 4%); and possible creation of a new State Grant Program for homeowners (similar to fund in Wisconsin which awards grants on the basis of income of the family and cost of the system.)

Without such sources of financial assistance, political opposition to Title V enforcement will persist, as has been found in Rhode Island and Washington State.

6. Appointment of a Technical Advisory Committee.

A panel of experts to advise the State on permitting of new technologies and other technical matters should be appointed, based on the examples of Washington, Illinois and Texas.

7. State assistance to education, training and research.

Training of engineers and installers, education of citizens and municipal officials and research on new technologies are all necessary to the eventual widespread use of alternatives. Federal funds are available for such projects, but in addition, states such as Texas and Florida have instituted building

permit fees (\$15.00) to fund such projects. Massachusetts should consider a similar fee.

8. Full staffing of on-site programs.

Wisconsin has 25 staff devoted to the development of on-site approaches in the State, while Massachusetts has not yet filled the three new positions proposed. Action needs to be taken on filling these slots, as well as reconsidering additional needs for State staff to coordinate with local demonstration projects, conduct assessment and planning studies, coordinate funding packages, etc.

9. Take steps to coordinate with FHA, HUD, Army Corps.

The State should initiate efforts to coordinate priorities and projects with federal agencies other than EPA. These agencies distribute millions of dollars within the State for wastewater treatment and generally support conventional technologies. Illinois has begun to intervene in these programs in an effort to promote cheaper alternatives and Massachusetts should do so as well. The allocation of funds to communities should also be consistent with the assessment and planning studies generated by the State.

Department of Agriculture land-grant extension programs to advise and assist farmers on wastewater treatment also need to be coordinated with DEP plans and priorities. Not only is agriculture one of the key non-point sources of pollution, but many of the technologies for remediation will be similar to those for homes, including buffer zones, constructed wetlands and de-nitrifying pre-treatment technologies. Washington State, for example, has broadened a Farm Assist program developed in Wisconsin into a Home Assist program for both farmers and homeowners.

10. Lobby Congress on the Clean Water Act

The State would better achieve its goals of a realignment in wastewater treatment technologies and priorities if the following changes were made in the Clean Water Act reauthorization this year: provide additional federal resources for demonstration projects; enhance funding for State planning efforts; reallocate funds from the SRF pool into non-point programs; and provide for greater flexibility in enforcement and use of funds at the State level.

The Patriot Ledger

MARCH 6-8, 1992

Democrats pledge more funds for harbor

By Scott Allen
The Patriot Ledger

BOSTON — The four major Democratic presidential candidates have pledged to make the federal government pay half the \$8 billion cost of cleaning up Boston Harbor, according to a survey by the National Toxics Campaign.

"Paul (Tsongas) promises to raise the federal contribution to sewer projects to 50 percent," said Judy Shope, speaking for former Sen. Paul Tsongas at a waterfront press conference to publicize the survey results.

Staff members for the other Democrats — former Calif. Gov. Jerry Brown, Arkansas Gov. Bill Clinton and Iowa Sen. Tom Harkin — told the Toxics Campaign they support 50 percent federal funding for the Boston Harbor cleanup.

President Bush has said he would not support a 50 percent federal subsidy. So far, the Bush administration has chipped in only \$260 million to build the sewer system needed for the cleanup.

Republican candidate Pat Buchanan did not respond to the survey.

Toxics Campaign deputy director Ross Bluestein estimated that 50 percent funding for future harbor cleanup costs would amount to \$3.5 billion.

The Massachusetts Water Resources Authority has spent about \$1 billion on the job.

Such a federal subsidy would save families in the authority's service area about \$500 a year by the year 2000. Without the subsidy, the authority predicts family water bills will reach \$1,400 a year in 2000.

Now, at nearly \$600 a family annually, Boston area sewer and water rates are among the highest in the country.

Authority director Doug B. MacDonald said he was delighted to hear that the Democrats support additional money for the cleanup.

"There is a peace dividend, and spending it for environmental improvement and infrastructure investment is the best way to spend it," he said.

Consumer advocate Ralph Nader, whose name is on the Democratic primary ballot in Massachusetts next week, chided Bush for using dirty Boston Harbor as a campaign issue in the 1988 presidential election against former Gov. Michael Dukakis and then doing little about it.

"Massachusetts residents should get together and fill up quart bottles of diseased and contaminated water and send it to George Bush, so George Bush can reach out and touch Boston Harbor," Nader said at the news conference.

Bush requested \$100 million for the harbor

cleanup in his budget this year, bringing his total contribution to \$260 million, but Nader called that "peanuts" compared with the cost of the cleanup.

Nader said Los Angeles and other cities that have built sewer systems have received up to 75 percent federal funding, compared with less than 5 percent in Greater Boston.

Of course, the difference between Greater Boston and the other cities is that sewer officials here fought the federal law that finally forced the water authority to replace its archaic sewer system.

By the time Greater Boston's legal challenges ended in defeat in 1985, the federal program that helped pay for sewer projects had been phased out by President Reagan.

As a result, the 2.5 million households in the 61 towns and cities served by the water authority are responsible for about 85 percent of the cost.

Nader made no reference to his own campaign for president during his appearance on Long Wharf near the New England Aquarium, but audience members held up placards reading "Nader in '92."

Nader got two percent of the vote in the New Hampshire primary as a write-in.

Bay State reps try to cash in on harbor pledge

By NICK TATE

Bay State congressional leaders yesterday forwarded a letter to President-elect Clinton urging him to keep his campaign promise to increase federal funds for the Boston Harbor cleanup project to as much as 50 percent.

U.S. Rep. Edward J. Markey said the congressional delegation hopes to open a dialogue with Clinton and his transition team on the harbor cleanup, which under the Bush administration has received \$200 million in federal grants — covering only about 8 percent of the total costs for the ongoing \$6.3 billion project.

"I think Greater Boston has a tremendous opportunity in having Bill Clinton as president and we're trying to take full advantage of that," said Markey. "I'm doing everything I can to bring federal funding to Boston Harbor and to work with the administration to do that."

The letter — signed by U.S. Sens. John F. Kerry and Edward M. Kennedy and Reps. Markey, J. Joseph Moakley, Joseph P. Kennedy II and Chester G. Atkins — cites a vow Clinton made in March to Boston Harbor, advocates to boost funds for the project and to cover up to half the costs.

That promise, which was made in response to a candidates' survey by the Massachusetts Toxics Campaign, was reiterated last month by top Clinton environmental adviser Brett Hulsey, who told the Herald the president-elect has every intention of following through on his pledge.

Citing the Herald report, yesterday's letter noted Massachusetts Water Resources Authority rates are projected to double — to nearly \$1,200 a year — by the year 2000 because the MWRA's 2.5 million ratepayers are currently paying more than 90 percent of the costs for the massive cleanup effort.

The Boston Globe

WEDNESDAY, DECEMBER 9, 1992

Mass. seeks Clinton ear on harbor cleanup

Arguing that Boston area residents are drowning in water and sewer bills, six members of the Massachusetts congressional delegation appealed to President-elect Clinton yesterday to provide up to half the money for the \$6.1 billion cleanup of Boston Harbor.

The appeal, contained in a letter written by Rep. Ed Markey (D-Mass.), followed by one day the release of a report by a Boston-based lobbying group that called on the federal government to help pay for \$400-500 billion worth of local water

and sewer projects across the country.

"Water and sewer bills for Boston-area residents are now reported to be the highest in the nation — and rates are projected to double by the year 2000 to an average [annual] bill of \$1,200 per family," read the letter signed by Sens. Edward Kennedy and John Kerry and Reps. Chester Atkins, Joseph Kennedy 2d, J. Joseph Moakley and Markey.

The federally ordered cleanup requires the Massachusetts Water Resources Authority to build a new

sewage treatment system for its 2.2 million customers in Greater Boston. Currently, MWRA customers pay about 90 percent of the bills because President Reagan pulled out the federal sewer grant program in the mid-1980s.

Markey said the letter called on Clinton to fulfill promises one of his spokesmen made in recent published remarks. The spokesman, Bret Hulsey, was quoted as saying Clinton would support up to half funding for the Boston Harbor project.

SCOTT ALLEN

Feds 'to pay for up to half of Harbor cleanup'

By NICK TATE

A top environmental adviser to Bill Clinton says the president-elect intends to keep his campaign promise to boost federal funding for the \$6.3 billion Boston Harbor cleanup - as much as 50 percent of the total cost.

Brett Hulsey, Clinton's chief environmental spokesman, said Clinton will honor a little-noted vow he made in March to increase funds for the pro-

ject, and other federally mandated cleanup efforts, to cover up to half the cost. While he could not say

Turn to Page 4

Clinton aide says help on way for Harbor cleanup

From Page 1

exactly what the MWRA project stands to gain under Clinton, citing possible roadblocks in Congress, Hulsey said the new administration will work closely with the state's congressional delegation to come up with a funding plan that could produce significant rate relief for MWRA ratepayers.

"The governor is committed to cleaning up Boston Harbor and keeping his promises," said Hulsey, a Sierra Club director who joined the campaign in July. "Obviously, because this involves the appropriations process of Congress, it can't be done overnight."

"But he's going to work with Congress to keep his promise ... to clean up Boston Harbor and other polluted waters of the United States."

Hulsey's remarks will, no doubt, be welcome news to the Massachusetts Water Resources Authority - whose 2.5 million ratepayers now pay most of the MWRA project's bills - and environmentalists who have high expectations for Clinton's ability to deliver on anti-pollution programs.

MWRA residential water-sewer rates are currently among the nation's highest, averaging about \$35 per household in the 61-community district.

That figure is projected to at least double by the year 2000 in the absence of significant federal and state funds.

At present, MWRA ratepayers are paying for almost 95 percent of the costs for the project, which calls for \$6.3 billion in new waste-treatment and disposal facilities, and another \$1.9 billion in waterworks and infrastructure upgrades.

In the 1970s, up to 75 percent of the costs for similar projects around the country were paid by the federal government in funds appropriated under the Clean Water Act.

But over the past decade, the Reagan and Bush administrations reduced levels of federal funds available for such projects.

Hulsey said Clinton intends to get the federal government back into the business of funding cleanup efforts. Under-scoring a central theme of the campaign, he said Clinton aims to support initiatives that are both pro-environment and pro-jobs.

If Clinton follows through, MWRA officials said ratepayers could save between \$200 and \$300 a year in projected rate hikes over the next six years - based on projections the MWRA will spend \$2.4 billion on Harbor cleanup efforts over that time.

Since 1988, the agency has spent \$965 million on the project.

MWRA Executive Director Douglas MacDonald said he is hopeful about the prospects for increased federal funding.

"I think we are going to see an increase in the federal role; partly that's because we're going to have continued support from our delegation," he said, noting U.S. Rep. Gerry Studds (D-Cohasset) is in line to take over as chairman of the influential House Committee on Merchant Marine and Fisheries.

"We're talking with (members of the delegation) now about how we can make certain that the agenda item is defined for the Clinton transition team," he said.

Hulsey's remarks last week, made after confer-

\$1.25

41-35 Court de Hon England

November 15, 1992

Nov. 15, 1992



HELPING HAND: President-elect Bill Clinton, left inset, shares spotlight with Boston Mayor Raymond L. Flynn during a visit to the city earlier this year. An aide says Clinton is committed to boosting federal funding for the cleanup of Boston Harbor, above.

File photo

ring with Clinton advisers in Little Rock, follow a pledge the Arkansas governor made in March in a survey by the Massachusetts Toxics Campaign, an affiliate of the National Toxics Campaign Fund.

In that survey, Clinton said he supports 50 percent federal funding for the Harbor cleanup, and for similar projects, if elected president. President Bush - who twice vetoed funding for the Harbor in 1989-1990, then approved \$200 million for the project in 1991-1992 - refused to take a similar pledge.

Bush was criticized by Clinton aides and environ-

mentalists during the campaign for failing to approve more funding for the Harbor, which became a campaign issue in 1988, when the president toured it to embarrass Gov. Michael Dukakis.

On the four-year anniversary of that tour last September, U.S. Rep. Joseph P. Kennedy II lambasted Bush for opposing legislation filed by the Massachusetts delegation calling for \$1 billion in federal funds for the Harbor over a five-year period.

"He said that cleaning the Harbor was an urgent problem, and then he got elected and didn't say or do anything else about

Boston Harbor for the next two years, until it was time to start thinking about his 1992 re-election campaign," said Kennedy (D-Brighton), who chaired Clinton's Massachusetts campaign.

"What you've got in Bill Clinton," he said, "is (someone) saying he has a commitment to see Boston Harbor is going to be cleaned up."

Last week, Hulsey said many details have yet to be ironed out, but the most likely source for additional Harbor funding is Clinton's "Rebuild America" program, which proposes to funnel \$20 billion a year for five years into

public-works projects.

Monies may also be available through direct federal budget appropriations, sought by U.S. Sens. Ted Kennedy and John Kerry (D-Mass.) in years, or new authorizations under the Clean Water Act, which is slated for congressional revision next year.

"Obviously we're in a situation now, and I speak only from what he has promised in the past, what he has done and what his agenda has been," Hulsey added. "But I think, yes, we're going to work with (the state delegation) to forward and clean up Boston Harbor." □

Dominga Vega
85 Clark Ave.
Chelsea, MA 02150

February 7, 1994

To the Massachusetts Congressional Delegation
and To Whom It May Concern:

My husband and I have been residents of Chelsea for 35 years, after moving here from Puerto Rico. We worked hard to save money to raise a family and to buy two houses, which we now own. But now with the bad economy we have not been able to refinance our mortgage. We are on the verge of losing our properties. Living in Chelsea means that we have to pay higher home insurance rates than in most other places.

On top of all this, the water and sewer rates are making matters unbearable. Water and sewer cost so much that we are now having to decide whether to pay our mortgage bills or pay our water and sewer bills, because they are about the same. This is outrageous. How are working families to survive without losing everything they have worked so hard for over many, many years?

There is a very good chance that the MWRA will raise the rates another 19% or more in July. If this happens, there is no way we can pay this increase. We are planning on freezing our rates where they are now, which is already bad enough.

I am asking you to help the people of our community with the necessary federal funds which the Boston area deserves for the Boston Harbor cleanup. I ask you to help President Clinton honor the promise he made in 1992, while running for office, that if elected he would make sure the Boston Harbor cleanup got 50% federal funding. We are trying very hard to make President Clinton keep his promise, and I hope that you do too.

You don't know what it feels like to lie awake at night thinking that we may end up sleeping on the streets soon. Please help us.

I hope that you respond to this letter personally.

Sincerely,

Dominga Vega

Dominga Vega

February 7, 1994

To Whom It May Concern:

Dear representatives for the State of Massachussetts, the Chelsea Campaing For Fare Rates strongly urge you to help our state to lower the outrageous high water and sewer rates.

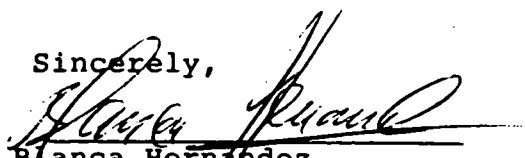
As middle class tax payers trying to make ends meet. Homeowners meet on a monthly basis to try to figure out what we can do to maintain our homes. I take this oportunity as the spokesperson to let you know that people have worked hard to buy a home or maybe buy another as profit, but with the economy at the present time it is not realistic. We can't have a profit because of the high costs of water, sewer, insurance, taxes, etc. we can't charge high rents because people cannot afford to pay the rents.

As homeowners we place our trust in you to figure how to help the citizens of Chelsea MA to help lower the rates for the water & sewer. Our city is small and the population is based mostly of low-income families or middle class trying to make ends meet.

In the mean time we have had several demonstrations in various cities who are having the same difficulty that we are and we stand firm to fight for what we have worked hard for. We have met with our Governor Weld, our representative, Thomas Birghmingham and Richard Voke. So far they are trying to figure out how can the cost go down.

We appreciate the time and effort that you will take to read this letter and any action that you will take to help control the outrageous high costs on water & sewer. Please respond to this letter.

Sincerely,


Blanca Hernandez
Chelsea Campaing For Fare
Rates.
Spokesperson

**CHELSEA CAMPAIGN FOR FAIR RATES ** CHELSEA COMMISSION
ON HISPANIC AFFAIRS ** MASSACHUSETTS TOXICS CAMPAIGN**

**PLEDGE TO FREEZE WATER AND SEWER
RATES**

- ** Ratepayers are paying 90% of the cost of the Boston Harbor cleanup.**
- ** \$2,000 annual water/sewer rates are expected within ten years, according to the Inspector General. Some families in Chelsea are already paying such high rates. Working families and people on fixed incomes face a choice: pay the mortgage or pay the water bill?**
- ** Citizen pressure, particularly from Chelsea residents, forced the Mass. Water Resources Authority (MWRA) to drop the rate increase this year from 19% to 6%, but this is only a temporary fix. Without a rate freeze rates could soon increase again by 19% or more.**
- ** Boston Acting Mayor Menino has already taken the first step to stabilize rates by freezing them at the current level. Chelsea City Hall should do the same.**
- ** The Chelsea Campaign for Fair Rates, the Chelsea Commission on Hispanic Affairs, and the Mass. Toxics Campaign are asking citizens to be willing to freeze their rates at the current level if there are any more rate increases after July 1, 1994. For Chelsea residents the rates are already much too high and must be lowered. We want you to join the citizens rate freeze campaign .**
- * (see other side for more details) ***

THE PLEDGE:

I, as a homeowner, am willing to join the water and sewer rate freeze campaign to keep my rates at the current level (established July 1, 1993). After July 1, 1994, when the new rates are set, I will consider paying no more than I pay now. I want this to be only the first step in lowering the rates from where they are now.

I, as a tenant, am willing to join the water and sewer rate freeze campaign.

Please keep this part with your water bill receipts. For more information contact: Chelsea Campaign for Fair Rates, phone - Blanca Hernandez (884-2625) or Dominga Vega (889-5070), or Tom Estabrook at the Mass. Toxics Campaign (787-9466).

Please sign, tear off or cut off, and send to the Massachusetts Toxics Campaign.

I, as a homeowner, am willing to join the water and sewer rate freeze campaign. After July 1, 1994, when the new rates are set, I will consider paying no more than I pay now. I want this to be only the first step in lowering the rates from where they are now.

I, as a tenant, am willing to join the water and sewer rate freeze campaign.

Signature

Date

I am a:

☐ Homeowner

☐ Tenant

Name (please print)

Street

City

ZIP

Phone

LONG-TERM WATER AND SEWER RATE RELIEF

Together, the Chelsea Campaign for Fair Rates, the Chelsea Commission on Hispanic Affairs and the Massachusetts Toxics Campaign (MTC) propose the following steps to win long-term rate relief.

1. Campaign to freeze water and sewer rates at the current level.

MTC is initiating a 10-month campaign to freeze the water and sewer rates. We are asking ratepayers to be willing to freeze their rates at the current level if there are any more rate increases after July 1, 1994. This means ratepayers are willing to pay no more on each quarterly bill after July 1, 1994 than they paid on the corresponding quarterly bill from the year before. A citizen rate freeze puts pressure on the MWRA to bring home 75% federal funding for Boston Harbor (which is the only long-term solution to bring relief to ratepayers), to end ratepayer subsidies for industrial polluters, and to come up with a meaningful new payment plan which includes a rate freeze for all MWRA communities.

Citizens from each community will take signed pledge cards to their local government to get them to consider instituting a municipal rate freeze, as Boston Acting Mayor Menino has done. When enough communities freeze the rates the MWRA will get the message and take action.

2. Continued citizen pressure for 75% federal funding and significant state funding for the Boston Harbor cleanup.

Despite recent citizen pressure, particularly from Chelsea residents, the federal government has done very little to bring rate relief to Boston area ratepayers. The Clinton Administration has appropriated only \$100 million for the \$6 billion Boston Harbor cleanup, leaving the ratepayers to pay over 90% of the cost. President Clinton backed away from a promise he made to the Mass. Toxics Campaign during the 1992 election campaign that, if elected, he would commit 50% federal funding to the Boston Harbor cleanup. Citizen pressure on the federal and state governments must continue.

3. Industrial polluters of Boston Harbor pay their fair share.

Until now, ratepayers have been subsidizing businesses who dump toxic chemical waste into the public sewer system and Boston Harbor. The Mass. Toxics Campaign has pushed the MWRA over the past 4 years to adopt a fee system that would make businesses discharging toxic chemical waste into Boston Harbor to pay for what they dump, would provide a small savings to ratepayers, and would make industry finally pay its fair share.

Please
put stamp
here

**Massachusetts Toxics Campaign
1105 Commonwealth Ave., #203
Boston, MA 02215**

MASSACHUSETTS TOXICS CAMPAIGN PLEDGE TO FREEZE WATER AND SEWER RATES

- ** Ratepayers are paying 90% of the cost of the Boston Harbor cleanup.
- ** \$2,000 annual water/sewer rates are expected within ten years, according to the Inspector General. Working families and people on fixed incomes face a choice: pay the mortgage or pay the water bill?
- ** Citizen pressure forced the Mass. Water Resources Authority (MWRA) to drop the rate increase this year from 19% to 6%, but this is only a temporary fix. Without a rate freeze rates could soon increase again by 19% or more.
- ** Boston Acting Mayor Menino has already taken the first step to stabilize rates by freezing them at the current level.
- ** The Massachusetts Toxics Campaign is asking citizens to be willing to freeze their rates at the current level if there are any more rate increases after July 1, 1994. We want you to join the citizens rate freeze campaign . * (see other side for more details) *

THE PLEDGE:

I, as a homeowner, am willing to join the water and sewer rate freeze campaign to keep my rates at the current level (established July 1, 1993). After July 1, 1994, when the new rates are set, I will consider paying no more after than I pay now.

I, as a tenant, am willing to join the water and sewer rate freeze campaign.

Please keep this part with your water bill receipts.

For more information call: Massachusetts Toxics Campaign, 1105 Commonwealth Ave., #203,
Boston, MA 02215, phone - (617) 787-9466

Please sign, tear off or cut off, and send to the Mass. Toxics Campaign.

I, as a homeowner, am willing to join the water and sewer rate freeze campaign. After July 1, 1994, when the new rates are set, I will consider paying no more than I pay now.

I, as a tenant, am willing to join the water and sewer rate freeze campaign.

_____ Signature		_____ Date		I am a:	
				☐ Homeowner	
				☐ Tenant	
_____ Name (please print)					
_____ Street	_____ City	_____ ZIP	_____ Phone		

LONG-TERM WATER/SEWER RATE RELIEF

The Massachusetts Toxics Campaign (MTC) is a grassroots organization which has been working with thousands of citizens over the past several years to pressure the federal and state governments for long-term water/sewer rate relief. MTC proposes the following steps to win long-term rate relief.

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Please
put stamp
here

**Massachusetts Toxics Campaign
1105 Commonwealth Ave., #203
Boston, MA 02215**



Town Council

TOWN OF WATERTOWN

ADMINISTRATION BUILDING • WATERTOWN, MA 02172

(617) 972-6470 • FAX (617) 972-6403

PAUL DENNING
DISTRICT B

February 7, 1994

Massachusetts Congressional Delegation
United States Congress
Washington, D.C.

Dear Representative/Senator:

Watertown homeowners are hurting. Water and sewer bills are high enough to make the Mass. Water Resource Authority seem like a partner in one's personal finances. Many are considering selling their homes. We must have relief!

As a municipal representative, I hear first hand what the skyrocketing cost of water and sewer rates have done to working people and senior citizens with fixed incomes. A recent incident is a widowed working mother whose bill has reached the \$3,000 per year mark. She had to take out a personal loan from her credit union to pay her water bill. This is outrageous!

Everyone agrees we must clean up Boston Harbor. However, for a \$9 billion project to be funded by 60 cities and towns is discriminatory. It was not the choice of those now living in MWRA communities like Watertown to use Boston Harbor to dump sewage. The harbor provides a port which is open to worldwide commerce benefitting all of the United States. The entire country will benefit from its clean up. The cost must be shared.

The state of Massachusetts will provide \$30 million for the project this year, the federal government \$100 million. This is not nearly enough. Over 90% of the project is funded by ratepayers. I urge you to file legislation requiring 75% of the project be funded federally, 15% by the state and 10% by ratepayers.

It is only a matter of time before people lose their homes. Please change this unfair policy.

Sincerely,

Paul Denning
Vice President of the Council

Boston Sunday Globe

NORTH WEEKLY

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JANUARY 23, 1994

\$258m sewer bill is about to fall

**Lack of federal aid forces local ratepayers
to bear brunt of cleanup costs for Salem Sound**

By John Laidler
SPECIAL TO THE GLOBE

The South Essex Sewerage District board is expected to formally propose this week a plan recommending how the \$258 million costs of cleaning up Salem Sound should be divided among its five communities.

