2011

Portsmouth, NH
Stormwater Utility Feasibility Study
Final Report

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Executive Summary

AMEC Earth & Environmental, Inc. was selected to complete a stormwater fee/utility feasibility study for the City of Portsmouth, NH. The feasibility study was designed to take a group of staff, elected officials, and citizens through all the key aspects of utility development without actually committing to develop the fee/utility. Portsmouth leaders and AMEC understood that the development of a fee/utility to fund the community's stormwater program would only occur if elected officials took formal action to initiate the development of a comprehensive program at a later date.

A series of workshops were held, primarily with staff, to discuss key aspects of the development of a stormwater utility user fee including:

- Key needs and issues of the local stormwater program;
- Current and anticipated future program costs;
- Potential rate structure components and characteristics;
- Estimated fee levels, public involvement planning; and,
- Billing system analysis.

Staff participants involved with the study were:

David Allen - Public Works Deputy Director
Judie Belanger - Finance Director
Peter Britz - Environmental Planner/Sustainability Coordinator
Gail Cunningham - Controller
James McCarty - GIS Coordinator
Peter Rice - Water & Sewer Engineer
Jared Sheehan - Engineer Technician
Robert Sullivan - City Attorney
Rick Taintor - Planning Director

The City currently spends about $512,500 on stormwater, per year, with the majority of the expenditures split evenly between Operations & Maintenance and capital construction ($221,400 and $200,000 respectively). The current source of the funding comes from both the City's general fund and Water and Sewer funds.

A key reason for the timing of the study was driven by the impending release of new stormwater regulations that will significantly increase the demands on the City. As the study discovered, in addition to the growing compliance costs, there are also several other key drivers to implement an enhanced stormwater program, including:

- Degrading water quality;
- Ecological protection;
- Preservation of Portsmouth's quality of life and the value of clean water;
- Drinking water protection;
- Flooding and aging infrastructure problems;
- Channel erosion; and,
- Development pressures.

A detailed assessment of potential future costs for a stormwater program was conducted as a part of this study. Based on current thinking, the average anticipated stormwater

related costs are expected to be about $2.5M annually. The areas with the greatest annual cost increase include:

- $800,000 in capital construction,
- $1M in CSO related projects and,
- An additional $400,000 in Operations & Maintenance.

In discussion on how to distribute the stormwater program costs between landowners, it was decided that the revenue and fee would be calculated based on a typical home size as the unit of measure – Equivalent Residential Unit (ERU). As a result of the data analysis, the work group further determined that the ERU size would be based on median home size which is 2,200 square feet. (see Section 6.1) Using this number, the total number of ERUs in the City is estimated to be 31,876. In regard to how most equitably to charge property owners, the decision was made that residential properties would be charged using a two-tier approach and non-residential charges would be calculated on actual impervious cover measures. To compute an estimated monthly fee the derived $2.5M annual cost was divided by the estimated number of ERUs resulting in an estimated fee in the range of $6.00 to $7.00 per ERU per month. If the City billed itself for its own public roads that would add an additional 11,468 ERUs which in turn would reduce the fee per ERU to around $5.00 per month. Section 6.2 provides a more detailed discussion of these funding options and revenue projections.

The overall assessment by the group was that ***the implementation of a stormwater user fee would provide the best means of revenue support for the required future stormwater program***. Such a fee could also, potentially, fund that part of the combined sewer program, which is related to stormwater management. This decision was made from the standpoints of:

- Revenue sufficiency,
- Revenue stability,
- Overall equity in terms of reflecting property impact on City cost, and
- Flexibility to reflect Portsmouth's current and future needs.

Based upon a review of the findings and recommendations of the staff work group, the following two key overall options are recommended, should the City decide to move forward with a fee/utility:

Option 1: Develop a Combined Stormwater Program Fee

Under this option the City would develop a stormwater program fee that would support the stormwater program and a portion of the combined sewer program, in a coordinated fashion. Under this option the fee is estimated to be in the $6-8/month per ERU range.

Option 2: A Stormwater Program Fee for a Reduced Program

Under this option the City could develop a scaled back stormwater fee. To reduce the initial fee two key options could be considered: (1) include the City streets as part of the impervious area calculation to reduce the stormwater fee by an estimated 30% - this would be funded out of current general fund stormwater expenditures; and/or (2) develop a program plan that is more back-end loaded in capital construction costs allowing a more gradual program growth trajectory. Under this option the fee is estimated to be $3.00 -$4.00 per month per ERU.

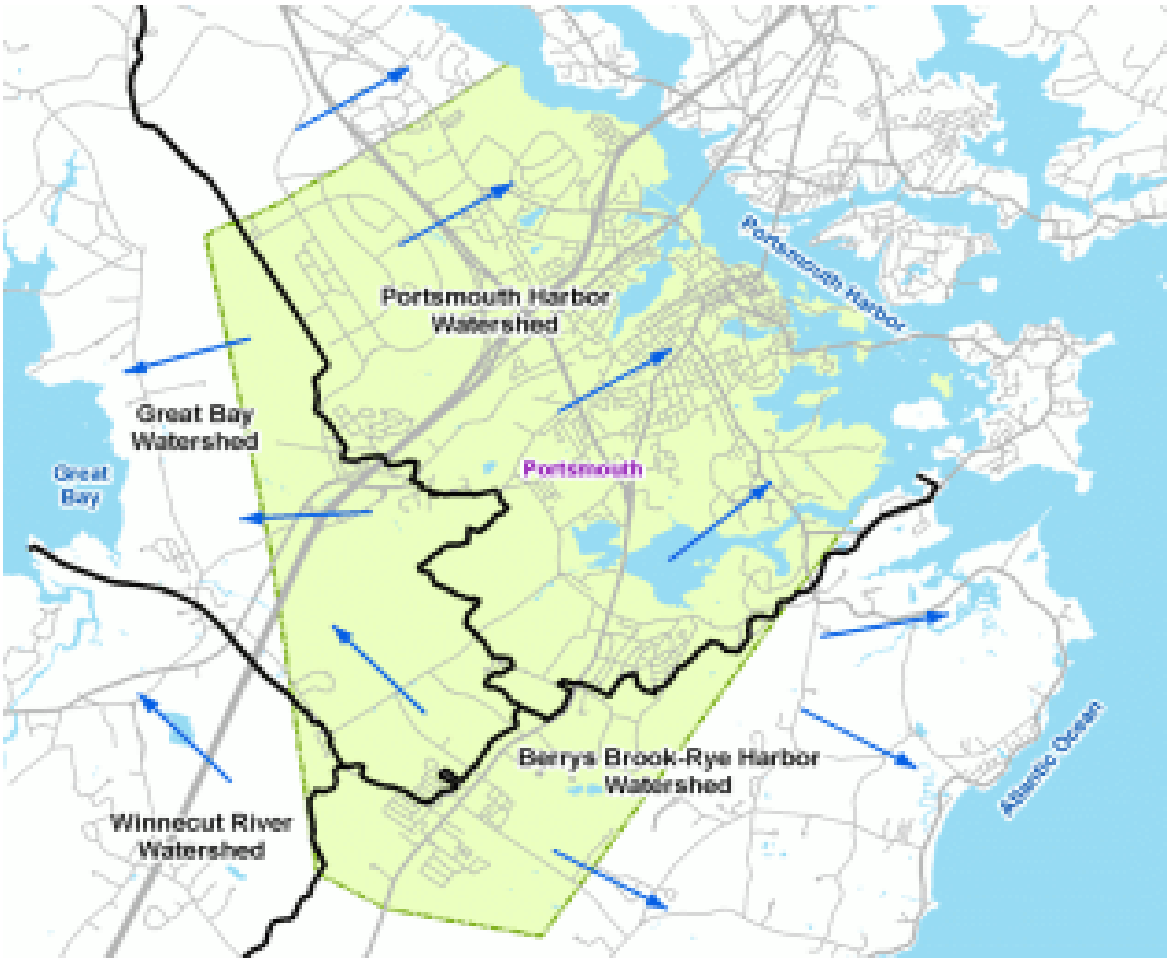
The resulting recommendation from the study is that that City staff present the study findings and recommended options to Council with a request to: (1) continue the study and (2) add a citizen's committee which would provide feedback on these options and review the details of the rate structure program, credits, etc. With such a vote, Council would not be authorizing a stormwater user fee, or a stormwater fee, but simply a continuation of the process of program development. The Council would have several opportunities to review citizen findings and recommendations throughout the process which would likely, ultimately, lead to a vote on fee establishment and rate levels.

1.0 Background and Introduction

Portsmouth, New Hampshire is a City of approximately 21,000 residents in coastal New Hampshire and covers an area of nearly 17 square miles that drain to the Piscataqua Estuary and four other coastal watersheds (see Figure 1.1):

- Portsmouth Harbor Watershed
- Berry's Brook-Rye Harbor Watershed
- Winnicut River Watershed
- Great Bay Watershed

Figure 1.1. Portsmouth Watersheds



Water quality monitoring within these watersheds show that a number of streams are listed as impaired; these streams are shown in Appendices II, III, and IV. As is typical of many older Northeastern municipalities, Portsmouth has a Combined Sewer collection and transport system that serves to carry both untreated sewer water and stormwater to the Wastewater Treatment Facility for treatment. When there are severe storm events

and the collection system is unable to handle the quantity of water from both sources, this creates an overflow condition where the stormwater bypasses the treatment plant and discharges directly to the receiving waters.

There have recently been new nutrient limits allocated to municipalities based on the findings of the Total Maximum Daily Load (TMDL) study developed by the State. These allocations will require Portsmouth to reduce the nutrient levels entering into the receiving waters. It is estimated that 70% of the nutrients entering these water bodies come from non-point source stormwater runoff discharging from the combined sewer.

The impacts of stormwater runoff on water quality, as well as flooding, are an ever growing concern, not only at the local level but at an overarching national level. Portsmouth's stormwater discharges are regulated through a Municipal Separate Storm Sewer (MS4) permit under the National Pollutant Discharge Elimination System (NPDES) as authorized by the Clean Water Act. New Hampshire is a "non-delegated" state and therefore oversight of this MS4 permit is the direct responsibility of Region I of the U.S. Environmental Protection Agency (USEPA) and not the New Hampshire Department of Environmental Services (DES).

Portsmouth has been managing their stormwater program under its initial MS4 permit issued in 2003. Figure 1.2 shows those areas of the City that are currently covered by the MS4 permit.

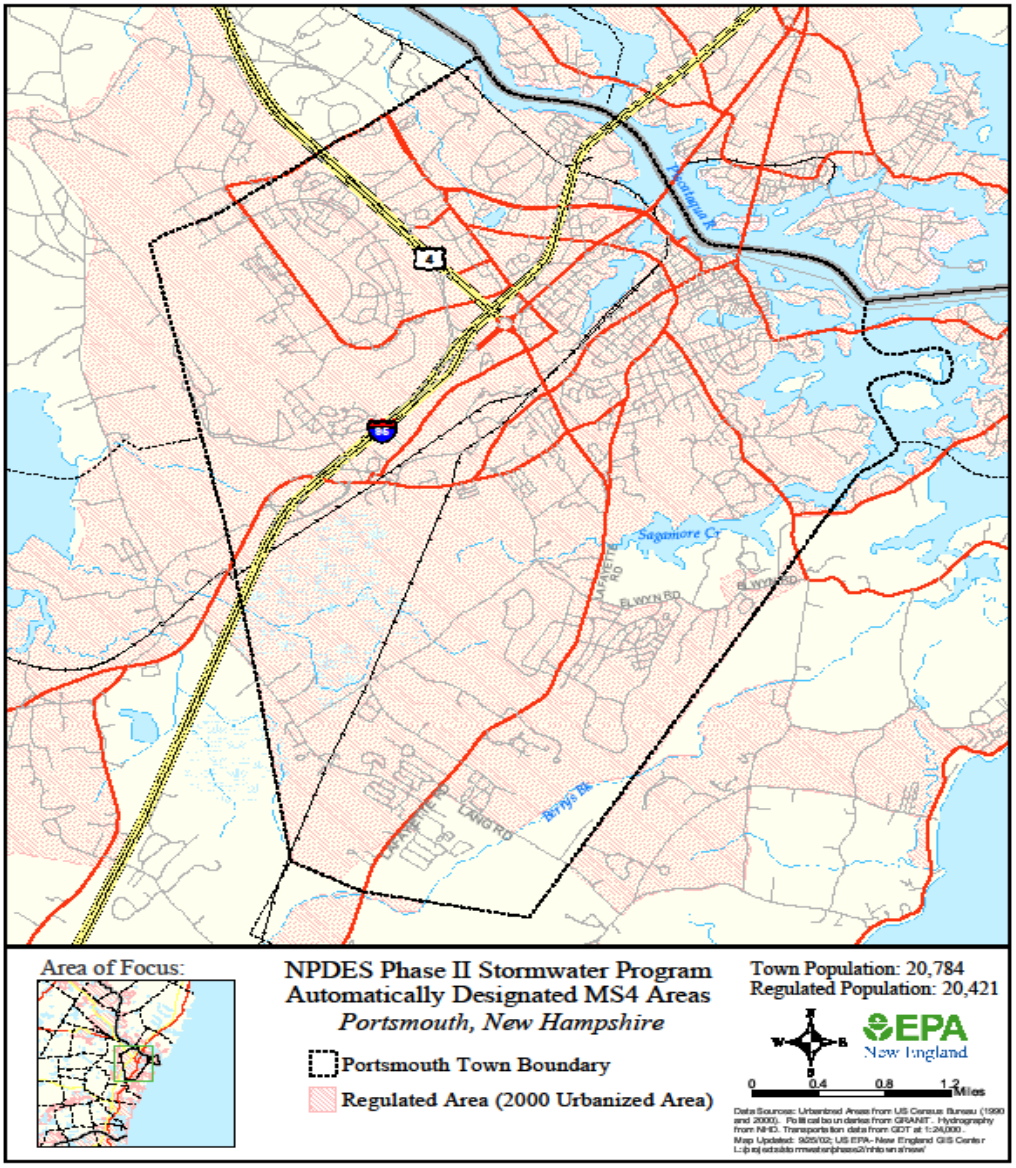
The City anticipated a substantial increase in its responsibilities and costs for stormwater management based on the draft of the new MS4 permit released in 2010; the final permit will likely be released before the end of the year. This realization was a primary factor in its decision to undertake this Feasibility Study to identify the City's options to fund stormwater management.

Currently the City of Portsmouth funds its stormwater program using General Funds. However, wastewater and the combined sewer operations and maintenance are funded using an Enterprise Fund generated by a bond and based on 6-year capital plans. The City allocates funding annually and there is no reserve. This Enterprise Fund does not cover any of the activities needed to manage stormwater.

In 2006-2007, the City conducted a Master Plan study which indicated that that there already existed a funding deficit related to stormwater issues in the City. With the release of the final draft of the new NPDES/MS4, the City realized the probability of needing to expand its stormwater program and that the related costs would further exceed what the City would be able to finance using the General Funds.

Concerned with how to finance its stormwater program, and learning that the DES had grant money available to fund a study to look into alternative stormwater funding options, the City of Portsmouth applied for and received a grant which funded this project.

Figure 1.2. Currently Designated MS4 Areas



In 2009, the DES Watershed Assistance Grants Program provided funding from the Clean Water Act Section 319 funds from the USEPA, to Portsmouth (as well as Dover and Nashua) to determine the feasibility of creating stormwater utilities as a funding source for their municipal stormwater programs.

In 2010, the City of Portsmouth issued an RFP to choose a consultant; AMEC Earth & Environmental was selected to conduct this feasibility study.

1.1 Study Approach

The feasibility study was intended to be just that, an opportunity to:

1. Review the existing stormwater program efforts;
2. Identify what would be needed for a stormwater program to be compliant with the new MS4 permit and meet the needs of the City going forward; and
3. Discuss financing options to fund that new program.

Should the development of a stormwater fee be deemed feasible, and of interest, the completed feasibility study would serve as a road map to help:

- Determine next steps to move the concept of a stormwater fee forward;
- Identify the components of the compelling case to be used to educate rate payers and gain acceptance; and,
- Identify what would be needed to make it technically implementable.

The goal of the study was NOT intended to reach a point where the Council would vote on whether to move forward with a fee, but rather to inform them about what had been learned in the process and the perceived feasibility of implementing a stormwater fee; and if warranted, to request authorization to begin the next steps in the funding feasibility investigation.

