PROJECT SUMMARIES

SECTION 604B WATER QUALITY MANAGEMENT PLANNING PROGRAM

FFY 1998-2018

Commonwealth of Massachusetts Executive Office of Energy and Environmental Affairs
Matthew A. Beaton, Secretary

Massachusetts Department of Environmental Protection
Martin Suuberg, Commissioner

Division of Municipal Services
Steven J. McCurdy, Director

2018

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 604B WATER QUALITY MANAGEMENT PLANNING PROGRAM PROJECT SUMMARIES

FFY 1998-2018

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NOTICE OF AVAILABILITY

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
8 NEW BOND STREET
WORCESTER, MA 01606

This Report is available from MassDEP's home page on the Internet at
http://www.mass.gov/eea/agencies/massdep/water/grants/watersheds-water-quality.html

Copies of the final reports for selected projects are available on CD upon request
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Introduction

This report presents brief summaries of the one hundred and three (103) projects funded under section 604b of the Clean Water Act in State fiscal years 1998 to 2018, including the 13 projects funded under the 2009 American Recovery & Reinvestment Act. The focus of these projects is watershed or subwatershed based nonpoint source assessment activities that support work planned by the Department of Environmental Protection in priority basins, the Department's TMDL development efforts, the Department's Massachusetts Estuaries Program, water supply source protection planning projects, activities identified in EEA's watershed action plans, or other suitable water quality assessment/planning projects identified by regional planning agencies or local communities. Projects that support DEP's assessment and planning priorities are selected for funding each year. Annual funding for these 604b projects which is derived from a percentage of the State's Clean Water Act State Revolving Fund award from EPA. Approximately $220,000 was available for projects in 2018.

Non-point source (NPS) pollution is caused by diffuse sources that are not regulated and are normally associated with precipitation and stormwater runoff from the land or infiltration into the soil. Common types of NPS pollution include phosphorus and nitrogen from lawn and garden fertilizers, bacteria from pet waste and waterfowl, oil and grease from parking lots and roadways, and sediment from construction activities and soil erosion.

Since 1998, the Department has funded one hundred and three (103) projects totaling $4,818,757 in twenty-five (25) of the Commonwealth's watersheds (see Table 1 below). Activities performed include: assessment of nonpoint source pollution in urban and rural watersheds, collection of water quality data from Massachusetts estuaries and coastal ponds, nutrient loading to coastal ponds, estuarine and freshwater shoreline surveys, assessments of stormwater management systems, assessments of unpaved rural roads, and priority land acquisition identification and planning.

As part of the federal American Recovery and Reinvestment Act (ARRA) of 2009 and Section 604b of the U.S. Clean Water Act, Massachusetts awarded $750,266 in grants to 11 projects to help conduct watershed nonpoint source pollution assessment and planning work to address water quality impairments. Two additional projects totaling $140,000 were also developed with UMASS Amherst to improve the Commonwealth's wetland and water quality monitoring programs.

Qualified proposals are selected on a competitive basis and grant recipients include municipalities and regional planning commissions. These projects are key to the Department's overall water resource protection efforts in threatened water bodies across the Commonwealth. The infusion of federal stimulus funding into this program in 2009 allowed the Department to greatly expand the development of plans to help remediate water quality concerns in more watersheds.

This report also provides a complete listing of all 604b projects conducted since 1991 by fiscal year and watershed in appendix Tables A and B. Summaries of these earlier projects can be found in a companion document " Section 604(b) Water Quality Management Planning Program, Project Summaries, 1991 to 1997" by L.K. O'Shea, et. al. 1997 which is available from the Department upon request..

Copies of the final reports for selected projects are available on CD upon request.

Table 1
Massachusetts Department of Environmental Protection
Number of 604b Projects and Allocation of Grant Funds by Basin (1998-2018)

Basin Name	Number of Projects	Federal Dollars Allocated
Blackstone	2	$ 49,789
Boston Harbor (Mystic, Neponset, Weymouth & Weir)	12	$ 610,339
Buzzards Bay	4	$ 172,576
Cape Cod	17	$ 788,335
Charles	5	$ 173,292
Chicopee	2	$ 95,400
Concord (Sudbury Assabet Concord)	1	$ 49,000
Connecticut	9	$ 482,288
Deerfield	4	$ 255,800
Farmington	1	$ 49,200
French & Quinebaug	1	$ 53,050
Housatonic	6	$ 255,300
Hudson (Hoosic, Kinderhook, BashBish)	3	$ 170,317
Ipswich	1	$ 26,000
Islands	9	$ 238,823
Merrimack	2	$ 92,900
Millers	1	$ 57,500
Narragansett Bay & Mount Hope Bay	5	$ 289,900
Nashua	1	$ 33,300
North Coastal	3	$ 92,676
Parker	1	$ 54,930
South Coastal	6	$ 311,730
Taunton	1	$ 82,000
Ten Mile	1	$ 36,025
Westfield	1	$ 29,004
Statewide	4	$ 269,283
Total	**103**	**$ 4,818,757**

Note: Dollar amounts shown are federal grant funds and do not include non-federal matching funds.

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 98-01

Project Title: Urban Watershed Management in the Mystic River Basin

Investigator: Metropolitan Area Planning Council

Location: Boston Harbor (Mystic) Watershed

Description: The project will provide recommendations for reducing pollutant runoff into Spy Pond based on a detailed analysis of land cover in watershed. Baseline water quality information, data gaps, and nonpoint source pollution issues will be identified in the Horn Pond watershed. Dry and wet weather water quality sampling will be conducted in Horn Pond watershed. A detailed assessment of the drainage area that contributes runoff for the one large stormwater outfall in Horn Pond will be conducted. Recommendations will be provided to improve stormwater management in the Horn Pond watershed including opportunities for stormwater remediation and future grant funding.

Cost: $49,820

Funding: $42,343 - U.S. Environmental Protection Agency
$ 7,477 - Metropolitan Area Planning Council

Duration: 1998 - 2002 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 98-02

Project Title: Parker River Basin: Assessment and Management of Nonpoint Source Pollution in the Little River Subwatershed

Investigator: Merrimack Valley Planning Commission

Location: Parker River Watershed

Description: This project will comprehensively inventory, map, and assess nonpoint sources of pollution in the Little River subwatershed of the Parker River Basin. To accomplish this, the following tasks will be performed:

1) production of parcel-based GIS maps and databases of land use and nonpoint pollution sources through research of local and state records, and intensive field surveys;
2) water quality sampling to identify fecal coliform bacteria sources and loadings in the Little River main stem and tributaries;
3) review and evaluation of local nonpoint source control measures; and
4) development of management recommendations for enhancing Little River water quality.

Cost: $62,420

Funding: $54,930 - U.S. Environmental Protection Agency
$ 7,500 - Merrimack Valley Planning Commission

Duration: 1998 - 2001 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 98-03

Project Title: Upper Blackstone River Watershed Wetlands Restoration Plan

Investigator: Worcester County Conservation District

Location: Upper Blackstone River Watershed

Description: The project involves preparation of an upper Blackstone River Watershed Wetlands Restoration Plan that complies with the technical and planning criteria of the Massachusetts Wetlands Restoration & Banking Program. This includes: updating wetlands map data; identifying, characterizing and mapping potential wetlands restoration sites; establishing a digital wetlands database; evaluating how wetlands restoration can help improve the watershed in terms of water quality, flood storage, fish habitat, and wildlife habitat. The project will be carried out by the Worcester County Conservation District in cooperation with the Wetland Restoration and Banking Program.

Cost: $69,489

Funding: $49,789 - U.S. Environmental Protection Agency
$19,700 - Wetland Restoration and Banking Program

Duration: 1998 - 2003 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 98-04

Project Title: Assessment of Current Quality and Projected Nutrient Loading: Menemsha Pond and Chilmark Great Pond.

Investigator: Martha's Vineyard Commission

Location: Islands Watershed

Description: This project will assess the water quality and determine the nutrient loading limits for Menemsha Pond and Chilmark Great Pond. To accomplish this, the Martha's Vineyard Commission will:

1) determine sources of bacterial contamination and assess nutrient status in Chilmark Great Pond using both existing and new water quality data;
2) determine nitrogen loading to Chilmark Great Pond and Menemsha Pond;
3) determine flushing time and estimate nitrogen loading limit for Chilmark Great Pond and Menemsha Pond;
4) project buildout loading and assess impact on Ponds; and
5) recommend options to reduce nitrogen loads (as needed) by bylaw revisions, easement acquisitions, and pond opening cycles.

Cost: $45,415

Funding: $37,670 - U.S. Environmental Protection Agency
$ 7,745 - Martha's Vineyard Commission

Duration: 1998 - 2001 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 99-01

Project Title: Priority Land Acquisition Assessment for Cape Cod: Phase 2

Investigator: Cape Cod Commission

Location: Cape Cod Watershed

Description: This project is the second phase of a priority land-rating project initiated under a previous 604b grant. This phase of the project will provide guidance to eleven Cape Cod towns towards securing new land for water supply. Project tasks will include providing detailed GIS maps of the most suitable parcels for potential acquisition. These GIS maps will provide surficial topography and depth to water table information. A detailed analysis of relevant water development factors including funding options, groundwater protection measures, withdrawal permitting issues, and identification of local concerns affecting site selection will be prepared for each recommended site. A series of Public meetings will be conducted to distribute project information.

Cost: $49,900

Funding: $49,900 - U.S. Environmental Protection Agency

Duration: 1999 - 2001 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 99-02

Project Title: Nutrient Loading to Two Great Ponds: Tisbury Great Pond and Lagoon Pond

Investigator: Martha's Vineyard Commission

Location: Islands Watershed

Description: Martha's Vineyard Commission will assess water quality in both Tisbury Great Pond and Lagoon Pond using existing water quality data and by acquiring new data. Groundwater watershed contribution boundaries, flushing times, existing and potential land uses, buildout nutrient loads, and acceptable load limits will be determined for each pond. Options to meet loading limits including land purchase, easements, zoning changes, performance standards, and sewage treatment options will be prepared for both ponds.

Cost: $52,000

Funding: $50,000 - U.S. Environmental Protection Agency
$ 2,000 - Martha's Vineyard Commission

Duration: 1999 - 2001 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 99-03

Project Title: Cape Cod Coastal Nitrogen Loading Studies

Investigator: Cape Cod Commission

Location: Cape Cod Watershed

Description: The Cape Cod Commission will complete the nitrogen loading assessments for three embayments – Centerville River, Nauset Marsh and Town Cove, and Herring River systems initiated under previous grants. Development of nitrogen limits/TMDLs, determination of nitrogen loads, and recommendations for potential pollution controls will be prepared. In addition, recent water quality and revised tidal flushing in the Popponesset Bay system, including the Mashpee River, will be used to produce nitrogen management options for this system.

Cost: $45,000

Funding: $45,000 - U.S. Environmental Protection Agency

Duration: 1999 - 2002 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 99-04

Project Title: Chicopee River Watershed Basin Assessment

Investigator: Pioneer Valley Planning Commission

Location: Chicopee River Watershed

Description: This project will address watershed assessment needs in the communities of Chicopee, Ludlow, Springfield, and Wilbraham that fall within the Chicopee River Basin. Stormwater infrastructure components will be identified, compiled into a database, and mapped; existing BMPs will be mapped and recommendations for future BMP implementation will be generated; existing water quality data will be compiled into a comprehensive database and analyzed to determine data gaps and to recommend future sampling efforts; and local water quality protection ordinances and bylaws will be reviewed and draft water protection bylaws prepared for communities within the study area.

Cost: $45,400

Funding: $45,400 - U.S. Environmental Protection Agency

Duration: 2000 - 2002 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2000-01

Project Title: Surface Water Nutrient Management (Long Pond, Barnstable, and Red Brook Harbor)

Investigator: Cape Cod Commission

Location: Cape Cod Watershed

Description: This project will address two Massachusetts Watershed Initiative Priority Projects: 1) Long Pond; and 2) Barnstable and Red Brook Harbor. Nitrogen loading and management options will be prepared for the Barnstable Harbor and Red Brook Harbor Coastal embayment systems. This includes watershed delineations, critical nitrogen loads, existing and buildout nitrogen loads, comparison of nitrogen loads to nitrogen limits, and developing management options. For Long Pond, data needs will be identified and if necessary additional data collected (a QAPP will be prepared if necessary), an Advisory Committee will be established, nutrient management options will be prepared, and a preferred set of options recommended.

Cost: $46,400

Funding: $46,400 - U.S. Environmental Protection Agency

Duration: 2000 - 2002 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2000-02

Project Title: Runnins River Watershed Bacterial and Nutrient Source Assessment and Water Quality Management Project

Investigator: Town of Seekonk

Location: Narragansett Watershed

Description: This project will focus on the assessment of water quality along the Runnins River and will identify significant sources of bacterial pollution to sections of the Runnins River and two tributaries with known water quality problems. Recommended management actions and conceptual designs for remedial measures will be provided.

Specific tasks to be conducted include:

1) Existing data compilation and subwatershed reconnaissance. Property ownership, zoning, site plans for large impervious areas, septic system location, existing planning/management reports (e.g. catch basin cleaning and street sweeping frequency), and water quality data reports/information will be compiled and summarized;
2) Develop an EPA/DEP approved Quality Assurance Project Plan (QAPP);
3) Conduct field sampling and analysis. Sampling will include wet and dry weather work plus groundwater sampling for fecal coliform and nutrients;
4) Prepare conceptual designs for remedial measures; and
5) Prepare draft and final reports and conduct public presentation of final results.

Cost: $44,900

Funding: $40,500 - U.S. Environmental Protection Agency
$ 4,400 - Town of Seekonk

Duration: 2001 – 2004 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2000-03

Project Title: Millers River Watershed Nonpoint Source Pollution Assessment

Investigator: Montachusett Regional Planning Commission

Location: Millers River Watershed

Description: Montachusett Regional Planning Commission and Franklin Regional Council of Governments will team up to create a solid information base to guide future governmental and private actions in reducing nonpoint source pollution and improve the water quality in the Millers River. MASS GIS data layers, state reports, community input, and fieldwork will be employed to identify potential nonpoint source pollution. An action plan incorporating Watershed Basin Team and Watershed Council goals will be created.

Cost: $57,500

Funding: $57,500 - U.S. Environmental Protection Agency

Duration: 2000 - 2002 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2000-04

Project Title: Lake Cochituate Nonpoint Source Management Plan

Investigator: Metropolitan Area Planning Council

Location: Concord (Sudbury Assabet Concord) Watershed

Description: This project will characterize and prioritize nonpoint source pollution problems in the Lake Cochituate watershed.

Tasks to be completed include:

1) conduct a watershed wide inventory, mapping, and assessment of land use activities and nonpoint sources;
2) conduct a detailed nonpoint source assessment and stormwater mapping in selected subbasins;
3) assess local water quality protection measures;
4) provide recommendations to communities for improved management of nonpoint source pollution within the watershed;
5) conduct a workshop to provide outreach and technical assistance; and
6) develop and distribute a public information brochure on preventing nonpoint source pollution in the watershed.

Cost: $53,900

Funding: $49,000 - U.S. Environmental Protection Agency
$ 4,900 - MAPC

Duration: 2001 - 2003 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2001-01

Project Title: Assessment of Unpaved Roadways in the Farmington River Watershed

Investigator: Berkshire Regional Planning Commission & Pioneer Valley Planning Commission

Location: Farmington River Watershed

Description: This project will assess unpaved roads in the Massachusetts portion of the Farmington River watershed. Assessment and planning activities, using the Roadway Surface Management System (RSMS) will identify potential environmentally degrading unpaved roadway maintenance and management practices that contribute to nonpoint source pollution. The project will address remediation of existing roadway problems, set goals for prevention of potential NPS problems, and develop proactive strategies for management and maintenance of unpaved roads.

Specific tasks to be conducted include:

1) unpaved road assessment training. Representatives from BRPC, PVPC, and from each participating town's DPW will receive RSMS training;
2) inventory and map unpaved roads;
3) map priority resource areas;
4) conduct unpaved roads condition assessment;
5) develop a customized RSMS database for each Town;
6) develop an unpaved roads assessment report for each Town;
7) conduct planning sessions with local municipal officials; and
8) prepare draft and final project reports.

Cost: $54,200

Funding: $49,200 - U.S. Environmental Protection Agency
$ 5,000 - BRPC

Duration: 2001 - 2003 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2001-02

Project Title: Assessment of Stormwater Management System

Investigator: City of Easthampton

Location: Connecticut River Watershed

Description: City of Easthampton will conduct an assessment of its stormwater management system and procedures as part of the City's efforts to meet the Phase II Stormwater Management requirements.

The City of Easthampton will:

1) create an information database and GIS maps depicting locations of stormwater management infrastructure;
2) identify and describe specific stormwater management shortcomings and provide specific BMP recommendations to address the identified problems; and
3) prepare a framework for the City's Phase II stormwater application including developing recommendations for meeting the six minimum Phase II Stormwater control measures that are required by the U.S. EPA.

Cost: $48,200

Funding: $48,200 - U.S. Environmental Protection Agency

Duration: 2001 - 2003 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2001-03

Project Title: Assessment of Land Use Activities, Nonpoint Source Pollution, and Water Quality in the Taunton River Watershed

Investigator: Southeastern Regional Planning and Economic Development District

Location: Taunton River Watershed

Description: This project will assess land use activities and identify nonpoint source (NPS) pollution areas for a minimum of six subwatersheds in the Taunton River basin. Local water quality protection measures will be assessed and subwatershed action plans developed to address identified nonpoint source pollution problems.

Specific project tasks include:

1) acquire, update, and develop GIS data for various physical, institutional, and natural features of the watershed;
2) create a land suitability map to illustrate general environmental constraints to development in the watershed;
3) update existing MassGIS information on the type, intensity and distribution of existing land uses in six subwatersheds;
4) identify and assess potential and existing sources of pollution through extensive field verification and model estimates of nutrient base loading;
5) assess local water quality protection measures; and
6) provide recommendations to address existing and potential NPS pollution problems in the watershed.

