CITY OF NEWPORT
AD HOC COMMITTEE ON WASTEWATER
AND
STORMWATER SYSTEM IMPROVEMENTS

SEMI-ANNUAL REPORT
TO THE
CITY COUNCIL

JUNE 2007

Introduction

The Ad Hoc Committee on Wastewater and Stormwater System Improvements (the "Committee") was appointed by the City Council in January 2007 with the following mission statement:

- To examine, analyze, and assess the adequacy of the wastewater and stormwater system infrastructure, pertaining to condition, capacity, system design, long and short term structural and operational requirements;

- To research means of correcting deficiencies in system operations and develop recommendations for implementation and financing;

- To develop public education programs and voluntary and compulsory corrective measures, to promote the publics' effective and efficient use of the City's wastewater and stormwater system; and,

- To report findings and recommendations to the City Council for consideration and adoption.

The Committee is made up of seven members appointed by the Council. The current membership is as follows:

Raymond C. Smedberg, Chairman
Dave McLaughlin, Vice Chairman
Paul Watters, Secretary
Drew Carey, Member
Martin Casey, Member
Charles Taylor, Member
Roger Wells, Member

Regular meetings are held on the first Tuesday of the month. The Committee met a total of eleven times, including facilities tours and meetings with City staff, from its initial organizational meeting on January 23rd through June 2007.

Executive Summary

The Committee's initial focus is on issues related to Combined Sewage Overflow (CSO) problems, and system issues that impact the utility and viability of the City's beaches. The following summarizes the key issues addressed in the report:

Wastewater and Stormwater System

- The City recently proposed reorganization of certain City departments.

  The Committee supports the proposed reorganization and separate department status as it relates to the Water Pollution Control operations.

- The 20-year operating agreement with Earth Tech is complex and comprehensive and has a current annual fee of some $3.5-million.

  It would be reasonable and prudent for the City to retain a qualified consultant to conduct periodic independent reviews of performance under the agreement.

- The wastewater treatment plant continues to experience non-compliance issues with respect to its RIPDES permit, subjecting the City to potential enforcement action and contributing to the passing of a moratorium on new sewer connections. Middletown also impacts these non-compliance issues in a material way.

  The City should prioritize and expedite efforts to address non-compliance issues at the wastewater treatment plant to improve operations and resultant compliance, and eliminate the moratorium on new sewer connections.

- Stormwater runoff discharging into Easton Pond Moat from the western residential neighborhoods is a major contributor to water quality/beach closure issues at Easton's Beach. Middletown also impacts this situation as result of its Wave Avenue Pump Station and stormwater quality originating from its Esplanade watershed area.

  See comments under the section on Easton's Beach below.

Wholesale Agreements for Wastewater Services

- The City provides sewer service to Middletown and Naval Station Newport under separate wholesale agreements. The agreement with Middletown was entered into in June 1985 and expired in July 2005, and is currently in renegotiation. The agreement with the Navy was entered into in July 1986 and continues in effect until terminated at the option of the Government with 180 days written notice. Flows from the Navy consistently remain below the contractual limit. Flows from Middletown vary significantly from normal average daily flows to high wet weather flows.

  As part of any program to manage flows in Newport, Middletown should be required to reduce its flows in general and control its wet weather discharges to Newport.

- The City operates a regional wastewater system with Middletown being the major wholesale customer and having major impact on Newport's system. Current coordination and communication between the parties appear to be minimal at best, particularly at the management and planning levels.

  The regional nature of the system should be reflected in its operation, management and planning, with formal and ongoing communication and coordination taking place, particularly at the management and planning levels. Some level of coordination between the City's Ad Hoc Committee and the Town's Roads and Utilities Committee might be an initial step.

- A section of the Newport Sewer Rate Evaluation Report dated November 2006 prepared by CDM deals with the matter of wholesale agreements and contains a number of recommendations. Also, the existing agreement with Middletown is in an abbreviated format and does not contain a number of provisions typically found in such agreements.

  The findings and recommendations from the above CDM report should be taken into account in the Middletown agreement negotiations. Also, in its report the Committee recommends a number of provisions to be included in renewed agreement. The key provision recommended relates to incorporating specific capacity and wastewater strength limitations on the Town's usage of the City's system.

Combined Sewer Overflow (CSO) Program

- The Committee believes it is important to have a general understanding of the chronology of the City's CSO program to date including its current status in order to determine the future direction of the program.

  Included in the report is a table listing the Chronology of the CSO measures taken.

- There are numerous documents and reports associated with the City's currently ongoing CSO program and development of the "phased approach" to implementation of the overall program. These have been produced over some period of time which makes it difficult to understand and track progress against goals and plans.

  The City should generate and maintain a high level strategy/scope document outlining the phase approach to the CSO program and tracking progress against goals and plans.

- No system of check/balance exists to ensure improper sewer connections (roof leaders, sump pumps, yard drains, etc.) are corrected and this issue appears to be lingering in its implementation.