In carrying out the study, the following activities were conducted:

Task 1: Stormwater Utility Development Workshops

In this task the AMEC team conducted in person meetings and interviews, virtual meetings, and two facilitated workshops to identify the problems, needs, and issues that should be addressed in an enhanced stormwater program. These meetings were also used to identify the priorities and objectives of the study; identify potential costs; and make recommendations on a funding plan and rate structure.

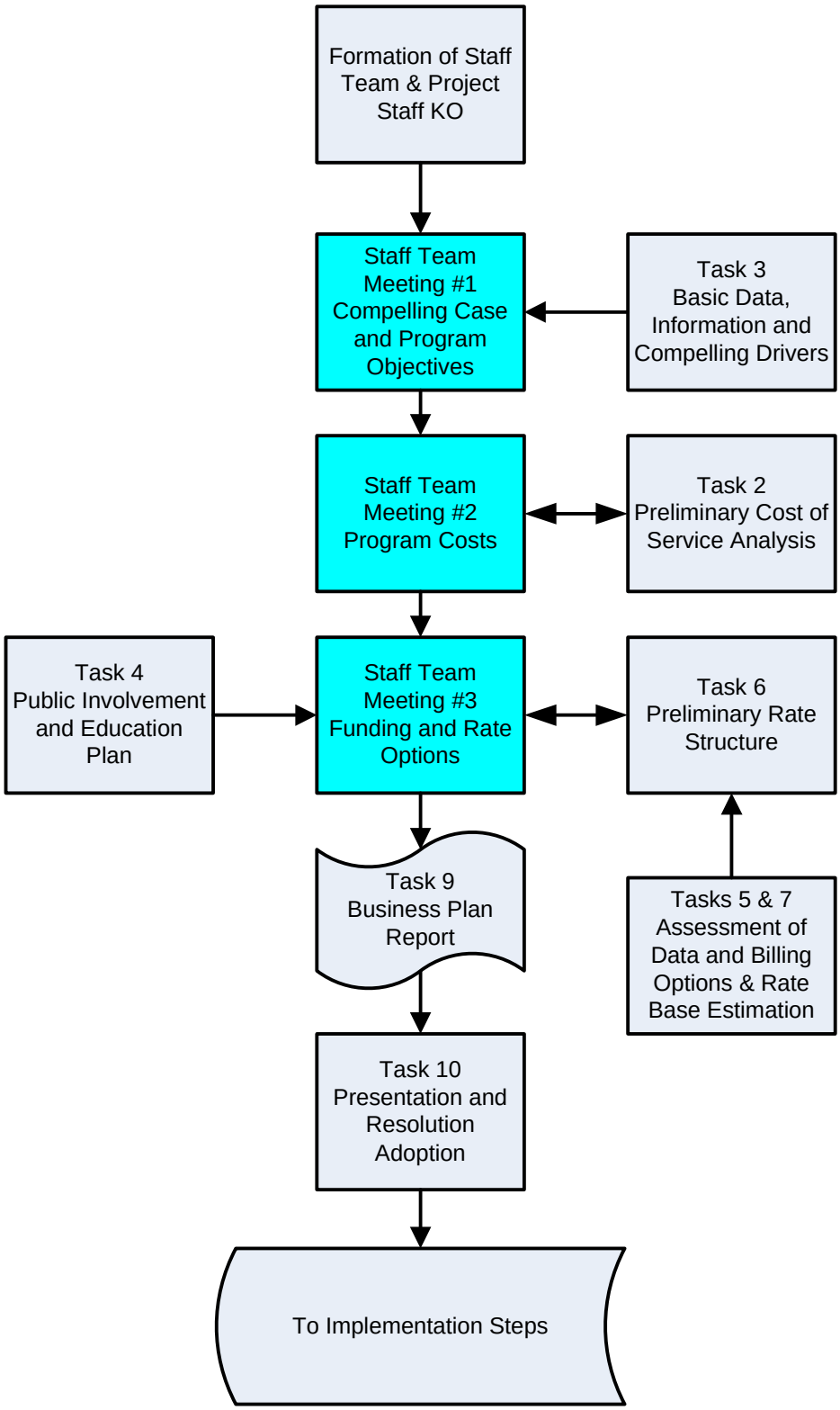
Task 2: Stormwater Program Analysis and Planning

In this task the AMEC team worked with City staff to gather information on current stormwater programs, activities, and budgets; Capital Improvement Plans (CIP); and permit requirements in order to develop a functional framework of the Existing Stormwater Program and costs. Based on this information, the AMEC team then analyzed the current program and developed recommendations and probable costs for an enhanced stormwater program scaled to reflect the objectives and priorities that had been identified in Task 1.

Task 3: Developing the Compelling Case

The AMEC team explored the range of reasons that might compel the City to undertake an enhanced stormwater program and made recommendations on how this Compelling Case might best be presented to stakeholders.

Figure 1.3. Stormwater Rate Structure Development Process



Task 4: Education & Outreach Strategies and Activities

In this task, the AMEC team held a preliminary discussion with staff to identify medium and longer term outreach strategies to identify key stakeholders, messages, and communications approaches. In the original scope, it was anticipated that three communication aides would be developed for the City to use to educate stakeholders on the need for an enhanced stormwater program. The City determined that this part of the task would not be implemented as it would be premature.

Task 5: Data Compilation for Rate Methodology

The AMEC team worked with City staff to identify and assess existing data; identify data gaps; and identify potential sources to fill those gaps for information related to:

- Parcel Layers;
- Land Use;
- Existing Utility Database Accounts;
- Parcel Ownership Database Accounts;
- Parcel Ownership & Address; and,
- Impervious Surface Coverage.

Task 6: Rate Structure Analysis

The AMEC team assessed the basic rate methodology and potential rate modifiers to project potential revenue that could be generated from a user fee based on the selected rate structure.

Task 7: Billing Methodology

The AMEC team reviewed potential billing options in order to make a recommendation on the possible approaches available to the City.

Task 8 and Task 9: Recommendations and Final Report

By way of this final report, the AMEC team is providing a summary of observations and recommendations based on the feasibility study findings.

Task 10: Presentation and Final Recommendations

This task was in the original proposal; however it was removed by the City in the final contract. However, should it be requested, the AMEC team is available to present the findings of the feasibility study.

1.2 The Portsmouth Stormwater Team

While a number of people provided on-going support, and sometimes behind the scenes assistance, the primary team members that were involved in conducting this feasibility study are listed below.

The day to day activities associated with this project were managed by **Silke Psula the Solid Waste Coordinator for Portsmouth**. In addition, the following City staff provided valuable input into the process.

David Allen - Public Works Deputy Director
Judie Belanger - Finance Director
Peter Britz - Environmental Planner/Sustainability Coordinator
Gail Cunningham - Controller
James McCarty - GIS Coordinator
Peter Rice - Water & Sewer Engineer
Jared Sheehan - Engineer Technician
Robert Sullivan - City Attorney
Rick Taintor - Planning Director

The contractor for this project was AMEC Earth & Environmental and **the Project Director and Senior Technical Lead was Andrew Reese.** In addition, the following AMEC team members provided support for the implementation of this project.

Marlou Church Gregory - Project Manager and Technical Peer Review
Kristie Rabasca - Stormwater Program Analysis and Planning
Rich Niles - Stormwater Programs
Keith Readling - Data Manager
John Styron - Data Compilation
Jason Wise - Data Compilation

1.3 Final Report

This final report contains a summary of the information that was gathered during the feasibility study and provides an overview of the likely issues and concerns that will need to be addressed by the City of Portsmouth to provide an adequate stormwater management program to meet future requirements and demands. It also provides rough estimates on the order of magnitude of costs that will be associated with those programs. An analysis of the data and other management related issues that would need to be addressed, should the decision be made by the City to conduct a more robust feasibility study for a stormwater fee in the future, are also included.

At the request of the City, the original number of workshops that were included in the proposal was reduced; however, the topics needing input were covered in informal conversations and communications to the extent that a straw stormwater program and estimated fee was developed. While cursory, the level of detail derived from this process should be sufficient for use in the decision making process to answer the ultimate question of the study: "Does It Make Sense" to enter into the next phase of a more robust study? Should it be determined to move forward, the next phase would need to take the additional steps required to get to the level of detail and build the support that is generally needed to be successful in implementing a stormwater fee (shown in part in Figure 1.2).

The information included in this final report was derived from:

- Both formal and informal meetings and communication with City staff;
- Information that was generated by AMEC from independent research; and
- The AMEC team's experience in this field of stormwater management programs and sustainable financing.

The report is presented in the following sections:

Section 1 – Introduction

Section 2 – Current Stormwater Program

Section 3 – Compelling Case for an Enhanced Stormwater Program

Section 4 – Proposed Future Stormwater Program

Section 5 – Data Analysis and Recommendations

Section 6 – Rate Analysis and Recommendations

Section 7 – Billing Analysis and Recommendations

Section 8 – Stakeholder Education & Outreach Recommendations

Section 9 – General Recommendations and Next Steps

2.0 Current Stormwater Program

This section provides an overview of the City's organizational structure, including the departments that are involved in managing and implementing the Stormwater Program. Following the City organization overview, a summary is provided of the key elements that drive the City's "Existing Stormwater Program". Based on a detailed cost of service spreadsheet developed with staff, Portsmouth currently spends about $512,500 annually on all aspects of stormwater management. For informational purposes, this level of expenditure for a city of Portsmouth's size can be characterized as "minimal to low moderate" when compared to other stormwater programs across the country.

2.1 City Organization

The City of Portsmouth has functioned as a City Council/City Manager form of government since 1947. The City Council appoints the City Manager by a two-thirds majority, and City Councilors are elected at-large for two-year terms. As the responsible supervisor for all department heads, the City Manager provides annual operating budgets and long-range capital improvement plans to the City Council annually. The City's fiscal year runs from July 1 to June 30 each year. Generally, budgeting commences in January and is completed by June 30.

The following is a listing of City Departments that have involvement in Stormwater Program Issues. Table 2.1 shows the different City departments and their associated stormwater activities and costs.

2.1.1 Public Works Department (DPW)

The DPW is responsible for maintaining the municipal infrastructure including all City streets, parks, municipal buildings, water system, sanitary sewer system, and the storm drain system. DPW is divided into the following Divisions:

> The Engineering Division is responsible for design and implementation of a variety of capital projects such as road improvements, water and sewer improvements and repairs, and municipal building improvements. This division also reviews site and subdivision plans for new and redeveloped projects.
>
> Components of the existing stormwater program that are completed by the Engineering Division include review of site and subdivision plans for stormwater components during planning board review and oversight of capital projects for storm sewer design and sediment and erosion control issues. The Engineering Division is funded by the General Fund.
>
> The Highway Division is responsible for maintaining all City streets, sidewalks, parks, playgrounds, recreation facilities, and municipal buildings, including snow removal operations. The Highway Division also maintains the City vehicle and equipment fleet and is responsible for solid waste collection, disposal and recycling.
>
> Components of the existing stormwater program that are completed by the Highway Division include inspection, cleaning and repair of culverts, catch basins,

storm sewer pipes, and ditches. Illicit discharge issues are investigated and, if small, are addressed by the Highway Division. Funding for the Highway Division is from the General Fund.

The Sewer and Water Divisions installs and maintains the sanitary sewer collection system, including catch basin cleaning for sanitary sewers, and treatment at two wastewater treatment plants (WWTPs): the Pease Tradeport WWTP and the Peirce Island WWTP. The Water Division maintains and installs the water mains and hydrants. The City water service provides water for fire protection and general consumption, and installs and reads water meters.

Components of the existing stormwater program that are completed by the Sewer and Water Divisions include sustainability programs, Geographic Information System (GIS) work, including field work and mapping services, and coordination and program review by the City Engineer and Deputy Public Works Director. The Sewer and Water Division services are provided through an Enterprise Fund.

Parking and Transportation Services is responsible for downtown public parking facilities, parking and traffic studies, and civilian enforcement of electronic parking meters. These services are provided through a special revenue fund. The Parking and Transportation Services Division does not currently provide significant services related to the Stormwater Program.

2.1.2. Finance Department

The Finance Department provides all City departments with a financial management information system to track budgets and expenditures associated with Governmental Funds, Enterprise Funds, and Fiduciary Funds. The Finance Department provides billing and collection services for the Water and Sewer Divisions. Though the Finance Department does not currently assist in billing for stormwater programs, if a user fee were implemented, the Finance Department would likely manage the accounts.

2.1.3 Planning Department

The Planning Department supports the functions of a number of boards including the Historic District Commission, the Conservation Commission, the Board of Adjustment, the Technical Advisory Committee, and the Planning Board. In addition, the Planning Department is responsible for working with other City departments to develop the long-term Capital Improvement Plan (CIP). The CIP is reviewed by the Planning Board prior to submission to the City Council. Portions of the existing stormwater program supported by the Planning Department include:

- Coordination of sustainability projects (such as the LEED-certified library),
- Development and administration of the City's Zoning Ordinance (including review by the Planning Board of development projects), and
- Interaction with the City's environmental groups, such as Hodgson Brook Advisory Board (HBAB).

Most Planning Department funding comes from the General Fund. Staff involved in the stormwater related activities includes the Environmental Planner / Sustainability Coordinator and Planning Director.

2.1.4. Inspection Department

The Inspection Department provides oversight on private development construction projects within the City limits. Inspection services provided include plumbing, electrical, mechanical, and zoning requirements (sediment and erosion control inspection). Generally, fees paid by developers' off-set department expenses.

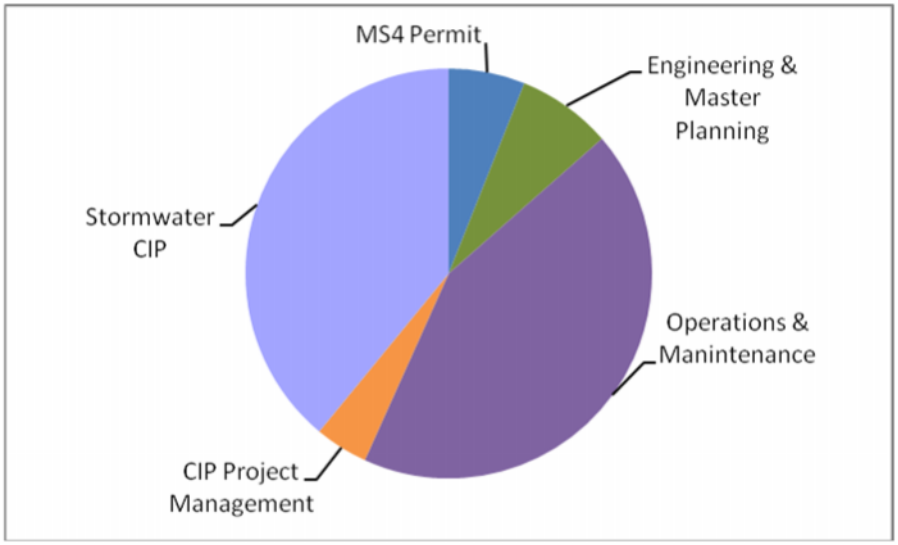
2.2 Key Elements of Existing Stormwater Program

The City of Portsmouth was designated as a Stormwater Phase II municipality in 2003, and, as such, became subject to the General Permit for Small Municipal Separate Storm Sewer Systems (MS4). The USEPA has authority for the Stormwater Phase II Program in New Hampshire. The USEPA issued a final MS4 General Permit in 2003 which was due to expire in 2008. The 2003-2008 General Permit has been extended until the USEPA finalizes the replacement permit. As such, the City of Portsmouth has continued to conform to the requirements of the 2003-2008 General Permit through continued implementation of the Best Management Practices identified in its 2003 -2008 Stormwater Management Plan. To meet those requirements the City spends approximately $512,000 a year, a summary of these costs are shown in Table 2.1 and the detailed costs are outline in Table 2.2. The majority of these costs are related to Operations and Maintenance and Capital Improvement Projects (CIP) as displayed in Figure 2.1.

Table 2.1 Summary of Existing Program Costs

MS4 General Permit	$31,000
Engineering & Master Planning	$38,500
Operations & Maintenance	$221,400
CIP Project Management	$21,600
Stormwater CIP	$200,000
Total	$512,500

Figure 2.1 Proportional Breakdown of Current Stormwater Costs



The draft of the new replacement MS4 General Permit was written in December 2008, and is anticipated to be finalized in the next few months. Based on the draft, it is anticipated that the City of Portsmouth, along with the rest of the New Hampshire MS4 permit holders will need to substantially increase their stormwater program and associated spending. The future stormwater program and the estimated costs are presented in Section 4 of this report.

