

**Final Task 6  
Report**

**PORTSMOUTH  
STORMWATER MASTER PLAN**



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**May 8, 2007**

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## **1. INTRODUCTION**

Edwards and Kelcey (n/k/a Jacobs Edwards and Kelcey) was selected by the City of Portsmouth through a competitive proposal process to prepare a Stormwater Master Plan to facilitate compliance with the United States Environmental Protection Agency (USEPA) National Pollution Discharge Elimination System (NPDES) Stormwater Phase II regulations. The City is regulated under two distinct components of the Stormwater Phase II regulations:

1. The City operates three facilities that are subject to the NPDES Stormwater Multi-Sector General Permit (MSGP) for Industrial Facilities (Peirce Island Wastewater Treatment Plant, Pease Tradeport Wastewater Treatment Plant, and the Portsmouth Public Works Facility). This set of regulations requires the City prepare and implement Stormwater Pollution Prevention Plans (SWPPPs) for each of the three facilities.
2. The City's storm drain system discharges are subject to the NPDES Stormwater Phase II Municipal Separate Storm Sewer System (MS4) General Permit. This component of the Phase II regulations requires that the City prepare and implement a five-year plan to reduce the discharge of pollutants from the MS4 to the maximum extent practicable; protect water quality, and satisfy the water quality requirements of the Clean Water Act and state water quality standards.

As with all regulations, compliance with these two components of the Phase II regulations requires that the City of Portsmouth conduct additional operation and maintenance activities and make additional capital expenditures. Although the City employees have already undertaken significant steps to evaluate and respond to these components of the Phase II regulations, they hired JEK to develop this Stormwater Master Plan to help prioritize their efforts.

This Stormwater Master Plan has been prepared through completion of the following tasks:

- Task 1 Regulatory Review of three SWPPPs and the City's five-year MS4 Plan
- Task 2 Stormwater Collection System Infrastructure Evaluation
- Task 3 Operation and Maintenance Program Recommendations
- Task 4 Local Regulation and Ordinance Review
- Task 5 Funding Opportunities Evaluation

The results of each of these tasks are described briefly in the following sections of this Stormwater Master Plan Report. A full copy of each Task report is contained in its own appendix at the end of this Stormwater Master Plan Report. Tables 1 and 2 (located following Section 6) provide summary cost information for Capital Improvement expenditures and Operation and Maintenance recommendations (respectively) for each of the tasks.

## 2. TASK 1 REGULATORY REVIEW OF THREE SWPPPS AND THE CITY'S FIVE-YEAR MS4 PLAN

Task 1 of the Stormwater Master Plan required a regulatory review of the following:

- Three facilities that are subject to the NPDES Stormwater Multi-Sector General Permit (MSGP) for Industrial Facilities (Peirce Island Wastewater Treatment Plant, Pease Tradeport Wastewater Treatment Plant, and the Portsmouth Public Works Facility).
- The City's five-year Stormwater Management Plan and Permit Year 3 Annual Report which are required by the NPDES Stormwater Phase II Municipal Separate Storm Sewer System (MS4) General Permit.

The goal of the regulatory review was to assess general compliance with the requirements of both regulations (MSGP and MS4 General Permit) and to estimate the costs associated with compliance. The regulatory review also provided a specific assessment of the cost associated with compliance as it relates to discharges to waters on the New Hampshire Department of Environmental Services' (NHDES) 2006 303(d) list of Impaired Surface Waters.

To complete the regulatory review, Jacobs Edwards and Kelcey (JEK) toured each of the three facilities subject to the MSGP with Ms. Paula Anania and Ms. Silke Psula, reviewed the facility SWPPPs, and compared the SWPPPs to the Draft MSGP for Industrial Activities that was issued by the USEPA in 2006. JEK also reviewed the City's five-year plan and Permit Year 3 Annual Report for the MS4 General Permit. Results of the reviews were compiled in a Regulatory Review report. A copy of the full report is contained in Appendix A.

### 2.1 REGULATORY REVIEW CAPITAL RECOMMENDATIONS

As a result of the regulatory reviews, it was determined that there are no necessary Capital Improvement expenditures associated with maintaining regulatory compliance with the Draft MSGP 2006 regulations and the MS4 General Permit.

It should be noted that many wastewater treatment plants have completed capital improvements or are designed to collect all stormwater runoff and discharge the runoff into the treatment works so that the facility can achieve a No Exposure certification. JEK discussed this possibility with Ms. Anania and Ms. Psula and determined that it would not be a reasonable option to pursue at this time.

## **2.2 REGULATORY REVIEW OPERATION AND MAINTENANCE RECOMMENDATIONS**

The operation and maintenance costs shown in Table 2 related to the three facilities' SWPPPs result from the following General Permit requirements:

1. Annual training of all employees in Stormwater Pollution Prevention.
2. Visual inspection of discharges from the facilities' outfalls on a quarterly basis.
3. Routine facility inspections on a monthly basis.
4. Annual Monitoring for enterococcus at Peirce Island WWTP, for chloride, E. coli, dissolved oxygen, and pH at Pease Tradeport WWTP, and pH and E. coli at the Public Works Facility.
5. Annual Site Compliance Evaluations for all three facilities.
6. Correction of any issues identified during the inspections or monitoring activities.

The costs shown in Table 2 that are related to the City's MS4 Plan and Permit Year 3 Annual Report result primarily from impaired water issues. Because most of the waters in the City of Portsmouth are listed by the New Hampshire Department of Environmental Services (NHDES) as impaired waters, the City must closely track and report a number of items on their Annual Report. Table 1 shows that the current financial impact of discharging stormwater to impaired waters is not significant. However, the cumulative effect of these discharges is growing and the following subsections present capital and operation and maintenance programs designed to minimize the future impact.