Cost: $82,000

Funding: $82,000 - U.S. Environmental Protection Agency

Duration: 2001 – 2003 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2002-01

Project Title: Shoreline Survey of Salem Sound

Investigator: City of Beverly, Board of Health

Location: North Coastal Watershed

Description: The Shoreline Survey of Salem Sound project will provide updated information on chronic bacteria pollution sources to coastal bathing beaches and shellfish beds. The survey will provide information to support remediation of 303d listed waters, Phase II stormwater management, and new swimming-beach water quality regulations. The Shoreline Survey project will update a 1993 shoreline survey to reflect numerous remedial actions, flood control projects, and sewer line repairs made in the last nine years and to identify remaining and new sources for remediation; provide supporting data to Division of Marine Fisheries to conduct a complete sanitary survey with the goal of opening shellfish beds; and assist local municipalities with both the Federal Beaches Act and Phase II stormwater permitting.

Project tasks to be completed include:

1) review 1993 shoreline survey and compile information from DPWs and South Salem Sewage District to determine locations of active pipes, and changes or improvements made over the last ten years;
2) develop a QAPP for standard survey and water quality data collection;
3) conduct shoreline survey of Salem Sound coastline to identify, at a minimum, all outfalls 12" diameter and larger within ¼ mile of swimming beaches or shellfish resource area;
4) collect water quality samples from dry weather flows at prioritized locations and analyze samples for bacteria;
5) produce GIS maps of all active outfalls, sources, swimming beaches, and shellfish resource areas; and
6) distribute survey results to municipalities at meetings and in a final report.

Cost: $49,600

Funding: $33,700 - U.S. Environmental Protection Agency
$15,900 - City of Beverly

Duration: 2002 – 2004 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2002-02

Project Title: Stormwater Management Assessment Project

Investigator: Town of Adams

Location: Hudson River Watershed

Description: The Town of Adams will conduct a comprehensive assessment of the stormwater management system, stormwater management practices, and development of review and management measures. This assessment will identify specific locations or discharges contributing to stormwater problems, identify needed improvements Adams's stormwater management practices, and identify improvements to Adams' development control measures. A comprehensive stormwater management plan will be prepared by the town with the goal of improving water quality in the Hoosic River and removal of specific segments of the Hoosic River from the 303d list of impaired waters.

Specific tasks to be conducted include:

1) identify, map, and evaluate Adams' stormwater management system in the urbanized area to provide a map of the existing storm drainage infrastructure, illicit discharges, and other problem areas;
2) conduct an assessment of the stream network to identify specific stormwater related problems;
3) prepare a QAPP and conduct a water quality monitoring program to identify "hot" spots;
4) prepare conceptual remediation designs and strategies for stormwater problem areas;
5) assess and evaluate existing stormwater management practices;
6) assess and evaluate development control measures including bylaws, regulations, and administrative procedures;
7) evaluate the capacity of local board members and personnel to implement stormwater management program; and
8) prepare a stormwater management plan and framework that addresses improvements and enhancements to the Town's stormwater management practices and infrastructure.

Cost: $76,355

Funding: $64,017 - U.S. Environmental Protection Agency
$12,338 - Town of Adams

Duration: 2002 – 2004 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2002-03

Project Title: Assessment of Stormwater Management Systems and Nonpoint Source Pollution

Investigator: Town of Swansea

Location: Narragansett/Mt. Hope Bay Watershed

Description: This project will assess the stormwater management system for the Town of Swansea and create a Stormwater Management Plan per EPA NPDES Phase II Stormwater program including identification and mapping of the Stormwater infrastructure. Nonpoint source pollution at Compton's Corners estuary will be investigated including water quality testing at identified drainage structure locations. The Stormwater Management Plan will include: locations and current status of stormwater management infrastructure, methodology for detecting illicit discharges, location and general character of illegal and illicit discharges, location and general character of nonpoint source and point sources of pollution, bacteria test data from water quality samples, review existing bylaws and ordinances, and draft recommendations and an action plan to address Phase II minimum requirements.

Project tasks include:

1) identification, mapping, and field inspections of the stormwater infrastructure including the creation of a GIS stormwater infrastructure database;
2) prepare a QAPP for water quality and dye testing in the Compton's Corners area;
3) map potential nonpoint source pollution sites including large impervious areas, industrial areas, areas prone to flooding, and new or redevelopment construction sites;
4) conduct a water quality and dye-testing program to identify sources of contamination and nonpoint source pollution; and
5) develop a Stormwater Management Plan that will address the six required Phase II stormwater elements and recommended remediation actions for identified nonpoint source pollution sources.

Cost: $84,060

Funding: $34,060 - U.S. Environmental Protection Agency
$50,000 - Town of Swansea

Duration: 2002 – 2004 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2002-04

Project Title: Stormwater Education Assessment and Planning

Investigator: Town of Plainville

Location: Ten Mile River Watershed

Description: This project will support nonpoint source pollution prevention activities in the watershed through an education program that will: create a watershed stormwater education committee; assess existing local educational resources and identify future educational needs regarding stormwater pollution and management; develop a five-year stormwater education and outreach plan for all watershed municipalities; and develop educational materials and resources to support implementation of the plan.

Specific project tasks include:

1) assessment of stormwater education resources and needs including the formation of a stormwater education committee;
2) develop and implement a five-year stormwater education and outreach plan including a summary of current stormwater education resources, an outline of specific education needs, and recommendations to meet those needs;
3) develop stormwater education resources and materials including materials for public distribution and display including pamphlets and brochures, hands-on materials appropriate for local schools, and develop and maintain a website for obtaining stormwater management information to be shared by local municipalities.

Cost: $43,025

Funding: $36,025 - U.S. Environmental Protection Agency
$ 7,000 - Town of Plainville

Duration: 2002 – 2004 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2002-05

Project Title: East Branch Housatonic Watershed Assessment

Investigator: Berkshire Regional Planning Commission

Location: Housatonic River Watershed

Description: This project will assess the extent of known and suspected nonpoint source pollution problems in the East Branch subwatershed of the Housatonic River. Berkshire Regional Planning Commission (BRPC) and Housatonic Valley Association will conduct targeted water quality sampling of suspected problem areas and will pilot an effort to include volunteer water quality monitoring into a municipal stormwater management plan. Additional efforts, if needed, will be directed towards waters on the 303d list. BRPC will assist the two communities in the subwatershed in meeting their stormwater management goals and will recommend remediation of identified erosion and sedimentation problems in two surface water supply watersheds.

Specific project tasks include:

1) Develop a QAPP and conduct a water quality sampling program;
2) Conduct a pilot sampling program to detect illicit discharges;
3) Conduct an unpaved road runoff and erosion assessment in two surface water supply subwatersheds;
4) Compile existing and collect new data to remove selected waters from the 303d list of impaired waters;
5) Conduct an assessment of outreach, regulatory, and policy needs for NPDES Phase II communities and prepare a draft Stormwater Management Program for these towns.

Cost: $44,955

Funding: $44,955 - U.S. Environmental Protection Agency

Duration: 2002 – 2004 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2003-01

Project Title: Martha's Vineyard: Water Quality Assessment of Nine Coastal Ponds

Investigator: Martha's Vineyard Commission

Location: Islands Watershed

Description: This project will obtain the additional water quality data from nine coastal salt ponds in support of the Massachusetts Estuaries Project. The nine coastal ponds on Martha's Vineyard that will be sampled are: Sengekontacket, Cape Pogue, Poucha, Tashmoo, Oak Bluffs Harbor, Farm, Menemsha, Chilmark, and Squibnocket. Water quality samples will be collected from forty-six stations during four sampling rounds from late July through mid September. Data will be incorporated into a final report and published on a web site.

Specific project tasks include:

1) update existing Quality Assurance Project Plan (QAPP) to reflect changes in the sampling locations, stations, sample collection and processing methodology, and equipment and handling;
2) identify and conduct field reconnaissance of up to forty-six sample station locations to collect GPS data and subsequently prepare a GIS map of the sample collection sites;
3) conduct four sample collection rounds at forty-six stations and analyze the water quality samples in accordance with the updated QAPP. Water quality data will be summarized by pond and sampling round and provided in spreadsheet format;
4) prepare GIS based data maps showing station locations, pond system physical location, and other water quality data collected. The resource information for each pond surveyed will be presented in a "clickable" format on web-ready maps and posted on the MVC's web site; and
5) prepare complete water quality assessment report.

Cost: $45, 424

Funding: $35,124 - U.S. Environmental Protection Agency
$10,300 - Martha's Vineyard Commission

Duration: 2003 – 2005 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2003-02

Project Title: An Ecosystem Approach to the Sawmill River Watershed Restoration

Investigator: Franklin Conservation District

Location: Connecticut River Watershed

Description: This project will provide a three-phase geomorphic approach for the lower portion of the Sawmill River Watershed. The assessments will use a state-of-the-art model to inventory and analyze river ecosystem health indicators. The project will use natural stream channel principles based on the river's ecosystem to design conceptual solutions for flooding, sedimentation, and erosion problems. The project will also offer a methodology for replication in other Massachusetts watersheds.

Specific tasks to be completed are:

1) review existing data prepared for the project to-date including NRCS Phase I and Phase II assessments and existing engineering data.
2) perform a Stream Geomorphic Assessment of the river to identify areas of concern including determination of bank full features, width of flood prone area, cross sections for stream typing, pebble counts and determining planform geometry.
3) perform cross section surveys and longitudinal profiles of selected reaches. Incorporate additional stream cross section data into hydrology study;
4) perform hydrology study using NRCS and Army Corps of Engineers computer models (TR 20 and HEC RAS, respectively);
5) prepare conceptual restoration design alternatives using project data and natural channel design principles; and
6) prepare and disseminate final project report.

Cost: $100,820

Funding: $54,500 - U.S. Environmental Protection Agency
$46,320 - Franklin Conservation District

Duration: 2003 – 2005 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2003-03

Project Title: Water Quality Monitoring: Parker's River, Lewis Bay, and Bass River

Investigator: Town of Yarmouth

Location: Cape Cod Watershed

Description: The Town of Yarmouth will conduct water quality sampling in the Parker's River, Lewis Bay, and Bass River sub-watersheds in support of the Massachusetts Estuaries Project. The sampling will produce data essential to the subsequent assessments of each ecosystem including the development of TMDLs and local watershed management plans. Data collected will be consistent with Massachusetts Estuaries Project criteria and consistent with Cape Cod Watershed Team Action Plan, the Cape Cod Commission's Regional Policy Plan, and the Town's Local Comprehensive Plan. Sampling efforts will directly involve local citizens from Yarmouth, Dennis, and Barnstable.

Specific tasks to be completed include:

1) prepare a Sampling and Analysis Plan (SAP) for the monitoring and assessment work;
2) recruit and train volunteer sampling teams;
3) collect and analyze water quality samples from sub-watershed sampling stations in accordance with approved SAP. Additional observations and measurements of macroalgae biomass and distribution, eelgrass biomass and distribution, sediment type, wind speed and direction, and air temperature will be collected from selected sampling stations in accordance with the approved SAP; and
4) prepare final project report including a summary and analysis of all data collected by sub-watershed and sampling round.

Cost: $62,963

Funding: $44,975 - U.S. Environmental Protection Agency
$17,988 - Town of Yarmouth

Duration: 2003 – 2005 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2003-04

Project Title: Estuaries Monitoring Program: Duxbury, Kingston, and Plymouth Coastal Waters

Investigator: Town of Kingston

Location: South Coastal Watershed

Description: This project will provide water quality and flow data to support the Massachusetts Estuaries Program assessment of Duxbury, Kingston, and Plymouth coastal waters including: Duxbury Harbor, Jones River, Kingston Bay, Plymouth Harbor, Ellisville Harbor, Eel River, and Town Brook. The project will establish a water quality database for the Town's coastal waters that will be used for the future development of TMDLs and nutrient management.

Tasks to be completed include:

1) completion of a Sampling and Analysis Plan (SAP) for the collection and analysis of water quality and flow data in the project area;
2) establish fresh and salt water monitoring locations for water quality and flow measurements. Descriptions and GPS data will be provided for each sampling site;
3) recruit and train volunteer sampling teams for each sub-watershed;
4) collect and analyze water quality and flow data from sub-watershed sampling sites in accordance with DEP approved SAP; and
5) prepare final project report including a summary and analysis of all data collected by subwatershed and sampling round.

Cost: $85,240

Funding: $76,410 - U.S. Environmental Protection Agency
$ 8,830 - Town of Kingston

Duration: 2003 – 2005 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2004-01

Project Title: Martha's Vineyard: Water Quality Assessment of Four Coastal Ponds

Investigator: Martha's Vineyard Commission

Location: Islands Watershed

Description: This project will obtain water quality data to prepare four coastal salt ponds (Farm Pond, Tashmoo Pond, Sengekontacket Pond, and Chilmark Pond) for entry into the Massachusetts Estuaries Project (MEP), enhance the dataset for two other salt ponds (Cape Pogue and Poucha Pond), and collect additional water quality data for Lagoon Pond which has already entered MEP. Water quality samples will be collected from thirty-one stations during four sampling rounds from late July through mid September. Data will be incorporated into a final report and added to the MVC's web site.

Specific project tasks include:

1) update existing Sampling and Analysis Plan (SAP) to reflect any changes in the sampling locations, stations, sample collection and processing methodology, and equipment and handling;
2) conduct four sample collection rounds at thirty-one stations and analyze the water quality samples in accordance with the updated SAP. Water quality data will be summarized by pond and sampling round, and provided in spreadsheet format;
3) prepare GIS based data maps showing station locations, pond system physical location, and other water quality data collected. The resource information for each pond surveyed will be presented on maps and posted on MVC's web site; and
4) prepare quarterly progress reports and a final water quality assessment report.

Cost: $18,012

Funding: $11,412 - U.S. Environmental Protection Agency
$ 6,600 - Martha's Vineyard Commission

Duration: 2004 – 2006 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2004-02

Project Title: A Subwatershed Approach to Nonpoint Source Pollution Assessment in the Deerfield River Watershed

Investigator: Franklin Regional Council of Governments

Location: Deerfield River Watershed

Description: This project will assess land use activities, identify and field-verify potential nonpoint sources of pollution for six subwatersheds (South, North, Green, Chickley, and River corridor segments 1 and 2) with impaired river segments within the Deerfield River Watershed, and create Watershed-Based Plans following EPA guidance to reduce nonpoint source pollution for these subwatersheds. The Franklin Regional Council of Governments (FRCOG) will partner with the Deerfield River Watershed Association (DRWA), the Berkshire Regional Planning Commission, and the MA Department of Fish and Game's Riverways/Adopt-A-Stream program to conduct the Deerfield River Watershed assessment project.

Specific project tasks include:

1) organize Stream Teams and conduct Shoreline Surveys in the Chickley River, South River, and North River sub-watersheds;
2) convene Advisory Committees for four targeted sub-watersheds and conduct an outreach program;
3) using MassGIS data layers and recent GIS mapping previously developed by the Contractor, prepare GIS theme maps of various physical, institutional, and natural features of the watershed including new development areas;
4) inventory existing and potential sources of nonpoint pollution in six sub-watersheds;
5) conduct a Rural Road Assessment for the Chickley River sub-watershed;
6) prepare a Quality Assurance Project Plan (QAPP) and conduct water quality sampling for *E. coli* in three sub-watersheds;
7) incorporate assembled data into a Watershed-Based Plan following EPA guidance;
8) provide site-specific nonpoint source management recommendations on a sub-watershed basis; and
9) prepare quarterly and final project reports.

Cost: $114,455

Funding: $87,700 - U.S. Environmental Protection Agency
$26,755 - Franklin Regional Council of Governments

Duration: 2004 – 2006 (Project complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2004-03

Project Title: Simulation of Soluble Waste Transport: Estuarine Reach of the Merrimack

Investigator: Merrimack Valley Planning Commission

Location: Merrimack River Watershed

Description: The project will conduct a dye tracer study to track the movement and dispersion of a solute in the Newburyport tidal basin of the lower Merrimack River. The tracer test will measure speed, dispersion, and resident time of a tagged water parcel as it passes through the estuarine network. This sampling will be tied to an existing tracer study to be conducted from Lawrence to the Rt. 1 Bridge in Newburyport by the USGS.

Specific tasks include:

1) coordinate project activities with USGS and other State and Local Agencies participating in the study. This will include planning for crews and equipment needed to collect the data according to USGS sampling protocols. The USGS sampling protocols shall establish specific sampling locations, times, and procedures;
2) collect water quality samples at pre-determined times and locations to document the passage of a dye tracer tagged parcel of water. All samples will be analyzed for final dye concentrations;
3) analyze dye tracer concentrations to simulate build up concentrations at each sampling location and to determine flushing (residence) time for the tidal basin; and
4) prepare quarterly reports and a final investigative report to document study findings.

Cost: $56,350

Funding: $46,350 - U.S. Environmental Protection Agency
$10,000 - U.S Geological Survey

Duration: 2004 – 2006 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2004-04

Project Title: Mount Hope Bay: Estuaries Water Quality Monitoring

Investigator: Southeastern Regional Planning and Economic Development District

Location: Mount Hope Bay Watershed

Description: This project will initiate water quality sampling in Mount Hope Bay including fresh, estuarine, and marine waters. This project will provide water quality and flow data to support the Massachusetts Estuaries Program assessment of coastal waters including: Mt. Hope Bay, Taunton River, Three Mile River, Segreganset River, Assonet River, and Quequechan River. Principle objectives will be to collect baseline data at established points, promote community involvement and awareness of water quality issues within the estuary.

Tasks to be completed include:

1) completion of a Sampling and Analysis Plan (SAP) for the collection and analysis of water quality and flow data in the project area;
2) establish fresh and salt water monitoring locations for water quality and flow measurements. Descriptions and GPS data will be provided for each sampling site;
3) recruit and train volunteer sampling teams for in-bay and fresh water sampling locations;
4) collect and analyze water quality and flow data from in-bay and fresh water sampling sites in accordance with approved SAP;
5) conduct a Workshop to increase community awareness of water quality issues; and
6) prepare final project report including a summary and analysis of all data collected by subwatershed and sampling round.