  Council should support staffing and/or contracted services to expedite completion of improper connection correction. Also, Council should take on a strong leadership role in the correction of improper connection corrections via examples set by City departments, schools, etc. and use this work to raise public awareness and understanding of how these connections impact the CSO issue.

- The City's current CSO program has been in progress for some 6 years and while a number of efforts have been undertaken including reports, studies and field investigations there is no comprehensive Long Term CSO Control Plan Report documenting the projected ultimate program including costs and rate impact.

  The City should adjust the phased approach schedule and expedite development of the comprehensive Long Term CSO Control Plan Report to provide the requisite planning tool to determine the course of the program as it proceeds. Key to this is expediting development of the system hydraulic model.

- Managing system peak flows is key to addressing CSO events and wastewater treatment plant permit compliance.

  The City should expedite implementation of the CSO control measure of maximizing wet weather flow to the treatment plant to reduce CSO volumes, enhance treatment of wet weather flows, and improve permit compliance and eliminate the moratorium on new sewer connections. In conjunction with this the following flow control measures should be expedited:
  - Increase coordination with Middletown with emphasis on reducing their flows to Newport;
  - Disconnect catch basins in Newport's stormwater system identified as tied into the sanitary sewers; and,
  - Step up implementation and enforcement of disconnection of improper connections.

Water Quality and Swimming Beach Closures

- Newport Harbor water quality is likely impaired by CSO and stormwater discharge yet remains an important swimming area for local residents.

  Begin water testing at Van Zandt Pier, Fort Adams and Newport Harbor.

- Easton's Beach closures are related to bacterial contamination from at least four sources – Easton's Pond Moat, Esplanade outfall pipes, Wave Avenue Pump Station, and DOT outfall.

  Develop collaborative approach to address contamination with Town of Middletown.

- Short term solutions will not prevent beach closures this summer.

  Support cleanup and disposal of drift seaweed from beach and efforts of Park and Recreation to anticipate closures.

- Long term solutions to beach closures will require substantial capital investment.

  Explore feasibility of stormwater utility administered jointly with Middletown to fund capital investment required for stormwater discharge treatment.

- Long term solutions to beach closures require a comprehensive stormwater management plan.

  Build upon Phase II Stormwater Management Plan to include new findings and proposed solutions.

- Long term solutions could require re-engineering of public water supply and flood control system.

  Convene meeting with State and Federal agencies and Congressional offices to explore requirements for realigning watershed to optimize safety of public water supply, flood control and quality of stormwater discharge.

Public Education and Participation

- The public expectation of a clean harbor will require cooperation of residents and businesses of Newport and Middletown to reduce introduction of stormwater into sanitary sewers as part of the CSO control program.

  Develop public education program to explain the relationship between rainwater entering the sanitary sewers and the challenge of eliminating CSOs.

- City has begun a "Green Initiative"

  Inspect City structures (schools, City Hall) for conformance with CSO control program and provide leadership on "Reduce and Reuse Water"

Introduction

Much of the Committee's initial efforts are on information gathering and familiarization with the City's wastewater and stormwater system and myriad associated issues. In accordance with the Resolution passed by the City Council creating the Committee, the Committee's initial focus is on "issues related to Combined Sewage Overflow (CSO) problems, and system issues that impact the utility and viability of the City's beaches." The following summarizes the major observations and recommendations resulting from the Committee's initial efforts and focus. We address five specific areas:

I. Wastewater and Stormwater System Overview
II. Wholesale Agreements for Wastewater Services
III. Combined Sewer Overflow (CSO) System
IV. Water Quality and Swimming Beach Closures
V. Public Education and Participation

I. *Wastewater and Stormwater System Overview*

The City operates a regional wastewater system providing service on a retail basis to approximately 8,800 customers in Newport, and on a wholesale basis to the Town of Middletown and the Naval Station Newport through existing long term agreements. The system consists of 75 miles of sanitary sewers, 9 pumping stations, the Wellington Avenue and Washington Street Combined Sewer Overflow (CSO) treatment facilities, and a 10.7-million-gallons-per-day (MGD) activated sludge secondary treatment plant.

The City operates the wastewater system under a Rhode Island Pollution Discharge Elimination System (RIPDES) permit and the treated wastewater must meet both State and Federal regulations prior to its discharge to the East Passage of Narragansett Bay. Current outstanding enforcement actions are:

- 1999 Consent Order regarding the CSO control program; and
- December 2006 Notice of Deficiency regarding fecal coliform violations at the wastewater treatment plant.

Both Enforcement actions were issued by the Rhode Island Department of Environmental Management (RIDEM). Efforts by the City in conjunction with Earth Tech to respond to RIDEM and meet the requirements of these actions are ongoing.

The City also operates a stormwater system providing service to Newport only. The system consists of 45 miles of storm sewers, some 2,400 catch basins, and 54 stormwater outfalls discharging to receiving waters.