### 3. TASK 2 STORMWATER COLLECTION SYSTEM INFRASTRUCTURE EVALUATION AND CAPITAL IMPROVEMENT PLAN

Task 2 of the Stormwater Master Plan contract consisted of two parts:

- Task 2A of the Master Plan contract required conducting field inspections to assess the condition and illicit discharge status of a portion of the storm drain system. The field activities and Stormwater Master Plan help fulfill the City's Stormwater Phase II Municipal Separate Storm Sewer System (MS4) General Permit conditions for Illicit Discharge Detection and Elimination (IDDE) and Pollution Prevention/Good Housekeeping.
- Task 2B summarized the Capital Improvement Recommendations for the immediate future, five-year, 10-year and 1five-year time frames based on the findings of the field inspections.

Copies of the Task 2A and Task 2B Memoranda are contained in Appendices B and C, respectively.

#### 3.1 TASK 2A FIELD INSPECTION RESULTS

The Task 2A Memorandum summarized the work completed under Task 2A including: (1) the method and rational used to select structures targeted for the field inspection, (2) a description of the areas where field inspections were completed, (3) the methodology used to complete the inspections, and (4) a summary of the data collected including significant findings that will impact Capital Improvement Planning and Operation and Maintenance activities for the City.

Because the scope of this project limited the amount of storm drain system that could be inspected, Jacobs Edwards and Kelcey (JEK) worked with the City to identify a subset of areas for data collection that would achieve the following goals:

- Fulfill Stormwater Phase II requirements for assessment of illicit discharges at most storm drain outfalls.
- Be representative enough of the storm drain system that an estimate of the accuracy of the existing mapping can be made.
- Be representative enough of the storm drain system that condition information can be extrapolated to provide Capital Improvement and Operation and Maintenance recommendations for the entire system at the planning level.

To achieve these goals, JEK met with the City on two different occasions to define where and how inspections would be completed. During the first meeting (June 16, 2006) it was decided

that JEK should initially focus on conducting illicit discharge and condition inspections for outfalls. During the second meeting (July 13, 2006), when the outfall inspection phase was substantially complete, JEK and the City met to discuss what areas to target as high priority areas for infrastructure data evaluation (assessment of catch basin and drain manhole condition, assessment of pipe condition to the extent possible using a flash digital camera on an extension pole, and assessment of the accuracy of the existing GIS pipe network).

The field work was completed over a six week period in June and July 2006. Figures 1 and 2 show the locations where outfall inspections and condition assessments were conducted.

### **3.2 TASK 2B FINDINGS OF THE FIELD INVESTIGATION**

The Task 2B Memorandum summarized the findings of the field investigations and presented recommendations for a Stormwater Capital Improvement Program. This subsection summarizes the findings of the program. Subsection 3.3 summarizes the Capital Improvement recommendations based on the findings.

- Inspection data was collected for 317 of the outfall structures. JEK estimates the City has approximately 450 outfalls total (not including combined sewer outfalls).
- Of the 317 outfalls inspected, 33 are classified as major outfalls (greater than 36 inches); 185 are classified as minor outfalls; and 99 are either culverts or may be privately owned.
- Qualitative data at the 317 outfalls were collected for the purposes of evaluating illicit discharge potential including: color of discharge, presence of foam, presence of pipe staining, presence of algae, presence of oil film, presence of vegetative matting, presence of sewage solids, presence of musty odors, presence of laundry-like odors, presence of sewage-like odor, presence of petroleum-like odor, indication of discharge clarity, and indication of discharge opaqueness. Each illicit discharge characteristic that was observed was assigned a numeric value. If more than one characteristic was exhibited, the numbers were added together. The highest score an outfall could exhibit for illicit discharge potential was 91. The following is a summary of the results of illicit discharge potential scores for the 317 outfalls that were inspected:

3 outfalls scored >25  
22 outfalls scored 15-25  
20 outfalls scored 10-14  
60 outfalls scored 1-9  
212 outfalls scored 0  
317 Total outfalls inspected



Infrastructure condition was evaluated during the outfall inspections and during a separate mapping and catch basin condition evaluation following the outfall inspections.

Results of the infrastructure evaluation reveal that the City of Portsmouth storm drain infrastructure consists of approximately 323,000 lineal feet of pipe, 3,700 catch basins or drain manhole structures, and 450 outfalls. These estimates do not include the infrastructure that is part of the Long Term Control Plan to separate the combined sewer system. JEK's findings and recommendations are based on condition evaluation of the 53 catch basin/drain manhole inspections, 317 outfall inspections and re-mapping of 25,500 lineal feet of infrastructure.

During the infrastructure evaluation, the following immediate and five-year condition issues were identified related to capital improvements:

- Approximately 16,500 lineal feet of pipe is estimated to need replacement based on a pipe condition rated as poor or failing condition, or because it is made of vitrified clay material (based on observations at 65 structures with these criteria).
- 19 of the 53 catch basins or drain manholes inspected (36%) were observed to be in failing or poor condition.
- 35 outfalls and 5 catch basins were observed to have a pipe material of corrugated metal. The design life of this material is typically 5 years.
- 60 outfall aprons were observed to be in failing or poor condition (19% of those observed).

Figure 3 shows the locations of the structures identified with immediate and five-year condition issues. It should be noted that JEK observed only the end of the pipes (at either a catch basin, drain manhole, or outfall inspection) and therefore it is not possible to know the condition of the pipes' interior. Typical storm drain pipe lengths are approximately 250 feet between structures. Also, because it is more cost effective to complete storm drain infrastructure replacement in conjunction with other infrastructure work that needs to be done, such as road reconstruction or sanitary sewer repairs, the immediate and five-year condition issues have been grouped into distinct projects as described in the following recommendations section.

