TOWN OF CANTON, MA

STORMWATER UTILITY FEASIBILITY ANALYSIS

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EXECUTIVE SUMMARY

This Stormwater Utility Feasibility Study was conducted with the goal of obtaining a local consensus on Canton’s current and future stormwater management program needs and to determine the viability of establishing a stormwater utility as a method to fund this program. During this study, two (2) workshops were held with local stakeholders to review and evaluate information pertaining to stormwater management in Canton. This study was conducted under the Massachusetts Department of Environmental Protection (MassDEP) SWMI grant No. BPR-2013-06 awarded to the Town of Canton Department of Public Services (DPW).

There are several reasons why Canton needs to enhance its stormwater program with flooding and erosion, drinking water preservation and wetland/wildlife preservation being the key drivers identified during the two (2) workshops. Canton currently spends about $767,000 annually on stormwater management activities; however, the Town is facing real, unresolved, and growing stormwater problems that it cannot address with its current level of service and level of funding. Future demands driven by the updated Phase II permit which is expected to be released in the near future and existing infrastructure maintenance and repair needs are projected to increase the level of service and the resultant cost for the stormwater program to about $1.38M annually.

A stormwater utility is being considered as a funding option because it would: provide dedicated revenue solely for the stormwater program; consolidate/coordinate responsibilities; and allow for development of a more comprehensive and predictable program. A stormwater user fee distributes the cost for public stormwater services based on a property’s estimated contribution to the stormwater system, not on property value, which is considered a more equitable way to distribute costs than most other funding methods.

AMEC conducted a preliminary evaluation of Canton’s program needs and available data to provide the Town with an idea of what a stormwater utility could look like for Canton. Based on the feedback given at Workshop #2, a three-tiered Stormwater Billing Unit (SBU) rate structure may be most appropriate for Canton, with a SBU of approximately 1,700 square feet of impervious area (IA). Based on the analysis conducted for this study, in order to achieve the projected $1.38M under the tiered SBU-based rate structure the monthly rate would be somewhere between $2.95 and $3.50 per SBU. Using the upper end of the range for discussion purposes, single family residential properties that fall within Tier I (small), Tier II (medium) and Tier III (large) would be paying a monthly rate around $3.50, $7.00 and $10.50, respectively. Fees for non-residential properties would be calculated by dividing their total IA by the SBU and multiplying that number by the fee for Tier I (i.e. a retail property with 17,000 square feet of IA would be equivalent to 10 SBUs and pay $35/month). The $3.50 per SBU rate would generate approximately $1,635,600 annually, which would cover projected future needs and provides contingency for revenue decreasing factors such as credits and bad debt.

The general consensus following the workshops was that a stormwater utility may be a good option for the Town of Canton in the future, but that the Town was not ready for it immediately. The participants felt that, in general, the public and Board of Selectmen need a better understanding of the current and future program needs. Once they better understand the need,
then options for funding the stormwater program should be presented, including a stormwater utility option.

Based on the results of this feasibility study, AMEC recommends the following next steps to better prepare the Town for future stormwater program and funding needs: implement a strong public education program for citizens, stakeholders, and decision makers so they better understand the current and future stormwater program needs as well funding options including a stormwater utility, continue refinement of future needs and costs, update the Town’s GIS data and capability, and continue to involve key stakeholders and decision makers in the stormwater utility feasibility process.
1.0 INTRODUCTION

AMEC Massachusetts, Inc. (AMEC) completed a preliminary stormwater utility cost and feasibility evaluation. This project was conducted under the Massachusetts Department of Environmental Protection (MassDEP) SWMI grant No. BPR-2013-06 to the Town of Canton Department of Public Services (DPW). The SWMI grant program is designed to assist eligible public water suppliers and municipalities with Water Management Act permit compliance by providing funds for planning assistance, demand management, and withdrawal impact mitigation projects. Canton’s project consists of two planning tasks: a Water Audit of the Town’s water management with recommendations to be made for reducing unaccounted for water (conducted by Kleinfelder); and a Stormwater Utility analysis that will evaluate the feasibility and potential revenue associated with establishing a utility. This report summarizes the results of the second planning task.

The scope of work for the Stormwater Utility Feasibility Analysis is summarized below and included two public workshops to provide stormwater utility background information and to review the results of the feasibility analysis. Town staff and regional planning groups directly involved in stormwater issues that impact the Town were invited to the workshops. A full list of participants is included in Attachment A.

- **Workshop #1 – Stormwater Utility Background** (completed on April 24, 2014): This workshop provided an introduction to stormwater programs and potential funding mechanisms with an emphasis on stormwater utilities. The goal was to provide an understanding of stormwater program needs, methods for funding and the process for pursuing and/or developing a stormwater utility.

- **Workshop #2 – Feasibility Study Results** (completed on June 4, 2014): At this workshop the draft results of the Stormwater Utility Feasibility Analysis were presented. The goal was to obtain feedback on the results of the analysis and discuss potential next steps for funding the stormwater program.

- **Stormwater Utility Feasibility Study Analysis**: the analysis included the following:
  - Summary of the Town’s Existing Stormwater Program (problems, needs and goals)
  - An Evaluation of Future Municipal Stormwater Program Elements and Costs
  - Data Analysis and Revenue Estimates
  - Review of Existing Legal Issues
  - Potential Next Steps

This report presents the results of the Stormwater Utility Feasibility Study Analysis and incorporates information from the above workshops. Copies of the PowerPoint presentations from the workshops are provided in **Attachment A**.
2.0 COMPELLING CASE FOR ACTION

In most every community there are good, even compelling, reasons to improve the way stormwater programs are executed. Understanding the current level of service provided and identifying gaps in service and related problems are the first steps for building a “compelling case for action”. It 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 education and action.