The proposal, which would be submitted to the South Essex communities, offers the first official glimpse of the staggering costs the federally mandated project are expected to impose on the district's

"can reasonably expect their rates to rise over 1990 levels, "and some communities are going to go up a lot more." In Salem, Ch. Quigley, public services director, said the average annual homeowner bill, now \$250, could rise to \$1,200 by 1997.

In the Massachusetts Water Resources Authority district, which serves 60 cities and towns, which are North Weekly communities, average combined water and sewer bills have risen from \$125 in fiscal 1990 to \$557 this year. By 1999, they are projected to rise to \$1,000, said spokesman Paul DiNatale.

**'Local towns
and ratepayers
can't afford the
shock of this.'**

RAY GAGNE

PHOTOCOPY
PRESERVATION

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The proposal, which would be submitted to the South Essex communities, offers the first official glimpse of the staggering costs the federally mandated project are expected to impose on the district's cities and towns in the absence of significant state or federal aid.

Under the proposed apportionment plan, approximate charges to communities would be: Peabody, \$87.5 million; Salem, \$65 million; Beverly, \$50 million; Danvers, \$30 million and Marblehead, \$20 million. The commonwealth would owe \$4 million, Essex County \$800,000 and Middleton about \$500,000 — all three purchase some South Essex services.

The figures do not include added costs to the five communities of funding \$43 million in other capital projects the district must carry out over the next few years.

Andrew Sims, executive director of South Essex, said ratepayers in all five communities

"can reasonably expect their rates to triple" over 1990 levels, "and some communities are going to go up a lot more." In Salem, Charles Quigley, public services director, said the average annual homeowner bill, now \$250-\$300, could rise to \$1,200 by 1997.

In the Massachusetts Water Resources Authority district, which serves 60 cities and towns, 11 of which are North Weekly communities, average combined water and sewer bills have risen from \$125 in fiscal 1985 to \$557 this year. By fiscal 1999, they are projected to rise to \$1,000, said spokesman Paul DiNatale.

The MWRA rates are soaring because the authority is carrying out the \$4.3 billion dollar Boston harbor cleanup project.

Next month, the South Essex district will advertise bids for the cleanup project, whose prime feature is construction of a secondary treatment plant alongside the district's existing primary plant at Cat Cove. Site preparation is already under way, with construction set to begin in July, and completion slated for 1997.

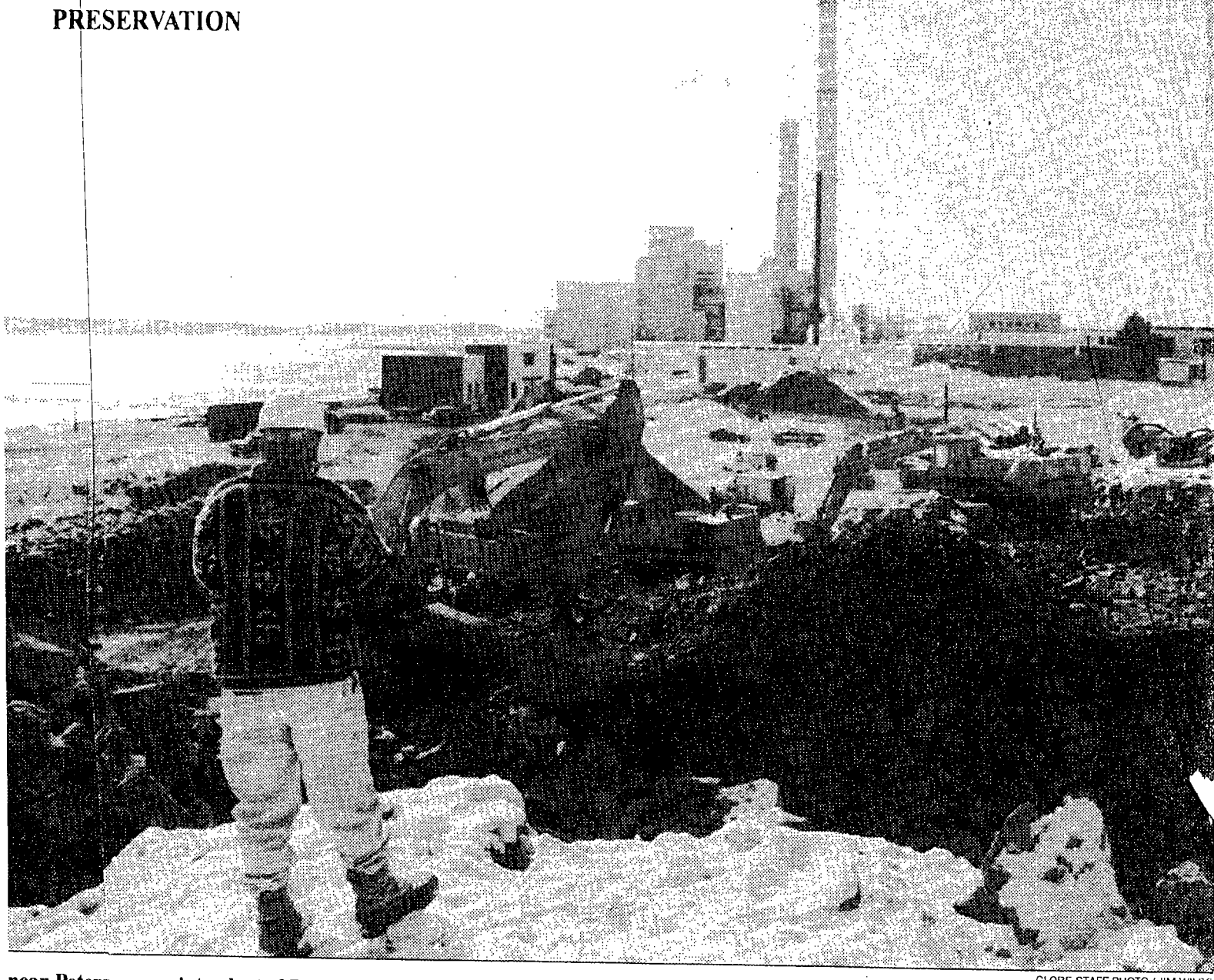
The project is expected to result over time in a significant improvement to the quality of Salem Sound, whose legacy as a dumping ground for factory waste has led to it being rated among the filthiest bodies of water in the

DISTRICT, Page 7

'Local towns and ratepayers can't afford the shock of this.'

RAY GAGNE
Director, Essex County
Community Organization

PHOTOCOPY
PRESERVATION

PHOTOCOPY
PRESERVATION

GLOBE STAFF PHOTO / JIM WILSON

nean Petersn, superintendent of D and C Construction, watches excavation proceedings at the Salem site of what will be a secondary treatment plant operated by the South Essex Sewerage District.

Water ratepayers face increase

DISTRICT
Continued from Page 1

ion. But officials concede the
nup comes at a price for the dis-
and its 170,000 residents.

Until 1987, the federal govern-
t reimbursed sewer districts for
to 75 percent of the costs of
te-water treatment projects
dated under the 1972 Clean Wa-
Act, with states kicking in addi-

ganization, an anti-poverty agency.
"People don't have that much money
to spend as it is."

Robert Bradford, president of
the North Shore Chamber of Com-
merce, said the rate hikes would
hurt the region's economy, forcing
businesses to not only pay higher
fees themselves, but to absorb a loss
in sales from consumers who have
less money to spend.

Local officials say they share the

The district initially was granted
a waiver by the federal Environmen-
tal Protection Agency, but that waiver
was later rescinded. Throughout
the 1980s, South Essex appealed the
decision even as the district pre-
pared for the possibility of second-
ary treatment. The issue was
brought to a head, however, when
the EPA sued the district to force
compliance with the secondary treat-
ment standards. The suit resulted in

The project includes construction
of the new secondary plant, which
will include facilities that will allow
bacteria to feed on sewage flowing
from the primary plant.

Also included in the project costs
are the retrofitting of the primary
plant, purchase of air rights at the
Peabody landfill - for use as a
backup sludge disposal site - and
purchase of property for a buffer

the female, usually in March. If the female merely flies past the proposed nest, it's over - a no thank you, he said. But if she decides to check the place out, it usually results in nest-building and mating.

Aliberti, with the help of the Winthrop Conservation Commission, Department of Public Works, Friends of Belle Isle Marsh, the Massachusetts Audubon Society and the Brookline Bird Club, has erected kestrel boxes and swallow homes that require constant attention.

"If a kestrel sees that a house has been occupied by another bird, even though the kestrel is dominant, it would not nest where another bird has nested."



Kestrel

Robert Buchsbaum, coast ecologist for Massachusetts Audubon North Shore, said that the project, combined with other developments, including better industry pretreatment of sewage, offer hope that Salem Sound can begin to turn around its legacy of pollution.

Officials warn, however, that without federal or state relief, the project will leave another imprint on financial hardship. "What we have Scanlon said, "is mandated character without any means to pay."

Peabody landfill - for use as a backup sludge disposal site - a purchase of property for a bull dog, including 13 homes on Peabody Avenue and the site of the state-owned Cat Cove Marine Laboratory. Costs also include \$6 million paid to Peabody and \$2.5 million to Peabody for being host community.

Officials and environmental advocates agree that the project will offer significant benefits to the environment. The current primary plant treats about 28.5 million gallons of sewage a day, removing just 60-62 percent of solids and about 22-24 percent of the "biological oxygen demand," the amount of oxygen consumed by organic material in the sewage. The more oxygen consumed by the sewage, the less that is available in the sound to support marine life. The new secondary treatment plant should eventually remove 90 percent of the solids and 90 percent of the biological oxygen demand.

primary treatment. The issue was brought to a head, however, when the EPA sued the district to force compliance with the secondary treatment standards. The suit resulted in a 1991 agreement under which South Essex pledged to build a secondary

businesses, but to only pay higher fees themselves, not to absorb a loss in sales from consumers who have less money to spend.

"I think this is one problem that ratepayers clearly cannot be solved at the local level," said Scanlon. "The danger exists that some households are going to have their water and sewer bills exceed their real estate taxes. We are going to have many people hang-

ing by their opponents.

"You can't spend \$200 million or derived by the federal government and not expect that to have a major impact," said Peabody Mayor Peter Torfigian. "To expect people to pick up that kind of tab to clean the harbor for the whole world is not fair." So far, the only promise of out-

side assistance South Essex has received for its project is a \$29 million low-interest loan from a state revolving loan program that is funded partly by the federal government, and \$135,000 through a new \$30 million state grant program initiated to help districts ease high water and sewer rates. South Essex was eligible for only a small grant from that fund because it will not begin major borrowing for the project until later this year.

Mass.), and state lawmakers say they plan to lobby for additional funding for the district. Sims said this year will be an important one for such lobbying because legislation to reauthorize the Clean Water Act is under consideration. "That's where the battle is going to be fought," he said of the effort to win more federal assistance for mandated sewer projects.

waste-water treatment projects mandated under the 1972 Clean Water Act, with states taking in additional funds. But those grants were discontinued in favor of a state-run limited help to districts still faced with mandated project. That has left ratepayers to pick up the tab. Estimates by district officials last

"This is going to affect everyone who takes a drink of water. Flushes a toilet, whether a homeowner, business owner or renter," said Beverly

The district earlier this year said Mayor William Scanlon said by 1997, the year secondary treatment is set to begin, the figure will rise to \$1,300.

Officials in the affected communities offered somewhat more conservative figures last week. But rates will depend not only on the added charges from South Essex, but on factors such as expenditure each community must make to maintain its own water and sewer line, and how much, if any, of the new costs communities choose to fund through taxes. Beverly and Salem, for instance, now subsidize a portion of their sewer and water costs through

the tax rate. Beverly Public Works Commissioner George Zambouras estimated that combined annual water and sewer fees for an average household in the city, which he estimated at \$365, would jump to \$1,000 within the next few years. In Danvers, Town Manager Wayne Marquis said the average water and sewer bill for the town, now \$435, would rise to \$894. Marblehead Water and Sewer

Commissioner Dana Shaw said the average household in town pays \$444 in combined annual water and sewer fees. He estimated the figure would rise to \$1,000. Outgoing Peabody Public Services Director John Seftes said the average homeowner bill in that city was \$387, he said it could rise to \$900.

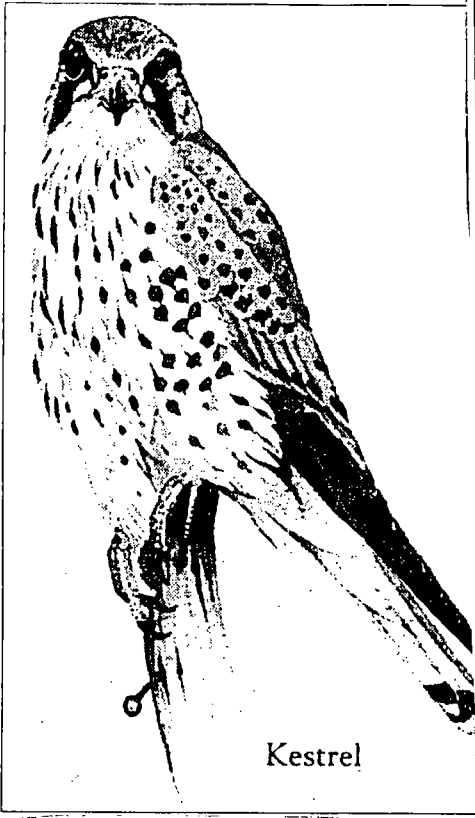
While the full impact of those increases has yet to be felt, those who advocate for residents and businesses have begun to warn about the severe hardship they will cause. "Local towns and ratepayers can't afford the shock of this," said Ray Gagne, director of the Peabody

rels home to roosts

female, usually in ch. If the female ely flies past the prod nest, it's over - a thank you, he said. it she decides to k the place out, it lly results in nest- and mating.

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Kestrel

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Essex pledged to build a secondary plant. which is why they plan an offensive state funding to ease the burden on ratepayers. "I think this is one problem that clearly cannot be solved at the local level," said Scanton. "The danger ex- ceeds their real estate taxes. We are going to have many people hang- ing by their fingernails."

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US Rep. Peter G. Torkildsen (R-Mass.), and state lawmakers say they plan to lobby for additional funding for the district. Sims said this year will be an important one for such lobbying because legislation to reauthorize the Clean Water Act is under consideration. "That's where the battle is going to be fought," he said of the effort to win more federal assistance for mandated sewer pro- jects.

The trail that led South Essex to is pending rate shock began with the passage of the federal Clean Wa- ter Act in 1972, which set discharge standards for sewer systems. To comply, the district sought built a primary treatment plant in the mid- 1970s, while at the same time apply- ing for a waiver from the require- ment that it build a secondary plant to provide more extensive sewage treatment.

While the full impact of those in- creases has yet to be felt, those who advocate for residents and busi- nesses have begun to warn about the se- vere hardship they will cause. "Local towns and ratepayers can't afford the shock of this," said Ray Gagne, director of the Peabody- based Essex County Community Or-

discontinued in favor of a state-run loan program that provides only limited help to districts still faced with mandated projects. That has left ratepayers to pick up the tab. Estimates by district officials last week suggest that increases facing district ratepayers will be every bit as severe as those the have hit homeowners and businesses in the MWRA district.

"This is going to affect everyone who takes a drink of water or flushes a toilet, whether a homeowner, busi- ness owner or renter," said Beverly Mayor William Scanton.

The district earlier this year said that the average combined water and sewer rate for homeowners in the five communities was \$400. It said by 1997, the year secondary treatment is set to begin, the figure will rise to \$1,300.

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RATE EQUITY ALLIANCE

P. O. Box 64
Arlington, MA 02174

Douglas J. Howard
Executive Director

(617) 643-4755

To: The Massachusetts Congressional Delegation

Dear Senators & Members of Congress:

In anticipation of our meeting regarding water/sewer rates on Wednesday, February 9, 1994, I want you to know something about the socio-economic and political dynamics occurring back in the district.

Most of you have your political beginnings in the Massachusetts Great & General Court wherein some of you had a hand in the creation of the Massachusetts Water Resource Authority. So it is not unreasonable to expect that you understand that there is something systemically adrift in the way that the delivery of clean water and wastewater services have evolved in the effected 43 MWRA Cities & Towns. It is also not unreasonable to expect that you understand that a solution to our problem rests with understanding the problem, and that is the purpose of our visit today.

Listed below are concerns that need to be addressed:

- Federal mandates without funding
- Local flexibility in EPA cleanwater standards and Clean Water Act interpretation (ie, Integrated Coastal Management approach)
- Shutting Water off in peoples homes
- The history of public authorities in Massachusetts
- The longer term agenda of the Massachusetts Water Resource Authority.
- Federal & state political support of cost savings associated with alternative wastewater treatment technologies
- ✓ - The lack of adequate fiscal & technical oversight over MWRA activities (perhaps Citizen Utility Boards, ala Ralph Nader)

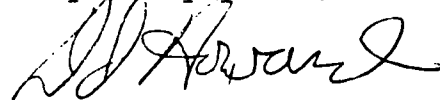
- The "don't touch it" syndrome (no state or federal political leadership)
- The awesome accumulation of debt service foisted upon the local cities & towns
- The absence "real" incentives for water conservation (only at the local level)
- ✓ - The temptation to pad water/sewer costs by the cities & towns (abuse of the enterprise funds)
- ✓ - A knee-jerk reaction by the Massachusetts legislature in shifting MWRA debt service to the real estate tax base
- The negative impact on the cost of doing business in the MWRA district
- The danger of a highly negative impact on the local real estate market
- Unclear numbers of unemployed and underemployed
- The vast majority of the ratepayers simply cannot afford this project

The solution requires your participation together with the Massachusetts legislature, the environmental protection community, the scientific & engineering sector, the EPA, citizen activists and others.

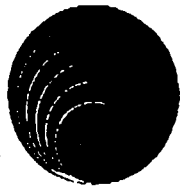
You are invited to continue this meeting back in the district at the Integrated Coastal Management Symposium scheduled for Thursday & Friday, March 24th & 25th at the Massachusetts Bay Marine Studies Consortium, University of Massachusetts, Boston.

An ad hoc working group of the interested parties will be formed to facilitate a forum with the purpose of reporting its findings at the Symposium to the participants and the ratepayers.

Very truly yours,



Douglas J. Howard



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FAX COVER SHEET

TO : Doug Howard

FAX # : 643-4755

FROM : Roger Stern

NUMBER OF PAGES: 11 (Including Cover Page)

DATE : 2/7/94

COMMENTS :

IF ALL PAGES ARE NOT RECEIVED, PLEASE CALL:

(617) 287-6540

draft agenda

Ninth Annual Boston Harbor/Massachusetts Bay Symposium
March 24-25, JFK Library, Boston

INTEGRATING COASTAL MANAGEMENT

In response to crises in coastal wastewater management in Boston and around the country, Congress commissioned the National Research Committee to study ecological and engineering solutions to reverse the decline of coastal waters. The NRC found that current laws and regulatory practices have failed to protect coastal ecosystems. The NRC recommends a model called Integrated Coastal Management that would allocate our limited pollution control resources according to severity of the various pollutants degrading local watersheds. Integrated Coastal Management would shift away command/control strategies of the past in favor of more flexible solutions generated at the state and local level. This year's Symposium will challenge us to consider if Integrated Coastal Management can work in Massachusetts. Assisting us will be distinguished guests US First Circuit Court of Appeals Judge Stephen Breyer, and authors of the National Research Committee wastewater study John Boland and William Eichbaum.

8:00-9:00am Registration & Continental Breakfast

9:00-10:15am **Invited Scientific Papers:** New research on inshore oceanography, economics, public health and coastal policy. Presenters to be chosen competitively. Dr. Joseph Cooney, Chair, Environmental Sciences Program, University of Massachusetts - Boston Moderator

10:15-10:30 Break and refreshments

10:30am-12:00pm Keynote Addresses

Honorable Stephen Breyer, US First Circuit Court of Appeals. Judge Breyer is author of *Breaking the Vicious Circle*, a critique of governmental risk regulation. He will provide an overview of the general problems facing legislators, regulators and the courts in regulating environmental threats. **John Boland**, Johns Hopkins University. Dr. Boland is the chair of the National Research Committee's study, Managing Wastewater in Coastal Urban Areas. He will discuss the Committee's recommendations for priority-based pollution control methods.

12:00-1:15pm Legal Sea Foods Buffet Lunch & concurrent Scientific Poster Session

1:15-2:30pm **Pollution control priorities - what should we fix first?** New research has implicated an array of pollution sources in the decline of coastal

ecosystems. But are these sources the ones we regulate? Scientists will discuss how our pollution control efforts might be optimized, challenging senior environmental officials on the next panel to respond. Dr. John Boland, Moderator
Dr. Bernie Gardner, University of Massachusetts - Boston
Dr. Judy Peterson Massachusetts Office of Coastal Zone Management, Boston
Dr. Charles Menzie, Menzie-Cura Associates, Chelmsford
Dr. Ivan Valiela, Boston University Marine Program, Woods Hole

2:30-2:45pm Break and refreshments

2:45-4:00pm Can regulation match reality? Some pollution sources are heavily regulated, some sources not at all. These senior policymakers will explore how we might tackle pollution priorities in an integrated coastal management scheme. Mr. William Eichsbaum, World Wildlife Fund, Moderator. Mr. Eichbaum is Senior Vice-President of the World Wildlife Fund and a member of the National Research Committee study

Ms. Trudy Cox, Secretary, Massachusetts Executive Office of Environmental Affairs, Boston

Ms. Arlene O'Donnell, Deputy Commissioner, Massachusetts Department of Environmental Protection, Boston

Mr. Peter Shelley, Chief Counsel, Conservation Law Foundation, Boston

5:00pm The JFK Library must be cleared.

Day 2

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10:15-10:30am Break and refreshments

10:30-11:45am US Clean Water Act Re-Authorization

The Clean Water Act drives our pollution control regulation and engineering. As of this writing, national environmental organizations have opposed all bills to re-authorize. Why? What are New England's priorities for the next Clean Water Act? Mr. Dan Ashe, US House of Representatives Merchant Marine and Fisheries Committee, Washington.

Dr. Valerie Nelson, Citizens for Alternative Wastewater Treatment and City Councilor, Gloucester.

Mr. Kurt Spalding, Executive Director, Save the Bay, Providence.

11:45am-1:15pm Lunch and Scientific Poster Session

1:15-2:00pm Tales of Towns and Cities

Not all environmental stories have unhappy endings. In Baltimore, a program of urban forestry designed by Yale's Urban Resources Institute is mitigating impacts from combined sewer overflows. Around Plum Island Sound Mass Audubon has combined a program of monitoring and education that brings together citizens, elected officials and environmental organizations to protect this pristine estuary. In Plymouth, citizens have prevailed in an effort to amend a consent decree for wastewater facilities to include alternative technologies.

Dr. Robert Buchsbaum & Andrea Cooper, Massachusetts Audubon Society,
Wenham

Leigh Shemitz, Yale School of Forestry, New Haven

Mr. Lothrop Withington, Plymouth First

**2:00-3:00pm POSSIBLE PERIOD FOR ADDRESSES BY CONGRESSIONAL
DELEGATION**

**Executive Office for Administration & Finance
Department of Revenue**

State Appropriation: Direct

**1231-0111 EMPLOYEE INSURANCE CONTRIBUTIONS
STUDY**

Projected	Recommended	Pro Forma
FY 1994	FY 1995	FY 1996
75	0	0

in thousands (\$000)

FY 1995 Program Description

Account 1231-0111 funds a study about pre-tax employee health insurance contributions. This is a one-time Fiscal Year 1994 expenditure.

State Appropriation: Direct

1231-1000 WATER AND SEWER RATE RELIEF PAYMENTS

Projected	Recommended	Pro Forma
FY 1994	FY 1995	FY 1996
21,000	40,000	50,000

in thousands (\$000)

FY 1995 Program Description

Account 1231-1000 funds rate relief for customers of the Massachusetts Water Resources Authority and other water districts.

Line Item Language

1231-1000 For the rate relief fund component of the local services program

..... \$40,000,000

Local Aid Fund 100.00 %

State Appropriation: Direct

**1233-2000 TAX REIMBURSEMENTS FOR DISABLED
VETERANS**

Projected	Recommended	Pro Forma
FY 1994	FY 1995	FY 1996
5,200	5,200	5,200

in thousands (\$000)

FY 1995 Program Description

Account 1233-2000 funds reimbursements paid to municipalities for property tax exemptions granted to disabled veterans.

Line Item Language

1233-2000 For the tax abatements program; provided, that cities and towns shall be reimbursed for abatements granted pursuant to clauses seventeen, twenty-two A, twenty-two B, twenty-two C, twenty-two E, and thirty-seven of section five of chapter fifty-nine of the General Laws

..... \$5,200,000

Local Aid Fund 100.00 %



M.W.R.A. Coalition Platform

1. We are **all** paying too much for water and sewer rates from the M.W.R.A. We are paying the **highest** rates in the United States.
2. We agree the Federal Government should pay 75%, the State Government 15%, and the local ratepayers 10%.
3. We agree that the industrial polluters should pay their fair share of the Harbor Cleanup.
4. We agree that the rates should be based on **actual use** and everyone should pay the same rate.

