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J-36800426.00001

April 29, 2005

U. S. Environmental Protection Agency
Water Technical Unit
P. O. Box 8127
Boston, MA 02114

Subject: NPDES General Permit for Storm Water Discharges from
Small Municipal Separate Storm Sewer Systems (MS4s)
Permit Number: MA041219/MaDEP Transmittal Number: W040844
Annual Report (Year 2)

Gentlemen:

On behalf of the City of Salem, please find enclosed the Annual Report (Year 2) for the subject NPDES General Permit.

If you should have any questions, please do not hesitate to call the writer at (781) 224-6094.

Very truly yours,
Metcalf & Eddy, Inc.

Mark R Meserve

Mark R. Meserve
Project Manager

Enc.

CC: Massachusetts DEP
Bruce Thibodeau
Joseph Nerden

Municipality/Organization: **City of Salem, Massachusetts**

EPA NPDES Permit Number: **MA041219**

MaDEP Transmittal Number: **W- 040844**

Annual Report Number & Reporting Period: **No. 2: March 04-March 05**

NPDES PII Small MS4 General Permit Annual Report

Part I. General Information

Contact Person: Bruce D. Thibodeau Title: Director of Public Services

Telephone #: (978) 745 – 9595 ext. 321 Email: BruceThibodeau@Salem.com

Certification:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature:

Printed Name: Stanley J. Usovicz, Jr.

Title: Mayor

Date: 4.27.05

Part II. Self-Assessment

The City of Salem, Massachusetts has completed the required self-assessment and has determined that our municipality is in compliance with all permit conditions, except for the following provisions:

Part I.B.2(g): The City's permit eligibility with regard to the National Historic Preservation Act was pending at the time of our NOI submission. During Year 1, a letter was sent to the local Historic Commission requesting assistance in determining if any historic properties are known to be within the path or immediate area of any of the City's existing stormwater discharges and if so, whether or not the stormwater discharge has the potential to adversely impact the historic property. As of this date, this remains a pending issue.

Part III. Summary of Minimum Control Measures

1. Public Education and Outreach

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 2 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 3
1	Website	Dept. of Public Services (through the efforts of Salem Sound Coastwatch, SSCW)	Maintain and update website (provided funding is available).	Maintained and updated website.	Continue to maintain and update website (provided funding is available).
Revised					
2	Informational brochures	Dept. of Public Services (through the efforts of SSCW)	Provide and maintain brochures at SSCW office. Distribute brochures at public events (provided funding is available).	Provided and maintained brochures at SSCW office, and distributed brochures at public events including the Annual Meeting held on November 18, 2004.	Continue to provide and maintain brochures at SSCW office and to distribute brochures at public events (provided funding is available).
Revised					
3	Newsletter	Dept. of Public Services (through the efforts of SSCW)	Provide and maintain newsletters at SSCW office. Mail newsletter to dues paying SSCW members and others on a quarterly basis (provided funding is available).	Provided and maintained newsletter at SSCW office, and distributed newsletter during the summer of 2004.	Continue to provide and maintain newsletter at SSCW office and to distribute newsletter (provided funding is available).
Revised					
4	Public event displays	Dept. of Public Services (through the efforts of SSCW)	Post display annually at the Maritime Festival, and other public events if possible (provided funding is available).	A display was posted at the annual Maritime Festival held on July 17, 2004.	Continue to post display annually at the Maritime Festival and other public events, if possible (provided funding is available).

Revised					
5	Local newspaper articles	Dept. of Public Services (through the efforts of SSCW)	One article per year.	An article was published in the Boston Globe on November 14, 2004 which heralded the upcoming SSCW annual meeting and highlighted the "Top Five Environmental Tasks" which the SSCW considers most important to focus on in order to continue the goal of minimizing stormwater contaminants and protecting or restoring wetlands habitat.	Continue with the goal to publish one newspaper article per year (provided funding is available).
Revised					
6	Training of volunteers	Dept. of Public Services (through the efforts of SSCW)	Annually (provided funding is available).	Conducted workshops on April 3, 2004 and May 1, 2004 on marine invasive species, including training of volunteers on species identification and monitoring the presence of invasive species on docks, pilings, rocky shoreline, saltmarsh creeks and tidepools. Conducted a workshop on May 26, 2004 which included the training of volunteers in collecting water samples from designated coastal sites. Conducted a workshop on July 13, 2004 which provided training to volunteers on salt marsh assessment techniques.	Continue annual training of volunteers (provided funding is available).
7	Publish results of water quality monitoring	Dept. of Public Services (through the efforts of SSCW)	Year 1 – Publish upon receipt of results. Years 2 through 5 – Based on available funding.	Results of water quality monitoring performed during Permit Year 2 are published in SSCW's website (www.salemsound.org).	Continue to publish results (provided funding is available for sampling).

