

Chapter 2

Data Review

CHAPTER 2

DATA REVIEW

2.1 INTRODUCTION

This chapter provides an overview of information used in preparing the Needs Assessment Report for the Town of Barnstable CWMP project. It also identifies ongoing projects which are developing information that may be used by the CWMP project as it proceeds.

2.2 TECHNICAL REPORTS AND DATA

The following technical reports and data were reviewed for the Needs Assessment Report.

A. **“Final Wastewater Facilities Plan and Final Environmental Impact Report for Town of Barnstable”, March 2007, Stearns & Wheeler (2007 Wastewater Facilities Plan).** The 2007 Wastewater Facilities Plan (WWFP) summarizes the technical evaluations, project decision-making, and recommended plan to address the wastewater needs in Barnstable that were last identified in 1993. The 2007 Wastewater Facilities Plan was developed for the 20 year planning period of 1994 through 2014 (it is noted that the CWMP Project planning period starts in 2015 and runs through 2035 as identified in Chapter 1). Figure 2-1 illustrates the Wastewater Areas of Concern (AOC) that were evaluated.

The 2007 Wastewater Facilities Plan completed many detailed evaluations that will be used as a starting point for the CWMP Project.

There were four main documents that were developed for the 2007 Wastewater Facilities Plan:

1. “WWFP Needs Assessment Report”, December 1993, Stearns & Wheeler. This technical report summarized the first phase of the WWFP and identified wastewater needs at several town-wide wastewater Areas of Concern (AOC) and at the Hyannis WPCF

2. “WWFP Alternatives Screening Analysis Report”, February 1996, Stearns & Wheler. This technical report summarized the second phase of the WWFP and identified and screened (described and selected the best of) the possible solutions to address the wastewater needs identified in 1993.
3. “Draft Wastewater Facilities Plan and Draft Environmental Impact Report”, October 2006, Stearns & Wheler. This technical report summarized the detailed evaluations and decision-making process to develop the Draft Plan. These detailed evaluations and the draft plan took ten years to complete, and it utilized several sub-evaluations (and technical reports) that are identified later in this section.
4. “Final Wastewater Facilities Plan and Final Environmental Impact Report”, March 2007, Stearns & Wheler. This report finalized the planning project and addressed the questions and issues that were raised for the October 2006 Draft Wastewater Facilities Plan.

There were additional sub-evaluations that were documented in technical reports and memoranda, and were incorporated into the four main documents listed above. These sub-evaluation reports and technical memoranda are briefly listed below:

1. “WWFP Plan of Study”, 1990. This document was prepared to outline the needed steps of the whole WWFP process.
2. “Three Bay Nitrogen Evaluations”, December 1996, Town of Barnstable. This report summarized detailed evaluations completed by the Town to document nitrogen loading problems to the watershed of the Three Bay System of West Bay, Cotuit Bay, and North Bay (and its connected coves, creeks, and rivers). The evaluations utilized calculations developed by the Buzzards Bay Project that were accepted by the regulatory and scientific community before the Massachusetts Estuaries Project was established in 2002.
3. “Cape Cod Community College Wastewater Planning Evaluations”, January 1999, Stearns & Wheler. These evaluations were necessary when MassDEP identified the college as exceeding state standards for their on-site septic system. These evaluations were the basis of subsequent recommendations for the college to connect to the Hyannis WPCF.

4. Treated Water Recharge Evaluations and Interim Reports. From 1997 through 2005. The Town evaluated several treated-water recharge alternatives as listed below:

- a. Injection well pilot testing evaluations, September 2003.
- b. Benchmark evaluations to investigate groundwater mounding downgradient of the Hyannis WPCF, February 18, 2005.
- c. Preliminary evaluation of the McManus property for treated-water recharge, April 2002.
- d. Preliminary evaluation of the Barnstable Municipal Airport for treated-water recharge, April 2002.
- e. Preliminary evaluation of the Lorusso property for treated-water recharge, November 2003.
- f. Preliminary evaluation of the Cape Cod Community College for treated-water recharge, May 2004.
- g. Task 8 Report – Candidate site evaluation and comparison, draft report, December 30, 2003.
- h. Infiltration loading tests, McManus site, October 2005.

These evaluations were incorporated into the 2007 WWFP documents and recommended plan.