The starting point for this Stormwater Utility Feasibility Analysis was to evaluate the compelling case for action in Canton. The Town of Canton is approximately 19.6 square miles in size and is located in Norfolk County; bordered by Norwood, Westwood, Dedham, Milton, Randolph, Stoughton and Sharon (Figure 1). Approximately 17% of the land area of Canton is currently impervious (Figure 2). The Town projects potential population growth of 9% by 2030. In addition to population growth, impervious cover is also expected to increase resulting in additional surface runoff and an increased burden on the current stormwater system. With the expected growth and potential for more development and impervious cover, the Town is looking for ways to effectively manage growth and mitigate potential stormwater issues. Some of the drivers for enhancing Canton's stormwater program are summarized below:

2.1 Drivers for Change

**Drinking water supply protection and enhancement:** The majority of Canton's drinking water supply is from groundwater sources. The Town is challenged with managing stormwater to both protect the quantity of water available for drinking water (i.e., mitigating the reduced infiltration from increased imperviousness) and the quality (i.e., mitigating pollution).

**Aging infrastructure:** Much of the Town's existing stormwater infrastructure is operating beyond its useful design life. Related concerns include: need to replace system components; damaged and failing systems; clogged systems; and undersized systems due to new development. The need and cost of maintenance is increasing as the system gets older and the DPW struggles to maintain the level of service needed with the resources and other competing demands it currently has. The National Research Council found that each $1 in deferred maintenance and repair work results in a long-term capital liability of $4 to $5.

The Town has recently been working with Kleinfelder to improve their Comprehensive Water Management Plan which includes stormwater management, Capital Improvement Program (CIP), and Asset Management. The results of this work will assist with better understanding the vulnerability of the current system and the need to upgrade or replace infrastructure to meet current and future demands. This work will influence development of a 10-year CIP program and provide the Town with a more accurate understanding of the cost, timing, and funding needs associated with its infrastructure.
Flooding problems: Because of increasing development, aging infrastructure, and the increased frequency and intensity of storm events, the Town faces increasing drainage problems that it is unable to adequately address with its current resources. Canton currently experiences stream and street flooding during substantial rain events (e.g., Neponset Street, Bolivar Street, Pine Street, Pond Street, Rockland Street Neighborhood, Massapoag Brook at Rockland Street, Pecuni Brook and York Brook on Rte 138), which is only expected to get worse as the Town continues to be further developed and storm events become more intense unless significant resources are targeted to mitigate the problem. Nuisance flooding creates safety hazards, places stress on infrastructure, and can lower property value.

Flooding and Road Washout near Waterfall Hills Apartment Complex

Regulatory mandates: Since 2003, the Town has been authorized to discharge stormwater under EPA’s National Pollutant Discharge Elimination System General Permit for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems (“Permit”). The Town struggled to meet the requirements of the Permit and, in 2009 the EPA issued an Enforcement Order and fined the Town for failure to fully comply with requirements of the Permit. Since then, the Town has increased outfall monitoring and planning efforts to comply with the Permit requirements. The current permit has been administratively extended and a new permit is expected to be issued by the EPA in the near future, which will have increased requirements for compliance. This unfunded mandate will require the Town to address pollutant removal from stormwater runoff to improve water quality in the streams and rivers to which the Town’s stormwater drainage system discharges. The Town is also required to continue to comply with their existing permit conditions by implementing the following minimum control measures: public education and outreach; public participation; illicit discharge detection and elimination; construction best management practices; post-construction runoff controls; and pollution prevention for municipal operations.

Water quality: As little as 10% impervious cover in a watershed can result in stream degradation\(^1\) and the Town is already experiencing water quality degradation resulting from increased runoff. The Neponset River forms the Town’s western boundary and all but a small northerly portion of

\(^1\) EPA Fact Sheet “Protecting Water Quality from Urban Runoff”, EPA 841-F-03-003, February 2003.
Canton lies within the Neponset River watershed (Figure 3). A Total Maximum Daily Load (TMDL) study was completed for the Neponset River Watershed for bacteria. Additional water bodies within the Town listed as impaired on the 2012 Massachusetts Integrated Water Report are also shown on Figure 3. Significant requirements to address the TMDL and impaired waters have been incorporated into the draft 2010 US EPA NPDES Phase II MS4 General Permit.

Where stormwater is found to be contributing to water quality impairments, it is expected that the new MS4 General Permit will require the regulated municipalities to implement the recommendations of the TMDL study. These requirements may include:

- Targeted public education and outreach activities;
- Detailed mapping, investigation and condition assessment for MS4 infrastructure;
- Litter and pet waste management programs;
- Increased pollution prevention activities (e.g., operation and maintenance of the MS4);
- Illicit discharge detection and elimination activities to remove pollutant sources; and
- Capital construction projects for installing structural BMPs to treat stormwater.

**Wetlands/Wildlife Preservation:** Pollutants contained in stormwater negatively affect the ecology of watersheds, as well as harm aquatic life. The Town values its natural space and appreciates that an effort will be needed to preserve these spaces as the Town continues to grow. Related concerns include: degrading water quality; 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, and curtail recreational use.