### **3.3 TASK 2B CAPITAL EXPENDITURES RECOMMENDATIONS**

For Capital Planning, the City of Portsmouth defines Capital Expenditures as non-recurring items greater than \$50,000 and Operation and Maintenance Activities as those less than \$50,000. As shown on Table 1, the following immediate capital expenditures are being recommended based on JEK's field data collection efforts.

Immediate Capital Expenditures:

- Complete outfall inspections: 317 of the 450 outfalls have been inspected, the remaining 133 outfalls still need to be inspected for illicit discharges, evaluated for condition, and confirmed regarding location in the existing GIS. These inspections are being classified as capital expenditures because it is anticipated the work will be outsourced.
- Field check of mapping: The City has a GIS layer showing structures and pipes. The structures (catch basins and drain manholes) were located using GPS. The pipe connections were based on review of digital Planning Board submittals, where available, and on staff knowledge of topography where Planning Board submittals were not available. JEK's review of mapping accuracy (based on only 5% of the City's stormdrain system) shows the pipe configurations are 30% correct. The level of mapping described below would assist greatly in addressing illicit discharge detection and elimination and flooding issues by identifying subcatchment areas for each major and minor outfall. Mapping tasks that remain to be completed are:
  - a. Confirm locations of separated storm drain pipes by opening all catch basin/drain manhole covers and collecting depth to invert and size of pipe information. Review paper copies of Planning Department submittals to confirm ownership and assist in developing hydraulic connections.
  - b. Complete rim elevation survey to confirm hydraulic direction of pipes.
- Purchase a new vacuum truck to conduct catch basin cleaning on a regular basis to remove sediment from structures (based on observations at 43 of 317 outfalls that were either plugged with sediment or filled  $\frac{3}{4}$  full or  $\frac{1}{2}$  full and observations at 14 of 53 outfalls that were either critical or full of sediment).

Five (5), Ten (10), and Fifteen (15)- Year Capital Expenditures:

Recommendations for capital improvement program funding for the five-year, 10-year, and 15-year planning purposes is based on a 50-year replacement cycle or when the pipe shows a failing or poor condition (whichever comes first). The operation and maintenance program described in the Task 3 Memorandum contains a component to conduct regular televising to evaluate condition. Assuming the total length of the system is approximately 323,000 lineal feet, and a replacement cost of approximately \$80/lineal foot (assuming the system is constructed only as a component of a full road reconstruction project – not as a stand-alone project), the total value of the infrastructure is approximately \$25,000,000.

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The five-year capital improvement budget, is a planning budget only for projects yet to be determined in Areas A, B, and C, (see Figure 3) where poor condition was observed at the end of the pipes in the field. Because the observations made during the field inspections were only at the end of each pipe (either an outfall or in a catch basin), it was not possible to determine if the entire pipe should be replaced. Televising is the most reliable and accurate method to use in making this decision. The Task 3 Memorandum (Appendix D) contains a recommendation to televise Areas A, B, and C shown on Figure 3 for purposes of developing a better budget number.

The City should budget approximately \$500,000 per year for replacement for the 10-year and 15-year planning cycles to maintain the infrastructure in a fair to good condition, which should minimize catastrophic failures and help improve water quality in the long term.

## **4. TASK 3 OPERATION AND MAINTENANCE PROGRAM RECOMMENDATIONS**

Task 3 of the contract requires that Jacobs Edwards and Kelcey (JEK) prepare an Operation and Maintenance (O&M) plan for the storm drain system including:

- A projection of staffing needs to fulfill the capital projects identified in Tasks 1 and 2 of the contract (Task 1 is a regulatory review and Task 2 is an evaluation of the infrastructure),
- A prioritization of problem maintenance areas with a cleaning and maintenance schedule for the infrastructure based on Tasks 1 and 2 of the contract, and
- A projected budget to support the O&M plan in the immediate future, within the next 5-, 10-, and 15-years.

A copy of the Task 3 Memorandum is contained in Appendix D.

### **4.1 IMMEDIATE O&M RECOMMENDATIONS**

The infrastructure evaluation (Task 2), identified several operation and maintenance issues that are being recommended for immediate attention. The issues are generally related to the catch basins, outfalls, and pipes that were observed to be plugged with sediment to the extent that they likely do not function properly. These pipes and catch basins should be cleaned immediately. In some cases, the sediment and physical condition was severe enough that televising is also being recommended to more fully assess the condition of the entire pipe (Areas A, B, and C shown on Figures 3 and 4).

### **4.2 LONG TERM O&M RECOMMENDATIONS**

Regular maintenance of the storm drain infrastructure has never been part of the City's general operations budget. Historically, maintenance of the storm drain infrastructure has only been completed as part of other capital projects or when a critical failure occurs.

