

BUZZARDS BAY WATERSHED – LAKE SEGMENT ASSESSMENTS

A total of 173 lakes, ponds or impoundments (the term "lakes" will hereafter be used to include all) have been identified and assigned Pond And Lake Information System (PALIS) code numbers in the Buzzards Bay Watershed (Ackerman 1989 and MA DEP 2002d). One hundred forty-three (143) of the lakes are less than 50 acres in total surface area; three are 50 acres; ten are between 50 and 100 acres; ten are between 100 and 200 acres; five are between 200 and 500 acres; and two are 500- 700 acres in total surface area. The total surface area of the Buzzards Bay Watershed lakes is 7,106 acres. This report presents information on 69 of the Buzzards Bay Watershed lakes that are listed in the WBS database. The remaining 103 lakes, which total 2,740 acres, are unassessed and are not currently included as segments in the WBS database.

The 69 lakes assessed in this report represent 4,366 of the 7,106 acres, or 61%, of the total lake acreage in the Buzzards Bay Watershed. The majority of the lakes assessed in the Buzzards Bay Watershed are located within the three communities in the northeastern most portion of the watershed; Plymouth (29), Wareham (13), and Carver (12). Baseline lake surveys were conducted on seven of these lakes (TMDL sampling) in the summer of 2000 (Appendix A, Tables A2 and A3). Synoptic surveys were conducted by DWM at 64 of these lakes in 1995 (Appendix A, Table A1). (Two of the lakes were sampled in both 1995 and 2000.)

Public boat launches are located on three of the assessed lakes: Big Sandy (MA95011), Long (MA95096), and Snipatuit (MA95137) Ponds. The launch at Long Pond is asphalt and is maintained by the Department of Environmental Management, Division of Forest and Parks. There are 50 parking spaces available at this site. MassWildlife maintains one gravel boat launch on Big Sandy Pond with six parking spaces. MassWildlife also maintains one concrete launch at Snipatuit Pond where there are five parking spaces available (DFWELE 2002).

The Department of Environmental Management, Lakes and Ponds Program works with local groups and municipalities to protect, manage, and restore these valuable aquatic resources. MA DEM provides grant funding and technical assistance to communities and citizen groups, helps to monitor water quality at various public beaches to ensure public safety, and provides educational materials to the public about various lake issues <http://www.state.ma.us/dem/programs/lakepond/lakepond.htm>. Four communities have received MA DEM Lakes and Pond Grants since 1999 as summarized below.

The Town of Dartmouth and the Lake Noquochoke Association were awarded a MA DEM Lakes and Pond Grant in 1999 to prepare a lake and watershed management plan for Noquochoke Lake (Segments MA95113, MA95170, and MA95171). The project examined the ecological impacts of excessive eutrophication through a limnological investigation. The resulting plan recommended appropriate long-term remediation measures to restore the pond.

The Town of Carver was also awarded a MA DEM Lakes and Pond Grant in 1999 to develop a master plan for septic system management in close proximity to Vaughn Pond (Segment MA951153). The project included locating septic systems and wells, conducting water quality analysis, developing the plan, and developing recommendations for mitigation of nutrient loading to the pond from septic systems and groundwater flow.

The Town of Acushnet was awarded a MA DEM Lakes and Pond Grant in 2001 to develop a lake and watershed management plan for the New Bedford Reservoir (Segment MA95110). ENSR International was contracted by the Town of Acushnet to examine land use; conduct chemical sampling; conduct phytoplankton surveys; and examine the aquatic vascular plant communities (ENSR 2002).

The Town of Dartmouth was awarded a 2001 MA DEM Lake and Pond Grant to control the spread of variable milfoil (*Myriophyllum heterophyllum*) for the use of herbicides on Lake Noquochoke, which is adversely affecting recreational pursuits and the ecosystem of the pond.

MA DEM manages the Myles Standish State Forest, the largest publicly owned recreation area in southeastern Massachusetts. The Forest contains 16 ponds (only five ponds listed in this report). Several

of the ponds are “ecologically significant coastal plain kettle ponds” (MA DEM Undated c). MA DEM collected bacteria data from five of the facility’s 16 ponds that have public bathing beaches.

The Six Ponds Improvement Association monitors the water quality of Long, Little Long, Halfway, Round, Gallows and Bloody ponds in South Plymouth. Little Long, Long, and Halfway ponds (Segments MA95088, MA95096, and MA95178, respectively) are located in the Buzzards Bay Watershed. Surveys were conducted over the past six years using state certified laboratory analyses of 21 chemical parameters plus other objective observations and measurements. A temporally and spatially intensive survey program was begun in 2002 to document existing baseline conditions of these six ponds and to identify possible contaminant sources. Six Ponds Improvement Association is currently developing a Quality Assurance Project Plan. Moreover, the Six Ponds Improvement Association together with other community organizations is soliciting and organizing volunteers from other Plymouth ponds to assist in building a database of pond conditions throughout the town. As this information is gathered it will become available on the web site of the Plymouth Water Quality Task Force (www.plymouthwaterquality.org) (Russell 2003).

The Nature Conservancy is beginning a program to monitor 12 coastal plain ponds in Plymouth, Carver, and Kingston under the Plymouth PondWatchers Program. Five of the 12 ponds, Darby, Halfway, Little Widgeon, Micajah, and Widgeon are in the Buzzards Bay Watershed. However, only Micajah Pond (MA95102) and Halfway Pond (MA95178) are currently designated as segments in the Water Body System. Sampling in 2002 occurred during the months of August, September, October, and November. Parameters measured included turbidity, temperature, dissolved oxygen, pH, fecal coliform bacteria, total phosphorus, and nitrate-nitrogen. The Nature Conservancy applied to the Massachusetts Environmental Trust for an FY03 grant to continue their program.

LAKE USE ASSESSMENTS

Lake assessments are based on information gathered during DWM surveys (recent and historic) as well as pertinent information from other reliable sources (e.g., abutters, herbicide applicators, diagnostic/feasibility studies, MDPH, etc.). The 1995 DWM synoptic surveys focused on observations of water quality and quantity (e.g., water level, sedimentation, etc.), the presence of native and non-native aquatic plants (as well as distribution and areal cover), and presence/severity of algal blooms (Appendix A, Table A1). During 2000 more intensive in-lake sampling was conducted by DWM in eight lakes in the Buzzards Bay Watershed as part of the TMDL program. This sampling included in-lake measurements of dissolved oxygen, pH, temperature, Secchi disk transparency, nutrients, and chlorophyll *a*, and detailed macrophyte mapping (Appendix A, Tables A2 and A3). While these surveys provided additional information to assess the status of the designated uses, bacteria (fecal coliform, *E. coli*, or *Enterococcus*) data were not collected by DWM and, therefore, the *Primary Contact Recreational Use* was usually not assessed. Under the beaches bill public and semi-public beaches are required to conduct bacteria monitoring and report closure information to MDPH. Beach closure information provided by MDPH was used to assess the *Primary* and *Secondary Contact Recreational Uses* where applicable (MDPH 2002b). To determine the status of the *Fish Consumption Use* fish consumption advisory information was obtained from MDPH (MDPH 2002c). Although the *Drinking Water Use* was not assessed in this water quality assessment report, the Class A waters were identified. Information on drinking water source protection and finished water quality is available at <http://www.state.ma.us/dep/brp/dws/dwshome.htm> and from the Buzzards Bay Watershed’s public water suppliers.

The use assessments and supporting information were entered into the EPA Water Body System database. Data on the presence of non-native plants from the 1995 DWM synoptic surveys, the 2000 DWM TMDL surveys, and other reliable sources were entered into the MA DEP DWM informal non-native plant-tracking database.

AQUATIC LIFE

As part of the 104 (b)(3) grant project (99-06/104) *Lake Surveys for TMDL Development*, DFWELE conducted fish population surveys in two of the eight TMDL lakes in the Buzzards Bay Watershed in 2000: Federal Pond, Carver (MA95055) and Parker Mills Pond, Wareham (MA95115). The objective of the project was to determine if a relationship existed between fish population parameters and macrophyte levels. Fish populations were surveyed using night boat-electroshocking, gill nettings, and beach seining. Aquatic vegetation sampling to estimate extent, density, and biovolume was also conducted. Statistical analysis showed no significant relationships between aquatic vegetation density/biovolume and fisheries parameters. However, given the small sample set, it is predicted that with additional data statistically significant relationships will become apparent. Additional sampling is recommended (Hartley 2003). Fish population data are presented in Table 4.

DFWELE also conducted fish population assessments in eight lakes in the Water Body System within the Buzzards Bay Watershed during the summers of 1998-2000 (Richards 2003 and Hurley 2003). Collection methods included boat electrofishing, experimental gillnets, and/or seines. The species lists and counts for fish are provided in Table 5. A watershed based fisheries management plan will be produced for the Buzzards Bay Watershed by DFWELE at a later date.

Table 4. Fish species-level taxa list and counts for Parker Mill Pond and Federal Pond. Fish collected by the Massachusetts Department of Fisheries, Wildlife, and Environmental Law Enforcement, Division of Fisheries and Wildlife between July and September 2000 in ponds of the Buzzards Bay Watershed as part of the 99-06/104 grant project *Lakes Survey for TMDL Development*. Collection methods included boat shocking, gillnets, and/or seines (Hartley 2003).

Common Name	Scientific Name	Parker Mill Pond (MA95115)	Federal Pond (MA95055)
American eel	<i>Anguilla rostrata</i>	36	5
Bluegill	<i>Lepomis macrochirus</i>	109	203
Brown bullhead	<i>Ameiurus nebulosus</i>	10	7
Black crappie	<i>Pomoxis nigromaculatus</i>	---	2
Banded sunfish	<i>Enneacanthus obesus</i>	1	---
Chain pickerel	<i>Esox niger</i>	27	46
Golden shiner	<i>Notemigonus crysoleucas</i>	149	2
Largemouth bass	<i>Micropterus salmoides</i>	126	71
Pumpkinseed	<i>Lepomis gibbosus</i>	52	5
Tesselated darter	<i>Etheostoma olmstedii</i>	---	4
Yellow bullhead	<i>Ameiurus natalis</i>	4	---
Yellow perch	<i>Perca flavescens</i>	29	---

Table 5. Species-level taxa list and counts for fish for Spectacle, Whites, Halfway, White Island, Little Long, and Long ponds, New Bedford Reservoir and Noquochoke Lake. Fish collected by the Massachusetts Department of Fisheries, Wildlife and Environmental Law Enforcement, Division of Fisheries and Wildlife, Southeast District between July 1998 and September 2000 in lakes and ponds in the Buzzards Bay Watershed (Hurley 2003a, b, and c). Collection methods included boat shocking, experimental gillnets, angling, and/or seines.

Common Name	Scientific Name	Spectacle Pond (MA95142) 1 July 1998	Whites Pond (MA95168) 29 July 1998	Halfway Pond (MA95178) 17 July 2000	New Bedford Reservoir (MA95110) 7 August 2000	White Island Pond (MA95166 and MA95173) 21 August 2000	Noquochoke Lake (MA95113, MA95170, and MA95171) 28 August 2000	Little Long Pond (MA95088) 11 September 2000	Long Pond (MA95096) 11 September 2000
American eel	<i>Anguilla rostrata</i>	Few	---	Sparse	Few	Few	Very abundant	Abundant	4
Alewife	<i>Alosa pseudoharengus</i>	26	---	57	---	83	---	---	---
Blueback herring	<i>Alosa aestivalis</i>	---	---	---	1	---	---	---	---
Chain pickerel	<i>Esox niger</i>	13	12	1	7	18	7	4	---
Golden shiner	<i>Notemigonus crysoleucas</i>	4	---	---	---	1	10	---	---
White sucker	<i>Catostomus commersoni</i>	1	---	18	---	---	---	23	3

Table 5 (Continued). Species-level taxa list and counts for fish for Spectacle, Whites, Halfway, White Island, Little Long, and Long ponds, New Bedford Reservoir and Noquochoke Lake. Fish collected by the Massachusetts Department of Fisheries, Wildlife and Environmental Law Enforcement, Division of Fisheries and Wildlife, Southeast District between July 1998 and September 2000 in lakes and ponds in the Buzzards Bay Watershed (Hurley 2003a, b, and c). Collection methods included boat shocking, experimental gillnets, angling, and/or seines.

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Brown bullhead	<i>Ameiurus nebulosus</i>	1	2	---	---	6	---	---	1
Banded killifish	<i>Fundulus diaphanus</i>	2	---	5	---	12	---	Abundant	12
Pumpkinseed	<i>Lepomis gibbosus</i>	36	20	17	15	34	40	---	23
Bluegill	<i>Lepomis macrochirus</i>	14	---	23	66	2	54	12	25
Sunfish (undetermined species)	<i>Lepomis sp.</i>	---	---	---	2	---	---	---	28
Largemouth bass	<i>Micropterus salmoides</i>	29	12	19	25	88	46	30	12
Yellow perch	<i>Perca flavescens</i>	98	137	172	34	323	72	14	4
White perch	<i>Morone americana</i>	---	---	13	10	16	---	2	23
Black crappie	<i>Pomoxis nigromaculatus</i>	---	---	1	18	---	---	---	---
Smallmouth bass	<i>Micropterus dolomieu</i>	---	---	25	---	54	---	12	61
Tessellated darter	<i>Etheostoma olmstedii</i>	---	---	5	---	---	---	---	---

Non-native aquatic macrophytes were observed in 13 of the 64 lakes surveyed by DWM in 1995 (Appendix A, Table A1). The non-native aquatic species observed in the Buzzards Bay Watershed lakes were *Myriophyllum heterophyllum* (variable water milfoil) and *Cabomba caroliniana* (fanwort). *M. heterophyllum* and *Cabomba caroliniana* have a high potential for spreading and are likely to have established themselves in downstream lake and river segments in the Buzzards Bay Watershed that may not have been surveyed. Figure 17 indicates where non-native aquatic species were observed during the DWM 1995 and/or 2000 surveys and the likely, or potential, avenues of downstream spreading.

Additionally, *M. heterophyllum* is suspected to be present in seven ponds in the Buzzards Bay Watershed (Appendix A, Table A1 and Table 6). At the time of the DWM surveys these plants had not matured sufficiently for positive identification. Because *M. heterophyllum* is suspected the *Aquatic Life Use* for these lakes is identified with an "Alert Status".

Lythrum salicaria (purple loosestrife) was identified at four of the 64 lakes surveyed by DWM in 1995 and/or 2000 (Appendix A, Table A1) and *Phragmites australis* (common reed) was identified at six. Although the presence of these species is not generally a cause of impairment to lakes, their invasive growth habit can result in the impairment of wetland habitat associated with lakes.

New Bedford Reservoir was sampled by ENSR on two occasions (June and August 2002) as part of a D/F Study for the Town of Acushnet. Temperature, pH, specific conductance, Secchi transparency, turbidity, total alkalinity, nitrate and nitrite, ammonia, total Kjeldahl nitrogen, total phosphorus and ortho-phosphorus samples were collected; phytoplankton surveys were conducted; and the aquatic vascular plant communities were examined (ENSR 2002). Unfortunately, this dataset does not meet minimum acceptance criteria required by EPA and MA DEP for use in reporting 305(b) assessments.

DWM, with assistance from DFWELE, conducted baseline sampling at eight lakes in the Buzzards Bay Watershed identified below for TMDL development. Samples collected between July and September 2000 included *in-situ* physical parameters using a Hydrolab Multiprobe® and grab samples for chemical analysis of alkalinity, total phosphorus, apparent color, and chlorophyll *a*. A technical memorandum entitled *Baseline Lake Survey 2000 Technical Memo* presents the results of DWM's 2000 Baseline Lakes Monitoring (Mattson 2003). Data pertaining to lakes within the Buzzards Bay Watershed were excerpted and appear in Appendix A.

- Turner Pond (MA95151), New Bedford
- New Bedford Reservoir (MA95110), Acushnet
- East White Island Pond (MA 95166), Plymouth
- West White Island Pond (MA95173), Plymouth
- New Long Pond (MA95112), Plymouth
- Crane Brook Pond (MA95033), Carver
- Federal Pond (MA95055), Carver
- Parker Mills Pond (MA95115), Wareham

DWM sampling of the north basin of New Bedford Reservoir in July, August, and September 2000 found dissolved oxygen depletion (5.7 mg/L-1.7 mg/L) and moderate total phosphorus concentrations (0.021-0.070 mg/L) indicative of an organic-enriched system (Appendix A, Table A2 and A3). The non-native aquatic plant *Myriophyllum heterophyllum* was identified in both the 1995 synoptic surveys and 2000 TMDL surveys. Approximately 80% of the surface area in the north basin has dense to very dense aquatic vegetation biovolume below it. The south basin showed generally good dissolved oxygen concentrations and low levels of total phosphorus, with the exception of one inlet draining the cranberry bog at the northeastern corner of the basin. Less than 20% of the surface area in the south basin has dense/very dense aquatic vegetation biovolume below it. Limited water quality data are available for the east basin of New Bedford Reservoir, however, only about 25% of the surface area there has dense/very dense vegetation biovolume below it. The *Aquatic Life Use* for New Bedford Reservoir is assessed as impaired due to non-native plants, DO, DO saturation, and phosphate. Suspected sources of impairment include storm water (road runoff), on-site septic systems, agricultural and cranberry bog operations, and waterfowl.

Physico-chemical data (low total phosphorus concentrations, good dissolved oxygen levels) collected from New Long Pond in Plymouth indicate that the pond supports the *Aquatic Life Use*. This use is, however, identified with an Alert Status due to very low pH and alkalinity.

Oxygen depletion occurred below 2 m in both the east and west basins of Turner Pond during the summer of 2000. Total phosphorus concentrations in Turner Pond ranged from below the detection limit to 0.10 mg/L in the eastern basin and 0.007 to 0.29 mg/L in the western basin. pH measurements in Turner Pond were very low and color was high (Appendix A, Table A1 and A2). These data are likely indicative of natural conditions associated with the large wetland complex upstream of the pond. The *Aquatic Life Use* is assessed as support for Turner Pond. However, this use is identified with an Alert Status due to elevated total phosphorus concentrations that may be associated with runoff or other anthropogenic sources.

The *Aquatic Life Use* was assessed as impaired (depending on the degree of biocommunity modification) in 13 lakes based on the confirmed presence of non-native macrophyte(s) (Table 6). Four lakes were assessed as impaired as a result of phosphates and/or organic enrichment/low dissolved oxygen. Two lakes in the Buzzards Bay Watershed, New Long Pond in Plymouth and Turner Pond in New Bedford/Dartmouth, are assessed as supporting the *Aquatic Life Use*. Fifty-four lakes are currently not assessed for the *Aquatic Life Use* because of the cursory nature of the synoptic surveys and/or the lack of dissolved oxygen data observations.

FISH CONSUMPTION

In July 2001 MDPH issued new consumer advisories on fish consumption and mercury contamination. The MDPH "...is advising pregnant women, women of childbearing age who may become pregnant, nursing mothers and children under 12 years of age to refrain from eating the following marine fish; shark, swordfish, king mackerel, tuna steak and tilefish. In addition, MDPH is expanding its previously issued statewide fish consumption advisory which cautioned pregnant women to avoid eating fish from all freshwater bodies due to concerns about mercury contamination, to now include women of childbearing age who may become pregnant, nursing mothers and children under 12 years of age (MDPH 2001)."

Additionally, MDPH "...is recommending that pregnant women, women of childbearing age who may become pregnant, nursing mothers and children under 12 years of age limit their consumption of fish not covered by existing advisories to no more than 12 ounces (or about 2 meals) of cooked or uncooked fish per week. This recommendation includes canned tuna, the consumption of which should be limited to 2 cans per week. Very small children, including toddlers, should eat less. Consumers may wish to choose to eat light tuna rather than white or chunk white tuna, the latter of which may have higher levels of mercury (MDPH 2001)."

MDPH's statewide advisory does not include fish stocked by the state Division of Fisheries and Wildlife or farm-raised fish sold commercially. The advisory encompasses all freshwaters in Massachusetts and, therefore, the *Fish Consumption Use* for lakes in the Buzzards Bay Watershed cannot be assessed as support or partial support. The MDPH fish consumption advisory list contains the status of each water body for which an advisory has been issued. If a water body is not on the list it may be because either an advisory was not warranted or the water body has not been sampled. MDPH's most current Fish Consumption Advisory list is available online at <http://www.state.ma.us/dph/beha/fishlist.htm>.]

Fish toxics monitoring was conducted cooperatively by DWM and the DFWELE Division of Fisheries and Wildlife Southeast District Office at two locations recommended by the EOE Buzzards Bay Team. Fish collections were made using boat electrofishing and gill nets on August 21, 2000 in White Island Pond (Plymouth), and on August 28, 2000 at Noquochoke Lake (Dartmouth). Edible fillets were analyzed for the presence of heavy metals, PCBs, and organochlorine pesticides. Data appear in the technical memorandum by R. Maietta and J. Colonna-Romano entitled *2000 Fish Toxics Monitoring Public Requests and Year 2 Watershed Surveys*. As a result MDPH issued the following fish consumption advisory for Noquochoke Lake due to elevated levels of mercury and PCBs in fish tissue.

1. Children younger than 12 years, pregnant women, and nursing mothers should not eat any fish from the Copicut River or Cornell Pond.
2. The general public should not consume any largemouth bass (*Micropterus salmoides*) and American eel (*Anguilla rostrata*) from Noquochoke Lake.

3. The general public should limit consumption of non-affected fish from this waterbody to two meals per month.

In 1995, fish toxics monitoring was conducted by DWM at two locations in the Buzzards Bay Watershed: Snipatuit Pond, Rochester and Glen Charlie Pond, Wareham. As a result MDPH issued the following fish consumption advisory for Snipatuit and Long ponds, Rochester due to elevated levels of mercury in fish tissue:

1. Children younger than 12 years, pregnant women, and nursing mothers should not eat any black crappie or largemouth bass from the Snipatuit and Long ponds.
2. The general public should limit consumption of black crappie and largemouth bass from this waterbody to two meals per month.

Two additional site-specific fish consumption advisories were issued by MDPH in the Buzzards Bay Watershed.