### 2.2 Feedback from Workshops

AMEC worked with participants of Workshop #1, who represented personnel directly involved in stormwater issues that impact the Town, to identify drivers for an enhanced stormwater program that would resonate with the Town. Participants at Workshop #1 were asked to identify a stormwater related issue, problem, or need that they felt were priorities for the Town. Of this list, they were asked to pick their top most important drivers for an enhanced stormwater program. This resulted in the most overall votes for the following 3 drivers:

- Flooding & Erosion
- Drinking Water Preservation
- Wetland/Wildlife Preservation

The list of workshop participants and the full list of identified drivers are included in Attachment A.

Although participants of the workshop were concerned about the costs associated with water quality improvements required to meet the TMDL as outlined in the draft permit, they did not feel that water quality and regulatory compliance were compelling reasons for the Town to enhance the stormwater program. They did not think that the public felt a connection to the Neponset River or other surface water bodies in Town, due to limited public access for recreational use and no perceived direct correlation between surface water quality and their drinking water. That being said, the participants felt that the issuance of the new permit could be the catalyst needed to
garner support from decision makers and the general public for the timing on when the stormwater enhancements would be needed.

Participants at Workshop #1 agreed that public education would be key to gaining more broad understanding and support of an enhanced stormwater program. In general, participants voiced concerns that the public and Town decision makers needed a better understanding of the current needs and costs of the stormwater program. They also agreed that the public and decision makers needed to understand the “cost of not doing anything” to appreciate the future needs.
3.0 EXISTING STORMWATER PROGRAM

Kleinfelder worked with DPW and other Town staff to estimate annual expenditures for the current stormwater management program. These costs are summarized in Table 3.1 by key cost center. The detailed analysis with assumptions is included in Attachment B.

Table 3.1 Summary of Existing Program Costs (annual)

<table>
<thead>
<tr>
<th>Key Cost Center</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operations and Maintenance</td>
<td>$360,000</td>
</tr>
<tr>
<td>Regulatory Compliance</td>
<td>$13,000</td>
</tr>
<tr>
<td>GIS Data Collection and Management</td>
<td>$13,500</td>
</tr>
<tr>
<td>Engineering &amp; Master Planning</td>
<td>$121,500</td>
</tr>
<tr>
<td>Administrative</td>
<td>$19,000</td>
</tr>
<tr>
<td>Capital Improvement Projects</td>
<td>$240,000</td>
</tr>
<tr>
<td><strong>Total Stormwater Program Cost:</strong></td>
<td>$767,000</td>
</tr>
</tbody>
</table>

Costs include labor, equipment, materials, subcontracted services, and other miscellaneous expenses for stormwater-related tasks. Costs for staff time were allocated under the corresponding cost center (e.g., Town Engineer costs were captured under the Engineering & Master Planning cost center). Costs for staff time were estimated from FY 2014 budgeted salaries with a 40% allocation for indirect costs for benefits that are paid through the general fund for staff. Staff costs were further refined by applying an estimated percentage of their time spent on stormwater related tasks.

The following is a brief description of each key cost center:

**Operations and Maintenance:** Labor, equipment, and materials for catch basin cleaning, street sweeping, outfall inspections, catch basin/storm drain/culvert/detention system maintenance, remedial repair and replacement, operational costs, and equipment maintenance and fuel.

**Regulatory Compliance:** Implementation of the six minimum control measures of the MS4 permit, dry and wet weather water quality sampling, enforcement, reporting.

**GIS Data Collection and Management:** Staff time and equipment/software costs for maintaining GIS information on stormwater infrastructure. Currently, the Town Department of Finance employs a GIS analyst who has provided support for stormwater as needed, but this is not his area of expertise.

**Engineering & Master Planning:** Staff time for storm system design and engineering oversight, engineering and planning for stormwater and watershed management projects, hydraulic & hydrologic modeling, subcontracted engineering services for comprehensive water management planning.
Administration: Staff time for the DPW Director and Town Administrator for general stormwater program management, administrative support, office expenses, training, and professional development.

Capital Improvement Projects: Construction and material costs for culvert and drainage projects, major infrastructure retrofits, and major equipment purchases. Current costs were based on completion of one typical drainage/culvert project per year, estimated annual debt services for major infrastructure projects using actual annual debt services costs for the Shepards Pond Dam Repair, and estimated annual cost for large equipment based on a 20-year life cycle for the cost of the catch basin truck requested in the FY 2014 budget.
4.0 FUTURE STORMWATER PROGRAM

Building on the work performed by Kleinfelder, AMEC estimated the annual expenditures for the potential future stormwater management program based on discussions with the Canton DPW and professional judgment. The future costs include estimated costs to comply with the new MS4 permit requirements as outlined in the draft permit as well as other enhanced stormwater services. The future cost represents an estimate of the annual costs over a five year period, assuming the new permit is issued within those five years. AMEC assumed that the Town would phase in the future requirements and CIP projects. The future cost does not represent the cost for the next fiscal year, but the level of investment expected within the next five years to meet evolving needs and requirements to assist with near-term planning.