There were also several technical reports called Notices of Project Change (NPC) that described WWFP project changes and the need to make changes in project scope or implement portions of the emerging plan as funding became available. The NPC documents are formal applications to the Massachusetts Executive Office of Energy and Environmental Affairs (EOEEA) to request the change; and these documents resulted in approval certificates from EOEEA. The NPC documents are briefly listed below for requested changes in project scope and for implementation of upgrades at the Hyannis WPCF and the collection system.

1. NPC for Changes in Project Scope.
 - a. The March 1996 NPC summarized the main findings of the Phase I Needs Assessment Report and the Phase II Alternatives Screening Analysis Report for environmental review by Massachusetts EOE and the CCC and prepared a Project Scope for an expanded WWFP Project.
 - b. The June 23, 2003 NPC was prepared and submitted for environmental review because more than three years had passed since the last environmental review document, and because in 2003 there was a need for nitrogen management planning to address new nitrogen loading limits being developed by the Massachusetts Estuaries Project (MEP). The June 2003 NPC and resulting Secretary's Certificate limited the recommendations of the WWFP to the AOCs that had been recommended for connection to the Hyannis WPCF in the eastern portion of Barnstable. It was agreed that recommendations on the AOCs in the western part of Town that relied on non-nitrogen removal technologies to address failing or stressed septic system technologies should wait until the MEP was complete, the Town had the scientifically based nitrogen limits, and the nitrogen limits could be addressed through the Town's Nutrient Management Program.
2. NPC for Interim Implementation of upgrades at the Hyannis WPCF and in the collection system. The following upgrades at the Hyannis WPCF and collection system were made through the preparation and approval of several NPC documents:
 - a. Construction of a new secondary clarifier (Clarifier No. 3) at the Hyannis WPCF to address capacity limitations at the facility (completed in 1997).
 - b. Construction of the following sewer extensions completed in the late 1990's and early 2000's:
 - Sewer replacement and extension along Barnstable Road
 - Sewer replacement and extension along Bearses Way (this was the vacuum sewer project)
 - Sewer extension along Corporation Street
 - Sewer extension along Summerside Lane in Hyannis
 - Sewer repairs at Center Street in Hyannis

- ▶ Sewer extensions at Norris Street
 - ▶ Sewer (forcemain) extension to Cape Cod Community College as part of the Route 132 road reconstruction project
- c. Construction of treated-water forcemains as part of the Route 132 road reconstruction project.
- d. Construction of Hyannis WPCF Improvements in the late 1990's that included a new Blower building and conversion of the aeration tanks from surface aeration to diffused aeration.
- e. Construction of Hyannis WPCF Improvements (finished in 2009) that included:
- ▶ A third aeration tank
 - ▶ Pretreatment Building improvements
 - ▶ Primary Sludge Building improvements
 - ▶ Improved yard piping connections

The main findings of the documents identified above were incorporated into four main documents of the 2007 WWFP.

The main recommendations of the 2007 WWFP included:

1. Wastewater collection system extensions and improvements including:
 - a. Sewer extensions and upgrades completed with NPC approvals as listed above.
 - b. Upgrade of the Main Street Pump Station (PS) and connection of this PS with a new forcemain directly to the Hyannis WPCF. This recommendation was completed in 2009.
 - c. Remaining portions of the Cape Cod Community College sewer extension including:
 - ▶ Collection system and pump station at the college
 - ▶ Forcemain connection from the pump station at the college to the forcemain installed in Route 132 (close to the Exit 6 interchange)

- ▶ Forcemain connection from the previously installed forcemain in Route 132 (at the Bearses Way/Route 132 intersection) to the Hyannis WPCF
 - d. Sewer extension to the Stewarts Creek Area (AOC H1) to address failed septic systems and Board of Health concerns. This extension is currently under construction and is planned for completion in 2011.
 - e. New pump station at Lincoln Road and West Main Street with a forcemain to connect to the Hyannis WPCF to address bottlenecks in the West Main Street collection system and Board of Health concerns. This extension is currently under construction and is planned for completion in 2011.
 - f. Sewer extension to the Lake Wequaquet/Long Pond Area (AOC CE4) to address failed septic systems and Board of Health concerns. This extension was originally proposed for construction in 2010 and 2011 but the project did not receive Town Council approval due to opposition to the project by a portion of the area residents.
 - g. Sewer extensions to the Following Zone II drinking water protection areas including:
 - ▶ CO7 Zone II Area
 - ▶ BWST1A, B, and C Zone II Areas
 - ▶ BWME1 1 A and B Zone II Areas
- It is noted that the Wequaquet Lake/Long Pond Area (CE4) also includes a Zone II contributing area to the Barnstable Fire District Waster Department (BFD-WD) Wells.
- h. Sewer extensions to the following coastal protection areas to address failing septic systems and Board of Health concerns:
 - ▶ CE1 Area at the Craigville Beach area
 - ▶ CE2 Area at the Red Lilly Pond Area
 - ▶ H3 Area at the Hyannis port area
 - i. Sewer extension to the densely developed areas along Bearses Way where there is much housing stock and many failed septic systems.