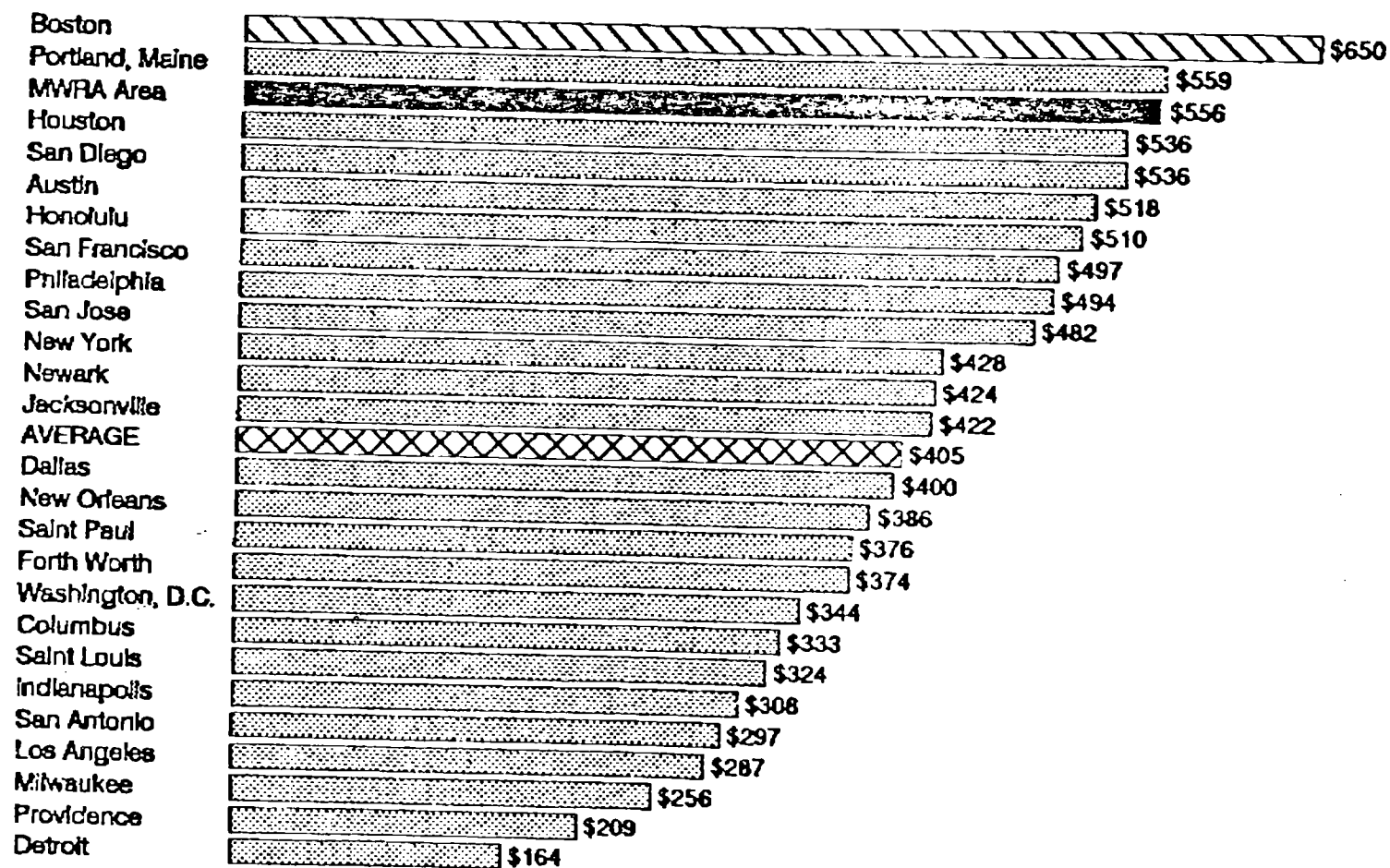
Combined Water/Sewer Charges USA

	A	B	C	D
1	Rank	Municipality	Combined Charges \$	Population
2				
3	1	Westwood, MA	\$954.64	12,557
4	2	Wilmington, MA	\$819.60	17,651
5	3	King Co., WA W&S Dist 107	\$801.34	8,500
6	4	Coupeville, WA	\$765.00	1,377
7	5	Stoughton, MA	\$736.22	26,777
8	6	Medford, WI	\$731.82	1,960
9	7	Friday Harbor, WA	\$726.26	1,492
10	8	Weymouth, MA	\$723.00	54,063
11	9	Germantown, WI	\$718.12	634
12	10	Winthrop, MA	\$715.20	18,127
13	11	Dedham, MA	\$710.26	23,782
14	12	Bedford, MA	\$708.00	12,996
15	13	Reading, MA	\$702.00	22,539
16	14	Winchester, MA	\$692.40	20,267
17	15	Hingham, MA	\$690.36	19,821
18	16	Chelsea, MA	\$690.00	28,710
19	17	Duvall, WA	\$685.59	2,770
20	18	Arlington, MA	\$678.00	44,630
21	19	Columbus, WI	\$670.71	4,083
22	20	New Berlin, WI	\$668.03	33,592
23	21	Melrose, MA	\$662.16	28,150
24	22	Mequon, WI	\$655.69	18,900
25	23	Mukwango, WI	\$652.01	5,974
26	24	Walpole, MA	\$647.46	20,212
27	25	Muskego, WI	\$647.27	16,813
28	26	Belmont, MA	\$640.80	24,720
29	27	Hartland, WI	\$641.54	770
30	28	Milton, MA	\$630.40	25,725
31	29	Elkhorn, WI	\$630.75	5,349
32	30	Chehalis, WA	\$628.07	6,527
33	31	Mayville, WI	\$622.15	4,374
34	32	Sturgeon Bay, WI	\$620.55	865
35	33	Elk Ridge, UT	\$617.43	749
36	34	Green River, UT	\$616.92	881
37	35	Ashland, WI	\$608.08	558
38	36	Lake Mills, WI	\$607.48	4,143
39				
40				
41			Total Population	521,038
42			MWRA Population	400,727
43			Top 20 less MWRA	120,311
44			% of Top 20 pop in MWRA	76.91
45				

TOWN	MWRA SEWER CHARGE	MWRA TOTAL COST ALLOCATION	COST ALLOCATION ON FLOW	PROJECTED (OVER UNDER CHARGE
ARLINGTON	\$4,779,007	\$168,154,263	\$101,763,003	(\$66,391,260)
ASHLAND	\$1,050,960	\$36,979,106	\$16,960,500	(\$20,018,605)
BEDFORD	\$1,780,932	\$62,663,919	\$51,509,668	(\$11,154,251)
BELMONT	\$2,658,927	\$93,557,074	\$76,008,169	(\$17,548,905)
BOSTON	\$69,183,441	\$2,434,290,334	\$3,004,311,860	\$570,021,526
BRAINTREE	\$3,656,640	\$128,662,629	\$146,153,448	\$17,490,819
BROOKLINE	\$5,854,587	\$205,999,649	\$144,897,115	(\$61,102,534)
BURLINGTON	\$2,579,828	\$90,773,894	\$77,473,891	(\$13,300,003)
CAMBRIDGE	\$11,997,580	\$422,147,158	\$520,540,792	\$98,393,634
CANTON	\$1,779,355	\$62,608,431	\$52,137,835	(\$10,470,596)
CHELSEA	\$3,108,858	\$109,388,358	\$103,228,725	(\$6,159,632)
DEDHAM	\$2,473,286	\$87,025,105	\$132,752,559	\$45,727,454
EVERETT	\$3,905,967	\$137,435,455	\$128,983,559	(\$8,451,896)
FRAMINGHAM	\$7,133,415	\$250,996,524	\$180,283,838	(\$70,712,685)
HINGHAM	\$597,750	\$21,032,447	\$23,032,778	\$2,000,332
HOLBROOK	\$935,611	\$32,920,433	\$17,588,667	(\$15,331,766)
LEXINGTON	\$3,062,296	\$107,750,026	\$145,315,893	\$37,565,867
MALDEN	\$5,785,999	\$203,586,310	\$143,012,615	(\$60,573,695)
MEDFORD	\$6,214,525	\$218,664,436	\$196,406,783	(\$22,257,653)
MELROSE	\$3,037,058	\$106,862,001	\$102,181,781	(\$4,680,220)
MILTON	\$2,689,845	\$94,644,955	\$95,271,947	\$626,992
NATICK	\$3,201,992	\$112,665,373	\$61,560,335	(\$51,105,038)
NEEDHAM	\$2,930,600	\$103,116,167	\$91,502,947	(\$11,613,220)
NEWTON	\$9,258,973	\$325,786,462	\$364,336,677	\$38,550,215
NORWOOD	\$3,216,320	\$113,169,518	\$101,763,003	(\$11,406,515)
QUINCY	\$9,303,672	\$327,359,242	\$282,046,841	(\$45,312,401)
RANDOLPH	\$3,167,364	\$111,446,951	\$71,192,224	(\$40,254,727)
READING	\$2,398,185	\$84,382,599	\$48,787,612	(\$35,594,987)
REVERE	\$4,563,233	\$160,562,034	\$127,727,226	(\$32,834,808)
SOMERVILLE	\$8,192,827	\$288,273,022	\$180,493,227	(\$107,779,794)
STONEHAM	\$2,396,999	\$84,340,868	\$89,618,447	\$5,277,578
STOUGHTON	\$2,384,004	\$83,883,626	\$50,672,113	(\$33,211,514)
WAKEFIELD	\$2,626,656	\$92,421,586	\$88,990,280	(\$3,431,305)
WALPOLE	\$1,849,429	\$65,074,056	\$45,018,612	(\$20,055,444)
WALTHAM	\$6,946,194	\$244,408,961	\$187,403,061	(\$57,005,900)
WATERTOWN	\$3,600,382	\$126,683,134	\$101,134,836	(\$25,548,298)
WELLESLEY	\$2,785,696	\$98,017,571	\$88,780,891	(\$9,236,680)
WESTWOOD	\$1,193,139	\$41,981,820	\$33,502,223	(\$8,479,596)
WEYMOUTH	\$5,603,236	\$197,155,606	\$104,694,447	(\$92,461,159)
WILMINGTON	\$1,270,854	\$44,716,302	\$26,173,612	(\$18,542,690)
WINCHESTER	\$2,179,512	\$76,688,365	\$94,225,003	\$17,536,637
WINTHROP	\$1,944,312	\$68,412,612	\$141,965,671	\$73,553,059
WOBURN	\$4,925,581	\$173,311,620	\$258,595,285	\$85,283,665
TOTAL	\$230,205,027	\$8,100,000,000	\$8,100,000,000	

COST BASED ON ~~8~~ \$8,100,000,000 PROJECT

COMPARATIVE CHART OF RESIDENTIAL COMBINED WATER AND SEWER ANNUAL COSTS



Source: MWRA Advisory Board 1993 Water & Sewer Retail Rate Survey
 Costs based on annual water consumption of 12,000 cubic feet (approximately 90,000 gallons) - rounded to the whole dollar.

Burlington • Ashland • Bedford • Belmont • Boston • Braintree • Brookline
Dorham • Everett • Framingham • Hingham • Holbrook • Leominster
Malden • Melrose • Milton • Nahant • Natick • Needham • Newton
Revere • Saugus • Somerville • South Hadley • Southborough • Stoneham
Watertown • Wellesley • Weston • Westwood • Weymouth • Wilbraham



Burlington • Cambridge • Canton • Chelsea • Chicopee • Clinton
Lexington • Lynn • Lynnfield • Malden • Marblehead • Marlborough
Northborough • Norwood • Peabody • Quincy • Randolph • Reading
Stoughton • Swampscott • Wakefield • Walpole • Waltham
Wilmington • Winchester • Winthrop • Woburn • Worcester

January 25, 1994

MEMORANDUM

To: Advisory Board Finance Contacts
From: Barbara Gottschalk, Vice Chairman for Finance
Subject: Agenda for February 2, 1994 Finance Committee Meeting

The next meeting of the Finance Committee will be:

Wednesday, February 2, 1994
8:30 - 10:00 am
11 Beacon Street, Suite 1010
Boston, Massachusetts 02108

Also, please note that the following Finance Committee meeting, originally scheduled for February 16, has been rescheduled for February 9 (due to a shift in the Authority's plans for Board of Directors meetings during February).

The February 2nd meeting will focus on proposed spending for the Boston Harbor group of projects. The enclosed six-page table displays all the contracts that make up the Boston Harbor group of projects, and the changes in project/contract costs between the current (FY94-96) CIP and the proposed (FY95-97) CIP.

The Boston Harbor Project still dominates the capital budget, with planned spending in FY95 at 72% of the proposed budget (including the contingency funds). By FY96, the proportion of overall spending drops to 50%; and by FY97, 33% of total planned spending. Spending would increase again in FY98 to 47% of all planned spending, if the Authority proceeds with full build-out of Batteries C & D, as well as the associated residuals and support facilities and services.

Total spending in FY95 is projected to be \$471.9 million. The largest areas of spending are:

Primary construction	\$104.2 m	22%
(including residuals)		
Secondary construction	243.0 m	51%
(including residuals)		
Construction management	51.8 m	11%
Water transportation	20.0 m	4%

Joseph E. Favalaro, Executive Director

11 Beacon Street • Suite 1010 • Boston, MA 02108-3002 • Telephone: (617) 742-7561 • Fax: (617) 742-4614

Studds: Polluters should pay under new water cleanup law

2-2-94
Patriot Ledger Washington Bureau

WASHINGTON - U.S. Rep. Gerry Studds, D-Cohasset, joined with several senators and the head of the Environmental Protection Agency yesterday in launching an effort to enact a new Clean Water Act this year.

At a news conference, Studds praised the administration's "greenbook," which details the issues and recommendations for action during congressional debate on the bill.

Studds pledged swift action in the House Merchant Marine and Fisheries Committee, which he chairs, with the first hearing set for Feb. 22.

However, Studds also indicated a significant disagreement with the administration over how to pay for the cost of ensuring clean water. Studds favors the "polluter pays"

concept, whereby industries would share in footing the cleanup bill.

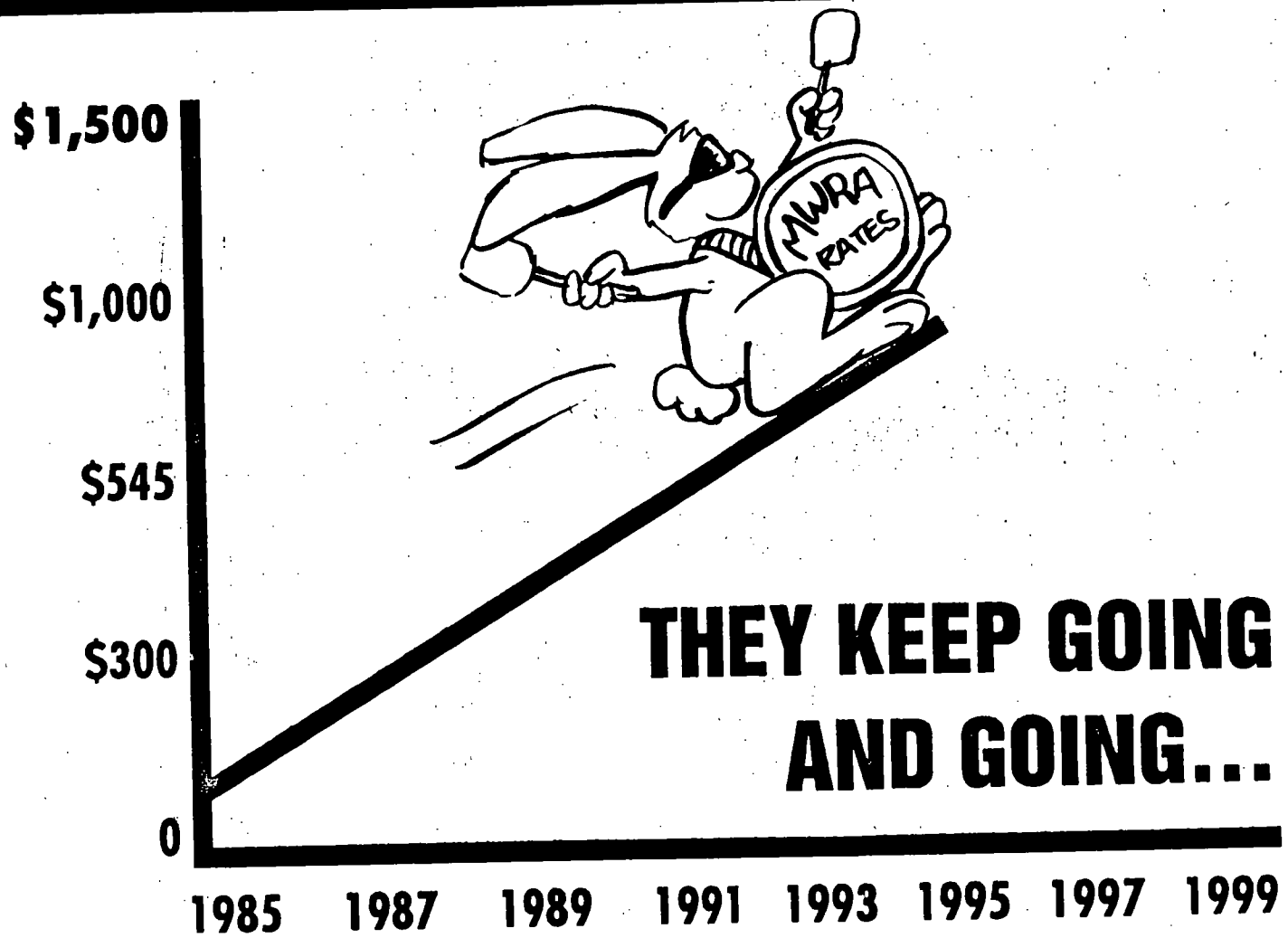
"We hope to fashion a bill where the polluter pays ... and duck the steamroller of unfunded mandates. We need to put our money where our mandates are," Studds said.

EPA administrator Carol Browner replied only that she wants to work with Studds on his proposal.

Browner said the administration is calling for spending \$70 billion annually for water cleanup, plus a state revolving loan fund and \$200 million in consolidated grants.

The Clean Water Act was enacted 20 years ago and is up for renewal this year.

The largest remaining barrier to cleanup is controlling polluted runoff water from city streets, farms and industrial plants, Browner said.



11/11/99 5:00:00 PM

Eske? First off \$100 fine to buy signs that say "No snowmobiling in Eske Park." There is not a single sign that says this anywhere. For a second offense, the snowmobile is confiscated, sold, and the proceeds used to put up barricades at all possible entrances to the park.

Where is the Conservation Commission in all this? Why haven't they acted?

Snowmobiles have no place in one of the last wildlife sanctuaries in Weymouth. This is a precious resource. If these first few snowmobiles are allowed to operate, word will soon get out. Before long 20 or 30 snowmobiles at a time will be roaring all over the Eske, waterbirds, songbirds, crushing hibernating mice and moles who are hiding under the snow (and who are part of the food chain that the hawks and owls need to survive) and providing a danger to children sledding and casual hikers.

Only a week ago, the snowmobiles were at least keeping to the paved fire truck access road, but tonight there were tracks all over the Eske, out on the salt marsh, out by the reversing falls, everywhere. Snowmobilers live by one rule only: "Are we having fun yet?" They have no interest in sharing the earth with another species beside themselves.

Snowmobiles must be stopped from jeopardizing the survival of what wildlife remains in Weymouth.

GREG TREVLEAVEN
Weymouth

Waterfowl perils ignored in article on bald eagles

It was comforting to read your article in the South Weekly, Jan. 30 ('Hard winter prompts run on suet'), about people venturing out even in bad weather to feed songbirds.

'No more money' for schools

Let us not even consider a Prop. 2½ override in Milton. It will not and shall not pass. The PTO, the propaganda arm of the Milton School Committee, will make the proposed override appear to be a worthy cause with eloquent speeches and glossy leaflets. Do not believe them. We have no more money!

Our MWRA water bills are an obscenity, the Clinton administration has increased our federal taxes and some state politician wants to graduate our state income tax to take more of our money.

Let me repeat, we have no more money.

It is about time that the town of Milton and every city and town consider assessing parents with children in the public school system with a surtax. Those who use the system directly must pay for it!

The PTO must face the world as it is not as it might want it to be. This is a new world. Pay as you go or do not go.

Milton selectman (John Michael) Shields was correct and should be praised for saying that citizens would come after the selectman with pitch forks if the town of Milton raised taxes. Mr. Shields, no violence is intended or advised but the pitch forks are at hand, and they are sharp.

EDITH HAMILTON
Milton

► To be published in South Weekly, letters must be signed and include an address and telephone number for verification. Letters are subject to condensation.

Send letters to: Letters to Editor, Boston Globe, 1165 Washington St., Hanover, MA 02339.

SOUTH WEEKLY.

The Boston Globe

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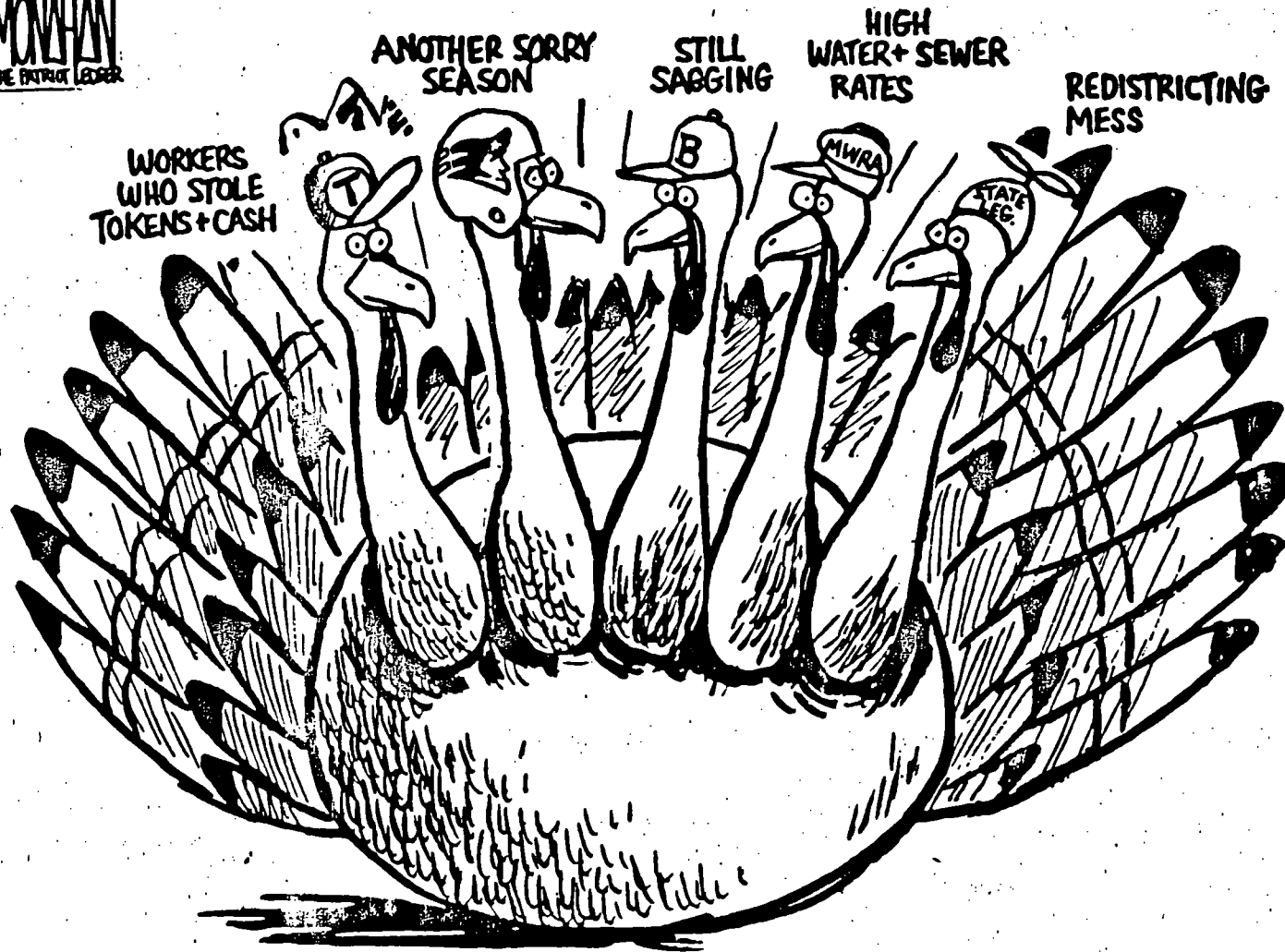
COMMUNITY BULLETIN BOARD: Kristin McMullen 617-826-1000

CALENDAR LISTINGS: Mail, attention: Cynthia Stanton

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FEBRUARY

MONAHAN
THE EXTRACT LEADER



THIS YEAR'S TURKEYS

Herald, 12-1-93





National Institute of Justice

Research in Action

Reprinted from National Institute of Justice Journal No. 227 • November 1993

AMERICORPS

A Call to Service

by Attorney General Janet Reno

On September 21st, President Clinton signed an historic piece of legislation into law—the National and Community Service Trust Act of 1993. National Service will offer thousands of Americans opportunities to address four priorities—public safety, education, human needs, and the environment—as part of a national service corps, AmeriCorps. In its first year, 20,000 service workers of all ages will engage in substantive, skill-building work in our Nation's communities through AmeriCorps. By 1996, service workers will number 100,000. Retired police officers and teachers will serve side by side with our Nation's youth, rebuilding America in the new AmeriCorps.