This represents a planning level estimate to account for anticipated cost increases and includes broad assumptions about the level of service required to meet the evolving regulatory requirements and aging infrastructure demands. The future CIP costs were estimated based on actual annual investment for recent CIP projects or equipment and recommendations for Best Management Practices (BMPs) for water quality improvements. The annual CIP cost represented in Table 4.1 are based on annual debt services (i.e. the Town gets a loan or bond for upfront payment of the project and then repays the load with annual payments) to mimic the Town’s current funding practice for CIP. Additional detailed analysis is still required and should consider the results of the ongoing comprehensive water management and asset management planning. Changes to long-term Capital Improvement Program planning will need to be incorporated in further analyses. The Town will also need to determine if they would like to continue their current funding practice of using bonds or loans which results in lower annual repayment cost but larger overall cost due to interest, or if they will fund CIP projects with budgeted Town funds upfront which would result in a higher initial annual cost but may be better for long-term planning and budgeting.

These costs are summarized in Table 4.1 below by key cost center, followed by a brief description of each.

<table>
<thead>
<tr>
<th>Key Cost Center</th>
<th>Current Cost</th>
<th>Future Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operations and Maintenance</td>
<td>$ 360,000</td>
<td>$ 530,000</td>
</tr>
<tr>
<td>Regulatory Compliance</td>
<td>$ 13,000</td>
<td>$ 44,000</td>
</tr>
<tr>
<td>GIS Data Collection and Management</td>
<td>$ 13,500</td>
<td>$ 56,000</td>
</tr>
<tr>
<td>Engineering &amp; Master Planning</td>
<td>$ 121,500</td>
<td>$ 208,000</td>
</tr>
<tr>
<td>Administrative</td>
<td>$ 19,000</td>
<td>$ 24,000</td>
</tr>
<tr>
<td>Capital Improvement Projects</td>
<td>$ 240,000</td>
<td>$ 518,000</td>
</tr>
<tr>
<td><strong>Total Stormwater Program Cost:</strong></td>
<td><strong>$ 767,000</strong></td>
<td><strong>$ 1,380,000</strong></td>
</tr>
</tbody>
</table>
Operations and Maintenance: Permit requirements will likely drive an increase in the frequency of catch basin cleaning, street sweeping and other storm drain system maintenance activities.

Regulatory Compliance: This increase in effort from existing program is related to the new permit and is due primarily to water quality and TMDL compliance requirements. This cost center captures mostly the administration, monitoring, and reporting requirements of the MS4 permit. Other actions and costs (such as increased street sweeping in priority areas) are also driven by the permit, but have been captured under other cost centers. The majority of the increased cost is for water quality monitoring. Although the Town has begun ramping up efforts for outfall monitoring, increased inspection and monitoring requirements are expected under the new MS4 permit. Additional water quality monitoring within the Neponset River watershed may also be required in the new MS4 permit.

GIS Data Collection and Management: The increased requirements of the new MS4 permit require dedicated GIS support and could support a new staff position. Asset management through GIS databases and mapping will be essential when trying to meet new permit requirements. The Town of Canton will need to gather data, screen and field verify locations of storm drain infrastructure throughout town in order to complete this effort.

Engineering and Master Planning: New planning efforts include: Comprehensive Water Management Plan, asset management, and plans to meet TMDL requirements that are incorporated into the NPDES MS4 permit. Large stormwater infrastructure and other BMP design projects that will be required and/or necessary throughout town will also contribute to the increase.

Administration: This is driven by increased efforts under other key cost centers and NPDES MS4 permit requirements.

Capital Improvement Projects: The estimate includes completing the following projects/purchases per year: one typical culvert/drainage repair, one major infrastructure retrofit project, BMP retrofits in one priority area, and purchase of one piece of equipment.

A detailed future cost spreadsheet can be found in Attachment B.
5.0 STORMWATER UTILITIES

The Town of Canton is challenged with funding stormwater management, which historically has not competed effectively for general fund tax dollars with other Town priorities like schools and public safety. A stormwater utility is an option that provides a legally dedicated revenue source and can succeed in addressing competing priorities, when due diligence is conducted and the utility is implemented correctly. Similar to a wastewater or water supply system, a stormwater utility is based on the premise that the stormwater drainage system is a public system and that management of the system is a public cost. When a user places a demand on either of these two other systems, the user pays a service fee that is reasonably aligned with the demand. In the case of stormwater, when a natural area is developed, it contributes a greater volume of runoff to the drainage system; thus, imposing a demand on the system. The greater the demand (i.e., the more the parcel of land is paved), the greater the user fee should be. A background document on stormwater utilities which AMEC provided the Town is included as Attachment C.

A Stormwater Utility Provides a vehicle for:

- Consolidating or coordinating responsibilities that were previously dispersed among several departments and divisions;
- Generating funding that is stable, adequate, equitable and dedicated solely to the stormwater function; and
- Developing programs that are comprehensive, cohesive and consistent year-to-year.

Key Advantages of a Stormwater Utility are:

- **It is Stable** because it is not as dependent on the annual budgetary process as taxes are.
- **It is Adequate** because a typical stormwater fee is based on a well thought out stormwater program to meet the needs and demands of the community, as well as other program drivers (e.g., water quality, regulations).
- **It is Flexible** because fees can be structured in multiple ways, and the program can be managed to fund activities based on changing priorities and needs.
- **It is Equitable** because the public cost for managing the system is distributed across the community based on customers estimated impact on the stormwater system.
6.0 DATA & STORMWATER BILLING UNIT ANALYSIS

AMEC evaluated the Town’s GIS data (i.e., impervious cover, parcels, land use) to develop a preliminary rate structure, to provide the Town with an idea of how costs could be distributed using existing information. This rate structure serves as the basis of the revenue analysis in Section 7 and provides an estimate of revenue that could be generated under a stormwater utility.