Because of conditions observed in the existing storm drain system and of the regulatory requirements of the Stormwater Phase II program, a more formalized operation and maintenance program is necessary, and has been developed for the 5-, 10-, and 15-year recommendations. Though the narrative requirements of the regulation are not specific, the operation and maintenance program must be developed to protect water quality to the "maximum extent practical". The following operation and maintenance program was designed in consultation with

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City of Portsmouth staff to minimize impacts to water quality and to maintain a fair to good quality of infrastructure to maximize its life-cycle effectiveness. The program generally consists of the following:

1. Catch Basins/Drain Manholes: If sediment is allowed to build up in catch basins and drain manholes to the extent that it discharges into waterbodies, it can suffocate critical species and carry other pollutants into the waterbody, resulting in decreased water quality. While removing sediment from catch basins, illicit discharges would be identified and the condition of the catch basins would be reviewed. All 3,700 catch basins and drain manhole structures would be inspected at least once per year.
2. Pipe System: The approximate 323,000 lineal feet of storm drain pipe that makes up the City's storm drain infrastructure is valued at approximately \$25,000,000. Televising storm drain system pipes on a regular basis is an efficient and effective way to identify illicit discharges and evaluate the condition of the pipes. A regular televising and subsequent maintenance program would minimize the potential for catastrophic events (pipe collapse, illicit discharge). The pipes comprising the storm drain system would be televised on a ten-year rotating cycle. Cleaning would be conducted when the inspections show sediment, debris, or roots that fill approximately one-third of the pipe.
3. Outfalls: Based on Task 1 and Task 2 recommendations, an illicit discharge detection and elimination program should include an outfall inspection program to determine if any illicit discharges are occurring. The inspection program is as follows:
  - a. 40 Major outfalls (>36 inches) and 70 outfalls designated as high priority (those discharging to North Mill Pond and Back Channel (impaired waters) would be inspected annually.
  - b. 110 Minor outfalls ( $\leq$ 36 inches) and outfalls in medium priority areas would be inspected on a 2-year rotating cycle (55 per year). No culverts would be inspected.
  - c. Any outfalls with an illicit discharge potential score of 25 or greater would be traced (televised) within 6 months of discovery.
  - d. Apron repairs would be required on a 20-year rotating cycle (outfalls and culverts).
4. Mapping: As the system expands and changes, the City's GIS system would need to be revised and updated. An approximate budget item has been added to account for staff time and license fees.
5. Capital Oversight: Staff time has been estimated to provide contract administration and field inspection for the capital projects identified in the Task 2B Memorandum.

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The Operation and Maintenance recommendations here are for the portions of the sewer system that are not part of the Long Term Control Plan (LTCP) to separate the combined sewer system. As progress is made in the LTCP in separating sewers, more infrastructure will need to be maintained under the Stormwater Master Plan program.

Additionally, as the overall system is better maintained, its life will be extended; therefore the need for unanticipated maintenance and emergencies will decrease, and the impact on waterbodies will be lessened.

## 5. TASK 4 LOCAL REGULATION AND ORDINANCE REVIEW

Task 4 of the contract requires that Jacobs Edwards and Kelcey (JEK) review selected ordinances for compliance with the USEPA Stormwater Phase II Municipal Separate Storm Sewer System (MS4) General Permit. The MS4 General Permit requires ordinance changes associated with three of the Minimum Control Measures (MCMs): (1) MCM 3 Illicit Discharge Detection and Elimination, (2) MCM 4 Construction Site Stormwater Runoff Control, and (3) MCM 5 Post Construction Stormwater Management in New Development and Redevelopment. As such, JEK has reviewed the following ordinances for compliance with associated MCM requirements:

- Draft Ordinance titled: “Regulation of Discharges into Stormwater Drainage System” for compliance with the requirements of MCM 3 Illicit Discharge Detection and Elimination (IDDE).
- Site Plan Review, Subdivision, and General Zoning Ordinances for compliance with the requirements of MCM 4 Construction Site Stormwater Runoff Control and MCM 5 Post Construction Stormwater Management in New Development and Redevelopment.

A copy of the full Task 4 Memorandum is contained in Appendix E. A summary of JEK’s findings is presented in the following subsections for each of these reviews.

### 5.1 REVIEW OF DRAFT ORDINANCE TITLED: REGULATION OF DISCHARGES INTO STORMWATER DRAINAGE SYSTEM

The City of Portsmouth provided JEK a draft of this ordinance dated January 10, 2006. The Draft Ordinance reviewed by Edwards and Kelcey is contained in Attachment A to the Task 4 Memorandum. The Draft Ordinance generally conforms to the requirements of the MS4 General Permit.

### 5.2 REVIEW OF SITE PLAN REVIEW, SUBDIVISION, AND GENERAL ZONING ORDINANCES FOR MCM 4 AND MCM 5:

JEK reviewed the subject ordinances for compliance with the requirements of MCM 4 Construction Site Stormwater Runoff Control and MCM 5 Post Construction Stormwater Management in New Development and Redevelopment.

The Zoning Ordinances that were provided by the City of Portsmouth and reviewed by JEK were last amended on December 18, 1995. The Site Review Regulations and Subdivision Rules and Regulations that were reviewed were last revised by the Planning Board on March 16, 2006.

Both the Construction and Post Construction MCMs are fulfilled in part by the State of New Hampshire Site Specific Permit Requirements. Data gaps to fulfill the remainder of the MCM requirements are described below for MCM 4 and MCM 5.

**5.2.1 Construction Runoff Control Recommendations**

It should be noted that development in New Hampshire that disturbs greater than one acre of soil is required to conform to the USEPA Construction General Permit (CGP). The MS4 General Permit allows the City to rely on the USEPA CGP and the Site Specific Permit as “other regulatory mechanisms” to fulfill the majority of the City’s requirement. The full Task 4 Memorandum contained in Appendix E provides recommendations related to MCM 4 Construction Site Stormwater Runoff Control. The recommendations provided are oriented towards ensuring that local developers are aware of and follow the USEPA CGP and Site Specific Permit.