Due to elevated levels of mercury and PCBs in fish tissue, MDPH advises the following for Copicut River and Cornell Pond in Dartmouth.

1. Children younger than 12 years, pregnant women, and nursing mothers should not eat any fish from the Copicut River or Cornell Pond.
2. The general public should not consume any American Eel from Copicut River or Cornell Pond.
3. The general public should limit consumption of largemouth bass to two meals per month.

MDPH issued the following advisory for Turner Pond in Dartmouth/New Bedford due to elevated levels of mercury in fish tissue.

1. Children younger than 12 years, pregnant women, and nursing mothers should not eat any fish from the Copicut River or Cornell Pond.
2. The general public should limit consumption of all fish from this waterbody to two meals per month.

Based on the MDPH site-specific fish consumption advisories the *Fish Consumption Use* is assessed as impaired for Cornell Pond, Noquochoke Lake, Snipatuit and Long Ponds, and Turner Pond.

PRIMARY AND SECONDARY CONTACT RECREATION AND AESTHETICS

In 1995 DWM conducted synoptic surveys of 64 lakes in the Buzzards Bay Watershed. These surveys included observations of water quality and quantity, the presence of native and non-native aquatic plants, and the presence/severity of algal blooms (Appendix A, Table A1). Additional data were collected at eight of these lakes by DWM in 2000 for the purpose of TMDL development. These data, combined with the 1998 303(d) List of Waters, MA DEM bathing beach bacteria data, MDPH bathing beach closure information, and diagnostic/feasibility studies were used to assess the recreational and aesthetics uses.

Weekly *Enterococci* bacteria samples were collected from the five MA DEM beaches in the Myles Standish State Forest during 2001 and 2002 between May and August (n=15 at each location). Ponds sampled included Barrett Pond, Charge Pond, College Pond, Curlew Pond, and Fearing Pond. Site-specific information on each pond is provided in the Use Assessment Table (Table 6). No information on beach closures is available (MA DEM 2002 and MDPH 2002b).

Lake Noquochoke was closed to swimming between 6/14-7/2/2001 due to elevated *Enterococci* levels (MDPH 2002b).

Where very dense aquatic macrophyte growth was noted during the 1995 synoptic surveys (Appendix A, Table A1) and there was no knowledge of remedial efforts the assessment of the recreational uses was assessed as impaired (Table 6). In lakes or areas of lakes that were previously unaffected by macrophyte growth the *Primary Contact Recreational Use* was not assessed due to the lack of any current data.

Ten lakes in the Buzzards Bay Watershed were assessed as support for the *Primary Contact* and *Secondary Contact Recreational Uses* (Table 6).

The *Primary Contact* and *Secondary Contact Recreational uses* were impaired for five lakes (1338 acres; 29.8% of the total acreage assessed in this report) in the Buzzards Bay Watershed (Table 6). Causes of impairment included overabundant plant growth (native and/or non-native vegetation), excessive algal growth, phosphate, and Secchi disk transparency. One additional lake, Noquochoke Lake in Dartmouth, was impaired for the *Primary Contact Recreation Use* due to elevated bacteria counts resulting in the closure of the bathing beach. The recreational uses were not assessed for the remaining 52 lakes (2,391 acres).

SUMMARY

A total of 15 of the 67 lakes in the Buzzards Bay Watershed assessed in this report were impaired for one or more uses. Causes of impairment included: noxious (overabundant) plant growth (including both native and non-native vegetation), mercury contamination, PCB contamination, organic enrichment, [low] dissolved oxygen, DO [super] saturation, excessive algal growth, phosphate, and Secchi disk transparency. No lakes supported all uses. Forty-two lakes are currently not assessed for any uses (Table 6).

Due to the focus of the lake surveys conducted the major cause for use impairment documented in this report was growth (in some cases excessive) of aquatic plants, either native or non-native. This cause may reflect symptoms of lake eutrophication, a process of enrichment from excessive plant nutrients. Site-specific sources of impairment to the lakes in the Buzzards Bay Watershed are largely unknown. However, nutrient enrichment from storm water runoff, failing, substandard, or inappropriately sited sewage disposal systems, and/or drainage from agricultural lands is likely to have increased the macrophyte productivity, resulting in impairments to the *Aquatic Life*, *Recreational*, and *Aesthetics* uses.

Cornell Pond in Dartmouth (totaling 16 acres), Noquochoke Lake in Dartmouth (totaling 146 acres), Snipatuit and Long Ponds in Rochester (totaling 743 acres), and Turner Pond in Dartmouth/New Bedford (totaling 55 acres) were impaired for the *Fish Consumption Use* because of PCB and mercury contamination.

Table 6 presents the individual use assessments for the lakes in the Buzzards Bay Watershed.

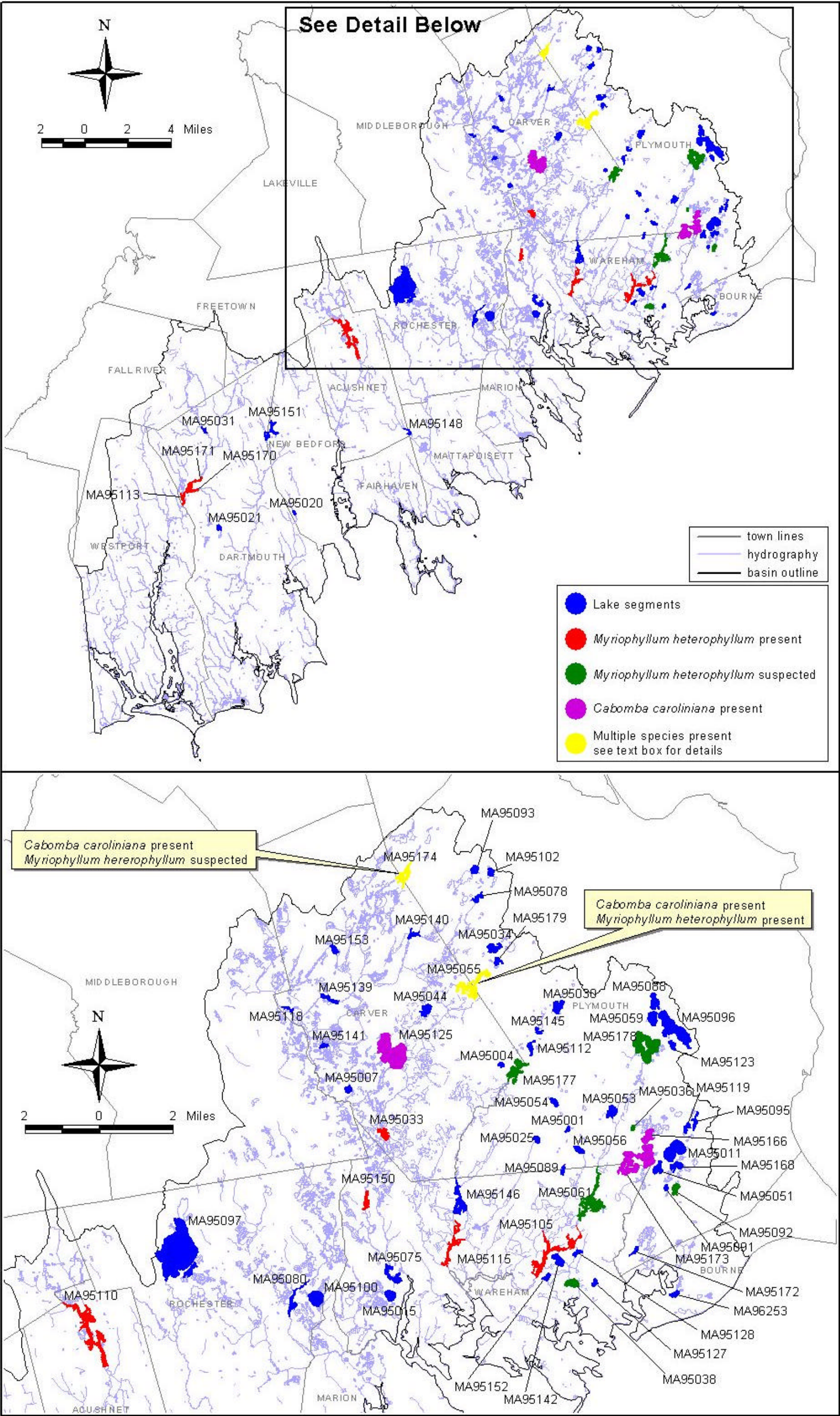


Figure 17. Buzzards Bay Watershed – presence of non-native aquatic vegetation.

Table 6. Buzzards Bay Watershed Lake Use Assessments.






Lake, Location	WBID	Size (Acres)	Aquatic Life  (Impairment Cause)	Fish Consumption  (Impairment Cause)	Primary Contact  (Impairment Cause)	Secondary Contact  (Impairment Cause)	Aesthetics  (Impairment Cause)
Abner Pond, Plymouth	95001	10	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: No public bathing beach. Pond used for recreation by boy scout camp. Synoptic survey in 1995 (Appendix A).							
Barrett Pond, Carver	95004	16	NOT ASSESSED	NOT ASSESSED	SUPPORT	SUPPORT	NOT ASSESSED
NOTE: Synoptic survey in 1995 (Appendix A). Barrett Pond is within the Myles Standish State Forest and has a public bathing beach. <i>Enterococci</i> samples were collected weekly by MA DEM from 6/25/01 through 8/13/01 and 5/21/02 through 7/16/02. The beach was not formally posted and, therefore, the recreational uses are assessed as support.							
Bates Pond, Carver	95007	20	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: No public bathing beach. Synoptic survey in 1995 (Appendix A).							
Big Rocky Pond, Plymouth	95119	18	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: No public bathing beach. Synoptic survey in 1995 (Appendix A).							
Big Sandy Pond, Plymouth	95011	135	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: No public bathing beach. There is a public boat launch (DFWELE 2 July 2002). Synoptic survey in 1995 (Appendix A).							
Blackmore Reservoir, Wareham	95015	46	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: No public bathing beach. Synoptic survey in 1995 (Appendix A).							
Buttonwood Park Pond, New Bedford	95020	12	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: No public bathing beach. Pond is located in Buttonwood Park Zoo.							
Cedar Dell Lake, Dartmouth	95021	24	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: No public bathing beach. Synoptic survey in 1995 (Appendix A).							
Charge Pond, Plymouth	95025	23	NOT ASSESSED	NOT ASSESSED	SUPPORT	SUPPORT	NOT ASSESSED
NOTE: Synoptic survey in 1995 (Appendix A). Charge Pond is within the Myles Standish State Forest and has a public bathing beach. <i>Enterococci</i> samples were collected weekly by MA DEM from 6/25/01 through 8/13/01 and 5/21/02 through 7/16/02. The beach was not formally posted and, therefore, the recreational uses are assessed as support.							
College Pond, Plymouth	95030	53	NOT ASSESSED	NOT ASSESSED	SUPPORT	SUPPORT	NOT ASSESSED
NOTE: Synoptic survey in 1995 (Appendix A). College Pond is within the Myles Standish State Forest and has a public bathing beach. <i>Enterococci</i> samples were collected weekly by MA DEM from 6/25/01 through 8/13/01 and 5/21/02 through 7/16/02. The beach was not formally posted and, therefore, the recreational uses are assessed as support.							

Table 6 (Continued). Buzzards Bay Watershed Lake Use Assessments.






Lake, Location	WBID	Size (Acres)	 Aquatic Life (Impairment Cause)	 Fish Consumption (Impairment Cause)	 Primary Contact (Impairment Cause)	 Secondary Contact (Impairment Cause)	 Aesthetics (Impairment Cause)
Cornell Pond, Dartmouth	95031	16	NOT ASSESSED	IMPAIRED (Mercury, PCBs)	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: No public bathing beach. Pond is accessible for recreation. Fish toxics monitoring conducted by DWM in 1988. MDPH issued a fish consumption advisory. Sources of PCB linked to the Resolve Superfund site- 16 (see details in summary of conditions and perceived problems and Copicut River segment MA95-43).							
Crane Brook Bog Pond, Carver	95033	37	IMPAIRED (Non-native plants) phosphate, excess algal growth)	NOT ASSESSED	IMPAIRED (Excess algal growth)	IMPAIRED (Excess algal growth)	IMPAIRED (Excess algal growth)
NOTE: Non-native aquatic plant (<i>Myriophyllum heterophyllum</i>) identified during the 2000 TMDL survey (Mattson 2003). The surface water was densely covered with aquatic macrophytes, duckweed and filamentous algae, indicating enrichment. Total phosphorus concentrations were elevated (i.e., ranging between 0.05 and 0.13 mg/L) in the pond as well as in the inlet (Appendix A). Dissolved oxygen was low on one of the two dates sampled (DO data censored from August 2000), however, it was not determined whether or not this was due to natural conditions or to anthropogenic sources. The low pH is considered natural. No public bathing beach. Suspected sources of impairment include highway/road runoff and irrigated, specialty crop production related to cranberry bogs.							
Curlew Pond, Plymouth	95034	43	NOT ASSESSED	NOT ASSESSED	SUPPORT	SUPPORT	NOT ASSESSED
NOTE: Synoptic survey in 1995 (Appendix A). Curlew Pond is within the Myles Standish State Forest and has a public bathing beach. <i>Enterococci</i> samples were collected weekly by MA DEM from 6/25/01 through 8/13/01 and 5/21/02 through 7/16/02. The beach was not formally posted and, therefore, the recreational uses are assessed as support							
Deer Pond, Plymouth	95036	11	NOT ASSESSED*	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: <i>Myriophyllum</i> sp. noted during synoptic survey in 1995 needs confirmation so <i>Aquatic Life Use</i> is identified with Alert Status (Appendix A). No public bathing beach. Forested shoreline.							
Dicks Pond, Wareham	95038	40	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: Synoptic survey in 1995 - <i>Myriophyllum</i> sp noted, not likely heterophyllum. Non-native plant (<i>Phragmites australis</i>) identified during the 1995 synoptic survey (Appendix A). No public bathing beach.							
Dunham Pond, Carver	95044	45	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: Synoptic survey in 1995 (Appendix A). There is a public bathing beach, but no sampling is currently conducted.							
East Head Pond, Carver/Plymouth	95177	92	NOT ASSESSED*	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: <i>Myriophyllum</i> sp. noted during synoptic survey in 1995 needs confirmation so <i>Aquatic Life Use</i> is identified with Alert Status (Appendix A). No public bathing beach.							

Table 6 (Continued). Buzzards Bay Watershed Lake Use Assessments.






Lake, Location	WBID	Size (Acres)	 Aquatic Life (Impairment Cause)	 Fish Consumption (Impairment Cause)	 Primary Contact (Impairment Cause)	 Secondary Contact (Impairment Cause)	 Aesthetics (Impairment Cause)
Ezekiel Pond, Plymouth	95051	36	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: Synoptic survey in 1995 (Appendix A). No public bathing beach. Developed shoreline.							
Fawn Pond, Plymouth	95053	33	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: Synoptic survey in 1995 (Appendix A). No public bathing beach. Forested shoreline.							
Fearing Pond, Plymouth	95054	24	NOT ASSESSED	NOT ASSESSED	SUPPORT	SUPPORT	NOT ASSESSED
NOTE: Synoptic survey in 1995 (Appendix A). Fearing Pond is within the Myles Standish State Forest and has a public bathing beach. <i>Enterococci</i> samples were collected weekly by MA DEM from 6/25/01 through 8/13/01 and 5/21/02 through 7/16/02. The beach was not formally posted and, therefore, the recreational uses are assessed as support.							
Federal Pond, Carver (also known as Federal Furnace Pond)	95055	129	IMPAIRED (Non-native plants)	NOT ASSESSED	IMPAIRED (Non-native plants)	IMPAIRED (Non-native plants)	IMPAIRED (Non-native plants)
NOTE: Non-native aquatic plants (<i>Cabomba caroliniana</i> and <i>Myriophyllum heterophyllum</i>) identified during the 2000 TMDL survey and the 1995 synoptic survey (Appendix A). <i>Lythrum salicaria</i> also noted during 2000 survey (Mattson 2003). DFWLE conducted a fish population survey in Federal Pond in 2000. Nine species were present and the assemblage was dominated by bluegill, largemouth bass and chain pickerel (Table 4.) The surface water was very densely covered with the non-native aquatic macrophyte <i>Cabomba caroliniana</i> . The total phosphorus concentrations were moderate ranging from 0.062 to 0.007 mg/L. There is no public bathing beach.							
Five Mile Pond, Plymouth	95056	29	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: No public bathing beach. Pond may be used by area residents for recreation. Synoptic survey in 1995 (Appendix A).							
Fresh Meadow Pond, Carver/Plymouth	95174	59	IMPAIRED (Non-native plants)	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: No public bathing beach. Non-native aquatic plants (<i>Cabomba caroliniana</i> and likely <i>M. heterophyllum</i>) noted during 1995 synoptic survey (Appendix A).							
Gallows Pond, Plymouth	95059	43	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: No public bathing beach. Pond used for recreation by girl scout camp. Synoptic survey in 1995 (Appendix A).							
Glen Charlie Pond, Wareham (also known as Shangrila Pond)	95061	185	NOT ASSESSED*	NOT ASSESSED	SUPPORT	SUPPORT	NOT ASSESSED
NOTE: Glen Charlie Pond has a public bathing beach. <i>E. Coli</i> samples were collected by Barnstable County Labs every two weeks in 2000 and weekly in 2001. According to the Wareham Board of Health, Shangrila Beach was only closed between July 18-23, 1999 and, therefore, the <i>Recreational</i> uses are assessed as support. <i>M. sp.</i> noted during 1995 synoptic survey (Appendix A); suspect <i>M. heterophyllum</i> so <i>Aquatic Life Use</i> is identified with an Alert Status. Non-native wetland plant (<i>Phragmites australis</i>) identified during the 1995 synoptic survey (Appendix A). Fish toxics monitoring conducted in pond by DWM in 1995 but no advisory issued (Appendix B)							

Table 6 (Continued). Buzzards Bay Watershed Lake Use Assessments.






Lake, Location	WBID	Size (Acres)	Aquatic Life  (Impairment Cause)	Fish Consumption  (Impairment Cause)	Primary Contact  (Impairment Cause)	Secondary Contact  (Impairment Cause)	Aesthetics  (Impairment Cause)
Halfway Pond, Plymouth	95178	232	NOT ASSESSED*	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: No public bathing beach. Shoreline partially developed. <i>M. sp.</i> noted during 1995 synoptic survey (Appendix A). It is suspected to be <i>M. heterophyllum</i> , therefore, <i>Aquatic Life Use</i> is identified with an Alert Status.							
Horseshoe Pond, Wareham	95075	85	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: No public bathing beach. Synoptic survey in 1995 (Appendix A).							
Kings Pond, Plymouth	95078	21	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: No public bathing beach. Developed shoreline. Synoptic survey in 1995 (Appendix A).							
Leonard's Pond, Rochester	95080	54	NOT ASSESSED*	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: No public bathing beach. <i>M. sp.</i> noted during 1995 synoptic survey (Appendix A). It is suspected to be <i>M. heterophyllum</i> , therefore, the <i>Aquatic Life Use</i> is identified with an Alert Status.							
Little Long Pond, Plymouth	95088	45	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: Synoptic survey in 1995 (Appendix A).							
Little Long Pond, Wareham	95089	19	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: No public bathing beach. Synoptic survey in 1995 (Appendix X).							
Little Rocky Pond, Plymouth	95091	11	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: No public bathing beach. Developed shoreline. Synoptic survey in 1995 (Appendix A).							
Little Sandy Pond, Plymouth	95092	29	NOT ASSESSED*	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: No public bathing beach. Developed shoreline. <i>M. sp.</i> noted during 1995 synoptic survey (Appendix A). It is suspected to be <i>M. heterophyllum</i> , therefore, the <i>Aquatic Life Use</i> is identified with an Alert Status.							
Little West Pond, Plymouth	95093	25	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: No public bathing beach. Pond may be used by campers for recreation. Synoptic survey in 1995 (Appendix A).							
Long Duck Pond, Plymouth	95095	23	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: No public bathing beach. Developed shoreline. Synoptic surveys in 1995 and 1996 (Appendix A).							

Table 6 (Continued). Buzzards Bay Watershed Lake Use Assessments.






Lake, Location	WBID	Size (Acres)	Aquatic Life  (Impairment Cause)	Fish Consumption  (Impairment Cause)	Primary Contact  (Impairment Cause)	Secondary Contact  (Impairment Cause)	Aesthetics  (Impairment Cause)
Long Pond, Plymouth	95096	211	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: No public bathing beach. Public boat launch. Synoptic survey in 1995 (Appendix A).							
Long Pond, Rochester	95097	33	NOT ASSESSED	IMPAIRED (Mercury)	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: No public bathing beach. In 1995 DWM sampled Snipatuit Pond which is connected to Long Pond (Appendix B). MDPH issued a fish consumption based on the data.							
Mare Pond, Plymouth	95172	12	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: No public bathing beach. Pond may be used by area residents for recreation. Synoptic survey in 1995 (Appendix A).							
Mary's Pond, Rochester	95100	81	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: Mary's Pond has a private bathing beach owned by Perry's Camp. Testing is reported to the New Bedford Board of Health and Town Clerk. Information on beach closings not determined. Synoptic survey in 1995 (Appendix A).							
Micajah Pond, Plymouth	95102	20	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: No public bathing beach. Synoptic survey in 1995 <i>Myriophyllum</i> sp. Noted, but not likely heterophyllum (Appendix A).							
Mill Pond, Wareham	95105	150	IMPAIRED (Non-native plants)	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: No public bathing beach. Non-native aquatic plant (<i>Myriophyllum heterophyllum</i>) identified during the 1995 synoptic survey (Appendix A).							

Table 6 (Continued). Buzzards Bay Watershed Lake Use Assessments.