- j. Old Colony Road pump station improvements to include:
 - New SCADA, pump controls and flow meters.
 - Further evaluations on the 10-inch force main to increase capacity and subsequent improvements.

- k. South Street gravity line replacements to address bottlenecks in this portion of the system.

- l. Possible West Main Street gravity line modification and replacements to increase capacity.

A cost summary on these recommendations is provided in Table 2-1.

- 2. Hyannis WPCF Improvements including:
 - a. Hyannis WPCF projects completed with NPC approvals as listed previously.

 - b. Effluent facility additions to allow 0.5 mgd treated-water recharge at the 6.9-acre site including:
 - Modifications to the pump gallery at the Hyannis WPCF
 - Effluent filtration and UV disinfection
 - Piping, valves and sand infiltration beds at the 6.9-acre site

 - c. Sludge Management improvements and addition of a new employee locker room including:
 - Additional thickened sludge storage
 - Additional waste activated sludge storage
 - Addition of a third sludge thickener in the Septage Building
 - Addition of a new employee locker and meeting room to replace the outdated existing one.

The new sludge management facility and employee locker room would be located south of the Septage Pretreatment Building and costs for these improvements are summarized on Table 2-2.

Table 2-1

Planning Conditions And Cost Summary^{(1) (2) (10)}

Sewer Extensions And Modifications Identified in 2007 WWFP

| | | | | | | | | | | | | | | | Fiscal, Legal, And Engineering | Total Capital | | | | | | | | | | | | | | |
|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|---|----------------------|---------------------------|-------------|---------------------------|--------|--------------|--------|-------------|-------------|-------------|--------------|-------------|-------------|--------------|-----|
| | | | | | | | | | | | | | | | Contractors General Conditions, Mobilization & Demobilization | Construction Cost | Contingency Cost (15%) | Cost (25%) | Cost | | | | | | | | | | | |
| | | | | | | | | | | | | | | | Restoration & General ⁽⁹⁾ | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | Pump Stations ⁽⁸⁾ | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | Low Pressure Sewer ⁽⁷⁾ | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | Force Main ⁽⁶⁾ | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | Gravity Sewers ⁽⁵⁾ | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | Length | Cost | Length | Cost | # G. Pumps ⁽⁴⁾ | Length | Cost | Number | Cost | | | | | | | |
| | | | | | | | | | | | | | | | Areas of Concern (AOC) | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | Sewer Extension and/or Improvement | | | | | | | | | | | | | | | |
| Main Street Pump Station Replacement | | | | | | | | | | | | | | | Construction was started in 2010 with completion scheduled for 2011 | | | | | | | | | | | | | | | |
| Main Street FM Modification and PS Modification | | | | | | | | | | | | | | | Completed in 2009 | | | | | | | | | | | | | | | |
| CE4 Area (Wequaquet Lake & Long Pond) ⁽³⁾ | | | | | | | | | | | | | | | 35,600 | \$5,500,000 | 17,700 | \$1,100,000 | 600 | 70,000 | \$13,200,000 | 4 | \$4,000,000 | \$4,400,000 | \$3,300,000 | \$31,500,000 | \$4,700,000 | \$7,900,000 | \$44,100,000 | |
| Area H1 (Stewarts Creek) | | | | | | | | | | | | | | | Construction was started in 2010 with completion scheduled for 2011 | | | | | | | | | | | | | | | |
| Zone II Protection Areas ⁽³⁾ | | | | | | | | | | | | | | | | | | | | | | | | | | | | \$0 | \$0 | |
| CO7 Area | | | | | | | | | | | | | | | 20,900 | \$3,300,000 | 0 | \$0 | 300 | 25,000 | \$4,800,000 | 0 | \$0 | \$1,700,000 | \$1,300,000 | \$11,100,000 | \$1,700,000 | \$2,800,000 | \$15,600,000 | |
| BWST1A Area | | | | | | | | | | | | | | | 44,600 | \$6,400,000 | 5,500 | \$280,000 | 100 | 7,100 | \$1,500,000 | 2 | \$2,000,000 | \$2,000,000 | \$1,500,000 | \$13,700,000 | \$2,100,000 | \$3,400,000 | \$19,200,000 | |
| BWST1B Area | | | | | | | | | | | | | | | 31,600 | \$5,000,000 | 4,400 | \$260,000 | 100 | 8,600 | \$1,700,000 | 2 | \$2,800,000 | \$1,500,000 | \$1,400,000 | \$12,700,000 | \$1,900,000 | \$3,200,000 | \$17,800,000 | |
| BWST1C Area | | | | | | | | | | | | | | | 22,400 | \$3,100,000 | 0 | \$0 | 0 | 0 | \$0 | 0 | \$0 | \$990,000 | \$550,000 | \$4,600,000 | \$700,000 | \$1,200,000 | \$6,500,000 | |
| BWMEL1A Area | | | | | | | | | | | | | | | 9,300 | \$1,400,000 | 3,900 | \$220,000 | 100 | 7,500 | \$1,500,000 | 1 | \$1,000,000 | \$660,000 | \$550,000 | \$5,300,000 | \$800,000 | \$1,300,000 | \$7,400,000 | |
| BWMEL1B Area | | | | | | | | | | | | | | | 4,800 | \$770,000 | 0 | \$0 | 0 | 0 | \$0 | 0 | \$0 | \$220,000 | \$110,000 | \$1,100,000 | \$200,000 | \$300,000 | \$1,600,000 | |
| Coastal Protection Areas | | | | | | | | | | | | | | | | | | | | | | | | | | | | | \$0 | \$0 |