1a. Additions

2. Public Involvement and Participation

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 2 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 3
8	Water quality monitoring program	Dept. of Public Services (through the efforts of SSCW)	Annually (provided funding is available).	Under SSCW's Clean Beaches and Streams Program, collected samples from prioritized sites and performed testing every two weeks during summer 2004.	Continue program (provided funding is available).
Revised					
9	Beach cleanup program	Dept. of Public Services (through the efforts of SSCW)	Conduct once per year, each summer (provided funding is available).	Under SSCW's Beach Buddy Program/Coastsweep, marine debris and trash were removed from coastal recreational areas in September 2004.	Continue program (provided funding is available).
Revised					
10	Storm drain stenciling	Dept. of Public Services (through the efforts of SSCW); Salem State College (through the efforts of MA Community Water Watch)	Evaluate once per year. Perform stenciling (provided funding is available).	No known stenciling was performed during Year 2.	Continue to evaluate and perform stenciling (provided funding is available).
Revised					
Revised					

2a. Additions

30	Coastal habitat invasive monitoring program	Dept. of Public Services (via the efforts of SSCW)	Annually (provided funding is available).	Under SSCW's marine invasive species monitoring program, trained volunteers collected information on location and amount of invasive species.	Continue program (provided funding is available).

3. Illicit Discharge Detection and Elimination

BMP ID #	**BMP Description**	**Responsible Dept./Person Name**	**Measurable Goal(s)**	**Progress on Goal(s) – Permit Year 2** (Reliance on non-municipal partners indicated, if any)	**Planned Activities – Permit Year 3**
11 Revised	Develop GIS database of the drainage system	Dept. of Public Services	Pending EOEA funding approval, begin digital mapping.	Performed field investigations to locate 989 drainage structures and to establish connectivity between structures; performed office work on preparation of the connectivity maps; completed creation of a stormwater drainage map and GIS database for selected areas of the City.	No known planned activities for Permit Year 3.
12 Revised	Salem Sound Shoreline Survey (Project No. 2002-01/604)	Health Dept.	Obtain copies of the quarterly progress reports, as well as other information pertinent to Salem.	The Salem Sound Shoreline Survey was initiated during Year 1. During Year 2, the shoreline survey and related mapping was completed, two rounds of water quality sampling were completed in the fall of 2004 and quarterly progress reports were generated. As one of the Municipal Partners included in the Watershed, the project progress and results of the above referenced work are made available to the City of Salem during the Watershed Team Meetings required in the scope of work for the Salem Sound Shoreline Survey.	The Salem Sound Shoreline Survey, including the final report, is expected to be completed in June 2005. Continue to receive progress reports and results of all project work related to Salem.
13	Visually inspect outfalls for dry weather flows	Dept. of Public Services (through the efforts of SSCW)	Inspect a representative number of outfalls annually (provided funding is available).	Performed a visual inspection of a representative number of outfalls during dry weather period.	Continue to inspect a representative number of outfalls annually (provided funding is available).

Revised					
14	Conduct water quality sampling at stormwater outfalls.	Dept. of Public Services (through the efforts of SSCW)	Year 1 – Publish results of sampling. Years 2 through 5 – Perform additional sampling (provided funding is available).	SSCW performed sampling every two weeks at various outfalls during the course of the summer of 2004. Results are published in SSCW's website (www.salemsound.org). The City also performed separate sampling at outfalls located along Juniper Beach and in the Willows Park area.	Perform additional sampling and publish results (provided funding is available).
Revised					
15	Conduct water quality sampling at beaches	Health Dept.	Perform weekly beach sampling during summer months in accordance with DEP criteria.	Weekly beach sampling was performed at 18 locations during the period extending from June 16, 2004 to September 8, 2004. Results are published in the MA DPH website.	Continue to perform weekly sampling during summer months in accordance with DEP criteria.
Revised					
16	Develop storm water ordinance	Dept. of Public Services	Year 1 – Review existing bylaws and regulations; Year 2 – Propose changes; Year 3 – Implement changes, subject to City approval.	The City received a grant from the Massachusetts CZM to develop and promote Low Impact Development (LID) guidelines and, in particular, develop a guidance document for the City's use when evaluating urban development. Effective stormwater management related to development will be a major component of the guidance document. The guidance document will lead to draft ordinance changes and will be utilized as an in-house document for use by developers and other urban communities. Stormwater aspects to be reviewed and discussed as part of this project will include, but not be limited to, large sites, small sites, construction activities, erosion and sedimentation control, and recharge.	Continue with the development of a guidance document to be utilized as part of a Watershed Protection Policy.
Revised					