Lake, Location	WBID	Size (Acres)	 Aquatic Life (Impairment Cause)	 Fish Consumption (Impairment Cause)	 Primary Contact (Impairment Cause)	 Secondary Contact (Impairment Cause)	 Aesthetics (Impairment Cause)
New Bedford Reservoir, Acushnet	95110	219	IMPAIRED (Non-native plants, DO, DO saturation, phosphate)	NOT ASSESSED	IMPAIRED (Non-native plants, phosphate)	IMPAIRED (Non-native plants, phosphate)	IMPAIRED (Phosphate)
NOTE: No public bathing beach, however, there is public access via two boat ramps off of Lake Street. The outlet structure is managed to maintain flows in the Acushnet River necessary for herring migration (ENSR 2002). DMF recently completed renovations (totaling \$ 0.25 million) to the fishway at the outlet to New Bedford Reservoir (Brady 2003). MA DEM Lake and Pond Grant 2001 to develop watershed management plan to control nutrients and nuisance aquatic plants, D/F Study. Non-native aquatic plant (<i>Myriophyllum heterophyllum</i>) identified during the 2000 TMDL survey and the 1995 synoptic survey (Appendix A). ENSR (2002) documented direct runoff from Lake Street into all three basins of New Bedford Reservoir. DFWLE conducted fish population work in New Bedford Reservoir in 2000 (Table 5). New Bedford Reservoir (north basin) (146 acres): low dissolved oxygen/saturation levels and very dense cover of <i>Wolffia</i> , total phosphorus concentrations were moderate (0.021 to 0.07 mg/L). One inlet to the north basin (station R, unique ID 788) draining the cranberry bog at the western edge of the Reservoir had very high total phosphorus concentrations (Appendix A). It should be noted that approximately 80% of New Bedford Reservoir North basin biovolume (the 3-dimensional space available for biological growth) has dense/very dense vegetation. New Bedford Reservoir (south basin) (48 acres): dissolved oxygen/saturation levels were generally good and total phosphorus concentrations were low (ranging between 0.018 and 0.058 mg/L). One inlet to the south basin (station S, unique ID 789) draining the cranberry bog at the northeastern corner of the south basin had high total phosphorus concentrations (Appendix A). It should be noted that less than 10% of New Bedford Reservoir south basin biovolume has dense/very dense vegetation. New Bedford Reservoir (east basin) (25 acres): limited water quality data available for this basin of the reservoir (Appendix A). It should be noted that approximately 25% of New Bedford Reservoir east basin biovolume has dense/very dense vegetation.							
New Long Pond, Plymouth	95112	23	SUPPORT*	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	SUPPORT
NOTE: No public bathing beach. TMDL surveys conducted in 2000 (Appendix A). Physico-chemical data (low total phosphorus concentrations, good dissolved oxygen concentrations) indicated good water quality, however, due to very low pH and alkalinity the <i>Aquatic Life Use</i> is identified with an "Alert Status" (Appendix A). No objectionable conditions (trash debris, oil sheens, etc) were noted by DWM during the 2000 TMDL surveys.							
Noquochoke Lake, Dartmouth	95113	110	IMPAIRED (Non-native plants)	IMPAIRED (Mercury, PCBs)	IMPAIRED (Enterococci)	NOT ASSESSED	NOT ASSESSED
NOTE: Non-native aquatic plant (<i>Myriophyllum heterophyllum</i>) identified during the 1995 synoptic survey (Appendix A). Fish toxics monitoring conducted by DWM in 1988 and again in 2000 (Appendix B). MDPH issued a fish consumption advisory. Sources of PCB linked to the Resolve Superfund site- code 16 (see details in summary of conditions and perceived problems and Copicut River segment MA95-43). Noquochoke Lake has a public bathing beach. Noquochoke Lake was closed to swimming between 6/14 –7/2/2001 (estimated as 25% of the swimming season) due to elevated <i>Enterococci</i> levels (MDPH 2002b). MA DEM Lake and Pond Grant 1999 to prepare watershed management plan with long term remediation recommendations.							
Noquochoke Lake (East Basin), Dartmouth	95170	17	IMPAIRED (Non-native plants)	IMPAIRED (Mercury, PCBs)	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: Non-native aquatic plant (<i>Myriophyllum heterophyllum</i>) identified during the 1995 synoptic survey (Appendix A). Fish toxics monitoring conducted by DWM in 1988 and again in 2000 (Appendix B). MDPH issued a fish consumption advisory. Sources of PCB linked to the Resolve Superfund site- code 16 (see details in summary of conditions and perceived problems and Copicut River segment MA95-43). MA DEM Lake and Pond Grant 1999 to prepare watershed management plan with long term remediation recommendations.							

Table 6 (Continued). Buzzards Bay Watershed Lake Use Assessments.






Lake, Location	WBID	Size (Acres)	 Aquatic Life (Impairment Cause)	 Fish Consumption (Impairment Cause)	 Primary Contact (Impairment Cause)	 Secondary Contact (Impairment Cause)	 Aesthetics (Impairment Cause)
Noquochoke Lake (North Basin), Dartmouth	95171	19	IMPAIRED (Non-native plants)	IMPAIRED (Mercury, PCBs)	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: Non-native aquatic plant (<i>Myriophyllum heterophyllum</i>) identified during the 1995 synoptic survey (Appendix A). Fish toxics monitoring conducted by DWM in 1988 and again in 2000 (Appendix B). MDPH issued a fish consumption advisory. Sources of PCB linked to the Resolve Superfund site- code 16 (see details in summary of conditions and perceived problems and Copicut River segment MA95-43). MA DEM Lake and Pond Grant 1999 to prepare watershed management plan with long term remediation recommendations.							
Parker Mills Pond, Wareham	95115	105	IMPAIRED (Non-native plants, phosphate)	NOT ASSESSED	IMPAIRED (Non-native plants, phosphate)	IMPAIRED (Non-native plants, phosphate)	IMPAIRED (Non-native plants, phosphate)
NOTE: No public bathing beach. Non-native aquatic plant (<i>Myriophyllum heterophyllum</i>) was identified during the 1995 synoptic survey (Appendix A) but not noted on the 2000 TMDL survey field sheets. Non-native plant (<i>Phragmites australis</i>) also identified during the 2000 synoptic survey (Mattson 2003). DFWELE conducted a fish population survey in Parker Mills Pond in 2000. Ten species were present and the assemblage was dominated by golden shiner, largemouth bass, and bluegill (Table 4.) The northern two-thirds of the pond surface water was very densely covered with <i>Lemna</i> , <i>Wolffia</i> , and <i>Ceratophyllum</i> . The total phosphorus concentrations were moderate to high ranging from 0.03 to 0.098 mg/L. One inlet (station B, unique ID 777) from a cranberry bog on the western edge of the southern end had very high total phosphorus concentrations (ranging from 0.10 to 2.5 mg/L – Appendix A). Dissolved oxygen data were very limited (Appendix A). Suspected sources of impairment include highway/road runoff and irrigated, specialty crop production related to cranberry bogs.							
Queen Sewell Pond, Bourne	95180	18	NOT ASSESSED	NOT ASSESSED	SUPPORT	SUPPORT	NOT ASSESSED
NOTE: Queen Sewell Pond has a public bathing beach. <i>E. coli</i> samples were collected every two weeks in 2001 and weekly in 2002 by Bourne Health Dept. The beach has not been closed and, therefore, the <i>Recreational</i> uses are assessed as support. Information on beach closings is not determined.							
Rocky Meadow Brook Pond, Carver	95118	11	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: No public bathing beach. Synoptic survey in 1995 (Appendix A).							
Rocky Pond, Plymouth	95179	18	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: No public bathing beach, developed shoreline. Synoptic survey in 1995 (Appendix A).							
Round Pond, Plymouth	95123	10	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: No public bathing beach. Synoptic survey in 1995 (Appendix A).							
Sampson Pond, Carver	95125	310	IMPAIRED (Non-native plants)	NOT ASSESSED	SUPPORT	SUPPORT	NOT ASSESSED
NOTE: Non-native aquatic plant (<i>Cabomba caroliniana</i>) identified during the 1995 synoptic survey (Appendix A). Sampson Pond has a public bathing beach. <i>E. coli</i> samples were collected by the Carver Board of Health roughly every three weeks from 5/24/01 through 9/12/01 (n=9). According to the Carver Board of Health the beach has never been closed and, therefore, the <i>Recreational Uses</i> are assessed as support.							

Table 6 (Continued). Buzzards Bay Watershed Lake Use Assessments.






Lake, Location	WBID	Size (Acres)	Aquatic Life  (Impairment Cause)	Fish Consumption  (Impairment Cause)	Primary Contact  (Impairment Cause)	Secondary Contact  (Impairment Cause)	Aesthetics  (Impairment Cause)
Sand Pond, Wareham	95127	15	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: Class A public water supply. Synoptic survey in 1995 (Appendix A). No public bathing beach.							
Sandy Pond, Wareham	95128	18	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: Synoptic survey in 1995 (Appendix A). No public bathing beach.							
Snipatuit Pond, Rochester	95137	644	NOT ASSESSED	IMPAIRED (Mercury)	SUPPORT	SUPPORT	NOT ASSESSED
NOTE: In 1995 DWM sampled Snipatuit Pond, which is connected to Long Pond (Appendix B). MDPH issued a fish consumption based on the data. Snipatuit Pond has a public access site (a public boat launch) and a bathing beach owned by a neighborhood association. In 2002, the beach was closed for two days out of the 10 weeks it was open (New Bedford Board of Health 2002). Based on this information, the <i>Recreational Uses</i> are assessed as support.							
South Meadow Brook Pond, Carver	95139	25	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: Synoptic survey in 1995 (Appendix A). No public bathing beach.							
South Meadow Pond, Carver	95140	17	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: Synoptic survey in 1995 (Appendix A). No public bathing beach.							
Southwest Atwood Bog Pond, Carver	95141	14	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: Synoptic survey in 1995 (Appendix A). No public bathing beach.							
Spectacle Pond, Wareham	95142	42	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: Synoptic survey in 1995 (Appendix A). No public bathing beach.							
Three Cornered Pond, Plymouth	95145	14	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: Synoptic survey in 1995 (Appendix A). No public bathing beach.							
Tihonet Pond, Wareham	95146	89	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: Synoptic survey in 1995 (Appendix A). No public bathing beach.							
Tinkham Pond, Mattapoisett/Acushnet	95148	20	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: Synoptic survey in 1995 (Appendix A). Non-native wetland plant (<i>Phragmites australis</i>) noted below outlet control structure. No public bathing beach.							

Table 6 (Continued). Buzzards Bay Watershed Lake Use Assessments.











Lake, Location	WBID	Size (Acres)	 Aquatic Life (Impairment Cause)	 Fish Consumption (Impairment Cause)	 Primary Contact (Impairment Cause)	 Secondary Contact (Impairment Cause)	 Aesthetics (Impairment Cause)
Tremont Mill Pond, Wareham	95150	50	IMPAIRED (Non-native plants)	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: Non-native aquatic plant (<i>Myriophyllum heterophyllum</i>) identified during the 1995 synoptic survey (Appendix A). No public bathing beach.							
Turner Pond, New Bedford/Dartmouth	95151	86	SUPPORT*	IMPAIRED (Mercury)	NOT ASSESSED	NOT ASSESSED	SUPPORT
NOTE: TMDL survey conducted in 2000 and synoptic survey in 1995. This pond had low dissolved oxygen/saturation at depths below 1.5m, very low pH, and high color (Appendix A). These data are likely indicative of natural conditions associated with the large wetland complex directly upstream. While there are moderate levels of total phosphorus at the surface (concentrations ranging between 0.024 to 0.057mg/L) and high concentrations near the lake bottom (ranging from 0.041 to 0.29 mg/L) they did not result in high lake productivity (i.e., plant community indicative of wetland conditions). Biovolume density estimated as 30% dense/very dense cover and no non-native plants were identified (Mattson 2003). The <i>Aquatic Life Use</i> is assessed as support, however, it is also identified with an Alert Status because it is uncertain if the phosphorus concentrations are elevated as a result of road runoff or other anthropogenic sources. Fish Toxics Monitoring was conducted by DWM in 1988 as part of a Paskamanset River survey. Two of four samples had elevated levels of total mercury in black crappie. There is no public bathing beach on Turner Pond. The Secchi disc depths taken as part of the 2000 TMDL survey do not meet the bathing beach guidelines, however, it is best professional judgment that these conditions are naturally occurring (a result of the highly colored water). No fecal coliform bacteria data are available and, therefore, the <i>Primary</i> and <i>Secondary Contact Recreational</i> uses are currently not assessed.							
Union Pond, Wareham	95152	25	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: Synoptic survey in 1995 (Appendix A). No public bathing beach.							
Vaughn Pond, Carver (also known as Crystal Lake)	95153	22	NOT ASSESSED	NOT ASSESSED	SUPPORT	SUPPORT	NOT ASSESSED
NOTE: Synoptic survey in 1995 (Appendix A). Vaughn Pond has a public bathing beach. <i>E. coli</i> samples were collected by Carver Board in 2001 and 2002. According to the Carver Board of Health the beach has never been closed and, therefore, the <i>Recreational Uses</i> are assessed as support. MA DEM Lake and Pond Grant 1999 septic system management shoreline properties.							
White Island Pond (East Basin), Plymouth	95166	159	IMPAIRED (Non-native plants, phosphate, excess algal growth, chlorophyll a)	NOT ASSESSED	IMPAIRED (Excess algal growth, Secchi disk transparency, phosphate)	IMPAIRED (Excess algal growth, Secchi disk transparency, phosphate)	IMPAIRED (Excess algal growth, Secchi disk transparency, phosphate)
NOTE: Non-native aquatic plant (<i>Cabomba caroliniana</i>) identified during the 2000 TMDL survey (Mattson 2003). <i>Lythrum salicaria</i> also noted during 2000 survey (Appendix A). Although dissolved oxygen concentrations met criteria, supersaturation was evident during the August and September surveys (100 to 105%). Chlorophyll a concentrations were also high (35 mg/m ³). Elevated in-lake total phosphorus concentrations (ranging from 0.077 to 0.12 mg/L) as well as from several inlets to the pond draining cranberry bogs (0.066 to 1.4 mg/L) (Appendix A). Fish toxics monitoring conducted by DWM (station F0108) in 2000 (Appendix B). No advisory was issued by MDPH. Secchi disk depth measurements were at or below 1.2 m (the bathing beach guideline) on all three sampling dates. Low biovolume density may be associated with phytoplankton dominance (field observations indicated phytoplankton blooms). Suspected sources of impairment include irrigated, specialty crop production related to cranberry bogs and on-site treatment systems (septic systems).							

Table 6 (Continued). Buzzards Bay Watershed Lake Use Assessments.

Lake, Location	WBID	Size (Acres)	Aquatic Life  (Impairment Cause)	Fish Consumption  (Impairment Cause)	Primary Contact  (Impairment Cause)	Secondary Contact  (Impairment Cause)	Aesthetics  (Impairment Cause)
White Island Pond (West Basin), Plymouth	95173	125	IMPAIRED (Non-native plants)	NOT ASSESSED	NOT ASSESSED*	NOT ASSESSED*	NOT ASSESSED*
NOTE: Non-native aquatic plant (<i>Cabomba caroliniana</i>) identified during the 2000 TMDL survey and the 1995 synoptic survey (Appendix A). <i>Lythrum salicaria</i> and <i>Phragmites australis</i> also noted during 2000 survey (Mattson 2003). Although dissolved oxygen concentrations met criteria, supersaturation was evident during the September survey (104 to 106%). Chlorophyll <i>a</i> concentrations were moderate (5.7 – 13.1 mg/m ³) and in-lake total phosphorus concentrations ranged from 0.037 to 0.076 mg/L (Appendix A). Fish toxics monitoring conducted by DWM (station F0114) in 2000 (Appendix B). No advisory was issued by MDPH. Secchi disk depth measurements were above 1.2 m (the bathing beach guideline) on all three sampling dates. The biovolume density was very low and may be associated with phytoplankton dominance (field observations indicated phytoplankton blooms and filamentous algae). No public bathing beach. Pond may be used by area residents for recreation. No fecal coliform bacteria data are available, therefore, the <i>Recreational</i> and <i>Aesthetic</i> uses are currently not assessed. However, these uses are identified with an Alert Status because of the noted phytoplankton bloom. Suspected sources include on-site treatment systems (septic systems).							
Whites Pond, Plymouth	95168	33	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED	NOT ASSESSED
NOTE: Synoptic survey in 1995 (Appendix A). No public bathing beach.							

RECOMMENDATIONS – LAKES

- Coordinate with MA DEM and/or other groups that conduct lake surveys to generate quality-assured lake data. Conduct more intensive lake surveys to better determine the lake trophic and use support status and identify causes and sources of impairment. As sources are identified within lake watersheds they should be eliminated or, at least, minimized through the application of appropriate point or non-point source control techniques.
- Work with the Six Ponds Improvement Association to complete their Quality Assurance Project Plan. Review data collected under their approved QAPP for use in future assessments.
- Work with MDPH and local municipalities to collect quality-assured data under the “Beaches Bill,” which requires water quality testing (bacteria sampling) at all formal bathing beaches. When available, review data and beach closure information to assess the status of the recreational uses.
- Review the MA DEP Drinking Water Program SWAP evaluations are when they are completed to develop and implement recommendations for the protection of Class A lakes in the Buzzards Bay Watershed, including Sand Pond, Wareham.
- Work with the MA DEM Weed Watchers Program to monitor ponds in the Buzzards Bay Watershed for the presence of exotic invasive species and to develop a removal plan if an infestation is found. Additional information may be obtained from the MA DEM website:
<http://www.state.ma.us/dem/programs/lakepond/weedwatch.htm>.
- Quick action is necessary to manage non-native aquatic or wetland plant species that are isolated in one or a few location(s) in order to alleviate the need for costly and potentially fruitless efforts to do so in the future. Two courses of action should be pursued concurrently. More extensive surveys need to be conducted, particularly downstream from these recorded locations (Figure 17 and Table 6), to determine the extent of the infestation. And, “spot” treatments (refer to the draft Generic Environmental Impact Report (GEIR) for Eutrophication and Aquatic Plant Management in Massachusetts [Mattson *et al* 1998] for advantages and disadvantages of each) should be undertaken to control populations at these sites. These treatments may include careful hand-pulling of individual plants in small areas. In larger areas, other techniques, such as selective herbicide application, may be necessary. In either case, the treatments should be undertaken prior to fruit formation and with a minimum of fragmentation of the individual plants. These actions will minimize the spreading of the populations. This draft GEIR (Mattson *et al* 1998) should be consulted prior to the development of any lake management plan to control non-native aquatic or wetland plant species.
- Where non-native plant infestations are more extensive conduct additional monitoring to determine the extent of the problem. The draft Generic Environmental Impact Report for Eutrophication and Aquatic Plant Management in Massachusetts (Mattson *et al* 1998) should be consulted prior to the development of any lake management plan to control non-native aquatic plant species. Plant control options can be selected from several techniques (i.e., bottom barriers, drawdown, herbicides, etc.) each of which has advantages and disadvantages that need to be addressed for the specific site. However, methods that result in fragmentation (such as cutting or raking) should be discouraged because of the propensity for some invasive species of these plants to reproduce and spread vegetatively (from cuttings).
- Confirm the presence of *Myriophyllum heterophyllum*, which is suspected to occur in East Head Pond and Fresh Meadow Pond, both in Carver/Plymouth. At the time of the DWM survey in 1995 these plants were not adequately developed to precisely identify them as *M. heterophyllum*.
- Prevent spreading of invasive plants. Once the extent of the problem is determined and control practices are exercised vigilant monitoring needs to be practiced to guard against infestations in unaffected areas and to ensure that managed areas stay in check. A key portion of the prevention program should be posting of boat access points with signs to educate and alert lake-users to the transport mechanisms and their ability/responsibility to reduce the spread of these species.

- Implement recommendations identified in TMDLs and lake Diagnostic/Feasibility studies, including lake watershed surveys, to identify sources of impairment. The single draft TMDL report for total phosphorus, which is being developed for the eight lakes sampled by DWM in 2000, has been delayed until the *Cranberry Bog Phosphorus Dynamics TMDL Project* (DeMoranville 2001) has been completed (Mattson 2002).

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BUZZARDS BAY

LIST OF APPENDICES

APPENDIX A – DWM LAKES SURVEY DATA 1995 AND 2000

Table A1.	Buzzards Bay Watershed 1995 Summer Lake Status
Table A2.	2000 DEP DWM Buzzards Bay Watershed Baseline Lakes <i>In-situ</i> Hydrolab® Data.
Table A3.	2000 DEP DWM Buzzards Bay Watershed Baseline Lakes <i>Physico-chemical</i> Data.

Figure A1.	Buzzards Bay Watershed 2000 Baseline Lake Survey Locations.
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APPENDIX B – MA DEP OWM/DWM FISH TOXICS MONITORING IN THE BUZZARDS BAY WATERSHED 1995 and 2000

Table B1.	2000 DEP DWM Buzzards Bay Watershed Fish Toxics Monitoring Data.
Table B2.	Analytical Results for 1995 Buzzards Bay Watershed Fish Toxics Monitoring Year 2 Watershed Surveys.

Figure B1.	Fish toxics Monitoring Locations in the Buzzards Bay Watershed.
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APPENDIX C - MEMORANDUM Qualitative benthos assessment upstream and downstream of Marion WWTP

Table 1.	List of macroinvertebrates collected (qualitatively) from 3 stream sites in Effluent Brook on 17 May 2000.
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APPENDIX D – DEP GRANT AND LOAN PROGRAMS

APPENDIX E - DMF SHELLFISH DATA, BUZZARDS BAY WATERSHED

Table E1.	DMF Shellfish Management Program Managed Shellfish Growing Area Classifications
Table E2.	Summary Shellfish Classification Area Information as of July 2000
Table E3.	Buzzards Bay Watershed DMF - Shellfish Project Classification Area Information as of July 2000

APPENDIX F- SUMMARY OF WMA PERMITTING INFORMATION, BUZZARDS BAY WATERSHED

APPENDIX A

DWM LAKES SURVEY DATA 1995 AND 2000

1995

In the Buzzards Bay Watershed, DWM conducted synoptic surveys at 64 lakes during 1995. Observations, from at least one access point on each lake (multiple access points on larger lakes) were recorded on standardized field sheets. An attempt was made to observe the entire surface area of each lake to determine the extent of areal macrophyte cover. At each sampling location general water quality conditions, identification and abundance of aquatic and wetland macrophyte plant species, and estimates of total percent areal coverage were recorded. Macrophyte visual observations were augmented at each station by identifying plant specimens collected from the lake bottom. Specimens were retrieved using a "rake" (a short handled, double-sided garden rake on a 50 foot line) thrown to its maximum extension in multiple directions at each station. Macrophytes collected in the "rake" were identified (in-situ or in the laboratory) and recorded on the field sheets. Transparency was measured where possible using a standard 20-centimeter diameter Secchi disk. Where Secchi disk measurements were not feasible, transparency was estimated as being above or below 1.2 meter (the MDPH bathing beach standard). Trophic status was estimated primarily using visual observations of macrophyte cover and phytoplankton populations. A more definitive assessment of trophic status would require more extensive collection of water quality and biological data.