In addition to the MS4 General Permit, the City operates three facilities that are subject to the NPDES Stormwater Multi-Sector General Permit for Industrial Facilities (MSGP): the Peirce Island WWTP, the Pease Tradeport WWTP, and the DPW Transfer Station/Recycling Facility. The MSGP was issued in September 2008 and is effective until September 2013. The MSGP requires the City to prepare and implement Stormwater Pollution Prevention Plans (SWPPPs) for each of the three facilities, including conducting quarterly visual assessments of discharges from outfalls during storm events, conducting quarterly inspections of the facility to review the potential for activities and materials to impact stormwater, and to conduct quarterly benchmark sampling and analysis for select analytical parameters.

Because of the growing regulations associated with the storm drain system, the City developed a Stormwater Master Plan in 2006-2007. The Master Plan provided an assessment of the condition of the infrastructure, a review of the regulatory requirements, an assessment of the City's overall compliance, and recommendations for Capital and Operation and Maintenance expenditures to maintain the system and comply with the permit requirements.

Table 2.2. Annual Stormwater Costs

Administration		Cost	Assumptions
NPDES NOI and SWMP	$	-	Not required until new MS4 permit is issued.
NPDES Annual Reporting	$	7,680	Includes time for Stormwater Coordinator to complete report and others to review.
NPDES Public Education Program	$	4,245	Includes time for Stormwater Coordinator to update website and send out brochures.
NPDES Training	$	2,087	Includes time for Stormwater Coordinator to conduct training for DPW and MSGP sites as required by permits.
Inter-agency Coordination (DOT and Pease Tradeport)	$	1,792	Portsmouth has an interagency agreement with the Pease Tradeport to conduct maintenance on their roads, including the ditches and storm drains. Time included here is for coordination with DOT and the Tradeport.
Grants Program	$	1,980	Average amount of time over the past 5 years spent on obtaining grant funding and reporting on it.
Impaired Waters Issues	$	12,424	Time spent reviewing impaired waters issues by Stormwater Coordinator, Deputy DPW Director, and other City Staff.
Watershed Group Support (Hodgson Brook)	$	819	Time spent coordinating with group by Sustainability Coordinator.
Subtotal:	**$**	**31,028**	
Billing and Finance		**Cost**	**Assumptions**
Financial Management	$	-	Placeholder for future NPDES program.
Indirect Cost Allocations	$	-	Placeholder for future NPDES program.
Billing, Finance and Customer Services	$	-	Placeholder for future NPDES program.
Cost and Rate Analysis	$	-	Placeholder for future NPDES program.
General Government Support	$	-	Placeholder for future NPDES program.
Subtotal:	**$**	**-**	

Engineering and Master Planning		Cost	Assumptions
Stormwater Quantity and Quality Master Planning	$	-	Nominal cost to refer back to recommendations of Master Plan completed in 2007. No updating has been done since 2007.
Stds, Design, Field & Ops Engineering (Private Projects)	$	-	Passes through an escrow system, nominal cost to City.
Sustainability Analysis/Design (Eco-Municipality)	$	4,097	Primarily Sustainability Coordinator working on LEED building green infrastructure and watershed projects .
Sustainability Analysis/Design (NPDES and other)			Placeholder for future NPDES program.
GIS, Database, and Mapping	$	24,300	Assumes approximately 1/4 time for GIS Coordinator to keep stormwater portions of GIS database up to date, including tracking where permits were issued to sites that need to complete post construction maintenance on stormwater infrastructure.
Field Data Collection (GIS and Engineering)	$	10,125	Includes time for mapping of new structures.
Subtotal:	**$**	**38,522**	

Operations		Cost	Assumptions
City Projects	$	9,558	Engineering Technician oversight on small and medium City projects.
Storm Sewer and Culvert Inspections and Cleaning	$	-	None completed in 2009.
Remedial Repair and Replacement	$	44,700	Includes items completed by City workers, such as small repairs to structures (labor and materials).
Inlet, Catch Basin, and Manhole Cleaning	$	41,885	1,000 CBs inspected and cleaned if necessary in 2009 (1/2 were cleaned) - crew of 2, plus $65/hr for truck.
Post Construction System Maintenance (City Operated Systems)	$	10,960	Estimate for maintenance of vortechnics units and detention ponds.
Ditch and Channel Maintenance	$	897	Estimated ditching typically completed.
Curb and Gutter Maintenance	$	95,352	Nominal current costs.

Water Quality Retrofitting Program	$	-	Nominal current costs.
Illicit Discharge Removal/Correction	$	3,586	Assumes one per year by DPW staff.
NPDES Stormwater Monitoring	$	1,087	Visual observations by DPW.
Pesticide, Herbicide, and Fertilizer Program	$	-	Placeholder for future NPDES program.
Toxic and Hazardous Materials Control Program	$	-	Nominal current costs.
Spill Response and Cleanup Program	$	725	Supplies and materials maintenance.
NPDES MSGP Program (Peirce, Pease, DPW)	$	12,634	Costs covered are only those expended by DPW assisting in MSGP compliance.
Subtotal:	**$**	**221,383**	
Regulation/Enforcement		**Cost**	**Assumptions**
Code Development and Enforcement	$	-	Most costs pass through escrow.
NPDES Chloride Tracking	$	-	Placeholder for future NPDES program.
Illicit Discharge Investigation/Tracking	$	-	Nominal illicit discharge issues investigated and tracked due to insufficient staff.
Subtotal:	**$**	**-**	
Capital Improvements		**Cost**	**Assumptions**
Capital Improvement Project Management	$	21,633	Oversight on Major Capital Projects.
Stormwater Major Capital Projects	$	200,000	Contractor and materials for Major Capital Projects.
Stormwater Portion of CSO Projects	$	-	Future CSO projects will have significant portions associated with the storm drain system.
Land, Easement, and Rights Acquisition	$	-	Nominal current costs.
Subtotal:	**$**	**221,633**	
Other		**Cost**	**Assumptions**
Hazard Mitigation	$	-	Determined by staff to be too small to reasonably identify costs, or not appropriate for stormwater program.
Flood Plain Management	$	-	
Flood Insurance Program	$	-	

Litter/Dumping Regulation Program	$	-
Emergency/Disaster Management	$	-
Groundwater and Drinking Water Program	$	-
Septic, Inflow, and Infiltration Program	$	-
Subtotal:	**$**	**-**
TOTAL:	**$**	**512,566**

Portsmouth has a land area of about 10,000 acres. When compared to other communities around the United States on a dollars per developed acre per year basis Portsmouth's investment in its stormwater infrastructure and protection and preservation of its surface water resources, at $51/acre would fall into the "minimal" category – a fact that is clearly indicated by the suite of issues described in the next section. A moderate investment, placing the City in the middle third of cities who manage stormwater and surface water protection proactively, would be in the range of $150-$200 per developed acre per year – or a budget in the range of $2 million annually, while the leading programs invest in the range of $250 per developed acre and more.

3.0 Compelling Case For an Enhanced Stormwater Program

3.1 Overview

Understanding the stormwater issues and concerns that face Portsmouth is the starting point for building a "compelling case for action." In every community there are good, even compelling, reasons to improve the way stormwater programs are executed. This reason might be a popular stream that is becoming increasingly impacted, a lack of riparian park space, decaying drainage infrastructure and mounting complaints, unfunded regulatory mandates, local flooding, financial pressures, loss of fish, beach closings, a roadway or bridge collapse, or law suits. Such issues can draw the attention and energy of stakeholders and leaders and turn into opportunities for action.

3.2 Drivers for Change

When we look at stormwater programs around the country and identify the impetus for improved stormwater programs, we have found that the reasons for change are generally motivated by some combination of ten key common "drivers" or forces. No community experiences all of these drivers, and not all of them compel local citizens to action. Each of these drivers can be understood and expressed in various ways depending on the local situation, but the generic titles and description are:

Water quality and ecology

Examples: beach and shellfish bed closures; nutrient-impaired embayments and recreational waters; fish kills; reduced ecological health; reduced number of game fish, destroyed habitat; toxic pollution; eutrophication of lakes and ponds; bacterial pollution; illicit connections and illegal dumping; combined sewer or sanitary sewer overflows, or other point discharge issues; urban hot spot pollution.

Quality of life and aesthetics

Examples: degrading water quality near beaches and subsequent loss of tourism; detention basin safety hazards or appearance; weeds, erosion or other stream impacts; loss of natural appearance; desire for greenways or trails; toxic or dangerous organisms that can effect human health and safety.

Preservation of property value

Examples: reduction in waterfront property values; floodplain property values declining; opportunities for waterfront enhancement; loss of reputation for safety or for natural features; development pressures eroding natural features; protection of unique water-related features.

Drinking water supply protection and enhancement

Examples: pollution of groundwater and drinking water supplies; well head pollution issues; filling of reservoirs; eutrophication and water taste issues; declining low flows for water treatment; effluent pollution.

Flooding problems
Examples: flooding along both major and minor streams; system backups and other capacity issues; tidal influenced flooding; culvert and other conveyance infrastructure under sizing or failure.

Aging infrastructure
Examples: limited life and need to replace leaching facilities; clogged systems; erosion of property; damaged systems; rusted culvert inverts; cracked and failing concrete; undersized systems due to new development; failing dams and detention ponds.

Development pressures
Examples: development related increased flows and flooding; filled detention ponds; increasing pollution and erosion.

Erosion of channels and creeks
Examples: major stream erosion; bridge undermining; infrastructure failure due to erosion; minor ditch erosion; head cutting; sediment buildup; filling lakes and ponds.

Regulatory mandates
Examples: NPDES permit (including anticipated requirements of renewed MS4 general permit); FEMA regulations; TMDLs; endangered species act; drinking water protection; well head protection; wetlands permitting; other state, regional, or local regulations.

Lawsuits
Examples: flooding caused by roads; environmental compliance law suites; nuisance flooding; erosion or other issues; health and safety suits.

3.3 City of Portsmouth's Drivers

During the first workshop conducted with the Portsmouth stormwater team, AMEC facilitated an exercise to identify what workshop participants thought to be the components of a compelling case to develop an enhanced stormwater program that would be supported by a fee for Portsmouth. This exercise consisted of three steps:

1. In the first step, the AMEC facilitator moved sequentially around the room asking each person to define need for an enhanced stormwater program and a reason that the creation of a utility fee might be compelling solution. By using this approach the Team was able to draw out ideas from all present and encourage all issues to be raised.

2. From this discussion the possible reasons for a developing a stormwater fee were written out on large sheets of paper and posted around the room so that everyone could see all of the issues. Each participant was then given 3 votes to apply to what they perceived and understood to be the top three most critical stormwater funding and program issues.

3. After the meeting, these voting results were analyzed and categorized to create themes, taking into account that several of the discreet issues raised could be grouped within a broader general principal.

There were seven general categories of issues that the workshop participants felt to be compelling. These results are laid out in Table 3.1. Based on the voting, Water Quality and Flooding were the primary concerns and therefore identified as the most compelling by this group. It should be noted that the voting group was composed of City staff. In our experience, it is not uncommon to have a different set of priorities/results when this same exercise is conducted with a group consisting of a variety of stakeholders. Because the goal of this exercise is to identify what the drivers are for a potential rate payer to be compelled to support a stormwater fee should the project move to the next phase, the City should conduct this type of exercise with various groups of potential rate payers to be able to analyze the correct messages to address with each group. More about how and why to address different stakeholders/ rate payers is also discussed in Section 8 of this report.

Table 3.1. Compelling Case Voting

Reason	# Votes	Category	Total Votes
Water quality regulatory compliance	8	WQ	
Well protection from chlorides	6	WQ	
Water quality for runoff into estuaries	5	WQ	
Impaired Streams	3	WQ	
Sediment runoff	2	WQ	24
Basement flooding from all sources	9	FLOOD	
Tidal Flooding	2	FLOOD	
Unresolved problems	2	FLOOD	
Roadway flooding	2	FLOOD	
House to house drainage problems	0	FLOOD	15
Stewardship of the systems	4	MAINT	
Unknown system condition	2	MAINT	
Failing infrastructure	1	MAINT	7
			7
Climate change preparation	7	CL	7
Sustainable green concerns	6	GREEN	6
CSO Separation	5	CSO	
Infiltration and inflow	0	CSO	5
Equitable fee vs. tax	2	FUNDING	
Credit to stimulate activity	0	FUNDING	2

The following is a discussion of those issues that received the most votes during the compelling case exercise.

- **Water Quality** received the majority of the votes. Included in the water quality heading are concerns related to: regulatory compliance, estuary quality, stream quality, and sediment runoff.
- While **Flooding,** as a category, received the second highest number of votes, as can be seen in the chart above, basement flooding, as a single issue, received the greatest number of votes overall, in the case of this exercise, primarily related to basement flooding. Although tidal, roadway, and "unresolved" flooding also received votes as compelling concerns.
- Care for the system (**Maintenance**), preparation for **Climate Change**, sustainability and **Green Concerns**, and interaction with the **Combined Sewer** system rounded out the top six categories. It may be that these received a lower number of votes as the workshop participants were in fact voting from the perceived perspective of the rate payers and therefore the less obvious public issues received fewer votes.

In the Portsmouth region, water quality and flooding issues have been studied extensively through TMDLs, water testing, and flood studies. Based on the known issues and a general understanding of the costs associated with solutions it appears that there is good evidential information available to develop a compelling case for an enhanced stormwater program and to a dedicated source like a stormwater fee.

3.4 Building a Compelling Case

Assembling a "compelling case" is an initial step in framing the key reasons why you need to change and improve the stormwater program. Now that Portsmouth has identified the drivers for change your next step should be to use that information to develop your own compelling case. This compelling case will serve as the City's publicly-stated rationale for why a rate structure is important.

In creating your own compelling case to address a wide variety of stakeholders it will be helpful to remember that, in general, people are motivated along two complimentary courses of persuasion: information (data) and stories. Some people, classified as Left Brain thinkers, want facts and statistics (data), while others, known as Right Brain thinkers, are moved to action by horror stories and pictures. When you begin to quantify the community's perception of program need or make the case for change and new funding, you should seek to address both types of people. Table 3.2 gives some examples taken from successful stormwater utilities.

Table 3.2. Compelling Case Examples

"Left Brain"	"Right Brain"
• Statistics on repair costs • Cost information • Infrastructure information • Lost revenue or tourist dollars • Regulatory facts Backlog information on flooding • Unfunded mandate information	• Flooding pictures • Horror stories • Movies • Testimonials • Environmental or aesthetic appeals • Drawings of a future greenway, trail, etc.

Below are the types of pictures that could be used in developing compelling case presentations.