3a. Additions

29	Perform study to identify contamination source(s)	Dept. of Public Services	Year 1 – Submit grant application to MCZM; Year 2 – Initiate study (provided funding is available).	Obtained grant funds from MCZM and completed the study of the Willows Park area to identify the sources of bacterial contamination of neighboring beaches. Obtained grant funds from MCZM and completed the evaluation of Juniper Beach to identify the sources of high contamination levels at the Juniper Beach outfall.	Currently working on a follow-up plan of action based on findings to date.

4. Construction Site Stormwater Runoff Control

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 2 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 3
17	Develop an ordinance requiring developers to prepare an Erosion & Sedimentation Control Plan for all sites disturbing more than 1-acre	Dept. of Public Services; Planning Board; Conservation Commission	Year 1 – Review existing bylaws & regulations; Year 2 – Propose changes; Year 3 – Implement changes, subject to City approval	As referenced in BMP ID#16, the City received a grant from the Massachusetts CZM to develop and promote LID guidelines and, in particular, develop a guidance document for the City's use when evaluating urban development. Effective stormwater management related to development will be a major component of the guidance document. The guidance document will lead to draft ordinance changes and will be utilized as an in-house document for use by developers and other urban communities. Stormwater aspects to be reviewed and discussed as part of this project will include, but not be limited to, large sites, small sites, construction activities, erosion and sedimentation control, and recharge.	Continue with the development of a guidance document to be utilized as part of a Watershed Protection Policy.
Revised					

18	Periodically check erosion control measures and construction material management on site inspections	Dept. of Public Services; Planning Board; Conservation Commission	Monitor and track violations	Monitored sites to inspect erosion control measures and construction material management.	Continue to monitor and track violations.
Revised					
Revised					

4a. Additions

5. Post-Construction Stormwater Management in New Development and Redevelopment

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 2 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 3

19	Develop an ordinance requiring storm water controls for all new and redevelopment projects disturbing more than 1-acre	Dept. of Public Services; Planning Board; Conservation Commission	Year 1 – Review existing bylaws & regulations; Year 2 – Propose changes; Year 3 – Implement changes, subject to City approval	As referenced in BMP ID#16, the City received a grant from the Massachusetts CZM to develop and promote LID guidelines and, in particular, develop a guidance document for the City's use when evaluating urban development. Effective stormwater management related to development will be a major component of the guidance document. The guidance document will lead to draft ordinance changes and will be utilized as an in-house document for use by developers and other urban communities. Stormwater aspects to be reviewed and discussed as part of this project will include, but not be limited to, large sites, small sites, construction activities, erosion and sedimentation control, and recharge.	Continue with the development of a guidance document to be utilized as part of a Watershed Protection Policy.
Revised					
Revised					
Revised					

5a. Additions

6. Pollution Prevention and Good Housekeeping in Municipal Operations

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 2 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 3
20	Street sweeping	Dept. of Public Services	Sweep streets between April & November (provided funding is available).	Completed annual sweeping program.	Continue program (provided funding is available).
Revised					
21	Clean Sweep Program	Dept. of Public Services	Conduct sidewalk cleanup program each year for 1 week in May (provided funding is available).	Completed annual sweeping program.	Continue program (provided funding is available).
Revised					
22	Catch basin cleaning	Dept. of Public Services	Inspect problem areas annually, and clean as needed (provided funding is available).	Completed inspection of problem areas and performed catch basin cleaning as needed.	Continue annual inspection of problem areas and cleaning as needed (provided funding is available).
Revised					
23	Trash collection program	Health Dept.; Dept. of Public Services	Weekly curbside pickup (provided funding is available).	Completed weekly curbside trash collection program.	Continue program (provided funding is available).
Revised					
24	Recycling program	Dept. of Public Services	Bi-weekly curbside pickup (provided funding is available)	Completed bi-weekly curbside recycling program.	Continue program (provided funding is available).
Revised					