In exchange for their service, AmeriCorps participants will receive an educational award that will help defray the costs of post-secondary education, as well as a modest stipend. Why should criminal justice practitioners take notice of AmeriCorps? For a number of very important reasons.

Significance of AmeriCorps

First, at a time when local resources are limited, AmeriCorps can help fill the gaps in the continuum of public safety services. AmeriCorps, working alongside our public safety providers, can help provide more comprehensive and integrated services

with respect to crime prevention, police protection, crime victim assistance, and community-based public safety services in urban and rural communities all across the country.

Second, AmeriCorps will re-engage some of our Nation's youth. We all decry overcrowded juvenile detention facilities, jails, and prisons. We must begin to think about our young not only at the point when they have come in contact with the criminal justice system but before, well before. Through service, AmeriCorps will instill a sense of citizenship in our youth. They will learn skills, access a path to a better life through education—not drugs, crime, and violence.

Third, National Service is not just another top-down, bureaucratic government answer to the problems of our Nation's communities. Local entities such as police departments, victim service agencies, community-based prevention organizations, prosecutor and defender offices, treatment, and community and institutional corrections agencies can apply to participate.

Criminal justice and AmeriCorps

A diverse group of practitioners has already suggested the following ways in which AmeriCorps can work with the criminal justice system to amplify public safety services:

Police practitioners have suggested AmeriCorps workers can help move community policing efforts forward. They can be trained to conduct community surveys of neighborhood crime and disorder, work on projects to prevent victimization of seniors, develop residential and commercial crime prevention workshops, and staff community policing neighborhood substations which will begin to bridge the gap between scarce police resources and legitimate neighborhood demands. In addition, through AmeriCorps, local police departments can establish a pre-professional police corps consisting of a cadre of high-quality local recruits.

Court administrators, prosecutors, and judges have suggested that AmeriCorps workers can help make the criminal justice system more accessible to the community by staffing neighborhood courts, assisting domestic violence victims to navigate the court system, and representing abused and neglected children as court-appointed advocates.

Victim assistance providers have proposed that AmeriCorps workers take part in the movement towards restorative justice. They could monitor community restitution programs, staff victim's desks in neighbor-

hood courts, and coordinate victim counseling volunteers.

Community and institutional correctional personnel have suggested that AmeriCorps workers help prepare offenders scheduled for release to make the transition to a drug-free, crime-free life. They can teach offenders basic reading, math, and computer literacy skills, train offenders in marketable jail industries areas like data management, construction, and the automotive trades.

These examples are offered as a beginning, serving as a series of creativity generators as we launch the first generation of AmeriCorps workers.

Operational issues

Now, how will AmeriCorps work? Here are a few of the particulars. A Federal corporation, the Corporation for National and Community Service, will function as a clearinghouse of information and technical expertise for service initiatives nationwide and, as a service "venture capitalist," provide funding on a competitive basis for local, State, and national service programs.

States will be asked to set up bipartisan commissions to receive AmeriCorps funds. One-third of overall program funding—as much as \$50 million in the first year—will go by formula grant to States. The second third will be awarded to States on a competitive basis. The remaining third will be administered by the Corporation in its "venture capitalist" capacity; some additional funds will be available for training and technical assistance.

Organizations and government entities applying for participation in National Service through AmeriCorps will be encouraged to form private/public partnerships to help financially support their programs. The Corporation will pay up to 85 percent of a modest salary (roughly minimum wage) for AmeriCorps participants, 85 percent of health-care costs, 75 percent of other operating costs, 100 per-

cent of eligible child-care costs, and an educational award of nearly \$5,000 for each year of service, up to two years. Programs may elect to pay participants more than minimum wage (at their own expense) with some restrictions.

Regulations will be set forth for the new Corporation over the next few months. Sometime early next year, applications will be available to cities, counties, police and sheriff's departments, district attorneys, courts, judges, wardens, not-for-profits, and all others eligible to apply for planning, operating, or replication grants.

A call for your participation

Over the coming months, you will be hearing more about AmeriCorps and the opportunities it offers our communities to re-engage through service, citizenship, skill-building work, and education. Between now and the new year, as program regulations are outlined and State commissions are set up, I encourage you and your communities to look closely at AmeriCorps to help your neighborhoods meet critical, unmet public safety needs. You will lead the wave as the first AmeriCorps workers hit the streets in the summer of 1994.

For more information about National Service, write to:

The Corporation for National and Community Service
1100 Vermont Avenue, NW.
Washington, DC 20525

The National Institute of Justice is a component of the Office of Justice Programs, which also includes the Bureau of Justice Assistance, Bureau of Justice Statistics, Office of Juvenile Justice and Delinquency Prevention, and the Office for Victims of Crime.

NCJ 145158

USA TODAY

THURSDAY, DECEMBER 2, 1993

Launching national service policy

By Dennis Kelly
USA TODAY

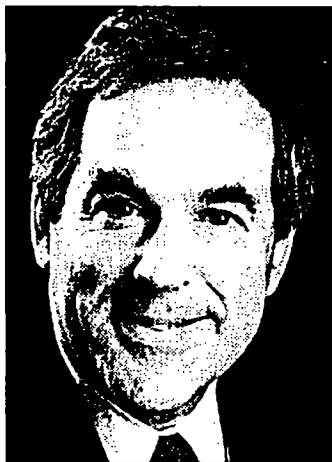
WASHINGTON — They aren't officially taking applications yet for President Clinton's national service plan — but they're already getting thousands of letters of interest.

The people running the Corporation for National and Community Service — just a few blocks from the White House — say that's an indication of high interest the program has generated. But it also leaves them nervous about expectations the program has created.

"There are moments of real anxiety about all that is expected. We feel a real need to get this done quickly," says Eli Segal, president of the corporation, the newly christened umbrella group overseeing Clinton's national service plan and a host of existing community service agencies. "We've got to go back to Congress and ask for appropriations (again) next year. The fear is how much needs to be done and how much we need the local communities to buy into this."

But the vision for Clinton's national service program is certainly heady stuff.

Its administrators see young



SEGAL: Feels pressure to get service program working soon

workers fixing up dilapidated homes or escorting the elderly to grocery stores in crime-infested neighborhoods. They see college students working in Head Start and early childhood education programs, all the time earning money that will help pay their college bill.

Those daydreams have been there ever since Clinton touted national service as one way to help young people earn money for college.

But the daydreaming has stopped, and the program is

now gearing up the process of making it work.

Regulations for the program will be published in January. Local and national groups then will compete for grants beginning in the spring and learn who gets funded between May and August. By the end of 1994, the Clinton administration expects to have 20,000 working in community service jobs and earning awards of \$4,725 per year in the program toward a college education or vocational training.

The \$1.5 billion program intends to have 100,000 participants over three years.

The part of the national and community service corporation devoted to Clinton's plan is called AmeriCorps. Anyone 17 or over will be able to earn the \$4,725 award toward college or vocational training by working with the non-profit groups that are awarded grants in the application process, or by working with one of two existing service agencies, the Civilian Community Corps or Volunteers in Service to America, better known as VISTA.

Those hired get a \$7,400 per year stipend — about minimum wage — plus health care and child care if needed, along

with the education award.

Programs that qualify will have to meet the educational, human, environmental or public safety needs of their communities. What those are will be up to commissions forming in each state — a "bottom-up" approach that Segal says will let communities decide what kinds of service are in their best interest.

Still, Shirley Sagawa, nominated as managing director of the corporation, says the corporation will help provide the program a "national identity." That will include a common oath taken by participants, a logo, as well as training and monitoring of program quality. The corporation even plans to hire some investigative-journalist types as "circuit riders" to help ensure programs are delivering on promises.

She says the program will also work hard to ensure that program participants "look like America." That's meant to allay concerns that AmeriCorps would be dominated either by low-income groups forced into national service as the only way to pay for college or by students from high-income families getting subsidies from the federal government.

How to get information

People who think they'd like to apply for one of the 20,000 national service slots available next year can get information now, but applications won't be officially taken for a while.

To get information on AmeriCorps, call the Corporation for National and Community Service at 202-606-5000 and then, if you have a touch-tone phone, dial 4 at the list of menu options. You can leave your name and address and you'll be sent a brochure.

This month, the corporation will announce a toll-free 800 number. Then in May and August when 300 to 400 non-profit groups are selected to offer the national service jobs, the toll-free number will get you to an operator who can tell you about programs in your area. Local and national agencies that win grants will do the hiring.

Those interested also can write the corporation at 1100 Vermont Ave. N.W., Washington, D.C. 20525, Attn: AmeriCorps.

The Washington Post

Youth Service Corps Officials Prepare For Recruiting Blitz

THURSDAY, DECEMBER 2, 1993

By Mary Jordan
Washington Post Staff Writer

Former inner-city gangsters and Stanford University honor students are among those expected to sign up in the new year for one of President Clinton's new programs: youths performing community service to pay for college tuition.

In January, radio and television advertisements are to begin telling thousands of students how they can enroll in AmeriCorps and get paid for work ranging from comforting AIDS patients to tutoring preschoolers.

In interviews last week with AmeriCorps leaders, details of one of Clinton's most visible campaign promises emerged for the first time. All 20,000 of the students to be selected next year will earn an \$8,000 wage (roughly \$4.25 an hour), plus health and child care benefits. If they successfully complete the 12-month program, the youths also will get \$4,725 in college or vocational school tuition or loan forgiveness. The government will write a check to the school of their choice.

Program officials expect a blizzard of applications from students, even though the compensation will be considerably lower than proposals floated during Clinton's campaign.

The first step is next month's media campaign, which will include spots on MTV, an effort that program officials hope will help make AmeriCorps as well known as the Peace Corps. In April and May, nonprofit service groups such as Teach for America, which brings recent college graduates into needy elementary school classrooms, will be selected to participate.

The winning service groups will then pick the students who will work for them. Some students will go to work next summer, with the big kickoff in September.

"One of our objectives is to create a national ethic of service," said Eli Segal, president of the Corporation for National and Community Service that oversees AmeriCorps.

Congress approved \$300 million for national service in 1994. The White House hopes funding will escalate, and that likely will depend on whether the program's initial reviews are good.

According to Clinton, youths who "look like America" will be selected. Most are expected to be between the ages of 17 and 25. Some will get involved in environmental work, others in public safety, education or health programs.

In addition to AmeriCorps, two smaller service programs are part of the national service corporation. One is the Civilian Community Corps (CCC), modeled after the popular 1930s program that gave people jobs on public works projects, such as planting trees and fixing parks.

The CCC will involve 800 students, and all will be housed on military bases. Former military personnel will work as instructors. Youths participating in this program do not have to have a high school degree and will be selected as early as February.

"The focus will be on civilian needs," said CCC director Donald Scott. Students will work at "creating green space in parks, tree-planting projects and erosion control," among other projects, Scott said.

The other part of the service corporation is VISTA (Volunteers in Service to America) formed in 1964 and located a few blocks from the White House at 1100 Vermont Ave. NW. VISTA's 3,400 volunteers will earn the same as AmeriCorps students, and will do much the same kind of community work.

By the end of this month, a toll-free hot line (1-800-94-ACORPS) will begin giving potential applicants basic information about the AmeriCorps program and help link students to specific programs in particular cities.

Each Cabinet-level agency also will be eligible to apply for AmeriCorps funds.

All states have or will set up a community service commission to help select and monitor the AmeriCorps programs. The commissions also will help distribute the federal funds. About \$11 million in federal money has been set aside for the state commissions, and they are expected to get some local funding too.

The national office will cost an additional \$14 million a year to operate. How it fares in its first year is considered crucial for the eventual success of AmeriCorps.

Some critics of the program say they worry it will not attract middle- and upper-class students because the pay is so low. Others are concerned about just the opposite, that only well-off students will be able to join. And many are waiting to see if worthwhile work will get done.

Los Angeles Times

TUESDAY, NOVEMBER 23, 1993

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Service Program to Take Aim at Crime

By ELIZABETH SHOGREN
TIMES STAFF WRITER

WASHINGTON—Reflecting a rising federal emphasis on anti-crime initiatives, the White House said Monday that its new national service program will concentrate on helping make American communities safer next summer.

The estimated 3,500 participants in the summer part of the 1994 national service program could perform such duties as joining in community policing, conducting crime prevention training for the elderly and children, helping clean up dangerous areas to return them to neighborhood use and counseling crime victims, Administration officials said.

"It was an idea formed after listening to the passion in the President's Memphis speech last week," said Eli Segal, president and chief of the new Corporation for National and Community Service, which will administer the national service program. "It's a way of reinforcing the President's commitment to public safety and a way of reinforcing that national service gets things done."

The White House announcement followed earlier pleas by President Clinton for communities to become more engaged in dealing with crime and violence.

"There are some changes we can make from the outside in—that's the job of the President and the Congress and the governors and the mayors and the social service agencies," Clinton said in his appeal to black church leaders in Memphis earlier this month. "And then there are some changes we're going to have to make from the inside out or the others won't matter."

National service, which has been described as a domestic Peace Corps, could help communities combat the sources of crime and violence from the inside out by involving young people in their own

neighborhoods.

The concentration on community safety next summer will draw a spotlight to national service, Segal said, because crime is a top concern of the public, the President and the Congress.

But it also presents a significant risk for the new program, which has been ordered by Congress to show measurable results if it wants to receive future funding. Community service programs have proved their effectiveness in environmental, education and urban renewal projects but public safety is a relatively untested area.

In signing the National and Community Service and Trust Act in September, the President fulfilled a major campaign promise to help young people pay for education by serving their country. In 1994, 20,000 participants are to be engaged in full-time community service and will receive a low-wage salary and benefits in addition to awards of \$4,725 each year of service to apply toward their education or training. Summer-only participants will receive smaller awards of \$1,000.

Although the size of the summer program is small, some law enforcement experts said that the impact on communities will be significant.

"Getting these young adults involved will be a tremendous asset for crime prevention," said Joseph Wright, executive director of the National Organization of Black Law Enforcement Executives. "They can persuade other young adults not to follow criminal lifestyles."

"I'll take about 50 of them," said Darrel Stephens, the police chief in St. Petersburg, Fla. He said he envisions national service participants organizing neighborhoods to work with police, walking the streets with beat cops, working in police stations so officers are free to patrol and being positive role models for children.

AmeriCorps

IS COMING

1993

November Proposed State Regulations Published

Final version of interim regulations for State Commissions published. Any state wishing to participate in national service programs establishes a commission through which at least two-thirds of the federal funding flows.

December Proposed National Program Regulations Published

Publication for public comment of the Corporation's proposed program regulations and applications for state and national direct funding.

1994

January Final State and National Regulations and Applications Published

Publication of final regulations and applications for state and national direct funding.

Technical Assistance Outreach Underway

The Corporation will provide extensive technical assistance to potential grant applicants. Assistance will include regional public meetings, national and regional teleconferencing, and travelling "road shows."

National Public Information Campaign Underway

Communications campaign to reach potential programs and participants.

March National/Multi-State Applications Due

Applications for national or multi-state programs due to the Corporation.

April Ongoing Review of Direct Funding Programs

Corporation reviews programs applying for national service direct funding.

May Announcement of First Grants (National/Multi-State Programs)

First grant awards announced for national, multi-state, and other programs eligible to apply directly to the Corporation.

Recruitment Campaign Begins

Programs begin recruitment of AmeriCorps members.

First Grant Programs Begin/CCC Underway

First national service grant programs begin service. First CCC camps underway.

June State Applications Due

Applications for state programs due to the Corporation.

July Announcement of Grants (State Programs)

Grant awards announced for state programs.

September Official Launch of AmeriCorps

Major rollout of what will be up to 20,000 AmeriCorps members serving in communities across the country.

SUMMER OF SAFETY

The young people in Summer of Safety will be an inspiring example for Americans of all ages to work together to make our streets safer by acting on our finest values.

President Clinton 12/11/93

The Corporation for National and Community Service plans to place more than 5000 Americans, young and young in spirit, into community-based summertime projects to respond to the plague of crime, violence, and fear sweeping the country. Communities will determine what they need most, and efforts likely to be launched include:

- working with community policing initiatives
- providing information to community residents concerning Neighborhood Watch and other crime prevention strategies
- involving youth as participants in community crime prevention efforts, such as escorting seniors or supervising recreation for children
- establishing "Safe Houses" and training parents and children about safety and crime prevention
- assisting victims of crime
- rehabilitating crack houses, cleaning up dangerous areas, and restoring them to neighborhood use
- providing crime prevention and anti-violence presentations and activities to youth groups

Program sponsors will include community organizations, law enforcement agencies, local coalitions, institutions of higher education, and other public agencies. To carry out these kinds of public safety strategies, projects will identify community public safety needs, build new partnerships and collaborations capitalizing on the community's resources, and demonstrate the role that young people can play in helping make their communities safer.

Though emphasizing youth service, opportunities to participate in Summer of Safety will be available for citizens of all ages, working through one of several programs sponsored by the Corporation. Some programs will provide full-time participants with stipends equivalent to minimum wage and a \$ 1000 educational benefit. Others will provide part-time and non-stipended service opportunities for older adults and for youth in the K-12 grades.

For further information, call or write the Corporation for National and Community Service....

AmeriCorps

IS COMING

EDUCATION

School Readiness: furthering early childhood development

Getting Things Done:

- Improving the quality and availability of child development programs by working in day care and Head Start centers and preschool programs
- Teaching literacy and other basic skills to parents of young children so that they can help their children learn
- Helping teen parents stay in school by providing needed services such as child care

School Success: aiding the educational achievement of school-aged children

Getting Things Done:

- Working in schools with high concentrations of low-income students
- Mentoring, tutoring, and providing after-school and summer learning opportunities
- Coordinating service-learning activities for K-12 students

PUBLIC SAFETY

•Crime Prevention: reducing the incidence of violence

Getting Things Done:

- Reducing crimes against youth by making schools safe, creating safe havens, providing training in conflict resolution, and involving youth in prevention efforts
- Providing substance abuse counseling and education
- Developing specific crime prevention strategies targeted at key locations such as playgrounds, public transportation points, and other public gathering places

•Crime Control: improving criminal justice services, law enforcement, and victim services

Getting Things Done:

- Enhancing community policing efforts by working with local law enforcement
- Reducing specific crime problems such as drug dealing, domestic violence, crimes motivated by bias, crimes against senior citizens, and child abuse
- Improving services available for victims of crime and strengthening innovative criminal justice programs such as neighborhood courts and community restitution

HUMAN NEEDS

Health: providing independent living assistance, home-and community-based health care

Getting Things Done:

- Providing independent living assistance and health care to the homebound elderly, people with disabilities, and people living with AIDS
- Improving the health of low-income communities by offering preventive health services through community health clinics
- Offering prenatal care, parenting education, and health care to families of young children through home visits

Home: rebuilding neighborhoods and helping people who are homeless

Getting Things Done:

- Helping people who are homeless by providing shelter support, assisting in moving into permanent housing, and related services
- Renovating and rehabilitating low-income housing
- Helping individuals move from public assistance and into self-sufficiency by providing job training, literacy tutoring, and other services

ENVIRONMENT

- **Neighborhood Environment: reducing community environmental hazards**

Getting Things Done:

- Revitalizing neighborhoods by creating and maintaining recreation areas, green spaces, and community gardens
- Eliminating environmental risks through education, testing, and cleanup
- Reducing waste through energy efficiency efforts, recycling, and other conservation measures

- **Natural Environment: conserving, restoring, and sustaining natural habitats**

Getting Things Done:

- Conserving and restoring public lands, forests, rivers, streams and wetlands
- Making parks more accessible through trail maintenance, infrastructure improvements
- Sampling, mapping, monitoring, and recording air and water quality and status of groundwater, land, plant, and animal resources

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President Clinton and youth corps members gather on the South Lawn of the White House for the signing of national service legislation.

AmeriCorps

President Signs National Service Bill

WASHINGTON, Sept. 21 -- Before an enthusiastic crowd of service, education, and congressional leaders, President Clinton signed into law the National and Community Service Trust Act to engage Americans in meeting critical needs through direct community-based service.

Promising that national service will "strengthen the cords that bind us together as a people," the President created AmeriCorps, a new program which will allow in its first year 20,000 young people to earn education benefits in exchange for grass-roots community service. With the enactment of this legislation, the nation will have the opportunity to marshal its best resources—Americans of all ages and backgrounds—to meet the challenge of rebuilding America through service.

The national service initiative was launched in the President's Inaugural Address, when he challenged "a new generation of young Americans to a season of service." In March, on the anniversary of the founding of the Peace Corps, the President unveiled his plan for national service and challenged the nation's youth to answer his call "to change America for ever and for the better." In May, the President proposed the National and Community Service Trust Act of 1993, legislation to strengthen and expand service and educational opportunities for all Americans. The President also initiated a pilot program, the Summer of Service, which engaged 1,500 young people in meeting the critical needs of children through sixteen programs across the country. By the end of the summer, the legislation creating the new Corporation for National and Community Service and AmeriCorps had passed with broad bipartisan support.

The new law focuses national service efforts on the most critical issues facing communities across the nation, bringing energy and commitment to address education, human, public safety, and environmental needs. The Act also creates a new administrative entity to coordinate AmeriCorps, as well as existing community service programs involving children, college students, adults, and seniors. In the best sense of reinventing government, the new Corporation for National and Community Service will feature a bipartisan board of directors, and an entrepreneurial, non-civil service management team and workforce.

At the bill signing, the President expressed his hope that "national service will remain throughout the life of America not a series of promises, but a series of challenges, across all the generations and all walks of life to help push to rebuild our troubled but wonderful land."



M.W.R.A. Coalition Platform

1. We are **all** paying too much for water and sewer rates from the M.W.R.A. We are paying the **highest** rates in the United States.
2. We agree the Federal Government should pay 75%, the State Government 15%, and the local ratepayers 10%.
3. We agree that the industrial polluters should pay their fair share of the Harbor Cleanup.
4. We agree that the rates should be based on **actual use** and everyone should pay the same rate.

Standard & Poor's Ratings Group

25 Broadway

New York, New York 10004-1064

Telephone 212/208-1851

Fax 212/412-0432



Philip Edwards

Director

Municipal Finance Department

November 29, 1993

Standard & Poor's analyses of the Boston Water and Sewer Commission, and Massachusetts Water Resources Authority, each of which were recently upgraded, are enclosed.

If you have any questions concerning these issues, please feel free to contact the individuals indicated on the analyses.

Phil Edwards

Director, Infrastructure Group

Boston Water and Sewer Commission, MA

Upgraded to 'A' from 'A-'

\$179 mil. Senior Lien Parity Debt

\$19 mil. Junior Lien Parity Debt

S&P Contacts: William Cox, San Francisco 415/765-5007;

Vickie Tillman 212/208-1854; Mark W. Glatfelter 212/208-1352



Rationale

The upgrade reflects:

- Continued lower-than-expected wholesale increases from the Massachusetts Water Resources Authority (MWRA) that have resulted in BWSC's substantial build-up of reserves and future rate flexibility;
- Greater certainty of future costs due to substantial design and contract progress at MWRA's major projects;
- Further prospects for reduced MWRA costs due to implementation of state debt service assistance and potential reductions in project needs;
- Consistently lower than forecasted retail rate needs;
- Conversion to a monthly billing cycle which has improved liquidity.

BWSC's ongoing strengths include substantial progress on internal cost reductions and capital needs; a largely diverse, stable, and institutional based revenue stream; and very strong financial performance. Rating concerns include a continued need for rate increases due to costs associated with MWRA's over \$4 billion of remaining projects, which will result in household costs that exceed national and regional averages. Also, BWSC is exposed to increased sewer costs if a new sewer rate methodology is adopted.