Cost: $ 81,000

Funding: $ 81,000 - U.S. Environmental Protection Agency

Duration: 2004 – 2006 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2005-01

Project Title: Continuation of Water Quality Monitoring – Parker's & Bass River, Lewis Bay

Investigator: Town of Yarmouth

Location: Cape Cod Watershed

Description: The Town of Yarmouth will continue to conduct water quality sampling in the Parker's River, Lewis Bay, and Bass River sub-watersheds in support of the Massachusetts Estuaries Project. The sampling will produce data essential to the subsequent assessments of each ecosystem including the development of TMDLs and local watershed management plans. Data collected will be consistent with Massachusetts Estuaries Project criteria and consistent with Cape Cod Watershed Team Action Plan, the Cape Cod Commission's Regional Policy Plan, and the Town's Local Comprehensive Plan. Sampling efforts will directly involve local citizens from Yarmouth, Dennis, and Barnstable.

Specific tasks to be completed include:

1) Revise a Sampling and Analysis Plan (SAP) as needed for monitoring and assessment work including collection and analysis of TSS samples from open-water sites;
2) Continue to recruit, train and support volunteer sampling teams;
3) Collect and analyze water quality samples from sub-watershed sampling stations in accordance with approved and/or revised SAP. Additional observations and measurements of total suspended solids (TSS), macroalgae biomass and distribution, eelgrass biomass and distribution, sediment type, wind speed and direction, and air temperature will be collected from selected sampling stations in accordance with the approved QAPP; and
4) Prepare final project report including a summary and analysis of all data collected by sub-watershed and sampling round.

Cost: $28,670

Funding: $20,140 – U.S. Environmental Protection Agency
$ 8,530 – Town of Yarmouth

Duration: 2005 – 2007 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2005-02

Project Title: Martha's Vineyard Coastal Pond Water Quality Assessment – Phase III

Investigator: Martha's Vineyard Commission

Location: Islands Watershed

Description: This project will obtain water quality data to prepare six coastal salt ponds for entry into the Massachusetts Estuaries Project (MEP). First year data will be collected for Katama Bay Pond and James Pond; second year data for Oyster Pond; and complete the dataset for Cape Pogue, Poucha Pond, and Farm Pond. MVC will collect additional water quality data for Tashmoo Pond and Sengekontacket Pond that have already entered MEP. Water quality samples will be collected from forty-two stations during four sampling rounds from late July through mid September. Data will be incorporated into a final report and added to the MVC's web site.

Specific project tasks include:

1) Update existing Sampling and Analysis Plan (SAP) to reflect any changes in the sampling locations, stations, sample collection and processing methodology, and equipment and handling including the collection of TSS at select stations;
2) Conduct four sample collection rounds at forty-two stations and analyze the water quality samples in accordance with the updated SAP. Water quality data will be summarized by pond and sampling round and provided in spreadsheet format;
3) Prepare GIS based data maps showing station locations, pond system physical location, and other water quality data collected. The resource information for each pond surveyed will be presented on maps and posted on a web site; and
4) Prepare quarterly progress reports and a final water quality assessment report.

Cost: $34,513

Funding: $28,013– U.S. Environmental Protection Agency
$ 6,500 – Martha's Vineyard Commission

Duration: 2005 – 2007 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2005-03

Project Title: Four Mile River Watershed Assessment

Investigator: Franklin Regional Council of Governments

Location: Connecticut River Watershed

Description: The goal of this project is to develop solutions to the erosion and sedimentation problems and to investigate new approaches to reducing nonpoint source pollution in the watershed. Franklin Regional Council of Governments will conduct a comprehensive assessment of the Four Mile Brook watershed including: a macroinvertebrate sampling program, a public education and outreach effort, and a watershed management plan which will prioritize watershed problems and provide recommendations for mitigation or restoration projects.

Specific project tasks include:

1) Inventory potential sources of nonpoint source pollution in the Four Mile River watershed. This inventory will include a pilot program to test a new EPA methodologies for watershed assessment – The Unified Stream Assessment and the Unified Subwatershed and Site Reconnaissance method.
2) Prepare a QAPP for a macroinvertebrate sampling program for EPA & MADEP approval;
3) Analyze water quality data collected, and, inventory and prioritize sites for restoration and mitigation projects;
4) Develop a Watershed Management and Restoration Plan with specific recommendations for restoration and mitigation projects;
5) Prepare draft conceptual engineering designs for a priority project;
6) Convene an Advisory Committee with watershed stakeholders;
7) Implement a Public Participation and Outreach Program; and
8) Prepare quarterly and final project reports.

Cost: $76,290

Funding: $61,700 – U.S. Environmental Protection Agency
$14,590 – Franklin Regional Council of Governments

Duration: 2005 – 2007 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2005-04

Project Title: Mount Hope Bay: Estuaries Water Quality Monitoring – Phase II

Investigator: Southeastern Regional Planning and Economic Development District

Location: Mt Hope Bay Watershed

Description: This project will continue the second of three years of water quality sampling planned for Mt. Hope Bay including fresh, estuarine, and marine waters. This project will provide water quality and flow data to support the Massachusetts Estuaries Program assessment of coastal waters including: Mt. Hope Bay, Taunton River, Three mile River, Segreganset River, Assonet River, and Quequechan River. Principle objectives will be to collect baseline data at established points, promote community involvement and awareness of water quality issues within the estuary.

Tasks to be completed include:

1) Revise the QAPP for the collection and analysis of water quality and flow data in the project area as needed;
2) Continue recruitment, training and support of volunteer sampling teams for in-bay and fresh water sampling locations;
3) Collect and analyze water quality and flow data from in-bay and fresh water sampling sites in accordance with approved QAPP including TSS data from open-water stations; and
4) Prepare final project report including a summary and analysis of all data collected by sub-watershed and sampling round.

Cost: $74,420

Funding: $74,420 – U.S. Environmental Protection Agency

Duration: 2005 – 2007 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2006-01

Project Title: Hamilton Reservoir Watershed Management

Investigator: Pioneer Valley Planning Commission

Location: French-Quinebaug Watershed

Description: The project will focus on assessment, management and BMP design solutions for road surfaces and stormwater runoff in the Hamilton Reservoir watershed to reduce sediment and nutrient loading to Hamilton Reservoir.

The project will conduct a comprehensive assessment of unpaved road surfaces in the Hamilton Reservoir Watershed including:

1) prepare a GIS map and database of watershed roads including ownership status, Federal functional road classification, road surface type, landuse and hydrology;
2) conduct road surface assessments using the Road Manager 2000 program to identify sources of sediment loading and develop unpaved road surface management recommendations including budget projections;
3) conduct a Shoreline survey of the Massachusetts portion of the Hamilton Reservoir watershed and three tributaries: Leadmine, Steven's and Brown's Brook. Shoreline surveys will also be conducted on the Connecticut portion of the watershed by volunteers from Connecticut;
4) complete BMP design schematics at three to four high priority locations and obtain written permission from landowners to proceed with BMP installation;
5) review local bylaws and recommend local regulatory tools for watershed protection; and,
6) conduct a public outreach program and prepare final report.

Cost: $32,110

Funding: $ 29,810 – U.S. Environmental Protection Agency
$ 2,300 – Pioneer Valley Planning Commission

Duration: 2006 – 2008 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2006-02

Project Title: Martha's Vineyard Coastal Pond Water Quality Assessment – Phase IV

Investigator: Martha's Vineyard Commission

Location: Islands Watershed

Description: This project will continue the collection of water quality data to prepare six coastal salt ponds for entry into the Massachusetts Estuaries Project (MEP). Second year data will be collected for Katama Bay Pond and James Pond; and third year data for Oyster Pond. Water quality samples will be collected from seventeen stations during four sampling rounds from late July through mid September. Data will be incorporated into a final report and added to the MVC's web site.

Specific project tasks include:

1) Update existing Sampling and Analysis Plan (SAP) to reflect any changes in the sampling locations, stations, sample collection and processing methodology, and equipment and handling including the collection of TSS at select stations;
2) Conduct four sample collection rounds at seventeen stations and analyze the water quality samples in accordance with the updated SAP. Water quality data will be summarized by pond and sampling round and provided in spreadsheet format;
3) Prepare GIS based data maps showing station locations, pond system physical location, and other water quality data collected. The resource information for each pond surveyed will be presented on maps and posted on a web site; and
4) Prepare quarterly progress reports and a final water quality assessment report.

Cost: $20,361

Funding: $ 13,498 – U.S. Environmental Protection Agency
$ 6,863 – Martha's Vineyard Commission

Duration: 2006 – 2008 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2006-03

Project Title: Old Harbor and Scorton Creek Water Quality Sampling

Investigator: Town of Sandwich

Location: Cape Cod Watershed

Description: This project will continue with the collection of baseline water quality data required for entry into Massachusetts Estuary Program initiated by the Town of Sandwich in 2005. Water quality data will be collected during the summer months at 15 stations in Sandwich Harbor and 14 stations in Scorton Creek.

Specific project tasks include:

1) Update existing Sampling and Analysis Plan (SAP) to reflect any changes in the sampling locations, stations, sample collection and processing methodology, and equipment and handling from the 2005 sampling effort including the collection of TSS at select stations;
2) Conduct up to two training sessions for sampling volunteers;
3) Assemble sampling kits as specified in the SAP for each Sampling team;
4) Conduct six sample collection rounds at twenty-nine stations and analyze the water quality samples in accordance with the updated SAP. Water quality data will be summarized by Harbor and sampling round and provided in spreadsheet format;
5) Prepare GIS based data maps showing station locations, Harbor system physical location, and water quality data collected; and
6) Prepare quarterly progress reports and a final water quality assessment report.

Cost: $21,400

Funding: $21,400 – U.S. Environmental Protection Agency

Duration: 2006 – 2008 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2006-04

Project Title: Mount Hope Bay: Estuaries Water Quality Monitoring – Phase III

Investigator: Southeastern Regional Planning and Economic Development District

Location: Mt Hope Bay Watershed

Description: This project will complete three years of water quality sampling for Mt. Hope Bay including fresh, estuarine, and marine waters. The project will provide water quality and flow data to support the Massachusetts Estuaries Program assessment of coastal waters including: Mt. Hope Bay, Taunton River, Three mile River, Segreganset River, Assonet River, and Quequechan River. Three new freshwater stream gauging and water quality monitoring stations will be established on Lewins Brook and Heath Brook/Kickamuit River. Principle objectives are to collect baseline data at established points and to promote community involvement and awareness of water quality issues within the estuary.

Tasks to be completed include:

1) Revise the QAPP for the collection and analysis of water quality and flow data in the project area as needed;
2) Continue recruitment, training and support of volunteer sampling teams for in-bay and fresh water sampling locations;
3) Collect and analyze water quality and flow data from in-bay and fresh water sampling sites in accordance with approved QAPP including TSS data from open-water stations; and
4) Prepare final project report for the three-year Water Quality Sampling Program including a summary and analysis of all data collected by sub-watershed and sampling round.

Cost: $59,920

Funding: $59,920 – U.S. Environmental Protection Agency

Duration: 2006 – 2008 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2007-01

Project Title: Martha's Vineyard Coastal Pond Water Quality Assessment – Phase V

Investigator: Martha's Vineyard Commission

Location: Islands Watershed

Description: This project will continue the collection of water quality data to prepare six coastal salt ponds for entry into the Massachusetts Estuaries Project (MEP). Third year data will be collected for Katama Bay Pond and James Pond. Additional data will be collected from both Oyster Pond and Tisbury Great Pond due to the discontinuous tidal nature of these systems. Water quality samples will be collected from twenty-five stations during four sampling rounds from late July through mid September. Data will be incorporated into a final report and added to the MVC's web site.

Specific project tasks include:

1) Update existing Sampling and Analysis Plan (SAP) to reflect any changes in the sampling locations, stations, sample collection and processing methodology, and equipment and handling including the collection of TSS at select stations;
2) Conduct four sample collection rounds at twenty-five stations and analyze the water quality samples in accordance with the updated SAP. Water quality data will be summarized by pond and sampling round and provided in spreadsheet format;
3) Prepare GIS based data maps showing station locations, pond system physical location, and other water quality data collected. The resource information for each pond surveyed will be presented on maps and posted on a web site; and
4) Prepare quarterly progress reports and a final water quality assessment report.

Cost: $24,744

Funding: $ 20,119 – U.S. Environmental Protection Agency
$ 4,625 – Martha's Vineyard Commission

Duration: 2007 – 2009 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2007-02

Project Title: Old Harbor and Scorton Creek Water Quality Sampling

Investigator: Town of Sandwich

Location: Cape Cod Watershed

Description: This project will complete the third year of baseline water quality data collection required for entry into Massachusetts Estuary Program. Water quality data will be collected during the summer months at 15 stations in Sandwich Harbor and 14 stations in Scorton Creek.

Specific project tasks include:

1) Update existing Sampling and Analysis Plan (SAP) to reflect any changes in the sampling locations, stations, sample collection and processing methodology, and equipment and handling from previous sampling efforts including the collection of TSS at select stations;
2) Conduct up to two training sessions for sampling volunteers;
3) Assemble sampling kits as specified in the SAP for each Sampling team;
4) Conduct six sample collection rounds at twenty-nine stations and analyze the water quality samples in accordance with the updated SAP. Water quality data will be summarized by Harbor and sampling round and provided in spreadsheet format;
5) Prepare GIS based data maps showing station locations, Harbor system physical location, and water quality data collected; and
6) Prepare quarterly progress reports and a final water quality assessment report that summarizes the three years of data collection.

Cost: $21,100

Funding: $ 21,100 – U.S. Environmental Protection Agency

Duration: 2007 – 2009 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2007-03

Project Title: Provincetown Harbor & Pamet Harbor Water Quality Assessment

Investigator: Town of Provincetown

Location: Cape Cod Watershed

Description: This project will collect the baseline water quality data necessary to prepare coastal water bodies in Provincetown and Truro for entry into the Massachusetts Estuaries Project (MEP). The Towns of Provincetown and Truro, in concert with UMASS School of Marine Science and Technology (SMAST), will prepare a Sampling and Analysis Plan and collect Year one data for Hatches Harbor, Provincetown Harbor, East Harbor Lagoon, and Pamet Harbor. Water quality samples will be collected from a minimum of thirty-nine stations during six sampling rounds from June through September.

Specific activities to be conducted by the Contractor during this project include:

1) Prepare a Sampling and Analysis Plan (SAP) including field survey station locations, GPS coordinates, and GIS maps of sample locations following existing Massachusetts Estuaries Program (MEP) Quality Assurance Project Plan (QAPP) to insure standard survey and water quality data collection methods;
2) Collect water quality samples from thirty-nine stations during six sampling rounds; and
3) Prepare final data summary.

Cost: $52,730

Funding: $ 47,730 – U.S. Environmental Protection Agency
$ 5,000 – Town of Provincetown

Duration: 2007 – 2009 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2007-04

Project Title: Barrett Pond Watershed Assessment

Investigator: City of Leominster

Location: Nashua Watershed

Description: This project will conduct an assessment of nonpoint pollution sources and develop solutions to improve water quality and restore recreational uses of Barrett Pond.

Specific activities to be conducted by the City during this project include:

1) Assess land uses in the watershed to identify nonpoint pollution sources,
2) Conduct water quality and biological assessments to identify pond management techniques that will reduce turbidity and algal blooms,
3) Develop preliminary designs, estimated costs, and identify locations to install Best Management Practices,
4) Prepare specific recommendations for stormwater controls and pond management measures,
5) Conduct a community outreach and education program, and
6) Prepare a final project report.

Cost: $45,300

Funding: $33,300 – U.S. Environmental Protection Agency
$12,000 – City of Leominster

Duration: 2007 – 2009 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2007-05

Project Title: Green Street Demonstration Project

Investigator: City of Boston

Location: Boston Harbor Watershed

Description: This project will assess the potential stormwater management and recharge benefits of Green Streets by implementing a pilot Green Street project in the City of Boston. The results will help the City of Boston, as well as the EOEEA and the Department of Environmental Protection (DEP), understand more fully the role that Green Streets could play in stormwater management and watershed protection in this region. The Contractor will work in partnership with the Charles River Watershed Association to complete the project. This project will provide an opportunity to integrate planning, design, development and education about ultra-urban Low Impact Development designs and innovative stormwater retrofits across agencies.

Specific tasks to be completed include:

1) Assess existing conditions at an urban location,
2) Develop Source Loading and Management Model estimates of surface water runoff and nutrient loading for the selected site,
3) Evaluate Low Impact Development (LID) Best Management Practices (BMP) Opportunities,
4) Conduct scenario modeling for various BMP's,
5) Select BMP options Streetscape Concept,
6) Conduct a Public Outreach program, and
7) Prepare a final project report.

Cost: $44,986

Funding: $25,406 – U.S. Environmental Protection Agency
$19,580 – City of Boston

Duration: 2007 – 2009 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2008-01

Project Title: Provincetown Harbor & Pamet Harbor Water Quality Assessment

Grantee: Town of Provincetown

Location: Cape Cod

Description: This project will continue the collection of baseline water quality data necessary to prepare coastal water bodies in Provincetown and Truro for entry into the Massachusetts Estuaries Project (MEP). The Towns of Provincetown and Truro and the National Park Service, in concert with UMASS School of Marine Science and Technology (SMAST), will revise the existing Sampling and Analysis Plan and collect Year two data for Hatches Harbor, Provincetown Harbor, East Harbor Lagoon, and Pamet Harbor. Water quality samples will be collected during six sampling rounds from June through September.

Specific activities to be conducted by the Grantee during this project include:

1) Revise existing Sampling and Analysis Plan (SAP) including field survey station locations, GPS coordinates, and GIS maps of sample locations following existing Massachusetts Estuaries Program (MEP) Quality Assurance Project Plan (QAPP) to insure standard survey and water quality data collection methods;
2) Collect water quality samples during six sampling rounds; and
3) Prepare final data summary.

Cost: $ 46,400

Funding: $ 46,400 - U.S. Environmental Protection Agency

Duration: 2008 -2010 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2008-02

Project Title: Cranberry Bog Management in the Weweantic Watershed

Grantee: Town of Carver

Location: Buzzards Bay

Description: This project seeks to reduce nutrient loading associated with cranberry production in the Weweantic watershed by updating the cranberry industry's Best Management Practices guide. The Grantee will produce an updated technical document to inform growers as to innovative methods of cranberry production that reduce environmental impacts. Project partners include the Cape Cod Cranberry Growers Assoc., UMASS Cranberry Station, and Coalition for Buzzards Bay.