**5.2.2 Post Construction Runoff Control Recommendations**

The Task 4 Memorandum also provides recommendations related to MCM 5 Post Construction Stormwater Management in New Development and Redevelopment. The Memorandum shows that the State Requirement for a Site Specific Permit only fulfills a small portion of this MCM requirement. The Site Specific Permit (and its recommended design manual – The BMPs for Urban Stormwater Runoff) does not effectively require any significant quality control of stormwater runoff. Most model ordinances for post construction recommend promoting groundwater recharge, surface water quality protection, and stream channel protection in addition to the flood control that has historically been used. Recommendations to this effect are contained in the Memorandum.

The City’s ordinances do contain language that reflects its intent to protect water quality from the detrimental effects of development. However, the content of the ordinances is not specific in providing developers with any information on what the stormwater issues are or which stormwater management techniques should be applied during design to control post construction runoff, especially for water quality issues. According to the City Planning office, historically many developers have used discharge through buffers to wetlands as a disposal method for stormwater. This practice has resulted in decreased wetland quality. The language in the Inland Wetlands Protection District was designed to protect the wetlands; however additional modification may be required to fulfill its intent.

An October 18, 2006 letter from the Hodgson Brook Restoration Project to the Planning Board describes suggested changes to the ordinances related to stream buffer protection. The Hodgson Brook Restoration Project recommendations are consistent with the recommended changes to



fulfill MCM 5 Post Construction requirements. The recommendations show that the City should consider developing water quality protection related standards (such as Smart Growth practices and Low Impact Design practices) to fulfill the MCM 5 Post Construction requirements.

The Planning Board and Public Works departments confirm that although there are no specific requirements to promote Smart Growth practices or Low Impact Design, developers are designing with quality considerations more frequently than in the past. Formalizing these requirements through ordinance and regulation will standardize their practice.

A second major component of the MCM 5 Post Construction relates to long-term maintenance of stormwater management infrastructure (such as vegetative buffers, wet ponds, level spreaders, catch basins, or pipes). Generally, compliance with the maintenance component of this MCM is directly related to the City's policies regarding acceptance of new roads and its associated storm drain infrastructure. If the City is diligent about requiring that new roadways and infrastructure be designed and constructed to the City standards and accepts them as public infrastructure that they maintain through their regular maintenance program, then only minor changes need to be implemented to comply with this MCM. The Task 4 Memorandum identifies that a stormwater user fee can assist in funding this type of policy.

However, the City of Portsmouth generally allows new roads and its storm drain infrastructure to remain in private ownership. Maintenance of new private storm drain infrastructure will require significant additional changes to the ordinances for the City, and will require significant oversight to ensure the private owners are adequately maintaining the infrastructure.

### **5.3 COSTS ASSOCIATED WITH RECOMMENDATIONS**

Because significant additional decision making is required by the City in order to implement the recommendations provided in the Task 4 Memorandum, no costs were required to be provided for this local ordinance review.

## 6. TASK 5 FUNDING OPPORTUNITIES EVALUATION

Under Task 5 of the Stormwater Master Plan contract, Jacobs Edwards and Kelcey (JEK) proposed and assessed a suite of grant opportunities and funding options to assist the City in securing financial support for the expenditures identified in Tasks 1 through 4 of the Stormwater Master Plan.

Traditionally, the City has paid for any stormwater infrastructure operation & maintenance and capital improvement projects through bonds and the general tax fund. The scope of the Stormwater Master Plan recommendations will likely require more financial support than the general tax fund will provide. The Task 5 Memorandum describes the following considerations for grant, bond, and user fee opportunities that are available to fund the Stormwater Master Plan:

*Grant Funding:* Although there are some grants available to help implement the Stormwater Master Plan, grant funding has the disadvantage of being unreliable as a consistent source of revenue and should only be counted on for single-event projects that are not considered a high priority. Often grant funding is useful for non-structural programs, for project enhancements, or for non-critical projects that would not be constructed unless grant funds are available.

*Bonding:* Bonding is useful only for initial capital improvement and cannot be applied to address the long-term maintenance issues identified in the Stormwater Master Plan. Bonding is not a funding source like property or employment taxes or service fees but, rather, is a mechanism for borrowing money to make an investment in facilities, land acquisition, or major equipment. It is recommended that the City use a combination of bonding and user fees.

*User Fees:* Whether in the form of plan and inspection fees or a stormwater utility, user fee funding has several advantages over other competing forms of finance including its equitability, stability, and adequacy. The New Hampshire Department of Environmental Services and the Attorney General's office have reviewed existing state utility legislation and determined that the existing Village District Statute (RSA 52) may allow communities to raise funds to pay for stormwater expenditures. City Counsel should be consulted to determine if the City agrees with this determination.

Choosing the appropriate funding mechanisms will require additional effort. The Task 5 Memorandum recommended a four-prong approach to funding the Stormwater Master Plan:

1. Maximize grant opportunities to pay for smaller program elements
  - a. NH Coastal Program Competitive Grant
  - b. FEMA Pre-Disaster Mitigation Program
  - c. NHDES Watershed Assistance and Restoration Grant

2. Establish ancillary fees to pay for pieces of the programs
  - a. Further exploration is needed to identify program fees
3. Begin a 2 to 3 year effort to bring stormwater utility legislation to the state
  - a. Review of Village District option by City Counsel
  - b. Consider promoting modification to existing legislation by contacting local representatives, or coordinating with other interested municipalities: Merrimack, Concord, Franklin, Dover.
4. Request tax support (general fund) for a dedicated amount to cover the following:
  - a. Immediate (18 months) needs identified in the SWMP