BWSC is forecasting lower-than-expected MWRA water and sewer assessments due to MWRA's expected \$20 million in debt service assistance from the state in fiscals 1994-95 and ongoing savings in its capital improvement plan. BWSC's payments to the MWRA through 1998 are currently projected to increase on average, 11% per year, down from the previously forecasted 18%. As a result of these savings, projected use of the rate stabilization fund, and continued efforts to lower non-MWRA operating expenses, future residential rates during this time period, are projected to rise -- on average 8.7%, down from 15%. While projected rate increases are lower, implementation is a continued concern from a affordability and political perspective.

BWSC's strong financial position is projected to remain strong. Cash based debt service coverage during fiscals 1994-98 is projected to range from 1.3-1.4 times (x). In 1993 BWSC converted to a monthly billing cycle which increased cash flow and resulted in cash coverage of over 3.0x. BWSC has accumulated an untapped rate stabilization fund reserve of \$13 million and it is projected to increase to \$34 million by 1994. Prudent use of this reserve is expected. BWSC could face some financial pressure from increased sewer costs if MWRA's rate setting methodology is changed. Although any increased costs are expected to be manageable and implemented in a reasonable time frame.

Outlook: Stable. The outlook reflects lower costs from MWRA, prudent use of reserves to reduce the impact of future rate increases, continued efforts of management to reduce non-MWRA costs, and the expectation that any future increased sewer costs will be manageably recovered over a reasonable time period.

Operations

-Water. The BWSC provides water service to approximately 87,300 accounts. MWRA is the sole supplier of water to the BWSC which in 1992 accounted for 44% of MWRA revenues. BWSC has reduced its water purchases to approximately 108 million gallons a day (mgd) in 1992, from 146 mgd in 1977; while consumption has remained at about 80 mgd. During this time period, unaccounted for water decreased to 25% of purchases, down from 48%. This reduction is primarily a result of water line repair and replacement, leak detection, and meter replacement. BWSC has budgeted \$42 million in its 1993-1995 capital improvement plan for additional water system repair and replacement. BWSC has also responded to federal regulations for monitoring and reducing lead and copper content in drinking water. To date, the BWSC has replaced approximately 2,100 lead services. BWSC does not anticipate that federal regulations will require additional spending beyond the scope of the current program.

—**Sewer.** The BWSC's sewer system encompasses five major sewer interceptors. Dry weather flows have been eliminated by replacement of two interceptors and repair to the remaining three. Although wet weather flows continue to be discharged into the harbor, BWSC has reduced these flows by closing 7 of 53 permitted combined sewer overflows (CSOs). Permits on the remaining 46 CSOs have expired, however, their discharge continues to be within the parameters established by the old permits. BWSC expects to be issued new permits by year end. BWSC has begun the process of complying with new stormwater regulations and expects permits to be issued sometime in 1994. BWSC forecasts costs of compliance with stormwater discharge permit requirements to be manageable. However, there is uncertainty as to the actual program costs. MWRA has assumed all legal responsibility for the pollution caused by the CSOs around the Harbor. Through a regional CSO facilities plan, MWRA has outlined necessary steps aimed at reducing the pollution discharged from the CSOs. The MWRA will fund and construct all CSO mitigation projects and spread the costs over its customer base. BWSC continues to work toward reducing the amount of flows associated with the CSOs discharge by replacing tidegates, separating storm and sanitary sewer lines, identifying illegal sewer connections, and correcting inflow and infiltration (I&I) into the sewer system. BWSC has budgeted approximately \$44 million in its 1993-1995 sewer capital improvement program for these projects.

—**Capital Improvement Program.** BWSC's 1993-1995 CIP is budgeted at \$122 million, up from 1992-1994's \$114 million. The 1993-1995 CIP includes approximately \$29 million for a new operations center. Funding sources for the current CIP are virtually the same as the previous CIP. BWSC's forecasts funding sources to be: 64% revenue bond proceeds, 26% rate revenue, 6% MWRA I&I grant, 2% other grants, and 2% state revolving fund loan. BWSC anticipates a \$30 million bond issuance in the second quarter of 1994. The preliminary 1994-1996 CIP is projected to be \$103 million, or 16% less than the current CIP.

—**MWRA.** MWRA has made considerable progress towards the court mandated clean-up of Boston Harbor. As a result, BWSC will see its MWRA assessments rise, over the next five years, 11% annually (projected). This is a substantial change over the previous estimates of 18% annual increases of MWRA assessments. The decrease in MWRA assessments is attributable to the savings in capital spending generated from a favorable interest rate environment, low inflation, and savings from modification of some projects. The CSO project has the potential for the largest decrease on MWRA's capital program and assessments. In 1990, the MWRA's Facilities Plan estimated CSO mitigation costs of at least \$1.38 billion. In February of 1993, MWRA submitted an interim CSO Report to the EPA that indicated that actual monitored flows were significantly lower than the original estimates of the 1990 CSO plan. This is attributable to very conservative estimates and BWSC's success in reducing the number of permitted CSOs to 46, from 53. As a result, MWRA and BWSC believe that the Court and EPA will allow a modification to the CSO program, and if allowed, costs will be dramatically reduced to an estimated \$600-700 million. These savings will ease pressure on residential rates, and improve BWSC's financial outlook. However, BWSC could face material cost increases if MWRA were to adopt a new rate methodology based on flow, rather than the current population equivalent structure. At this time, it is unclear as to the extent of increased costs that BWSC could face, however, it is expected to be manageably recovered over a reasonable time period.

Finances. BWSC's financial position remains strong despite MWRA's annual cost increases of 20% a year during the time period 1988-1992. Coverage of annual junior and senior lien debt service (cash basis) in 1992 was 2.20x. In 1993 BWSC converted to a monthly billing cycle that improved cash flow and financial performance. 1993 cash basis coverage is projected to exceed 3.0x. This healthy financial performance has allowed BWSC to accumulate a \$13 million balance in the rate stabilization fund at fiscal year end 1993. BWSC anticipates to increase this amount to \$34 million by 1994. This fund will be drawn upon through 1998 to blunt the impact of needed substantial rate increases to offset MWRA's, lower, but still significant, projected 11% average annual cost increases. A past concern of the BWSC was the large dollar amount of outstanding uncollected receivables. Through a sophisticated billing and collection system BWSC has been able to substantially reduce this amount. BWSC's collection ratio has improved to 107.9% for the 12 month billing period ending September 30, 1993; up from 93.5% in 1990. Current average residential rates are high at \$427 a year, and are projected to further increase to about \$700 a year by 1998. Although the projected increase is lower than originally anticipated, there is still a considerable amount of concern from both an affordability standpoint and political perspective.

BWSC Projected Financial Statistics

Fiscal Year Ending 12/31	1993	1994	1995	1996	1997	1998
Total Revenues (000s)	196,488	189,327	203,485	225,745	254,242	278,646
Net Revenues (000s)	66,093	30,956	30,859	36,725	33,321	37,094
Total Debt Service Coverage (Cash)	3.69	1.37	1.41	1.32	1.39	1.37
MWRA Expense (000s)	103,342	107,815	124,873	143,572	158,677	172,530
% Budget	59	52	60	61	64	65
Reserve Balances						
Operating Reserve (000s)	25,280	26,690	29,831	33,258	36,098	38,742
Total Reserves (000s)*	47,598	70,059	60,500	46,727	45,459	48,103
Avg. Annual Resid. Bill (\$)	473	473	520	575	637	698
*Excluding Debt Service Reserves						

Massachusetts Water Resources Authority

Rating Assigned: 'A'

\$275 million General Revenue Bonds Series 1993 C

Rating Upgraded to 'A' from 'A-'

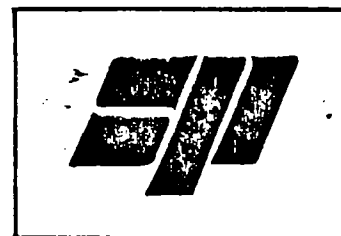
\$1.9 billion Parity Debt

Rating Affirmed: SP-1

\$72 million BANs

S&P Contacts: William Cox, San Francisco 415/765-5007;

Vickie Tillman 212/208-1854; Mark W. Glofely 212/208-1352



Rationale

The upgrade reflects:

- The completion of substantial design and contract work that limits potential for increased project costs and allows for more realistic assumptions of future revenue requirements;
- Continued progress of financing the construction of mandated projects at lower than conservatively assumed costs due to strong management and very fortuitous inflation and interest rate environments;
- Still high, but lower-than-expected, retail rate needs;
- The positive fiscal and political effects engendered by recent legislative action, including a direct debt service subsidy, and local tax raising flexibility;
- Successful resolution of a number of controversial issues including the elimination of the Walpole landfill and the environmental approval of the outfall tunnel.
- The improved credit rating of the Boston Water & Sewer Commission (BWSC; whose rating was raised to single-'A' from single-'A'-minus). BWSC accounts for 33% of MWRA revenues.

MWRA's ongoing strengths include very strong collection enforcement mechanisms that have limited the impact of some local communities' fiscal weakening; proactive and beneficial federal court oversight of mandated projects; and a good financial position enhanced by flexibility to utilize future financing alternatives including substantially more short-term debt.

S&P continues to be concerned about the rates that need to be absorbed by communities and their retail customers due to MWRA's still large and mostly mandated \$4.8 billion, 12-year capital program. Although the much feared \$100 per month water and sewer bill is not likely to be seen by ratepayers in this decade, Boston area rates will remain among the highest in the nation, relative to similarly sized communities. Some mitigation of this concern is provided by legislation enacted to relax proposition 2 1/2 limitations for MWRA expenses. In addition, MWRA continues to work to reduce the scope of some projects.

Another concern will be the need to resolve disputes over allocating future wholesale sewer costs among the communities. This dispute is the subject of litigation, legislative review, and consultants' studies. Though controversial, S&P believes that the ultimate resolution of this issue will be implemented without major financial impact to any single community or the MWRA. Finally, costs associated with further delays of the effluent outfall tunnel are not expected to be significant, nor is the court expected to be unreasonable in its response to these delays.

In 1990, due to many uncertainties surrounding the unfolding capital program, MWRA's revenue requirements were conservatively projected to be much higher than current expectations. Inflation assumptions of 7% and interest rate assumptions of 8% were viewed as prudent given the need for refinement of the program. However, significant design and contracting completion over the past four years has created greater confidence in cost projections and allows for comfortably reduced, but still prudently conservative, projections. For example, in 1996 projected rate needs are 32% lower than had been expected in 1990.

Outlook: Stable. Continued construction and financial risks of over \$4 billion of remaining projects can be reasonably withstood at the single-'A' rating level due to expectations of continued cost controls.

Security Features. MWRA's legal protections continue to offer bondholders better than average security. The bond

ordinance has coverage requirements of at least 1.2x annual debt service, but currently requires 1.3x including incorporation of a 10% CORE fund balance. S&P considers a 1.2x level of coverage to be strong for a wholesale entity such as MWRA given the largely fixed nature of its budget (greater than 50% debt service) and its more than adequate reserves (see table 2). A very important security consideration is the strong legislation which created and governs the authority. In addition to having operating autonomy, MWRA has broad and solid collection enforcement mechanisms including the ability to intercept state aid from most of its customer communities. The state intercept is a critical protection against some fiscally weakened communities which have on occasion withheld portions of MWRA's quarterly billing. The intercept has strong legal standing and due to Massachusetts constitutional structure is not expected to be subjected to any legal challenge. The levels of state aid, especially to those communities likely to have fiscal difficulties, remains high despite recent declines. The Commonwealth's legislative and executive prerogative to ensure fiscal solvency at the local level is demonstrated by its successful intervention in cities such as Chelsea, which has been in state governed receivership. MWRA has consistently had 100% collection of its quarterly charges to communities. Finally, as always, the existence of the federal court oversight continues to play a major role in the smooth implementation of MWRA's mandates.

Communities. The MWRA provides wholesale water delivery to 47 communities, sewer service to 43. In all, 61 communities are served with the largest being the Boston Water and Sewer Commission (BWSC) which represents 33% of revenues. Only 5 other communities contribute greater than 3% of revenues, thus there is great dispersion of credit risk outside of BWSC. BWSC's rating on its outstanding revenue debt has been raised to A, from A- (see attached analysis). Overall, despite economic decline and losses in the rate of increase in revenues from state and local sources, many of the communities retain above average creditworthiness. Importantly, the communities are legislatively (not contractually) bound to the MWRA, and their payments to the MWRA are full faith and credit general obligations. (Less than 15% of MWRA's revenues are received from communities rated below the A category and more than 20% of the revenues are received from those rated above the A category.)

Recent Issues. Many controversial or troubling issues confronting the MWRA have been resolved favorably over the past year. The most significant has been the court sanctioned dissolution of the Walpole landfill, a constant political and legal struggle. The MWRA has replaced the landfill with what proves to be a cost effective out of state disposal alternative, with the Walpole site remaining a permitted MWRA owned backstop. Another key victory for the MWRA was the final federal and biological assessments approving the location of the 9.5 mile outfall tunnel. The tunnel remains behind schedule due to unanticipated construction delays, however, the court appears amenable to a revised schedule. A later start-up of the tunnel could actually help reduce lingering concerns of Cape Cod residents because of the higher quality of effluent that will be achieved in 1996. Still troubling the MWRA is the issue of allocating the cost of sewer system improvements amongst the communities. The current methodology appears to be an inadequate measurement of community contribution to flow and strength of wastewater based on data that has been accumulated by MWRA. The city of Quincy has filed suit to force a new methodology. More importantly, the legislature has ordered studies aimed at resolving the issue by June 30, 1994. BWSC has filed notice of its intent to maintain its interests. Clearly there is room for compromise on this issue, and the Advisory Board has the ability to see to it that a change in methodology is done prudently and in a time frame that does not bring rate shock to any single community. S&P will monitor this situation closely, but expects that even a long fight over cost allocation will not result in delay in any revenues, especially from the fiscally sound BWSC.

State Actions. The governor and legislature have made marked improvements in their attention to the MWRA and its increasingly burdened rate payers. A spring 1993 series of protests brought quick political response, at a pace faster than believed would occur. Most importantly, the Commonwealth has begun providing \$20 million of direct debt service subsidy to the MWRA. The subsidy contributed to lowering MWRA's 1994 rate increase to under 5%, down from a proposed 18.9%. While not legislatively permanent, it is felt that political realities will make it extremely difficult to reverse this action in future budget deliberations unless there is a corresponding increase in other outside revenue sources and/or a reduction in expenses. Preliminary indications are that the subsidy may even increase in fiscal year 1995. The other significant change in the Commonwealth's budget for 1994 was the legislative amendment to Proposition 2 1/2 that will allow communities (many of whom are at their levy limits) to raise tax revenues for MWRA debt service expenses outside of the 2 1/2 limitations. While reverting to taxes is a departure from positive trends towards user fees, the new taxing ability provides communities with much needed flexibility and homeowners with tax deductibility. S&P expects that the executive and legislative branches will continue to move towards enhancing the positive relationship with the MWRA and refrain from interfering with the day to day pursuit of MWRA's mandates.

CIP. MWRA has met every court ordered milestone. Of \$6.6 billion (1994 \$) of total projects, \$1.8 billion has been expended. The most important project is the 1 billion gallon per day Deer Island (DI) treatment plant and related facilities, with a cost estimate of \$3 billion. DI had the most exposure to cost overruns and expanded scope, but due to very conservative design estimates and a weak construction/inflation environment, the growth in the project has stopped. At DI, over \$2.2 billion has been contracted, 85% of design is complete, 42% of physical construction is complete, bids have averaged 17% under design estimates and change orders have been at 3%. Clearly MWRA has substantial projects and costs remaining that can be exposed to a changed construction environment - the capital budget is \$1.9 billion through 1996 and \$2.8 billion more through 2005 - but new assumptions such as 5% inflation estimates are reasonably conservative in light of the progress that has been made to date. The extreme peak in construction will occur over the next two years, after which the pace is slower and less onerous. Up to \$1 billion of projects are being considered for curtailment or elimination. a court sanctioned master capacity reevaluation plan, to be completed at the end of calendar year 1994, could lead to the reduction of these projects which would come mostly after 2000. S&P does not expect the MWRA to be able to waive Safe Drinking Water Act (SWDA) filtration requirements at its water supply reservoirs, therefore, does not include those reductions in its financial analysis.

Financial. Consistently lower than budgeted interest and inflation rates have contributed to lower than projected rate increases and higher than expected accumulation of rate stabilization reserves. S&P had felt the potential absorption by project costs of the conservative cushion was a key restriction on credit quality. However, the progress in project construction outlined above, the flexibility in scheduling some non-mandated projects, the resolution of some critical legal and political issues, the infusion of direct and indirect state assistance, and the potential for reduction or elimination of some of the mandated program, give comfort to scaling back some of the conservative assumptions. As a result, the burden on rate payers can be more accurately predicted. S&P performed financial analysis of projections based on a list of assumptions that included constant \$20 million state assistance, no additional federal assistance, 5% inflation, 7% average interest costs, delayed expenditures for Combined Sewer Overflow projects, and continued 1.3x coverage of debt service. The results, in table 2, show a marked improvement in the outlook for rate payers compared to prior years' projections. In addition, MWRA still has savings to be derived from its substantial unused capacity to issue short term debt, commercial paper, and other financing options. This combination of circumstances provides S&P with greater comfort on MWRA's ability to maintain consistent financial margins.

Table 1

Massachusetts Water Resources Authority
Projection Comparisons
Nov. 93

	<u>1990</u> <u>Proj.</u>	<u>% ch</u>	<u>1992B</u> <u>Proj.</u>	<u>% ch</u>	<u>1993C</u> <u>Proj.</u>	<u>% ch</u>
1990	\$171		\$171		\$171	
1991	\$218	27.49%	\$185	8.19%	\$185	8.19%
1992	\$296	35.78%	\$243	31.35%	\$243	31.35%
1993	\$389	31.42%	\$293	20.58%	\$291	19.75%
1994	\$483	24.16%	\$370	26.28%	\$304	4.47%
1995	\$564	16.77%	\$489	32.16%	\$346	13.82%
1996	\$619	9.75%	\$572	16.97%	\$422	21.97%
1997			\$672	17.48%	\$493	16.82%
1998			\$777	15.63%	\$559	13.39%
1999					\$630	12.70%

1. All Projections in that year's dollars.

2. Bold = actuals

Table 2

MWRA Projected Financial Statistics

	<u>1994</u>	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>
Rate Revenue Requirements (\$000)	304,359	345,519	420,840	492,173	554,588	618,410
State Subsidy (\$000)	20,000	20,000	20,000	20,000	20,000	20,000
Debt Service	152,806	138,461	141,469	149,928	149,782	139,431
Annual Rate Increase (%)	4.80	13.50	21.80	17.00	12.70	11.50
Household Charge (1994 \$)	545	574	631	680	716	751
Household Charge (Inflated \$)	572	631	732	829	916	1,006
Fund Balances (\$000)						
CORE Fund	15,281	13,846	14,147	14,993	14,972	13,943
Renewal and Replacement Fund	26,640	33,164	36,666	39,369	45,622	49,530

Herald, 12.1.93



**Metering installations will
be amenable for use in
establishing user charges
based on flow discharges to
M.W.R.A. sewers by the
individual member communities.**

Arlington • Ashland • Bedford • Belmont • Boston • Braintree • Brookline
Dedham • Everett • Framingham • Hingham • Holbrook • Leominster
Medford • Melrose • Milton • Nahant • Natick • Needham • Newton
Revere • Saugus • Somerville • South Hadley • Southborough • Stoneham
Watertown • Wellesley • Weston • Westwood • Weymouth • Wilbraham



Burlington • Cambridge • Canton • Chelsea • Chicopee • Clinton
Lexington • Lynn • Lynnfield • Malden • Marblehead • Marlborough
Northborough • Norwood • Peabody • Quincy • Randolph • Reading
Stoughton • Swampscott • Wakefield • Walpole • Waltham
Wilmington • Winchester • Winthrop • Woburn • Worcester

**CRITERIA RELEVANT TO EVALUATING A
SEWER RATE METHODOLOGY TO
REFLECT THE FULL/REAL O & M COST OF OPERATIONS**

*THE ROLE OF THE SEWER RATE METHODOLOGY COMMITTEE
IS TO ESTABLISH MAJOR CRITERIA THAT MAKE UP THE KEY
COMPONENTS OF A RATE STRUCTURE AND DETERMINE THE
RELATIVE IMPORTANCE OF THAT CRITERIA WHICH
MAXIMIZES FAIRNESS TO ALL COMMUNITIES, ENCOURAGES
CONSERVATION OF RESOURCES AND ESTABLISHES
INCENTIVES TO ACHIEVE THESE GOALS.*

PRIMARY CRITERIA

QUANTITY

Volume
Peak Volume
I/I

QUALITY/STRENGTH

Biochemical Oxygen Demand
Toxins
Total Suspended Solids
Fats, Oil & Grease
Metals

INCENTIVES

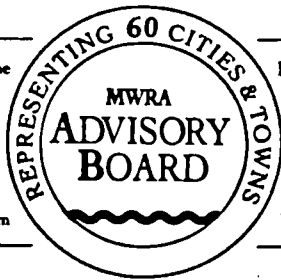
Encourage the elimination of inflow/infiltration from local systems
Sewer separation

**ADOPTED AT THE MAY 14, 1993 MEETING OF THE SEWER RATE
METHODOLOGY COMMITTEE.**

Joseph E. Favaloro, Executive Director

11 Beacon Street • Suite 1010 • Boston, MA 02108-3002 • Telephone: (617) 742-7561 • Fax: (617) 742-4614

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Revere • Saugus • Somerville • South Hadley • Southborough • Stoneham
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Stoughton • Swampscott • Wakefield • Walpole • Waltham
Wilmington • Winchester • Winthrop • Woburn • Worcester

CAPITAL COST CRITERIA

PRIMARY CRITERIA

QUANTITY OF FLOW

QUALITY OF FLOW

SECONDARY CRITERIA

**INCENTIVES TO ENCOURAGE I/I REDUCTION AND SEWER
SEPARATION**

PHYSICAL/GEOGRAPHICAL LIMITATIONS

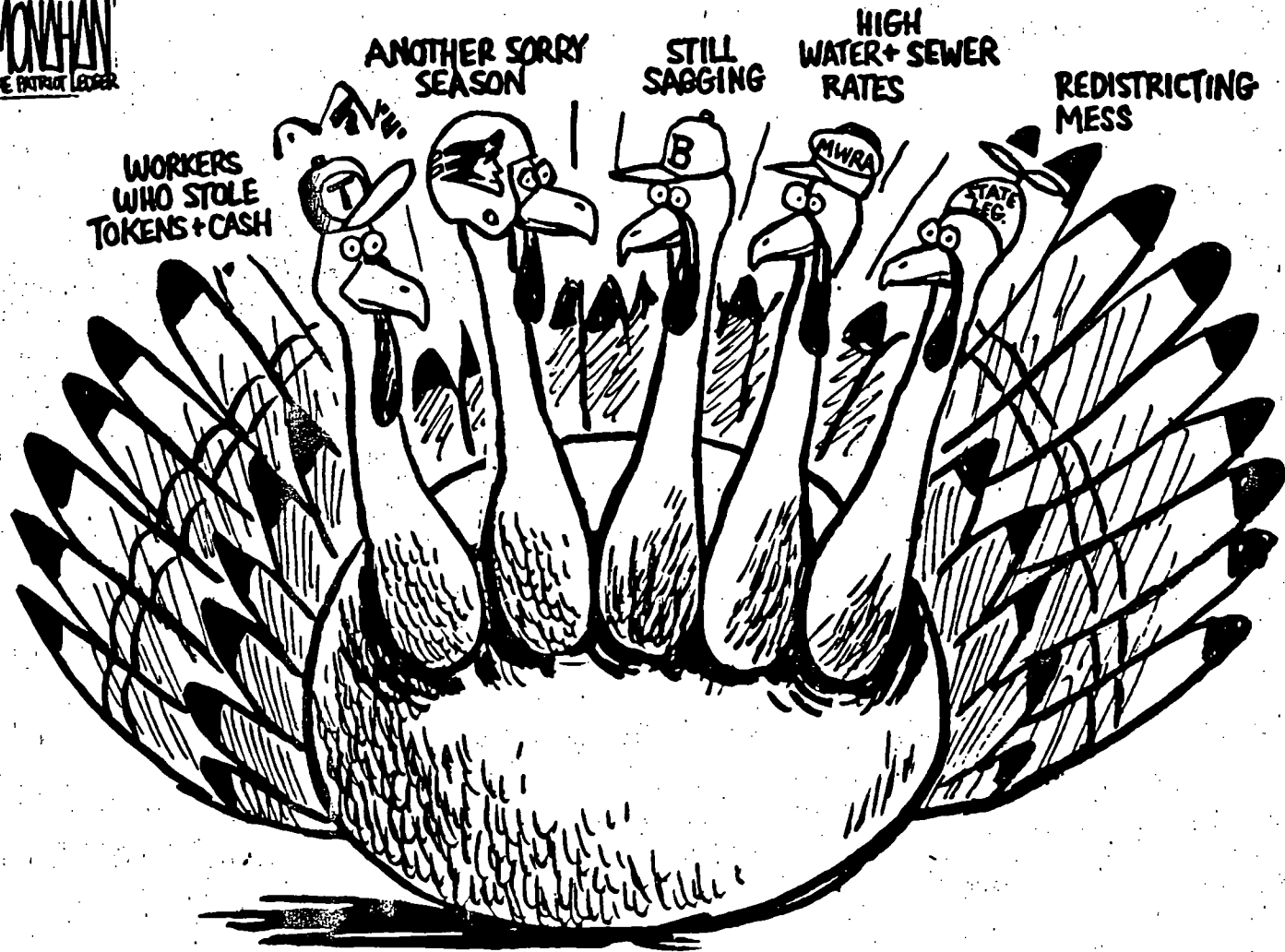
BENEFIT FROM POTENTIAL EXPANSION.