Specific tasks to be completed include:

1) Collect, compile and assess current research on reducing nutrient inputs;
2) Publish and distribute a Fact sheet to cranberry growers on environmental issues in the Weweantic;
3) Synthesize research into a BMP manual and distribute BMP manual to growers; and
4) Conduct a workshop with cranberry growers and present the updated technical BMP document at an annual cranberry growers conference.

Cost: $ 17,040

Funding: $ 16,500 - U.S. Environmental Protection Agency
$ 540 – Town of Carver

Duration: 2008 – 2010 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2008-03

Project Title: Martha's Vineyard Coastal Pond Water Quality Assessment – Phase VI

Grantee: Martha's Vineyard Commission

Location: Islands

Description: This project will continue the collection of water quality and land use data to prepare coastal salt ponds on Martha's Vineyard for entry into the Massachusetts Estuaries Project (MEP). Additional data will be collected from both Oyster Pond and Tisbury Great Pond at regular intervals before, during and after openings to the ocean are cut through the barrier beaches. Water quality samples and pond surface elevation data will be collected from 12 stations during six sampling rounds. Data will be incorporated into a final report and added to the MVC's web site.

The Grantee will also complete a land use analysis for Farm Pond watershed using the methodology developed by the Cape Cod Commission for nitrogen loading models. Parcel-level uses and their development potential will be identified and residential wastewater production estimated. Lawn size and fertilizer treatment level, commercial wastewater loads, and golf course turf acreage will be measured to estimate landscape nitrogen loading. All parcel-level data will be entered into spreadsheets for use in the MEP analysis.

Specific project tasks include:

1) Update existing Sampling and Analysis Plan (SAP) to reflect any changes in the sampling locations, stations, sample collection and processing methodology, and equipment and handling including the collection of TSS at select stations;
2) Install water pressure transducers to record pond level elevations before, during and after these systems are open to the ocean;
3) Conduct six sample collection rounds at twelve stations and analyze the water quality samples in accordance with the updated SAP. Water quality data will be summarized by pond and sampling round and provided in spreadsheet format;
4) Prepare GIS based data maps showing station locations, pond system physical location, and other water quality data collected. The resource information for each pond surveyed will be presented on maps and posted on a web site;
5) Prepare parcel-level land use analysis to estimate nitrogen loading from residential, recreational and commercial land uses; and
6) Prepare quarterly progress reports and a final water quality assessment report.

Cost: $22,366

Funding: $16,137 - U.S. Environmental Protection Agency
$ 6,229 – Martha's Vineyard Commission

Duration: 2008 – 2010 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2008-04

Project Title: Westfield River Basin Water Quality Monitoring Program

Grantee: Pioneer Valley Planning Commission

Location: Westfield River

Description: The Grantee, in collaboration with Westfield State College's Westfield River Environmental Center will implement a water quality monitoring program in the Westfield River watershed to identify sources of impairments. A QAPP that describes sampling locations, sampling and analysis methodologies will be submitted to DEP/EPA for review. This project will conduct 18 months of baseline chemical and bacterial sampling.

Project tasks include:
1) Review and edit QAPP based on DEP/EPA comments and finalize QAPP;
2) Organize volunteer stream teams and train volunteers;
3) Conduct monitoring program;
4) Analyze samples; and
5) Conduct outreach and publish water quality data on Westfield State College's web site.

Cost: $ 37,379

Funding: $ 29,004 - U.S. Environmental Protection Agency
$ 8,375 – PVPC & Westfield State College

Duration: 2008 – 2010 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

American Recovery & Reinvestment Act

SECTION 604b PROJECT 2009-01-ARRA

Project Title: Developing Tools for More Effective Assessment of Wetlands and Aquatic Ecosystems

Grantee: UMASS - Amherst

Location: Statewide

Description: This project will continue efforts by UMASS and MADEP to develop a landscape level assessment method that will inform MADEP's wetland and water quality sampling programs. The method under development is the Conservation Assessment and Prioritization System (i.e. CAPS) developed by the University of Massachusetts at Amherst.

Specific activities to be conducted include:

1) Development of reference condition (or disturbance gradient) for the assessment of wetland and water quality condition and aid in the incorporation of wetland issues into broader watershed planning and watershed management goals;
2) Development of Tidal Restriction and Ditching salt marsh metrics for the CAPS landscape level model to aid in wetland monitoring and assessment of wetland condition;
3) Identification of algae and/or invertebrates and other data collected to aid in calibration of the CAPS model; and
4) Preparation of final report detailing work completed in the above tasks.

Cost: $ 100,000

Funding: $ 100,000 - U.S. Environmental Protection Agency

Duration: 2009 – 2010 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

American Recovery & Reinvestment Act

SECTION 604b PROJECT 2009-02-ARRA

Project Title: Technical Support for the Development of a Probabilistic Water Quality Monitoring Program for Massachusetts

Grantee: UMASS - Amherst

Location: Statewide

Description: This project will provide technical support for the design of a probabilistic water quality monitoring program for the Commonwealth of Massachusetts which would provide sufficient data to report on the overall quality of freshwaters in Massachusetts every two years and at the same time provide MADEP with additional information to assess the condition of water quality in specific lakes and rivers to meet the Commonwealth's obligations under section 303d of the federal Clean Water Act.

The Massachusetts Water Resources Research Center of UMass will work with MassDEP to support the development of a probabilistic monitoring program for wadable rivers, lakes and estuaries in the Commonwealth.

Technical support will be provided in the following areas:

- Preparation of an overview of relevant literature, including an evaluation of other state programs to determine if and how they have integrated probabilistic monitoring designs into their water assessment and management programs and, if so, the approximate number of FTEs allotted to those efforts; and
- Modifications to the high resolution (1:24,000) National Hydrography Dataset (NHD) within Massachusetts to allow for its use as the sample frame for river and lake probabilistic surveys.

Cost: $ 40,000

Funding: $ 40,000- U.S. Environmental Protection Agency

Duration: 2009 – 2010 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

American Recovery and Reinvestment Act (ARRA)

SECTION 604b PROJECT 2009-03-ARRA

Project Title: Paines Creek and Stony Brook Watershed Stormwater Mitigation Project

Grantee: Town of Brewster

Location: Cape Cod

Description: The goal of this project is to continue improvements to untreated stormwater discharges for the Paines Creek and Stony Brook Watershed in Brewster. A stormwater mitigation assessment project for this area was completed in 2007 under a Massachusetts Coastal Zone Management Non Point Source grant and identified four priority sites. One of the four sites, Stony Brook Mill, received a CZM Coastal Pollution Remediation grant for final design and a Section 319 Non Point Source grant for implementation.

This project will include a site survey and preliminary design of stormwater improvements for two additional priority sites; the Route 6A Triangle and Paines Creek Road North of the Route 6A intersection. The primary pollutants of concern are: suspended solids, sediments, pathogens/bacteria, and nutrients. Preliminary design plans up to the 50% review stage will be prepared for both sites in a format suitable to submit as a proposal for FFY11 319 funding.

Specific activities to be conducted by the Contractor during this project include:
1) site survey and data collection; and
2) prepare preliminary design plans for 50% review.

Cost: $ 58,000

Funding: $ 58,000- U.S. Environmental Protection Agency

Duration: 2009 – 2011 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

American Recovery and Reinvestment Act (ARRA)

SECTION 604b PROJECT 2009-04-ARRA

Project Title: Provincetown Harbor Stormwater Mitigation Project

Grantee: Town of Provincetown

Location: Cape Cod

Description: This project will continue improvements to the West End outfalls to correct ongoing bacteria pollution and improve the overall water quality of Provincetown Harbor. A stormwater mitigation assessment project funded by a Coastal Zone Management CPR grant identified 25 stormwater discharge points to Provincetown Harbor. Stormwater mitigation measures have already been designed, implemented and planned at many of these outfalls. This project will provide preliminary design for stormwater collection improvements, infiltration facilities and installation of porous pavement as a combined solution. The Contractor will conduct a site survey, subsurface investigations, and preliminary design of Commercial Street redevelopment between the West End lot and Atlantic Avenue.

Specific activities to be conducted by the Contractor during this project include:
1) site survey and data collection;
2) conduct subsurface investigations, and
3) prepare preliminary design plans for 50% review.

Cost: $ 90,240

Funding: $ 90,240- U.S. Environmental Protection Agency

Duration: 2009 – 2011 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

American Recovery and Reinvestment Act (ARRA)

SECTION 604b PROJECT 2009-05-ARRA

Project Title: South River Bacterial Source Assessment Project

Grantee: Town of Marshfield

Location: South Coastal

Description: This project will assess potential sources of bacteria in the South River watershed through iterative source tracking sampling; prioritize potential solutions and problem areas according to feasibility and expected improvement; and provide designs for BMPs to improve the top three priority areas. Project goal is to reach water quality goals supportive of opening South River shellfish beds and allowing safe recreation.

Specific activities to be conducted by the Contractor during this project include:

1) Update existing North and South River Watershed Association QAPP;
2) Conduct water quality sampling to identify bacterial sources;
3) Compile watershed information including identification and feasibility analysis of BMP retrofit sites; and
4) Prioritize BMP sites and develop preliminary designs.

Cost: $60,835

Funding: $49,430 - U.S. Environmental Protection Agency
$11,405 – Town of Marshfield

Duration: 2009 – 2011 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

American Recovery and Reinvestment Act (ARRA)

SECTION 604b PROJECT 2009-06-ARRA

Project Title: Kingston Bay Stormwater Mitigation Project

Grantee: Town of Duxbury

Location: South Coastal

Description: This project will advance the work already underway in Kingston Bay to mitigate the worst stormwater outfalls. The project will complement a recent FFY09 Coastal Pollution Remediation award for the second worst outfall (#44) by preparing designs for three additional BMPs for this outfall. Additionally, four other outfalls will be selected after water quality sampling and analysis. BMP designs will be prepared for these sites. The project goal is to bring technical documents for these seven BMPS to a level of engineering and design where they can become the substance of an application for construction funds under the s319 Grant or other programs.

Specific activities to be conducted by the Contractor during this project include:
1) Prepare a QAPP including soil boring and water quality sampling;
2) Conduct water quality sampling;
3) Prioritize sites, conduct site investigations, and develop final BMP designs.

Cost: $58,180

Funding: $53,600- U.S. Environmental Protection Agency
$ 4,580 – Town of Duxbury

Duration: 2009 – 2011 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

American Recovery and Reinvestment Act (ARRA)

SECTION 604b PROJECT 2009-07-ARRA

Project Title: Furnace & Oldham Pond Watershed Restoration Project

Grantee: Town of Pembroke

Location: South Coastal

Description: This project will develop a long-term watershed restoration plan for both Oldham and Furnace Ponds. Both Ponds are located in Pembroke, MA within the North River Watershed and are on the 303(d) List of Impaired Waters for noxious aquatic weeds (Oldham), low dissolved oxygen (Furnace) and organic enrichment (Furnace). A number of watershed improvements have been implemented over the past 10 years. Additionally, a local volunteer effort to collect water quality data was implemented in 2008. This restoration plan will prioritize future watershed protection activities to obtain the most cost effective pollutant removal, while estimating the anticipated improvements. The project will focus on pollutant sources, in this case phosphorus, and will determine how much phosphorus needs to be removed under existing and buildout conditions to reduce in-lake phosphorous levels to meet recreational goals. The plan will be used by the Town to implement the most cost-effective BMPs to meet water quality goals and to obtain future funds for implementation.

Specific activities to be conducted by the Contractor during this project include:
1) Amend an exisiting QAPP to include water quality modeling and any proposed changes;
2) Conduct water quality sampling; and
3) Prioritize sites, conduct site investigations, and develop final BMP designs.

Cost: $54,335

Funding: $47,150- U.S. Environmental Protection Agency
$ 7,185 – Town of Pembroke

Duration: 2009 – 2011 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

American Recovery and Reinvestment Act (ARRA)

SECTION 604b PROJECT 2009-08-ARRA

Project Title: Improving Water Quality in Urban Watersheds Project

Grantee: City of Cambridge

Location: Boston Harbor/Lower Charles River Basin

Description: This project will determine street-dirt accumulation rates, wash-off of street dirt due to precipitation, trace-element concentrations in street-dirt, and develop a productivity function for a high-efficiency (H-E) street cleaner in areas representing two well-defined land-use categories (multifamily residential and commercial/industrial) in the City of Cambridge, MA over a 9-month (April to December) street-cleaning season. These data and data from other sources, where available, will be used to develop, calibrate and verify a Source Loading and Management Model (SLAMM) to simulate the effectiveness of a H-E street cleaning program at reducing phosphorus loading to the Lower Charles River.

The data acquired by this effort will be used to refine existing stormwater runoff models, estimate urban non-point source reductions of total phosphorus relative to the lower Charles River total phosphorus TMDL, and develop appropriate load-reduction credits to facilitate additional high-efficiency vacuum sweeping in the Lower Charles River Basin and other areas statewide. Information derived from this study will enhance the knowledge base about effective BMPs and will help prioritize municipal good housekeeping decisions for TMDL implementation and NPDES Phase II compliance.

Specific activities to be conducted by the Contractor during this project include:

1) Prepare a QAPP;
2) Determine street-dirt accumulation rates, wash-off of street dirt due to precipitation, and trace-element concentrations in street-dirt;
3) Develop a productivity function for a high-efficiency (H-E) street cleaner in areas representing two well-defined land-use categories (multifamily residential and commercial/industrial) in the City of Cambridge;
4) Develop, calibrate and verify a Source Loading and Management Model (SLAMM) to simulate the effectiveness of a H-E street cleaning program at reducing phosphorus loading to the Lower Charles River; and
5) Provide final report including physical and chemical results for each analytical constituent and a discussion of the SLAMM model and simulations of phosphorus load reductions due to a street cleaning program.

Cost: $345,000

Funding: $150,000- U.S. Environmental Protection Agency
$195,000 – MassDEP, USGS, City of Cambridge

Duration: 2009 – 2011 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

American Recovery and Reinvestment Act (ARRA)

SECTION 604b PROJECT 2009-09-ARRA

Project Title: Lake Gardner Bacteriological Study

Grantee: Town of Amesbury

Location: Merrimack River

Description: This project will collect water quality data and conduct assessment activities for the upstream Powow River segment (Tuxbury Lake to Lake Gardner segment of the Powow River) and in Lake Gardner. Lake Gardner is an 80-acre lake that lies between several reaches of the Powow River in the Merrimack River Watershed. The Powow River is a Class A waterbody and is listed as a Category 5 impaired waterbody on the 2006 303(d) list of impaired waters for pathogens, suspended solids, noxious aquatic weeds and turbidity. Periodic beach closures occur due to elevated bacteria levels; other water quality problems for Lake Gardner include algal blooms, sedimentation and nuisance aquatic weeds.

In addition to collecting water quality data, the Town will develop a long-term remediation plan focusing on pathogens for the Powow River (Tuxbury Lake outlet to Lake Gardner) including Lake Gardner to prioritize and plan for future water quality improvements, particularly relating to bacteria and nutrients, for these waterbodies.

Specific project tasks include:
1) Prepare an USEPA and MassDEP approved Quality Assurance Project Plan (QAPP);
2) Collect watershed data to identify potential bacteria sources;
3) Collect and analyze water quality data;
4) Prepare long-term remediation plan; and
5) Provide progress and final reports.

Cost: $49,950

Funding: $46,550 - U.S. Environmental Protection Agency
$ 3,400 – City of Amesbury

Duration: 2009 – 2011 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

American Recovery and Reinvestment Act (ARRA)

SECTION 604b PROJECT 2009-10-ARRA

Project Title: Water Quality Assessment of Windsor & Cady Brooks

Grantee: City of Pittsfield

Location: Housatonic

Description: This project is part of a comprehensive management approach to protect the City of Pittsfield's water supply. The City will assess sources of sediment to Windsor and Cady Brooks and identify best management practices to prevent sediment from entering Cleveland Reservoir. Sediment deposits in these waterbodies and the re-suspension of these materials during storm events and high water flows are contributing to the increased turbidity impacting Cleveland Reservoir. An analysis of the watershed, stream system, sediment characteristics, and potential management alternatives will be conducted. The baseline information collected and conceptual alternatives developed will form the framework for implementation of BMPs that will protect the water quality of the streams and the water supply reservoirs.

Specific project tasks include:

1) Prepare an USEPA and MassDEP approved Quality Assurance Project Plan (QAPP);
2) Characterize the turbidity in Windsor and Cady Brook impoundments;
3) Prepare bathymetric profiles and calculate sediment volumes in these impoundments;
4) Evaluate potential sediment sources;
5) Estimate watershed sediment volumes;
6) Evaluate BMPs for managing sediment and turbidity
7) Evaluate effectiveness of management practices in reducing sediment load; and
8) Provide final project report.

Cost: $107,200

Funding: $ 69,300 - U.S. Environmental Protection Agency
$ 37,900 – City of Pittsfield

Duration: 2009 – 2011 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

American Recovery and Reinvestment Act (ARRA)

SECTION 604b PROJECT 2009-11-ARRA

Project Title: Stormwater Remediation in the Upper Ipswich Watershed

Grantee: Town of North Reading

Location: Ipswich

Description: The goal of this project is to conduct assessments of stormwater conveyances, streambank erosion, sediment plumes at outfalls, and water quality in small-scale catchments in the upper Ipswich watershed area. This assessment information will be used to design low impact BMPs that will mitigate NPS pollution caused primarily by stormwater runoff and develop implementation plans for these BMPs.

Specific activities to be conducted by the Contractor during this project include:
1) Prepare a Quality Assurance Project Plan (QAPP);
2) Assess streambank erosion and sediment plumes;
3) Sample catchment water quality during storm events;
4) Prepare conceptual plans and cost estimates; and
5) Provide a Final report on project activities and recommendations.