| CE1 Area | | | | | | | | | | | | | | | 7,800 | \$1,200,000 | 6,200 | \$330,000 | 50 | 3,100 | \$550,000 | 1 | \$1,000,000 | \$440,000 | \$330,000 | \$3,900,000 | \$600,000 | \$1,000,000 | \$5,500,000 | |
| CE2 Area | | | | | | | | | | | | | | | 6,200 | \$1,100,000 | 3,500 | \$220,000 | 100 | 6,800 | \$1,300,000 | 1 | \$1,000,000 | \$55,000 | \$550,000 | \$4,200,000 | \$600,000 | \$1,100,000 | \$5,900,000 | |
| H3 | | | | | | | | | | | | | | | 13,000 | \$2,000,000 | 4,600 | \$330,000 | 250 | 4,000 | \$770,000 | 1 | \$1,000,000 | \$660,000 | \$440,000 | \$5,200,000 | \$800,000 | \$1,300,000 | \$7,300,000 | |
| Bearses Way Densely developed Area | | | | | | | | | | | | | | | 24,100 | \$3,700,000 | 0 | \$0 | 100 | 11,200 | \$2,200,000 | 0 | \$0 | \$1,200,000 | \$880,000 | \$8,000,000 | \$1,200,000 | \$2,000,000 | \$11,200,000 | |
| Old Colony Road PS Improvements | | | | | | | | | | | | | | | | | | | | | | | \$340,000 | | | \$340,000 | \$60,000 | \$100,000 | \$500,000 | |
| South Street Line Replacements | | | | | | | | | | | | | | | 3,000 | \$620,000 | | | | | | | | \$220,000 | \$110,000 | \$1,000,000 | \$200,000 | \$300,000 | \$1,500,000 | |
| West Main Street Line Replacements | | | | | | | | | | | | | | | 6,000 | \$1,600,000 | | | | | | | | \$480,000 | \$320,000 | \$2,400,000 | \$400,000 | \$600,000 | \$3,400,000 | |
| Components to Connect the CCCC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Route 132 Force Main (FM) | | | | | | | | | | | | | | | Completed in 2009 and paid by CCCC | | | | | | | | | | | | | | | |
| CC Community College Pump Station (PS) | | | | | | | | | | | | | | | To be paid by CCCC | | | | | | | | | | | | | | | |
| FM from Route 132 to WPCF | | | | | | | | | | | | | | | To be paid by CCCC | | | | | | | | | | | | | | | |
| Notes: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. All costs are referenced to June 2006, ENR 7700 and are for the facilities in the AOC as indicated in Figure 2-1. These costs are based on the AOC being implemented radially from the Hyannis WPCF outward to the AOC. If sewers are implemented in one of the more distant AOC before all of the transmission lines and pump stations are constructed in the closer AOC; the costs will need to be increased for the distant AOC to transmit the flow to the WPCF. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2. All costs are rounded to 2 significant digits except construction costs which have a high number of digits to avoid rounding error in the contingency. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3. The CE4 area also has portions located in a Zone II Protection Area | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4. "G. Pumps" is short for grinder pumps. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5. Gravity Sewer Components: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| a) 8- to 12-inch gravity sewer lines of \$90 to \$180/LF (where: \$90/LF for 0 to 12-foot depth and installation in a Town Road and \$180/LF for 12- to 18-foot depth and installation in a state road). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| b) Trench dewatering of \$100/LF. c) Service laterals of \$700 each. d) Lateral fittings of \$300 each lateral. e) 4-foot manholes at \$4,200 each. f) Miscellaneous (chimneys, cleanouts, etc.) at \$5,000 each. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6. Force Main Components: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| a) Force main lines of \$65 to \$100/LF depending on placement in Town or state roadways. b) Credit for a force main in a trench shared with a gravity main at -\$45/LF. c) Air release/flushing manholes at \$5,000 each. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7. Low Pressure Sewer Components: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| a) Low pressure sewer main at \$45 to \$80/LF depending on Town or state road. b) Air release/flushing manholes at \$5,000 each. c) Connection to gravity manhole at \$2,800 each. d) Grinder pumps at \$10,500 each, including pump, panel, installation and engineering. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8. Pump station cost range includes: a) \$400,000 each for less than 100 gpm pump station. b) \$1,000,000 each for 100 to 500 gpm pump station. c) \$1,800,000 each for 500 to 1,000 gpm pump station. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9. Restoration and General Items include: a) Trench base. b) 2-inch trench binder and 1-inch trench top course each at \$75/ton. c) 1.5-inch top course, full width overlay at \$58/ton. d) Record drawings, erosion controls, final cleanup and site restoration and test pits. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10. Costs do not include any allowance for land acquisition or taking of easements. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11. Based on short- and long- term recommendation of June 2002 evaluation report. Scada and controls were installed as part WPCF Improvements completed in 2009. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