**Appendix A**

**TASK 1 REPORT - REGULATORY REVIEW**

**Appendix B**

**TASK 2A MEMORANDUM SUMMARY OF FIELD DATA COLLECTION  
PROGRAM AND TRANSMISSION OF DATA FILES**

**Appendix C**

**TASK 2B MEMORANDUM – STORMWATER CAPITAL IMPROVEMENT  
PROGRAM**

**Appendix D**

**TASK 3 MEMORANDUM – STORMWATER OPERATION AND MAINTENANCE  
PLAN**

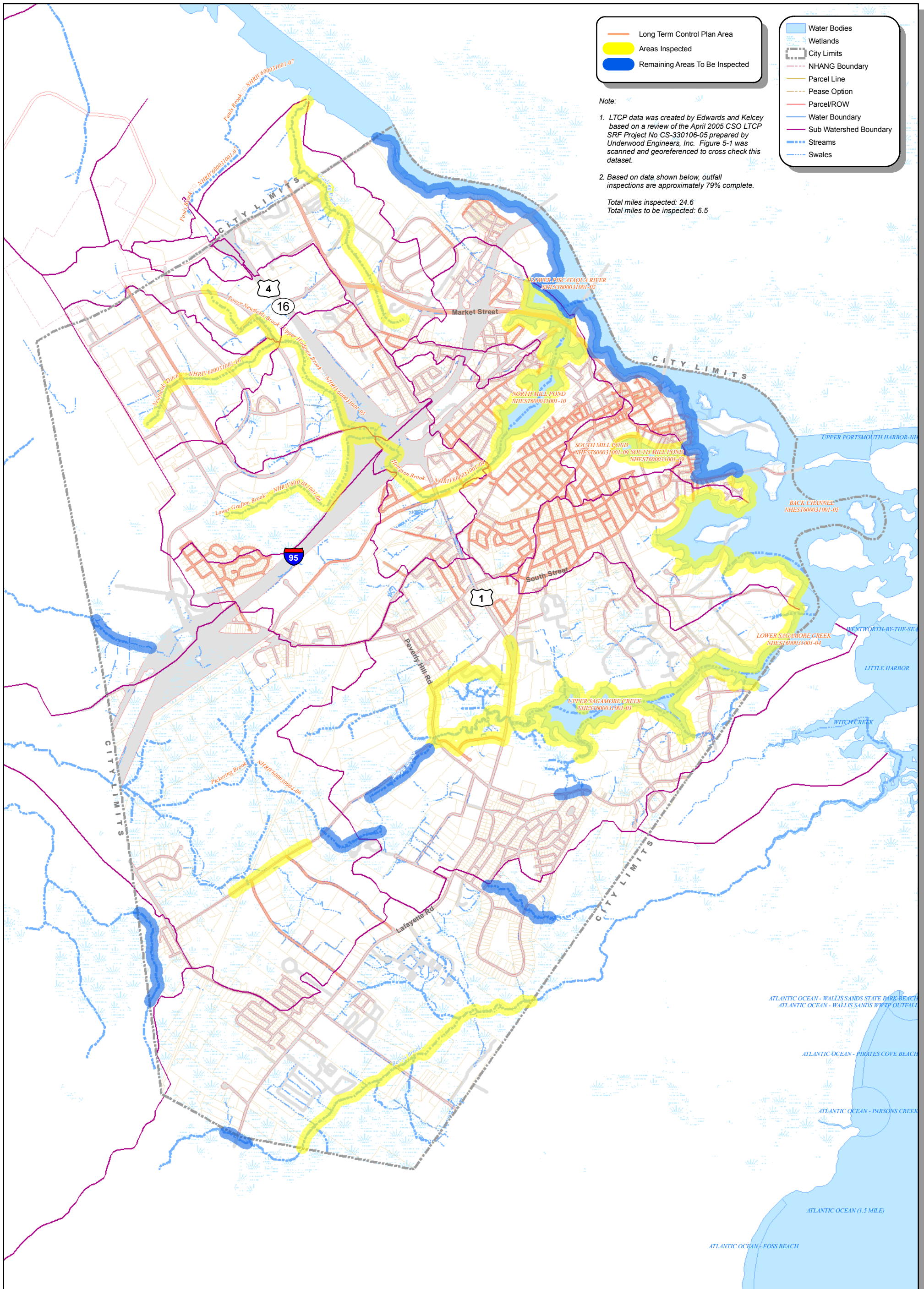
**Appendix E**

**TASK 4 MEMORANDUM – LOCAL ORDINANCE REVIEW**



**Appendix F**

**TASK 5 MEMORANDUM – FUNDING OPPORTUNITIES EVALUATION**