Cost: $36,000

Funding: $26,000 - U.S. Environmental Protection Agency
$10,000 – Town of North Reading

Duration: 2009 – 2011 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

American Recovery and Reinvestment Act (ARRA)

SECTION 604b PROJECT 2009-12-ARRA

Project Title: Three Town BMP Development Project

Grantee: Town of Sharon

Location: Boston Harbor – Neponset River

Description: The goal of this project is to identify sites in the Towns of Sharon, Stoughton and Walpole that are suitable for retrofitting with structural stormwater BMPs and to develop conceptual designs for BMPs at those sites. The Contractor will identify, prioritize and design BMP retrofits in each of the three towns. The Contractor will use a new approach that will emphasize a visual survey of BMP retrofit potential that will be applied to: prioritize retrofit opportunities, determine ease of implementation, provide qualitative estimates of pollutant loading, determine engineering feasibility, estimate potential for pollutant load reduction, and determine the likelihood for acceptance by abutters. Upon completion of this assessment, and the vetting of potential sites with key community stakeholders, the Contractor will prepare final conceptual designs and determine pollutant loading from the sites selected in each of the three towns.

Specific activities to be conducted by the Contractor during this project include:

1) Demonstrate a methodology which can be used to efficiently identify and prioritize stormwater BMP retrofit opportunities in other towns and other watersheds.
2) Identify at least three sites (neighborhoods or discrete collection areas) that are amenable to the implementation of structural BMP retrofits in each town.
3) Prepare conceptual designs and cost estimates for three sites in each town to support future applications for implementation funding.

Cost: $91,374

Funding: $82,790 - U.S. Environmental Protection Agency
$ 8,584 – Town of Sharon

Duration: 2009 – 2011 (Project Complete)

MASSACHUSETTS DEPA RTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

American Recovery and Reinvestment Act (ARRA)
SECTION 604b PROJECT 2009-13-ARRA

Project Title: Connecticut River Water Quality Monitoring Project

Grantee: Pioneer Valley Planning Council

Location: Connecticut

Description: This project will continue an on-going volunteer based bacteria monitoring program in the Connecticut River watershed in Franklin, Hampshire and Hampden Counties. The Contractor will oversee the collection of bacteria samples along the main stem of the river, collection of new baseline data on tributaries suspected to be sources of bacteria, and new monitoring and field reconnaissance at specific locations for bacteria source tracking. Data collected will be shared with the public, MassDEP, municipal officials, and other stakeholders through posting the data to a web site targeting recreational river users as well as outreach through local media and forum outlets.

Specific activities to be conducted by the Contractor during this project include:

1) Update existing QAPP for the Tri-State Connecticut River Volunteer Monitoring Program;
2) Coordinate recruitment and training of volunteer samplers;
3) Select sampling sites on the main stem, suspect tributaries, and specific source tracking sites;
4) Collect water quality samples and conduct bacteria analysis to identify bacterial sources;
5) Conduct public outreach to disseminate water quality results; and
6) Provide a final report on project activities.

Cost: $104,788

Funding: $ 77,206 - U.S. Environmental Protection Agency
$ 27,582 - PVPC

Duration: 2009 – 2011 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2009-01

Project Title: Stormwater Best Management Practices Retrofit Development

Grantee: Town of Canton

Location: Boston Harbor – Neponset

Description: The goal of this project is to identify sites in the Town of Canton that are suitable for retrofitting with structural stormwater BMPs and to develop conceptual designs for BMPs at those sites. The Contractor will employ a new method for identifying, prioritizing and designing BMP retrofits. This approach will emphasize a visual survey of BMP retrofit potential that can be rapidly applied to a large area to: prioritize retrofit opportunities, determine ease of implementation, provide qualitative estimates of pollutant loading, determine engineering feasibility, estimate potential for pollutant load reduction, and determine the likelihood for acceptance by abutters. Upon completion of this assessment, and the vetting of potential sites with key community stakeholders, the Contractor will prepare final conceptual designs and determine pollutant loading from the selected sites.

Specific activities to be conducted include:

1) Demonstrate a methodology which can be used to efficiently identify and prioritize stormwater BMP retrofit opportunities in other towns and other watersheds.
2) Identify at least three sites (neighborhoods or discrete collection areas) that are amenable to the implementation of structural BMP retrofits.
3) Prepare conceptual designs and cost estimates to support future applications for implementation funding.
4) Conduct an outreach program through the distribution of a press release and newsletter article announcing the commencement of the project and the project's findings.

Cost: $ 26,904

Funding: $ 23,830 - U.S. Environmental Protection Agency
$ 3,074 – Town of Canton

Duration: 2009 – 2012 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2009-02

Project Title: Provincetown Harbor & Pamet Harbor Water Quality Assessment

Grantee: Town of Provincetown

Location: Cape Cod

Description: This project will continue the collection of baseline water quality data necessary to prepare coastal water bodies in Provincetown and Truro for entry into the Massachusetts Estuaries Project (MEP). The Towns of Provincetown and Truro and the National Park Service, in concert with UMASS School of Marine Science and Technology (SMAST), will revise the existing Sampling and Analysis Plan and collect Year three data for Hatches Harbor, Provincetown Harbor, East Harbor Lagoon, and Pamet Harbor. Water quality samples will be collected during six sampling rounds from June through September. A final report that summarizes all three years of sampling will also be prepared.

Specific activities to be conducted by the Grantee during this project include:

1) Revise existing Sampling and Analysis Plan (SAP) including field survey station locations, GPS coordinates, and GIS maps of sample locations following existing Massachusetts Estuaries Program (MEP) Quality Assurance Project Plan (QAPP) to insure standard survey and water quality data collection methods;
2) Collect water quality samples during six sampling rounds; and
3) Submit a final data summary and analysis report covering all three years of sampling to MassDEP.

Cost: $ 35,670

Funding: $ 35,670 - U.S. Environmental Protection Agency

Duration: 2009 – 2011 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2009-03

Project Title: Bernardston Wellhead Protection Planning

Grantee: Franklin Regional Council of Governments

Location: Connecticut & Deerfield Watersheds

Description: The objective of this project is to implement two of the priority actions listed in the *5-Year Watershed Action Plan for the Connecticut River* and the protection planning recommendations in the MassDEP SWAP report. These actions will help protect the drinking water quality of public water supplies, private wells, and aquifers in the Town of Bernardston.

Specific project tasks include:

1) Develop a Wellhead Protection Plan to protect public water supplies, private drinking water wells and high yield aquifers in Bernardston;
2) Evaluate options for gaining ownership or control of the entire Zone I areas for the two wells;
3) Conduct a detailed, parcel-level field inventory of the current land uses in the Zone I and Zone II areas and prepare GIS maps;
4) Develop specific regulatory and non-regulatory controls to address the potential sources of contamination identified; and
5) Prepare updates to the town's zoning bylaws to meet 310 CMR 22.21(2) and include the Zone II delineations for adoption by Town Meeting.

Cost: $30,401

Funding: $24,000 - U.S. Environmental Protection Agency
$ 6,401 – Town of Bernardston

Duration: 2009 – 2012 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2010-01

Project Title: Fluvial Geomorphic and Habitat Assessment of the South River Watershed

Grantee: Franklin Regional Council of Governments

Location: Deerfield

Description: The Franklin Regional Council of Governments (FRCOG) will conduct a geomorphic assessment of the South River to provide information on the causes of erosion, channel instability and habitat degradation. Fish community and physical habitat surveys will be performed in the South River and its tributaries to characterize the current habitat conditions and provide data to the fluvial geomorphic study. This project will: 1) help fill significant water quality data gaps for the South River watershed, 2) provide conceptual restoration designs for 4 reaches, and 3) provide a final engineering design for the highest priority restoration site.

Cost: $82,885

Funding: $74,900 - U.S. Environmental Protection Agency
$ 7,985 – Deerfield River Watershed Association

Duration: 2010 – 2012 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2010-02

Project Title: Stormwater Best Management Practices Retrofit Development

Grantee: Town of Dedham

Location: Boston Harbor – Neponset

Description: The goal of this project is to identify sites in the Town of Dedham that are suitable for retrofitting with structural and nonstructural stormwater BMPs using a LID approach and to develop conceptual designs for BMPs at those sites. The project will utilize a methodology for identifying and prioritizing BMP retrofit opportunities that is currently employed on two existing 604b projects in Sharon and Canton respectively. This approach will emphasize a visual survey of BMP retrofit potential that can be rapidly applied to a large area to: prioritize retrofit opportunities, determine ease of implementation, provide qualitative estimates of pollutant loading, determine engineering feasibility, estimate potential for pollutant load reduction, and determine the likelihood for acceptance by abutters. Upon completion of this assessment, and the vetting of potential sites with key community stakeholders, the Contractor will prepare final conceptual designs and determine pollutant loading from the selected sites.

Specific activities to be conducted include:

1) Demonstrate a methodology which can be used to efficiently identify and prioritize stormwater BMP retrofit opportunities in other towns and other watersheds.
2) Identify at least three sites (neighborhoods or discrete collection areas) that are amenable to the implementation of structural BMP retrofits. Less detailed cost estimates will be provided for an additional seven sites.
3) Prepare conceptual designs and cost estimates to support future applications for implementation funding.
4) Conduct an outreach program through the distribution of a press release and newsletter article announcing the commencement of the project and the project's findings.

Cost: $ 40,258

Funding: $ 37,010 - U.S. Environmental Protection Agency
$ 3,248 – Town of Dedham

Duration: 2010 – 2012 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2010-03

Project Title: Knob Hill Stormwater Planning

Grantee: Great Barrington

Location: Housatonic

Description: The Town of Great Barrington will develop implementation plans (i.e. preliminary designs and cost estimates for Best Management Practices) for managing the nonpoint source pollution into Lake Mansfield that originates from Knob Hill. This area is one of several major sources of runoff that contribute to the water quality impairment of the Lake. The plans and estimates developed will provide the basis for the implementation and ongoing management of these BMPs.

Cost: $ 13,200

Funding: $10,700 - U.S. Environmental Protection Agency
$ 2,500 – Town of Great Barrington

Duration: 2010 – 2012 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2010-04

Project Title: Bellingham Subwatershed Stormwater Restoration Planning

Grantee: Bellingham

Location: Charles River

Description: The Town of Bellingham will create a subwatershed restoration plan to address nonpoint source pollution problems and restore water function in a portion of Bellingham that lies within the Charles River watershed. The project will identify opportunities for both on-site and regional stormwater management approaches, especially techniques that use green infrastructure and Low Impact Development (LID) techniques, as it works to address stormwater problems and water body impairments. The Town will identify a priority subwatershed, evaluate various restoration design options, estimate costs and pollution reduction potential, and select a preferred subwatershed restoration plan that will enable Bellingham to significantly improve stormwater management. The plan will include a priority list of projects which would bring the most benefit at the least cost, and which appear to have the fewest site constraints.

Cost: 45,090

Funding: $45,090 - U.S. Environmental Protection Agency

Duration: 2010 – 2012 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2010-05

Project Title: Stormwater Assessment & Stormwater Retrofit Plan

Grantee: Peabody

Location: North Coastal

Description: This project will perform a stormwater retrofit assessment and develop conceptual design plans that the City could implement to improve altered hydrology in the City. This project will identify, evaluate, and prioritize structural and non-structural best management practices (BMPs) to control nonpoint source pollution problems and ultimately improve water quality and attenuate stormwater runoff conditions in the North River watershed. A comprehensive stormwater retrofit assessment will be conducted of the City's stormwater management systems on publicly owned parcels in the North River Watershed. This project will: 1) identify subwatershed stormwater retrofit potential and feasibility, 2) identify the most effective sites and most appropriate BMPs to improve stormwater runoff water quality as well as reduce water quantity and peak flow rates discharging into the watershed, and 3) prepare conceptual design plans, sizing calculations, and cost estimates for potential BMP retrofit opportunities

Cost: $38,440

Funding: $35,240 - U.S. Environmental Protection Agency
$ 3,200 – City of Peabody

Duration: 2010 – 2012 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2010-06

Project Title: Strategic Fish Tissue Monitoring Survey to Assess Mercury Impairments

Grantee: New England Interstate Water Pollution Control Commission

Location: Statewide

Description: The objective of this project is to complete a comprehensive regional fish tissue monitoring survey to assess the status of mercury impairments in the region and the impacts of mercury reduction activities. The results will support the re-evaluation of the Northeast Regional Mercury TMDL. NEIWPCC will coordinate the design and development of a regional approach to fish tissue monitoring with other New England states and coordinate this effort with the on-going Massachusetts monitoring plan and existing database. Additional work to be conducted by NEIWPCC will include: 1) revise existing Massachusetts approved QAPP to meet EPA requirements; 2) collect fish tissue samples from both Smallmouth Bass (SMB) and Largemouth Bass (LMB) and from specific Massachusetts lakes recommended by the Department to augment Massachusetts data; 3) assist MassDEP Wall Experiment Station staff with sample processing; 4) perform SMB/LMB fish tissue mercury comparisons; and 5) provide quarterly and final project reports.

Cost: $ 75,783

Funding: $ 75,783 - U.S. Environmental Protection Agency

Duration: 2010 – 2012 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2011-01

Project Title: Aberjona River Watershed BMP Development Project

Grantee: Woburn

Location: Boston Harbor (Mystic)

Description: This project will evaluate subwatersheds in Woburn, Burlington, Reading and Winchester to identify suitable sites for retrofitting with structural stormwater BMPs that will address pollutants of concern as recommended in the EEA Mystic River Watershed Action Plan. Potential retrofit sites will be prioritized based on water quality assessment, GIS analysis, site surveys, and a collaborative decision making process. Conceptual designs and cost estimates will be prepared for one site in each of the four participating municipalities. This project will provide each of the four participating municipalities with a list of BMP projects they can implement to remediate water quality impairments in the Aberjona River watershed.

Specific project tasks include:
1) Prepare list of Town preferred BMPs;
2) Revise existing QAPP for wet-weather monitoring;
3) Conduct analysis of non-point source loading;
4) Conduct analysis of priority drainage basins to screen potential BMP sites;
5) Prioritize sites for BMP implementation;
6) Conduct wet-weather monitoring at priority sites;
7) Survey sites and collect design data;
8) Prepare conceptual designs and cost estimates; and
9) Quarterly and Final reports.

Cost: $67,500

Funding: $49,860 - U.S. Environmental Protection Agency
$ 17,640 – Woburn, Burlington, Reading, & Winchester

Duration: 2011 – 2013 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2011-02

Project Title: Stormwater Best Management Practices Retrofit Development

Grantee: Town of Milton

Location: Boston Harbor – Neponset

Description: This project will replicate stormwater BMP development efforts ongoing in other Boston Harbor watershed towns. A mobile GIS based strategy will be used to survey subwatersheds in the Town of Milton to identify suitable sites for retrofitting with structural stormwater BMPs that address pathogens and other pollutants of concern as recommended in applicable TMDLs and EEA Watershed Action Plan. Conceptual designs for BMPs will be developed at three or more sites and less detailed cost estimates at an additional seven sites. The Milton Department of Public Works will partner with the Neponset Watershed Association to identify sites suitable for retrofitting with structural stormwater BMPs and to develop conceptual designs for BMPs at those sites.

The specific project tasks include:

- Identify at least three sites (neighborhoods or discrete collection areas) that are amenable to the implementation of structural BMP retrofits in the near term.
- Prepare conceptual designs and cost estimates to support future applications for implementation funding at those sites.
- Assemble planning level data on as many other retrofit opportunities as possible, to guide longer term efforts and infrastructure planning.
- Apply and refine a methodology which is being used successfully in other Neponset communities to efficiently identify and prioritize stormwater BMP retrofit opportunities.

Cost: $ 40,258

Funding: $ 37,010 - U.S. Environmental Protection Agency
$ 3,248 – Town of Milton

Duration: 2011-2013 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2011-03

Project Title: Cranberry Bog Nutrient Loss Study

Grantee: Carver

Location: Buzzards Bay

Description: This project will collect data to better understand actual nutrient losses from various types and configurations of cranberry bogs. This project will collect information to estimate the potential for nitrogen to discharge from cranberry bogs of various configurations. This information can be used to more accurately model the potential contribution that cranberry bogs may be making to the eutrophication of Buzzards Bay estuaries.

Specific tasks to be completed include:

1) Identification of six bogs from two different bog types – three pass through bog systems and three closed-loop systems;
2) Develop QAPP and sampling plan;
3) Install groundwater monitoring wells and water level loggers;
4) Data collection and analysis over 24 months;
5) Quarterly & Final Reports.

Cost: $ 68,642

Funding: $58,642 - U.S. Environmental Protection Agency
$10,000 – Cape Cod Cranberry Growers Assoc. & Coalition for Buzzards Bay

Duration: 2011 – 2014 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2011-04

Project Title: Bacteria Source Tracking & Mitigation in the Hoosic River Watershed

Grantee: Berkshire Regional Planning Commission

Location: Hudson (Hoosic)

Description: The project will identify nonpoint sources of bacterial contamination in the Hoosic River Watershed and develop strategies to mitigate the sources found. This work will continue work initiated by the DEP's Division of Watershed Management, Pilot BST Program, to address the primary cause of impairment in the watershed.

Specific tasks to be completed include:

1) Develop QAPP that builds on DEP's Bacteria Source Tracking Program;
2) Assemble existing data into a geo-referenced database;
3) Collect, analyze and document water quality samples;
4) Maintain communication of project efforts and results with municipalities and MassDEP WERO;
5) Indentify and prioritize a minimum of three sites for mitigation; and
6) Quarterly & Final project reports

Cost: $63,100

Funding: $56,300 - U.S. Environmental Protection Agency
$ 6,800 - Massachusetts College of Liberal Arts

Duration: 2011 -2014 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2012-01

Project Title: Kingston Town Center Stormwater Assessment Project

Grantee: Town of Kingston

Location: South Coastal

Description: This project will continue local efforts to assess and remediate bacterial water quality impairments of the lower Jones River and Duxbury Bay where TMDLs are required due to pathogenic contamination (Category 5 listing for pathogens). This phase will focus on a subwatershed of the Jones River in and around Kingston town center where "first flush" stormwater sampling will occur during two storm events at four MassDOT outfalls and six town-owned outfalls that discharge to the Jones River. Analysis of water quality data and "first flush" volumes will direct prioritization of new remediation design plans while an on-going Massachusetts Bays Research & Planning project will advance development of final, implementation ready design plans. Stormwater remediation plans generated through the 604b project will include low impact development BMPs that provide the highest bacterial removal efficiencies in accordance with Massachusetts Stormwater regulations. Through these stormwater assessment and planning activities this project will promote restoration of beneficial uses in impaired waters and will address regional public health, environmental, economic, recreational, as well as aesthetic concerns.