TABLE 2-2

**CAPITAL AND O&M COSTS FOR
SLUDGE SYSTEM AND EMPLOYEE LOCKER ROOM IMPROVEMENTS
RECOMMENDED IN 2007 WWFP**

| | |
|--|----------------|
| Capital Costs ⁽¹⁾ | |
| New GBT in Septage Building | 280,000 |
| New Sludge Storage Facility | 1,900,000 |
| New Locker and Meeting Rooms (2,500 sf) | <u>640,000</u> |
| Subtotal | 2,900,000 |
| Process and Yard Piping | 290,000 |
| Electrical | 440,000 |
| Site Work | 58,000 |
| Total Construction Costs | 3,700,000 |
| Contingencies (15%) | 560,000 |
| Fiscal, Legal, Engineering (25%) | 930,000 |
| Total Capital Costs | 5,200,000 |
| O&M Costs ⁽¹⁾ | |
| Labor for Sludge Processing | 80,000 |
| Electricity | 69,000 |
| Polymer and Odor Control Chemicals | 59,000 |
| Maintenance and Repair | 10,000 |
| Total O&M Costs per year | 220,000 |
| Notes: | |
| 1. Costs are based on sludge production associated with a maximum month wastewater flow of 4.2 mgd, and on an ENR index of 7700 referenced to June 2006. | |

The wastewater flows that were estimated to be treated at the Hyannis WPCF from the proposed collection system are summarized on Table 2-3 and sum to slightly less than 4.2 mgd which is the current maximum month capacity of the WPCF.