The City recently completed its Phase II Stormwater Management Plan as required by Federal and State regulations. That plan sets forth the City's program for the management and operation of its stormwater system, including monitoring and reporting performance against requirements. The key issues associated with the stormwater system are;

- the Easton Pond moat; and
- Easton Beach water quality/beach closures.

It must be noted that the Easton Pond moat and Easton Beach water quality/beach closures issues are separate from the CSO control issue and require their own distinct set of solutions.

The wastewater and stormwater system is operated by Earth Tech under a long term agreement with the City.

Section I Initial findings and recommendations are as follows:

- *Finding:* The City Manager recently proposed reorganization of certain City departments. Included was a proposal to separate the Water Pollution Control and Water Fund operations from Public Works and give them separate department status.

  Recommendation:

  1. The Committee supports the proposed reorganization and separate department status as it relates to the Water Pollution Control operations.
     - Given the myriad issues facing the wastewater industry in general, and the City of Newport and the region in particular, this is a logical step toward giving proper focus to such important environmental issues and enhancing short and long term strategic planning.

- *Finding:* The 20-year operating agreement with Earth Tech is complex and comprehensive and has a current annual fee of some $3.5-million, which represents half of the Water Pollution Control annual operating expenditures.

  Recommendation:

  2. It would be reasonable and prudent for the City to retain a qualified engineering consultant on an ongoing basis to conduct periodic independent reviews of performance under the agreement with Earth Tech to verify and document compliance with requirements.
     - A number of municipalities who operate and manage their utility systems via contract operations routinely perform such reviews.

- *Finding:* Although significant capital and operating improvements have been made to the wastewater treatment plant in recent years as result of the operating agreement with Earth Tech, the facility continues to experience non-compliance issues with respect to its RIPDES permit, particularly regarding flow and fecal coliform limits. Such non-compliance subjects the City to potential enforcement action and contributed to the passing of a moratorium on new sewer hookups. In addition to high wet weather flows in Newport's system, high wet weather flows from Middletown materially impact these non-compliance issues.

  Recommendation:

  3. Prioritize and expedite efforts to address non-compliance issues at the wastewater treatment facility to improve operations and resultant compliance, and eliminate the moratorium on new sewer connections.
  4. In addition to current efforts underway to address flow and fecal coliform compliance issues the City should expedite evaluation of alternatives for maximizing wet weather flow to the treatment plant, and design and implementation of the selected alternative including securing necessary permit modifications from RIDEM.
     - In conjunction with these efforts the City needs to coordinate closely with Middletown to mitigate its impact on Newport's system and contribute toward resolving these non-compliance issues.

- *Finding:* The Committee was advised by the City that the Easton's Beach water quality/beach closure is the priority matter to be addressed. The preliminary Fuss & O'Neill report provided to the City indicated stormwater runoff discharging into Easton's Pond moat from the western residential neighborhoods is a major contributor of bacteria to Easton's Beach. Middletown also impacts this situation in a material way as result of its Wave Avenue Pump Station and stormwater quality originating from its Esplanade watershed area. Short term solutions (control access to moat and pond, clear and maintain the moat and channel, wildlife management, etc.) are not likely to materially improve water quality this summer.

  Recommendation:

  5. The City needs to coordinate closely with Middletown to mitigate its impact on this situation and assist in developing long term solutions.
  6. Consider the feasibility of developing a stormwater utility to support the long term improvement of the water quality and flood control capacity of the system.
  7. Build upon the Phase II Stormwater Management Plan to include recent findings regarding the moat and incorporate proposed solutions.
  8. Ongoing efforts to develop long term solutions to these problems should consider the entire watershed including the public water supply and storm systems in order to develop an assessment of all alternatives identified in the Fuss & O'Neil report.

II. *Wholesale Agreements for Wastewater Services*

The City provides sewer service to the Town of Middletown and Naval Station Newport under separate wholesale agreements for receiving and treating wastewater delivered to the City's system. The agreement with Middletown was entered into in June 1985 and expired on July 1, 2005. The City has indicated that it has been in the process of negotiating a renewed agreement with the Town for some time. The agreement with the Navy was entered into in July 1986 and continues in effect until terminated at the option of the Government with 180 days written notice. Information indicates flows received from the Navy consistently remain below the contractual limit. However, flows received from Middletown vary significantly with weather and there is a significant amount of inflow and infiltration (I/I) entering their system. The existing agreement with Middletown references a 2005 average daily flow limit of 2.1-million-gallons-per-day; however, there is no provision for peak flow limits. Middletown does exceed its allowable flow based on the daily flow limit, which is the only flow limit called out in the agreement. Peak wet weather flows from the Town reach as much as 3 to 4 times the average daily flow.

The Town of Middletown (Wave Avenue Pumping Station) has been determined to have significant impact on Newport's system in general, and on CSO events and permit compliance at the treatment plant in particular.

Section II Initial findings and recommendations are as follows:

- *Finding:* The City operates a regional wastewater system with Middletown being the major wholesale customer and having major impact on Newport's system. Current coordination and communication between the parties appears to be minimal at best, particularly at the management and planning levels.