25	Yard waste program	Dept. of Public Services	Curbside pickup several times per year (provided funding is available). Allow residents to drop off yard waste at City's transfer station year round.	Completed yard waste collection program.	Continue program (provided funding is available).
26	Household hazardous waste program	Health Dept.	Hold twice over the 5-year permit term (provided funding is available).	Household hazardous waste collection program was performed in June 2004.	Household hazardous waste collection program is scheduled to be performed in June 2005 (provided funding is available).
Revised					
27	Animal control program	Police Dept. Animal Control Officer	Track the number of animals collected (provided funding is available).	Completed tracking of animals collected.	Continue program (provided funding is available).
Revised					
28	Beach Cleanup Program	Parks & Recreations Dept.	Clean beaches every week between May and September (provided funding is available).	Beaches were cleaned several times during the spring and summer of 2004.	Continue to clean the beaches in the spring and summer of each year (provided funding is available).
Revised					

6a. Additions

7. BMPs for Meeting Total Maximum Daily Load (TMDL) Waste Load Allocations (WLA) *<<if applicable>>*

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 2 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 3
Revised					
Revised					
Revised					
Revised					
Revised					
Revised					

7a. Additions

7b. WLA Assessment

Part IV. Summary of Information Collected and Analyzed

* A summary of water quality monitoring results is attached. The summary, prepared by Salem Sound Coastwatch, includes the results from monitoring by Salem Sound Coastwatch (BMP #14) and from the City of Salem Board of Health (BMP #15). During 2004, the following beach closings occurred:

- Willow Avenue: closed July 7 to August 11, September 1
- Pickman Park: closed July 14 to August 17
- Ocean Avenue: closed July 28 to September 1
- Pioneer Village: closed September 1

Part V. Program Outputs & Accomplishments (OPTIONAL)

Programmatic

Stormwater management position created/staffed	(y/n)	
Annual program budget/expenditures	($)	

Education, Involvement, and Training

Estimated number of residents reached by education program(s)	(# or %)	
Stormwater management committee established	(y/n)	
Stream teams established or supported	(# or y/n)	
Shoreline clean-up participation or quantity of shoreline miles cleaned	(y/n or mi.)	
Household Hazardous Waste Collection Days		
▪ days sponsored	(#)	
▪ community participation	(%)	
▪ material collected	(tons or gal)	
School curricula implemented	(y/n)	

Legal/Regulatory

	In Place Prior to Phase II	Under Review	Drafted	Adopted
Regulatory Mechanism Status (indicate with "**X**")				
▪ Illicit Discharge Detection & Elimination				
▪ Erosion & Sediment Control				
▪ Post-Development Stormwater Management				
Accompanying Regulation Status (indicate with "**X**")				
▪ Illicit Discharge Detection & Elimination				
▪ Erosion & Sediment Control				
▪ Post-Development Stormwater Management				

Mapping and Illicit Discharges

Outfall mapping complete	(%)	
Estimated or actual number of outfalls	(#)	
System-Wide mapping complete	(%)	
Mapping method(s)		
▪ Paper/Mylar	(%)	
▪ CADD	(%)	
▪ GIS	(%)	
Outfalls inspected/screened	(# or %)	
Illicit discharges identified	(#)	
Illicit connections removed	(#) (est. gpd)	
% of population on sewer	(%)	
% of population on septic systems	(%)	

Construction

Number of construction starts (>1-acre)	(#)	
Estimated percentage of construction starts adequately regulated for erosion and sediment control	(%)	
Site inspections completed	(# or %)	
Tickets/Stop work orders issued	(# or %)	
Fines collected	(# and $)	
Complaints/concerns received from public	(#)	

Post-Development Stormwater Management

Estimated percentage of development/redevelopment projects adequately regulated for post-construction stormwater control	(%)	
Site inspections completed	(# or %)	
Estimated volume of stormwater recharged	(gpy)	

Operations and Maintenance

Average frequency of catch basin cleaning (non-commercial/non-arterial streets)	(times/yr)	
Average frequency of catch basin cleaning (commercial/arterial or other critical streets)	(times/yr)	
Total number of structures cleaned	(#)	
Storm drain cleaned	(LF or mi.)	
Qty. of screenings/debris removed from storm sewer infrastructure	(lbs. or tons)	
Disposal or use of sweepings (landfill, POTW, compost, recycle for sand, beneficial use, etc.)		
Cost of screenings disposal	($)	

Average frequency of street sweeping (non-commercial/non-arterial streets)	(times/yr)	