6.1 GIS Data Evaluation

The Town of Canton does not have their own complete GIS data layer for impervious cover so AMEC used the state-wide impervious cover layer (2005) from the Massachusetts Geographic Information System (MassGIS). Parcel boundaries and land use coding by parcel were also obtained from the MassGIS website (Figure 2). Total impervious area (IA) by parcel was then estimated with the Zonal Statistics function in ArcGIS, using the parcel layer to create the “zones” to tabulate impervious area. The resulting database was sorted by land use to separate single family residential (SFR) and non-single family residential parcels (NSFR).

Impervious Cover Layer

The 2005 MassGIS state-wide impervious cover layer was considered sufficient for the purpose of this evaluation and a detailed update of the impervious cover was not conducted at this time.

Example of IA Capture in the State-Wide Impervious Cover Layer
However, as demonstrated in the example from the GIS data above, there is noticeable under-capture or missed capture of IA in the state-wide impervious cover layer (e.g. missing driveways). Should the Town decide to continue consideration of a stormwater utility, the impervious cover layer will need to be updated.

**Parcel Layer**

Canton has over 6,800 parcels, 5,105 of which are classified as single family residential (SFR). For the purposes of this analysis, the other 1,724 parcels were classified as non-single family residential (NSFR), 157 of which lack land use coding (classified as "NO_LU"). For this study based on available data, AMEC treated the 171 parcels identified as SFR with over 10,000 sf of impervious area as NSFR properties. NSFR parcels also include multi-family residential parcels (2 or more units), commercial, industrial, nonprofit/tax-exempt parcels, etc. (Figure 4).

The total number of SFR and NSFR parcels, while representative of property type, does not take into account total land classified as SFR, NSFR and NO_LU. The number of properties does not have a direct correlation with the total land area in the Town or with the amount of imperviousness. As shown in Table 6.1 below, although the majority of parcels are residential, SFR properties do not represent the largest area in Town (only 23.5%).

<table>
<thead>
<tr>
<th>Category</th>
<th>% of Total Land</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roads</td>
<td>13.2%</td>
</tr>
<tr>
<td>No Land Use Data</td>
<td>2.4%</td>
</tr>
<tr>
<td>NSFR</td>
<td>60.9%</td>
</tr>
<tr>
<td>SFR</td>
<td>23.5%</td>
</tr>
</tbody>
</table>

**Table 6.1 Land Use in Canton**

### 6.2 Billing Unit Analysis

Most commonly, stormwater utility rate structures are based on the median measured IA of single family residential homes (called an Equivalent Residential Unit or ERU). The majority of existing utilities use a flat rate of one ERU for all SFR properties. The ERU is determined by finding the median IA of all SFR properties in the utility. Some utilities that have a wide range of IA among SFRs use a tiered rate structure constructed based on Stormwater Billing Units (SBUs). A tiered SBU-based rate structure is similar to an ERU-based rate structure, but it enables the utility to assess different fees to SFR properties. The impervious areas of Non-Single Family Residential (NSFR) parcels are individually measured then divided by the value of the ERU or SBU, depending on which rate structure is utilized by the utility.
For the purposes of this analysis, two potential billing structures were assessed: a flat rate using an ERU and tiered rate using a SBU. These terms are defined as follows:

- **Equivalent Residential Unit (ERU):** The value of the median total IA of SFR parcels (calculation includes parcels with less than 10,000 sq ft of IA).

- **Stormwater Billing Unit (SBU):** The value of the average IA in Tier 1 in a tiered rate structure of SFR parcels. For this study, a three tiered structure was considered.

The majority of existing stormwater utilities use an ERU-based rate structure, but the tiered SBU-based rate structure is growing in popularity due to improving data. The primary benefit of each of these billing units is that:

- ERU rate structures have proven to be both equitable and defensible when challenged in court. The data needs for the ERU method are less than other methods.

- SBU rate structures assign multiple fees for SFR parcels as opposed to assessing the same fee to a parcel with 500 sqft of IA and 10,000 sqft of IA. This method is considered more fair and equitable, especially in communities with a wide range of impervious cover on their SFR parcels.

### 6.2.1 Equivalent Residential Unit

An ERU was developed by calculating the median IA of SFR parcels in Canton. The distribution of the total IA in SFR parcels in Canton is shown in the following graph.

![Graph showing Equivalent Residential Unit Analysis](image)

**Equivalent Residential Unit Analysis**

- Median: 3,150 sqft
The median IA of SFR parcels in Canton is 3,150 sq ft. This number is similar to ERUs found in other municipalities of Canton’s size and composition across the country. Total ERUs in Canton by property type are shown in Table 6.2 below.

### Table 6.2 Total ERUs in Canton

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>SFR Parcels</th>
<th>NSFR Parcels</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td># Lots</td>
<td>5,105</td>
<td>1,724</td>
<td>6,829</td>
</tr>
<tr>
<td>Impervious Area</td>
<td>412.3 ac</td>
<td>1,043.3 ac</td>
<td>2,097.9 ac</td>
</tr>
<tr>
<td># of ERUs</td>
<td>5,276</td>
<td>14,427</td>
<td>19,703</td>
</tr>
</tbody>
</table>

*SFR parcels with >10,000 sf IA were treated as NSFR properties.