**ADOPTED AT THE OCTOBER 29, 1993 MEETING OF THE SEWER RATE
METHODOLOGY COMMITTEE**

Joseph E. Favaloro, Executive Director

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MONTGOMERY
THE PATRIOT LEADER



THIS YEAR'S TURKEYS

**I
AM
NOT
GOING
TO PAY
A LOT FOR
MY SEWER BILL**

Top Twenty Communities in EPA Study Matched with Individual MWRA Communities

Old Rank	Municipality	Combined Charges (\$)	Population	New Rank
	Westwood, MA	954.64	12,557	1
	Wilmington, MA	819.60	17,651	2
1	King Co. , Wa W&S Dist. 107	801.34	8,500	3
2	Coupeville, WA	765.00	1,377	4
	Stoughton, MA	736.22	26,777	5
3	Medford, WI	731.82	1,960	6
WEYMOUTH 4	Friday Harbor, WA	726.26	1,492	7
5	Germantown, WI	718.12	634	8
	Winthrop, MA	715.20	18,127	9
	Dedham, MA	710.26	23,782	10
	Bedford, MA	708.00	12,996	11
	Reading, MA	702.00	22,539	12
	Winchester, MA	692.40	20,267	13
	Hingham, MA	690.36	19,821	14
	Chelsea, MA	690.00	28,710	15
6	Duvall, WA	685.59	2,770	16
	Arlington, MA	678.00	44,630	17
	Weymouth, MA	675.60	54,063	18
7	Columbus, WI	670.71	4,083	19
8	New Berlin, WI	668.03	33,592	20
	Melrose, MA	662.16	28,150	21
9	Mequon, WI	655.69	18,900	22
10	Mukwango, WI	652.01	5,974	23
	Walpole, MA	647.46	20,212	24
11	Muskego, WI	647.27	16,813	25
	Belmont, MA	640.80	24,720	26
12	Hartland, WI	641.54	770	27
	Milton, MA	638.40	25,725	28
13	Elkhorn, WI	630.75	5,349	29
14	Chehalis, WA	628.07	6,527	30
15	Mayville, WI	622.15	4,374	31
16	Sturgeon Bay, WI	620.55	865	32
17	Elk Ridge, UT	617.43	749	33
18	Green River, UT	616.92	881	34
19	Ashland, WI	608.08	558	35
20	Lake Mills, WI	607.48	4,143	36
		Total Population	521,038	
		MWRA Population	400,727	
		Top 20 less MWRA	120,311	
		% of Top 20 pop. in MWRA	76.91%	

Not mounted to CSO DATE

Arrive at DFO Grant 5.3 miles
90% Accuracy
Having Estimates
Adding 19 =
Meters
First 1/2 Year

Specification Sheet

Model 3500 - Telemetered Open Channel Flow Monitor

Description

The Model 3500 is recognized as the industry standard for permanent open-channel flow monitoring. The battery powered system transmits accurate flow data through telemetry to a central station computer.

Applications

The Model 3500 is used for many applications including:

- infiltration/inflow quantification
- master plan studies
- billing networks
- CSO monitoring
- storm sewer monitoring
- sewer capacity studies/trending
- rehabilitation effectiveness monitoring
- rainfall monitoring networks

The telemetry capability offers low cost operation of the system through voice grade dial-up telephones. Other options are available.

Available Sensors and Interfaces

Quadreredundant Ultrasonic Level Sensor - The distance from the sensor to the flow surface is measured by four independent, ultrasonic transceivers. This non-intrusive, zero-drift sensing technique results in a stable, accurate and reliable flow depth and quantity calculation.

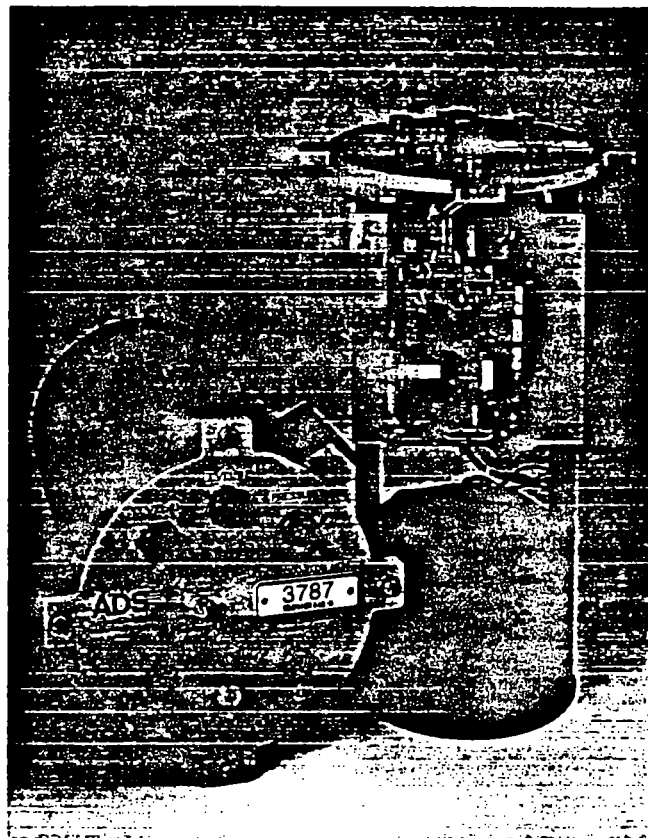
Digital Doppler Velocity Sensor - An ultrasonic signal is transmitted throughout the flow cross-section. The returning signal is digitally analyzed through spectrum analysis to calculate average flow velocity.

Pressure Depth Sensor - The depth of flow is measured by a piezoresistive bridge contained within a streamlined epoxy housing which is placed within the flow, as close to the invert as possible.

Water Quality Sampler Interface - A variety of industry standard water quality samplers are compatible and easily interfaced to the Model 3500. Sampling is initiated automatically based on a fixed-time or flow proportional basis.

Features

- Quantifies flow under open channel, free flow conditions and non-free flow conditions, including surcharge and backwater.
- Ultra low power consumption. Batteries will last for over 1 year on a standard sampling interval.
- Stores up to 3600 time stamped sensor readings before data is overwritten.
- Fully water-resistant housing - even under surcharge conditions. Cylindrical seamless canister, military specification connectors.



Model 3500 combines high technology open channel flow monitoring and data acquisition with telemetered data transmission.

- Low cost telemetry and remote diagnostics allow significant reduction in field labor.
- Programmable in industry standard BASIC for custom applications.
- Each unit undergoes factory test and certification by qualified technicians after complete burn-in phase.
- High performance communications error checking provides for data integrity.
- Interfaces with ADS Quadrascan® 4.0, a complete hydraulics and analysis package for telemetered data collection, trending, reporting, on-screen graphics and file management.
- Each unit is self checking and monitors internal temperature and voltages.
- Standard telemetry interface is voice grade telephone line.
- Data security is guaranteed through use of hand-shaking identification.
- 1200 baud transmission rate.
- Easy electronic maintenance through modular sub-assemblies.
- Battery-backed, crystal controlled, real-time clock/calendar is used to maintain time and date.
- Transient suppressors on the telephone line protect the unit against nominal lightning transients.
- Each unit will support up to 2 ultrasonic level sensors, 1 differential pressure sensor, 1 velocity sensor, and 1 sampler.
- Early warning alarm callback notifies operators that a pre-set condition, i.e. high depth, low flow, low voltage, is detected.

SPECIFICATIONS - Model 3500

Flow Monitor

Housing: 0.25 in. (0.64cm) thick seamless marine-grade aluminum, with stainless steel hardware. Housing cylinder is 22 in. long x 10 in. diameter (55.88cm x 25.4cm). The canister is pressurized to eliminate moisture intrusion.

Connectors: Military spec, MIL-C-26482 series 1, for environmental sealing, with gold plated contacts.

Electronics: Ultra-low power consuming, CMOS microprocessor based architecture.

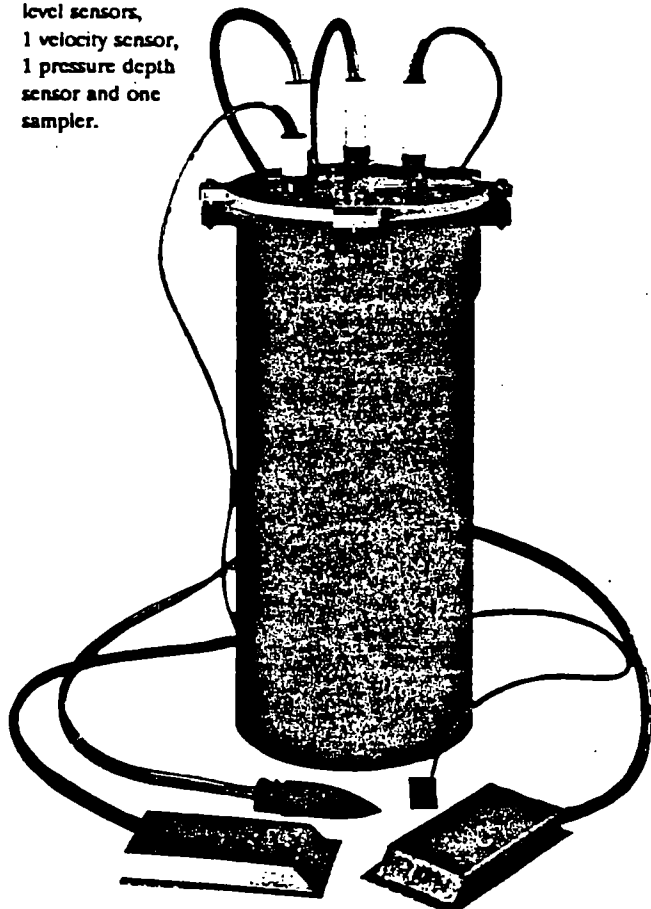
Sampling Interval: A crystal oscillator timer activates samples at pre-set intervals such as 2.5, 5, 7.5 and 15 minutes. Other time intervals are available. Time is synchronized with the central station.

Memory: 64K bytes of RAM and 64K bytes of EPROM.

Power: 12 volt battery pack powers unit for over a year at 15 minute sampling interval.

Warranty: 1 year parts warranty against defects.

The Telemetered Model 3500 supports 2 ultrasonic level sensors, 1 velocity sensor, 1 pressure depth sensor and one sampler.



Sensors

Quadreredundant Ultrasonic Level Sensor

Measures elapsed time for an ultrasonic signal to travel to the flow surface and back and records the distance to the flow surface. The sensor is composed of 4 independent piezoelectric crystals which operate at a 40kHz frequency. Resident software evaluates sensor readings and discards aberrant data.

Range	Up to 8 ft. (2.44m), dead zone less than 2.0 in. (5.08cm). Greater ranges are available.
Resolution	0.02 in. (0.05cm)
Accuracy	0.125 in. (0.32cm)
Housing	Aluminum housing 7.5 in. x 4.25 in. x 0.875 in. (19.05cm x 10.79cm x 2.22cm) with sound absorbing closed cell material surrounding crystals.
Temperature	Compensated through redundant temperature sensors.
Cable	35 ft. (10.7m) standard length.

Pressure Depth Sensor

Measures depth of flow by recording difference in atmospheric water height pressure.

Range	Up to 11 ft. (3.35m). Greater ranges are available through factory modifications.
Resolution	0.04 in. (0.10cm)
Accuracy	0.125 in. (0.32cm)
Housing	5.0 in. x 1.36 in. x 1.0 in. (12.7cm x 3.45cm x 2.54cm) streamlined molded epoxy shell.
Cable	40 ft. (12.2m) standard length.

Digital Doppler Velocity Sensor

Ultrasonic signal is transmitted out into the flow. Reflected signal is digitally analyzed for doppler shift to measure the flow velocity.

Range	-5 to +15 ft/sec (-1.52 to +4.57m/sec)
Resolution	0.01 ft/sec (0.003 m/sec)
Accuracy	for readings of: 0-5 ft/sec (0-1.5m/s) : 1.0% Full Scale 5-10 ft/sec (1.5-3.0m/s) : 1.5% Full Scale 10-15 ft/sec (3.0-4.57m/s) : 3.5% Full Scale
Size	1.5 in. x 1.125 in. x 0.5 in. (3.8cm x 2.85cm x 1.27cm)
Cable	40 ft. (12.2m) standard length.

Patent Protected

Specification Date: July 1, 1990

Specifications Subject To Change Without Notice.

About ADS

ADS Environmental Services, Inc. provides turn-key engineering and field services to municipal agencies and consulting engineers worldwide. Services include equipment design and installation, site inspection and hydraulic profiling, flow monitoring, data analysis, smoke testing, and TV inspection and line cleaning.

ADS Environmental Services, Inc.

2227 Drake Avenue, SW
Huntsville, Alabama 35805

Phone (205) 883-9323
FAX (205) 882-6765

Toll Free in U.S.A. 1-800-633-7246



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION I

J.F. KENNEDY FEDERAL BUILDING, BOSTON, MASSACHUSETTS 02203-2211

March 20, 1990

Paul Levy, Director
Massachusetts Water Resources Authority
100 First Street
Charlestown Navy Yard
Boston, Massachusetts

Dear Mr. Levy:

We have completed our review of the Authority's user charge system. The review indicates that the methodology employed by the Authority in setting the wholesale rates to member communities meets our user charge system regulations.

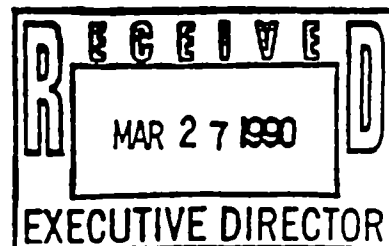
We would recommend, however, that the Authority develop the capability to accurately allocate costs from other Divisions to the appropriate Water or Sewer Divisions. Presently these costs are pro-rated according to the budget amounts for Water and Sewer Divisions. This procedure does not reflect the true costs for providing each of those services.

EPA's user charge regulations also require that subscribers receiving wastewater treatment services from the grantee must adopt user charge systems in accordance with those regulations. Please provide this office with a status report on the user charge systems currently in effect in your member communities. We would appreciate any information you may have on non-conforming systems and your efforts to assure compliance with EPA requirements.

If you have any questions, please have your staff call Mark Malone at 565-3492.

Sincerely,

Roger A. Janson, Chief
Wastewater Management Section, MA-RI-VT



GARY

CY 1992 METER DATA (1)
from the interim metering system

CY 1991 METER DATA (1)
from the interim metering system

	DRAFT CY 1992 Meter data Ave daily flow (MGD)	Percent Share of Total ADF	CY 1991 Meter data Ave daily flow (MGD)	Percent Share of Total ADF
Arlington	5.01	1.36%	4.86	1.26%
Ashland	0.74	0.20%	0.81	0.21%
Bedford	2.17	0.59%	2.46	0.63%
Belmont	3.47	0.94%	3.63	0.94%
BWSC	121.27	32.92%	143.48	37.09%
Braintree	7.12	1.93%	6.98	1.80%
Brookline	14.22	3.86%	6.92	1.79%
Burlington	4.09	1.11%	3.70	0.96%
Cambridge	23.69	6.43%	24.86	6.43%
Canton	2.15	0.58%	2.49	0.64%
Chelsea	4.88	1.32%	4.93	1.27%
Dedham	5.84	1.59%	6.34	1.64%
Everett	5.54	1.50%	6.16	1.59%
Framingham	6.72	1.82%	8.61	2.22%
Hingham	0.87	0.24%	1.10	0.28%
Holbrook	0.66	0.18%	0.84	0.22%
Lexington	6.51	1.77%	6.94	1.79%
Malden	6.63	1.80%	6.83	1.77%
Medford	7.29	1.98%	9.38	2.42%
Melrose	4.45	1.21%	4.88	1.26%
Milton	4.13	1.12%	4.55	1.18%
Natick	4.12	1.12%	2.94	0.76%
Needham	4.37	1.19%	4.37	1.13%
Newton	18.54	5.03%	17.40	4.50%
Norwood	4.24	1.15%	4.86	1.26%
Quincy	15.12	4.10%	13.47	3.48%
Randolph	3.65	0.99%	3.40	0.88%
Reading	2.33	0.63%	2.33	0.60%
Revere	5.98	1.62%	6.10	1.58%
Somerville	12.00	3.26%	8.62	2.23%
Stoneham	4.05	1.10%	4.28	1.11%
Stoughton	2.33	0.63%	2.42	0.63%
Wakefield	4.42	1.20%	4.25	1.10%
Walpole	2.68	0.73%	2.15	0.56%
Waltham	8.15	2.21%	8.95	2.31%
Watertown	4.62	1.25%	4.83	1.25%
Wellesley	3.74	1.02%	4.24	1.10%
Westwood	1.36	0.37%	1.60	0.41%
Weymouth	6.66	1.81%	5.00	1.29%
Wilmington	1.15	0.31%	1.25	0.32%
Winchester	5.39	1.46%	4.50	1.16%
Winthrop	5.32	1.44%	6.78	1.75%
Woburn	10.76	2.92%	12.35	3.19%
Totals	368.43	100%	386.84	100%

(1) Figures are tabulated using data from the MWRA Interim Wastewater Metering System for calendar years 1991 and 1992. These data (a) exclude unmetered portions of some communities (up to 10% of flow), (b) do not reflect new data from additional and relocated meter sites for the permanent system, and (c) include MWRA system infiltration. Figures for most communities are believed to be within +/- 15% of true flow.

The permanent wastewater metering system is scheduled to be completed by September 1993.

DRAFT CY 92 MWRA WASTEWATER COMMUNITY FACTS AND FIGURES

Metering System Status				1992 Annual Averages(1)		Components of Average Daily Flow (Estimated) (1)						Peak I/I and Max. Day Flows (est) (1)		
LOCAL BODY	Total Population	# OF METERS INSTALLED		A	B	C	D	E	F	G	H	I	J	K
		INTERIM SYSTEM	PERMANENT SYSTEM	average daily flow ADF (MGD)	average dry day flow (MGD)	average infiltration (MGD)	infiltration as a % of average daily flow	average sanitary flow (MGD)	sanitary as a % of average daily flow	average annual inflow (4) (MGD)	inflow as a % of average daily flow	peak infiltration (high month) (MGD)	max. day inflow (MG)	max. day total flow (MG)
Arlington	44,630			6.01										
Ashland	12,066			0.74										
Bedford	12,996			2.17										
Belmont	24,720			3.47										
BWSC (5)	574,263			121.27										
Braintree	33,636			7.12										
Brookline	54,718			14.22										
Burlington	23,302			4.09										
Cambridge (5)	95,602			23.69										
Canton	18,530			2.15										
Chelsea (5)	28,710			4.86										
Dedham	23,782			5.84										
Everett	35,701			5.54										
Framingham	64,989			6.72										
Hingham	6,099			0.87										
Holbrook	11,041			0.66										
Lexington	26,974			6.51										
Malden	53,684			6.63										
Medford	57,407			7.29										
Melrose	28,150			4.45										
Milton	25,725			4.13										
Natick	30,510			4.12										
Needham	27,557			4.37										
Newton	82,585			18.54										
Norwood	28,700			4.24										
Quincy	84,985			15.12										
Randolph	30,093			3.65										
Reading	22,539			2.33										
Revere	42,786			5.98										
Somerville (5)	76,210			12.00										
Stoneham	22,203			4.05										
Stoughton	26,777			2.33										
Wakefield	24,825			4.42										
Walpole	20,212			2.68										
Waltham	57,678			8.15										
Watertown	33,284			4.62										
Wellesley	26,615			3.74										
Westwood	12,557			1.36										
Weymouth	54,063			6.66										
Wilmington	17,651			1.15										
Winchester	20,267			5.39										
Winthrop	18,127			5.32										
Woburn	35,943			10.76										
Totals/Averages 2,055,712				368.43										

(1)

(2)

MWRA WASTEWATER COMMUNITY FACTS AND FIGURES

18-Jun-93

LOCAL BODY	Community Demographics			1991 Annual Averages (1)		Components of Average Daily Flow (Estimated) (1)						Peak Inflow and Max. Day Flows (est) (1)			Septage (2)
	A Total Population	B Community Profile (3) Residential %	C Comm. & Industrial %	D average daily flow ADF (MGD)	E average dry day flow (MGD)	F average infiltration (MGD)	G infiltration as a % of average daily flow	H average sanitary flow (MGD)	I sanitary as a % of average daily flow	J average annual inflow (4) (MGD)	K inflow as a % of average daily flow	L peak infiltration (high month) (MGD)	M max. day inflow (MG)	N max. day total flow (MG)	O Est. 1990 septage volume gal/yr
Arlington	44,630	92%	8%	5.01	4.37	1.77	36%	2.80	53%	0.50	10%	2.53	6.5	11.63	28,050
Ashland	12,086	81%	19%	0.74	0.78	0.34	41%	0.45	55%	0.03	4%	0.48	0.3	1.23	705,706
Bedford	12,996	44%	56%	2.17	2.30	1.28	52%	1.02	42%	0.15	6%	2.02	1.0	4.04	498,618
Belmont	24,720	94%	6%	3.47	3.38	1.74	48%	1.65	45%	0.25	7%	2.78	4.2	6.61	65,283
BWSC (5)	574,283	34%	66%	121.27	128.38	64.77	45%	63.58	44%	15.12	11%	75.74	211.8	351.13	381,132
Braintree	33,836	58%	44%	7.12	6.14	3.80	54%	2.34	34%	0.84	12%	5.54	8.1	15.98	127,073
Brookline	54,718	82%	18%	14.22	5.05	3.37	49%	2.58	37%	0.97	14%	4.39	8.8	16.77	34,465
Burlington	23,302	38%	62%	4.09	3.57	1.85	50%	1.72	46%	0.13	4%	2.78	1.8	6.10	293,082
Cambridge (5)	95,802	38%	61%	23.89	21.73	10.63	43%	11.10	45%	3.14	13%	12.12	42.2	65.42	80,252
Canton	18,530	63%	37%	2.15	2.32	1.42	57%	0.89	38%	0.17	7%	1.77	1.8	4.48	710,943
Chelsea (5)	28,710	43%	57%	4.88	4.21	2.12	43%	2.10	42%	0.72	15%	2.49	9.3	13.89	18,113
Dedham	23,782	63%	37%	5.84	5.88	4.18	66%	1.70	27%	0.46	7%	6.50	6.8	14.80	298,119
Everett	35,701	30%	70%	5.54	5.61	2.86	46%	2.75	45%	0.55	9%	3.40	6.9	13.05	22,516
Framingham	64,989	63%	37%	6.72	8.11	4.22	49%	3.89	45%	0.50	8%	5.27	3.6	12.78	163,522
Hingham	6,099	83%	17%	0.87	0.98	0.67	61%	0.31	26%	0.12	11%	1.10	1.5	2.91	137,987
Holbrook	11,041	75%	25%	0.86	0.80	0.48	56%	0.32	38%	0.03	4%	0.80	0.4	1.52	624,908
Lexington	28,974	73%	27%	6.51	6.45	4.36	63%	2.09	30%	0.49	7%	6.40	2.7	11.19	218,618
Malden	53,884	74%	26%	6.63	6.39	3.14	46%	3.26	48%	0.44	8%	3.88	4.7	11.84	33,836
Medford	57,407	74%	26%	7.29	8.61	5.58	60%	3.03	32%	0.77	8%	6.78	11.8	21.61	36,101
Melrose	28,150	90%	10%	4.45	4.53	2.57	53%	1.96	40%	0.34	7%	3.99	3.7	9.65	17,738
Milton	25,725	95%	5%	4.13	4.15	2.79	61%	1.36	30%	0.41	9%	4.04	6.2	11.00	194,214
Natick	30,510	78%	24%	4.12	2.33	1.13	38%	1.20	41%	0.61	21%	2.23	3.3	6.73	882,642
Needham	27,557	78%	24%	4.37	4.12	2.29	52%	1.83	42%	0.25	6%	3.22	2.9	7.96	405,535
Newton	82,585	74%	26%	18.54	16.26	11.45	60%	4.81	26%	1.14	7%	15.42	14.3	34.53	103,899
Norwood	28,700	58%	44%	4.24	4.43	2.63	58%	1.60	33%	0.43	9%	4.02	5.4	11.02	18,113
Quincy	84,985	82%	38%	15.12	12.47	5.47	41%	7.00	52%	0.99	7%	8.52	7.4	22.92	55,346
Randolph	30,093	80%	20%	3.65	3.26	1.39	41%	1.87	55%	0.14	4%	1.79	2.3	5.96	227,170
Reading	22,539	90%	10%	2.33	2.21	1.27	54%	0.95	41%	0.12	5%	1.98	1.1	4.01	425,283
Revere	42,786	74%	26%	5.98	5.50	2.92	48%	2.59	42%	0.59	10%	3.49	8.7	14.78	80,755
Somerville (5)	78,210	67%	33%	12.00	8.41	3.21	37%	2.20	25%	3.22	37%	4.52	18.1	25.82	47,925
Stoneham	22,203	85%	15%	4.05	4.08	2.21	52%	1.86	44%	0.21	5%	3.39	2.0	7.25	75,346
Stoughton	28,777	75%	25%	2.33	2.24	1.33	55%	0.91	37%	0.19	8%	2.21	1.7	4.82	1,347,298
Wakefield	24,828	67%	33%	4.42	3.94	2.32	55%	1.62	38%	0.31	7%	3.26	3.3	8.18	171,698
Walpole	20,212	82%	18%	2.68	2.05	1.13	52%	0.92	43%	0.10	5%	1.63	1.0	3.55	1,298,604
Waltham	57,878	41%	59%	8.15	8.48	4.81	54%	3.65	41%	0.49	6%	6.71	5.9	18.26	36,352
Watertown	33,284	68%	32%	4.62	4.56	2.19	45%	2.37	49%	0.27	6%	2.92	4.2	9.49	20,881
Wellesley	26,615	80%	14%	3.74	3.88	2.27	53%	1.61	38%	0.36	8%	3.73	2.6	7.94	368,302
Westwood	12,557	68%	32%	1.36	1.52	0.88	55%	0.63	40%	0.08	5%	1.26	0.9	2.79	358,491
Weymouth	54,063	81%	19%	6.66	4.57	1.93	39%	2.64	53%	0.44	9%	4.37	1.3	8.31	680,000
Wilmington	17,651	45%	55%	1.15	1.14	0.83	67%	0.31	25%	0.11	9%	1.17	0.5	1.98	2,064,780
Winchester	20,267	92%	8%	5.39	4.20	2.50	56%	1.70	38%	0.30	7%	2.50	3.0	7.20	22,893
Winthrop	18,127	94%	6%	5.32	5.88	3.62	56%	2.06	30%	0.90	13%	6.64	11.9	20.60	11,447
Woburn	35,943	45%	55%	10.76	11.58	6.62	54%	4.06	40%	0.78	6%	9.78	8.4	21.14	316,478
Totals/Averages	2,055,712	66%	31%	368.43	348.66	188.70	49%	159.97	41%	38.17	10%	249.52	453.9	863.39	13,669,182