Recommendation:

1. City of Newport/Town of Middletown wastewater services communications and coordination improvements
   - The regional nature of the system should be reflected in its operation, management and planning.
   - Formal and ongoing communication and coordination should be taking place at the operational level and, more importantly, at the management and planning levels.
   - An initial step toward this goal might be some level of ongoing coordination between the City's Ad Hoc Committee and the Town's Roads and Utilities Committee.

- *Finding:* Section 5 of the Newport Sewer Rate Evaluation Report dated November 2006 prepared by CDM deals with the matter of Wholesale Agreements.

  Recommendation:

  2. The findings and recommendations from the above CDM Report should be taken into account in the Middletown agreement renewal negotiations.

- *Finding:* In Phase 1 Part 1 and Part 2 CSO Control Plan Reports prepared by Earth Tech the impact of flows from Middletown on Newport's system was clearly noted. And it was stated that as part of any program to manage flows in Newport the Town should be required to reduce its flows in general and to control its wet weather discharges to Newport.

  Recommendation:

  3. As recommended in the Earth Tech Control Plan Reports dry and wet weather flow limitations should be imposed on Middletown by the City in conjunction with the agreement renewal negotiations to provide incentive for the Town to reduce their flows to Newport.

- *Finding:* The existing agreement with Middletown is in an abbreviated format and does not contain a number of provisions typically found in such agreements.

  Recommendation:

  4. Include the following key provisions in the pending agreement with Town of Middletown:
     - There should be a "Definitions and Interpretations" section to set forth the meanings of the key terms referenced in the agreement.
     - The City's wastewater collection and treatment facilities used to receive, convey, and treat the Town's wastewater should be defined in the agreement and clearly delineated on a map of the City's wastewater system appended to the agreement.
     - Specific "Capacity and Wastewater Strength Limitations" on the Town's usage of the City's system should be established Wastewater capacity limitations should include Average Daily Flow, Maximum Daily Flow and Peak Hourly Flow; and strength limitations should include BOD (Biochemical Oxygen Demand), TSS (Total Suspended Solids) and FOG (Fat Oil and Grease).
     - Meters for measuring wastewater flow from the Town should be inspected and calibrated semi-annually and metering equipment with additional data logging

and reporting capabilities, particularly with respect to flow variations and peak flow rates, provided.

- "Ancillary Expenses" should not be fixed as provided for in the current agreement. These costs should be determined based on actual allocable expenses incurred and in the same manner as Overall Operation and Maintenance Cost.
- Any obligation on the part of the City to provide additional treatment and conveyance capacity for the Town, in addition to conditions imposed in the current agreement, should be made subject to receipt of timely notification of need from the Town.

III. *Combined Sewer Overflow (CSO) Program*

The City of Newport operates a combined sewer system, which means sewers in certain areas of the City carry both stormwater and sanitary sewage. During wet weather periods the sewers can become over capacitated with stormwater and, to protect from flooding and property damage, excess flow is relieved through overflow pipes, which discharge directly to receiving waters. In addition to some storm drains that are still connected to the sanitary sewers, excess wet weather flow comes from such sources as yard drains, sump pumps and basement drains, roof leaders and downspouts (this flow is called "inflow"), and groundwater which enters the sewers through open joints, cracks, deteriorated manholes, or other structural defects (collectively called "infiltration"). The City has undertaken a number of measures over several decades to control combined sewer overflows (CSO). The Committee believes it is important to have a general understanding of the chronology of the City's CSO program to date including its current status in order to determine the future direction of the program. The following table provides a general chronology of the City's CSO program:

Chronology of CSO Control Measures Taken

Date	Description of CSO Control Measure Taken
1950s	Long Wharf Pump Station was constructed and placed on-line to direct additional wastewater flow to the treatment plant
1970s	The City carried out a sewer separation program throughout sections of the City to install separate storm sewers and remove storm drain connections from the sanitary sewers
1978	The Wellington Avenue Pump Station and Micro-Strainer Facility were placed on-line with 1.5 MGD of sanitary flow capacity and 25 MGD of micro-strainer treatment and chlorination of CSOs. Over subsequent years the micro-strainer treatment system proved unreliable and ineffective and was removed from service sometime in the 1990s, while the sanitary flow pumping and CSO disinfection operations continue