Street flooding post Tropical Storm Allison. (Photo credit LJWorld.com)

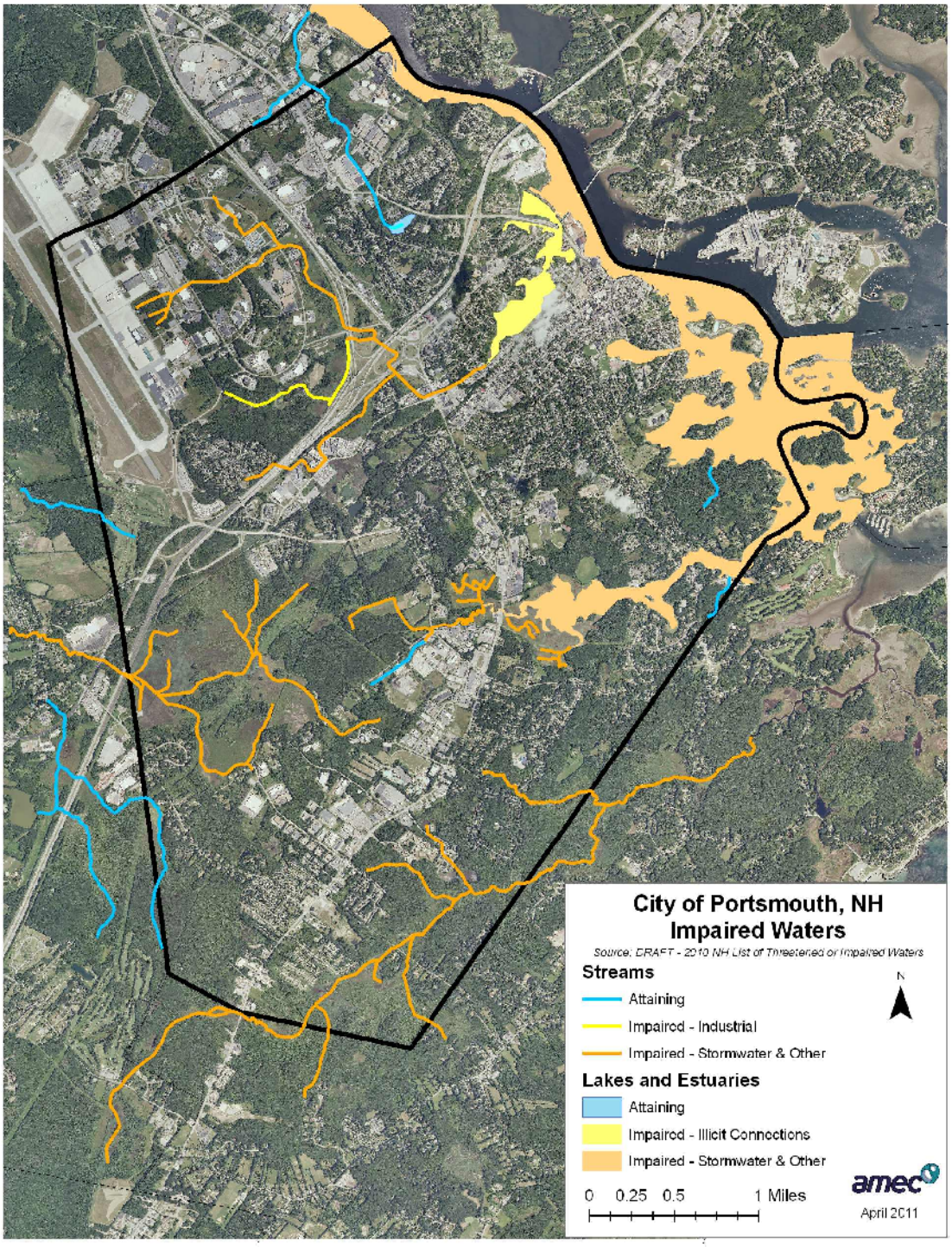
Stormwater Run-off from land sources impact water quality. (Photo credit: CLF)

Construction Runoff in the Hodgson Brook Watershed Photo (Credit D. B.Truslow Associates, Rye, NH)

Building a compelling case and knowing when, how, and to whom it should be presented is more of a political and technical art form than it is a science. But taking time to build informed consensus to move forward and to support program change and new funding methods is vitally necessary. Should Portsmouth decide to move forward, you should use the results of these compelling case exercises along with your knowledge of local to craft the compelling case that is right for both the City and the stakeholder groups. However, it is important to note that in some cases what could end up being the most compelling case may not yet be on the rate payer's radar screen. It will therefore be incumbent upon the City to first educate stakeholders on the importance of an issue.

For example, water quality received the most votes as the compelling reason for an increase in stormwater management. The severity of this issue is seen in the map (Figure 3.1) showing the impaired waters in the watersheds surrounding Portsmouth. Ironically, while those who work in the water resources field and government are highly aware of this concern, most stakeholders have little understanding of the pollutants of concern and impairments affecting local water bodies.
Using maps like the one below or pulling from the data on actual waterway impairments, provided in Appendix II are tools that you can use when discussing why water quality is such a large concern needing to be addressed.

Figure 3.1. Portsmouth Impaired Waters



4.0 Proposed Future Stormwater Program

The proposed Future Stormwater Program draws from the Existing Stormwater Program, but accounts for future system needs and upcoming regulations. The Future Stormwater Program incorporates input from City Staff provided through two workshops.

4.1 Developing Costs

To develop the future program and costs the Team first defined the current program as a starting point. Appendix V contains the complete spreadsheet outlining the major elements that make up the Future Stormwater Program and provides estimated costs for each element. Fully burdened salary costs are estimated by assuming a 1.3 multiplier. Future costs also assume 3% annual rate of inflation. The spreadsheet was drafted to estimate stormwater program costs for the City of Portsmouth for the following time periods:

1. *Current:* Period covered is the City of Portsmouth Fiscal Year from July 1, 2009 – June 30, 2010. Cost estimates are taken from AMEC's understanding of the City's DPW budget and operations.
2. *Years 1 through 5:* Period covered was assumed to be the first year of the next MS4 General Permit (has assumed a 2010/2011 Fiscal Year for the City). Cost estimates assume the Current period as a starting point, and includes the anticipated Stormwater Program based on the Stormwater Master Plan (dated May 2007), General Permit for Municipal Separate Storm Sewer Systems (the MS4 General Permit, drafted December 2008, not yet finalized), applicable programs from the Capital Improvement Program (09/10 Program), and any additional components identified by staff. Assumes an inflation rate of 2.5%.
3. *Year 10:* Period covered is assumed to be nine years after Year 1. Cost estimates are effectively the same as for the Stormwater Program described in Years 1 through 5, assuming a similar inflation rate. Year 10 costs may vary from Year 1 through 5 costs because of differing regulatory requirements.

4.1.1 Current Costs

The Stormwater Program categories contained in the spreadsheet are generally representative of other programs being implemented by Phase II municipalities (subject to MS4 General Permits) across the United States. All Phase II municipalities are generally responsible for:

- Constructing and maintaining stormwater infrastructure,
- Regulating private development in some way,
- Addressing flooding issues, and
- Implementing the requirements of the MS4 General Permit.

Each municipality has its own unique organizational structure and Portsmouth is no exception. The Team has refined the general cost categories to better reflect the Portsmouth organizational structure and stormwater program.

Brief descriptions of each of the cost categories and assumptions used to populate the costs associated with the current stormwater program, and the Year 1 stormwater program, are provided in the following Table 4.1.

Table 4.1. **Stormwater Cost Categories and Assumptions**

Cost Category	Assumptions for Current Costs	Assumptions for Year 1 Costs
Administration	Currently, the City of Portsmouth employs a part time stormwater coordinator. The majority of the administrative costs result from work completed by the stormwater coordinator, with some additional support by DPW staff.	Increases include additional time by all parties to complete a Stormwater Management Plan for the new MS4 Permit and coordinate annual meetings for public input (Costs from 1/2009 comments on MS4 permit).
Billing and Finance	No costs are included for current year because we are not aware of any applicable costs.	Subsequent years may include billing and finance costs if a user fee is implemented.
Engineering and Master Planning	Current costs for sustainability, GIS, and field data collection have been included. GIS mapping assumes continued updating of the GIS system as required by the current MS4 General Permit. Additional line items included in this category may also be applicable.	Year 1 costs include all current costs as a baseline necessity. The SW Master Plan identified additional mapping tasks that needed to be completed (outfall inspections, field checks of piping configurations and a rim survey). Increases to the sustainability line item incorporate the MS4 requirements for: a. LID ordinance changes, b. evaluation of street and parking lot design criteria, c. general evaluation of potential green infrastructure practices, and d. an inventory and priority ranking of all City facilities. (Costs from 1/2009 comments on MS4 permit).
Operations	Catch basin operational costs reflect inspecting all 4,700 catch basins each year (crew of 2) and cleaning those basins that exhibit excessive sediment in the sump. The cost of removal of one illicit discharge (by DPW work crews) has also been included.	Year 1 costs include: Development of a formal O&M Plan for infrastructure as required by the MS4 General Permit. Televising and cleaning the storm drain pipes (323,000 lf) as described in the SW Master Plan on a 10-year cycle. Televising truck at $75/hr. Remedial repair and replacement reflects outfall apron repair as described in the SW Master Plan. Catch basin cleaning as required by the MS4 General Permit (4,700 CBs inspected every year, cleaned every other year), Vac truck cost at $65/hr., sediment disposal at $70/ton. Illicit Discharge removal costs reflect the new MS4 permit requirement to remove within 6 months of detection, and assume 2 per year: 1 by DPW crew, 1 by outside contractor. (based on observations made during SW Master Plan inspections),

Regulation/ Enforcement		Implementation of the IDDE program identified in Task 3 of the SW Master Plan plus additional dry weather screening, sampling and analysis required by the MS4 General Permit (25% of outfalls each year, 10% are flowing). Development and Implementation of the Chloride tracking program required by the MS4 General Permit.
Capital Improvements		Staff oversight of Capital City Stormwater related Projects is included (Cost from SW master Plan). Capital Improvement Projects identified in the SW master Plan include: BI-PW-28 Maple Haven Storm Water Drain system construction (identified in the 2001-2015 Capital Improvement Plan).
Stormwater Quality	Current levels of effort for NPDES reporting, public education programs, training, MSGP compliance and impaired waters issues have been estimated and may need refinement.	Cost elements are requirements of MS4 General Permit input (Costs from 1/2009 comments on MS4 permit). Operation and Maintenance items identified related to the MSGP Program facilities is included as a line item (Costs from SW Master Plan) Costs for the following impaired water issues were evaluated as part of the SW Master Plan: Little Harbor has a Total Maximum Daily Load for bacteria, and as such additional annual reporting is required by the MS4 General Permit. Additional Televising, dry weather inspections, and public education are recommended for North Mill Pond.

4.1.1 Future Costs

As discussed in the workshops, significant changes and increased costs in the Future Stormwater Program are anticipated due to increased regulatory requirements and continued decline in the condition and capacity of the stormwater infrastructure. While it is anticipated there will be cost increases across the board, the drivers for the most significant future costs were identified as follows:

- The Stormwater Master Plan recommends reconstruction of 2% of the stormwater system each year, resulting in complete replacement of the system after 50 years.

- The City of Portsmouth anticipates that a significant portion of their Combined Sewer Overflow (CSO) separation program is a major component of the Future Stormwater Program. Projected costs for the stormwater portion of the CSO program are estimated to be approximately $1,000,000 annually extending through year ten of the Future Stormwater Program.

- Anticipated regulatory requirements, specifically from the MS4 permit are anticipated to cost approximately $500,000 per year.

Projecting future costs solely for stormwater was complex due to the existing inter-relationship between the stormwater and CSO programs, such as:

- Many elements of the Existing Stormwater Program and Future Stormwater Program are completed through personnel whose salaries are funded through the General Fund (including Highway and Parks and Recreation staff), while many others are completed by staff whose salaries are from the Water and Sewer Enterprise funds.

- Approximately 14% of the costs associated with the Existing Stormwater Program are currently being funded by the Water and Sewer Enterprise Funds. For the Future Stormwater Program, approximately 42% of costs will be funded by the Water and Sewer Enterprise Funds.

- There was concern expressed that separation costs under the CSO program might partially be a stormwater cost, and therefore are reflected in the table above. This cost, which is 40% of the total program or approximately $1M annually, may or may not be considered a stormwater cost to be funded by user fee revenue.

- Review of the detailed spreadsheets shows that approximately 14% of the costs associated with the Stormwater Program ($70,000) are currently being funded by the Enterprise funds for Water and Sewer.

Future demands and correction of past deficiencies are expected to significantly increase this level of expenditure. The detailed cost of service projections put the anticipated stormwater program need at about $2.5M annually for a typical year. Table 4.2 shows a summary and rounded cost estimates for both existing and proposed future program though year 5.

Driven by new permit requirements additional cost categories were added to the stormwater management budget going forward. Guided by the AMEC team the City estimated both the costs and timing of activities to be included in these categories. The proportional division of costs between categories varies considerably between the first year and the proportional costs that average out between Year 2 and Year 5.

Table 4.2 Summary of Existing and Proposed Future Programs

Summary of Future Stormwater Program Estimated Costs						
Major Cost Category	Current	Year 1	Year 2	Year 3	Year 4	Year 5
MS4 General Permit	$ 31,000	$ 81,600	$ 32,600	$ 37,600	$ 29,000	$ 44,000
Billing and Finance	$ -	$ 258,600	$ 211,200	$ 217,300	$ 218,700	$ 222,600
Engineering and Master Planning	$ 38,500	$ 198,600	$ 39,500	$ 41,700	$ 32,500	$ 33,400
Operations and Maintenance	$ 221,400	$ 655,700	$ 621,900	$ 640,500	$ 632,100	$ 679,900
Regulation/Enforcement	$ -	$ 8,000	$ 16,700	$ 25,600	$ 22,300	$ 22,900
Capital Improvements						
Project Management	$ 21,600	$ 100,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000
Stormwater Major Capital Projects	$ 200,000	$ 1,000,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000
Stormwater CSO Projects	$ -	$ 1,023,000	$ 1,024,000	$ 1,025,000	$ 1,025,000	$ 1,026,000
Land and ROW Acquisition	$ -	$ 22,500	$ 17,600	$ 17,700	$ 17,800	$ 17,800
Subtotal:	$ 221,600	$ 2,145,500	$ 1,591,600	$ 1,592,700	$ 1,592,800	$ 1,593,800
TOTAL:	**$ 512,500**	**$ 3,348,000**	**$ 2,513,500**	**$ 2,555,400**	**$ 2,557,400**	**$ 2,596,600**