FOOTNOTES:

- (1) Figures tabulated using data from the MWRA Interim Wastewater Metering System for calendar year 1991. These data (a) exclude unmetered portions of some communities (up to 10% of flow), (b) do not reflect new data from additional and relocated meter sites selected for the permanent system, and (c) include MWRA system infiltration. Figures for most communities are believed to be within +/- 15% of true flow.
- (2) The 1990 septage volumes are based on estimated annual contributions from the unserved residential population of each user community. These figures do not represent actual septage volume received and treated. Septage strength can vary widely. For example, the BOD (Biochemical Oxygen Demand) of septage typically ranges from 2,000-25,000 mg/l as compared to the range for domestic wastewater of 110-400 mg/l.
- (3) The "Community Profile" is a representation of the residential versus commercial/industrial mix based on the 1992 property tax levy.
- (4) Shows total annual inflow spread across 365 days. Actual inflow during a specific storm event must be calculated separately.
- (5) Combined sewer community. Inflow figures include combined flow during storm events.

Col Summations: Average Daily Flow (ADF) column D = F+H+J. Average Dry Day Flow column E = F+H. Maximum Day Total Flow column N = H+L+M.



Ww A.2
9/8/93

STAFF SUMMARY

TO: Board of Directors *Richard V. Babine*
FROM: Douglas B. MacDonald, Executive Director
DATE: September 8, 1993
SUBJECT: 1992 MWRA Wastewater Community Facts and Figures

COMMITTEE - Wastewater Policy and Oversight

X INFORMATION
VOTE

Carl H. Leone, Senior Program Manager - I/I
Preparer/Title

John F. Fitzgerald (M)
John F. Fitzgerald
Division Director Approval

RECOMMENDATION:

For information only.

DISCUSSION:

In October 1992, staff provided to the Board of Directors a table entitled "MWRA Wastewater Community Facts and Figures" which was based on calendar year 1991 information. This staff summary provides the calendar year 1992 Wastewater Community Facts and Figures (see both tables, attached). Both the 1991 and 1992 data were derived from the interim wastewater metering system.

On June 30, 1993, the Board of Directors approved award of a contract for supply of wastewater flow metering equipment and related services to make the necessary modifications to upgrade the interim system to the permanent wastewater metering system. During discussions, the Board directed staff to prepare a summary document on the MWRA's wastewater metering project which could then be distributed to the decision-makers in the area's cities and towns so that they could understand the complexity of the regional wastewater collection system and the issues involved in metering community flow contributions. Subsequent to the Board's comments, this staff summary, including the 1992 Wastewater Community Facts and Figures table, will be distributed to all 43 sewer service area communities to fulfill this directive.

Summary of the Wastewater Metering Project

The purpose of the Wastewater Metering Project is to provide a means for quantifying wastewater flows from each of the 43 MWRA sewer service area communities for: 1) collection and treatment system planning; 2) regional infiltration and inflow (I/I) quantification; and 3) evaluation of alternative wholesale rate structures which may include a flow-based component.

Metering data is an important tool used by I/I Program staff who work in cooperation with community representatives to identify system I/I problem areas and to document flow reductions following rehabilitation. The metering system makes it possible to evaluate the current I/I situation of all the service area community systems on a comparable basis. Documentation of wastewater flow levels and hydraulic inadequacies in the collection system is crucial for the identification of sewer relief/rehabilitation projects and for substantiating the need for these projects to obtain regulatory approval. Metering data is also being used to determine the interrelationship of the collection system with potential CSO facilities under the system master plan/CSO project. Information produced from the meters will also help the operations staff target resources and maintain the collection system efficiently.

Evaluation of the Authority's current wholesale rate structure is being performed by the MWRA Advisory Board - Rates Methodology Committee. Authority staff involved in the development of the wastewater metering project have met with the committee to provide technical assistance in their evaluation of ways in which metered flow data may be used as a component for alternative rate methodologies.

Project Status/Schedule/Cost

The first phase of the two-phased wastewater metering project was completed in October 1990 when the "interim" system (comprised of 170 meters) became operational. The second phase of the project involves operating the interim system, evaluating the interim system's performance, and installing upgrades/revisions to institute the "permanent" wastewater metering system. The permanent metering system will be comprised of about 200 meters and will be completed in the fall of 1993 following the addition and/or relocation of some meters and equipment upgrade at some of the metering sites. At completion of the permanent wastewater metering system, the MWRA will have expended about \$7.5 million for planning, design, equipment purchase, equipment calibration/start-up, and staff training costs. Under the project's 90% DEP grant (which excludes operation and maintenance costs), the Authority will be reimbursed about \$5.3 million, leaving about \$2.2 million as the MWRA's capital cost for construction and initial operation of the wastewater metering system. The additional annual cost for maintenance of the system, including field crews, replacement parts, utilities, etc., will be about \$300,000 per year.

Metering Equipment Operation

Each remote sewer manhole meter is comprised of an ultrasonic velocity sensor, an ultrasonic depth sensor, and a battery powered monitor. The monitor activates the sensors every 15 minutes and stores up to 3 weeks of depth and velocity data. Each meter is connected to a standard New England telephone service via a buried telemetry cable. Two system computers are programmed to "dial-up" each meter and collect the flow data twice per week. The metering system also includes flow measurement devices at key pump station and headworks facilities. Existing metering equipment at these facilities has been modified so that the flow signal can be integrated into the wastewater metering system.

Regional Collection System

The regional wastewater collection system is comprised of about 5400 miles of sewers owned and operated by the 43 sewer service area communities, as well as about 230 miles of MWRA owned interceptors. The interceptor system was constructed over a period of many decades based on regional topography, with little regard for city/town boundaries. Unlike the water distribution system, which was built to allow for the metering of flow delivered to each service area community, the wastewater collection system was built to maximize the use of gravity and minimize the need for pumping. Largely because of this rationale, the MWRA inherited a wastewater interceptor system with more than 1800 sewer connections. Some service area communities have one or only a few connections, others have hundreds of connections to the Authority's interceptor system. The number of connections each community has permitted with the MWRA is listed in column C of the calendar year 1992 MWRA Wastewater Community Facts and Figures table.

Methodology to Measure Flow from Each Community

Two methodologies were devised to measure the wastewater flow contributed from each service area community because of the large number of connections to the MWRA interceptor system and the physical constraints of the regional collection system. The methodologies are:

1. Direct Method - metering the quantity of flow directly from a community's major sewer connections; and,
2. Subtraction Method - metering the quantity of flow both leaving and entering a community and then subtracting to estimate the community's flow contribution.

In many instances, a combination of the direct and subtraction methods are used to determine a community's total flow contribution. For each of the 43 sewer service area communities, a "flow formula" has been established. The flow formula defines which system meters are used for addition and/or subtraction of data for each community. The flow formula also provides an estimate for any portion of a community which is not metered by prorating the metered portion of that community. The entire flow from every community cannot be metered due to the physical configuration of the collection systems. For the 43 sewer service area communities, the unmetered portion of flow under the permanent system will average about five percent.

Conversion From Interim System to Permanent System

Based on the intensive evaluation of the interim system, it was determined that the previously selected metering equipment and telemetry system are appropriate for continued use by the MWRA. However, as expected, some revisions/upgrades to the interim system are required to institute the permanent metering system. A list of the number of meters used to calculate each community's flow under the permanent metering system is presented in column E of the calendar year 1992 MWRA Wastewater Community Facts and Figures table. Column F of the Facts and Figures table identifies which community's metering configuration will be revised in the transition from the interim to the permanent metering systems. The column lists whether "major", "minor", or no ("none") revisions are being implemented.

CY 92 MWRA WASTEWATER COMMUNITY FACTS AND FIGURES

02-Sep-93

LOCAL BODY	A		B	C	D	E	F	G		H	I						J	K	L	M	N	O	P
	Community Demographics		No. of Connects to MWRA System	Miles of Local Sewers	No. of Meters for Permanent System	Revision From Interim to Permanent	Average Daily Flow ADF (MGD)	Average Dry Day Flow (MGD)	Average Infiltration (MGD)	Infiltration As a % of Average Daily Flow	Average Sanitary Flow (MGD)	Sanitary As a % of Average Daily Flow	Average Annual Inflow (2) (MGD)	Inflow As a % of Average Daily Flow	Peak Infiltration (High Month) (MGD)	Design Storm One Day Inflow (3) (MG)							
	Total Population	Percent Residential																					
Arlington	44,630	92%	320	103	5	Major	5.02	4.39	1.78	35.5%	2.61	52.0%	0.62	12.4%	3.03	2.6							
Ashland	12,066	81%	2	18	2	None	0.74	0.68	0.23	31.1%	0.44	59.5%	0.06	8.1%	0.33	0.1							
Bedford	12,996	44%	2	67	1	None	2.17	1.98	1.08	49.8%	0.90	41.5%	0.19	8.8%	1.57	0.5							
Belmont	24,720	94%	2	76	2	None	3.47	3.10	1.54	44.4%	1.56	45.0%	0.38	11.0%	2.25	1.6							
BWSC (4)	574,283	94%	844	840	32	Minor	121.27	104.05	51.81	42.7%	52.25	43.1%	17.21	14.2%	62.55	118.8							
Braintree	33,836	58%	18	134	7	None	7.12	6.22	3.73	52.4%	2.49	35.0%	0.90	12.6%	4.98	3.0							
Brookline	54,718	82%	9	108	10	Minor	14.22	11.66	7.22	50.8%	4.45	31.3%	2.55	17.9%	11.53	19.0							
Burlington	23,302	38%	1	107	1	None	4.09	3.85	1.88	46.0%	1.98	48.4%	0.24	5.9%	2.87	1.0							
Cambridge (4)	95,802	39%	103	163	8	Major	23.60	20.36	9.43	39.8%	10.93	46.1%	3.32	14.0%	11.67	47.7							
Canton	18,530	63%	60	60	4	None	2.15	1.79	1.03	47.9%	0.76	35.3%	0.36	16.7%	1.42	0.8							
Chelsea (4)	28,710	43%	39	41	6	None	4.88	4.21	2.36	48.4%	1.85	37.9%	0.67	13.7%	2.77	7.2							
Dedham	23,782	63%	28	81	7	None	5.84	5.08	3.48	59.6%	1.60	27.4%	0.76	13.0%	5.80	1.8							
Everett	35,701	30%	19	57	8	None	5.54	4.88	2.58	46.6%	2.30	41.5%	0.66	11.9%	3.34	6.4							
Frammingham	64,989	63%	3	275	3	None	6.72	6.15	2.72	40.5%	3.44	51.2%	0.56	8.3%	4.02	1.9							
Hingham	6,099	83%	1	31	1	Minor	0.87	0.74	0.48	55.2%	0.26	29.9%	0.13	14.9%	0.68	0.2							
Holbrook	11,041	75%	2	31	2	None	0.66	0.61	0.31	47.0%	0.30	45.5%	0.05	7.6%	0.45	0.1							
Lexington	28,974	73%	11	156	4	None	6.51	6.09	4.01	61.6%	2.08	32.0%	0.42	6.5%	5.80	0.8							
Malden	53,884	74%	228	100	6	Major	6.76	6.02	2.15	31.8%	3.87	57.2%	0.74	10.9%	4.42	2.8							
Medford	57,407	74%	70	115	6	Major	7.29	6.70	4.14	56.8%	2.57	35.3%	0.58	8.0%	5.58	4.5							
Melrose	28,150	90%	194	74	5	None	4.60	4.07	2.34	50.9%	1.73	37.6%	0.52	11.3%	3.80	0.6							
Milton	25,725	95%	43	82	14	Minor	4.13	3.61	2.30	55.7%	1.31	31.7%	0.52	12.6%	3.54	2.1							
Natick	30,510	76%	25	103	4	Major	4.12	3.65	1.73	42.0%	1.93	46.8%	0.47	11.4%	2.90	0.5							
Needham	27,557	76%	24	119	2	None	4.37	3.81	2.16	49.4%	1.66	38.0%	0.56	12.8%	3.11	1.1							
Newton	82,585	74%	51	264	6	None	18.54	16.56	9.19	49.6%	7.37	39.8%	1.97	10.6%	12.08	5.7							
Norwood	28,700	56%	29	94	7	Minor	4.24	3.64	2.29	54.0%	1.35	31.8%	0.60	14.2%	3.95	1.3							
Quincy	84,985	62%	55	240	6	Minor	15.12	13.95	8.92	59.0%	5.03	33.3%	1.16	7.7%	10.91	3.8							
Randolph	30,093	80%	2	101	2	None	3.65	3.17	1.39	38.1%	1.78	48.8%	3.48	13.2%	1.98	0.9							
Reading	22,539	90%	2	90	2	None	2.33	2.12	1.14	48.9%	0.98	42.1%	3.21	9.0%	1.95	0.4							
Revere	42,786	74%	3	78	2	Minor	5.98	5.11	2.99	50.0%	2.12	35.5%	0.87	14.5%	3.56	4.0							
Somerville (4)	76,210	67%	44	128	6	Major	12.00	11.00	7.20	60.0%	3.80	31.7%	1.00	8.3%	7.20	11.6							
Stonham	22,203	85%	23	63	7	None	4.05	3.70	1.77	43.7%	1.93	47.7%	0.35	8.6%	2.43	0.9							
Stoughton	26,777	75%	1	58	1	None	2.33	1.97	1.09	46.8%	0.88	37.8%	0.36	15.5%	1.74	0.7							
Wakefield	24,825	67%	10	78	2	None	4.42	4.01	2.46	55.7%	1.54	34.8%	0.42	9.5%	3.89	1.0							
Walpole	20,212	82%	2	54	2	None	2.68	2.39	1.26	47.0%	1.13	42.2%	0.29	10.8%	1.95	0.7							
Waltham	57,878	41%	4	137	3	None	8.15	7.72	4.31	52.9%	3.42	42.0%	0.43	5.3%	5.75	1.4							
Watertown	33,284	68%	14	75	3	None	4.62	4.30	2.00	43.3%	2.30	49.8%	0.31	6.7%	2.60	1.5							
Wellesley	26,615	86%	2	130	3	None	3.74	3.37	1.86	49.7%	1.51	40.4%	0.37	9.9%	2.95	1.0							
Westwood	12,557	68%	3	74	3	None	1.36	1.18	0.63	46.3%	0.56	41.2%	0.18	13.2%	0.93	0.4							
Weymouth	54,063	81%	17	174	4	Major	6.66	5.80	2.33	35.0%	3.48	52.3%	0.85	12.8%	3.43	2.6							
Wilmington	17,651	45%	2	19	1	Minor	1.15	1.07	0.78	67.8%	0.29	25.2%	0.08	7.0%	0.95	0.2							
Winchester	20,267	92%	65	83	8	Major	5.39	4.71	2.83	52.5%	1.88	34.9%	0.68	12.6%	4.12	1.8							
Winthrop	18,127	94%	21	31	5	Major	5.32	4.68	2.91	54.7%	1.77	33.3%	0.64	12.0%	4.28	8.2							
Woburn	35,943	45%	20	135	13	None	10.76	10.23	6.33	58.8%	3.90	36.2%	0.53	4.9%	8.74	2.6							
Totals/Averages	2,055,712	69%	1,803	5,047	226		366.69	324.43	174.14	47.2%	150.29	40.8%	44.26	12.0%	217.90	275.27							

FOOTNOTES:

- (1) Figures tabulated using data from the MWRA Interim Wastewater Metering System for calendar year 1992. These data (a) exclude unmetered portions of some communities (up to 10% of flow), (b) do not reflect new data from additional and relocated meter sites selected for the permanent system, and (c) include MWRA system infiltration. Figures for most communities are believed to be within +/- 15% of true flow.
- (2) Shows total annual inflow spread across 366 days. Actual inflow during a specific storm event must be calculated separately.
- (3) Design Storm One Day Inflow (MG) based upon DEP Design Storm rainfall of approximately 1.7 inches.
- (4) Combined sewer community. Inflow figures include combined flow during storm events.

Column Summations: Average Daily Flow (ADF) Column G = I+K+M Average Dry Day Flow Column H = I+K

CY 91 MWRA WASTEWATER COMMUNITY FACTS AND FIGURES

Oct - 92

LOCAL BODY	Community Demographics			1991 Annual Averages (1)		Components of Average Daily Flow (Estimated) (1)						Peak (1) and Max. Day Flows (est) (1)			Septage (2)
	A Total Population	B Community Profile (3) % Residential	C % Comm & Industrial	D average daily flow ADF (MGD)	E average dry day flow (MGD)	F average infiltration (MGD)	G infiltration as a % of average daily flow	H average sanitary flow (MGD)	I sanitary as a % of average daily flow	J average annual inflow (4) (MGD)	K inflow as a % of average daily flow	L peak infiltration (high month) (MGD)	M max. day inflow (MG)	N max. day total flow (MG)	
Arlington	44,830	92%	8%	4.88	4.37	1.77	36%	2.00	53%	0.50	10%	2.53	8.5	11.03	28,050
Ashland	12,068	81%	19%	0.81	0.78	0.34	41%	0.45	55%	0.03	4%	0.48	0.3	1.23	705,786
Bedford	12,998	44%	56%	2.48	2.30	1.28	52%	1.02	42%	0.15	6%	2.02	1.0	4.04	498,618
Belmont	24,720	84%	8%	3.63	3.38	1.74	48%	1.85	45%	0.25	7%	2.76	4.2	8.61	85,283
BWSC (5)	574,283	34%	66%	142.48	128.36	64.77	45%	63.58	44%	15.12	11%	75.74	211.8	351.13	381,132
Braintree	33,838	56%	44%	6.96	6.14	3.80	54%	2.34	34%	0.84	12%	5.54	8.1	15.98	127,673
Brookline	54,718	82%	18%	6.92	5.95	3.37	49%	2.58	37%	0.97	14%	4.39	9.8	18.77	34,485
Burlington	23,302	38%	62%	3.70	3.57	1.85	50%	1.72	46%	0.13	4%	2.78	1.8	6.10	293,082
Cambridge (5)	95,802	30%	81%	24.86	21.73	11.63	43%	11.10	45%	3.14	13%	12.12	42.2	65.42	60,752
Canton	18,530	63%	37%	2.49	2.32	1.42	57%	0.89	36%	0.17	7%	1.77	1.8	4.48	710,943
Chelsea (5)	28,710	43%	57%	4.03	4.21	2.12	43%	2.10	42%	0.72	15%	2.48	9.3	13.89	18,113
Dedham	23,782	63%	37%	6.34	5.88	4.18	66%	1.70	27%	0.48	7%	6.50	8.8	14.80	299,119
Everett	35,701	30%	70%	6.16	5.61	2.86	48%	2.75	45%	0.55	9%	3.40	6.8	13.05	22,518
Framingham	64,989	63%	37%	8.61	8.11	4.22	49%	3.89	45%	0.50	8%	5.27	3.8	12.78	163,522
Hingham	8,099	83%	17%	1.10	0.98	0.87	81%	0.31	28%	0.12	11%	1.10	1.5	2.91	137,987
Holbrook	11,041	75%	25%	0.84	0.80	0.48	58%	0.32	38%	0.03	4%	0.80	0.4	1.52	624,906
Lexington	28,974	73%	27%	8.94	8.45	4.38	63%	2.09	30%	0.49	7%	6.40	2.7	11.19	218,618
Malden	53,884	74%	26%	6.83	6.39	3.14	46%	3.29	48%	0.44	8%	3.88	4.7	11.84	33,838
Medford	57,407	74%	26%	9.38	8.61	5.58	60%	3.03	32%	0.77	8%	6.78	11.8	21.61	36,101
Melrose	28,150	90%	10%	4.88	4.53	2.57	53%	1.98	40%	0.34	7%	3.99	3.7	9.65	17,736
Milton	25,725	95%	5%	4.55	4.15	2.79	61%	1.38	30%	0.41	9%	4.04	8.2	11.60	194,214
Natick	30,510	76%	24%	2.84	2.33	1.13	38%	1.20	41%	0.61	21%	2.23	3.3	8.73	882,842
Needham	27,557	78%	24%	4.37	4.12	2.29	52%	1.83	42%	0.25	6%	3.22	2.9	7.95	405,535
Newton	82,585	74%	26%	17.40	16.26	11.45	66%	4.81	28%	1.14	7%	15.42	14.3	34.53	103,899
Norwood	28,700	58%	44%	4.86	4.43	2.83	58%	1.80	33%	0.43	9%	4.02	5.4	11.02	18,113
Quincy	84,985	62%	38%	13.47	12.47	5.47	41%	7.00	52%	0.99	7%	8.52	7.4	22.92	55,348
Randolph	30,093	80%	20%	3.40	3.26	1.39	41%	1.87	55%	0.14	4%	1.79	2.3	5.98	227,170
Reading	22,539	90%	10%	2.33	2.21	1.27	54%	0.95	41%	0.12	5%	1.98	1.1	4.01	425,283
Revere	42,786	74%	26%	8.10	5.50	2.92	48%	2.59	42%	0.59	10%	3.48	8.7	14.78	60,755
Somerville (5)	78,210	67%	33%	8.62	5.41	3.21	37%	2.20	25%	3.22	37%	4.52	18.1	25.82	47,925
Stoneham	22,203	85%	15%	4.28	4.08	2.21	52%	1.86	44%	0.21	5%	3.38	2.0	7.25	75,348
Stoughton	26,777	75%	25%	2.42	2.24	1.33	55%	0.91	37%	0.19	8%	2.21	1.7	4.82	1,347,298
Wakefield	24,825	87%	13%	4.25	3.94	2.32	55%	1.62	38%	0.31	7%	3.26	3.3	8.18	171,698
Walpole	20,212	82%	18%	2.15	2.05	1.13	52%	0.92	43%	0.10	5%	1.83	1.0	3.55	1,298,804
Waltham	57,878	41%	59%	8.95	8.48	4.81	54%	3.65	41%	0.48	6%	8.71	5.9	16.28	36,352
Watertown	33,284	68%	32%	4.63	4.58	2.19	45%	2.37	49%	0.27	6%	2.92	4.2	9.40	20,881
Wellesley	28,815	88%	14%	4.24	3.88	2.27	53%	1.61	38%	0.36	8%	3.73	2.8	7.94	368,302
Westwood	12,557	88%	12%	1.80	1.52	0.88	55%	0.83	40%	0.08	5%	1.26	0.9	2.79	358,491
Weymouth	54,083	81%	19%	5.00	4.57	1.93	39%	2.64	53%	0.44	9%	4.37	1.3	8.31	680,000
Wilmington	17,651	45%	55%	1.25	1.14	0.83	67%	0.31	25%	0.11	9%	1.17	0.5	1.98	2,064,780
Winchester	20,287	92%	8%	4.50	4.20	2.50	56%	1.70	38%	0.30	7%	2.50	3.0	7.20	22,893
Winthrop	18,127	94%	6%	8.78	5.88	3.82	56%	2.08	30%	0.90	13%	8.84	11.9	20.60	11,447
Woburn	35,943	45%	55%	12.35	11.58	6.62	54%	4.98	40%	0.78	6%	9.78	8.4	21.14	318,478
Totals/Averages	2,055,712	69%	31%	388.84	348.66	188.70	49%	159.97	41%	38.17	10%	240.52	453.9	863.39	13,689,182

FOOTNOTES:

- (1) Figures tabulated using data from the MWRA Interim Wastewater Metering System for calendar year 1991. These data (a) exclude unmetered portions of some communities (up to 10% of flow), (b) do not reflect new data from additional and relocated meter sites selected for the permanent system, and (c) include MWRA system infiltration. Figures for most communities are believed to be within +/- 15% of true flow.
- (2) The 1990 septage volumes are based on estimated annual contributions from the unserved residential population of each user community. These figures do not represent actual septage volume received and treated. Septage strength can vary widely. For example, the BOD (Biochemical Oxygen Demand) of septage typically ranges from 2,000-25,000 mg/l as compared to the range for domestic wastewater of 110-400 mg/l.
- (3) The "Community Profile" is a representation of the residential versus commercial/industrial mix based on the 1992 property tax levy.
- (4) Shows total annual inflow spread across 365 days. Actual inflow during a specific storm event must be calculated separately.
- (5) Combined sewer community. Inflow figures include combined flow during storm events.