TABLE 2-3

**FUTURE FLOWS TO THE HYANNIS WPCF
PROPOSED IN THE 2007 WWFP**

| FLOW SOURCES | PROJECTED FLOWS AT DESIGN YEAR 2014(MGD) | |
|---|--|-------------------------------|
| | MAXIMUM MONTH ⁽¹⁾ | AVERAGE ANNUAL ⁽²⁾ |
| Current and Future Flows | | |
| Existing flows at WPCF at 1993 | 2.1 | 1.6 |
| Infilling along existing sewers (developed and undeveloped) | 0.30 | 0.22 |
| Bearses Way sewer extension | 0.03 | 0.22 |
| Route 28 and Corporation Street sewer extension | 0.01 | 0.007 |
| Independence Park | 0.40 | 0.30 |
| AOCs in H1, H3, CE1-3 | 0.47 | 0.35 |
| AOCs in ZOCs (5% of area) | 0.07 | 0.05 |
| Infilling along proposed AOC sewers | 0.05 | 0.04 |
| Bearses Way AOC (50% of area) | 0.20 | 0.15 |
| Cape Cod Community College | 0.03 | 0.02 |
| Potential Expansion and Additional Infilling | | |
| Growth along existing sewer lines not currently sewered | 0.20 | 0.15 |
| Gravel pit development | 0.13 | 0.10 |
| Industrial Zone north of Kidd's Hill Road | 0.10 | 0.07 |
| TOTAL | 4.2 | 3.1 |
| Notes: 1. Presented in the 2007 WWFP. 2. Based on Annual Average to Maximum Month Peaking Factor of 0.74 as reported in 1993 Needs Assessment Report. | | |

B. **“Draft Memorandum on Sewer Phasing Evaluation and Implementation Schedule”**, November 2008, Stearns & Wheler. This memorandum was prepared to evaluate ways for the sewer extension program to proceed radially outward from the Hyannis WPCF. It was based on the prioritizations of the 2007 WWFP as well as other factors.

The full draft memorandum is attached in Appendix 2-1. Figure 2-3 illustrates the phasing that was being considered at the time of the draft memoranda. The phase numbering on Figure 2-3 indicates a logical grouping and not a priority ranking. The following sewer extensions have proceeded since the 2008 memorandum was developed:

- Lincoln Road PS
- Area H-1 West Sewer Extension
- Area H-1 East Sewer Extension

These projects are currently (2010) under construction.

C. Additional Wastewater Collection and Treatment Facility Reports and Permits.

1. 1980 Groundwater Discharge Permit for Hyannis WPCF (attached in Appendix 2-2).
2. 1990 Draft Groundwater Discharge Permit for Hyannis WPCF (attached in Appendix 2-2).
3. March 2010 Groundwater Discharge Permit for Marstons Mills WWTF (attached in Appendix 2-3).
4. Final Preliminary Design Report for Stewarts Creek/Area H-1 Sewer Extension Project, February 2005.

2.3 MAPPING AND DESIGN DRAWINGS

The following maps and plans were reviewed for this Needs Assessment Report:

- Geographic Information System (GIS) mapping from the Town's GIS Department.
- Drawings and plans for the following proposed and/or implemented improvement projects for the Hyannis WPCF and collection systems, and Hyannis Water System:
 - Area H-1 East (Stewarts Creek Area) Sewer Extension and Water Main Replacement, October 2009.
 - Area H-1 West (Stewarts Creek Area) Sewer Extension and Water Main Replacement, October 2009

- Main Street Pump Station (new pump station located at intersection of West Main Street and Lincoln Road) Relocation, 2009
- Downtown Water Main Improvements, October 2009
- Maher Water Treatment Plan Improvements, October 2009
- Hyannis Water System SCADA System Upgrade, October 2009
- Hyannis Water System Security and Fire Alarm System, October 2009
- Hyannis Water System Site Improvements, October 2009

2.4 TOWN AND REGIONAL DATA

Additional technical data from Town and regional sources has been received and reviewed as identified below:

1. Town of Barnstable Assessors Data, GIS data, including areas of critical environmental concern (ACECs), wetlands, floodplains, historic districts, existing and planned public well sites, marine water recharge areas, water supply zones of contribution, surface contours, and additional flyover information.
2. WWTF influent and treated-water analytical data.
3. U.S. Census data and Town Annual Reports.
4. Town of Barnstable Comprehensive Plan, Final Draft, June 2008.
5. Town of Barnstable 2005 Open Space and Recreation Plan.
6. Cape Cod Regional Policy Plan
7. Guidance Documents on wastewater planning on Cape Cod prepared (and/or funded) by the Cape Cod Commission and the Cape Cod Water Protection Collaborative as listed in Section 1.2E of Chapter 1.

2.5 MEETINGS AND TELEPHONE CONTACTS

Several meetings and telephone conversations were undertaken to research project information. These meetings and telephone contacts are briefly identified below.