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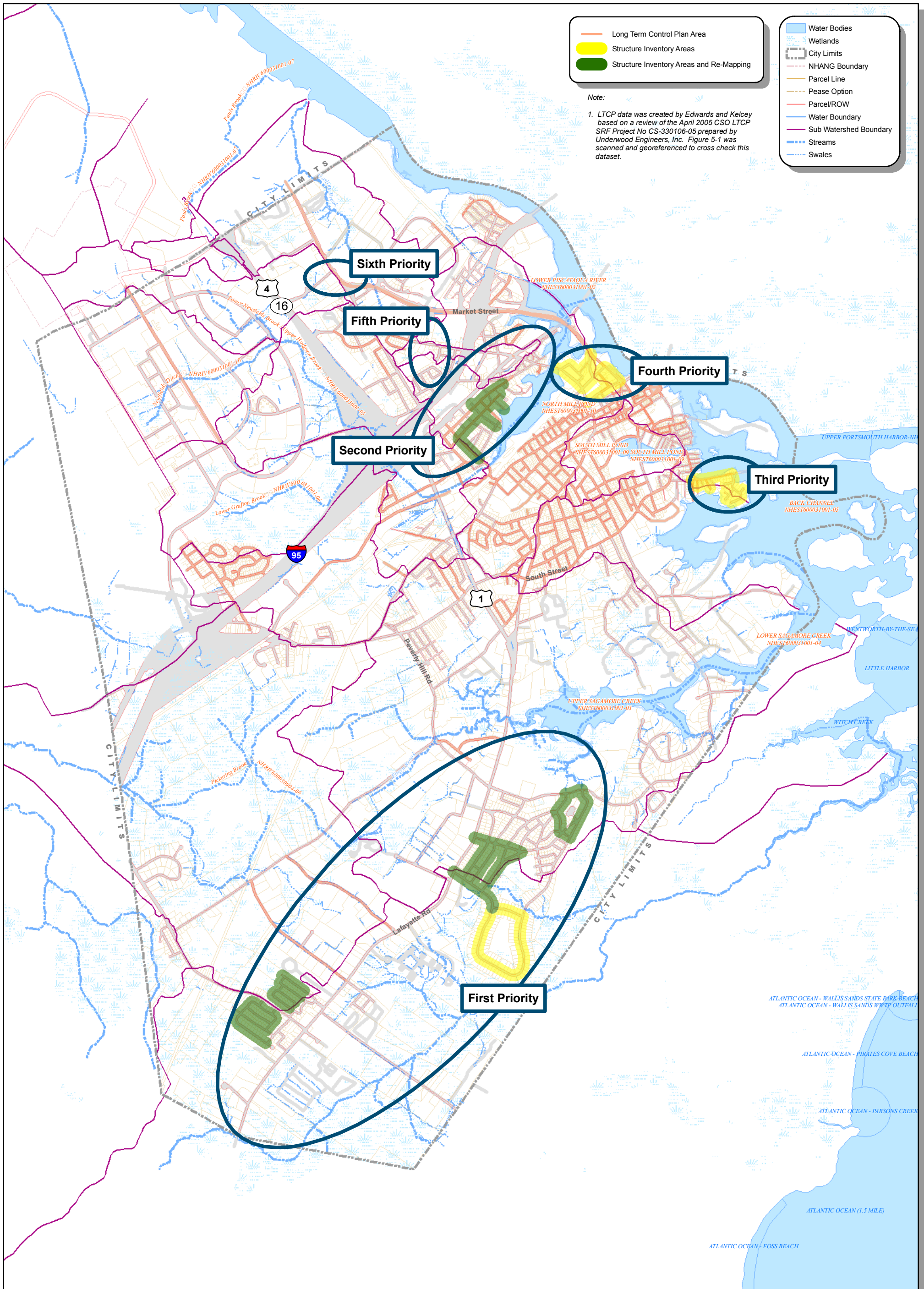
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# Figure 1 Extent of Outfall Mapping and Inspections

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City of Portsmouth, New Hampshire





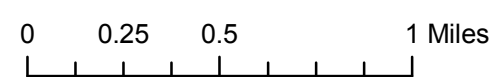
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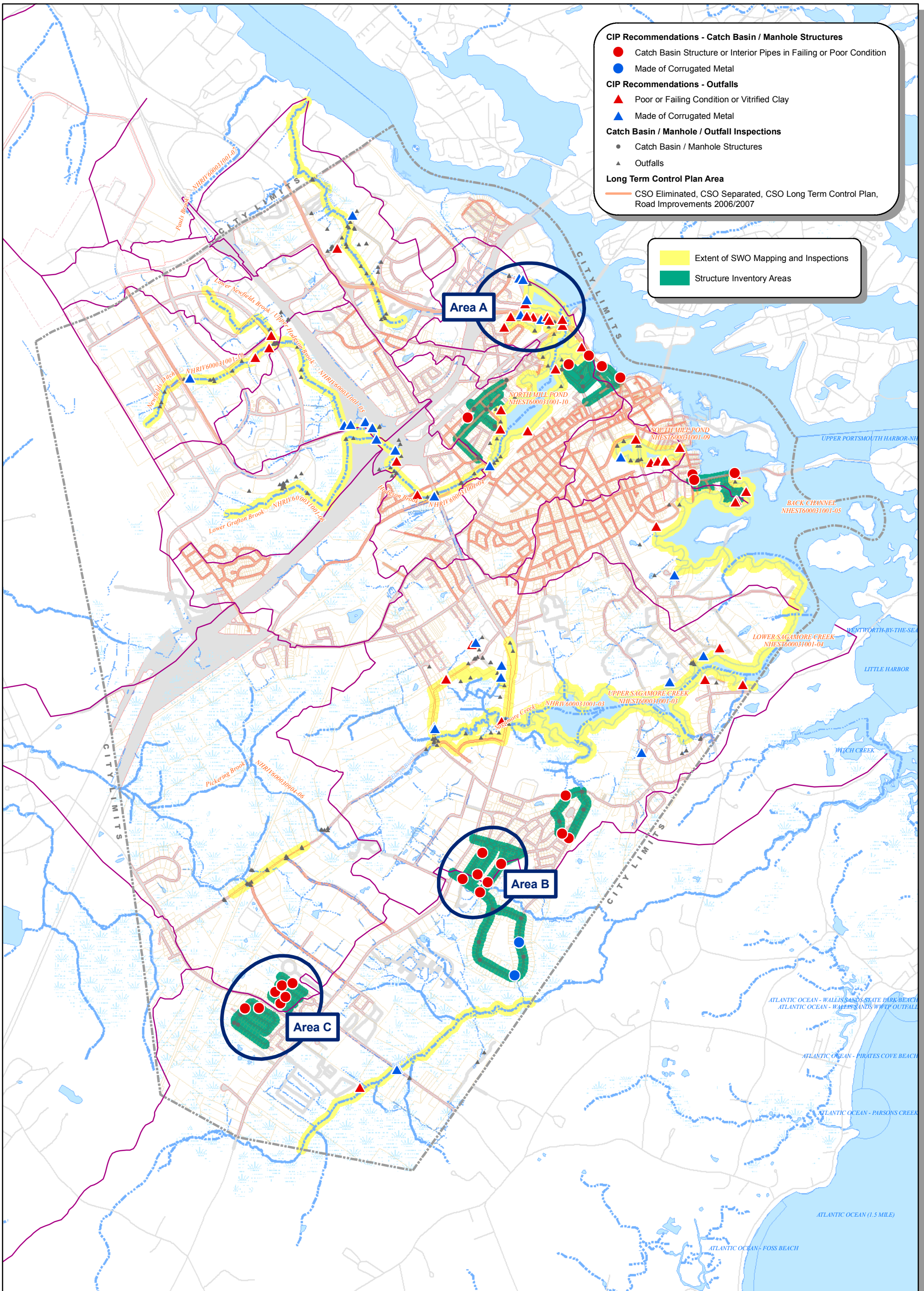
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## Figure 2 Extent of Structure Inventories and Mapping