Table A1. Buzzard Bay Watershed 1995 Summer Lake Status.

Lake, Location	WBID	Size (Acres)	TROPHIC STATUS	SURVEY OBSERVATIONS (Objectionable Conditions)
Abner Pond, Plymouth	95001	10	U	Water level low, silty muck and undecomposed matter on bottom, moderate cover of floating and emergent plants around most of pond
Barrett Pond, Carver	95004	16	M	Slightly turbid water, scum on surface, extensive undecomposed debris on sandy bottom, moderate to dense patches of submerged vegetation
Bates Pond, Carver	95007	20	E	Slightly turbid water, extensive partially decomposed debris on bottom, water level low, dense cover of floating vegetation, very dense cover of submerged vegetation over 50% of pond
Big Rocky Pond, Plymouth	95119	18	U	Good water clarity, water level low, silt and undecomposed matter over sand bottom, sparse vegetation
Big Sandy Pond, Plymouth	95011	135	U	Good water clarity, slight mucky debris on bottom, sparse vegetation, many cottages and numerous recreational boats
Blackmore Reservoir, Wareham	95015	46	U	Turbid water, extensive debris on windward shore, water level low, evidence of blue greens in windrows, dense low-growing plant cover on bottom, developed shoreline
Cedar Dell Lake, Dartmouth	95021	24	E	Visible only from a distance, 100% floating vegetative cover
Charge Pond, Plymouth	95025	23	U	Excellent water clarity, slight silting on sand and vegetation, water level low, moderate low-growing plant cover on bottom
College Pond, Plymouth	95030	53	M	Slightly turbid water, moderate muck and undecomposed debris over sandy bottom, some algal clouds on bottom, sparse plant cover
Crane Brook Bog Pond, Carver	95033	37	E	100% cover of floating vegetation and duckweed, no open water, pond filling in

* Indicates Class A (water supply) water body; all others are Class B.

WBID – Water body Identification code.

Trophic State: **E**= Eutrophic, **H**= Hypereutrophic, **M**= Mesotrophic, **U**= Undetermined.

Non-native Plants: **Ls** = *Lythrum salicaria*, **Mh** = *Myriophyllum heterophyllum*, **Pa** = *Phragmites australis*, **Cc** = *Cabomba Caroliniana*

Note: **M. sp.** – Possible *Myriophyllum heterophyllum*, requires further confirmation when flowering heads are evident.

Table A1 (Continued). Buzzards Bay Watershed 1995 Summer Lake Status.

Lake, Location	WBID	Size (Acres)	TROPHIC STATUS	SURVEY OBSERVATIONS (Objectionable Conditions)
Curlew Pond, Plymouth	95034	43	M	Slightly turbid water, silt over sand/gravel bottom, floccy green algae on bottom, water level low, moderate to dense submerged vegetation, moderate cottage/campsite density
Deer Pond, Plymouth	95036	11	U	Very slightly turbid water, organic muck on bottom, green/brown periphyton present, 10% dense emergent vegetation near shoreline, possible non-native (M. sp.), large bog next to pond
Dicks Pond, Wareham	95038	40	U	Turbid water, silty organic bottom, Phragmites present, dense vegetation near shore, majority of water open. <i>Myriophyllum</i> sp. noted not likely <i>heterophyllum</i> .
Dunham Pond, Carver	95044	45	U	Good water clarity, slight silt and undecomposed matter over sandy bottom, water level low, dense mat of submerged low growing vegetation
East Head Pond, Carver/Plymouth	95177	92	M	Slightly turbid water, extensive undecomposed debris over sandy bottom, algal/bacterial floc on many plants, scattered patches of very dense floating vegetation, submerged plants moderate, possible non-native (M. sp.)
Ezekiel Pond, Plymouth	95051	36	U	Good water clarity, water level low, green periphyton present, extensive debris over sandy bottom, patches of emergents along undeveloped shore, submerged plants common, mostly developed shoreline
Fawn Pond, Plymouth	95053	33	U	Slightly turbid water, silt on plants and sand/gravel bottom, water level slightly low, scattered emergents around shore
Fearing Pond, Plymouth	95054	24	U	Slightly turbid water near beach, good water clarity otherwise, water level low, fine brown silt and undecomposed matter over sand bottom, moderate to dense low-growing plants, shoreline erosion at several points
Federal Pond, Carver	95055	129	E	Turbid water, very mucky organic bottom, floc on plants, 100% very dense cover of floating and submerged vegetation in upper end, lower end unobserved, water appears more open in center of pond, non-natives present (Mh and Cc)
Five Mile Pond, Plymouth	95056	29	U	Good water clarity, some undecomposed matter over sand/gravel/rock bottom, sparse vegetation
Fresh Meadow Pond, Carver/Plymouth	95174	59	M	Good water clarity, slight silt and undecomposed matter over sand bottom, very dense floating vegetation scattered along shore, non-natives present (Cc and likely M. h.)
Gallows Pond, Plymouth	95059	43	U	Good water clarity, fine silt over sandy bottom, residents said lime treatment administered several years ago helped plants and fish to make a comeback, sparse vegetation
Glen Charlie Pond, Wareham	95061	185	U	Good water clarity, slight debris on sand/gravel bottom, moderately dense development along shore, non-natives present (M. sp. and Pa)

* Indicates Class A (water supply) water body; all others are Class B.

WBID – Water body Identification code.

Trophic State: **E**= Eutrophic, **H**= Hypereutrophic, **M**= Mesotrophic, **U**= Undetermined.

Non-native Plants: **Ls** = *Lythrum salicaria*, **Mh** = *Myriophyllum heterophyllum*, **Pa** = *Phragmites australis*, **Cc** = *Cabomba Caroliniana*

Note: **M. sp.** – Possible *Myriophyllum heterophyllum*, requires further confirmation when flowering heads are evident.

Table A1 (Continued). Buzzards Bay Watershed 1995 Summer Lake Status.

Lake, Location	WBID	Size (Acres)	TROPIC STATUS	SURVEY OBSERVATIONS (Objectionable Conditions)
Halfway Pond, Plymouth	95178	232	M	Slightly turbid water, rock/gravel bottom, orange stain on rocks near intake channel, algal bloom next to intake/outflow from bog, dense vegetation along western cove, possible non-native (M. sp.)
Horseshoe Pond, Wareham	95075	85	U	Moderate turbidity, stain in water, control structure exposed, pond lowered, only a stream through old pond
Kings Pond, Plymouth	95078	21	E	Observed from a distance, very dense vegetation around perimeter and in northeast cove, developed shoreline
Leonards Pond, Rochester	95080	54	U	Tea stain, mucky bottom, very dense duckweed and floating leaf vegetation near outlet to bog, most of pond open water, many Canadian Geese present, possible non-native (M. sp.)
Little Long Pond, Plymouth	95088	45	U	Good water clarity, slight algal floc over sand/gravel bottom, sparse vegetation
Little Long Pond, Wareham	95089	19	E	Slightly turbid water, extensive non-algal floating debris, mucky organic bottom, filamentous algae dense to very dense, floating, submerged, and emergent vegetation encroaching almost to the center
Little Rocky Pond, Plymouth	95091	11	E	Good water clarity, mucky organic bottom, 75-100% vegetative cover over entire pond
Little Sandy Pond, Plymouth	95092	29	U	Good water clarity, water level low, some debris over sand/gravel bottom, black decomposing material along shore (possibly from filamentous algae washing ashore), sparse vegetation, possible non-native (M. sp.)
Little West Pond, Plymouth	95093	25	U	Good water clarity, brown silt on plants and rocks, water level low, very dense low-growing plants
Long Duck Pond, Plymouth	95095	23	E	Little open water, mucky bottom, water level low, 100% cover of floating leaf and emergent plants. Survey also conducted in September 1996 with same general observations.
Long Pond, Plymouth	95096	211	U	Good water clarity, some debris on sand/gravel bottom, sparse vegetation, developed shoreline
Mare Pond, Plymouth	95172	12	M	Slightly turbid water, slight stain, algal clouds, abundant organics on bottom near center of lake, 20% with very dense floating leaf plants, beach erosion apparent, cranberry bog adjacent, developed shoreline
Marys Pond, Rochester	95100	81	U	Slightly turbid water, water level low, silt over sand/gravel/rock bottom, sparse vegetation
Micajah Pond, Plymouth	95102	20	U	Good water clarity, silt over sand/gravel bottom, sparse vegetation, moderate density of cottages. <i>Myriophyllum</i> sp. noted not likely <i>heterophyllum</i> .
Mill Pond, Wareham	95105	150	E	Slight to moderately turbid water, organics over sand bottom, very dense emergent and floating vegetation around perimeter and northeast arm, non-native present (Mh)

* Indicates Class A (water supply) water body; all others are Class B.

WBID – Water body Identification code.

Trophic State: **E**= Eutrophic, **H**= Hypereutrophic, **M**= Mesotrophic, **U**= Undetermined.

Non-native Plants: **Ls** = *Lythrum salicaria*, **Mh** = *Myriophyllum heterophyllum*, **Pa** = *Phragmites australis*, **Cc** = *Cabomba caroliniana*

Note: **M. sp.** – Possible *Myriophyllum heterophyllum*, requires further confirmation when flowering heads are evident.

Table A1 (Continued). Buzzards Bay Watershed 1995 Summer Lake Status.

Lake, Location	WBID	Size (Acres)	TROPIC STATUS	SURVEY OBSERVATIONS (Objectionable Conditions)
New Bedford Reservoir, Acushnet	95110	219	E	Turbid water, partly decomposed matter over gravel/rock bottom, very dense floating vegetation around perimeter (mainly in west cove and eastern shore), non-native present (Mh)
New Long Pond, Plymouth	95112	23	E	Slightly turbid water, water level low, extensive undecomposed debris over sand bottom, 100% cover of emergent, floating, and submerged vegetation
Noquochoke Lake, Dartmouth	95113	110	E	Very turbid water (likely <4' Secchi), brown scum in cove area, 75% cover of floating and submerged vegetation in small cove, remaining basin mostly open water, east and south shores developed, non-native present (Mh)
Noquochoke Lake (East Basin), Dartmouth	95170	17	E	Very dense submerged vegetation over most of area, non-native present (Mh)
Noquochoke Lake (North Basin), Dartmouth	95171	19	E	Brown, turbid water (likely <4' Secchi), 100% covered with duckweed and submergent vegetation, highly developed shore, non-native present (Mh)
Parker Mills Pond, Wareham	95115	105	E	Turbid water, mucky black organic sediment on bottom, very dense duckweed and submerged vegetation, non-native present (Mh)
Rocky Meadow Brook Pond, Carver	95118	11	U	Slightly turbid water, tea stain, extensive undecomposed debris over sand bottom, encroachment by vegetation apparent along entire shore
Rocky Pond, Plymouth	95179	18	U	Difficult to access and observe, widely scattered dense patches of vegetation
Round Pond, Plymouth	95123	10	M	Good water clarity, extensive undecomposed debris over sand bottom, water level low, evidence of past algal bloom on shore, dense low-growing vegetation
Sampson Pond, Carver	95125	310	U	Good water clarity, silt over sand/gravel/rock bottom, encroaching emergent vegetation near outlet, non-native present (Cc)
Sand Pond, Wareham	95127	15	U	Good water clarity, silt over sand bottom and low vegetation, water level low, few emergent patches around perimeter
Sandy Pond, Wareham	95128	18	M	Slightly turbid water, water level low, mucky bottom, dense to very dense floating and emergent vegetation around majority of perimeter and east end
Sassaquin Pond, New Bedford	95129	34	U	Good water clarity, water level low, slight debris over gravel/rock bottom, multiple storm drain outlets around pond, non-natives present (Ls and Pa)
South Meadow Brook Pond, Carver	95139	25	E	Little open water, mucky bottom, water level low, many stumps exposed, 100% covered with duckweed and floating vegetation
South Meadow Pond, Carver	95140	17	M	Slightly turbid water, water level low, weedy bottom over sand/gravel, very dense floating and submerged vegetation along perimeter of southern shore
Southwest Atwood Bog Pond, Carver	95141	14	E	Difficult to access and observe, limited open water, 100% floating vegetation cover on west side, east side open with many stumps visible

* Indicates Class A (water supply) water body; all others are Class B.

WBID – Water body Identification code.

Trophic State: **E**= Eutrophic, **H**= Hypereutrophic, **M**= Mesotrophic, **U**= Undetermined.

Non-native Plants: **Ls** = *Lythrum salicaria*, **Mh** = *Myriophyllum heterophyllum*, **Pa** = *Phragmites australis*, **Cc** = *Cabomba caroliniana*

Note: **M. sp.** – Possible *Myriophyllum heterophyllum*, requires further confirmation when flowering heads are evident.

Table A1 (Continued). Buzzards Bay Watershed 1995 Summer Lake Status.

Lake, Location	WBID	Size (Acres)	TROPHIC STATUS	SURVEY OBSERVATIONS (Objectionable Conditions)
Spectacle Pond, Wareham	95142	42	U	Good water clarity, sand/gravel bottom, dense patches of lilies and encroaching emergent vegetation at north end
Three Cornered Pond, Plymouth	95145	14	E	Slightly turbid water, water level low, undecomposed and mucky debris over sand bottom, little open water in center, very dense emergent vegetation over entire pond
Tihonet Pond, Wareham	95146	89	M	Slightly turbid water, periphyton apparent over sand/gravel bottom, dense floating vegetation to right of dam, but sparse elsewhere
Tinkham Pond, Mattapoisett/Acushnet	95148	20	U	Slightly turbid water, tea stain, very dense floating and emergent vegetation around majority of shoreline
Tremont Mill Pond, Wareham	95150	50	U	Turbid water, tea stain, extensive debris over rocky bottom, non-native present (Mh)
Turner Pond, New Bedford/Dartmouth	95151	55	U	Slightly turbid water, dark tea stain, Secchi disk .6m, water level low, encroaching emergent vegetation in northeast basin, dense cover in southwest cove
Union Pond, Wareham	95152	25	U	Good water clarity, organic bottom, dense to very dense cover of lilies around perimeter
Vaughn Pond, Carver	95153	22	M	Slightly turbid water, plants over sand bottom, slight stain, water level low, very dense submerged and emergent vegetation along northeast shore
White Island Pond (west), Plymouth	95173	125	U	Turbid water, organic debris over sand bottom, non-native present (Cc), sparse vegetation, dense development along shoreline
Whites Pond, Plymouth	95168	33	M	Slightly turbid water, extensive debris and algae on plants and over sand/gravel bottom, submerged growth heavy with periphyton, emergent patches on southwest side

* Indicates Class A (water supply) water body; all others are Class B.

WBID – Water body Identification code.

Trophic State: **E**= Eutrophic, **H**= Hypereutrophic, **M**= Mesotrophic, **U**= Undetermined.

Non-native Plants: **Ls** = *Lythrum salicaria*, **Mh** = *Myriophyllum heterophyllum*, **Pa** = *Phragmites australis*, **Cc** = *Cabomba caroliniana*

Note: **M. sp.** – Possible *Myriophyllum heterophyllum*, requires further confirmation when flowering heads are evident.

2000

In the Buzzards Bay Watershed, baseline lake surveys were conducted in July, August, and September 2000 to coincide with maximum growth of aquatic vegetation, highest recreational use, and highest lake productivity. Crane Brook Bog Pond, Federal Pond, New Bedford Reservoir, New Long Pond, Parker Mills Pond, Turner Pond, and White Island Pond were sampled three times each (generally at monthly intervals). A technical memorandum by Dr. Mark Mattson entitled *Baseline Lakes 2000 Technical Memo (TM-S-15)* provides details of sample collection methods, results, data, and weed maps for the lakes surveyed in the Deerfield, Millers, Shawsheen, Ipswich, Islands, and Buzzards Bay watersheds in 2000. Hydrolab® Multiprobe data and physico-chemical data are excerpted below.

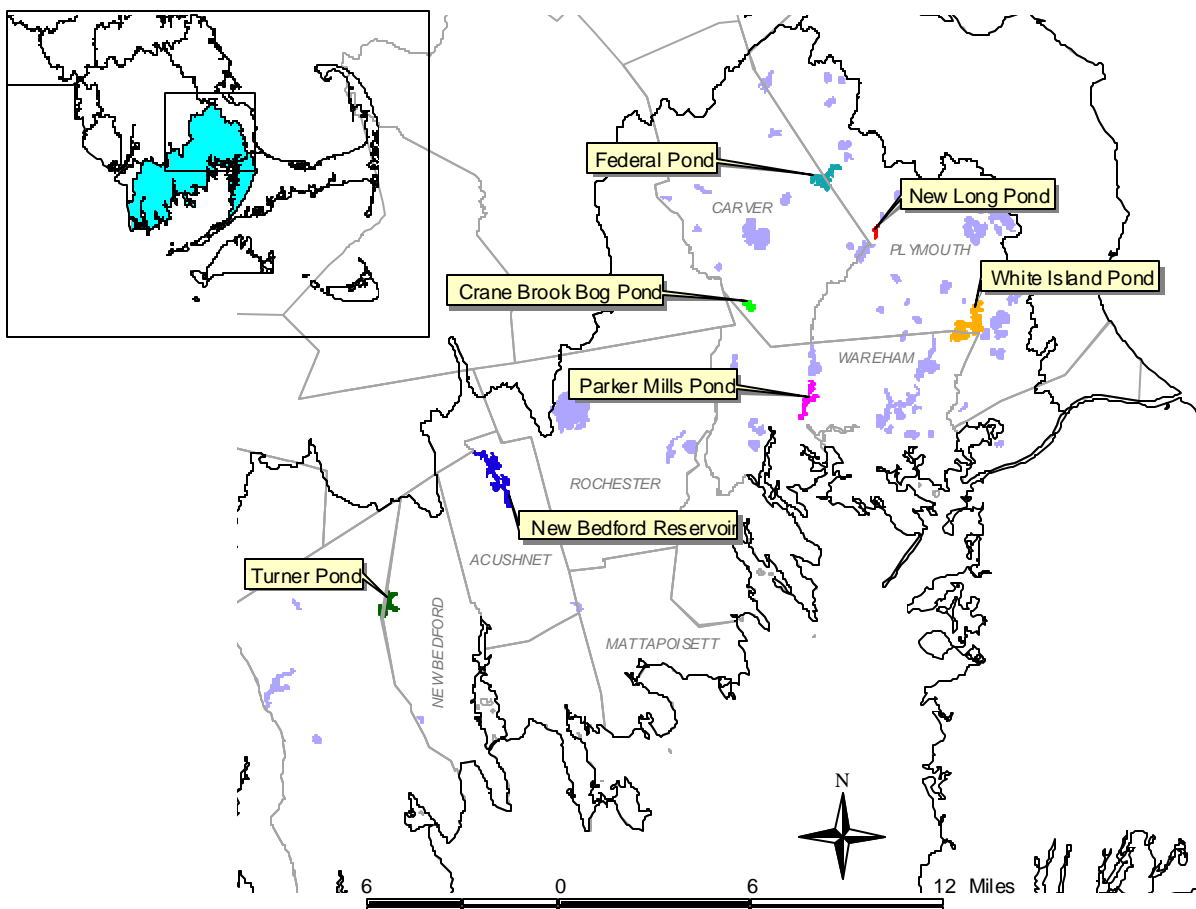


Figure A1. Buzzards Bay Watershed 2000 Baseline Lakes Survey Locations

Table A2. 2000 DEP DWM Buzzards Bay Watershed Baseline Lakes *In-situ* Hydrolab® Data

Date	OWMID	Time (24hr)	Depth (m)	Temp (C)	pH (SU)	Cond@ 25C (uS/cm)	TDS (mg/l)	DO (mg/l)	SAT (%)
Crane Brook Bog Pond (Palis: 95033)									
Unique_ID: WO790 Station: A									
Description: deep hole, northern end of pond, Carver									
7/13/2000									
	LB-0674	16:03	0.3	25.3u	5.9	63.8	40.8	7.1	85
8/10/2000									
	LB-0763	10:29	0.5	24.7	5.9	63.5	40.6	**u	**u
9/14/2000									
	LB-0854	10:42	0.3	20.4	5.7	63.2	40.4	3.7	40
Federal Pond (Palis: 95055)									
Unique_ID: WO763 Station: A									
Description: deep hole between larger islands of southern lobe, Carver									
7/20/2000									
	LB-1033	14:25	** m	**m	**m	**m	--	**m	--
		14:28	** m	**m	**m	**m	--	**m	--
		14:31	** m	**m	**m	**m	--	**m	--
	LB-1033	14:34	** m	**m	**m	**m	--	**m	--
		14:37	** m	**m	**m	**m	--	**m	--
8/16/2000									
	LB-1073	11:04	** m	**m	**m	**m	--	**m	--
		11:07	** m	**m	**m	**m	--	**m	--
		11:12	** m	**m	**m	**m	--	**m	--
		11:16	** m	**m	**m	**m	--	**m	--
		11:19	** m	**m	**m	**m	--	**m	--
9/12/2000									
	LB-1116	12:20	0.1	22.8	6.6	42.5	--	8.9	--
		12:23	0.5	22.7	6.6	42.5	--	8.9	--
		12:27	1.0	22.0	6.6	42.3	--	9.1	--
		12:31	1.5	21.6	6.1	42.7	--	6.2u	--
		12:36	2.0	20.3	5.5	44.4	--	1.4	--
New Bedford Reservoir (Palis: 95110)									
Unique_ID: WO781 Station: A									
Description: deep hole in southeast end of North Basin, Acushnet									
7/18/2000									
	LB-0634	16:01	0.5	25.0	6.2	90.1	57.7	4.9	58
		16:05	1.5	24.3	6.1	90.6	58.0	3.4	40
		16:10	2.0	23.7u	6.0	91.1	58.3	1.7	19
8/15/2000									
	LB-0729	15:01	0.5	22.1	6.2	86.3	55.2	5.2	59
		15:07	1.6	21.9	6.1	86.7	55.5	3.9	44
		15:18	2.3	21.8	6.0	87.3	55.9	3.3	37
9/19/2000									
	LB-0826	11:44	0.5	19.8	6.2	88.7	56.7	5.7	61
		11:52	1.5	19.0	6.0	88.2	56.5	3.7	39
		11:56	2.0	18.7	5.9	88.1	56.4	3.2	33