#### 6.2.2 Stormwater Billing Unit

A stormwater billing unit (SBU) was developed based on an analysis of the distribution of total impervious area in SFR parcels in Canton. Based on the distribution of IA observed during this analysis, AMEC divided the SFR parcels into three tiers: Tier 1 = lower 25% of parcels, Tier 2 = mid 50% of parcels, Tier 3 = upper 25% of parcels. The SBU was calculated by finding the average IA in Tier I, which was calculated to be 1,700 sf. A histogram showing the tier structure is shown below.
SFR properties would be charged 1, 2 or 3 SBU based on the tier to which they are assigned. Fees for NSFR are determined by dividing the total IA on the property by the SBU (1,700 sf) and multiplying that number by the fee for Tier 1. A summary of the SFR and NSFR data is provided in Table 6.4 below.

### Table 6.4 Total SBUs in Canton

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>SFR Parcels</th>
<th>NSFR Parcels</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td># Lots</td>
<td>5,105</td>
<td>1,724</td>
<td>6,829</td>
</tr>
<tr>
<td>Impervious Area</td>
<td>412.3 ac</td>
<td>1,043.3 ac</td>
<td>1,455.6 ac</td>
</tr>
<tr>
<td># SBUs (1,700 sf SBU)</td>
<td>10,285</td>
<td>28,658</td>
<td>38,943</td>
</tr>
</tbody>
</table>

*SFR parcels with >10,000 sf IA were treated as NSFR properties.

Based on the straw poll and feedback given at Workshop #2, the participants felt that a tiered SBU-based rate structure would be most appropriate for Canton. Although participants at Workshop #2 recognized that using an ERU would be simpler, while still providing the basis for an equitable and defensible rate structure, the overall opinion was that the ability to differentiate between SFR parcels with small amounts of IA from larger IA would be important to the Town. The tiers laid out in this section may change as additional analysis is conducted and impervious cover data is updated or made available in the future, but the example above should provide an indication of what a tiered rate structure could look like in Canton.

### 6.2.3 Roads

The billing analysis above assumes that the stormwater utility rate structure will exclude roads (local, state, and federal). This assumption was used based on common practices and feedback from the participants at the workshops. The total roadway IA in Canton is 642.3 acres (30% of the total IA in town) which, if included in the fee, would change the billing analysis. Although there would be some increase in revenue due to state-owned and federal roads, the fee structure would require further evaluation based on the level of service that would be provided for these properties.

A CD containing the data used for these analyses has been attached to this report.
7.0 REVENUE ANALYSIS

A stormwater revenue analysis was performed using the future stormwater program costs and the SBU analysis discussed in Section 6. The revenue analysis considers future revenue requirements for program implementation and accounts for the several assumptions. The cost for administering the utility was considered to be part of the administrative costs and assumes that billing will be handled through the existing water and sewer billing program.

The revenue needed is a combination of the future program cost (approximately $1.38 million) and several assumptions. It is assumed the following factors will impact the total revenue generated by the utility:

- 5% bad debt (delinquent accounts)
- 3% credits (revenue lost due to credits given to property owners)
- 0% SBU growth rate
- 15% operating reserve

Under the tiered SBU-based rate structure outlined in Section 6, the monthly rate would be a range from $2.95 - $3.50 per SBU. SFR properties that fall within Tier II (medium) and Tier III (large) would be paying $5.90 - $7.00 and $8.85 - $10.50, respectively. Since it is important to ensure that the proposed utility meet the expectations of the ratepayers, a rate of $3.50 could be proposed. Tier II (medium) and Tier III (large) would then pay $7.00 and $10.50, respectively. This proposed monthly rate per SBU is reasonable compared to the national average for similar communities with a similar level or service. The adjusted rate would generate approximately $1,635,600 annually, which provides ample excess for revenue decreasing factors such as credits and bad debt.
8.0 CREDITS

Once the rate structure has been chosen, the Town can begin considerations for a credit system for the utility. Credits are required by law in many states and are a pivotal part of successful stormwater utilities. If the Town of Canton decides to pursue a stormwater utility, a credit program should be developed and the resulting reduction in revenue estimated to account for the impact to the rate or SBU. The scope of work for this study did not include an evaluation of credits for the Town of Canton, but background information related to credits is provided below for future consideration.

Credits...

- Normally little revenue impact (<5%)
- Offers a carrot to better manage stormwater onsite
- Credits are earned, not given
- Ongoing recognition of ongoing private investment for a public good

Credit systems are becoming increasingly important in stormwater utilities because they create incentives for property owners to reduce the amount or improve the quality of stormwater generated on their property. It is not enough to simply provide funding for the stormwater program, property owners need to help manage stormwater on-site, at the point it is generated. For example, roof runoff can be directed to a dry well on the property, and depending on the size, parking lot runoff can also be “disconnected” by draining to a lawn area, rain garden or other on-site infiltration or treatment system. Improvements made by property owners reduce the volume of runoff that must be managed by the town and thus reduce the town’s overall stormwater program costs.

There are two general types of credits:

1. Impact Reduction – Measure of IA does not reflect a property’s true impact to the system
   - Often tied to managing stormwater on-site and thus reducing impact to the larger system or meeting design criteria.

2. Cost Reduction – Reduces the Town’s costs through private efforts
   - Take on a public responsibility such as education or maintenance (i.e. education on water quality, maintenance of larger areas or NPDES permit compliance).

These and other credit considerations need to be part of the further study of a stormwater utility.
9.0 CONSIDERATIONS FOR IMPLEMENTATION

9.1 Data Needs

AMEC conducted an analysis of data needs in order to continue with further study and potentially establish a stormwater utility for Canton. The following subsections summarize the findings of the data needs analysis. Please note that some of these data needs can be addressed over time as the Town pursues the development of a stormwater utility.