Figure 4.1
Current Proportional Division of Costs

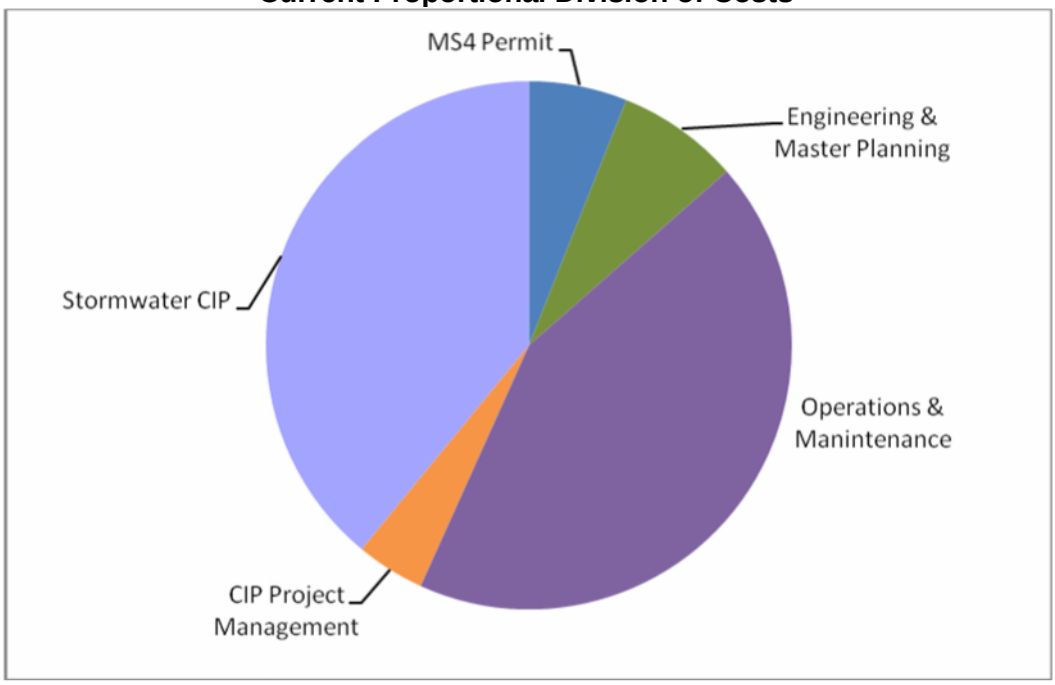


Figure 4.2
Year 1 Proportional Division of Costs

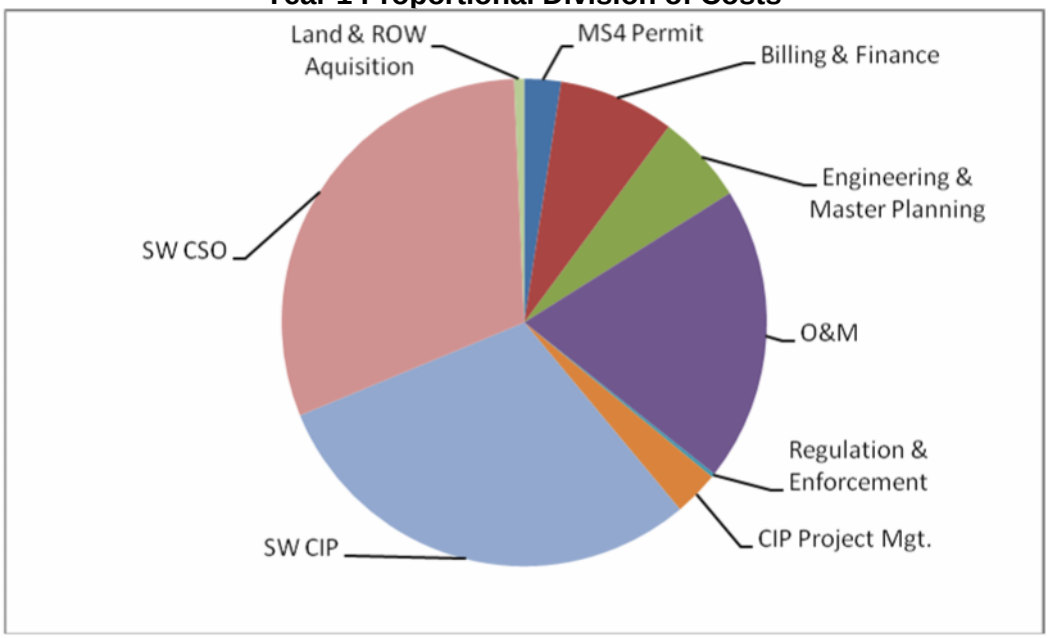
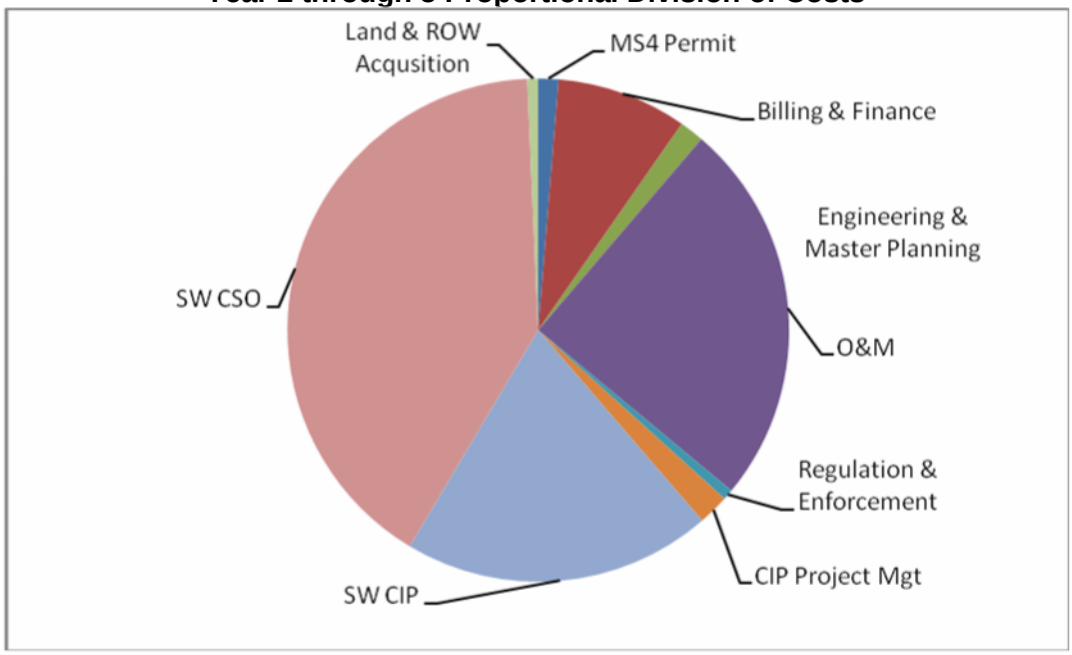


Figure 4.3
Year 2 through 5 Proportional Division of Costs



5.0 Data Analysis

To conduct the data analysis portion of this project, the AMEC team acquired from the City existing source data which would likely be used to develop and implement a stormwater utility, if the decision to move forward were to be made. This data received included: parcel geometry and parcel attributes (including ownership, address, and land use), impervious surface geometry, and utility billing information. This information was used, in concert with additional information gathered during the on-site meeting on February 25, 2010 between the AMEC data team and City staff, to develop the following findings and recommendations.

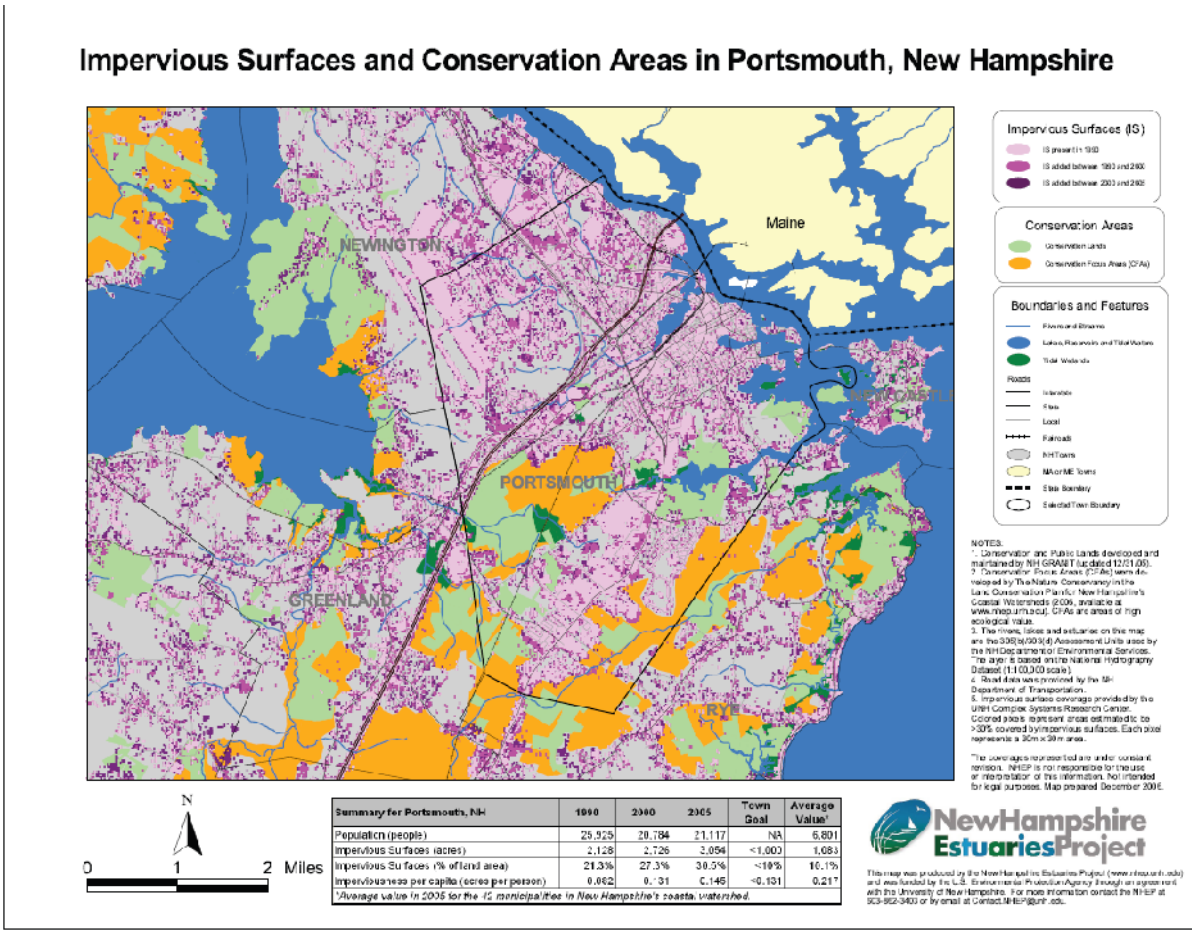
5.1. Parcels and Parcel Attributes

The City controls and maintains parcel geometry and parcel attribute data in a GIS format. This data includes owner and address data, land use data, and the parcel polygons themselves. The land use data appears to be sufficient to support the identification of detached single-family parcels with homes, at the level that would be needed if a simplified residential rate structure were to be used. However, the positional accuracy of the parcel polygons with respect to impervious features (see the list of impervious features below) is not perfect. This is particularly true where public streets and sidewalks fall outside the street rights-of-way when the two layers are overlaid.

5.2 Impervious Surface

The City controls and maintains impervious feature polygon and attribute data. This data was developed from 2005 imagery and is sufficiently detailed to support the measurement of impervious area on a parcel-by-parcel basis. Figure 5.1 shows impervious cover based on 2005 data.

Figure 5.1 Impervious Cover



5.3 Utility Billing Data

The AMEC team acquired a copy of the September 2008 utility billing file. This tabular data includes both physical and mailing address, customer name, and service- and account-specific information. The utility billing data does not directly associate utility accounts to land parcels.

5.4 Conclusions and Recommendations from Data Analysis

In order to support a stormwater utility for the City of Portsmouth, several requirements must be met from a data and systems point of view. These are:

- Parcel-based stormwater charges must be accurately computable from source data,
- Parcel-based charges must be translated accurately to the chosen billing system, and billed to customers, and
- Data must be maintained over time, so that as characteristics influencing stormwater charges change, the resulting bills can likewise be changed.

Given the apparent slow rate of changes that would affect the impervious cover of properties in Portsmouth, getting the data in a usable format to support a fee system should not be a difficult undertaking. The Team recommends the implementation of the following to address the current data shortcomings and/or inconsistencies to reach a level of data integrity that should be sufficient to support the calculations that would need to be done during the fee implementation stage:

- Parcel-based charges can be computed through intersection of impervious features with the parcel polygons.
- If a simplified rate structure is employed for residential detached parcels, these can be indentified through land use data.
- Since the imagery used for developing the impervious features polygons is not current, the results from the intersection will need to be edited using more recent data that can be derived from newer imagery, building permits, or site visits.
- Because the parcel polygons and impervious features are not positionally consistent, some edits will be required to adjust the computed amounts to avoid overcharges or undercharges.

6.0 Rate Analysis and Recommendations

The details of a stormwater utility rate structure are the result of a myriad of policy decisions that are made when answering three questions.

1. What is the basic rate methodology?
2. What are the rate method modification factors?
3. What are the secondary funding methods?

6.1 Rate Methodology – Determining the ERU

In developing a fee, the standard procedure is to base the billing unit on some representative measure of the housing stock. After considering a suite of possible rate structures, the Team determined that billing stormwater on the basis of an Equivalent Residential Unit (ERU) was the most logical. In developing the rate methodology, the AMEC team conducted an analysis of the single family residential units (SFRs) that exist in Portsmouth to calculate the ERU.

Figure 6.1 is a histogram of the housing stock in Portsmouth and shows the distribution of the impervious areas covered by each of the SFRs. The red line represents the median value. In the case or Portsmouth the median equates to 2,200 square feet of impervious cover.

Figure 6.1. Median Parcel Size

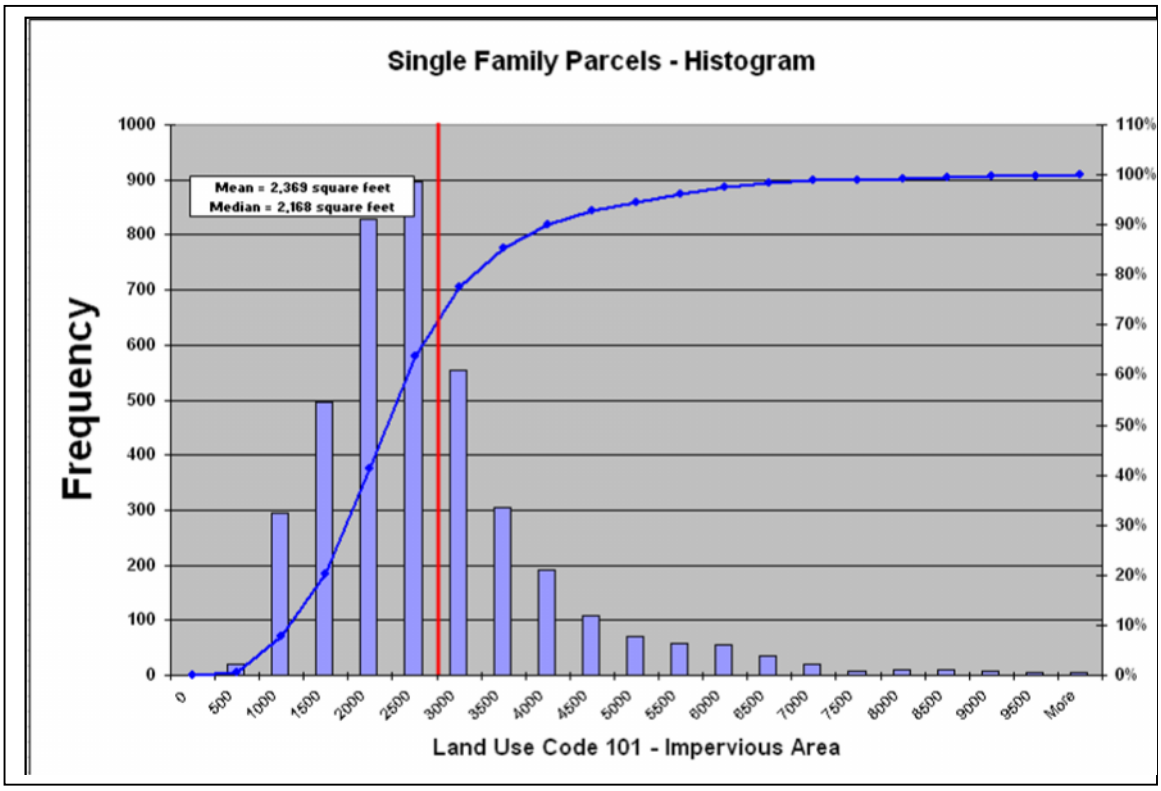


Figure 1. Single Family Residential Structure Histogram

A variation on this approach is to develop a multi-tiered formula to establish fees for SFRs. In the case of a multi-tiered approach, the ERU would be based on the square footage of the impervious cover of a "typical" house in the lowest tier range of residential stock. Homes whose square footage falling into other designated tiers would then be charged proportionately. Another option for determining the billing unit of ERU, used by other municipalities, is to use 1,000 square feet of impervious cover, or other standard number, as the basis for calculation and charge the fee based on actual impervious footage of all SFRs.

Typically, in the simplest fee structures, charges for all other types of properties (commercial, industrial, institutional, and governmental) are based on actual square footage of imperviousness, divided by the square footage value of an ERU to determine their relative rate. These properties are referred to as Non-Single Family Residential (NSFR) properties.

6.2 Income Projections

For this feasibility study, the City asked AMEC to estimate the projected income which could be possible if a stormwater fee were to be implemented. As indicated in the previous section, there are several policy decisions that will need to be made on how the final ERU will be determined and how fees will be calculated. Therefore, AMEC calculated, for the purpose of comparison at a rough order of magnitude, the rates for SFR properties under three different scenarios. These results are presented in Figure 6.2.

1. All SFRs get a flat rate charge of 1 ERU;
2. Two rate tiers of residential properties are created – those above 3,000 square feet of impervious cover and those below, and
3. Each SFR is measured individually and is charged according to their actual impervious area in the same manner as NSFR units.

The first section of Figure 6.2 below shows the estimated revenue outcome, for the purpose of comparison at a rough order of magnitude, of these three different options for determining SFR rates. Should the City decide to enter into an implementation phase, a complete and detailed rate study should be conducted.

The second section of Figure 6.2 shows the estimated additional projected revenue potential taking into consideration two special property types: public roadways (they are impervious) and the Pease Development Authority.[*] The City may or may not choose to charge for these areas. If the City does decide to charge, it will result in two outcomes:

- It is estimated that the cost of the user fee, for all users, would decrease by over 30% due to the increased number of properties paying a stormwater fee, and

[*] The City has a municipal services agreement with Pease Development Authority which does not include a provision for a stormwater fee. Given the uncertainty of amending that agreement a with/without Pease scenario is included.

- It would retain the City's current level of investment in/payments for the stormwater program from out of the General Fund.

In the third section of Figure 6.2, it shows fee implications to achieve an annual revenue of $2.5M annually using three different scenarios:

1. The monthly ERU cost without including the Pease Development Authority or roads as rate payers.
2. The monthly ERU cost with the inclusion of the Pease Development Authority as a rate payer.
3. The monthly ERU cost with the inclusion of both the Pease Development Authority and public roads as rate payers.

Based on these calculations the ability to charge less than $5/ERU/Month (the preferred amount indicated by the City) can only be achieved through the inclusion of both Pease and public roads. The charge for public roads amounts to an estimated 26.5% of total revenue.