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"u" = unstable readings, due to lack of sufficient equilibration time prior to final readings, non-representative location, highly-variable water quality conditions, etc

Table A2 (Continued). 2000 DEP DWM Buzzards Bay Watershed Baseline Lakes *In-situ* Hydrolab® Data

Date	OWMID	Time (24hr)	Depth (m)	Temp (C)	pH (SU)	Cond@ 25C (uS/cm)	TDS (mg/l)	DO (mg/l)	SAT (%)
New Bedford Reservoir (Palis: 95110)									
Unique_ID: WO782 Station: B									
Description: deep hole in southern end of South Basin, Acushnet									
8/15/2000									
	LB-0733	16:42	0.5	23.0	6.5	89.7	57.4	7.1	81
		16:48	1.5	22.9	6.6	89.5	57.3	7.1	81
		16:55	2.4	22.9	6.5	90.0	57.6	6.6	75
		17:02	3.5	22.4u	6.5u	99.0u	63.3u	**u	**u
		17:10	4.0	20.1	7.0	127	81.5	<0.2	<2
9/19/2000									
	LB-0830	12:58	0.5	21.2	6.6	89.6	57.3	7.7	84
		13:02	1.5	20.7	6.4	89.3	57.2	7.0	76
		13:06	2.5	20.5	6.4	89.3	57.2	7.1	77
		13:09	3.5	20.4	6.4	89.3	57.1	6.5	71
New Bedford Reservoir (Palis: 95110)									
Unique_ID: 783 Station: C									
Description: deep hole in southeast end of East Basin, Acushnet									
8/15/2000									
	LB-0737	12:56	0.5	22.6	6.8	151	97.0	7.1	81
		13:03	1.5	22.5	6.8	152	97.0	6.9u	77u
New Long Pond (Palis: 95112)									
Unique_ID: WO780 Station: A									
Description: deep hole center of pond, Plymouth									
7/13/2000									
	LB-0664	11:51	0.3	26.5	5.6	34.1	21.8	7.8	95
		12:00	1.0	26.0	5.6	34.0	21.7	7.8	94
8/17/2000									
	LB-0970	11:38	0.7	22.3	5.3	32.0	20.5	8.1	91
	LB-0970	11:44	1.2	22.3	5.3	31.9	20.4	8.1	91
9/14/2000									
	LB-0862	13:27	0.5	23.7	5.6	33.5	21.5	8.5	98
		13:36	1.1	23.7	5.6	33.5	21.5	8.6	99

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Table A2 (Continued). 2000 DEP DWM Buzzards Bay Watershed Baseline Lakes *In-situ* Hydrolab® Data

Date	OWMID	Time (24hr)	Depth (m)	Temp (C)	pH (SU)	Cond@ 25C (uS/cm)	TDS (mg/l)	DO (mg/l)	SAT (%)
Parker Mills Pond (Palis: 95115)									
Unique_ID: WO776 Station: A									
Description: deep hole in southern end, Wareham									
7/20/2000									
	LB-1040	11:25	** m	**m	**m	**m	--	**m	--
		11:28	** m	**m	**m	**m	--	**m	--
		11:31	** m	**m	**m	**m	--	**m	--
		11:34	** m	**m	**m	**m	--	**m	--
		11:37	** m	**m	**m	**m	--	**m	--
		11:40	** m	**m	**m	**m	--	**m	--
8/16/2000									
	LB-1080	13:23	** m	**m	**m	**m	--	**m	--
		13:26	** m	**m	**m	**m	--	**m	--
		13:29	** m	**m	**m	**m	--	**m	--
		13:33	** m	**m	**m	**m	--	**m	--
		13:37	** m	**m	**m	**m	--	**m	--
		13:40	** m	**m	**m	**m	--	**m	--
9/12/2000									
	LB-1123	10:07	0.1	22.1	6.7	82.4	--	9.4	--
		10:12	0.5	22.1	6.6	82.4	--	9.3	--
		10:15	1.0	21.9	6.6	82.6	--	9.2	--
		10:19	1.5	21.8	6.5	82.5	--	9.2	--
		10:23	2.0	21.5	6.3	83.8	--	7.0u	--
Turner Pond (Palis: 95151)									
Unique_ID: WO774 Station: B									
Description: deep hole in eastern lobe of western basin, New Bedford									
7/18/2000									
	LB-0633	13:08	0.5	25.6	4.9	116	74.4	5.7	69
		13:14	1.5	17.4u	5.4	114	73.1	<0.2	<2
		13:19	2.5	13.1	5.6	119	75.8	<0.2	<2
		13:24	3.5	11.7	5.6	119	76.4	<0.2	<2
8/15/2000									
	LB-0724	09:44	0.5	21.5	4.8	110	70.4	6.3	70
		09:52	1.5	**u	4.8	110	70.3	**u	**u
		09:59	2.5	14.7u	5.7	122	77.9	<0.2	<2
		10:05	3.5	12.3	5.6	123	78.4	<0.2	<2
9/20/2000									
	LB-0819	12:57	0.5	21.4u	4.7	117	74.6	7.0	78
		13:02	1.5	18.4u	4.7	119	76.1	3.3u	35u

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Table A2 (Continued). 2000 DEP DWM Buzzards Bay Watershed Baseline Lakes *In-situ* Hydrolab® Data

Date	OWMID	Time	Depth	Temp	pH	Cond@ 25C	TDS	DO	SAT
		(24hr)	(m)	(C)	(SU)	(uS/cm)	(mg/l)	(mg/l)	(%)
Turner Pond (Palis: 95151)									
Unique_ID: WO775 Station: A									
Description: deep hole in southeastern lobe of eastern basin, New Bedford									
7/18/2000									
	LB-0620	11:10	0.5	24.8	4.7	122	78.0	6.5	77
		11:21	1.5	20.7u	4.7	116	73.9	2.0	22
		11:26	2.5	13.2	5.0	117	75.2	<0.2	<2
		11:30	3.5	11.1	4.9	117	74.8	<0.2	<2
		11:34	4.5	10.1	5.0	115	73.6	<0.2	<2
		11:39	4.7	9.9	5.0	115	73.8	<0.2	<2
8/15/2000									
	LB-0728	11:04	0.5	21.3	4.6	120	76.6	6.1	67
		11:10	1.5	20.3	4.6	115	73.5	2.8	30
		11:17	2.5	14.8	5.2	122	78.3	<0.2	<2
		11:23	3.5	11.9	5.2	122	78.1	<0.2	<2
		11:29	4.5	10.5	5.2	118	75.4	<0.2	<2
		11:35	5.0	10.2	5.2	118	75.4	<0.2	<2
9/20/2000									
	LB-0817	11:37	0.5	20.1	4.8	124	79.3	7.1	77
		11:42	1.5	19.6	4.8	125	79.9	6.5	70
		11:48	2.4	15.8	5.2	128	82.0	<0.2	<2
		11:57	3.5	11.7	5.3	122	77.8	<0.2	<2
		12:02	4.5	10.7	5.3	119	75.9	<0.2	<2
White Island Pond (Palis: 95166)									
Unique_ID: WO762 Station: A									
Description: deep hole in southern lobe of East Basin, Plymouth									
7/19/2000									
	LB-0656	10:02	0.5	24.4	6.4	49.4	31.6	7.8	92
		10:11	1.4	24.3	6.3	49.3	31.6	7.6	89
		10:17	2.5	24.2	6.3	49.1	31.4	7.2	85
		10:23	3.4	24.2	6.2	49.1	31.4	7.2	84
		10:30	3.9	24.2	6.2	49.2	31.5	7.1	83
8/16/2000									
	LB-0747	14:13	0.5	22.7	6.8u	46.9	30.0	9.0	103
		14:17	1.5	22.7	6.7	46.9	30.0	8.9	101
		14:22	2.5	22.7	6.7	46.9	30.0	8.8	101
		14:26	3.7	22.7	6.6	47.1	30.1	8.5u	96u
9/20/2000									
	LB-0836	12:57	0.5	21.2	7.3ci	46.4	29.7	9.4	105
		13:04	1.5	21.2	7.1ci	46.4	29.7	9.3	103
		13:10	2.5	21.1	6.6i	46.4	29.7	9.0	100
		13:16	3.5	21.0	6.0i	47.0	30.1	**u	**u
		13:23	4.0	20.7	5.8i	48.1	30.8	5.2u	57u

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Table A2 (Continued). 2000 DEP DWM Buzzards Bay Watershed Baseline Lakes *In-situ* Hydrolab® Data

Date	OWMID	Time (24hr)	Depth (m)	Temp (C)	pH (SU)	Cond@ 25C (uS/cm)	TDS (mg/l)	DO (mg/l)	SAT (%)
White Island Pond (Palis: 95173)									
Unique_ID: WO754 Station: A									
Description: deep hole in northern lobe of West Basin, Plymouth									
7/19/2000									
	LB-0657	11:40	0.5	24.8	6.0	48.5	31.0	7.7	91
		11:46	1.5	24.8	6.1	48.6	31.1	7.7	91
		11:52	2.5	24.9	6.0	48.6	31.1	7.6	90
		11:59	3.5	24.9	6.1	48.7	31.1	7.6	90
8/16/2000									
	LB-0751	12:50	0.5	23.2	6.0	46.8	29.9	7.9	91
		13:00	1.5	23.2	6.0	46.8	29.9	7.9	90
	LB-0751	13:03	2.5	23.2	5.9	46.8	29.9	7.8	90
		13:08	3.5	23.2	5.9	46.8	29.9	7.8	90
	LB-0975	13:16m	3.5m	23.2m	6.0m	46.8m	29.9m	7.8m	90m
		13:20m	2.5m	23.2m	6.0m	46.8m	29.9m	7.9m	91m
		13:24m	1.5m	23.2m	6.0m	46.7m	29.9m	7.9m	91m
		13:29m	0.5m	23.2m	6.0m	46.8m	29.9m	7.8m	90m
9/20/2000									
	LB-1167	15:00	0.5	22.1	7.0u	46.2	29.6	9.4	106
		15:06	1.5	22.0	7.0	46.4	29.7	9.3	105
		15:12	2.5	21.9	6.6	46.3	29.6	9.2	104
		15:19	3.5	21.5	5.7	46.9	30.0	6.9u	77u
Unnamed Tributary									
Unique_ID: WO791 Station: B, Mile Point: 0.01									
Description: inlet to Crane Brook Bog Pond from unnamed tributary upstream/west of Route 58 at northwestern end of pond, Carver									
7/13/2000									
	LB-0671	14:54	0.5	25.5	5.9	62.5	40.0	8.2	98
Unnamed Tributary									
Unique_ID: WO769 Station: B, Mile Point: -9									
Description: inlet to White Island Pond [East Basin] from cranberry bog at eastern edge of northern lobe, Plymouth									
9/20/2000									
	No Flow	--	--	--	--	--	--	--	--
Unnamed Tributary									
Unique_ID: 786 Station: O, Mile Point: -9									
Description: inlet to New Bedford Reservoir [North Basin] from cranberry bog at northern point of western lobe of New Bedford Reservoir [North Basin], Acushnet									
8/15/2000									
	No Flow	--	--	--	--	--	--	--	--

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Table A3. 2000 DWM Buzzards Bay Watershed Baseline Lakes *Physico-chemical* Data.

Date	Secchi (m)	Secchi Time 24hr	Station Depth (m)	OWMID	QAQC	Time 24hr	Sample Depth (m)	Alkalinity (mg/l)	Total Phosphorus (mg/l)	DWM Color PCU	Chlorophyll a (mg/m3)
Federal Pond (Palis: 95055)											
Unique_ID: WO763 Station: A											
Description: deep hole between larger islands of southern lobe, Carver											
7/20/2000	2.3	14:20	2.8								
				LB-1025	LB-1026	**	0.5	<2	0.011	--	--
				LB-1026	LB-1025	**	0.5	<2	0.012	23	--
				LB-1027	BLANK	**	--	<2	<0.005	--	--
				LB-1028		**	0 - 2.3	--	--	--	8.7
				LB-1029		**	2.3	2	0.027	--	--
8/16/2000	>3.0	11:00	3.0								
				LB-1067	LB-1068	**	0.5	4	0.013b	23	--
				LB-1068	LB-1067	**	0.5	4	0.010b	23	--
				LB-1069	DUP	**	0.5	3	0.010b	<15	--
				LB-1070	BLANK	**	--	2	0.006b	<15	--
				LB-1071		**	0 - 2.5	--	--	--	7.4 h
				LB-1072		**	2.5	4	0.062	17	--
9/12/2000	>2.8	12:17	2.8								
				LB-1109	LB-1110	**	0.5	3	0.007	<15b	--
				LB-1110	LB-1109	**	0.5	3	0.007	<15b	--
				LB-1111	DUP	**	0.5	4	0.007	46b	--
				LB-1112	BLANK	**	--	<2	<0.005	23b	--
				LB-1113		**	2.3	4	0.037	46b	--
				LB-1114		**	0 - 2.3	--	--	--	5.9

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"--" = No data (i.e., data not taken/not required)
"h" = holding time violation (usually indicating possible bias low)

Table A3 (Continued). 2000 DWM Buzzards Bay Watershed Baseline Lakes *Physico-chemical* Data.

Date	Secchi (m)	Secchi Time 24hr	Station Depth (m)	OWMID	QAQC	Time 24hr	Sample Depth (m)	Alkalinity (mg/l)	Total Phosphorus (mg/l)	DWM Color PCU	Chlorophyll a (mg/m3)
New Bedford Reservoir (Palis: 95110) Unique_ID: WO781 Station: A											
Description: deep hole in southeast end of North Basin, Acushnet											
7/18/2000	1.1	16:29	2.4								
				LB-0635		**	0.5	12	0.070	140	--
				LB-0636		**	2.0	11	0.070	150	--
				LB-0637		**	0 - 2.0	--	--	--	4.1
8/15/2000	1.5	14:54	2.8								
				LB-0730		**	0.5	12	0.042	160	--
				LB-0731		**	2.3	13	0.031	140	--
				LB-0732		**	0 - 2.3	--	--	--	8.7
9/19/2000	2.2	11:37	**								
				LB-0820		**	**m	16m	0.021m	65m	--
				LB-0821		**	**m	12m	0.025m	49m	--
				LB-1137	AUDIT	**	--	--	0.032	--	--
				LB-1138	AUDIT	**	--	--	0.025	--	--
				LB-1139		**	0 - 2.0	--	--	--	5.8 h
New Bedford Reservoir (Palis: 95110) Unique_ID: WO782 Station: B											
Description: deep hole in southern end of South Basin, Acushnet											
7/20/2000	1.5	10:55	4.6								
				LB-0882		**	0.5	--	0.058m	--	--
8/15/2000	1.8	16:40	4.5								
				LB-0950		**	0.5	12	0.028	80	--
				LB-0951		**	4.0	15	0.031	85	--
				LB-1163		**	0 - 4.0	--	--	--	7.4
9/19/2000	2.1	12:50	4.2								
				LB-0828		**	**m	--	0.018m	--	--
New Bedford Reservoir (Palis: 95110) Unique_ID: WO783 Station: C											
Description: deep hole in southeast end of East Basin, Acushnet											
7/20/2000	1.7	10:11	2.1								
				LB-0881		**	0.5	--	0.047m	--	--
8/15/2000	>2.1	12:45	2.1								
				LB-0734		**	0.5	23	0.016	60	--
				LB-0735		**	1.5	23	0.021	60	--
				LB-0736		**	0 - 1.5	--	--	--	35.6 h
9/19/2000	1.5	13:50	** m								
				LB-0827		**	**m	--	0.044m	--	--

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 "h" = holding time violation (usually indicating possible bias low)
 "m" = method SOP not followed, only partially implemented or not implemented at all, due to complications with sample matrix (e.g., sediment in sample, floc formation), lab error (e.g., cross-contamination between samples), additional steps taken by the lab to deal with matrix complications, lost/unanalyzed samples, and missing data.

Table A3 (Continued). 2000 DWM Buzzards Bay Watershed Baseline Lakes *Physico-chemical* Data.

Date	Secchi (m)	Secchi Time 24hr	Station Depth (m)	OWMID	QAQC	Time 24hr	Sample Depth (m)	Alkalinity (mg/l)	Total Phosphorus (mg/l)	DWM Color PCU	Chlorophyll a (mg/m3)
New Long Pond (Palis: 95112) Unique_ID: WO780 Station: A											
Description: deep hole center of pond, Plymouth											
7/13/2000	>1.7	11:30	1.7								
				LB-0665	LB-0666	**	0.5	<2	0.008	<15	--
				LB-0666	LB-0665	**	0.5	<2	0.007	<15	--
				LB-0667		**	1.3	<2	0.008	<15	--
				LB-0668		**	0 - 1.0	--	--	--	<1.0
				LB-0669	BLANK	13:00	--	<2	<0.005	<15	--
8/17/2000	** m	11:10	2.5m								
				LB-0764	BLANK	**	--	<2	<0.005	<15h	--
				LB-0765		**	1.2	2	0.008	20h	--
				LB-0766		**	**m	--	--	--	<1.0 m
				LB-0888	LB-0889	**	0.5	3	0.006	16h	--
				LB-0889	LB-0888	**	0.5	2	0.006	18h	--
				LB-0890	DUP	**	0.5	<2	0.007	18h	--
9/14/2000	>1.6	13:30	1.6								
				LB-0855	LB-0856	**	0.5	<2	0.006	<15	--
				LB-0856	LB-0855	**	0.5	<2	0.006	<15	--
				LB-0857	DUP	**	0.5	<2	0.006	<15	--
				LB-0858	BLANK	**	--	<2	<0.005	<15	--
				LB-0859	AUDIT	**	--	--	0.026	--	--
				LB-0860		**	0 - 1.1	--	--	--	<1.0 h
				LB-0861	AUDIT	**	--	--	0.024	--	--
				LB-1133		**	1.1	--	<0.005	--	--

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Table A3 (Continued). 2000 DWM Buzzards Bay Watershed Baseline Lakes *Physico-chemical* Data.

Date	Secchi (m)	Secchi Time 24hr	Station Depth (m)	OWMID	QAQC	Time 24hr	Sample Depth (m)	Alkalinity (mg/l)	Total Phosphorus (mg/l)	DWM Color PCU	Chlorophyll a (mg/m3)
Parker Mills Pond (Palis: 95115) Unique_ID: WO776 Station: A											
Description: deep hole in southern end, Wareham											
7/20/2000	1.8	11:20	3.2								
				LB-1034		**	0.5	7	0.054	65	--
				LB-1035		**	2.5	6	0.098	75	--
				LB-1036		**	0 - 2.5	--	--	--	12.1
8/16/2000	2.1	13:20	3.2								
				LB-1077		**	0.5	6	0.048	25	--
				LB-1078		**	2.7	6	0.052	40	--
				LB-1079		**	0 - 2.7	--	--	--	3.0
9/12/2000	2.2	10:03	2.6								
				LB-1117		**	0.5	6	0.030	32	--
				LB-1118		**	2.1	5	0.041	25	--
				LB-1119		**	0 - 2.1	--	--	--	5.8 h
Turner Pond (Palis: 95151) Unique_ID: WO774 Station: B											
Description: deep hole in eastern lobe of western basin, New Bedford											
7/18/2000	0.6	13:30	3.9								
				LB-0630		**	0.5	<2	0.057	320	--
				LB-0631		**	3.5	6	0.29	150	--
				LB-0632		**	0 - 1.8	--	--	--	<1.0
8/15/2000	0.6	10:07	3.8								
				LB-0718	LB-0719	**	0.5	2	0.030b	280	--
				LB-0719	LB-0718	**	0.5	2	0.027b	280	--
				LB-0720	DUP	**	0.5	2	0.032b	250	--
				LB-0721	BLANK	**	--	<2	0.007b	<15	--
				LB-0722		**	3.3	5	0.28 b	380	--
				LB-0723		**	0 - 1.8	--	--	--	9.4
9/20/2000	0.7	13:55	2.0								
				LB-0818		**	**m	--	0.033	--	--

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Table A3 (Continued). 2000 DWM Buzzards Bay Watershed Baseline Lakes *Physico-chemical* Data.

Date	Secchi (m)	Secchi Time 24hr	Station Depth (m)	OWMID	QAQC	Time 24hr	Sample Depth (m)	Alkalinity (mg/l)	Total Phosphorus (mg/l)	DWM Color PCU	Chlorophyll a (mg/m3)
Turner Pond (Palis: 95151) Unique_ID: WO775 Station: A											
Description: deep hole in southeastern lobe of eastern basin, New Bedford											
7/18/2000	0.5	12:05	5.3								
				LB-0621		**	0.5	<2	0.055	320	--
				LB-0622	LB-0623	**	4.6	3	0.097	300	--
				LB-0623	LB-0622	**	4.6	3	0.10	320	--
				LB-0628	BLANK	**	--	<2	<0.005	<15	--
				LB-0629		12:05	0 - 1.5	--	--	--	1.0
8/15/2000	0.6	11:00	5.5								
				LB-0725		**	0.5	<2	0.027	320	--
				LB-0726		**	**m	5m	0.078m	320m	--
				LB-0727		**	0 - 1.8	--	--	--	1.2
9/20/2000	0.5	11:30	6.0								
				LB-0811	LB-0812	**	0.5	<2	0.032d	230	--
				LB-0812	LB-0811	**	0.5	<2	0.024d	230	--
				LB-0813	DUP	**	0.5	<2	0.026	280	--
				LB-0814	BLANK	**	0.5	<2	<0.005	<15	--
				LB-0815		**	0 - 1.5	--	--	--	<1.0 h
				LB-0816		**	5.0	8	0.12	280	--
				LB-1136	AUDIT	**	--	--	0.025	--	--

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Table A3 (Continued). 2000 DWM Buzzards Bay Watershed Baseline Lakes *Physico-chemical* Data.