Specific project tasks include:

1) Prepare QAPP for wet-weather monitoring;
2) Collect "first flush" water quality samples for two storm events;
3) Conduct analysis of water quality samples;
4) Conduct analysis of priority sites to screen potential BMP designs;
5) Prioritize sites for BMP implementation;
6) Survey sites, collect design data and create conceptual designs for these sites;
7) Prepare preliminary design plans and cost estimates for three sites; and
8) Prepare Quarterly and Final reports.

Funding: $ 48,620 - U.S. Environmental Protection Agency
$ 5,860 – Town of Kingston

Duration: 2012 -2014 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2012-02

Project Title: Fluvial Geomorphic & Habitat Assessment of the North River

Grantee: Franklin Regional Council of Governments

Location: Deerfield

Description: This project will complete a geomorphic assessment and a fish community and physical habitat survey of the North River. Stream bank erosion was previously identified as a significant source of nonpoint source pollution in this watershed. The geomorphic assessment will provide information on the causes of erosion, channel instability and habitat and water quality degradation. Causes for channel instabilities will be determined and solutions identified to improve aquatic habitat and water quality. The current fish community and habitat conditions will be characterized and provide data that will inform the work of the fluvial geomorphologist. This project will: characterize fish community and habitat conditions; provide water quality data for the North River watershed; provide conceptual restoration designs for 4 reaches in sufficient detail for a s.319 proposal; and provide final (30%) engineering design and cost estimates for the highest priority restoration site.

Funding: $ 61,200 - U.S. Environmental Protection Agency
$ 4,507 – Franklin Regional Council of Governments

Duration: 2012 – 2015 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2012-03

Project Title: Arcadia Lake & Metacomet Lake Watershed Assessment

Grantee: Pioneer Valley Planning Commission

Location: Connecticut River

Description: This project will identify and assess nonpoint pollution sources to Arcadia and Metacomet Lakes and will assist watershed residents and Belchertown Town officials in the development and implementation of a stormwater management project.

Specific tasks to be completed include:

1) Conduct shoreline surveys of each of the two lakes to identify and map potential sources of pollution;
2) identify water quality monitoring locations;
3) conduct water quality sampling to determine which subwatersheds deliver the greatest pollutant loads to the lakes;
4) survey high priority subwatershed areas identified through water quality monitoring to track sources of pollution;
5) develop preliminary Green Infrastructure/Low Impact Development BMP design and cost estimates for nonpoint source control at 3 to 4 high priority locations;
6) work with residents and town officials to share results and promote better stormwater management practices; and
7) prepare Quarterly & Final Reports.

Funding: $ 50,000 - U.S. Environmental Protection Agency
$ 5,092 – Pioneer Valley Planning Commission

Duration: 2012 – 2015 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2012-04

Project Title: Sassaquin Pond Stormwater Restoration Project

Grantee: City of New Bedford

Location: Buzzards Bay

Description: The project will conduct an analysis of the non-point source pollution in the Sassaquin Pond watershed and develop a plan for improving the waters of Sassaquin Pond. Low Impact Development strategies, due to their ability to mimic natural conditions and the lower cost of implementation, will be investigated to determine their feasibility. Structural BMPs will also be investigated if LID BMPs are not feasible.

Specific tasks to be completed include:

1) Review existing plans, reports, soils information and parcel data as it relates to the stormwater drainage system;
2) Evaluate the watershed for specific Low Impact development best management practices;
3) Examine specific parcels where Low Impact Development Best Management Practices may be appropriate;
4) Identify up to ten possible locations for Low Impact Development Best Management Practices;
5) Perform hydrologic modeling of the watershed to determine flows and preliminary sizing of the selected BMP locations;
6) Perform calculations and analysis for structural BMP's if appropriate;
7) Prepare conceptual designs and sketches, including landscaping architecture, for the ten selected BMP locations;
8) Develop preliminary cost estimates for the BMP's based on the conceptual sketches;
9) Prepare a brochure and Powerpoint presentation describing non-point source pollution issues and the impacts that non-point source pollution has on Sassaquin Pond;
10) Present the Powerpoint presentation at up to three information sessions.

Funding: $50,552 - U.S. Environmental Protection Agency
$ 8,580 – City of New Bedford

Duration: 2012 -2014 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2013-01

Project Title: Mystic River Headwaters: Alewife & Mill Brook Sub-watersheds

Grantee: Town of Arlington

Location: Boston Harbor/Mystic

Description: The Town of Arlington will partner with the Town of Belmont to collectively address the problem of non-point source pollution in the Alewife and Mill Brook sub-watersheds. The two municipalities will identify pollution sources and reduce pollutant loading through an examination of solutions with a focus on "green" structural BMPs. This collaborative approach will allow the Towns to share key expertise at a reduced cost, foster communication on the shared resources (Alewife Brook and Mystic River) and provide greater opportunity to learn from the projects completed in each other's communities. The project will focus on "green" structural BMPs – based on LID principles - because of their demonstrated performance, cost effectiveness, and the broad community benefits that they impart. Specific BMPs that may be considered during the project include vegetated swales, bio-retention structures, permeable pavement, street trees and rainwater harvesting.

The project goals include developing conceptual designs for five BMPs – three within Arlington and two in Belmont– that will reduce pollutant loading from respective sites to water bodies in the Alewife and Mill Brook sub-watersheds. This project will provide the towns with the information, experience, and tools necessary to move forward with more widespread BMP implementation in the future.

Specific tasks include:

1) Kickoff and preparation of preferred BMP list
2) Review continuous monitoring sampling plan and QAPP with MassDEP and amend plan and QAPP accordingly
3) Conduct GIS analysis of non-point source loading
4) Conduct GIS analysis of priority drainage basins to screen potential BMP sites
5) Prioritize sites for BMP implementation
6) Conduct continuous sampling at final sites and in-stream load analysis
7) Survey sites to verify feasibility of preferred BMPs and to collect design data
8) Prepare conceptual designs and cost estimates
9) Reporting and project management

Funding: $39,580 - U.S. Environmental Protection Agency
$ 8,800 – Town of Arlington

Duration: 2013 -2015 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2013-02

Project Title: Provincetown Harbor - Commercial Street Reconstruction – Phase 3

Grantee: Town of Provincetown

Location: Cape Cod

Description: The Town of Provincetown will continue with the Phase 3 Preliminary Design of Commercial Street as part of the Provincetown Harbor Storm water Mitigation Project. This design would address the storm water impacts of a portion of Commercial Street beginning at the intersection of Johnson Street and heading east approximately 2,300 feet to Howland Street with the installation of porous pavement and other drainage improvements. This project will improve the water quality of the six ocean outfalls that currently discharges from this area into Provincetown Harbor.

Prior work in this area includes the construction of Phase 1 with funding assistance from the MassWorks Infrastructure Program (funded under a Public Works Economic Development (PWED) grant). Preliminary design of the Phase 2 area was developed with funding assistance from an ARRA FFY2009 604(b) Water Quality Management Planning Grant. The s.319 Nonpoint Source Pollution Competitive Grant Program provided funding assistance for Phase II which will begin final design this spring/summer with construction to follow during the fall of 2013 and spring of 2014.

Specific tasks to be completed include:
1) Site Survey and Data Collection
2) Prepare Preliminary Design Plans – 50% Review
3) Project Reporting

Funding: $ 73,946 - U.S. Environmental Protection Agency
$ 400 – Town of Provincetown

Duration: 2013 -2015 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2013-03

Project Title: West Falmouth Harbor Wetland Restoration Feasibility Assessments

Grantee: Cape Cod Conservation District

Location: Cape Cod

Description: This project will determine the feasibility of restoring three (3) previously-identified tidally-restricted wetland systems within this impaired water body in order to improve water quality and restore salt marsh and benthic habitats. The restoration of natural tidal flow to a coastal ecosystem improves their ecosystem services and values, including improved water quality and improved habitat. These feasibility assessments for tidal restoration will directly advance the water quality management priorities of the Town of Falmouth and MassDEP, as these assessments are the first steps which will lead to implementation (e.g. installation of new larger culverts to restore tidal flow). Restoration of tidal flow at the tidally restricted sites within West Falmouth Harbor will improve water quality by decreasing nitrogen concentrations and increasing dissolved oxygen. Salt marsh health and functioning and benthic habitats will also improve as a result.

Seven (7) separate tidal restrictions were previously identified within the West Falmouth watershed (Atlas for Tidally Restricted Salt Marshes in the Buzzards Bay Watershed, published in 2004 by the Buzzards Bay National Estuary Program). These sites include the bridge at Mashapaquit Creek, the bridge on Chapaquoit Road, the culvert into Oyster Pond, the culvert west of the Chapaquoit Road bridge, the culvert south of FA19, and two (2) culverts on the west side of Falmouth Harbor on Chappaquoit Island. Three of these sites will be selected in consultation with MassDEP and the Town of Falmouth for this project.

Specific tasks to be completed include:

1) Prepare QAPP for site assessment and modeling tasks;
2) Conduct Site Inspection and GIS Mapping
3) Conduct Tidal Survey and Assessment
4) Supplemental Ground Survey and Low-lying Property Assessment
5) Analytical hydraulic/hydrologic Modeling
6) Landowner Coordination and Outreach
7) Prepare a Digital Inventory of Project data
8) Prepare Quarterly & Final Reports.

Funding: $ 47,934 - U.S. Environmental Protection Agency
$ 1,000 – Cape Cod Conservation District

Duration: 2013 -2015 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2013-04

Project Title: Westwood - Green Infrastructure Planning

Grantee: Town of Westwood

Location: Boston Harbor - Neponset

Description: This project will identify voluntary retrofitting opportunities on private property that is not the subject of active redevelopment, as a strategy for reducing water quality, hydrologic, and habitat impacts. The goal of the project is to retrofit existing impervious surfaces on private property, using green infrastructure techniques. Once potential sites are identified and landowner interest established, the Westwood will work with private landowners to encouraging them to implement recommended measures, through a program of general education, technical assistance workshops, and other incentives. A variety of mechanisms such as water banks, tradable mitigation credits or storm water utilities may be considered to support and incentivize retrofits in areas where they would otherwise be unlikely to occur.

Project tasks include:

1) Identify and prioritize private properties where simple, low-cost, green infrastructure techniques, such as downspout disconnection, rain gardens, rain barrels, and dry wells are feasible retrofit options;
2) Identify private property owners willing to consider implementation of such practices on their land;
3) Develop and test a methodology that can be utilized as a model in other communities facing similar challenges;
4) Prepare quarterly and final project reports.

Funding: $23,974 - U.S. Environmental Protection Agency
$ 2,000 – Town of Westwood

Duration: 2013 – 2015 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2013-05

Project Title: Ipswich River Watershed Resource Assessment & Protection Plan

Grantee: Metropolitan Area Planning Council

Location: North Coastal

Description: The project will address water quality and quantity issues that persist within the Ipswich River Watershed, with a focus on the town of Ipswich. The objectives include: (1) to assess sub watersheds of the Ipswich River and its tributaries to identify and prioritize potential sites for the implementation of storm water BMP's using a green infrastructure approach; and (2) to prepare preliminary engineering designs for the highest priority sites that the town can move to implementation following this project. The project will provide targeted technical assistance for both structural and non-structural management of storm water with the goal of promoting sustainable green infrastructure approaches to the water quality challenges of the Ipswich River.

Specific tasks to be completed include:

1) Convene local task force;
2) Prepare GIS maps of the watershed;
3) Compile and summarize existing data;
4) Conduct Initial Screening for Green Infrastructure/ BMP Implementation Sites
5) Develop Best Management Practice Alternatives Matrix and Select Preferred Options;
6) Conduct Field Reconnaissance/Final Screening of Potential Green Infrastructure/BMP Sites;
7) Prepare Preliminary Green Infrastructure BMP Designs; and
8) Project Management/Reporting

Funding: $23,736 - U.S. Environmental Protection Agency
$20,500 – Metropolitan Area Planning Council

Duration: 2013 – 2015 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2014-01

Project Title: North Allston Sub-watershed Restoration Plan

Grantee: City of Boston – Boston Redevelopment Authority

Location: Boston Harbor – Charles River

Description: The Boston Redevelopment Authority (BRA) in partnership with the Charles River Watershed Association (CRWA) will develop a Restoration Plan for a sub-watershed in the North Allston neighborhood and integrate this plan with ongoing public realm improvement efforts and development projects in the area.

The project team will identify a priority sub-watershed in North Allston, evaluate various Green Infrastructure (GI) design options in terms of feasibility and benefits, and develop a sub-watershed scale restoration plan that will enable the City to meet regulatory requirements at the least cost and with maximum environmental benefit.

The objectives of the project include:

1) Develop a GI Plan that uses Low Impact Development (LID) techniques, decentralized storm water management and increased vegetation to improve storm water management and restore a more natural hydrologic regime in this dense urban neighborhood;
2) Identify priority retrofit projects and demonstrate the multiple benefits of GI;
3) Ensure that this Plan is integrated with the City's ongoing public realm improvement efforts; and
4) Conduct public outreach and education about GI and its application in an ultra-urban environment like North Allston

Funding: $48,546 - U.S. Environmental Protection Agency
$16,000 – City of Boston/BRA

Duration: 2014 – 2017 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2014-02

Project Title: Chicopee River Bacteria Source Tracking

Grantee: Pioneer Valley Planning Commission

Location: Chicopee River – Connecticut River

Description: This project will identify the degree to which illicit connections and urban stormwater are contributing to bacteria impairments on the Chicopee River and associated tributaries. The Grantee will work with watershed residents and municipal officials in Chicopee, Ludlow and Springfield toward development and implementation of a project to restore water quality. The four objectives for the project are:

1) Contribute to ongoing and future assessments of whether bacterial contamination impairs the river's ability to support primary (and in some cases secondary) contact recreation;
2) Engage watershed residents, municipal officials, and other interested stakeholders in advancing improved water quality in the Chicopee River, Poor Brook and Fuller Brook;
3) Locate sources of bacteria contamination within targeted sub-watersheds; and
4) Recommend appropriate action to initiate remediation (including preliminary structural BMP design where appropriate).

The proposed project will complement the ongoing work to eliminate combined sewer overflows and improve flow from hydropower operations. As the project proposes to organize and train a watershed team, this work will also help build capacity towards a revived watershed group for the Chicopee River.

Funding: $ 50,000 - U.S. Environmental Protection Agency
$ 6,800 – Pioneer Valley Planning Commission

Duration: 2014 -2017 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2014-03

Project Title: Stormwater mitigation: Ell Pond

Grantee: City of Melrose

Location: Boston Harbor/Mystic

Description: This project seeks to build upon the decades of work undertaken by the City to improve water quality and hydraulic capacity of Ell Pond. Earlier work has eliminated cross connections and mitigated flooding by increasing outlet capacity. The City will now address the storm water system discharging into Ell Pond by identifying points in the system where BMP units could be installed. The 1100 acre Ell Pond Watershed lies primarily in Melrose and includes some 85,000 linear feet of streets in five sub-watersheds. Given the size and complexity of the Melrose storm drain system flowing into Ell Pond, the work to identify sites and develop preliminary designs will be conducted in two phases, separated by a 2-3 year period of construction implementation.

During the first phase of the project funded by this grant, the City of Melrose will:

1) Conduct project mapping and delineation of all sub-drainage areas;
2) Calculate the "first flush" volumes for all sub-drainage areas;
3) Prepare a EPA and MassDEP approved QAPP and SOP for sub-surface investigations;
4) Conduct water quality sampling and analysis at up to 15 locations in the select sub-drainage areas during the "first flush" of two rain events;
5) Calculate mass balance values for each location;
6) Prioritize areas warranting treatment;
7) Develop conceptual design drawings for all areas deemed to warrant treatment;
8) Develop estimates of construction cost;
9) Conduct subsurface soils investigations for up to ten locations;
10) Prepare preliminary design drawings for up to ten locations; and
11) Prepare draft final and final reports that include all mapping, drawings, tables, and descriptions of the work completed with conclusions and recommendations.

Funding: $50,000 - U.S. Environmental Protection Agency
$ 6,130 – City of Melrose

Duration: 2014 – 2016 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2014-04

Project Title: Stockbridge Bowl Watershed Assessment

Grantee: Town of Stockbridge

Location: Housatonic

Description: The Stockbridge Bowl Watershed Assessment Project will identify the major contributing sources of sediment and organic material to Stockbridge Bowl from the sub-watersheds of the lower, southern portion of the lake and the Lily Brook watershed, and to develop strategies to address these sources. The project will accomplish this by running sediment yield modeling, conducting detailed field reconnaissance, and developing conceptual BMP designs for two or three high priority sites. Controlling sediment inputs to these will aid in the overall goal of reducing the prolific growth of exotic aquatic macrophytes, particularly *M. spicatum*.

The project consists of these four major tasks:

1) Delineate sub-watersheds in the project areas and create GIS-based analyses to estimate which sites are most likely to contribute significant sediment loading to the lower lake; conduct field work to verify delineations and identify probable sources of sediment;
2) Conduct a Sediment Yield Analysis to estimate the sediment loads from land uses, streambank erosions and other probable contributors;
3) Prepare conceptual level BMPs and cost estimates for up to three of the most significant contributors; and
4) Conduct a public Education effort to engage residents within the targeted subwatersheds to aid in the identification and mitigation of sediment inputs and increase their awareness of nonpoint source pollution.

Funding: $50,000 - U.S. Environmental Protection Agency
$ 7,500 – Town of Stockbridge

Duration: 2014 -2017 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2015-01

Project Title: Berkshire Regional Phase II NPDES

Grantee: Berkshire Regional Planning Commission

Location: Hudson & Housatonic

Description: The Berkshire Regional Planning Commission (BRPC) will work with the Towns of Adams, Cheshire, Dalton and Lanesborough and the City of Pittsfield to form a NPDES Regional Working Group to develop a plan to address the cost of stormwater management and MS4 compliance. BRPC will conduct research to determine if a stormwater utility is appropriate for the City and Towns. BRPC will quantify the current and future cost of stormwater management programs, estimate the costs to comply with MS4 requirements, and develop regional agreements and funding structures to address the cost of stormwater management and MS4 compliance.