1986	Report on Combined Sewer Abatement Alternatives prepared by Metcalf & Eddy Engineers included the following major findings: The City had separate collection and drainage networks; inflow and infiltration were significant contributors to CSOs; large portion of CSO flow attributed to buildings within the drainage area with roof leaders and yard drains tied into the collection system; and, removal of this inflow and infiltration was not cost effective at this time. The study resulted in a recommendation to design and construct the Washington Street CSO Treatment Facility
1991	The Washington Street CSO Treatment Facility was placed on-line with a capacity to treat (screening, grit removal & disinfection) up to a maximum of 43 MGD
1997/1998	RIDEM issues renewed RIPDES permit to the City w/ subsequent modifications including requirement to conduct studies of the Wellington Avenue & Washington Street CSO Treatment Facilities to assess their performance & recommend improvements. Permitted CSO outfalls are located at the Long Wharf/America's Cup Diversions Structure, Washington Street CSO Facility, and Wellington Avenue CSO Facility.
1999	City enters into Consent Agreement w/ RIDEM regarding development of a long term CSO control plan including submittal of 3 Technical Memorandums prepared by Malcolm Pirnie Engineers which would provide a basis for the scope of work for preparation of the City's long term CSO control program.
2001	City enters into long term design/build/operate agreement w/ Earth Tech to provide capital improvements & operation of the wastewater & stormwater system.
2001-2004	RIDEM & City discuss the approach for development of the CSO Control Program & agree on a phased approach for development as well as implementation of the Program.
2003/2004	Completed capital improvements to Wellington Avenue CSO Facility & Narragansett Avenue storage conduit, & upgrade of Long Wharf Pump Station & improvements to Washington Avenue CSO Facility.
2004	RIDEM approves Request For Proposals for engineering services which provides for a phased approach for development of the City's Long Term CSO Control Program; RIDEM approves bid award & City Council awards contract to Earth Tech for development of the City's CSO Control Program.
2005	Phase I of the program initially addresses the Wellington Avenue CSO Facility & service area since it was prioritized in the approved plan. Phase I Part 1 (data collection, field inspections, flow metering, and recommended follow up actions/improvements) completed & approved by RIDEM including authorization to proceed w/ work associated w/ Phase I Part 2.

2006	RIDEM approves Phase I Part 2 scope & Earth Tech authorized to proceed w/ further sewer inspections, flow monitoring, hydraulic model evaluation for the sanitary sewer system; and, further field inspections, flow monitoring, house inspections, smoke & dye testing in the prioritized service area (Wellington Avenue catchment area).
2006	City Council approves Phase I Part 3 work associated w/ design work to separate catch basins found under the Phase 1 Part 2 work to be connected to the sanitary sewer.
2007	Phase 1 Part 2 report completed & submitted to RIDEM for review.
2007	Phase 1 Part 3 construction documents & bidding completed w/ construction anticipated for the fall.

Section III Initial findings and recommendations are as follows:

- *Finding:* There are numerous documents and reports associated with the City's currently ongoing CSO program. The long term "phased approach" adopted for the program and the fact that these documents have been produced over the period from approximately 1999 and continuing through present make it difficult to understand and track progress against goals and plans. There is neither a "living document" updating the track of the CSO reduction/elimination phased approach nor public visibility to agreements made with RIDEM regarding the approved/agreed track of the phased CSO elimination approach.

  Recommendations:
  1. Ensure that key goals and engineering/investigation components for the phased approach to CSO reduction/control are defined and that the contractual agreements with Earth Tech adequately address same.
  2. City of Newport should generate and maintain a high level strategy/scope document outlining the phased approach to CSO reduction/elimination and tracking progress against goals and plans.

- *Finding:* No system of check/balance exists to ensure that improper sewer connections (roof leaders, sump pumps, yard drains, etc.) are corrected. The city does not appear to be staffed to ensure that this important work gets done, and this issue is lingering.

  Recommendations:
  3. Council should support staffing and/or contract services to support execution and completion of improper connection correction
  4. Council should take a strong leadership role on improper connection correction by authorizing the appropriate City departments, agencies, authorities, etc. to immediately and publicly correct city owned improper connections (schools, etc.). Council could use this work to raise awareness and increase public understanding of how such connections impact the CSO issue.

- *Finding:* The City's current CSO program has been in progress for approximately six years and while a number of reports, studies, field investigations, etc. have been completed there is still no comprehensive Long Term CSO Control Plan Report to fully

document what the ultimate program is projected to be including associated costs and impact on future rates.

Recommendation:

5. The City should adjust the phased approach schedule and expedite development of the comprehensive Long Term CSO Control Plan Report in order to have the necessary planning tools to determine the course of the program as it proceeds. Key to this is expediting the system hydraulic model for utilization as a planning and design tool.

- *Finding:* Managing system peak flows is key to addressing CSO events and permit compliance at the wastewater treatment plant.

Recommendation:

6. The City should expedite implementation of the CSO control measure of maximizing wet weather flow to the treatment plant in order to reduce CSO volumes, enhance treatment of wet weather flows, and improve permit compliance and eliminate the moratorium. In conjunction with this the City should also expedite the following flow management measures:
   - Increased coordination with Middletown with emphasis on the Town reducing their flows to Newport;
   - Disconnect the 28 catch basins in Newport's system identified as being connected to the sanitary sewers; and,
   - Expedite implementation and enforcement of the disconnection of improper connections.

IV. Water Quality and Swimming Beach Closures

Beach closures have occurred in Newport Harbor and along the open ocean at Easton's Beach. The conditions leading to beach closures and water quality impairment at these two locations are quite different and may be difficult for the public to distinguish.