Date	Secchi (m)	Secchi Time 24hr	Station Depth (m)	OWMID	QAQC	Time 24hr	Sample Depth (m)	Alkalinity (mg/l)	Total Phosphorus (mg/l)	DWM Color PCU	Chlorophyll a (mg/m3)
White Island Pond (Palis: 95166) Unique_ID: WO762 Station: A											
Description: deep hole in southern lobe of East Basin , Plymouth											
7/19/2000	1.2	10:30	4.5								
				LB-0645	LB-0646	**	0.5	3	0.12	--	--
				LB-0646	LB-0645	**	0.5	4	0.098	--	--
				LB-0647	BLANK	**	--	<2	<0.005	--	--
				LB-0648		**	0 - 3.6	--	--	--	** m
				LB-0649		**	**m	4m	0.099m	--	--
8/16/2000	1.1	14:07	4.3								
				LB-0738	LB-0739	**	0.5	4	0.085	--	--
				LB-0739	LB-0738	**	0.5	4	0.084	--	--
				LB-0740	DUP	**	0.5	4	0.093	--	--
				LB-0741		**	3.7	4	0.089	--	--
				LB-0742	BLANK	**	--	<2	<0.005	--	--
				LB-0743		**	0 - 3.7	--	--	--	35.4
9/20/2000	1.1	12:35	4.5								
				LB-0831	BLANK	**	--	<2	<0.005	<15	--
				LB-0832	LB-0833	**	**m	2	0.077	23	--
				LB-0833	LB-0832	**	**m	2	0.077	23	--
				LB-0834		**	**m	2m	0.080m	17m	--
				LB-0835		**	0 - 4.0	--	--	--	35.5 h
White Island Pond (Palis: 95173) Unique_ID: WO754 Station: A											
Description: deep hole in northern lobe of West Basin , Plymouth											
7/19/2000	2.0	11:45	4.0								
				LB-0652		**	0.5	2	0.076	--	--
				LB-0653		**	3.5	<2	0.048	--	--
				LB-0654		**	0 - 3.5	--	--	--	5.7
8/16/2000	2.2	12:30	4.0								
				LB-0748		**	0.5	4	0.038	--	--
				LB-0749		**	3.5	3	0.037	--	--
				LB-0750		**	0 - 3.5	--	--	--	11.8
9/20/2000	1.3	14:30	4.0								
				LB-0849		**	0.5	<2	0.038	<15	--
				LB-1165		**	3.5	2	0.037	<15	--
				LB-1166		**	0 - 3.5	--	--	--	13.1 h

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Table A3 (Continued). 2000 DWM Buzzards Bay Watershed Baseline Lakes *Physico-chemical* Data.

Date	Secchi (m)	Secchi Time 24hr	Station Depth (m)	OWMID	QAQC	Time 24hr	Sample Depth (m)	Alkalinity (mg/l)	Total Phosphorus (mg/l)	DWM Color PCU	Chlorophyll a (mg/m3)
Unnamed Tributary											
Unique_ID: WO778 Station: C, Mile Point: 0.1											
Description: inlet to Parker Mills Pond at Tihonet Road (from cranberry bog entering western lobe of northern end), Wareham											
7/20/2000	--	--	--	LB-1038		**	--	--	0.019	--	--
8/16/2000	--	--	--	LB-1150		**	--	4	0.046	23	--
9/12/2000	--	--	--	LB-1121		**	--	--	0.029	--	--
Unnamed Tributary											
Unique_ID: WO791 Station: B, Mile Point: 0.01											
Description: inlet to Crane Brook Bog Pond from unnamed tributary upstream/west of Route 58 at northwestern end of pond, Carver											
7/13/2000	--	--	--	LB-0670		**	--	4	0.11	70d	--
8/10/2000	--	--	--	LB-0760		**	--	7	0.11	60h	--
9/14/2000	--	--	--	LB-0852		**	--	--	0.056	--	--
Unnamed Tributary											
Unique_ID: WO769 Station: B, Mile Point: -9											
Description: inlet to White Island Pond [East Basin] from cranberry bog at eastern edge of northern lobe, Plymouth											
7/19/2000	--	--	--	LB-0650		**	--	--	0.11	--	--
8/16/2000	--	--	--	LB-0744		**	--	--	0.31	--	--
9/20/2000	--	--	--	No Flow		--	--	--	--	--	--
Unnamed Tributary											
Unique_ID: WO770 Station: C, Mile Point: -9											
Description: inlet to White Island Pond [East Basin] from cranberry bog at northwestern edge of northern lobe, Plymouth											
7/19/2000	--	--	--	LB-0651		**	--	--	0.068	--	--

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Table A3 (Continued). 2000 DWM Buzzards Bay Watershed Baseline Lakes *Physico-chemical* Data.

Date	Secchi (m)	Secchi Time 24hr	Station Depth (m)	OWMID	QAQC	Time 24hr	Sample Depth (m)	Alkalinity (mg/l)	Total Phosphorus (mg/l)	DWM Color PCU	Chlorophyll a (mg/m3)
Unnamed Tributary											
Unique_ID: WO771 Station: D, Mile Point: -9											
Description: inlet to White Island Pond [East Basin] from cranberry bog at western edge of northern lobe, Plymouth											
8/16/2000	--	--	--	LB-0745		**	--	--	0.18	--	--
Unnamed Tributary											
Unique_ID: WO772 Station: F, Mile Point: -9											
Description: inlet to White Island Pond [East Basin] from cranberry bog at northern edge of northern lobe, Plymouth											
9/20/2000	--	--	--	LB-0837		**	--	--	1.4	--	--
Unnamed Tributary											
Unique_ID: WO773 Station: G, Mile Point: -9											
Description: inlet to White Island Pond [East Basin] from cranberry bog at southern edge, Wareham											
7/19/2000	--	--	--	LB-0655		**	--	--	0.066	--	--
Unnamed Tributary											
Unique_ID: WO777 Station: B, Mile Point: -9											
Description: inlet to Parker Mills Pond from cranberry bog at western edge of southern end, approximately 30 feet upstream of pond, Wareham											
7/20/2000	--	--	--	LB-1037		**	--	--	0.10	--	--
8/16/2000	--	--	--	LB-1151		**	--	6	0.12	65	--
9/12/2000	--	--	--	LB-1120		**	--	--	2.5	--	--
Unnamed Tributary											
Unique_ID: WO785 Station: N, Mile Point: -9											
Description: inlet to New Bedford Reservoir [North Basin] from cranberry bog at northern edge of western lobe of New Bedford Reservoir [North Basin], Acushnet											
8/15/2000	--	--	--	LB-0954		**	--	--	0.017	--	--
9/19/2000	--	--	--	LB-0823		**	--	--	0.11 m	--	--

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Table A3 (Continued). 2000 DWM Buzzards Bay Watershed Baseline Lakes *Physico-chemical* Data.

Date	Secchi (m)	Secchi Time 24hr	Station Depth (m)	OWMID	QAQC	Time 24hr	Sample Depth (m)	Alkalinity (mg/l)	Total Phosphorus (mg/l)	DWM Color PCU	Chlorophyll a (mg/m3)
Unnamed Tributary											
Unique_ID: WO786 Station: O, Mile Point: -9											
Description: inlet to New Bedford Reservoir [North Basin] from cranberry bog at northern point of western lobe of New Bedford Reservoir [North Basin], Acushnet											
8/15/2000	--	--	--	No Flow			--	--	--	--	--
Unnamed Tributary											
Unique_ID: WO787 Station: Q, Mile Point: -9											
Description: inlet to New Bedford Reservoir [North Basin] from unnamed tributary to northwestern lobe of New Bedford Reservoir [North Basin],											
7/20/2000	1.4	13:16	--	LB-0887	BLANK	**	--	--	<0.005	--	--
Unnamed Tributary											
Unique_ID: WO788 Station: R, Mile Point: -9											
Description: inlet to New Bedford Reservoir [North Basin] from cranberry bog at western edge of New Bedford Reservoir [North Basin], Acushnet											
8/15/2000	--	--	--	LB-0955		**	--	--	0.52	--	--
9/19/2000	--	--	--	LB-0824		**	--	--	0.55 m	--	--
Unnamed Tributary											
Unique_ID: WO789 Station: S, Mile Point: -9											
Description: inlet to New Bedford Reservoir [South Basin] from cranberry bog near northeastern corner of New Bedford Reservoir [South Basin], Acushnet											
7/20/2000	--	--	--	LB-0883		**	--	--	** m	--	--
8/15/2000	--	--	--	LB-0952		**	--	--	0.13	--	--
9/19/2000	--	--	--	LB-0829		**	--	--	0.25 m	--	--
ROSE BROOK (Saris: 9558825)											
Unique_ID: WO779 Station: D, Mile Point: -9											
Description: inlet to Parker Mills Pond from cranberry bog/Rose Brook upstream/west of Tihonet Road, Wareham. (Rose Brook runs through cranberry bogs.)											
7/20/2000	--	--	--	LB-1039		**	--	--	0.056	--	--
8/16/2000	--	--	--	LB-1152		**	--	8	0.030	25	--
9/12/2000	--	--	--	LB-1122		**	--	--	0.009	--	--

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Table A3 (Continued). 2000 DWM Buzzards Bay Watershed Baseline Lakes *Physico-chemical* Data.

Date	Secchi (m)	Secchi Time 24hr	Station Depth (m)	OWMID	QAQC	Time 24hr	Sample Depth (m)	Alkalinity (mg/l)	Total Phosphorus (mg/l)	DWM Color PCU	Chlorophyll a (mg/m3)
KEENE RIVER (Saris: 9559675)											
Unique_ID: WO784 Station: M, Mile Point: -9											
Description: inlet to New Bedford Reservoir [North Basin] from cranberry bog/Keene River at northwest corner of New Bedford Reservoir [North Basin], Acushnet. (Keene River runs through cranberry bogs.)											
9/19/2000	--	--	--	LB-0825		**	--	--	0.028m	--	--
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APPENDIX B

MA DEP OWM/DWM FISH TOXICS MONITORING IN THE BUZZARDS BAY WATERSHED 1995 AND 2000

INTRODUCTION

Fish toxics monitoring is a cooperative effort between three Massachusetts Department of Environmental Protection Offices/Divisions- Watershed Management, Research and Standards (ORS), and Environmental Analysis (Wall Experiment Station- WES), the Massachusetts Department of Fisheries, Wildlife, and Environmental Law Enforcement (DFWELE), and the Massachusetts Department of Public Health (MDPH). Fish toxics monitoring is typically conducted to assess the concentrations of toxic contaminants in freshwater fish, identify waterbodies where those concentrations may pose a risk to human health, and identify waters where toxic contaminants may impact fish and other wildlife.

Between September 1995 and August 2000, fish were collected by the DEP Office of Watershed Management (OWM)/Division of Watershed Management (DWM) at four sites in the Buzzards Bay Watershed as follows: Snipatuit Pond, Rochester in September 1995, Glen Charlie Pond, Wareham in October 1995, Noquochoke Lake, Dartmouth and White Island Pond, Plymouth in August 2000.

PROJECT OBJECTIVES

Fish tissue monitoring is typically conducted to assess the levels of toxic contaminants in freshwater fish, identify waterbodies where those levels may impact human health, and identify waters where toxic chemicals may impact fish and other aquatic life. Nonetheless, human health concerns have received higher priority and, therefore, fish tissue analysis has been restricted to edible fillets. The fish toxics monitoring was designed to screen the edible fillets of several species of fish representing different feeding groups (i.e., bottom dwelling omnivores, top-level predators, etc.) for the presence of heavy metals, Polychlorinated biphenyls (PCBs) and chlorinated pesticides. In 2000, MA DEP DWM Fish Toxics Monitoring was conducted under an EPA-approved Fish Toxics Quality Assurance Project Plan CN 0037.0. Data Quality Objectives are presented in the above-mentioned QAPP. There were no deviations from the QAPP.

METHODS

Uniform protocols, designed to assure accuracy and prevent cross-contamination of samples, were followed for collecting, processing, and shipping fish collected for the fish toxics monitoring. In 1995 fish were collected on 14 September from Snipatuit Pond, Rochester and on 5 October from Glen Charlie Pond, Wareham. In 2000, fish were collected from White Island Pond, Plymouth on 21 August and Noquochoke Lake, Dartmouth on 28 August. All fish were collected using boat-mounted electroshocking gear and/or gill nets. Fish selected for analysis were placed in an ice filled cooler and brought back to the OWM/DWM laboratory for processing. Processing included measuring lengths and weights and visually inspecting fish for tumors, lesions, or other indications of stress or disease. Scales, spines, or pectoral fin ray samples were obtained from each sample to determine the approximate age of the fish. Fish were filleted (skin off) with stainless steel knives on glass cutting boards.

1995 FISH TOXICS

Details related to the collection, handling, and processing of samples were excerpted from the report entitled *1995 Public Request Fish Toxics Monitoring Surveys* (Maietta 1995).

Fillets targeted for metals analysis were placed in VWR high density polyethylene (HDPE) cups with covers. The opposite fillets were wrapped in aluminum foil for % lipids, PCB and organochlorine pesticide analysis. In the case of composite samples, two or three fillets from like-sized individuals of the same species were wrapped together in aluminum foil or stored in the single sample container. Samples were tagged and frozen

for subsequent delivery to WES. All equipment used in the filleting and storage process was rinsed in accordance with USEPA procedures (1993). Methods used at WES for metals analysis include a cold vapor method using a VGA hydride generator for mercury and Varian 1475 flame atomic absorption for all remaining metals. PCB/organochlorine pesticide analysis was performed on a gas chromatograph equipped with an electron capture detector.

2000 FISH TOXICS

Details related to the collection, handling, and processing of samples were excerpted from the report entitled *2000 Fish Toxics Monitoring Public Request and Year 2 Watershed Surveys* (Maietta and Colonna-Romano 2000).

All equipment used in the filleting process was rinsed in tap water and then rinsed twice in de-ionized water before and or after each sample. Samples (individual or composite) targeted for % lipids, PCBs and organochlorine pesticide analysis were wrapped in aluminum foil. Samples targeted for metals analysis were placed in VWR 32-ounce high density polyethylene (HDPE) cups with covers. Composite samples ranged from two to five fillets from like-sized individuals of the same species (occasionally the same genus). Samples were tagged and frozen for subsequent delivery to the Department's Wall Experiment Station (WES).

Methods used at WES for metals analysis include the following:

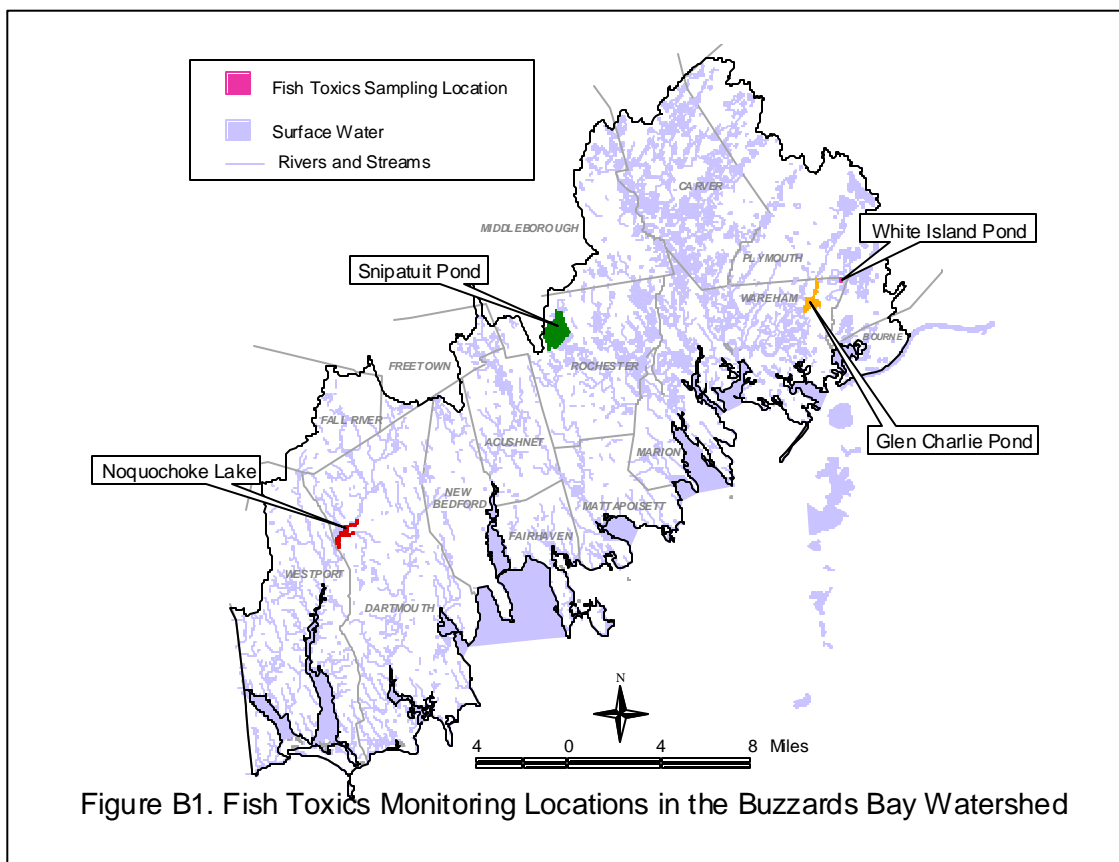
Mercury is analyzed by a cold vapor method using a Perkin Elmer, FIMS (Flow Injection Mercury System), which uses Flow Injection Atomic Absorption Spectroscopy. Cadmium and lead are analyzed using a Perkin Elmer, Optima 3000 XL ICP - Optical Emission Spectrophotometer. Arsenic and selenium are analyzed using a Perkin Elmer, Zeeman 5100 PC, Platform Graphite Furnace, Atomic Absorption Spectrophotometer.

PCB Arochlor, PCB congener, and organochlorine pesticide analysis was performed on a gas chromatograph equipped with an electron capture detector "according to the modified AOAC 983.21 procedure for the analysis of PCB Arochlors, Congeners, and Organochlorine Pesticides."

According to standard practice, all laboratory analytical results were forwarded to the Massachusetts Department of Public Health.

RESULTS

The results of MA DEP Buzzards Bay Watershed fish toxics monitoring surveys are described below for each sampling event (MA DEP 1995, MA DEP 2000, Maietta 1995, and Maietta and Colonna-Romano 2000). Data for all surveys are presented in Tables 3-1 through 3-4. Sampling locations are depicted in Figure B1. All raw data files, field sheets, lab reports, chain of custody forms, and other metadata are maintained in open files and databases at the MA DEP DWM in Worcester. Quality Assurance Data is available in *Data Validation Report for Year 2000 Project Data (CN 083.0) DRAFT December 19, 2002*.



1995 FISH TOXICS

Snipatuit Pond, Rochester

Fish collected and retained for analysis from Snipatuit Pond included American eel (*Anguilla rostrata*), bluegill (*Lepomis macrochirus*), brown bullhead (*Ameiurus nebulosus*), black crappie (*Pomoxis nigromaculatus*), chain pickerel (*Esox niger*), largemouth bass (*Micropterus salmoides*), pumpkinseed (*Lepomis gibbosus*), and yellow perch (*Perca flavescens*). Three-fillet composites of largemouth bass, black crappie, American eel and yellow perch were analyzed at the Wall Experiment Station for cadmium, lead, mercury, arsenic, selenium, percent lipids, PCB arochlors and congeners, and pesticides. Two pumpkinseed fillets and one bluegill fillet were composited and analyzed for metals and organics. Individual samples of brown bullhead and chain pickerel were also submitted to WES. The brown bullhead sample was analyzed for organics only and the chain pickerel sample was analyzed for metals only.

Mercury in the fish tissue from Snipatuit Pond ranged from 0.224 to 0.579 mg/kg wet weight. The mercury data triggered a site-specific advisory against the consumption of fish from Snipatuit Pond (*"Children younger than 12 years, pregnant women, and nursing mothers should not eat fish from this water body." "The general public should limit consumption of black crappie and largemouth bass from this water body to two meals per month."* MDPH 2002).

Selenium levels ranged from 0.206 to 0.688 mg/kg wet weight. Lipid concentrations ranged from 0.16% to 0.62%. PCB arochlors and congeners, pesticides, cadmium, arsenic, and lead were not detected in the edible fillets of all samples analyzed from Snipatuit Pond.

Glen Charlie Pond, Wareham

American eel, bluegill, largemouth bass, yellow perch, and white perch (*Morone americana*) were collected from Glen Charlie Pond for fish toxics analysis. Three-fillet composites of largemouth bass, yellow perch, American eel, and bluegill were analyzed at WES for metals and organics. An individual white perch sample was also analyzed for metals and organics.

Mercury in the fish tissue ranged from 0.252 to 0.740 mg/kg wet weight. The 0.740 mg/kg, from an individual white perch sample, slightly exceeded the MDPH trigger level of 0.50 mg/kg, however, MDPH does not issue an advisory based on an individual sample. With the exception of the white perch sample, which contained 0.0470 mg/kg of arsenic, arsenic, PCB arochlors and congeners, pesticides, cadmium, and lead were not detected in the edible fillets. Selenium levels ranged from 0.069 to 0.112 mg/kg.