Average frequency of street sweeping (commercial/arterial or other critical streets)	(times/yr)	
Qty. of sand/debris collected by sweeping	(lbs. or tons)	
Disposal of sweepings (landfill, POTW, compost, beneficial use, etc.)	(location)	
Cost of sweepings disposal	($)	
Vacuum street sweepers purchased/leased	(#)	
Vacuum street sweepers specified in contracts	(y/n)	

Reduction in application on public land of: ("N/A" = never used; "100%" = elimination)		
▪ Fertilizers	(lbs. or %)	
▪ Herbicides	(lbs. or %)	
▪ Pesticides	(lbs. or %)	

Anti-/De-Icing products and ratios	% NaCl % $CaCl_2$ % $MgCl_2$ % CMA % Kac % KCl % Sand	
Pre-wetting techniques utilized	(y/n)	
Manual control spreaders used	(y/n)	
Automatic or Zero-velocity spreaders used	(y/n)	
Estimated net reduction in typical year salt application	(lbs. or %)	
Salt pile(s) covered in storage shed(s)	(y/n)	
Storage shed(s) in design or under construction	(y/n)	

ATTACHMENT

(Refer to Part IV. Summary of Information Collected and Analyzed)

SALEM SOUND COASTWATCH

Protecting the Coastal Habitats of the Salem Sound Watershed with the Communities of Manchester, Beverly, Danvers, Peabody, Salem, and Marblehead.

Salem Sound Clean Beaches and Streams Program 2004 Report

The following report is a summary of results from water quality testing that has occurred over the past summer by Salem Sound Coastwatch's Clean Beaches and Streams Program and by Salem Sound municipalities. The data is displayed in tables and graphs below: Table 1. displays results of tests performed by Salem Sound Coastwatch (SSCW) at coastal outfall pipes and streams. Appendix 1. and Appendix 3. show water testing results conducted at bathing beaches by the Salem Sound municipalities, including Beverly, Danvers, Manchester, Marblehead and Salem. The purpose of showing both sets of data is to give a more complete picture of the health of a particular beach.

US EPA National Water Quality Inventory reports runoff from urbanized areas is the leading source of water quality impairments to surveyed estuaries, harming fish and marine plants and animals, killing native vegetation, and making recreational areas unsafe and unpleasant.

(EPA 841-F-03-003)

Approach and Methods

While municipalities test bathing waters at public beaches, Salem Sound Coastwatch focuses on storm water outfall pipes and coastal streams, many of which are located on bathing beaches and near boating areas. SSCW's samples are collected at sites of stormwater discharge at low tide. As a result, bacterial counts tend to be higher than from samples taken from the water in the middle of a bathing beach. However, results from outfall pipes and streams indicate that contaminants are still making their way into our area waters.

EPA has concluded that *Enterococci* is the best indicator organism in marine waters to show a correlation with adverse human health effects. Therefore, all states have been mandated to use this standard by April of 2004. During the 2003 transition year, SSCW tested for both fecal coliform and *Enterococci*. In 2004, all Salem Sound communities and SSCW used *Enterococci* as the indicator organism for marine water testing. SSCW tested only one site in 2004 for fecal coliform to enable historical comparisons.

The Salem Sound municipalities test bathing waters at least once a week during the swimming season, more frequently if *Enterococci* levels were shown to be high. **Beaches are closed if a single test reports *Enterococci* levels greater than 104 CFU/100mL or if the geometric mean of the most recent five (5)**

***Enterococci* levels within the same bathing season exceeds 35 colonies per 100mL** (Massachusetts state sanitary code 105 CMR 445.000). The numbers shown in column 1, Appendix 3. represent the "geometric mean" of all test results collected over the summer by the Boards of Health. This is a statistical averaging method used to even out the average when dealing with a wide range of numbers. The variation in bacterial counts is depicted more clearly in the three graphs displayed in Appendix 1. The graphs are plotted using the logarithmic scale, and each y axis marking is an order of magnitude (1, 10, 100, 1000). Appendix 3. column 2 lists the range of *Enterococci* levels for each beach.

Definition of Dry vs. Wet Conditions

Rain can cause temporary elevated bacterial counts at discharge sites and within nearshore coastal waters. Runoff from impervious surfaces (parking lots, roofs, streets) flushes contaminants through storm drains, bringing pollution onto the beaches and other coastal habitats.

Salem Sound Coastwatch defines "dry" conditions vs. "wet" differently than the municipalities. Under SSCW's definition, dry conditions are less than 0.2" precipitation the day of sampling or less than 0.5" within the three days preceding sampling. Wet conditions are defined as more than 0.2" precipitation on the day of sampling or more than .5" within three days preceding sampling. Protocols for wet weather sampling are the same as for dry weather sampling.