For a charge of $4.81/ERU/month, the bill to the City for its public roads would be approximately $662,000, a number which is in the range of its current expenditure for stormwater.

Figure 6.2. Revenue Estimates for Different Scenarios

ERU = 2,200 sf (median of all the data)
NSFR + SFR totals – three scenarios

Option or Topic (Pease Development Authority and Public roads NOT included)	**SFR ERUs**	**NSFR ERUs**	**Total ERUs**	**Annual Rev. per $1**	**≈ Fee/ERU for $2.5M/yr**
1 - All SFR are a flat rate	4,003	22,682	26,685	$320,220	$7.80
2 - SFR two tiers split at 3,000 sf	4,920	22,682	27,602	$331,224	$7.55
3 - All SFR direct measurement	6,504	22,682	29,186	$350,232	$7.14
Additional Areas					
Option or Topic	**SFR ERUs**	**NSFR ERUs**	**Total ERUs**	**Annual Rev. per $1**	
7 - Pease Development Authority	N/A		4,274	$51,288	N/A
8 - Charging for Public Roads	N/A		11,468	$137,616	N/A
Summary Using The Two Tier Residential Option					
Component	***ERUs***	***Rev./ $1***	***% of Total***	***Acc. Total Rev./$1***	**≈ Fee/ERU for $2.5M/yr**
9 - SFR	4,920	$59,040	11.4%	$59,040	$7.55
10 – NSFR	22,682	$272,184	52.3%	$331,224	
11 - plus Pease Dev. Auth.	4,274	$51,288	9.9%	$382,512	$6.54
12 – option 11 plus Public Roads	11,468	$137,616	26.5%	$520,128	$4.81

6.3 Willingness/Ability to Pay

In reviewing the estimated fees and revenue projections the City may want to consider what the stormwater team believes to be the threshold of "willingness to pay" for stormwater services. However, to pass the legal "litmus test" to be upheld as a fee, and not a tax, should it be challenged in court, the rate charged must be based on the cost of the stormwater program and not an arbitrary number. Therefore, a program with a fee exceeding the threshold of willingness should consider the following possible options:

- Reduce the scope and cost for the stormwater program,
- Restructure the fee schedule, or
- Identify other sources of funding to offset some of the costs.

The AMEC team and the City staff discussed their perception of citizen's willingness to pay for stormwater "if we made a good compelling case and they knew every penny would go toward those needs."

The majority of the stormwater group estimated a willingness to pay to be about $5/month. The average of those surveyed was about $4.50. There was a suggestion to start with a $2/month fee and increase each year, but that suggestion was countered by others who felt that the City should begin with the appropriate fee for a "sustainable" program from the beginning as it would be more difficult to increase the fee significantly each year.

In the end, most of the stormwater team felt that, given any flexibility in what to include in the stormwater program and therefore the stormwater budget, $4/month sounded acceptable as it stays below two emotional barriers: $5/month and $50/year.

The stormwater team also discussed possible approaches to generate additional revenue, if needed, to meet the goals of the Stormwater Program. The three approaches identified were:

- Establish the monthly cost of the ERU in the $4 to $5 range by billing roads,
- Establish the monthly cost of the ERU in the $4 to $5 range by reducing the stormwater program scope of services by $1M, and
- Reduce the initial stormwater program, establish the monthly cost of an ERU at the corresponding lower rate but also establish a built-in schedule for annual increases to meet an expanding stormwater program

6.4 Rate Method Modification –Policy Decisions

As previously mentioned, there are a series of interrelated funding policy issues that need preliminary resolution before determining the rate structure. The decisions may rely on such things as program decisions, legality, local preferences, and past practice of stormwater funding. In the process of this feasibility, a number of decisions were made upon which the outcomes found in this report are based., Should Portsmouth move to an implementation phase, while the same conclusions may be reached, it is suggested that the City review these policy decisions based on input they may receive from other stakeholders and continued discussion.

For the purposes of this study, and after significant discussion, it was decided to proceed with the development of a stormwater rate structure using the concepts that:

- Only impervious cover would be used to calculate fees, and
- Green space that reduces runoff volume may be eligible for credit.

Based on this decision, there were a number of additional detailed questions answered about how to handle various parcel types, including condominiums, apartments, and industrial sites.

In the end it was decided to:

- **Proceed on the basis of an Equivalent Residential Unit, and**
- **Proceed with two or more tiers of residential flat rates.**

6.5 Stormwater Credits

Another consideration in establishing stormwater rates is the decision as to whether or not to offer a credit system that could be used to reduce the fees paid by some property owners. The AMEC team provided the City with information regarding how they could establish credits for private activities and investments that reduce either a parcel's impact on the system, or reduce the City's cost to provide services either to that parcel or overall.

AMEC discussed with the stormwater team their interest in providing credits and what a credit system might include. Based on voting along a continuum, the average response was that a maximum 50% credit seemed appropriate for a site that met all peak flow and water quality design standards. However, the following concerns arose.

Table 6.2. Stormwater Credit Considerations

Question	*Team Response*
How will existing conditions be factored? Do good designs already get credit or do they have to go above and beyond?	*All private investments to reduce impact should be recognized, past, present and future.*
How is credit given for non-structural practices and how will it be tracked to demonstrate effectiveness?	*This can be done but is manpower intensive.*
Potential inequity may be perceived with residential credits due to limited abatement options. Residential credits seemed to be very low	*There are ways to implement a residential credit mechanism but due regard has to be paid to the administrative costs versus benefit, and streamlining has to be done.*
What is the potential reduction of revenue?	*Reductions are typically less than 5%.*

If the City moves forward with a stormwater fee, policy decisions addressing a credit system will need to be revisited and analyzed from both a political and cost analysis perspective.

7.0 Billing Analysis and Recommendations

The AMEC Team evaluated the various options available to Portsmouth for billing a stormwater fee using the following criteria:

- Ease to add a service fee,
- Flexibility to add credits or refunds,
- Potential integration and maintenance issues,
- Time required for set-up,
- Percentage of parcel information contained in the database, and
- Cost to bill.

Our analysis concluded that the existing utility billing system could be modified to accommodate a new fund and a new charge for stormwater, and could accommodate the receipt and processing of a periodic "change file" of amended stormwater charges.

Billing the stormwater charge on this existing system will likely maximize the collection rate as well as promote and maximize the desired perception of ratepayers that the stormwater charge is a utility fee, just like the existing fee for potable water.

In order to append the stormwater charge to the existing utility bill, each billable land parcel will need to be linked to the existing utility account(s) that are associated to that parcel. This will require policy decisions about how to handle tenant/owner issues and other non-conforming relationships that might exist between the utility account and the parcel of land. The recommended approach to establish this relationship would be "address matching". Given the small number of accounts and parcels (<10,000) and the high quality of address data that exists in the two data sources, this effort should not be difficult.

Maintaining the data over time will require that the City monitor new or changed information in the utility billing system (since in most cases, new construction will lead to new utility accounts in advance of impervious feature data being collected). This new data will be used as an event trigger, triggering a measurement and stormwater charge calculation, as well as an assignment of the charge to one or more utility accounts. In addition to monitoring changes to the utility billing system, changes to the stormwater fee for accounts will need to be passed to the utility billing system. This can best be done with a compact "change file" that will contain only the data needed to effect the change to a stormwater charge. This file will be founded on the account number for the appropriate utility account(s).

Basic customer service can be provided by the same staff currently performing this duty for the existing utilities. This basic customer service would generally be limited to FAQ-type answers and the associated provision of information regarding the City's billing policies for stormwater. For customer service requests that require research, map-based answers, or edits to stormwater charges, these will likely need to be passed on to technical staff who can provide the detailed response required. In the event that a customer service procedure results in the need to make a change to bills or charges, the change(s) will need to be stipulated in the "change file" (mentioned above), and conveyed to the utility billing system periodically.

By using the existing utility billing system to convey the stormwater charges, the accounting of charges and revenues can be automatically handled in an appropriately rigorous way (once the new stormwater fund is established).

Additionally, customer service must be provided to customers who request such service, and fee revenues must be collected and accounted for in a rigorous manner consistent with a public utility.

8.0 Stakeholder Education & Outreach Recommendations

Portsmouth has not yet decided to implement a stormwater utility. Therefore it is premature to determine all of the specifics related to future phases of a stormwater fee public outreach and information plan. However despite this being only a feasibility study, the idea of a stormwater charge has gone public and local stakeholders not involved in the feasibility study process have asked questions about this potential new charge for municipal services (see Figure 8.1). The City should be prepared with messages to not only address the idea of a fee but, more importantly, to use these opportunities to educate the public on the realities and issues related to stormwater in Portsmouth.

Figure 8.1. Seacoastonline.com Article
(Complete article in Appendix VI)

City to consider stormwater utility

Fee could be levied for impervious surfaces

By **Charles McMahon** cmcmahon@seacoastonline.com
December 12, 2010

PORTSMOUTH — A new utility could be in the cards for residents in the near future as the city works to grapple with increasing pressure from federal and state regulators over stormwater discharge.

Much still has to be decided before the city heads in this direction, but city officials have indicated they intend to bring together all the information for a future work session with the City Council. City Manager John Bohenko said the proposal was brought up at the council's retreat last month. He said the subject of creating a stormwater utility, or fee, is expected to rise to the surface over the next year.

"We're not saying this will happen either way, but what we want to do is educate the City Council as to what it is," Bohenko said. "It will involve the regulations as it relates to stormwater now and the utility that may be required in the future."

Bohenko said the main priority from a city perspective is educating the council as policy makers and then exploring all of the options. "At this point we are really bringing this stuff forward as educational material and letting them know that the regulations are changing," he said.

8.1 Public Education and Outreach Phases

There are typically five major phases in a public outreach and education plan:

- The Quiet Phase
- The Build-Up Phase
- Billing Day
- Post Billing
- On-Going

The **"Quiet Phase"** is where the City is right now. This is when discussions are primarily at the staff and officials level. There may be a few others brought in to the discussions to provide added in-sight. During the Quiet Phase there are more unanswered questions then answered ones. Quiet does not mean secret in any way. But as many of the fundamental decisions about what is needed and how to progress have not yet have been made; the City is not able to go external with any specific messages; as there are no officials decisions yet made.

The **"Build-Up"** phase is the period after the basic stormwater program components have been identified. The Build-Up may have several sub-phases, depending on the needs identified in the creation of the outreach plan, and will continue through the development and implementation of a utility. In the case where there is a pre-feasibility study, like Portsmouth, there may be distinct pre- and post-decision phases.

The **"Billing Day**" phase would start from the codification of the utility and rate and extends to the time when the utility bills are mailed with the new stormwater charge. It generally consists of the first wide "public" coverage of the reasons for the billing, examples of the new effectiveness of the stormwater program, and customer service responses to those who call in with inquiries and complaints. At this stage of the feasibility study it is too early in the process to more than identify that this phase would exist, in the future, if the utility moves to an implementation phase. The specific details of how this Phase would be implemented should be identified in the future

The **"Post Billing"** period is a finite period of time that typically lasts from the time the utility bills are mailed through the next month or two. During that phase there is generally a heightened level of information that then blends into a more long term "On-Going" outreach program that will educate the rate payers about the utility, as well as general stormwater education.

When developing your Public Information and Education (PI&E) Plan, keep in mind that outreach is important for both gaining support for stormwater funding and as an effective stormwater management strategy for prevention. A comprehensive PI&E is also a requirement of the NPDES permitting process. Even though you are currently meeting the minimal MS4 requirement for public outreach, it may be in the City's best interest to go beyond the minimums to undertake an education program that will prevent and reduce stormwater impacts before they ever happen.

If you want to sustain an on-going public education program, you will need to include education costs in your stormwater program development in order to adequately fund it.

An on-going PI&E Plan may contain the following areas of information for the public –at-large. The following messages might also be refined and targeted for specific sectors like the construction or landscaping industries:

- Impacts their actions have on stormwater,
- The need for having and adequately financing a stormwater management program,
- Options for reducing impact (Best Management Practices),
- Understanding the legal requirements pertaining to stormwater.

8.2 Portsmouth's Public Outreach and Education Plan

The appropriate PI&E plan for Portsmouth still needs to be defined. Some cities choose not to engage in general public information campaigns about a potential fee until the utility has been codified. Other cities choose to include a more general public outreach component throughout the process, gathering and disseminating data and information, identifying and meeting with different key stakeholders and public sectors, and educating the press, in an effort to form specific policies for the utility.

The Portsmouth stormwater group identified the following key messages/concepts as needing to be presented in discussing the stormwater fee, if it is to go forward.

- The connection between stormwater management, economic benefits, and property values; and that clean water is key to our way of life and our economy.
- Private citizens are flooded from public water; therefore it is a public responsibility.
- While the City needs to address an unfunded mandate and CSO requirements, there are a lot of things in the stormwater program that the City would do anyway; we all want clean water – it is key to our environment here in Portsmouth.
- We need to better protect our drinking water from toxic and polluted runoff.
- We want to be sustainable and green in all our actions concerning stormwater and our environment, way of life.
- Climate change may be real and we want to understand its potential impacts and prepare for them as much as possible.
- The Master Plan process identified drivers – water quality/ecology, regulatory mandates, and aging infrastructure, as the top 3 concern. The order or those 3 depends on who you ask and therefore the messages should be targeted to the audience.
- "Quality of life" is an important message as are "eco-friendly", "sustainable" and the concept of "preserving the existing community".
- In discussions related to operations funding, it is important to use terms such "sustainable" and "cost effective".

- Because the daytime population of Portsmouth more than doubles; it is more equitable that commercial properties, that benefit from non-residential users, take a proportionate role in solving the problem.

- People need to realize that these stormwater programs are city-wide services and that all benefit; cost is not a matter of where one lives in the watershed.

The group also identified suggested approaches to avoid some negative reactions to stormwater fee including:

- Demonstrate how the stormwater utility will maximize efficiency of existing resources – through reorganization. A new fee does not necessarily require creating new Departments/Divisions; rather it requires dedicating existing resources to effectively address stormwater issues.
- Emphasize that the new stormwater program cost would not equate to a fivefold increase over the existing program, but rather the total cost include the reallocation of current costs from other programs.
- There may be options available to assist in offsetting fees for low income residents.

When developing an outreach plan the appropriate strategy is community specific and the pros and cons of the various options should be discussed. The Portsmouth stormwater team should analyze, and get input on, which messages they believe will resonate the best, with which audiences, throughout the City. It is rare that the first attempt at convincing stakeholders is successful. It may take several approaches, and some time, for them to assimilate the information and to understand and accept the reality of the situation and the need for the fee. Some may never agree. However, more often than not, if a municipality has not implemented an adequate public education and outreach program they find that when the time comes for a vote, there is not enough political will to move forward with implementing a fee.

9.0 General Recommendations and Next Steps

9.1 Summary of the Findings of Fact

- Portsmouth is a City of uncommonly beautiful water resources, the preservation of which is seen as important by staff and citizens.
- There are real, growing and unresolved stormwater and related infrastructure problems. Delayed maintenance for many years has taken its toll on the stormwater infrastructure system and the quality of surface waters in the City.
- The problems are not conceptually hard to solve and the City has a plan to do so. Master plans and estimates of future regulatory requirements indicate the City must spend five times the current level of investment.
- There is no dedicated, stable and adequate funding source to support this important need. The current level of investment in the stormwater system is seen as minimal when compared to other communities around the United States.
- Other competing program needs limit the ability to provide adequate stewardship of the stormwater program under the current funding structure.
- Significant benefits to the City's vital natural water resources, and by implication, quality of life and preservation of property values, will result from such an investment.
- A stormwater user fee is a relatively new idea to New Hampshire but is not a new idea nationally. Over 1,200 other communities have come to the conclusion that the management of the stormwater infrastructure should be handled and funded in a manner similar to the wastewater or drinking water program – through the use of a user fee.
- Delay may place the City in a precarious position with respect to compliance with clean water mandates from the upcoming MS4 stormwater permit – though it has not yet been issued. Premature initiation of the stormwater user fee idea may create resistance because the permit conditions have not been finalized.
- The demands of the long term control plan (see below) are seen as taking current precedence over stormwater at this time – they are seen as competitors for scarce dollars. And a new fee on top of increased wastewater costs does not seem advisable.

9.2 The Combined Sewer Program

Of significant importance is the relationship between the combined sewer program and its long term control plan and the stormwater program. It is clear that the two programs' conveyance systems are intertwined and that some of the separation activities will add runoff to the separate stormwater system.