King Park, Fort Adams and Newport Harbor

- *Finding*: Fort Adams State Park is tested 12 times per month by the Rhode Island Department of Health (RIDOH). Over the past 5 years there has been more than one beach closure event per swimming season. Here is a sample of the data from the RIDOH website: 2002-4; 2003-2; 2004-5; 2005-2; 2006-4; 2007-0.

- *Finding*: King Park Swim Area was tested 8 times per month by the Rhode Island Department of Health (RIDOH). Over the past 5 years there has been more than one beach closure event per swimming season: 2002- N/A; 2003-4 (16 days per City of Newport); 2004-4; 2005-Closed; 2006-Closed; 2007-Closed (information from RIDOH Website).

  Anecdotal information indicates swimming activity is still taking place at some level at the King Park Swim Area. In 2003 King Park Swim Area was designed as an EPA "Flagship Beach" as a result of combined water quality issues at King Park Swim Area and Fort Adams. The combined closures represented 11% of the total state closures since

1998. In 2004 the lifeguard's primary task was to warn people not to swim at King Park Swim Area. Due to city budget issues the beach was closed indefinitely. Recent discussion with EPA (May 2007) indicates that the status for King Park Swim Area has been changed however the beach remains closed.

- *Finding:* Newport Harbor is not a recognized beach location or water testing location by the Rhode Island Department of Health and water quality measurements are not available. Anecdotal information indicates swimming activity regularly takes place at Van Zandt Pier and most likely other locations in the harbor.

Potential sources

- *Finding:* The main cause of *Enterococci* Bacteria at Fort Adams State Park, Kings Park Swim Area and Newport Harbor is assumed to be Combined Sewage Overflow (CSO) events; however, additional water testing is needed to evaluate this as well as other possible causes such as stormwater discharges. It is probable that in the past decades that improper handling of waste discharge within the boating community may have had a significant impact on the water quality. However, regulations have addressed this issue and it is presumed to be a small factor in comparison to multi-million gallon CSO events that occur dozens of times per year and stormwater discharges.

Recommendation:

1. City of Newport needs to eliminate CSO events into Newport Harbor to the extent feasible and evaluate the impact of stormwater discharges on receiving water quality. The City needs to begin an *Enterococci* water testing program at Van Zandt Pier and other locations in Newport Harbor, and at control locations within Narragansett Bay adjacent to the harbor to provide a baseline for water quality conditions in the harbor.

Easton's Beach

- *Finding:* Water quality impairment of Easton's Beach from enteric bacteria has led to frequent beach closures for public health risk. The contamination of the beach is primarily due to stormwater discharge from the stream flowing under the Memorial Boulevard Bridge, stormwater outfalls on the Esplanade and secondarily from direct runoff from beach parking lots. Beach closures are related to discharge of bacteria from stormwater systems and overflow from the Wave Avenue Sanitary Sewer pump station. These discharges occur most frequently during and after rain storms. Studies conducted of each source have concluded that human sources of bacteria are confined to the sewage overflows from the Wave Avenue Sanitary Sewer pump station and these only occur during the largest storm events (> 2" rain in 12 hours). Bacteria from wildlife and pets persist in stormwater systems and drainage areas and discharge onto the beach during and after rain storms. No short term solutions have been identified and trial efforts to collect more information will be conducted this summer. Long term solutions will require substantial capital (>$5 million) and a collaborative engagement of the City of Newport and the Town of Middletown including cost sharing, joint planning and management, and long term operation and maintenance agreements.

- *Finding:* Easton's Beach is tested 8 times per month by the Rhode Island Department of Health (RIDOH). Additional testing is performed by the City of Newport conditional on local rainfall events. Over the past 5 years there has been more than one beach closure event per swimming season: 2002-1; 2003-3; 2004-16; 2005-11; 2006-23;2007-1 (RIDOH Website).

- *Finding:* Non-Summer month water testing performed by Clean Ocean Access (October 10th 2006 to May 25th 2007) indicated that 33% of the days sampled during this time period had *Enterococci* bacteria levels greater than the state acceptable limit. Although bacteria levels were greatest during or immediately following rain events, several occurrences of high pollution levels 2-4 days after a rain event, as well as high pollution levels without rain events were recorded during this time period.

Water Quality and Easton's Beach Closures: The problem.

- *Finding:* Four primary systems have been identified as sources of enteric bacteria (Enterococci) discharge to the Easton's Beach receiving waters. Sanitary Sewer Overflows (SSOs) from the Wave Avenue Pump Station; stormwater discharge from outfalls along the Esplanade in Middletown; stormwater discharge from the "DOT" outfall north of the Memorial Blvd. Bridge; and, stormwater discharge from the moat surrounding the public water supply of Easton's Pond. An additional source is direct runoff from beach parking areas which become contaminated by food and bird and animal droppings. All of these sources are affected by rainstorms and the water quality on the beach is invariably impaired after rain events. However, all of these sources appear to contain certain levels of enteric bacteria during dry weather and at times can produce beach closures without rain events. In order to ensure minimization of beach closures from water quality impairment, the City of Newport must coordinate efforts with the Town of Middletown as three of the four sources are in the Town.