1. Dale Saad, DPW PM and Mark Ells, DPW Director regarding project goals and management, existing information on water and wastewater systems, Town regulations, and recent improvements with the Hyannis WPCF collection, treatment and recharge system, and Hyannis Water System.
2. The Town Land Use and Project Buildout Working Group, comprised of Dale Saad, DPW PM; Jo Anne Miller Buntich, Growth Management Dept. Director; Jackie Etsten, Principal Planner; and Jim Benoit, GIS Coordinator to develop Town buildout analysis and review Town planning documents, GIS information, and Town regulations.
3. Peter Doyle, DPW Water Pollution Control Division Supervisor about facility needs at the Hyannis WPCF and operations and performance data.
4. Glenn Santos, DPW Solid Waste Division Supervisor about groundwater monitoring results and site considerations at the Town of Barnstable Solid Waste Division site in Marstons Mills.
5. Robert Gatewood, Town Conservation Director about freshwater pond water quality and previous evaluations on individual ponds.
6. John Mendes, Terry O'Neil, and Ross Kessler of the Massachusetts Division of Marine Fisheries (DMF) regarding water quality issues related to shellfish resource areas in Barnstable.
7. Jim Benoit of the Town's GIS Department regarding the GIS data.
8. Thomas McKean of Barnstable's Health Department regarding on-site system problem areas, BOH regulations, and the performance of innovative and alternative (I/A) on-site systems.

9. Karen Malkus, Barnstable's Coastal health Resource Coordinator, regarding bathing beach water quality.
10. Town Nutrient Management Citizens Advisory Committee Meetings for policy decisions on wastewater and nutrient management.
11. Brian Dudley regarding the Massachusetts Estuaries Project and coordination of project information.
12. Tom Cambareri of CCC regarding groundwater modeling scenarios for Barnstable.

2.6 ONGOING TOWN PROJECTS

The following projects are ongoing in Barnstable developing information that could be used in the wastewater and nutrient management planning project. Efforts have been made to coordinate our work with these ongoing projects.

A. **Town-Wide Zone II Assessment.** This project is being completed by the Cape Cod Commission for the following technical assistance:

- Evaluate existing approved Town-Wide zoning maps illustrating all groundwater protection areas
- Update database information using information from the four water districts in Barnstable and from adjacent towns
- Update and rerun the groundwater model
- Document recommended changes to Zone II areas
- Recommend changes to town zoning
- Assist with the MassDEP approval process for recommended changes to Zone II areas
- Assist the Town(s) with recommended changes to zoning

B. **Hyannis Water System Improvements Projects.** These projects have been funded by State Revolving Fund (SRF) low interest loans and Federal Stimulus Funds that result in principal forgiveness (grants) toward the projects. The projects have all been designed and bid and the following construction contracts are ongoing:

- ▶ Downtown Water Main Improvements
- ▶ H1 Area (Stewarts Creek Area) Water Main Replacement
- ▶ Maher Water Treatment Plant Improvements
- ▶ Site Improvements
- ▶ SCADA System Upgrade
- ▶ Security and Fire Alarm System Project

C. **Hyannis WPCF and Collection System Improvements.** Similar to the Water System Improvement Projects listed above, a group of projects at the Hyannis WPCF and the collection system have been funded by SRF and Federal Stimulus Funds and the construction projects are ongoing. These projects include:

- ▶ Wind Turbine Installation at Hyannis WPCF
- ▶ Photovoltaic Installation at Hyannis WPCF
- ▶ Energy Efficiency Improvements at the Hyannis WPCF
- ▶ Area H1 Sewer Extensions
- ▶ West Main Street/Lincoln Road Pump Station and Force Main Installation

D. **Wequaquet Lake (Area CE4) Collection System Design Project.** This design project was initiated with the other Hyannis WPCF and collection system improvement projects because its implementation would have received SRF and Federal Stimulus Funds. This project was put on hold due to opposition from a portion of the property owners in the Wequaquet Lake area and subsequent vote of Town Council. Its implementation is expected to be rescheduled with the other sewer extension projects recommended by the 2007 Wastewater Facilities Plan

E. **Town Investigations on Alternative Funding Methods for Clean Water Protection Projects.** As discussed in Chapter 1, Section 1.2.D, The Town is investigating alternative methods to fund Clean Water Protection projects. These projects have (since 1988) been paid by 100 percent property betterments. The Town is investigating other methods that will make the cost of these projects more affordable to the property owners.