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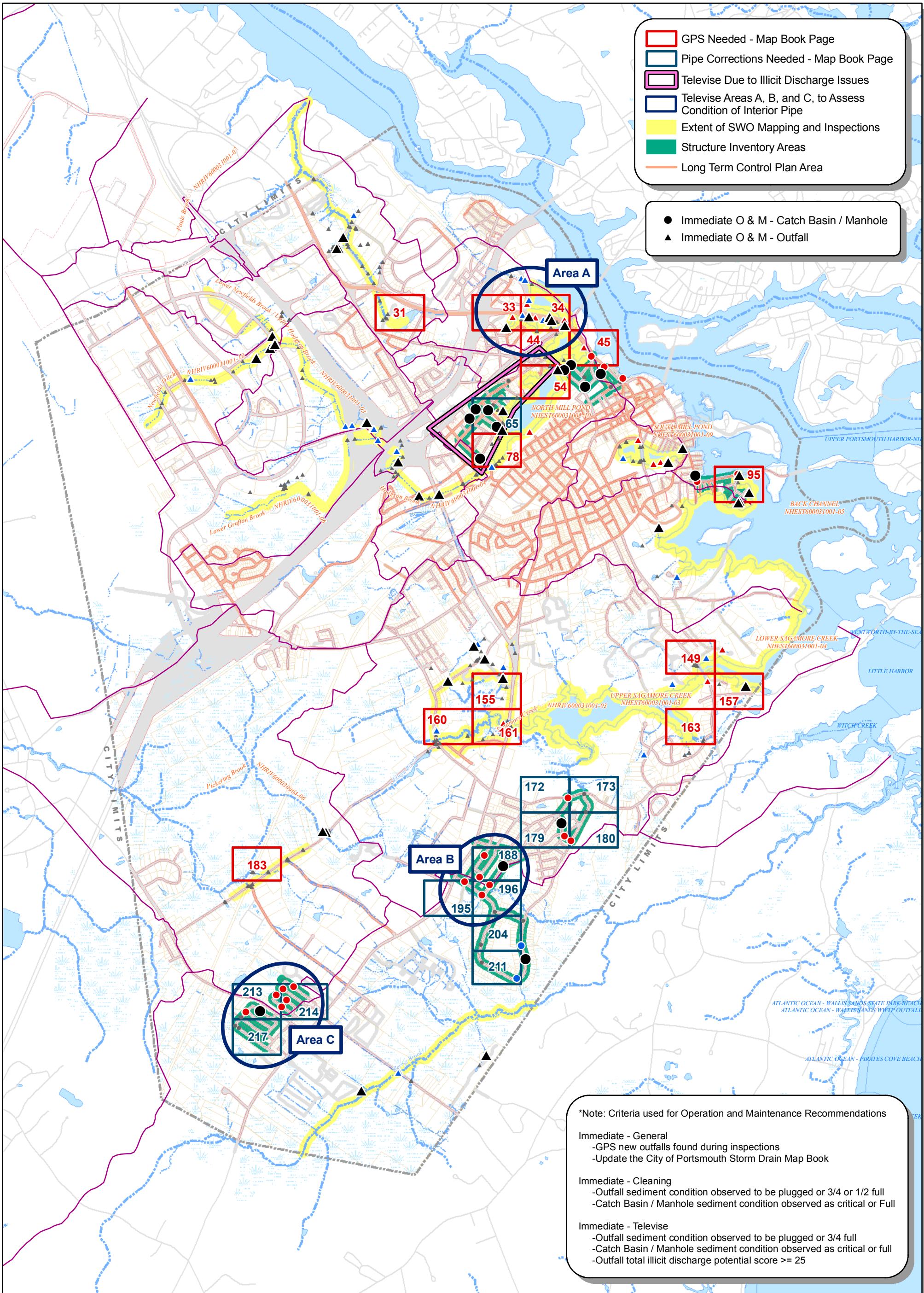
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**Figure 3**  
**Summary of Capital Improvement Recommendations**

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0 0.25 0.5 1 Miles  
 NORTH



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**Figure 4**  
**Summary of Operation and Maintenance Recommendations**

**Stormwater Master Plan Final Report**  
**City of Portsmouth, New Hampshire**

0 0.25 0.5 1 Miles  
 NORTH