1. The Wave Avenue Pump Station receives sewage from Middletown residences and businesses and pumps the wastewater under pressure into a "force main" that conveys the wastewater to the Newport sewer system, via the Thames Street interceptor sewer, for processing at the Newport Wastewater Treatment Plant. The force main was replaced this winter under orders from RIDEM. When rainwater enters the sanitary sewage system (through downspouts, yard drains, sump pumps, leaking pipes and manholes) the volume can increase beyond the capacity of the pump station to deliver the wastewater to the interceptor. When the capacity is exceeded, SSOs occur directly to the stream north of the DOT outfall and the Memorial Blvd. Bridge. Middletown is under order from the RIDEM to make further upgrades to the pump station and has an ongoing program to reduce stormwater inflow and infiltration into the system. However, high flows and resultant discharges continue to occur during heavy storms despite these efforts to date.
2. Two stormwater outfalls are located along the Esplanade and drain the watersheds of Easton's Point. These outfalls have been sampled as part of the COA fall and winter water quality program and consistently had elevated levels of enteric bacteria (particularly the northern outfall nearest the beach). Middletown has investigated the source of the bacteria and concluded that there is no evidence of human sources and no obvious single source, however, impact from wildlife activity is suspect. Middletown has contracted with Woods Hole Group to investigate the feasibility of extending these

outfalls into Easton's Bay some distance offshore to mix with ocean water and minimize beach closures.

3. The "DOT' outfall has contributed significant volumes of stormwater to the stream and has been measured with elevated concentrations of bacteria as well as surfactants typically associated with sanitary sewage. RIDEM suspects that there may be illegal connections to this stormwater system and is investigating.
4. The "moat" is an emergency spillway for the public water supply reservoirs that also receives stormwater from at least ten outfalls that drain the neighborhoods surrounding the pond. The moat also receives water from groundwater discharge and possibly leaks through the earthen dam. As a result the moat has some level of flow year-round even during dry weather periods and has insufficient hydraulic capacity to handle a 2 year storm event (3.4" in 24 hours), which is the size storm at which street and some house flooding occurs. Enteric bacteria in the moat appear to come primarily from wildlife (birds, raccoons, rodents) and pets and may well survive in the sediments to form a reservoir of bacteria sufficient to contaminate the beach during increased discharge after storms. There is no evidence of human sources of enteric bacteria directly to the moat (although SSOs to the stream could create some cross-contamination in the unlikely event that flow is reversed by tides). In its current condition, the moat is inadequate to provide either reliable flood control or stormwater management.

Water Quality and Easton's Beach Closures: Potential solutions.

- *Finding:* Stormwater management practices generally promote treatment of stormwater as close to the sources as possible. For routine urban watersheds (those without detectable contamination other than bacteria) these practices are designed to slow the flow of stormwater over the land surface and infiltrate as much as possible into the groundwater. In the watersheds around Easton's Pond, the presence of paved surfaces (streets, parking lots, playgrounds), high groundwater and clayey soils makes effective infiltration on a large scale difficult. Measures can be promoted for businesses and homeowners to detain stormwater (rain gardens, sand filters, pervious asphalt, paving blocks or grids) and some public areas could be used to increase retention of stormwater within the watershed (parks, medians). Analysis by Fuss & O'Neill concluded that these measures would not be enough to prevent flooding or adequately treat the stormwater. Stormwater can be treated through the use of detention ponds and stormwater wetlands but these techniques require large surface areas within the watershed.

- *Finding:* Direct treatment of stormwater just prior to the discharge point is usually considered a last resort, but under the circumstances may be a feasible alternative for the stream discharge onto the beach. Three of the four primary sources converge just before the stream passes under the Memorial Blvd. Bridge. Direct treatment could include chlorination, filtration or ultra-violet radiation.

Short term solutions

- *Finding:* ***No effective short term (for this beach season) solutions have been identified.*** Measures could be taken to minimize wildlife and pet access to the moat, the moat bottom could be cleaned and lined with gravel, cisterns could be cleaned but these measures are not likely to prevent all beach closures. With four identified potential sources of contamination, all sources need to be addressed in a comprehensive manner to

prevent future beach closures. Beach managers are taking precautionary actions to minimize seaweed in the swimming areas, restricting access to the stream and preemptively closing the beach during and just after rainstorms.

- *Finding:* Trial use of ultra-violet treatment has been proposed and will be very useful for collecting data on turbidity and effectiveness of this treatment under summer conditions.

Long term solutions

Long term solutions are related to the future of the infrastructure within the watershed of the pond and beach including the earthen dam and public water supply reservoir. The study by Fuss & O'Neill indicated that the earthen dam and spillways are in poor shape and will need reconstruction and in some areas may need to be relocated. The flood control properties of the moat are inadequate and a better hydraulic solution needs to be developed for conveying stormwater and flood water away from roads and homes.