In addition to this, it has long been understood that some of the costs of any City's long term control plan could properly be charged on a Stormwater basis instead of a consumptive use basis (the current sewer charges are based on water use). It is runoff from paved areas that causes overflows, and it is wastewater that is the problem when overflows occur.

Several other east coast communities are in the process of determining whether some of the combined sewer costs should be allocated on a stormwater charge basis (i.e. an impervious area charge). Philadelphia has been in this transition for several years while Washington DC has instituted an initial stormwater charge for combined sewer costs. Portland ME is investigating such a move.

One alternative that would address both the combined sewer program and the stormwater program would be to institute a stormwater charge that would handle the stormwater program and some aspects of the combined sewer program. This would have the effect of meeting both stormwater needs and part of the combined sewer costs in a way that can be seen as more equitable than current methods of paying for both.

9.3 Final Recommendations

It is our overall assessment that the use of a stormwater program fee will provide the best support of the future stormwater, and potentially part of the combined sewer program, from the standpoints of revenue sufficiency and stability, overall equity in terms of reflecting property impact on City cost, and flexibility to reflect Portsmouth's current and future needs.

Based upon a review of the findings and recommendations of the staff work group, the following two key overall options are recommended, should the City decide to move forward with a fee/utility:

Option 1: Develop a Combined Stormwater Program Fee
Under this option the City would develop a stormwater program fee that would support the stormwater program and a portion of the combined sewer program, in a coordinated fashion. Under this option the fee is estimated to be in the $6-8/month per ERU range.

Option 2: A Stormwater Program Fee for a Reduced Program
Under this option the City could develop a scaled back stormwater fee. To reduce the initial fee two key options could be considered: (1) include the City streets as part of the impervious area calculation to reduce the stormwater fee by an estimated 30% ; and (2) develop a program plan that is more back-end loaded in capital construction costs allowing a more gradual program growth trajectory. Under this option the fee is estimated to be $3.00 -$4.00 per month per ERU.

The resulting recommendation from the study is that that City staff present the study findings and recommended options to Council with a request to: (1) continue the study and (2) add a citizen's committee which would provide feedback on these options, as well as review and discuss details of the rate structure, credits, etc. With such a vote Council would not be authorizing a stormwater program fee, but simply a continuation of the process. The Council would have several opportunities to review citizen findings and recommendations throughout the process which would likely, lead to a vote on fee establishment and rate levels.

Appendix I

Stormwater Utility Fund Enabling Legislation

TITLE X
PUBLIC HEALTH

CHAPTER 149-I
SEWERS

Assessment for Sewers

Section 149-I:10-a

149-I:10-a Stormwater Utility Fund. –

I. The funds received from stormwater utility fees shall be kept as a separate and distinct fund to be known as the stormwater utility fund. Such fund shall be allowed to accumulate from year to year, shall not be commingled with town or city tax revenues, and shall not be deemed part of the municipality's general fund accumulated surplus. Such fund may be expended only for stormwater treatment, conveyance, and discharge systems.

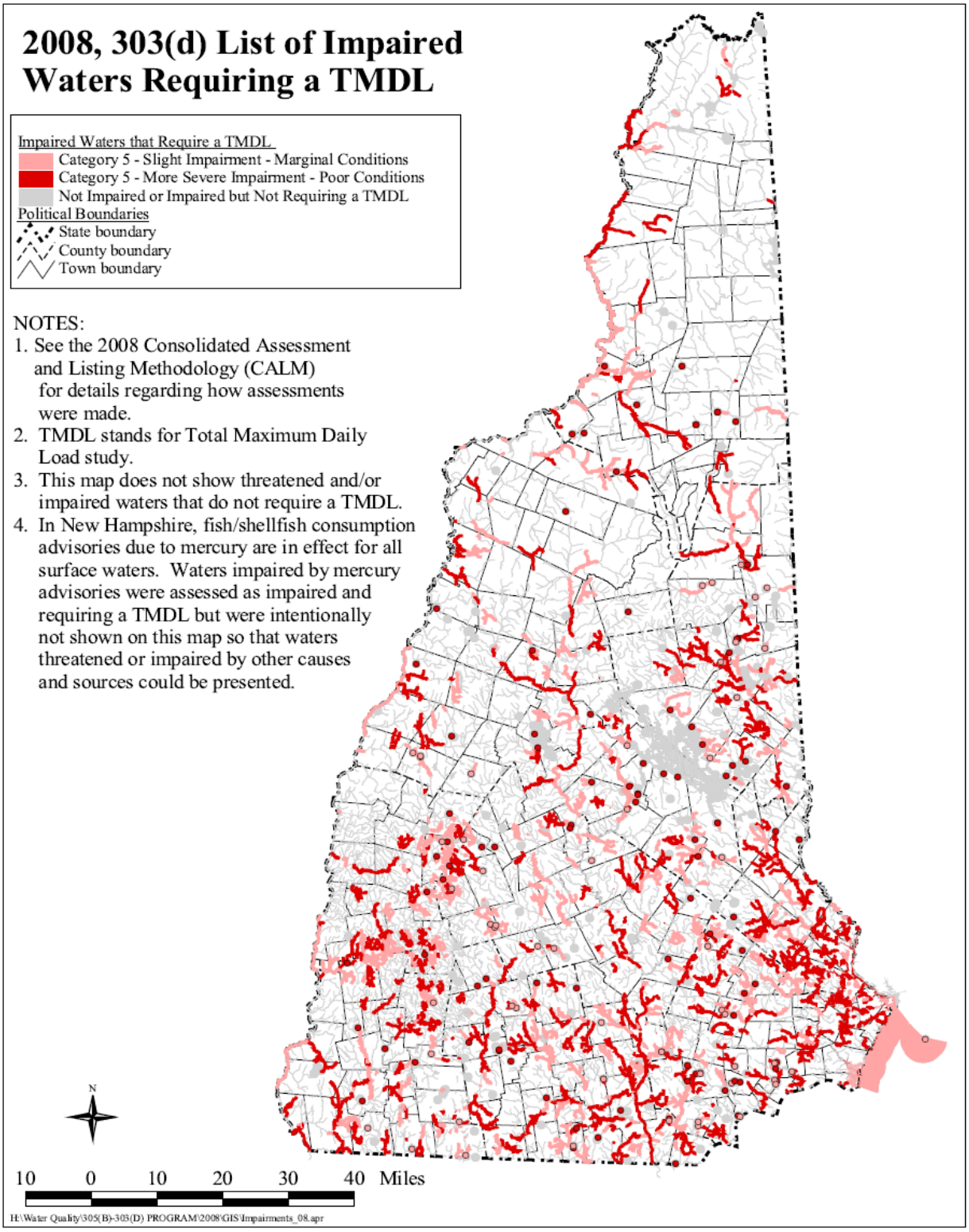
II. Except when a capital reserve fund is established pursuant to paragraph III, all stormwater utility funds shall be held in the custody of the municipal treasurer. Estimates of anticipated revenues and anticipated expenditures from the stormwater utility fund shall be submitted to the governing body as set forth in RSA 32:6 if applicable, and shall be included as part of the municipal budget submitted to the local legislative body for approval. If the municipality has a properly established stormwater utility commission, then notwithstanding RSA 41:29 or RSA 48:16, the treasurer shall pay out amounts from the stormwater utility fund only upon order of the stormwater utility commission. Expenditures shall be within amounts appropriated by the local legislative body.

III. At the option of the local governing body, or of the stormwater utility commission if any, all or part of any surplus in the stormwater utility fund may be placed in one or more capital reserve funds and placed in the custody of the trustees of trust funds pursuant to RSA 35:7. If such a reserve fund is created, then the governing body, or stormwater utility commission if any, may expend such funds pursuant to RSA 35:15 without prior approval or appropriation by the local legislative body, but all such expenditures shall be reported to the municipality pursuant to RSA 149-I:25. This section shall not be construed to prohibit the establishment of other capital reserve funds for any lawful purpose relating to municipal water systems.

Source. 2008, 295:8, eff. Aug. 26, 2008.

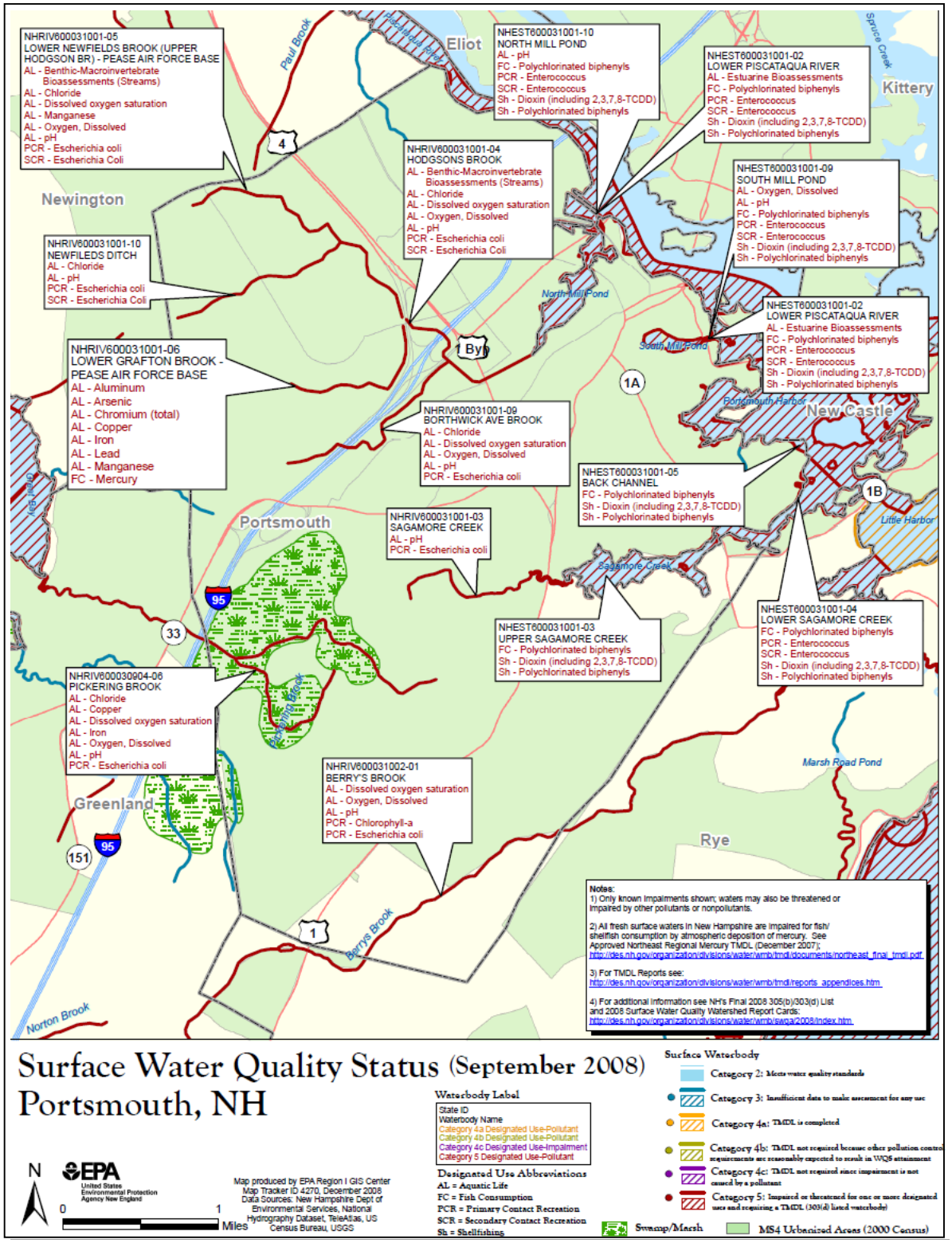
Appendix II

New Hampshire Impaired Waters



Appendix III

Portsmouth Surface Water Quality Status`



Appendix IV

New Hampshire 303(d) List (Excerpts)

New Hampshire Department of Environmental Services (DES) does not specifically designate stormwater as an Impairment Source. However, stormwater runoff is a likely contributor to impaired waters in the Portsmouth region. Therefore, to identify those streams that are likely affected by stormwater, the following Impairments were used as indicators.

- Benthic macro assessments
- Chlorophyll - a
- E coli
- Enterococcus
- Estuarine bioassessments
- Fecal coliform
- Light attentuation
- Nitrogen

Stream Identifier	Stream Name	Impaired/ Attaining	Impairments	Impairment Source
NHIMP600031001-01	UNNAMED BROOK	Attaining		
NHLAK600031001-01	UNNAMED POND	Attaining		
NHRIV600030901-04	HAINES BROOK - UNNAMED BROOKS	Attaining		
NHRIV600030904-06	PICKERING BROOK	Impaired	Chloride, Copper, DO, Iron, pH, E coli	Source Unknown, Industrial Point
NHRIV600030904-07	UNNAMED BROOK	Attaining		
NHRIV600031001-02	UNNAMED BROOK	Attaining		
NHRIV600031001-03	SAGAMORE CREEK	Impaired	Chloride, pH, E coli	Source Unknown
NHRIV600031001-04	LOWER HODGSON BROOK	Impaired	Benthic Macro Assessments, Chloride, DO, pH, E coli	Municipal, Source Unknown, commercial, Highway/Road Runoff
NHRIV600031001-05	UPPER HODGSON BROOK	Impaired	Benthic Macro Assessments, Chloride, DO, Manganese, pH, E coli	Source Unknown, Commercial, highway/Road Runoff, Municipal, Industrial Point
NHRIV600031001-06	GRAFTON DITCH	Impaired	Aluminum, Aresenic, Chromium, Copper, Iron, Lead, Manganese, Zinc	Industrial Point
NHRIV600031001-09	BORTHWICK AVE TRIBUTARY	Impaired	Chloride, DO, Iron, pH, E coli	Commercial, Highway/Road Runoff, Municipal, Source Unknown
NHRIV600031001-10	NEWFILEDS DITCH	Impaired	Chloride, pH, E coli	Source Unknown
NHRIV600031001-11	UNNAMED BROOK	Attaining		
NHRIV600031001-12	ELWYN BROOK	Attaining		
NHRIV600031001-21	UNNAMED BROOK	Attaining		
NHRIV600031002-01	BERRYS BROOK	Impaired	DO, pH, Chlorophyll-a, E coli	Source Unknown

Estuary Identifier	Estuary Name	Impaired/ Attaining	Impairments	Impairment Source
NHEST600031001-02-01	LOWER PISCATAQUA RIVER - NORTH	Impaired	Estuarine Bioassessments, Mercury, Polychlorinated, Dioxin	Source Unknown, Atmospheric Deposition
NHEST600031001-02-02	LOWER PISCATAQUA RIVER - SOUTH	Impaired	Estuarine Bioassessments, Mercury, Polychlorinated, Enteroccoccus, Dioxin	Source Unknown, Atmospheric Deposition
NHEST600031001-03	UPPER SAGAMORE CREEK	Impaired	Acenaphthylene, Aluminum, Aresenic, Benzo (A) Pyrene (PAHS), Benzo (A) Anthracene, Cadmium, Chrysene, copper Dibenz (A,H) Anthracene, Estuarine Bioassessments, Fluoranthene, Lead, Mercury, Nickel, Phenanthrene, Pyrene, Trans-Nonachlor, Polychlorinated, Enterococcus, Dioxin, Fecal coliform	Source Unknown, Atmospheric Deposition
NHEST600031001-04	LOWER SAGAMORE CREEK	Impaired	Estuarine Bioassessments, Mercury, Polychlorinated, Enteroccoccus, Dioxin	Source Unknown, Atmospheric Deposition, On-Site Treatment Systems
NHEST600031001-05	BACK CHANNEL	Impaired	Estuarine Bioassessments, Light Attenuation, Nitrogen, Mercury, Polychlorinated, Dioxin	Source Unknown, Atmospheric Deposition
NHEST600031001-09	SOUTH MILL POND	Impaired	pH, Mercury, Polychlorinated, Enterococcus, Dioxin	Source Unknown, Atmospheric Deposition, Combined Sewer Overflows
NHEST600031001-10	NORTH MILL POND	Impaired	ph, Mercury, Polychlorinated, Enterococcus	Source Unknown, Atmospheric Deposition, Illicit Connections
NHIMP600031001-01	UNNAMED BROOK	Attaining		
NHLAK600031001-01	UNNAMED POND	Attaining		

Appendix V

Summary of Current and Future Stormwater Program Estimated Costs for Portsmouth, NH