2000 FISH TOXICS

The results of MA DEP 2000 Buzzards Bay Watershed fish toxics monitoring surveys described below are excerpted from *2000 Fish Toxics Monitoring Public Request and Year 2 Watershed Surveys* (Maietta and Colonna-Romano 2000).

Noquochoke Lake

This 124-acre lake is located within the Buzzards Bay Watershed in Dartmouth. An impoundment of the Shingle Island River, Noquochoke Lake is downstream from a{n} EPA Superfund site (Re-Solve Site) which is located in the Copicut River subwatershed.

Noquochoke Lake was first sampled by DEP in 1988 as part of an assessment of the Re-Solve Superfund site. As a result of elevated mercury concentrations in 9 of 10 samples analyzed (multiple species) and elevated PCBs in an American eel, the following fish consumption advisory is currently in effect for Noquochoke Lake. It should be noted that mercury is not a site related contaminant. *"Children younger than 12 years, pregnant women, and nursing mothers should not eat any fish from this water body."* *"The general public should not consume any largemouth bass or American eel from this water body."* *"The general public should limit consumption of all other fishes from this water body to two meals per month (MDPH 2002)."*

Electrofishing and gillnetting at Noquochoke Lake in Dartmouth in 2000 resulted in the collection of three largemouth bass, three yellow perch, three bluegill, and three black crappie.

Although mercury concentrations were lower in 2000, two of the four samples analyzed in 2000 exceeded the MDPH "trigger level" of 0.50 mg/kg. Due to the small number of samples analyzed during the two surveys it is impossible to ascertain whether mercury concentrations are actually decreasing in fishes from this water body.

Cadmium, lead, and arsenic were below MDLs {Method Detection Limits}. Selenium concentrations were consistent with those found in other water bodies within the Commonwealth and do not appear to be of concern.

PCBs and organochlorine pesticides were below MDLs in four samples analyzed from Noquochoke Lake. {MDLs can be found in Table 2 in *2000 Fish Toxics Monitoring Public Request and Year 2 Watershed Surveys*.}

White Island Pond

This 294-acre Eutrophic Pond is located within the Buzzards Bay watershed in the Town of Plymouth. There are a number of cranberry bogs located on the northern and southern shores of this water body. Shoreline development is moderate to heavy.

Electrofishing and gillnetting at White Island Pond resulted in the collection of three large mouth bass, three smallmouth bass *Micropterus dolomieu*, three yellow perch, three pumpkinseed, three white perch, and three brown bullhead.

Mercury was below the MDPH trigger level of 0.5 mg/kg in all six samples. Cadmium, lead, and arsenic were below MDLs in all samples analyzed. Selenium concentrations were consistent with those found in other water bodies within the Commonwealth and do not appear to be of concern.

PCB toxic congener BZ#77 (0.0021 mg/kg) was detected in a composite of white perch (Wif00-13-15) from White Island Pond. Although concentrations of this congener appear to be low, the MA DEP ORS and the MDPH are in the process of assessing the potential implications of various concentrations of congeners. PCBs Arochlors, congeners, and organochlorine pesticides were below method detection limits (MDLs) in the remaining five samples analyzed. {MDLs can be found in Table 2 in *2000 Fish Toxics Monitoring Public Request and Year 2 Watershed Surveys*.}

SUMMARY

Fish toxics monitoring in the Buzzards Bay Watershed in 1995 and 2000 resulted in site-specific fish consumption advisories for one of the waterbodies sampled and the collection of additional data for a waterbody previously listed on the MDPH fish consumption advisory list.

While one sample of fish tissue collected from Glen Charlie Pond, Wareham indicated elevated levels of mercury, MDPH does not issue site-specific advisories based on elevated concentrations in individual samples. Additional sampling should be conducted in Glen Charlie Pond to determine if a site-specific fish consumption advisory is warranted.

Annual monitoring of fish from Copicut River and Cornell Pond continues; since 1998, EPA has hosted an annual fishing derby at Cornell Pond to ensure appropriate fish species were collected under the Re-Solve Superfund site's environmental monitoring program. The fishing derbies have been held in September or October, and tap into the experience of local fishermen to collect fish from the pond. The derbies actively and safely involve the community in an important fish-monitoring program, and provide EPA an opportunity to re-emphasize the Massachusetts Department of Public Health Fish Advisory not to consume American eel and limit consumption of other fish species caught from the pond or river (EPA 13 December 2003). Additional monitoring of Noquochoke Lake is not conducted/required under the environmental monitoring program.

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Table B1. 2000 DEP DWM Buzzards Bay Watershed Fish Toxics Monitoring Data excerpted from 2000 Fish Toxics Monitoring Public Request and Year 2 Watershed Surveys (Maietta and Colonna-Romano 2000). Results, reported in wet weight, are from individual fish fillets with skin off.

Sample ID	Collection Date	Species Code ¹	Length (cm)	Weight (g)	Sample ID (laboratory sample #)	Cd (mg/kg)	Pb (mg/kg)	Hg (mg/kg)	As (mg/kg)	Se (mg/kg)	% Lipids (%)	PCB Arochlors and Congeners (µg/g)	Pesticides (µg/g)
Noquochoke Lake, Dartmouth, Buzzards Bay Watershed													
NOF00-01	8/28/00	LMB	36.6	650	2000051 (L2000345-1 metals)	<0.02	<0.20	0.43	<0.04	0.16	0.18	ND	ND
NOF00-02	8/28/00	LMB	35.5	700	(L2000352-1 organics)								
NOF00-03	8/28/00	LMB	35.5	720									
NOF00-04	8/28/00	YP	22.1	140	2000052 (L2000345-2 metals)	<0.02	<0.20	0.49	<0.04	0.21	0.11	ND	ND
NOF00-05	8/28/00	YP	23.8	170	(L2000352-2 organics)								
NOF00-06	8/28/00	YP	24.2	190									
NOF00-07	8/28/00	B	19.1	150	2000053 (L2000345-3 metals)	<0.02	<0.20	0.50	<0.04	0.17	0.53	ND	ND
NOF00-08	8/28/00	B	20.4	190	(L2000352-3 organics)								
NOF00-09	8/28/00	B	22.3	250									
NOF00-10	8/28/00	BC	21.6	150	2000054 (L2000345-4 metals)	<0.04	<0.40	0.64	<0.04	0.21	0.062	ND	ND
NOF00-11	8/28/00	BC	22.9	180	(L2000352-4 organics)								
NOF00-12	8/28/00	BC	25.4	210									

1 Species (YP) yellow perch *Perca flavescens* (LMB) largemouth bass *Micropterus salmoides*
 (BC) black crappie *Pomoxis nigromaculatus* (B) bluegill *Lepomis macrochirus*

ND - not detected or the analytical result is at or below the established method detection limit (MDL).

Table B1 (Continued). 2000 DEP DWM Buzzards Bay Watershed Fish Toxics Monitoring Data excerpted from 2000 Fish Toxics Monitoring Public Request and Year 2 Watershed Surveys (Maietta and Colonna-Romano 2000). Results, reported in wet weight, are from individual fish fillets with skin off.

Sample ID	Collection Date	Species Code ¹	Length (cm)	Weight (g)	Sample ID (laboratory sample #)	Cd (mg/kg)	Pb (mg/kg)	Hg (mg/kg)	As (mg/kg)	Se (mg/kg)	% Lipids (%)	PCB Arochlors and Congeners (µg/g)	Pesticides (µg/g)
White Island Pond, Plymouth, Buzzards Bay Watershed													
WIF00-01	8/21/00	LMB	33.5	680	2000071 (L2000347-1 metals)	<0.02	<0.20	0.41	<0.04	0.18	0.19	ND	ND
WIF00-02	8/21/00	LMB	33.3	620	(L2000354-1 organics)								
WIF00-03	8/21/00	LMB	32.6	610									
WIF00-04	8/21/00	SMB	34.4	600	2000072 (L2000347-2 metals)	<0.02	<0.20	0.29	<0.04	0.19	0.32	ND	ND
WIF00-05	8/21/00	SMB	30.9	400	(L2000354-2 organics)								
WIF00-06	8/21/00	SMB	30.1	380									
WIF00-07	8/21/00	BB	33.1	450	2000073 (L2000347-3 metals)	<0.02	<0.20	0.14	<0.04	0.09	0.25	ND	ND
WIF00-08	8/21/00	BB	29.0	370	(L2000354-3 organics)								
WIF00-09	8/21/00	BB	33.9	500									
WIF00-10	8/21/00	YP	28.2	270	2000074 (L2000347-4 metals)	<0.02	<0.20	0.38	<0.04	0.24	0.14	ND	ND
WIF00-11	8/21/00	YP	29.2	290	(L2000354-4 organics)								
WIF00-12	8/21/00	YP	26.9	270									
WIF00-13	8/21/00	WP	32.2	490	2000075 (L2000347-5 metals)	<0.02	<0.20	0.37	<0.04	0.28	0.81	BZ#77-0.0021	ND
WIF00-14	8/21/00	WP	31.7	490	(L2000354-5 organics)								
WIF00-15	8/21/00	WP	31.0	460									
WIF00-16	8/21/00	P	22.3	250	2000076 (L2000347-6 metals)	<0.02	<0.20	0.36	<0.04	0.14	0.18	ND	ND
WIF00-17	8/21/00	P	21.4	240	(L2000354-6 organics)								
WIF00-18	8/21/00	P	21.5	240									

¹ Species (YP) yellow perch *Perca flavescens*
(BB) brown bullhead *Ameiurus nebulosus*
(WP) white perch *Morone Americana*
(LMB) largemouth bass *Micropterus salmoides*
(SMB) smallmouth bass *Micropterus dolomieu*
(P) Pumpkinseed *Lepomis gibbosus*

ND - not detected or the analytical result is at or below the established method detection limit (MDL).

TABLE B2. Analytical Results for 1995 Buzzards Bay Watershed Fish Toxics Monitoring Year 2 Watershed Surveys. Results, reported in wet weight, are from individual or composite samples of fish fillets with skin off.

Sample ID	Collection Date	Species Code ¹	Sample Type ²	Length (cm)	Weight (g)	Cd (mg/kg)	Pb (mg/kg)	Hg (mg/kg)	As (mg/kg)	Se (mg/kg)	% Lipids (%)	PCB Arochlors and Cogeners ² (µg/g)	Pesticides (µg/g)
Glen Charlie Pond, Wareham													
GCF95-1	10/5/95	LMB	C	32.5	440	<0.20	<1.00	0.381	<0.040	0.096	0.020	ND ³	ND
GCF95-2	10/5/95	LMB	C	31.9	350								
GCF95-3	10/5/95	LMB	C	34.1	540								
GCF95-4	10/5/95	YP	C	22.2	80	<0.20	<1.00	0.259	<0.040	0.083	0.040	ND	ND
GCF95-5	10/5/95	YP	C	23.0	90								
GCF95-6	10/5/95	YP	C	20.7	70								
GCF95-7	10/5/95	AE	C	56.2	270	<0.20	<1.00	0.375	<0.040	0.077	7.5	ND	ND
GCF95-8	10/5/95	AE	C	50.0	220								
GCF95-9	10/5/95	AE	C	40.1	170								
GCF95-10	10/5/95	B	C	20.2	160	<0.20	<1.00	0.252	<0.040	0.069	0.14	ND	ND
GCF95-11	10/5/95	B	C	19.3	140								
GCF95-12	10/5/95	B	C	18.7	120								
GCF95-13	10/5/95	WP	I	29.9	320	<0.20	<1.00	0.740	0.047	0.112	0.10	ND	ND

Notes: ¹ Species

American eel (AE) *Anguilla rostrata*
 bluegill (B) *Lepomis macrochirus*
 brown bullhead (BB) *Ameiurus nebulosus*
 black crappie (BC) *Pomoxis nigromaculatus*
 chain pickerel (CP) *Esox niger*
 largemouth bass (LMB) *Micropterus salmoides*
 pumpkinseed (P) *Lepomis gibbosus*
 white perch (WP) *Morone americana*
 yellow perch (YP) *Perca flavescens*

² Sample Type (All samples were fillets with skin off.)

Composite (C)
 Individual (I)

³ ND = Not Detected

* Submitted for organics analysis only.

** Submitted for metals analysis only.

TABLE B2 (Continued). Analytical Results for 1995 Buzzards Bay Watershed Fish Toxics Monitoring Year 2 Watershed Surveys. Results, reported in wet weight, are from individual or composite samples of fish fillets with skin off.

Sample ID	Collection Date	Species Code ¹	Sample Type ²	Length (cm)	Weight (g)	Cd (mg/kg)	Pb (mg/kg)	Hg (mg/kg)	As (mg/kg)	Se (mg/kg)	% Lipids (%)	PCB Aroclors and Cogeners ² (ug/g)	Pesticides (ug/g)
Snipatuit Pond, Rochester													
SPF95-1	9/14/95	LMB	C	38.6	920								
SPF95-2	9/14/95	LMB	C	38.4	860	<0.20	<1.00	0.552	<0.040	0.390	0.22	ND	ND
SPF95-3	9/14/95	LMB	C	38.6	900								
SPF95-4	9/14/95	P	C	20.0	160								
SPF95-5	9/14/95	P	C	17.9	120	<0.20	<1.00	0.224	<0.040	0.409	0.085	ND	ND
SPF95-6	9/14/95	B	C	20.3	190								
SPF95-7	9/14/95	BC	C	30.5	390								
SPF95-8	9/14/95	BC	C	28.5	370	<0.20	<1.00	0.579	<0.040	0.688	0.032	ND	ND
SPF95-9	9/14/95	BC	C	27.4	320								
SPF95-10	9/14/95	AE	C	62.1	340								
SPF95-11	9/14/95	AE	C	59.9	400	<0.20	<1.00	0.216	<0.040	0.268	0.62	ND	ND
SPF95-12	9/14/95	AE	C	52.3	250								
SPF95-13	9/14/95	YP	C	21.4	100								
SPF95-14	9/14/95	YP	C	20.8	100	<0.20	<1.00	0.308	<0.040	0.431	0.16	ND	ND
SPF95-15	9/14/95	YP	C	19.3	80								
SPF95-16	9/14/95	BB*	I	24.9	180						0.090	ND	ND
SPF95-17	9/14/95	CP**	I	39.1	350	<0.20	<1.00	0.179	<0.040	0.206			

Notes: ¹ Species

American eel (AE) *Anguilla rostrata*
bluegill (B) *Lepomis macrochirus*
brown bullhead (BB) *Ameiurus nebulosus*
black crappie (BC) *Pomoxis nigromaculatus*
chain pickerel (CP) *Esox niger*
largemouth bass (LMB) *Micropterus salmoides*
pumpkinseed (P) *Lepomis gibbosus*
white perch (WP) *Morone americana*
yellow perch (YP) *Perca flavescens*

² Sample Type (All samples were fillets with skin off.)

Composite (C)

Individual (I)

³ ND = Not Detected

* Submitted for organics analysis only.

** Submitted for metals analysis only.

APPENDIX C

Memorandum

To: Dave Pincumbe, US EPA, Region 1, New England, Boston, MA

Through: Arthur Johnson, MA DEP/DWM, Worcester, MA

From: John Fiorentino, MA DEP/DWM, Worcester, MA

Date: 21 August 2000

Subject: **Qualitative benthos assessment upstream and downstream of Marion WWTP**

Upon request by US EPA, the Massachusetts Department of Environmental Protection's Division of Watershed Management (MA DEP/DWM) conducted biological monitoring upstream and downstream from the Marion WWTP (NPDES Permit No. MA0100030) facility's discharge to its unnamed receiving stream known locally as Effluent Brook. Sampling was conducted 17 May 2000 by John Fiorentino of DWM, with assistance from Dave Pincumbe of EPA.

Aquatic benthic macroinvertebrate biomonitoring was conducted based on modifications to US EPA Rapid Bioassessment Protocol I (RBP I), a screening or reconnaissance assessment that documents specific visual observations made in the field by a trained professional. RBP I is used to discriminate obviously impacted and non-impacted areas from potentially affected areas. A biosurvey component focuses on qualitative sampling of benthic macroinvertebrates, and is supplemented by a preliminary field examination of other aquatic biota (periphyton, macrophytes, and fish). Qualitative benthic samples are collected from all available habitats using a "kick" net; Benthic macroinvertebrate orders/families are observed in the field (or in this case, in the laboratory) and listed on a field data sheet with an estimate of their relative abundance. On the basis of the observations made on habitat, water quality data (when available), physical characteristics, and the qualitative biosurvey, the investigator determines whether impairment is detected. Impairment may be indicated by the absence of generally pollution-sensitive benthic macroinvertebrate taxa such as Ephemeroptera (mayflies), Plecoptera (stoneflies), and Trichoptera (caddisflies)—collectively known as EPTs; dominance of generally pollution-tolerant groups such as Oligochaeta or Chironomidae; or overall low benthic abundance or taxa richness. If impairment is detected, the study area should be considered for more intensive evaluation such as RBP III, toxicity testing, or quantitative studies based on statistical hypothesis testing.

To determine the effects of the Marion WWTP discharge on the aquatic community of Effluent Brook, DWM conducted sampling at one station immediately upstream from the discharge, and two downstream stations approximately 100 m and 0.5 miles downstream from the discharge respectively. Instream benthos habitat was relatively similar at all stations with respect to epifaunal substrate composition—sand and fine sediments dominated, with occasional cobble and gravel present as well. In addition, snags and aquatic vegetation—most notably *Callitriche* sp.—provided additional benthic microhabitat at all stations. Beds of *Callitriche* sp. were particularly dense downstream from the discharge. Filamentous green algae was observed at all sampling stations, but appeared most abundant downstream from the discharge. Productive lotic habitat was extremely limited upstream from the discharge, with low base flow resulting in poorly developed riffle areas and exposed benthos habitat. Immediately downstream from the discharge flow regimes improved considerably as the stream received significant discharge contributions (approximately 50%) from the treated effluent. Despite the sandy nature of much of the stream reach downstream from the discharge, riffle areas and occasional larger substrates provided

good macroinvertebrate habitat. Riparian habitat—consisting of mostly forested undeveloped space—remains relatively undisturbed throughout most of the Effluent Brook subwatershed; however, nonpoint source pollution inputs associated with the new home construction that has recently commenced here may threaten this stream in the near future.

Despite the limited benthos habitat resulting from naturally-occurring (i.e., intermittent) low base flow upstream from the discharge, a surprisingly diverse macroinvertebrate assemblage was observed. Fifteen taxa, representing virtually every benthic macroinvertebrate trophic guild, were collected in the 100 m reach above the effluent discharge (Table 1). In addition, four of these taxa were pollution-sensitive EPTs, including two families (Leuctidae and Nemouridae) of Plecoptera—generally considered the most intolerant of the insect orders.

Community composition and trophic structure changes abruptly at the Marion WWTP discharge point. Most trophic groups are displaced by more opportunistic gathering collectors, indicating that deposited organic matter is the predominant food resource immediately downstream from the discharge. Suboptimal community structure—and especially the hyperdominance of red chironomids and naidid worms—is indicative of an aquatic community structured in response to organic enrichment and possibly low levels of dissolved oxygen. The displacement of EPT and other sensitive taxa by organisms considered more tolerant of organic pollution is typical of a benthos assemblage located downstream from a point source discharge.

Slight improvements in community composition and trophic structure were detected at the most downstream sampling location. The return of additional trophic guilds and the addition of several macroinvertebrate taxa—including two EPT taxa, suggest some recovery to the aquatic community in this portion of Effluent Brook.

It is unknown what effect the increase in effluent discharge proposed by the Marion WWTP may have on the Effluent Brook aquatic community; however, current benthos data suggest that improved levels of effluent treatment may be warranted. While future impacts to the macroinvertebrate assemblage immediately downstream from the discharge may be indiscernible, it is possible that discharge effects—especially in lieu of adequate effluent treatment—may be more pronounced further downstream in the form of a suppressed or altogether absent “recovery zone”. If in fact, increased discharge and effluent treatment upgrades do occur, it is highly recommended that biomonitoring be conducted here again after these changes have gone into effect. More intensive upstream-downstream comparisons of the resident biota—based on statistical hypothesis testing—should be considered for future biomonitoring efforts.

Cc: Bryant Firmin
Ron Lyberger

Table 1. List of macroinvertebrates collected (qualitatively) from 3 stream sites in Effluent Brook on 17 May 2000. Taxon presence at a station is indicated with an "x".

TAXON	FFG ¹	TV ²	upstream from WWTP	100 m downstream from WWTP	0.50 miles downstream from WWTP
Planorbidae	SC	6	x		
Physidae	GC	8	x	x	x
Pisidiidae	FC	8	x	x	x
Lumbriculidae	GC	8	x	x	x
Naididae	GC	9	x	x	x
Glossophoniidae	PR	7			x
Asellidae	GC	8	x	x	x
Crangonyctidae	GC	8	x		
Hydracarina	PR	6	x		
Leuctridae	SH	0	x		
Nemouridae	SH	2	x		
Hydropsychidae	FC	4			x
Limnephilidae	SH	4	x		x
Hydrophilidae	PR	5	x	x	
Simuliidae	FC	6	x		x
Tipulidae	SH	5	x		x
Chironomidae	GC	6	x	x	x
Chironomidae (red)	GC	8		x	

¹ Functional Feeding Group (FFG) lists the primary feeding habit of each species and follows the abbreviations: SH-Shredder; GC-Gathering Collector; FC-Filtering Collector; SC-Scraper; PR-Predator.

² Tolerance values (TV) range from 0 for organisms very intolerant of organic pollution to 10 for organisms very tolerant.

APPENDIX D – DEP GRANT AND LOAN PROGRAMS

Excerpted from the DEP/DWM World Wide Web sites,

<http://www.state.ma.us/dep/brp/mf/othergrt.htm>

<http://www.state.ma.us/dep/brp/wm/projsums.htm>

604(B) WATER QUALITY MANAGEMENT PLANNING GRANT PROGRAM

This grant program is authorized under the federal Clean Water Act Section 604(b) for water quality assessment and management planning. There have been no 604(b) grants awarded in the Buzzards Bay Watershed.