During this project BRPC will:

1. Assist the NPDES Phase II regulated communities of Adams, Cheshire, Dalton, Lanesborough & Pittsfield in developing an effective and efficient strategy to fund compliance with the MA Small MS4 General Permit.
2. Provide outside expertise to each community, both individually and collectively, to evaluate current practices and develop a recommended approach.

Funding: $50,000 – U.S Environmental Protection Agency

Duration: 2015 -2017 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2015-02/604

Project Title: Green Infrastructure Strategy

Grantee: Town of Watertown

Location: Charles

Description: The Town of Watertown will build on previous green infrastructure (GI) planning efforts, including Massachusetts projects funded by the 604b program and projects elsewhere in the region, to identify green infrastructure priorities for Watertown. A number of these GI projects have developed and tested GIS methodologies to assess sources of pollutant loadings and to identify promising areas for green infrastructure projects. In addition, there has been substantial research on the performance and cost-effectiveness of various green infrastructure designs in different circumstances from the Charles River Watershed Association's Blue Cities Program, from the UNH Stormwater Center, and elsewhere. Watertown will draw on the results of these projects, both to inform stakeholders about effective green infrastructure approaches and to recommend green infrastructure priorities for Watertown.

The five components to Watertown's approach for this project are:

1. Apply proven analytic and planning methods to identify opportunities and constraints for green infrastructure projects in Watertown;
2. Educate key decision-makers about the benefits and practicalities of green infrastructure projects;
3. Develop a list of priority sites and projects for town road, parks and other public property improvements;
4. Engage a broad stakeholder effort to select and develop preliminary designs and implementation plans for two pilot projects for initial implementation; and
5. Develop a reporting process to track GI components of future developments and redevelopments on both public and private property by either the property owner or the town.

Funding: $41,110 - U.S. Environmental Protection Agency
$13,260 – Town of Watertown

Duration: 2015 -2018 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2015-03

Project Title: Manhan River Water Quality Monitoring & Source Tracking

Grantee: Pioneer Valley Planning Commission

Location: Manhan River – Connecticut River

Description: The Pioneer Valley Planning Commission will work to identify the major sources of *E. coli* impairment in the Manhan River, including nonpoint sources and potential illicit connections through water quality monitoring and bacterial source tracking. The *Connecticut River 2003 Watershed Water Quality Assessment Report* recommends bacteria monitoring "to assess the Primary and Secondary Contact Recreation uses in the upper and lower sections of this segment." This project conducted by PVPC will build on those 2003 recommendations through the following objectives:

1. Identify sources of bacterial contamination through targeted sampling based on land uses and features, and past stormwater outfall mapping;
2. Enhance data associated with and understanding of the river's ability to support primary recreational uses;
3. Engage municipal officials in Southampton and Easthampton, residents, and other stakeholders in understanding and improving water quality of the Manhan River, with the potential to form a watershed organization; and
4. Provide recommendations for remediation, including preliminary design of BMPs, and other follow-up work

Cost: $ 50,000 – U.S. Environmental Protection Agency
$ 5,700 - Pioneer Valley Planning Commission

Duration: 2015 -2018 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2015-04

Project Title: Phosphorus Sources for Hummock & Miacomet Ponds

Grantee: Town of Nantucket

Location: Islands

Description: Both Hummock and Miacomet Ponds are major public recreational resources on Nantucket, but both experience algae blooms in summer, including cyanobacteria at potentially hazardous levels. Extensive work has evaluated nitrogen loading in conjunction with the Massachusetts Estuaries Program (MEP), and in-lake phosphorus levels are known to be elevated, but there has been no focused assessment of the sources of phosphorus supporting algae blooms. With low atmospheric inputs and minimal overland runoff or stream flow, the likely sources are groundwater and internal release from sediment. Groundwater will be influenced by both wastewater disposal and stormwater infiltration. This project seeks to sample groundwater entering the lake and test surficial sediments to determine the potential for those sources to supply enough phosphorus to support observed blooms. The Town of Nantucket will conduct additional work to assess blooms and oxygen status critical to release of phosphorus from sediments. This project will allow planning for nutrient reductions to improve the conditions of these ponds, and complements the work done to date by the Town, SMAST, and independent researchers. This project will also provide data to MassDEP for potential development of a TMDL for phosphorus for each lake.

Nantucket will complete the following tasks:

1. Prepare a QAPP
2. Conduct Groundwater sampling
3. Conduct surficial sediment sampling
4. Conduct a Dissolved Oxygen assessment of the ponds
5. Characterize the algae communities
6. Prepare a final project report.

Funding: $26,850 – U.S. Environmental Protection Agency
$ 5,000 – Town of Nantucket

Duration: 2015 -2017 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2015-05

Project Title: Sturbridge Stormwater Pollution Reduction

Grantee: Central Massachusetts Regional Planning Commission

Location: Quinebaug

Description: Green Infrastructure and Low Impact Development (LID) techniques reduce stormwater runoff from residential and commercial development and mimic natural site hydrology by storing, infiltrating and recharging stormwater on site. Currently the Town of Sturbridge does not have a LID Bylaw, which is identified as a need in the Town's Master Plan. With this project, the Central Massachusetts Regional Planning Commission (CMRPC) will assist the Town in the development of a LID Bylaw for passage at the Sturbridge Town Meeting. The second task to be completed by CMRPC is the development of a LID-based education component that will be implemented at Old Sturbridge Village (OSV), the largest outdoor museum in New England with 260,000 annual visitors. Thirdly, CMRPC will work with OSV on a conceptual drawing/feasibility for the OSV main visitor parking lot. This parking lot has been identified with having existing stormwater runoff issues. If implemented, these activities will help to lead to better water quality throughout the Town, which drains into the Quinebaug River Watershed.

Specific activities to be conducted by CMRPC during this project include:

1. Develop an LID Bylaw for implementation by the Town of Sturbridge;
2. Conduct a LID based education program.
3. Prepare LID Conceptual designs for OSV parking area.

Funding: $23,240 – U.S. Environmental Protection Agency
$ 2,500 - Central Massachusetts Regional Planning Commission

Duration: 2015 -2017 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2016-01

Project Title: Nutrient Loading for Lake Garfield, Monterey

Grantee: Town of Monterey

Location: Housatonic

Description: The Grantee will conduct an in-lake and watershed assessment of phosphorus inputs to Lake Garfield and evaluate management options. Observed water quality issues have resulted in this waterbody being placed on the integrated list of impaired waters for elevated phosphorus, low oxygen, and aquatic invasive species (Eurasian water milfoil).. This project seeks to augment existing data to support development of a TMDL for phosphorus which very likely also relates to the depression of oxygen. The primary data needs are quantification of storm water phosphorus inputs from diffuse sources around the lake, updated in-lake phosphorus and oxygen profiles that include the deepest water, and assessment of internal phosphorus loading from sediment under anoxic water. Newly generated data will be used to characterize phosphorus loading to Lake Garfield. The model will be applied to determine the level of reduction necessary to reach a loading level appropriate to the designated uses of this lake, and to evaluate specific management actions for their ability to achieve the necessary load reduction.

Tasks to be completed by the Grantee include:

1. Prepare a QAPP to cover all activities under this project
2. Obtain in-lake oxygen profiles in the deepest part of the lake from spring through summer
3. Measure in-lake phosphorus concentrations in the epilimnion and hypolimnion during stratification
4. Pre-, first flush and post-storm water sampling for 3 storms
5. Assessment of available P in surficial sediment in areas subject to anoxia
6. Calibration of a lake and watershed model
7. Determination of target P loading to meet water quality objectives
8. Testing of watershed and in-lake management scenarios to determine how target loading can be met
9. Prepare a comprehensive report of the results and management implications of the above tasks

Funding: $44,320 - U.S. Environmental Protection Agency
$ 6,725 – Town of Monterey

Duration: 2016 – 2018 (Project Complete)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2016-02

Project Title: Documenting Bacterial Contamination Improvements

Grantee: Berkshire Regional Planning Commission

Location: Hoosic & Housatonic

Description: The Berkshire Regional Planning Commission (BRPC) will document current bacterial levels in select river segments of the Hoosic and Housatonic River Watersheds to determine if bacteria levels have decreased in those river segments due to known land use changes and/or infrastructure improvements conducted by municipal public works departments. BRPC will document whether these select river segments meet MassDEP's criteria for Primary Contact Recreation and if they can become candidates for delisting from the 303d list for Fecal Coliform.

Tasks to be completed during this project include:

1. Update existing Quality Assurance Project Plan (QAPP);
2. Compile existing E. Coli data into master database compatible with MassDEP Watershed Program systems;
3. Listing of known land use changes and infrastructure improvements;
4. Collect new water quality samples;
5. Analyze & summarize water quality data and provide recommendations to address suspected bacterial sources; and
6. Project management and reporting.

Funding: $ 36,025 - U.S. Environmental Protection Agency

Duration: 2016 - 2018

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2016-03

Project Title: Statewide Stormwater Collaborative
Grantee: Central Massachusetts Regional Planning Commission
Location: Statewide
Description: The Central Massachusetts Regional Planning Commission (CMRPC) will partner with the existing Massachusetts regional stormwater groups, as well as a technical consultant, to assist in the creation of a Massachusetts Statewide Stormwater Coalition. Key among coalition activities will be to support and enhance the permit implementation for years one to year three of the MS4 permit. The state-wide group will promote resource and tool development and sharing across regions, helping regulated municipalities meet terms of the MS4 permit at the least cost possible. Over the past three years, the regional stormwater groups across Massachusetts have formed a strong partnership with MassDEP, EPA, Mass Municipal Association (MMA), and others. The project is divided into three tasks as described below.

1) Create a framework to form the MA Statewide Stormwater Collaborative.
2) Define needs within the new permit, inventory existing materials, develop collaborative strategies to update these materials, and create a venue for highlighting high quality materials. A compilation of high quality materials, will be made available for all regional coalitions and municipalities across Massachusetts.
3) Conduct an inventory and a gaps analysis, then determine which materials and/or tools are most needed by regulated municipalities. Anticipated deliverables may include, but are not limited to:

- Update MS4 cost estimation spreadsheets to help municipalities achieve stable funding for stormwater work, including consideration of Stormwater Utilities;
- Update municipal code review checklists with new model regulation recommendations based on the new permit requirements;
- Conduct an education and outreach campaign that draws from the tenets of community based social marketing and that can therefore provide the metrics required for measuring success for education and outreach under the permit;
- Conduct education and outreach that draws on EPA's Soak up the Rain materials to help promote understanding related to permit requirements on retaining the first inch of rainfall in new development or redevelopment projects;
- Coordinate program of best practices trainings for municipal officials, possibly with the help of MassDOT's Bay State Roads program;
- Coordinate program of trainings for municipal officials on IDDE requirements and source tracking strategies, possibly in collaboration with MassDEP and EPA;
- Conduct presentations at the Mass Municipal Association Conferences to educate municipal leaders statewide.

Funding: $53,500 - U.S. Environmental Protection Agency
$10,800 – Central Mass Regional Planning Agency

Duration: 2016 - 2018

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2016-04

Project Title: Green Street Guidance

Grantee: City of Cambridge

Location: Charles

Description: The City of Cambridge (City) in partnership with the Charles River Watershed Association (CRWA) will develop conceptual green street design plans for three public rights of way and integrate these plans with the City's five-year roadway improvement plan. The Grantee will also develop a general green street guidance document for use by the Department of Public Works (DPW), other City agencies and private developers. The document will provide guidance on green street implementation in space-constrained urban settings with a focus on typical residential street layouts in the City of Cambridge.

The Grantee has identified three public roadways scheduled for capital improvements in the coming four years. Conceptual green street designs will be produced for each of the three streets including an evaluation of each design for water quality and quantity impacts and benefits to the Charles River. These plans will enable the City to incorporate green infrastructure installations into some of their smaller scale capital improvement projects which often have very limited design budgets. Systematically integrating green infrastructure into roadway projects will maximum environmental benefit while reducing costs for the City.

The objectives of the project include:

1. develop three [3] conceptual green street plans that use low impact development (LID) techniques, decentralized stormwater management, and increased vegetation to improve stormwater management and restore a more natural hydrologic regime in this dense urban community;
2. develop general green street guidance document for dense residential urban streets, a common typology in the City, that can be adapted to future capital improvement projects;
3. provide specific input on green street planning for the City-wide master plan; and
4. engage various City departments and key stakeholders in discussions about green infrastructure and its application in urban settings.

Funding: $45,000 - U.S. Environmental Protection Agency
$20,000 – City of Cambridge

Duration: 2016 - 2018

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2017-01

Project Title: Jones River Water Quality Assessment & Stormwater BMP Designs

Investigator: Town of Kingston

Location: South Coastal

Description: The Jones River Water Quality Assessment and Best Management Practices project will continue a multi-phase project to assess and address bacterial water quality impairments to the degraded waters of the lower Jones River and Duxbury Bay. The water quality sampling and engineering design work funded under both the 2011 Mass Bays Grant and the 2012 604b Grant led to the implementation of a series of stormwater remediation projects under the MA Office of Coastal Zone Management (MA CZM) Coastal Pollutant Remediation (CPR) Grant program in 2013, 2014, 2015, & 2016. This project will use recent survey work from Brook & Elm Streets to develop conceptual and preliminary design plans for the Elm Street outfalls to be included in a FY19 CPR grant application in order for BMP implementation to coincide with the head-of-tide dam removal project.

Specific work to be undertaken in this project includes: 1) Prepare a QAPP for sampling and analysis protocols; 2) Conduct the water quality survey to include bacteria (fecal coliform, enterococci), and total suspended solids (TSS). 3) Identify sampled locations with the greatest adverse water quality impact; 4) Create conceptual BMP designs for the outfalls sampled; 5) Perform subsurface investigations at three locations in a manner satisfactory to meet Stormwater Regulations; 6) Prepare Draft Preliminary Design Plans for BMPs; 7) Refine Preliminary Design Plans (50% complete, not to include details or technical specifications); 8) Prepare a construction cost estimate; and 9) Prepare Quarterly Reports, Draft Final, and Final Reports.

Funding: $36,520 - U.S. Environmental Protection Agency
$ 4,500 – Town of Kingston

Duration: 2017 - 2019

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2017-02

Project Title: Provincetown Harbor Stormwater Mitigation – Phase 4

Investigator: Town of Provincetown

Location: Cape Cod

Description: Through a multi-year effort on Commercial Street, the Town has successfully completed improvement projects with porous pavement in the Phase 1 and 2 areas of Commercial Street. Benefits have been observed with significant improvement in water quality measured by a reduction in beach closures within the limits of the porous pavement. Phase 3 is currently in construction with final completion expected by June 1, 2017. This will expand the improvement corridor for water quality in Provincetown Harbor.

With this project the Town of Provincetown will continue with Phase 4 Site Survey and Conceptual Design of Commercial Street as part of the Provincetown Harbor Stormwater Mitigation Project. The design goal is to address the stormwater impacts to a portion of Commercial Street beginning at the intersection of Howland Street and heading east approximately 2,300 feet to Allerton Street with the installation of porous pavement and other drainage improvements. This project will improve the water quality that currently discharges from this area by six ocean outfalls into Provincetown Harbor. Work to be completed will include: Site survey and Data collection, Preliminary Design plans (50% review), and project reporting.

Funding; $ 40,000 - U.S. Environmental Protection Agency
$ 500 – Town of Provincetown

Duration: 2017 - 2019

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2017-03

Project Title: Feasibility Study for a Stormwater Utility

Investigator: Town of Belchertown

Location: Connecticut/Chicopee

Description: This project will help to define a program of sustainable stormwater funding for Belchertown, from obtaining needed information about possible fee models and methodologies that make sense for the Town, to engaging property owners on the need for sustainable stormwater funding and their concerns, to devising a workable strategy to moving forward in funding the stormwater program.

Specific work to be completed includes: 1) Prepare RFR for and select qualified consulting services; 2) Conduct parcel analysis and calculate equivalent residential unit (ERU); 3) Define and evaluate the financial elements of the stormwater utility; 4) Engage Town Stormwater Committee so that members learn in-depth about the needs and costs for Belchertown's stormwater program, consider the options in establishing a sustainable funding source for the program, and make recommendations; 5) Conduct two public roundtable events for property owners to help frame issue of stormwater funding and hear directly about concerns; and 6) Project Reporting.

Funding $ 50,000 - U.S. Environmental Protection Agency
$10,750 – Town of Belchertown

Duration: 2017 - 2019

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2017-04

Project Title: Cape Cod Stormwater Coalition: Regional Framework for Stormwater

Investigator: Cape Cod Commission

Location: Cape Cod

Description: The Cape Cod Commission will develop a regional stormwater management entity, a "Cape Cod Stormwater Coalition" (CCSWC), to assist Cape Cod municipalities in meeting stormwater management requirements under the 2016 Small Municipal Separate Storm Sewer General Permit (MS4 permit) and the Cape Cod 208 Area Wide Water Quality Management Plan (208 Plan). Working with members of the CCSWC and coordinating this effort with the Statewide Coalition project, deliverables will include: inventory of existing resources; needs analysis; gap analysis; cost estimates for each town to meet MS4 requirements; recommendations for financing options, municipal and regional coordination, policies, best management practices (BMPs) and performance measures, Model Public Education and Outreach Plan, recommendations for building a municipal CCSWC to coordinate stormwater management, and public outreach to build public support for improving water quality through stormwater management.

Specific tasks to be completed include: 1) Inventory of existing resources: 2) Conduct a needs assessment; 3) Conduct a gap analysis; 4) Develop collaborative stormwater strategies for efficient and cost-effective stormwater management; 5) Prepare MS4 cost estimates for each town; 6) Identify possible financing approaches to help all Cape Cod municipalities achieve stable funding for stormwater management; 7) Develop recommendations for municipalities for "Incorporating Good Housekeeping and Pollution Prevention for Permittee Owned Operations"; 8) Identify policies and SOPs for cost-effective stormwater management best-suited to Cape Cod conditions, governance, and needs; 9) Identify suitable MS4 performance measures and measurable goals from the EPA menu or other sources that would benefit Cape Cod towns; 10) Prepare a "Model Public Education and Outreach Plan" and 11) Provide Recommendations for a Regional Stormwater Framework and Cape Cod Stormwater Coalition (CCSWC).