Column Summations: Average Daily Flow (ADF) column D = 388.84

Average Dry Day Flow (DDF) column E = 348.66

UPDATE ON THE MWRA WASTEWATER METERING PROJECT

Prepared for the October 21, 1993 Advisory Board Meeting

The purpose of the Wastewater Metering Project is to provide a means for quantifying wastewater flows from each of the 43 MWRA sewer service area communities for: 1) collection and treatment system planning; 2) regional infiltration and inflow (I/I) quantification; and 3) evaluation of alternative wholesale rate structures which may include a flow-based component.

Metering data is an important tool used by I/I Program staff who work in cooperation with community representatives to identify system I/I problem areas and to document flow reductions following rehabilitation. The metering system makes it possible to evaluate the current I/I situation of all the service area community systems on a comparable basis. Documentation of wastewater flow levels and hydraulic inadequacies in the collection system is crucial for the identification of sewer relief/rehabilitation projects and for substantiating the need for these projects to obtain regulatory approval. Metering data is also being used to determine the interrelationship of the collection system with potential CSO facilities under the system master plan/CSO project. Information produced from the meters will also help the operations staff target resources and maintain the collection system efficiently.

Evaluation of the Authority's current wholesale rate structure is being performed by the MWRA Advisory Board - Rates Methodology Committee. Authority staff involved in the development of the wastewater metering project have met with the committee to provide technical assistance in their evaluation of ways in which metered flow data may be used as a component for alternative rate methodologies.

Project Status/Schedule/Cost

The first phase of the two-phased wastewater metering project was completed in October 1990 when the "interim" system (comprised of 170 meters) became operational. The second phase of the project involves operating the interim system, evaluating the interim system's performance, and installing upgrades/revisions to institute the "permanent" wastewater metering system. The permanent metering system will be comprised of about 210 meters and will be completed in the fall of 1993 following the addition and/or relocation of some meters and equipment upgrade at some of the metering sites. At completion of the permanent wastewater metering system, the MWRA will have expended about \$7.5 million for planning, design, equipment purchase, equipment calibration/start-up, and staff training costs. Under the project's 90% DEP grant (which excludes operation and maintenance costs), the Authority will be reimbursed about \$5.3 million, leaving about \$2.2 million as the MWRA's capital cost for construction and initial operation of the wastewater metering system. The additional annual cost for maintenance of the system, including replacement parts, utilities, etc., will be about \$300,000 per year.

Metering Equipment Operation

Each remote sewer manhole meter is comprised of an ultrasonic velocity sensor, an ultrasonic depth sensor, and a battery powered monitor which activates the sensors every 15 minutes and stores up to 3 weeks of depth and velocity data. Each meter is connected to a standard New England telephone service via a buried telemetry cable. Two system computers are programmed to "dial-up" each meter and collect the flow data twice per week. The metering system also includes flow measurement devices at key pump station and headworks facilities. Existing metering equipment at these facilities has been modified so that the flow signal can be integrated into the wastewater metering system.

Regional Collection System

The regional wastewater collection system is comprised of over 5000 miles of sewers owned and operated by the 43 sewer service area communities, as well as about 230 miles of MWRA owned interceptors. The interceptor system was constructed over a period of many decades based on regional topography, with little regard for city/town boundaries. Unlike the water distribution system, which was built to allow for the metering of flow delivered to each service area community, the wastewater collection system was built to maximize the use of gravity and minimize the need for pumping. Largely because of this rationale, the MWRA inherited a wastewater interceptor system with more than 1800 sewer connections. Some service area communities have one or only a few connections, others have hundreds of connections to the Authority's interceptor system. The number of connections each community has permitted with the MWRA is listed in column C of the calendar year 1992 MWRA Wastewater Community Facts and Figures table.

Methodology to Measure Flow from Each Community

Two methodologies were devised to measure the wastewater flow contributed from each service area community because of the large number of connections to the MWRA interceptor system and the physical constraints of the regional collection system. The methodologies are:

1. Direct Method - metering the quantity of flow directly from a community's major sewer connections; and,
2. Subtraction Method - metering the quantity of flow both leaving and entering a community and then subtracting to estimate the community's flow contribution.

In many instances, a combination of the direct and subtraction methods are used to determine a community's total flow contribution. For each of the 43 sewer service area communities, a "flow formula" has been established. The flow formula defines which system meters are used for addition and/or subtraction of data for each community. The flow formula also provides an estimate for any portion of a community which is not metered by prorating the metered portion of that community. The entire flow from every community cannot be metered due to the physical configuration of the collection systems. For the 43 sewer service area communities, the unmetered portion of flow under the permanent system will average about five percent.

Conversion From Interim System to Permanent System

Based on the intensive evaluation of the interim system, it was determined that the previously selected metering equipment and telemetry system are appropriate for continued use by the MWRA. However, as expected, some upgrades/revisions to the interim system are required to institute the permanent metering system. A list of the number of meters used to calculate each community's flow under the permanent metering system is presented in column E of the calendar year 1992 MWRA Wastewater Community Facts and Figures table. Column F of the Facts and Figures table identifies which community's metering configuration will be revised in the transition from the interim to the permanent metering systems. The column lists whether "major", "minor", or no ("none") revisions are being implemented.

CY 92 MWRA WASTEWATER COMMUNITY FACTS AND FIGURES

1992 Annual Averages (1)

Components of Average Daily Flow (Estimated) (1)

LOCAL BODY	Community Demographics		No. of Connects to MWRA System	Miles of Local Sewers	No. of Meters for Permanent System	Revision From Interim to Permanent	1992 Annual Averages (1)		Components of Average Daily Flow (Estimated) (1)						Peak Infiltration (High Month) (MGD)	Design Storm One Day Inflow (3) (MG)
	Total Population	Percent Residential					Average Daily Flow ADF (MGD)	Average Dry Day Flow (MGD)	Average Infiltration (MGD)	Infiltration As a % of Average Daily Flow	Average Sanitary Flow (MGD)	Sanitary As a % of Average Daily Flow	Average Annual Inflow (2) (MGD)	Inflow As a % of Average Daily Flow		
Arlington	44,630	92%	320	103	5	Major	5.02	4.39	1.78	35.5%	2.61	52.0%	0.62	12.4%	3.03	2.8
Ashland	12,066	81%	2	18	2	None	0.74	0.68	0.23	31.1%	0.44	59.5%	0.06	8.1%	0.33	0.1
Bedford	12,996	44%	2	67	1	None	2.17	1.98	1.08	49.8%	0.90	41.5%	0.19	8.8%	1.57	0.5
Belmont	24,720	94%	2	78	2	None	3.47	3.10	1.54	44.4%	1.56	45.0%	0.38	11.0%	2.25	1.6
BWSC (4)	574,283	34%	244	840	32	Minor	121.27	104.05	51.81	42.7%	52.25	43.1%	17.21	14.2%	62.55	118.8
Braintree	33,836	56%	13	134	7	None	7.12	6.22	3.73	52.4%	2.49	35.0%	0.90	12.6%	4.98	3.0
Brookline	54,718	82%	9	108	10	Minor	14.22	11.66	7.22	50.8%	4.45	31.3%	2.55	17.9%	11.53	19.0
Burlington	23,302	38%	1	107	1	None	4.09	3.85	1.88	46.0%	1.98	48.4%	0.24	5.9%	2.87	1.0
Cambridge (4)	95,802	39%	103	183	8	Major	23.69	20.36	9.43	39.8%	10.93	46.1%	3.32	14.0%	11.67	47.7
Canton	18,530	63%	50	60	4	None	2.15	1.79	1.03	47.9%	0.76	35.3%	0.38	16.7%	1.42	0.8
Chelsea (4)	28,710	43%	39	41	6	None	4.88	4.21	2.36	48.4%	1.85	37.9%	0.67	13.7%	2.77	7.2
Dedham	23,782	63%	28	81	7	None	5.84	5.08	3.48	59.6%	1.60	27.4%	0.78	13.0%	5.80	1.8
Everett	35,701	30%	19	57	8	None	5.54	4.88	2.58	46.6%	2.30	41.5%	0.66	11.9%	3.34	6.4
Frammingham	64,989	63%	3	275	3	None	6.72	6.15	2.72	40.5%	3.44	51.2%	0.56	8.3%	4.02	1.9
Hingham	6,099	83%	1	31	1	Minor	0.67	0.74	0.48	55.2%	0.26	29.9%	0.13	14.9%	0.68	0.2
Holbrook	11,041	75%	2	31	2	None	0.66	0.61	0.31	47.0%	0.30	45.5%	0.05	7.6%	0.45	0.1
Lexington	28,974	73%	11	156	4	None	6.51	6.09	4.01	61.6%	2.08	32.0%	0.42	6.5%	5.80	0.8
Malden	53,884	74%	228	100	6	Major	6.76	6.02	2.15	31.8%	3.87	57.2%	0.74	10.9%	4.42	2.8
Medford	57,407	74%	70	115	6	Major	7.29	6.70	4.14	56.8%	2.57	35.3%	0.58	8.0%	5.58	4.5
Metrose	28,150	90%	194	74	5	None	4.60	4.07	2.34	50.9%	1.73	37.6%	0.52	11.3%	3.80	0.6
Milton	25,725	95%	43	82	14	Minor	4.13	3.61	2.30	55.7%	1.31	31.7%	0.52	12.6%	3.54	2.1
Natick	30,510	76%	25	103	4	Major	4.12	3.65	1.73	42.0%	1.93	46.8%	0.47	11.4%	2.90	0.5
Needham	27,557	76%	24	119	2	None	4.37	3.81	2.16	49.4%	1.66	38.0%	0.56	12.8%	3.11	1.1
Newton	82,585	74%	51	264	6	None	16.33	14.55	8.22	50.3%	6.33	38.8%	1.78	10.9%	10.74	5.7
Norwood	28,700	56%	29	94	7	Minor	4.24	3.64	2.29	54.0%	1.35	31.8%	0.60	14.2%	3.95	1.3
Quincy	84,985	62%	55	240	6	Minor	15.12	13.95	8.92	59.0%	5.03	33.3%	1.16	7.7%	10.91	3.8
Randolph	30,093	80%	2	101	2	None	3.65	3.17	1.39	38.1%	1.78	48.6%	0.48	13.2%	1.98	0.9
Reading	22,539	90%	2	80	2	None	2.33	2.12	1.14	48.9%	0.98	42.1%	0.21	9.0%	1.95	0.4
Revere	42,786	74%	3	78	2	Minor	5.98	5.11	2.99	50.0%	2.12	35.5%	0.87	14.5%	3.56	4.0
Somerville (4)	76,210	67%	44	128	6	Major	12.00	11.00	7.20	60.0%	3.80	31.7%	1.00	8.3%	7.20	11.6
Stoneham	22,203	85%	23	63	7	None	4.05	3.70	1.77	43.7%	1.93	47.7%	0.35	8.6%	2.43	0.9
Stoughton	26,777	75%	1	58	1	None	2.33	1.97	1.09	46.8%	0.88	37.8%	0.36	15.5%	1.74	0.7
Wakefield	24,825	67%	10	78	2	None	4.42	4.01	2.46	55.7%	1.54	34.8%	0.42	9.5%	3.89	1.0
Walpole	20,212	82%	2	54	2	None	2.68	2.39	1.26	47.0%	1.13	42.2%	0.29	10.8%	1.95	0.7
Waltham	57,878	41%	4	137	3	None	6.15	7.72	4.31	52.9%	3.42	42.0%	0.43	5.3%	5.75	1.4
Watertown	33,284	68%	14	75	3	None	4.62	4.30	2.00	43.3%	2.30	49.8%	0.31	6.7%	2.60	1.5
Wellesley	26,615	86%	2	130	3	None	3.74	3.37	1.86	49.7%	1.51	40.4%	0.37	9.9%	2.95	1.0
Westwood	12,557	68%	3	74	3	None	1.36	1.18	0.63	46.3%	0.56	41.2%	0.18	13.2%	0.93	0.4
Weymouth	54,063	81%	17	174	4	Major	6.66	5.80	2.33	35.0%	3.48	52.3%	0.85	12.8%	3.43	2.6
Wilmington	17,651	45%	2	19	1	Minor	1.15	1.07	0.78	67.8%	0.29	25.2%	0.08	7.0%	0.95	0.2
Winchester	20,267	92%	65	83	8	Major	5.39	4.71	2.83	52.5%	1.88	34.9%	0.68	12.6%	4.12	1.8
Winthrop	18,127	94%	21	31	5	Major	5.32	4.68	2.91	54.7%	1.77	33.3%	0.64	12.0%	4.28	8.2
Woburn	35,943	45%	20	135	13	None	10.76	10.23	6.33	58.8%	3.90	36.2%	0.53	4.9%	8.74	2.6
Totals/Averages	2,055,712	69%	1,803	5,047	226		366.48	322.42	173.17	47.3%	149.25	40.7%	44.06	12.0%	216.56	275.27

FOOTNOTES:

- (1) Figures tabulated using data from the MWRA Interim Wastewater Metering System for calendar year 1992. These data (a) exclude unmetered portions of some communities (up to 10% of flow), (b) do not reflect new data from additional and relocated meter sites selected for the permanent system, and (c) include MWRA system infiltration. Figures for most communities are believed to be within +/- 15% of true flow.
- (2) Shows total annual inflow spread across 366 days. Actual inflow during a specific storm event must be calculated separately.
- (3) Design Storm One Day Inflow (MG) based upon DEP Design Storm rainfall of approximately 1.7 inches.
- (4) Combined sewer community. Inflow figures include combined flow during storm events.

C

Summations:

1 36 Daily Flow (ADF) Column G = I+K+M

36 Dry Day Flow Column H = I+K

UPDATE ON THE MWRA WASTEWATER METERING PROJECT

Prepared for the October 21, 1993 Advisory Board Meeting

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2. Subtraction Method - metering the quantity of flow both leaving and entering a community and then subtracting to estimate the community's flow contribution.

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CY 92 MWRA WASTEWATER COMMUNITY FACTS AND FIGURES

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LOCAL BODY	A Community Demographics		C No. of Connects to MWRA System	D Miles of Local Sewers	E No. of Meters for Permanent System	F Revision From Interim to Permanent	G 1992 Annual Averages (1)		Components of Average Daily Flow (Estimated) (1)						O Peak Infiltration (High Month) (MGD)	P Design Storm One Day Inflow (3) (MG)
	Total Population	Percent Residential					Average Daily Flow ADF (MGD)	Average Dry Day Flow (MGD)	Average Infiltration (MGD)	Infiltration As a % of Average Daily Flow	Average Sanitary Flow (MGD)	Sanitary As a % of Average Daily Flow	Average Annual Inflow (2) (MGD)	Inflow As a % of Average Daily Flow		
Arlington	44,630	92%	320	103	5	Major	5.02	4.39	1.78	35.5%	2.61	52.0%	0.62	12.4%	3.03	2.6
Ashland	12,066	81%	2	18	2	None	0.74	0.68	0.23	31.1%	0.44	59.5%	0.08	8.1%	0.33	0.1
Bedford	12,996	44%	2	67	1	None	2.17	1.98	1.08	49.8%	0.90	41.5%	0.19	8.8%	1.57	0.5
Belmont	24,720	94%	2	76	2	None	3.47	3.10	1.54	44.4%	1.56	45.0%	0.38	11.0%	2.25	1.8
BWSC (4)	574,283	34%	244	840	32	Minor	121.27	104.05	51.81	42.7%	52.25	43.1%	17.21	14.2%	62.55	118.8
Braintree	33,836	56%	13	134	7	None	7.12	6.22	3.73	52.4%	2.49	35.0%	0.90	12.6%	4.98	3.0
Brookline	54,718	82%	9	108	10	Minor	14.22	11.66	7.22	50.8%	4.45	31.3%	2.55	17.9%	11.53	19.0
Burlington	23,302	38%	1	107	1	None	4.09	3.85	1.88	46.0%	1.98	48.4%	0.24	5.9%	2.87	1.0
Cambridge (4)	95,802	39%	103	163	8	Major	23.69	20.36	9.43	39.8%	10.93	46.1%	3.32	14.0%	11.67	47.7
Canton	18,530	63%	50	60	4	None	2.15	1.79	1.03	47.9%	0.76	35.3%	0.36	16.7%	1.42	0.8
Chelsea (4)	28,710	43%	39	41	6	None	4.88	4.21	2.36	48.4%	1.85	37.9%	0.67	13.7%	2.77	7.2
Dedham	23,782	63%	28	81	7	None	5.84	5.08	3.48	59.6%	1.60	27.4%	0.76	13.0%	5.80	1.8
Everett	35,701	30%	19	57	8	None	5.54	4.88	2.58	46.6%	2.30	41.5%	0.66	11.9%	3.34	6.4
Frammingham	64,989	63%	3	275	3	None	6.72	6.15	2.72	40.5%	3.44	51.2%	0.56	8.3%	4.02	1.9
Hingham	6,099	83%	1	31	1	Minor	0.87	0.74	0.48	55.2%	0.26	29.9%	0.13	14.9%	0.68	0.2
Holbrook	11,041	75%	2	31	2	None	0.66	0.61	0.31	47.0%	0.30	45.5%	0.05	7.6%	0.45	0.1
Lexington	28,974	73%	11	156	4	None	6.51	6.09	4.01	61.6%	2.08	32.0%	0.42	6.5%	5.80	0.8
Malden	53,884	74%	228	100	6	Major	6.76	6.02	2.15	31.8%	3.87	57.2%	0.74	10.9%	4.42	2.8
Medford	57,407	74%	70	115	6	Major	7.29	6.70	4.14	56.8%	2.57	35.3%	0.58	8.0%	5.58	4.5
Melrose	28,150	90%	194	74	5	None	4.60	4.07	2.34	50.9%	1.73	37.6%	0.52	11.3%	3.80	0.6
Milton	25,725	95%	43	82	14	Minor	4.13	3.61	2.30	55.7%	1.31	31.7%	0.52	12.6%	3.54	2.1
Natick	30,510	76%	25	103	4	Major	4.12	3.65	1.73	42.0%	1.93	46.8%	0.47	11.4%	2.90	0.5
Needham	27,557	76%	24	119	2	None	4.37	3.81	2.16	49.4%	1.66	38.0%	0.56	12.8%	3.11	1.1
Newton	82,585	74%	51	264	6	None	16.33	14.55	8.22	50.3%	6.33	38.8%	1.78	10.9%	10.74	5.7
Norwood	28,700	56%	29	94	7	Minor	4.24	3.64	2.29	54.0%	1.35	31.8%	0.60	14.2%	3.95	1.3
Quincy	84,985	62%	55	240	6	Minor	15.12	13.95	8.92	59.0%	5.03	33.3%	1.16	7.7%	10.91	3.8
Randolph	30,093	80%	2	101	2	None	3.65	3.17	1.39	38.1%	1.78	48.8%	0.48	13.2%	1.98	0.9
Reading	22,539	90%	2	90	2	None	2.33	2.12	1.14	48.9%	0.98	42.1%	0.21	9.0%	1.95	0.4
Revere	42,786	74%	3	78	2	Minor	5.98	5.11	2.99	50.0%	2.12	35.5%	0.87	14.5%	3.56	4.0
Somerville (4)	76,210	67%	44	128	6	Major	12.00	11.00	7.20	60.0%	3.80	31.7%	1.00	8.3%	7.20	11.6
Stoneham	22,203	85%	23	63	7	None	4.05	3.70	1.77	43.7%	1.93	47.7%	0.35	8.6%	2.43	0.9
Stoughton	26,777	75%	1	58	1	None	2.33	1.97	1.09	46.8%	0.88	37.8%	0.36	15.5%	1.74	0.7
Wakefield	24,825	67%	10	78	2	None	4.42	4.01	2.46	55.7%	1.54	34.8%	0.42	9.5%	3.89	1.0
Walpole	20,212	82%	2	54	2	None	2.68	2.39	1.26	47.0%	1.13	42.2%	0.29	10.8%	1.95	0.7
Waltham	57,878	41%	4	137	3	None	8.15	7.72	4.31	52.9%	3.42	42.0%	0.43	5.3%	5.75	1.4
Watertown	33,284	66%	14	75	3	None	4.62	4.30	2.00	43.3%	2.30	49.8%	0.31	6.7%	2.60	1.5
Wellesley	26,615	86%	2	130	3	None	3.74	3.37	1.66	49.7%	1.51	40.4%	0.37	9.9%	2.95	1.0
Westwood	12,557	66%	3	74	3	None	1.36	1.18	0.63	46.3%	0.56	41.2%	0.18	13.2%	0.93	0.4
Weymouth	54,063	81%	17	174	4	Major	6.66	5.80	2.33	35.0%	3.48	52.3%	0.85	12.6%	3.43	2.6
Wilmington	17,651	45%	2	19	1	Minor	1.15	1.07	0.78	67.8%	0.29	25.2%	0.08	7.0%	0.95	0.2
Winchester	20,267	92%	65	83	8	Major	5.39	4.71	2.63	52.5%	1.88	34.9%	0.68	12.6%	4.12	1.8
Winthrop	18,127	94%	21	31	5	Major	5.32	4.68	2.91	54.7%	1.77	33.3%	0.64	12.0%	4.28	8.2
Woburn	35,843	45%	20	135	13	None	10.76	10.23	6.33	58.8%	3.90	36.2%	0.53	4.9%	8.74	2.6
Totals/Averages	2,055,712	69%	1,803	5,047	226		366.48	322.42	173.17	47.3%	149.25	40.7%	44.06	12.0%	216.56	275.27

FOOTNOTES:

- (1) Figures tabulated using data from the MWRA Interim Wastewater Metering System for calendar year 1992. These data (a) exclude unmetered portions of some communities (up to 10% of flow), (b) do not reflect new data from additional and relocated meter sites selected for the permanent system, and (c) include MWRA system infiltration. Figures for most communities are believed to be within +/- 15% of true flow.
- (2) Shows total annual inflow spread across 366 days. Actual inflow during a specific storm event must be calculated separately.
- (3) Design Storm One Day Inflow (MG) based upon DEP Design Storm rainfall of approximately 1.7 inches.
- (4) Combined sewer community. Inflow figures include combined flow during storm events.

Column

ions:

Average Daily Flow (ADF) Column G = I+K+M

ge Dry Day I

Column H = I+K