If testing of an ultraviolet treatment system indicates that it can be scaled up to successfully treat stormwater discharge, the area near the bridge will need to be reconstructed to accommodate installation of an efficient system. If the test indicates that some pre-treatment is necessary, then further modification of the moat and possibly reservoir will be required to allow settlement of sediments from the stormwater.

The best long term solutions could be a combination of watershed management, stormwater wetland construction, detention pond construction and a small-scale UV treatment facility that incorporated all stormwater and SSO discharge in the area. This approach could require redesigning the public water supply structure to permit more efficient conveyance of stormwater, conversion of the some of the storage area to detention ponds and stormwater wetlands, and collaboration with the Town of Middletown to engage in a comprehensive set of solutions for all watersheds discharging to the Bay. A major advantage of this approach is that conversion of some of the City owned land to stormwater wetlands and flood control could include habitat restoration and make portions of the project available for federal and state support of wetland protection and habitat restoration. This approach would also likely be supported by state resource agencies as it would be consistent with coastal land use policies.

Recommendations:

1. City of Newport and Town of Middletown need to work together on a permanent solution for clean water at Easton's Beach and Atlantic Beach.
    - Identifying, evaluating and implementing alternatives such as a discharge pipe for the Esplanade sources and UV treatment for the Moat are compromised without the full partnership of the City and Town in addressing this issue. The Town of Middletown should take all necessary measures to eliminate SSO events.
2. Establish a regional stormwater utility for the watersheds draining to coastal areas used for swimming, surfing, recreational boating and public water supply. Link efforts to protect the public water supply and provide flood control with stormwater management plans.
3. Develop a comprehensive regional stormwater management plan for both communities that includes watershed protection, infiltration and detention where appropriate.
4. Develop ordinances, planning and zoning guidelines, and incentives for businesses and residences to retain, reuse and recycle stormwater.

5. Promote Low Impact Renovation/Redevelopment and create model stormwater management practices for historic urban areas.
6. Convene a meeting with state and federal agencies and congressional staff to explore the feasibility and funding opportunities for alternatives for such a regional stormwater management plan.

V. Public Education and Participation

The objective is to develop public education programs and voluntary and compulsory corrective measures, to promote the public's awareness of the City's wastewater and stormwater issues and the effective and efficient use of the wastewater and stormwater system.

- *Finding*: The public demands clean waters and the end of discharge of partially treated and untreated wastewater into local receiving waters that impacts beaches and the harbor. In spite of many efforts made over the years to improve the City's wastewater and stormwater system to improve treatment and reduce CSO events and sanitary sewer overflows, the public perception is that the City is not doing enough to prevent such discharges and expects to see improvements in the short term. A voter initiated sewer moratorium was recently passed, a new force main sewer line installed on Memorial Boulevard, and an ADHOC Committee on Wastewater and Stormwater Improvements was formed. To a degree the public perception is that those events should have solved the problem of continued beach closures.

Recommendations:

1. The City should develop a comprehensive public education program aimed at increasing awareness and understanding of the City's wastewater and stormwater issues and past, present and future efforts to address them. Such a program should be carried out through available local media such as the City's website, newspaper, radio, and public forums, and public information brochures and house to house mailings.
2. An active water conservation program, or re-emphasis of any existing such program, is suggested that would encourage the use of water saving devices such as low flow toilets and shower heads, especially in hotels, B and B's and commercial buildings. In conjunction with this any appropriate revisions to existing building and plumbing codes necessary for requiring installation of low flow devices in all new or renovated dwelling units should be incorporated as soon as possible.
3. Communication and enforcement of the program to eliminate roof leaders, downspouts, yard drains and sump pumps throughout the City that are connected to the sanitary sewer system should be stepped-up as needed to expedite the reduction of the amount of storm water entering the sanitary sewer system.

- *Finding:* The City recently announced its "Green City" initiative.

Recommendation:

1. The City should incorporate wastewater and stormwater issues in its "Green City" program with the objective to raise awareness that excess water use and stormwater discharge impact the health of our local receiving waters and place a substantial strain on the City's finances to address. Use concept of "Reduce and Reuse Water".

2. Link the tourism drivers of beach, mansions, sailing and historic Newport to a plan for site development and landscaping that captures and reuses water as much as possible to sustain the quality of the local environment for those who live here as well as those who visit. Promote the innovation alongside the reverence for historical properties.
3. Work with civic groups and non-profits (Newport in Bloom, Newport Historical Society, Newport Restoration Foundation, Preservation Society, Salve Regina University) to develop and promote a Liveable Newport that eliminates harmful discharge of nutrients, waste and bacteria to coastal waters.
4. Develop links with Naval Station Newport to promote Low Impact Development in construction of naval facilities.
5. Work with Newport Schools and Salve Regina University to carry out student projects aimed at reduced water use and good stormwater management practices.