The municipalities define wet conditions, or a "storm" event, as any occurrence of precipitation during the sampling or within the 24 hours preceding the sampling.

Salem Sound Coastwatch Test Results

Table 1. below shows the results of samples taken by Salem Sound Coastwatch over the course of the summer. Samples were taken every 2 weeks within two hours of low tide. All samples were tested at Biomarine (16 East Main Street, Gloucester, MA 01930), using membrane filtration method 9222d.

Since there were too few samples to calculate a meaningful geometric mean, each test result is included in the table. Those values that are higher than EPA standards (EPA-823-R-03-008) are indicated in **bold**: *Enterococci* >104 CFU/100mL and fecal coliform >200 CFU/100mL.

During the summer of 2004, six of the eight SSCW's water quality testing dates took place during dry weather conditions. The two wet events took place on 8/17 and 8/31. On 8/31, every site, except one, exceeded the standards set by EPA (EPA-823-R-03-008), and test results ranged from 500 to 100,000 CFU/100mL for *Enterococci*. See Table 1.0.

For Additional Information

For additional information about Salem Sound Coastwatch's Clean Beaches & Streams Program, including information on how you can get involved as a volunteer in this important, environmental monitoring program, please call Salem Sound Coastwatch at 978-741-7900 or email barbara.warren@salemsound.org.

Appendix 2. Public beach closings during the 2004 bathing season

Beaches are closed if a single test finds *Enterococci* levels greater than 104 CFU/100mL or if the geometric mean of the most recent five (5) *Enterococci* levels within the same bathing season exceeds 35 colonies per 100mL (Massachusetts state sanitary code 105 CMR 445.000)

Beverly:

No beaches were closed.

Danvers:

Sandy Beach closed July 28, reopened August 2.

Manchester:

West Manchester Beach closed June 30, reopened July 7 and closed July 28, reopened August 4.

Marblehead:

Stramski's closed July 16, reopened August 12.
Grace Oliver's closed July 30, reopened August 1.
Gas House Beach closed July 30, reopened August 12.

Salem:

Willow Avenue closed July 7 to August 11, and then closed again on September 1.
Pickman Park closed July 14, reopened August 18.
Ocean Ave. closed July 28 through September 1.
Pioneer Village closed September 1.

Appendix 3. Salem Sound Bathing Beaches tested by local Boards of Health, 2004

Figures listed in this table are the **geometric mean of all available water quality testing results** per beach by municipality.

City and Beach Sampled	*Enterococci* (including rain events)	Range in *Enterococci* (CFU/100mL)
Beverly		
Brackenbury Beach	9	2 - 36
Dane St. (mid-beach)	11	2 - 80
Goat Hill	10	2 - 115
Independence Park	9	2 - 174
Lynch Park	11	2 - 146
Mingo Beach	18	2 - 95
Ober Park	8	2 - 46
Rice Beach	5	2 - 44
Sandy Point	9	2 - 134
West Beach	14	2 - 56
Woodbury Beach	10	2 - 380
Danvers		
Sandy Beach East	32	2 - 755
Sandy Beach West	28	2 - 870
Manchester		
Black Beach	10	1 - 97
Magnolia Beach	7	1 - 97
Manchester Bath and Tennis	4	1 - 61
Singing Beach	3	1 - 22
Singing Beach (right of pkg. lot)	3	1 - 17
Tucks Point Beach	9	1 - 87
West Manchester Beach	16	1 - 190
White Beach	9	1 - 89
Marblehead		
Crocker Park	6	2 - 31
Devereaux Beach	6	2 - 460
Gas House Beach	12	2 - 220
Grace Oliver Beach	13	2 - 440
Stramski Beach	8	2 - 49
Village Beach	19	2 - 185
Salem		
Collins Cove	8	2 - 32
Dead Horse Beach	6	2 - 80
Forest River Point	10	2 - 52
Juniper Point	9	2 - 28
Mackey Beach	7	2 - 71
Naumkeag	11	2 - 96
Ocean Ave. Beach	31	1 - 1100
Osgood Beach	6	2 - 77
Pickman Park	32	1 - 210
Pioneer	13	2 - 320
Steps Beach	4	1 - 24
Willow Ave.	33	1 - 490
Willows Pier	8	1 - 33
Winter Island	7	2 - 48