9.1.1 Impervious Data

The existing impervious coverage needs to be updated. At the very least, a basic review and update of major NSFR features will need to be performed to enhance the SBU estimate by capturing significant data gaps in coverage. Prior to implementation-phase rate modeling or development of a billing master account file (MAF), AMEC recommends that the impervious cover for all properties be reviewed/updated on a finer scale to improve accuracy. Since nearly all SFRs have existing impervious cover, it would be beneficial to include them in the impervious update for a complete impervious dataset.

9.1.2 Parcel/Imagery Alignment

The parcel data aligns pretty well with the aerial imagery, which is important for per-property measurements of impervious area and fee calculation. Little to no additional effort is expected related to parcel spatial alignment.

9.1.3 Imagery

The available imagery from MassGIS is good quality, but other sources or more recent imagery should be used to improve the overall impervious analysis. Impervious capture should be planned based on the highest resolution data available. If aerial photography becomes available through the Town, MassGIS or some other source, it goes without saying that Canton should plan to utilize the best data available.

9.1.4 Parcel Data

The existing parcel data available from MassGIS provides enough information to cleanly separate detached-single-family (SFR) from NSFR properties. Additional information is needed about condos/shared common areas, and parcels that have no associated data in the layer provided to AMEC.

9.1.5 Parcel/Utility Account Association

A review of the match between parcels and existing water/sewer accounts will be needed to identify any stormwater-only properties and to develop the correct account/parcel associations in the MAF. Depending on whether the utility accounts have parcel IDs or not, this could be a manual process.
## 9.2 Billing Considerations

Before a stormwater utility can be implemented in Canton the Town’s data for billing systems will need to be reviewed along with existing billing mechanisms to consider how a stormwater utility might be billed and the level of effort to develop a MAF for billing. This effort incorporates all rate factors, parcel classification, final parcel/account association, fee calculation, fee-testing and verification, test-file integration with billing system, technical implementation support, and basic documentation. For the purpose of this preliminary evaluation, it has been assumed that the stormwater utility billing could use the current water and sewer billing account file. An association will need to be made between parcel ID and billing account, including parcels with multiple accounts and multiple parcels with the same account. This greatly reduces the effort to develop the MAF; however, not every parcel in Town has a water or sewer account. There will be some manual matching to complete the MAF and match stormwater billing accounts to water and sewer accounts.

AMEC assumed that the current billing method for water and sewer can be used to bill for stormwater and a stormwater bill with the water and sewer bill appears to be the most cost-effective billing method. A detailed effort and cost estimate for developing the MAF was not conducted as part of this initial feasibility study.

## 9.3 Implementation Cost Estimate

The cost to implement a stormwater utility in a community like Canton is generally in the range of $75,000-150,000, depending on the level of effort for public education/outreach and the ability of Town staff to support various elements of the utility such as database management, billing and customer service. A detailed cost estimate for stormwater utility implementation was not prepared since the level of effort was not addressed as part of this initial study.
10.0 REVIEW OF LEGAL FRAMEWORK

AMEC reviewed the existing legal framework that is appropriate for implementing a stormwater utility. Massachusetts General Law Chapter 83 Section 16 and Chapter 40 Section 1A are the enabling legislation for a stormwater utility. Originally established for sanitary sewer systems, this section was revised in 2004 to include “main drains and related stormwater facilities”; thereby enabling municipalities to charge a fee for stormwater services. The following comments regarding the enabling legislation are provided for consideration in the development of a stormwater utility (i.e., bylaw, ordinance):

- The fee is to “supplement” other available funds; however a definition of what should be considered available is not provided.
- Stipulates that charges must be either quarterly or annual, which will influence the billing options that are considered.
- Fees must be charged uniformly across residential properties and a uniform fee established for non-residential properties. The alternative option given is that a uniform fee be established for all properties – this would allow for the SBU approach.
- Current language seems to allow for policy decisions to be made as long as it is fair, equitable, and uniform.
- Because the language states that such a fee shall be paid for “by every person” this language would seem to indicate that all properties would be required to pay said stormwater fee. This interpretation is further substantiated by the discussion of credits as an option to reduce a fee.

The Town of Canton also has stormwater enabling legislation in addition to the Massachusetts enabling legislation:

- Article XXI – Section 5.0(H): “Stormwater Utility. The Board of Selectman may adopt, through the Regulations authorized by this Stormwater Management Bylaw, a Stormwater Utility pursuant to M.G.L. Chapter 83 Section 16 and Chapter 40 Section 1A. The Board of Selectman shall administer, implement and enforce this Utility. Failure by the Canton Board of Selectman to promulgate such a Stormwater Utility through its Regulations or a legal declaration of its invalidity by a court shall not act to suspend or invalidate the effect of the other provisions of this Bylaw.”