	Current	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10	Description
Cost Subcategory								
Administration								
General Stormwater Program Administration	$ -	$ -	$ -	$ -	$ -	$ -	$ -	General Administrative costs are sometimes tracked separately for Stormwater Programs. The City of Portsmouth includes any administration costs within the specific task as detailed in this table.
NPDES NOI and SWMP	$ -	$ 28,800	$ -	$ -	$ -	$ -	$18,100	Year 1 costs include development of the Stormwater Management Plan required by the MS4 General Permit. Development of the plan will require outside consulting services and will include an assessment that selected non-stormwater discharges will not affect water quality, and an assessment of the potential impacts to impaired waters. Year 10 costs estimate the cost to complete a revised stormwater management plan when the MS4 permit is renewed (permit cycle is 5 years).
NPDES Annual Reporting	$ 7,700	$18,800	$ 5,500	$16,000	$16,500	$17,000	$32,500	Costs represent completion of the annual report required by the MS4 General Permit. Some years have additional reporting requirements beyond the based MS4 requirements including impaired waters issues, annual public education and participation evaluations, summarizing the municipal holdings impervious surfaces assessment and LID improvements, development of a pesticide/herbicide plan. The Year 1 costs are higher than other years because development of the first report is typically more labor intensive than subsequent years.
NPDES Public Education Program	$ 4,200	$ 23,500	$ 7,300	$11,500	$ 2,200	$ 2,300	$3,900	Costs for MS4 public education and public participation program are more labor intensive during Year 1, when a plan must be developed and implemented, and during Year 3, when the program must be evaluated.
NPDES Training	$ 2,100	$ 5,900	$ 4,900	$ 5,000	$ 5,200	$ 5,300	$ 6,200	Costs consist of DPW time to conduct training for the MS4 General Permit and the three MSGP permit facilities (Peirce WWTP, Pease WWTP and DPW facility).
Inter-agency Coordination (DOT and Pease Tradeport)	$ 1,800	$ 1,800	$ 1,900	$ 2,000	$ 2,000	$ 2,100	$ 2,400	Costs represent administrative costs to coordinate with Pease and DOT on stormwater related projects (both DOT and Pease), and street sweeping, catch basin cleaning and

								maintenance (Pease only).
Grants Program	$ 2,000	$ 2,000	$ 2,100	$ 2,200	$ 2,200	$ 2,300	$ 2,700	Costs to apply for and administer grants received for stormwater programs.
Impaired Waters Issues	$ 12,400	$ -	$ -	$ -	$ -	$ 14,100	$ 18,000	Additional administrative time is required to assess operations impact from Impaired waters issues. Current costs represent City Staff time to address Great Bay issues. Future costs are estimated for Chloride TMDL (due 2019) and Mercury (due 2017).
Watershed Group Support (Hodgson Brook)	$ 800	$ 800	$ 900	$ 900	$ 900	$ 900	$1,100	Current costs are estimated based on time for Sustainability Coordinator to interact with the Hodgson Brook Advisory Board. Future costs assumed to be similar to current costs.
Subtotal:	$ 31,000	$ 81,600	$ 32,600	$ 37,600	$ 29,000	$ 44,000	$ 84,900	

Billing and Finance								
Financial Management	$ -	$ -	$ -	$ -	$ -	$ -	$ -	Costs for financial management are rolled into Indirect Cost allocations.
Indirect Cost Allocations	$ -	$ 240,000	$ 192,000	$ 197,600	$ 198,400	$ 201,600	$ 209,600	Indirect cost allocations are estimated to be 8% of the total program costs.
Billing, Finance and Customer Services	$ -	$ 18,600	$ 19,200	$ 19,700	$ 20,300	$ 21,000	$ 21,600	Costs are based on approximately 6,200 bills per year.
Cost and Rate Analysis	$ -	$ -	$ -	$ -	$ -	$ -	$ -	Costs are included in Indirect Cost Allocations.
General Government Support	$ -	$ -	$ -	$ -	$ -	$ -	$ -	Costs are included in Indirect Cost Allocations.
	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
Subtotal:	$ -	$ 258,600	$ 211,200	$ 217,300	$ 218,700	$ 222,600	$ 231,200	

Engineering and Master Planning								
Stormwater Quantity and Quality Master Planning	$ -	$ 2,600	$ 2,700	$ 2,800	$ 2,900	$ 3,000	$ 3,400	Stormwater Master Plan completed in 2007 has not been reviewed substantially or revised by City staff. Costs included for years 1 through 10 include City Staff time to review Master Plan and provide input to Capital Planning.

Stds, Design, Field & Ops Engineering (Private Projects)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	Costs to review and complete construction oversight on private development projects are covered through escrows paid for by developers, resulting in no significant cost to the City.
Sustainability Analysis/Design (Eco-Municipality)	$ 4,100	$ 4,200	$ 4,300	$ 4,500	$ 4,600	$ 4,700	$ 5,500	Current and Future years consist primarily of Sustainability Coordinator time to work on LEED projects such as Library.
Sustainability Analysis/Design (NPDES)	$ -	$ 66,200	$ 9,000	$ 10,200	$ -	$ -	$ -	Year 1 costs estimated to complete an inventory of municipal facilities to be evaluated for potential to be retrofitted for LID. Year 2 costs estimated to complete an assessment of City parking ordinance and regulations. Year 3 includes costs to complete a prioritized evaluation of the municipal holdings potential to implement LID projects.
GIS, Database, and Mapping	$ 24,300	$18,600	$ 19,200	$ 19,800	$ 20,400	$ 21,000	$ 24,300	Costs consist of time for GIS Coordinator to manage stormwater layers in cooperation with Stormwater Coordinator and catch basin/televising foreman.
Field Data Collection (GIS and Engineering)	$ 10,100	$107,000	$ 4,300	$ 4,400	$ 4,600	$ 4,700	$ 5,400	Year 1 Cost includes time to cross check and update existing piping network in GIS system. This costs may be spread out over subsequent years. Other costs include time to cross check anomies and conduct field checks of new infrastructure.
Subtotal:	$ 38,500	$ 198,600	$ 39,500	$ 41,700	$ 32,500	$ 33,400	$ 38,600	

Operations								
City Projects	$ 9,600	$ 9,800	$ 10,100	$ 10,400	$ 10,800	$ 11,100	$ 12,800	Current costs include Engineering Technician oversight on small an medium City Projects. Future costs assume same level of effort.
Storm Sewer and Culvert Inspections and Cleaning	$ -	$ 52,700	$ 54,300	$ 55,900	$ 57,600	$ 59,300	$ 68,800	Costs represent inspection and televising of approximately 323,000 lineal feet of storm sewer pipe on a 10 year cycle (32,300 lf/year).
Remedial Repair and Replacement	$ 44,700	$ 106,700	$ 44,400	$ 45,800	$ 47,100	$ 48,500	$ 54,000	Current and all future years include ~$30k labor (approximate current levels of maintenance completed on catch basins, culverts, and pipes. Year 1 includes Apron repair for 118 outfalls recommended in SW Master Plan
Inlet, Catch Basin, and Manhole Cleaning	$ 41,900	$ 245,700	$ 253,000	$ 260,600	$ 270,800	$ 276,500	$ 320,500	Current costs reflect 2009 level of service (500 catch basins cleaned) Future years reflect MS4 requirement of 50 % each year (2,350/year).

Post Construction System Maintenance (City Operated Systems)	$ 11,000	$ 15,000	$ 11,600	$ 12,000	$ 12,300	$ 12,700	$ 14,700	Costs for current and future years reflect current costs to maintain City vortechnics units and detention ponds.
Ditch and Channel Maintenance	$ 900	$ -	$ -	$ -	$ -	$ -	$ -	Current costs reflect nominal ditch maintenance completed in recent years.
Curb and Gutter Maintenance	$ 95,300	$ 96,600	$ 99,500	$ 102,500	$ 105,500	$108,700	$ 126,000	Current costs and future costs reflect approximate same level of street cleaning that is currently conducted.
Illicit Discharge Removal/Correction	$ 3,600	$ 16,000	$16,400	$ 16,900	$ 17,400	$ 18,400	$ 21,200	New MS4 General Permit requires address of Illicit Discharges within 60 days of identification. Costs assumes one small illicit discharge addressed each year by DPW staff, and one larger illicit discharge issue addressed by an outside contractor
NPDES Wet Weather Monitoring	$ 1,100	$ 80,000	$ 101,800	$ 104,800	$ 108,000	$ 111,200	$ 128,900	Nominal sampling and analysis is completed currently. The MS4 General Permit requires sampling and analysis during wet weather at 25% of the outfalls each year for bacteria, pH, ammonia, potassium, surfactants, temp, turbidity, chlorine + impairment parameters
Pesticide, Herbicide, and Fertilizer Program	$ -	$ 3,500	$ -	$ -	$ -	$ -	$ -	Costs during year 1 reflect MS4 Requirement (PY1) for development of an O&M plan for parks and recreation and development of an herbicide pest program.
Toxic and Hazardous Materials Control Program	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
Spill Response and Cleanup Program	$ 700	$ 700	$ 800	$ 800	$ 800	$ 800	$ 1,000	Future costs reflect current level of service to address Spill Prevention Control and Countermeasure Plans.
NPDES MSGP Program (Peirce, Pease, DPW)	$ 12,600	$ 29,000	$ 30,000	$ 30,800	$ 31,800	$ 32,700	$ 38,000	Current costs reflect DPW time for MSGP implementation. Future costs include time for Peirce and Pease to perform own inspections, monitoring, reporting.
Subtotal:	$ 221,400	$ 655,700	$ 621,900	$ 640,500	$ 662,100	$ 679,900	$ 785,900	

Regulation/Enforcement		

NPDES Chloride Tracking	$ -	$ -	$ -	$ 8,500	$ 4,700	$ 4,800	$ 5,300	Future costs reflect MS4 Requirement - Year 3 Develop regulatory requirement, and Years 4 and 5 to process information collected on approximately 130 private parcels and conduct public education.
Illicit Discharge Investigation/Tracking	$ -	$ 8,000	$ 16,700	$ 17,100	$ 17,600	$ 18,100	$ 15,200	Future costs reflect new MS4 requirement to inspect 110 (25%) outfalls in Years 2 through 5. Costs include sampling 10% of those inspected for wet weather parameters, includes GIS tracking.
Subtotal:	$ -	$ 8,000	$ 16,700	$ 25,600	$ 22,300	$ 22,900	$ 20,500	

Capital Improvements								
Capital Improvement Project Management	$ 21,600	$100,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	Costs reflect staff time only for oversight of Major Capital Improvments.
Stormwater Major Capital Projects	$ 200,000	$1,000,000	$500,000	$ 500,000	$ 500,000	$ 500,000	$ 500,000	Current costs estimated from 2009 budget. Future costs reflect recommendation from SW Master Plan to replace 2.5 % of system each year - condition issues
Stormwater Portion of CSO Projects	$ -	$ 1,023,000	$1,024,000	$1,025,000	$1,025,000	$ 1,026,000	$ 1,030,000	Future costs reflect estimate stormwater portion of CSO projects which are currently covered under Sewer Enterprise fund.
Land, Easement, and Rights Acquisition	$ -	$ 22,500	$ 17,600	$ 17,700	$ 17,800	$ 17,800	$ 18,300	Future costs reflect estimated legal time associated with capital projects.
Subtotal:	$ 221,600	$ 2,145,500	$ 1,591,600	$ 1,592,700	$1,592,800	$ 1,593,800	$ 1,598,300	
TOTAL:	**$ 512,500**	**$ 3,348,000**	**$2,513,500**	**$ 2,555,400**	**$2,557,400**	**$ 2,596,600**	**$ 2,759,400**	

Appendix VI

Complete Article on the Possible Stormwater Utility

By **Charles McMahon**
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PORTSMOUTH — A new utility could be in the cards for residents in the near future as the city works to grapple with increasing pressure from federal and state regulators over stormwater discharge.

Much still has to be decided before the city heads in this direction, but city officials have indicated they intend to bring together all the information for a future work session with the City Council. City Manager John Bohenko said the proposal was brought up at the council's retreat last month. He said the subject of creating a stormwater utility, or fee, is expected to rise to the surface over the next year.

"We're not saying this will happen either way, but what we want to do is educate the City Council as to what it is," Bohenko said. "It will involve the regulations as it relates to stormwater now and the utility that may be required in the future."

Bohenko said the main priority from a city perspective is educating the council as policy makers and then exploring all of the options. "At this point we are really bringing this stuff forward as educational material and letting them know that the regulations are changing," he said.

Changes in stormwater regulation date to 2003, when the city received its first Stormwater National Pollutant Discharge Elimination System (NPDES) permit from the federal Environmental Protection Agency. Similar to the city's wastewater permits, the NPDES permit is issued on a five-year cycle. The proposed 2008 permit, which is still in draft form, is expected to require increased levels of effort in maintenance and operation of the city's stormwater system.

Stormwater is defined as "any natural precipitation including rainstorm water runoff, snow melt runoff and surface runoff in drainage."

The city's project team on the proposal includes Deputy Public Works Director David Allen, Solid Waste Coordinator Silke Psula and City Engineer Peter Rice.

Most recently in 2009, Rice said the DPW applied for a grant from the state Department of Environmental Services to conduct a feasibility study to determine if a stormwater utility is an appropriate funding approach for the city. The study looked at stormwater program functions, funding and billing issues, stormwater systems improvements as well as identifying the hurdles of implementing a stormwater utility.

Rice said the creation of a utility is just one approach that has come out of the study.

"There are not any concrete recommendations," Rice said. "This is purely intended as a heads-up for the council."

Rice said he expects all recommendations from the study will go before the council in the coming year.

"We need to start the educational process and determine the impacts these regulations could have," he said. "The types of things we need to be thinking about involve any potential for consolidation and reorganization."

According to a memorandum from city staff, the city is facing several compelling factors that magnify the need for funding to increase stormwater management activities. Most notably is what Rice called the significant increase in regulatory requirements of the proposed permits involving federal clean water regulations. "Stormwater is viewed as being on the next frontier of pollutants of concern," he said.

Rice said regulators develop water quality standards that identify various pollutants of concern. If a water body contains a certain level of bacteria, Rice said regulators consider it to be "impaired."

"They have identified the water bodies around the Great Bay estuary as being impaired due to a number of pollutants in relation to stormwater," Rice said.

All of the water bodies into which the city's stormwater system discharges have some level of impairment, according to a recent city memorandum.

In a previous interview with the Herald, Allen said studies have shown stormwater impacts the environment "in an amount equal to or greater than sewer discharge." Impacts can include adverse effects on aquatic plant and animal life, including algae blooms from lawn fertilizers and pollutants from road grit and oils, Allen said.

Compounding the problem is the fact the city has some of the oldest stormwater infrastructure in the state.

Studies also showed impervious surface coverage greater than 10 percent throughout a city results in negative impact on receiving waters. The city has a database of aerial photos for every lot, coupled with geographic information systems software, that shows how much pavement is on every city parcel.

Portsmouth's impervious coverage is 27 percent of the total area of the city. The EPA defines an impervious surface as "A hard surface area that either prevents or retards the entry of water into the soil mantle or causes water to run off the surface in greater quantities or at an increased rate of flow."

Common impervious surfaces include, but are not limited to, rooftops, walkways, patios, driveways, parking lots, storage areas, concrete or asphalt paving and gravel roads.

It is unclear when the council will hold its work session, but a memorandum to the council indicates the update would involve understanding Portsmouth's stormwater program functions and cost; identifying, describing and framing key issues facing the city; developing framework for the stormwater improvement program to address the issues; and understanding funding options to support the program and to specifically explore the use of a stormwater utility and supporting structure.

Rice said there is currently no estimation as to the cost of coming into compliance with the new regulations. Rice said he couldn't even speculate.

If a utility is created, Rice said the money brought in through it would go toward operations and maintenance of existing catch basins and infrastructure.

"If you have more impervious surface on your site, you will pay more into the system to fund it," Allen said in 2008 when describing the working model for the new utility.

Other options referenced in the earlier interview with Allen involve the city considering a flat fee for all property owners, versus billing per square foot of impervious surface. Adopting a flat fee, he said, would be similar to all taxpayers funding the schools through property taxes, regardless of whether they have children.

When asked about how a resident would be billed as part of the utility, Rice said a concrete plan has yet to be determined.

"There is a number of options out there, but it's too premature to talk about that," Rice said.