Funding: $ 50,000 - U.S. Environmental Protection Agency
$ 53,972 – Cape Cod Commission and other project partners

Duration: 2017 - 2019

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2017-05

Project Title: Municipal Facilities Green Infrastructure Retrofit Design

Investigator: City of Waltham

Location: Charles River

Description: The City of Waltham (City) in partnership with the Charles River Watershed Association (CRWA) will develop conceptual green infrastructure (GI) retrofit design plans for one municipal facility located in the downtown area immediately abutting the Charles River. The project will include analysis, planning, development of a conceptual stormwater treatment design and stakeholder engagement. The City will produce a conceptual GI retrofit design for the Embassy Parking Lot including an evaluation of each design for water quality and quantity impacts and potential benefits to the Charles River. This plan will enable the City to incorporate GI installations into some of their other capital improvement projects.

The objectives of the project include: (1) to develop one [1] conceptual GI retrofit plans that uses low impact development (LID) techniques, decentralized stormwater management, and increased vegetation to improve stormwater management and restore a more natural hydrologic regime in this dense urban community; and (2) to engage with various City departments and key stakeholders about GI and its application in urban settings.

Funding: $17,092 - U.S. Environmental Protection Agency
$ 12,000 – City of Waltham

Duration: 2017 - 2019

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2018-01

Project Title: Sub-watershed Restoration Planning

Investigator: Town of Milford

Location: Charles River

Description: The Town of Milford and Charles River Watershed Association (CRWA) will develop a restoration plan for an impacted sub-watershed within the Town of Milford that discharges to the Charles River. The project will include analysis, planning, conceptual stormwater treatment design for multiple sites and preliminary engineering design for a priority site, soil assessments, water quality and quantity modeling, and stakeholder engagement. The Town will prioritize the restoration opportunities identified for Town owned or managed parcels and conduct soil assessments at priority sites. The Town will select one priority site for preliminary engineering design. Stakeholders within the community including Town board volunteers and the Milford Water Company will be engaged during the design and prioritization processes.

Specific tasks to be completed include:

1) conduct an existing conditions assessment,
2) develop site specific restoration goals,
3) produce a comprehensive sub-watershed restoration plan,
4) identify and prioritize sites,
5) prepare preliminary designs for selected sites, and
6) prepare quarterly progress and final reports.

Funding: $25,000 - U.S. Environmental Protection Agency
$34,300 – Town of Milford

Duration: 2018 - 2020

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2018-02

Project Title: Green Streets Approach to Improve Water Quality

Investigator: Franklin Regional Council of Governments

Location: Deerfield

Description: The goal of this project is to develop a cost-effective and replicable assessment protocol that calculates stormwater pollutant loads and evaluates site suitability for including Green Infrastructure stormwater management BMPs in transportation and downtown revitalization projects. This project will also provide Green Infrastructure (GI) stormwater management BMPs for up to three sites that meet MassDOT's 25% design submission guidelines so the Town of Buckland can incorporate the BMPs into their planned transportation and downtown revitalization projects. Once built, these "Green Streets" can help improve water quality in the Deerfield River. The assessment methods developed for Buckland will be disseminated by FRCOG to other small, rural towns to help them incorporate Green Infrastructure stormwater management techniques into municipal transportation and redevelopment projects in their towns.

Specific tasks to be completed include:

1) conduct stormwater drainage and pollutant loading analysis,
2) conduct a Green Infrastructure feasibility Analysis,
3) prepare preliminary designs (25%) for two identified sites,
4) prepare green streets guidance document for distribution to other towns
5) conduct public outreach to provide project updates.
6) prepare quarterly progress and final reports.

Funding: $32,000- U.S. Environmental Protection Agency
$ 1,800 – FRCOG

Duration: 2018 - 2020

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MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2018-03

Project Title: Nutrient sampling in the Connecticut River Watershed

Investigator: Pioneer Valley Planning Commission

Location: Connecticut

Description: PVPC, with project partners US Geological Survey (USGS), and the Connecticut River Conservancy, will conduct a nonpoint source nutrient sampling program on the Connecticut River in Massachusetts. The project will attempt to characterize nonpoint source loading for up to three land uses in tributaries with the highest nonpoint source nutrient loading to the Connecticut River. Water quality sampling for this study will entail collecting a minimum of 18 cross-sectional composited samples over one year's time to capture the variability of nutrient inputs through the seasons and will be timed to capture high and low flow events. Project results will help determine what land uses are generating the highest nonpoint source net nutrient loads to the Connecticut River within Massachusetts. Further, this project will help to guide nutrient management strategies and future nonpoint sampling efforts.

Specific tasks to be completed include:

1) select water quality monitoring locations,
2) develop QAPP for US EPA and MADEP review and approval,
3) Collect and analyze water quality samples,
4) Prepare summary report and provide water quality data in MADEP approved format,
5) prepare quarterly progress and final reports, and
6) Conduct stakeholder meetings.

Funding: $66,618 - U.S. Environmental Protection Agency
$ 5,000 – PVPC

Duration: 2018 - 2020

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROJECT SUMMARIES

SECTION 604b PROJECT 2018-04

Project Title: Assessing Nutrient Reduction Scenarios in the Wareham River Watershed

Investigator: Southeastern Regional Planning and Economic Development District

Location: Buzzards Bay

Description: The Massachusetts Estuaries Project determined that close to 40% of the total nitrogen load to the Wareham River needs to be removed for water quality to be restored to target levels. Wastewater and cranberry agriculture are the two largest managed sources of nitrogen to the River. The Town of Wareham is actively working on ways to expand sewering to reduce the nitrogen from septic wastewater. Cranberry agriculture represents about one-third of the area of the Wareham River watershed and is estimated to contribute approximately 20% of the non-atmospheric nitrogen load to the Wareham River. As the cranberry industry is evolving towards higher-yielding varieties, there has been increasing interest in restoring cranberry bogs to natural wetlands. Natural wetlands may serve as nutrient sinks that have the potential to reduce the nitrogen load in the Wareham River. Currently, very limited data exist on how cranberry restoration contributes to nitrogen reductions in the watershed. It is also unknown to what extent cranberry bog restoration can help to meet the pollutant load reductions necessary to meet water quality standards. This project will use an existing nutrient loading model and recent research on the restoration of cranberry bogs to examine how different potential scenarios of cranberry bog restoration could contribute to the target of reducing nitrogen loads by up to 40% in the Wareham River watershed.

Specific tasks to be completed include:

1) Develop QAPP for US EPA and MA DEP review and approval,
2) Calibrate NLOAD model,
3) Collect and analyze Nitrogen concentrations in wet and dry atmospheric deposition samples,
4) Develop potential Nitrogen reduction scenarios,
5) Conduct Public Outreach on project results, and
6) prepare quarterly progress and final reports.

Funding: $46,882 - U.S. Environmental Protection Agency
$ 2,014 – SRPEDD

Duration: 2018 - 2020

PROJECT SUMMARIES

SECTION 604b PROJECT 2018-05

Project Title: Red Brook Harbor Monitoring to support TMDL Development

Investigator: Town of Bourne

Location: Cape Cod

Description: This project will assess the benthic habitat and water quality in the Red Brook Harbor system. The project will support management planning by providing a piece of the site-specific scientific foundation required for TMDL development. Benthic habitat assessment will be performed using existing protocols previously applied in this area for developing the science for a TMDL. A project specific QAPP will be developed that will outline detailed specifications for this assessment.

At least six sites will be selected for benthic habitat sampling and will be distributed around the Red Brook Harbor system. Sediment samples for benthic infauna, sediment grain size, and total organic content will be collected in triplicate using Van Veen grabs

Water samples for nutrient analysis will be collected from at least six stations on at least three dates in summer 2019 and summer 2020. More in-depth sampling will occur for at least four stations where 20 measurements of summertime dissolved oxygen will be performed each summer. Samples will be analyzed for the full suite of nitrogen parameters (ammonium, nitrate + nitrite, total dissolved nitrogen, and particulate organic nitrogen), as well as particulate organic carbon, phosphate, the main algal pigments (chlorophyll and phaeophytin), and salinity. Analysis of dissolved oxygen, temperature, and salinity will be performed in the field. Dissolved oxygen samples will be analyzed using modified Winkler titrations and automated probes (e.g., YSI ProDSS). All water quality sampling and analysis will follow the procedures and protocols outlined in the water quality monitoring QAPP.

Specific tasks to be completed include:

1) develop a QAPP for US EPA and MA DEP review and approval,
2) collect and analyze benthic infauna and water quality samples,
3) prepare an assessment of the relative health of Red Brook Harbor,
4) conduct public outreach on project results, and
5) prepare quarterly progress and final reports.

Funding: $49,500 - U.S. Environmental Protection Agency
$ 7,392 – Town of Bourne

Duration: 2018 - 2020

Appendix Table A

604b Projects from FFY91 to FFY97 by Watershed

Boston Harbor

Project Number	Project Title
91-06/604	Charles River Southwest Regional Water Supply Protection Planning Project
94-06/604	Tri-Town Watershed Protection Implementation Project

Cape Cod

Project Number	Project Title
91-01/604	Control of Hazardous Materials Users to Protect Groundwater Quality on Cape Cod
91-02/604	Monomoy Lens Regional Water Protection Project
92-01/604	Cape Cod Small Volume Well Prioritization Project
94-01/604	Sagamore Lens Groundwater Protection Project
97-02/604	Priority Land Acquisition Assessment for Cape Cod: Protecting Suitable Land for Future Water Supply Needs

Charles

Project Number	Project Title
91-06/604	Charles River Southwest Regional Water Supply Protection Planning Project

Chicopee

Project Number	Project Title
91-03/604	Quaboag River Water Supply Protection Project
91-04/604	Franklin County Water Resources Protection Planning Project
92-03/604	Franklin County Water Resources Protection Planning Project
92-08/604	Pioneer Valley Water Resources Protection Planning Project
93-02/604	Franklin County Water Quality Improvement Program
94-02/604	Small Public Water System Collaborative Project
94-04/604	Public Water Supply Technical Assistance, Watershed Inspection Implementation, and ISTEA Planning Project
96-03/604	An Assessment of Urban Stream Restoration: Tannery and Poor Brooks

Concord

Project Number	Project Title
93-04/604	Sudbury-Assabet-Concord (SuAsCo) River Basins Water Supply Protection

Connecticut

Project Number	Project Title
96-06/604	Assessment and Evaluation of Stormwater Source Reduction Practices on Combined Sewer Overflows
97-01/604	Stream Classification and Assessment Project

Deerfield

Project Number	Project Title
92-09/604	Small Public Water Supplies Planning and Protection Project
93-01/604	Technical Assistance to Community and NonTransient NonCommunity (NTNC) Water Suppliers in Preparing Source Protection Plans
97-01/604	Stream Classification and Assessment Project

Farmington

Project Number	Project Title
95-02/604	Farmington River Watershed Nonpoint Source Assessment Project

Housatonic

Project Number	Project Title
92-09/604	Small Public Water Supplies Planning and Protection Project
93-01/604	Technical Assistance to Community and NonTransient NonCommunity (NTNC) Water Suppliers in Preparing Source Protection Plans
96-05/604	Housatonic River Watershed Nonpoint Source Pollution Assessment Project

Hoosic

Project Number	Project Title
92-09/604	Small Public Water Supplies Planning and Protection Project,
93-01/604	Technical Assistance to Community and NonTransient NonCommunity (NTNC) Water Suppliers in Preparing Source Protection Plans
96-01/604	Hoosic River Nonpoint Source Pollution Assessment Project

Ipswich

Project Number	Project Title
92-06/604	Ipswich and North Coastal River Basins Water Resources Protection Planning Project
95-04/604	Nonpoint Source Assessment in the Ipswich River Watershed

Islands

Project Number	Project Title
92-04/604	Martha's Vineyard Water Resources Protection Planning Project
96-04/604	Edgartown Great Pond: Existing and Projected Nitrogen Load

Merrimack

Project Number	Project Title
91-05/604	Merrimack River Water Resources Protection Project
91-08/604	Northern Middlesex County Water Resources Protection Project
92-05/604	Merrimack Valley Regional Water Supply Protection Project
93-03/604	Development and Implementation of Local Floor Drain Regulations in the Merrimack and Parker River Basins

Millers

Project Number	Project Title
91-07/604	Upper Naukeag Lake Watershed Protection Study
92-07/604	Montachusett Water Resources Protection Planning Project

Narragansett

Project Number	Project Title
94-05/604	A Regional Approach to Water Resources Protection and Protecting a Future Potential Water Supply

Nashua

Project Number	Project Title
92-02/604	Fitchburg Watershed Planning Project

North Coastal

Project Number	Project Title
92-06/604	Ipswich and North Coastal River Basins Water Resources Protection Planning Project
94-03/604	Cape Ann Emergency Water Supply Plan
96-02/604	Assessment of On-site Sewage Related Pollution in Gloucester Waters

Parker

Project Number	Project Title
93-03/604	Development and Implementation of Local Floor Drain Regulations in the Merrimack and Parker Basins

South Coastal

Project Number	Project Title
95-03/604	South Shore Nonpoint Source Management Plan

Taunton

Project Number	Project Title
91-09/604	Upper Taunton River Basin Water Supply Protection and Development Project
91-11/604	Mattapoisett River Water Supply Protection Project
92-10/604	Taunton River Basin Water Resources Planning Project
93-05/604	Upper Taunton River Basin Water Supply/Contingency Planning Program
93-07/604	Technical Assistance to the Palmer River Watershed, Mattapoisett River Valley Water Supply Protection Advisory Committee and the Taunton River Basin Needs Study
94-05/604	A Regional Approach to Water Resources Protection and Protecting a Future Potential Water Supply

Westfield

Project Number	Project Title
91-10/604	Pioneer Valley Water Resource Protection Project
92-09/604	Small Public Water Supplies Planning and Protection Project
93-06/604	Pioneer Valley Regional Water Supply Protection Project
95-01/604	Nonpoint Source Assessment in the Westfield River Watershed

Appendix Table B
604b Projects from FFY91 to FFY97 by Fiscal Year

FFY 91

Project Number	Project Title
91-01/604	Control of Hazardous Materials Users to Protect Groundwater Quality on Cape Cod
91-02/604	Monomoy Lens Regional Water Protection Project
91-03/604	Quaboag River Water Supply Protection Project
91-04/604	Franklin County Water Resources Protection Planning Project
91-05/604	Merrimack River Water Resources Protection Project
91-06/604	Charles River Southwest Regional Water Supply Protection Planning Project
91-07/604	Upper Naukeag Lake Watershed Protection Study
91-08/604	Northern Middlesex County Water Resources Protection Project
91-09/604	Upper Taunton River Basin Water Supply Protection and Development Project
91-10/604	Pioneer Valley Water Resource Protection Project
91-11/604	Mattapoisett River Water Supply Protection Project

FFY 92

Project Number	Project Title
92-01/604	Cape Cod Small Volume Well Prioritization Project
92-02/604	Fitchburg Watershed Planning Project
92-03/604	Franklin County Water Resources Protection Planning Project
92-04/604	Martha's Vineyard Water Resources Protection Planning Project
92-05/604	Merrimack Valley Regional Water Supply Protection Project
92-06/604	Ipswich and North Coastal River Basins Water Resources Protection Planning Project
92-07/604	Montachusett Water Resources Protection Planning Project
92-08/604	Pioneer Valley Water Resources Protection Planning Project
92-09/604	Small Public Water Supplies Planning and Protection Project
92-10/604	Taunton River Basin Water Resources Planning Project

FFY 93

Project Number	Project Title
93-01/604	Technical Assistance to Community and NonTransient NonCommunity (NTNC) Water Suppliers in Preparing Source Protection Plans
93-02/604	Franklin County Water Quality Improvement Program
93-03/604	Development and Implementation of Local Floor Drain Regulations in the Merrimack and Parker River Basins
93-04/604	Sudbury-Assabet-Concord (SuAsCo) River Basins Water Supply Protection Project
93-05/604	Upper Taunton River Basin Water Supply/Contingency Planning Program
93-06/604	Pioneer Valley Regional Water Supply Protection Project
93-07/604	Technical Assistance to the Palmer River Watershed, Mattapoisett River Valley Water Supply Protection Advisory Committee and the Taunton River Basin Needs Study

FFY 94

Project Number	Project Title
94-01/604	Sagamore Lens Groundwater Protection Project
94-02/604	Small Public Water System Collaborative Project
94-03/604	Cape Ann Emergency Water Supply Plan
94-04/604	Public Water Supply Technical Assistance/Watershed Inspection Implementation and ISTEA Planning Project
94-05/604	A Regional Approach to Water Resources Protection and Protecting a Future Potential Water Supply
94-06/604	Tri-Town Watershed Protection Implementation Project

FFY95

Project Number	Project Title
95-01/604	Nonpoint Source Assessment in the Westfield River Watershed
95-02/604	Farmington River Watershed Nonpoint Source Assessment Project
95-03/604	South Shore Nonpoint Source Management Plan
95-04/604	Nonpoint Source Assessment in the Ipswich River Watershed

FFY 96

Project Number	Project Title
96-01/604	Hoosic River Nonpoint Source Pollution assessment project
96-02/604	Assessment of On-site Sewage Related Pollution in Gloucester Waters
96-03/604	An Assessment of Urban Stream Restoration: Tannery and Poor Brooks
96-04/604	Edgartown Great Pond: Existing and Projected Nitrogen Load
96-05/604	Housatonic River Watershed Nonpoint Source Pollution Assessment Project
96-06/604	Assessment and Evaluation of Stormwater Source Reduction Practices on Combined Sewer Overflows

FFY 97

Project Number	Project Title
97-01/604	Stream Classification and Assessment Project
97-02/604	Priority Land Acquisition Assessment for Cape Cod: Protecting Suitable Land for Future Water Supply Needs