The implementation of a stormwater utility in Canton would require the passing of a stormwater utility ordinance by the Board of Selectmen. Ideally, the Town should first create a stormwater enterprise account and then pass a stormwater utility ordinance to establish the utility. As a result of the local enabling legislation which was passed at Town Meeting, once the enterprise fund has been created, the stormwater utility ordinance can be presented to the Board of Selectmen and passed by a majority vote. The Board of Selectmen can enact the ordinance themselves, but have the discretion to request a vote on the ordinance at Town Meeting.
It is becoming increasingly common to pass a separate stormwater utility rate ordinance as opposed to outlining the rate structure in the initial stormwater utility ordinance. The primary reason for creating a separate rate ordinance is that edits to the fee or rate structure will not require edits to the larger stormwater utility ordinance. A credit manual is also commonly a stand-alone regulation.
11.0 POTENTIAL NEXT STEPS

The Town of Canton appreciates that stormwater management is becoming more complicated and more expensive. The Town also appreciates that they will need to update their stormwater management plan to address future needs and that this plan will need to be quantifiable with funding support to make it feasible. Canton recognizes the value in proactive long term planning, and is making a concerted effort to improve management of its water resources needs. Here are just a few examples of recent successful and ongoing efforts by Canton:

- **Comprehensive Water Management Planning** - Working closely with Kleinfelder, Canton has recently begun the process of developing a Comprehensive Water Management Plan including asset management and 10-year capital improvement planning. Canton and Kleinfelder are discussing innovative ways to address water quality in Town. Phase I of this effort and the accompanying report is expected to be completed this year. Through this comprehensive planning process and other studies, such as this stormwater utility feasibility study, Canton is moving towards an integrated approach to water resource management, including stormwater.

- **MS4 Implementation** - Canton complies with the current MS4 permit requirements and has begun implementing some of the anticipated requirements of the new permit, such as dry and wet weather monitoring and water quality BMP planning. Canton has completed the inventory, mapping, and sampling of all of its stormwater outfalls. Canton has been working with Kleinfelder to plan and prepare for the other expected requirements of the pending NPDES MS4 Permit ahead of its issuance as final. An increased Public Education and Outreach program focusing on stormwater and water quality issues in town should be implemented in preparation for stormwater management program enhancements.

- **Continued Collaboration with local organizations** - The Town has worked with Neponset River Watershed Association (NepRWA) and the Metropolitan Area Planning Council (MAPC) over the past several years on watershed management, stormwater management, and water quality issues. In June 2012, NepRWA completed a Stormwater BMP Retrofit Study for Canton under a 604B Grant, the results of which were considered in this feasibility study. Canton is currently partnering with NepRWA on a number of regional efforts.

The ability to bring about action, stormwater program improvements along with funding, depends on bringing key leaders to: (1) an understanding of the problems, (2) a vision of the solutions, and (3) a logical and acceptable process for moving forward. Without that, many utilities have failed. Following the two workshops, the general consensus was that a stormwater utility may be a good option for the Town of Canton in the future, but that the Town was not ready for it immediately. The participants of the study felt that, in general, the public and Board of Selectmen need a better understanding of the current or future program needs. Once they better understand the need, then the options for funding should be presented including a stormwater utility option. The consensus was that, if introduced right now to the general public, a stormwater utility concept would not be supported by the majority of residents.
11.1 Stakeholder Education & Outreach Recommendations

Although still in the study phase, The Town should continue to educate the public on the realities and issues related to stormwater in Canton. A public education and outreach plan for Canton should be defined if the Town decides to move towards a Stormwater Utility. Some municipalities choose not to engage in general public information campaigns about a potential fee during the initial study phase. Other municipalities 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.

A local outreach plan must be community specific, and the pros and cons of the various options should be discussed. 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.

A successful public education and outreach program involves stakeholders early in the process, provides numerous opportunities and ways for them to learn about the program and have their questions and concerns addressed, considers their input and ideas, emphasizes two-way communications, and allows them time, to assimilate the information and the compelling need for the fee.

11.2 Recommendations for Next Steps

AMEC recommends the following next steps based on the results of this feasibility study:

1. The Town needs to better understand future stormwater management needs and their potential cost. Two key components of better understanding the future needs and cost will be:
   - The results of the current Comprehensive Water Management planning efforts and asset management assessment.
   - Issuance of the new MS4 permit. Although the Town is prepared for most of the anticipated requirements of the new permit, the requirements for implementation of the TMDL are still not understood and could have a big impact on the stormwater management needs. This will be driven by the quantifiable requirements (i.e. load reduction) and schedule outlined in the new permit.

2. The Town needs to make an informed decision about the level of service to provide with the future stormwater management program. Will the Town provide a minimal level of service to meet regulatory requirements and maintain the current system or will their stakeholders value a more enhanced, more proactive level of service?

3. The Town should update their GIS data and capability. GIS is a powerful tool for stormwater management planning. For example, an updated comprehensive impervious
data layer will not only support future stormwater utility analyses, but will also be valuable in evaluating land use impacts and water quality issues.

4. A strong public education program is needed so the citizens, stakeholders, and decision makers understand the need and support the level of service of the future stormwater management program.

5. Stakeholder participation should be considered/developed to provide review and input as part of further study. Stakeholders should represent the groups that will be impacted by a potential stormwater user fee, both the potential supporters and opponents. Stakeholders may include: homeowners, commercial/industrial property owners, local businesses, watershed and nature groups, tax-exempt organizations like churches, state-owned property managers like the hospital administrators, and MassDOT.

6. Further study is needed to determine if a stormwater utility is an appropriate mechanism to fund the stormwater program. This will require buy-in from the public.

7. Informational workshops presenting the results of the studies and stakeholder feedback should be presented to the Board of Selectmen at key milestones.
FIGURES
Figure 2: Town-Wide Impervious Cover
Stormwater Utility Feasibility Analysis
Town of Canton
Figure 3: Impaired Waters
Stormwater Utility Feasibility Analysis
Town of Canton