104(B) (3) WETLANDS AND WATER QUALITY GRANT PROGRAM

This grant program is authorized under the wetlands and Clean Water Act Section 104(b)(3) of the federal Clean Water Act. The water quality proposals received by DEP under this National Environmental Performance Partnership Agreement (NEPPA) with the U.S. Environmental Protection Agency is a results oriented approach that will focus attention on environmental protection goals and the efforts to achieve them. The goals of the NEPPA are to: 1) achieve clean air, 2) achieve clean water, 3) protect wetlands, 4) reduce waste generation, and 5) cleanup waste sites.

- 97-09/104 *Project on Numeric Biocriteria*. This proposal is designed to address two issues relating to the current Biocriteria Pilot Study; specifically, to evaluate subcoregion difference in stream biota, if any, and formulate the biological indicators (fish and macroinvertebrates) that are essential to assess conditions and monitor changes in streams. Study expects to establish reference streams in 5 of the 13 Massachusetts Ecological Subregions.

Numeric Biocriteria sampling in the Buzzards Bay Watershed. MA DEP DWM. 2000. Open files. *Biocriteria Development Project files*. Massachusetts Department of Environmental Protection, Division of Watershed Management, Worcester, MA.

Stream	Station	Sampling Dates
Unnamed Tributary	NB03COP	October 1996
Mattapoissett River	NB13MAT	October 1996
Bread and Cheese Brook	NB04BAC	October 1996
Shingle Island River	NB14SHI	October 1996

- 99-06/104 *Lake Surveys for TMDL Development*. The objective for this statewide study is to provide a database for lakes listed as impaired on the 303d list. Data such as Secchi, bathymetry, nutrients, aquatic plant species composition and plant coverage will be compiled to determine optimal plant coverage for fisheries. Additionally, the Division will provide technical assistance and transfer of fisheries data to government agencies and private organizations involved in watershed management and assist in the development of volunteer and watershed participant action plans. Two lakes in the Buzzards Bay Watershed, Federal Pond in Carver and Parker Mills Pond in Wareham, were sampled as part of this project in 2000.
- 02-01c/104 *Acushnet River TMDL Surface Water Flow and Nitrogen Load: Nitrogen Loading to New Bedford Inner Harbor* This project will quantify Acushnet River discharge and nitrogen loading from the upper watershed region to New Bedford Inner Harbor and support the development of water quality models and nitrogen loading thresholds for this system. In addition, analysis will be made to determine the potential for the river to be a source of bacterial (fecal coliform, *E. coli*, *Enterococci*) contamination to the estuary. A stream gauge will be maintained and nitrogen and bacterial samples collected weekly for 12 months, with additional samples associated with rain events. The goal of the project is to help acquire sufficient data that can later be used by DEP and EPA in the development of appropriate TMDL and management approaches for the restoration of

water quality in the Acushnet River Estuary system. Also, the data collected are directly applicable to on-going nitrogen issues relating to management and permitting of NPDES discharges within this system. The project will leverage other proposed and on-going efforts for this system (EMPACT, CZM, EPA) and is an important component for application of the Massachusetts Estuaries Project approach to the Acushnet River Estuary.

- 03-02/104c *Quantifying The Build-Up Of Solids And Contaminants On Street Surfaces, And Their Potential Removal By Street-Sweeping Technologies, New Bedford, Massachusetts* Storm water runoff from impervious surfaces has been identified as a significant source of contaminant loading to urban waterways. the City of New Bedford, Massachusetts removed an average of 4,100 cubic yards of sediment annually from 440 miles of street surface in the 1990 to 1995 period, using both mechanical and vacuum sweepers. This street-sweeping effort realized a greater than 92-percent reduction of sediment entering New Bedford's wastewater treatment plant from the combined-sewer areas of the City. The study objectives are to (1) provide preliminary estimates of contaminant build-up rates on selected street surfaces during dry weather periods in an urban New England setting; (2) compare sediment removal efficiencies of mechanical and vacuum sweepers for a range of grain-size classes; (3) characterize the chemical quality of the sediments presently being removed by vacuum sweepers in New Bedford, and the annual loads of selected contaminants that the City presently removes from its streets.

319 NONPOINT SOURCE GRANT PROGRAM

This grant program is authorized under Section 319 of the CWA for implementation projects that address the prevention, control, and abatement of nonpoint source (NPS) pollution. In order to be considered eligible for funding projects must: implement measures that address the prevention, control, and abatement of NPS pollution; target the major source(s) of nonpoint source pollution within a watershed/subwatershed; have a 40 percent non-federal match of the total project cost (match funds must meet the same eligibility criteria as the federal funds); contain an appropriate method for evaluating the project results; address activities that are identified in the Massachusetts NPS Management Program Plan. 319 projects in the Buzzards Bay Watershed include:

- 99-01/319 *Alternative Septic System Test Center Project Monitoring*. For 12 months, this project will concurrently monitor contaminant removal by twenty-one wastewater systems at the Alternative Septic System Test Center at the Massachusetts Military Reservation. The monitoring will produce a scientifically valid body of data which will be disseminated to state regulators, local boards of health, installers, and consumers through trade shows, newspaper articles, site visits, and through Website coverage. Project goals are to: provide verified, comparable data for regulatory decision making; speed approval of technologies which have advanced contaminant removal, particularly nitrogen; and increase the variety of alternative systems approved to provide greater siting flexibility and thus reduce the cost to consumers and benefit the environment.
- 99-04/319 *Winsegansett Salt Marsh Restoration Project*. Winsegansett Salt Marsh is a 30-acre coastal wetland on the western shore of Buzzards Bay. This project will replace a culvert beneath Winsegansett Avenue with a larger box culvert thereby restoring natural tidal flow, increasing salinity in the marsh and eliminating an existing stand of *Phragmites*. The end objective is to permit natural recolonization of *Spartina* plant communities in the upper reaches of Winsegansett Marsh, thereby improving juvenile finfish and shellfish habitat and supporting the feeding habitats of local wildlife species, including the federally-listed endangered Roseate Tern and Osprey. The project also includes publication and distribution of the "Atlas of Tidally Restricted Salt Marshes in Buzzards Bay" which can be used to target other salt marshes in need of similar restoration efforts. Tasks to be completed under this project include: design and installation of the box culvert at Winsegansett Avenue; monitoring of pre- and post-construction water quality in accordance

with an EPA-approved sampling protocol, and pre- and post-construction GIS mapping of the extent of salt marsh vegetation in Winsegansett Salt Marsh; and printing and distribution of the "Atlas of Tidally Restricted Salt Marshes" to coastal communities in Buzzards Bay.

- 00-02/319 *Alternative Septic System Test Center Project Monitoring II* This project will continue the monitoring of contaminant removal by twenty-one wastewater systems at the Alternative Septic System Test Center at the Massachusetts Military Reservation, first undertaken in project 99-01/319. The monitoring will produce a scientifically valid body of data which will be disseminated to state regulators, local boards of health, installers and consumers through trade shows, newspaper articles, site visits, and through Website coverage. Project goals continue to be to: provide verified, comparable data for regulatory decision making; speed approval of technologies which have advanced contaminant removal, particularly nitrogen; increase the variety of alternative systems approved to provide greater siting flexibility and thus reduce the cost to consumers and benefit the environment; and provide needed baseline data about the conventional system's contaminant removal capabilities.
- 00-03/319 *Development of a Rapid Field Test for the Quality of Stone Aggregate in Onsite Septic Systems* This project will develop and/or validate a simple field test for quality of stone aggregate used in the soil absorption portions of onsite septic systems. The overall goal is to encourage the production of better quality aggregate. Project goals are: to promote the use of aggregate that will maximize the life of soil absorption systems and meet the intent of Title 5 to prevent the intrusion of fine-textured material at the system-soil interface; to determine the validity of the various simple field tests (i.e., the bucket test) in predicting the level of fine-textured material in aggregate samples; to correlate the findings of simple field tests with the actual level of impairment to the leaching facility imparted by the level of fines observed; to refine the test for aggregate such that the result will indicate an appropriate level of "clean" that is neither too restrictive/cost prohibitive, nor too lenient as to decrease the life of a leaching facility; to produce a guidance document that will describe the appropriate methodology for testing aggregate in the field and to provide training workshops for its use.
- 00-05/319 *Atlas of Stormwater Discharges* This project will prepare, print and disseminate a "user friendly" *Atlas of Stormwater Discharges* for the Buzzards Bay. The *Atlas* will then be used for an outreach program designed to assist Buzzards Bay communities in preparing grant application to the DEP 319 and MCZM CPR grant programs to mitigate storm water discharges into the Bay. The project is an important first step in implementing the Buzzards Bay Comprehensive Conservation and Management Plan (CCMP), one of the first comprehensive watershed management plans to be completed in the Commonwealth. One of the priority management issues identified in the CCMP is control and remediation of storm water discharges impacting the water quality of Buzzards Bay. Investigations by the Buzzards Bay Project and Division of Marine Fisheries have identified storm water runoff as the primary factor in most of the Bay's shellfish bed closures. Today, more than 10,000 acres of shellfish beds in Buzzards Bay are closed to harvest due to elevated levels of fecal coliform bacteria with a subsequent loss of economic opportunity to coastal communities. Due to the unique nature of the Buzzards Bay coastline, restoration of Bay water quality is highly dependent on localized remediation of storm water runoff.
- 00-09/319 *Onset Bay, Wareham, MA, Nonpoint Source Pollution Remediation Project* The northern portion of Onset Bay is closed to shellfishing from May 1st through November 1st, due in large part to fecal contamination associated with storm water runoff. The 1989 report entitled *Sanitary Survey Report of Onset Bay in the Towns of Bourne and Wareham* identified fecal contamination as the principal contributing factor in shellfish area closures in the area. The Town of Wareham has made substantial

investment to sewer the Onset and Point Independence areas and so has virtually eliminated failing or substandard septic systems as a source of fecal contamination to the Bay. The Town has also undertaken a comprehensive storm water management program and has made significant progress in remediating storm water discharges at several problem areas in town. This project will address four storm water outfalls that discharge directly into Onset Bay from South Boulevard and the Onset Town Pier. The project augments previous projects undertaken by the Town of Wareham to remediate storm water impacts to local shellfish beds. The goals of the project are to upgrade the seasonally closed shellfishing areas of Onset Bay and to mitigate the direct storm water discharges located at public beaches along South Boulevard. Remediation efforts at the four storm water discharges will concentrate on subsurface infiltration of the “first flush” or the first one-half inch of runoff from a precipitation event. Soil conditions at the sites are mapped as Carver coarse sands with water tables expected to be in excess of six to ten feet below grade. These soils are excellent for storm water infiltration and will provide a high degree of treatment. Critical catch basin structures will also be upgraded to provide deep sumps, hoods and pipes to infiltration chambers.

- 01-05/319 *Evaluation of Phosphorus Removal in Onsite Septic Systems* This research project will support implementation of Total Maximum Daily Loads (TMDL) of phosphorus to freshwater bodies that currently do not meet water quality standards. All information that can be used to reduce phosphorus inputs will be vital in implementing lake TMDLs in coming years. It will also further the goals of the Department's Title 5 Program that approves alternative onsite septic systems and alternatives to onsite septic systems where appropriate. The project will test a minimum of four different onsite septic technologies that purport to remove phosphorus, and test the efficacy of installing phosphorus-removing reactive media beneath standard septic systems. The project also includes a report on the feasibility of scaling up the tested technologies to serve small clustered areas of development and the potential for using small packaged treatment plants for removing phosphorus from wastewater. The goal is to develop proven options for reducing phosphorus inputs to fresh water bodies from onsite septic systems. Testing will be done at the Massachusetts Alternative Septic System Test Center.
- 01-07/319 *Wareham NPS Remediation Program: East River, Broad Cove, Muddy Cove* The northern portion of Onset Bay is closed to shellfishing from May 1st through November 1st, due in large part to fecal contamination associated with storm water runoff. The Town of Wareham has made substantial investment to sewer the Onset and Point Independence areas and so has virtually eliminated failing or substandard septic systems as a source of fecal contamination to the Bay. The Town has also undertaken a comprehensive storm water management program and has made significant progress in remediating storm water discharges at several problem areas in town. This project will install storm water BMPs (i.e.; deep sump catch basins, infiltration chambers and possibly Stormtreat systems) at seven storm water outlets in Onset village. The BMPs will be installed on town land in the road right-of-way at one site at the East Avenue boat ramp, four sites along North Boulevard, one site at the Stone Bridge Marina and one site off of East Boulevard. The project augments previous projects undertaken by the Town of Wareham to remediate storm water impacts to local shellfish beds. The work done in this project will be upstream of work done as part of another 319-funded project (00-09/319) which addressed four storm water outfalls that discharge directly into Onset Bay, and a similar project funded through the CZM CPR Program. The goals of the project are to upgrade the seasonally closed shellfishing areas of Onset Bay, protect swimming beaches along Onset Bay and begin remediation of estuarine resources in the Bay by reducing fecal coliform entering Onset Bay.
- 01-12/319 *Cranberry Bog Phosphorus Dynamics for TMDL Development* (University of Massachusetts Cranberry Experiment Station). This project will study phosphorus dynamics in Massachusetts cranberry bogs to assist the MA DEP in formulating Total

Maximum Daily Load performance standards. Specifically, the objectives of this project are (1) determine phosphorus and nitrogen import and export from representative cranberry beds associated with water management, including floods, irrigation, and rain events; (2) determine nitrogen and phosphorus export from a natural freshwater wetland; (3) determine phosphorus and nitrogen export from beds where phosphorus fertilizer rates are reduced to less than 20 pounds of phosphorus per acre; and (4) determined the impact of reduction in phosphorus fertilization on cranberry sustainability.

- 02-06/319 *Head of Westport Stormwater Project* In the Town of Westport, the Westport River has 35 miles of shoreline and drains approximately 85% of the town's land area. The river supports an extensive and productive estuarine habitat including over 1000 acres of salt marsh vegetation. Within the estuary, there are approximately 3000 acres of shellfish beds. Two branches of the River, the East Branch and the West Branch, converge at Westport Point to form a single discharge into Buzzards Bay. The tidal component of the East Branch extends from the area known as the Head of Westport to the mouth of the river. The watershed of the East Branch is the larger of the two branches and consists primarily of agricultural and residential land use in the lower region, and forest in the upper part. Currently, the East Branch of the Westport River from Lake Noquochoke to the West branch is 303d listed for pathogens. This bacterial contamination threatens the health of the shellfish beds located within the watershed, causing restrictions on harvesting. The goal of the project is to improve water quality in the East Branch by reducing nonpoint source pollution at the Head of Westport through implementation of a combination of structural storm water control Best Management Practices to remove bacteria from the first flush of storm water, and public outreach and education to watershed stakeholders.

MASSACHUSETTS WATERSHED INITIATIVE PROJECTS

The Massachusetts Watershed Initiative is a broad partnership of state and federal agencies, conservation organizations, businesses, municipal officials and individuals that protects and restores natural resources and ecosystems on a watershed basis. The primary goals of the Watershed Initiative are to: improve water quality; restore natural flows to rivers; protect and restore habitats; improve public access and balanced resource use; improve local capacity to protect water resources; and, promote shared responsibility for watershed protection and management. Projects funded under the MWI include hydrologic and water quality monitoring and assessment, habitat assessment, nonpoint source assessment, hydrologic modeling, open space and growth planning, technical assistance and outreach. MWI projects in the Buzzards Bay Watershed include:

- 99-03/MWI *Nutrients, Eutrophication and Harmful Algal Blooms in Buzzards Bay, Massachusetts*. The purpose of this project is to further analyze water quality and biological samples collected since 1987 in Buzzards Bay. This will be accomplished by completing taxonomic analyses of selected phytoplankton samples and completing analyses and consolidation of nutrient and other data collected.
- 01-02/MWI *Westport River Nonpoint Source Pollution Assessment Project*. This project will conduct an assessment of nonpoint source pollution in the Westport River subwatershed of Buzzards Bay.
- 02-03/MWI *Slocums and Little River Flushing Studies*. This project will conduct detailed flushing and particle tracking studies of the Slocums River and Little River Systems for use in developing TMDLs.

SOURCE WATER AND TECHNICAL ASSISTANCE/LAND MANAGEMENT GRANT PROGRAM

The Source Water Protection Technical Assistance/Land Management Grant Program provides funds to *third party* technical assistance organizations that assist public water suppliers in protecting local and regional ground and surface drinking water supplies.

- 99-14/SWT *Resource Planning for Cranberry Bogs within Drinking Water Supply Areas*. This project will provide direct technical assistance with farm planning to cranberry growers in the Cape Cod, Buzzards Bay, Taunton, South Coastal, and Nantucket Basins in an effort to conserve and protect water resources. Resource planning for cranberry bogs located within or adjacent to public drinking water supply areas will provide cranberry growers with the information necessary for the protection of public surface and groundwater drinking water supplies in Southeastern Massachusetts.

MASSACHUSETTS DRINKING WATER STATE REVOLVING FUND PROGRAM

The Massachusetts Drinking Water State Revolving Fund (DWSRF) provides low-cost financing to help community public water suppliers comply with federal and state drinking water requirements. The DWSRF Program's goals are to protect public health and strengthen compliance with drinking water requirements, while addressing the Commonwealth's drinking water needs. The Program incorporates affordability and watershed management priorities. The DWSRF Program is jointly administered by the Division of Municipal Services of the Department of Environmental Protection (MA DEP) and the Massachusetts Water Pollution Abatement Trust (Trust). The current subsidy level is equivalent to a 50% grant, which approximates a two percent interest loan. The Program will initially operate with approximately \$50 million in financing capacity. For calendar years 1999 through 2003, up to \$400 million may be available through the loan program.

- *Water Main Rehabilitation (SRF ID 1707)*. New Bedford
- *Lining on Vinyl Lined AC Water Main (SRF ID 1656)*. Dartmouth
- *Cement Line Water Main (SRF ID 1655)*. Dartmouth

WELLHEAD PROTECTION GRANT PROGRAM

The Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing wellhead protection through local projects and education.

- 99-24/WHP *Wareham Wellhead Protection Project* This project will install 6 monitoring wells for potential contamination from pesticides, fertilizers, and priority pollutant metals associated with cranberry bog activities.
- 01-10/WHP *Old Colony Vocational School Replacement Fuel/Waste Storage Tank*. This project will replace two above-ground fuel/waste storage tanks located in the well's recharge area with tanks that have secondary containment and appropriate safe guards.

RESEARCH AND DEMONSTRATION GRANT PROGRAM

The Research and Demonstration Program (R&D) is authorized by section 38 of Chapter 21 of the Massachusetts General Laws and is funded by proceeds from the sale of Massachusetts bonds. Specifically, the R&D Program was established to enable the Department to conduct a program of study and research and demonstration relating to water pollution control and other scientific and engineering studies "...so as to insure cleaner waters in the coastal waters, rivers, streams, lakes and ponds of the Commonwealth." R&D projects in the Cape Cod Watershed include:

- 02-06/R&D *Coastal Embayment Delineations* For this project the United States Geological Survey will develop a regional understanding of the ground-water flow and the sources of water to ecologically sensitive coastal embayments throughout Cape Cod. The delineation of the contributing areas, the determination of time-of-travel distributions, and the calculation of groundwater fluxes to the natural receptors will be completed for current pumping and recharge conditions. Ground-water flow models previously developed for the delineation of the source of water to public-supply wells will be used to: delineate areas that contribute water to coastal embayments, upgradient ponds and streams, and wetlands greater than 16 acres in area; determine time-of-travel distributions within the embayment contributing areas; and determine steady-state ground-water fluxes to coastal embayments as well as the ponds and streams within the contributing areas to these.

CLEAN WATER STATE REVOLVING LOAN FUND (CWSRF) PROGRAM

The Massachusetts State Revolving Fund for water pollution abatement projects was established to provide a low-cost funding mechanism to assist municipalities seeking to comply with federal and state water quality requirements. The SRF Program is jointly administered by the Division of Municipal Services of the Department of Environmental Protection and the Massachusetts Water Pollution Abatement Trust. Each year the Department solicits projects from Massachusetts municipalities and wastewater districts to be considered for subsidized loans, which are currently offered at 50% grant equivalency (approximates a no-interest loan). In recent years the program has operated at an annual capacity of \$150 to \$200 million per year, representing the financing of 40 to 50 projects annually. The SRF Program now provides increased emphasis on watershed management priorities. A major goal of the SRF Program is to provide incentives to communities to undertake projects with meaningful water quality and public health benefits and which address the needs of the communities and the watershed.

- *MARION 1725 WWT and Collection System Improvements* Marion's Wastewater Treatment Facility is being upgraded to provide pretreatment (grit and screenings removal) and sequencing batch reactors (SBRs) for ammonia removal. The upgrade will reduce the nitrogen load to Aucoot Cove and Buzzards Bay. The plant construction will begin in August 2003 and the plant should begin startup in spring 2005. In addition, the Town is sewerage three areas of town where existing, dense housing cannot be adequately supported by on-site systems due to high groundwater and poor soils. Sewering these areas will reduce bacteria and nutrient loads to Sippican Harbor and the Weweantic River watershed; and instead the wastewater will be treated to a high quality effluent at the central facility.

Additional 2003 projects:

- *WWTP Upgrade (SRF ID 898).* Wareham
- *Earle Street Separation (SRF ID 1726).* New Bedford
- *West End Sewer Separation Phase 2 (SRF ID 1727).* New Bedford
- *West End Sewer Separation Phase 3 (SRF 1728).* New Bedford
- *Black Brook Corridor Water Resource Lands (SRF ID 1744).* New Bedford
- *Sewage Collection System (SRF ID 1732).* Acushnet
- *Brandt Beach Sewer Extension Project (SRF ID1711).* Mattapoisett
- *Construction of UV at WWTP (SRF ID 1716).* Fairhaven
- *Route 6 Sewer Extension (SRF ID 1708).* Mattapoisett
- *Weweantic Shores Sewers and PS (SRF ID 1743).* Wareham
- *Construction of New Odor Control Facilities (SRF ID 1717).* Fairhaven
- *Construction of new sewers (SRF ID 1715).* Dartmouth
- *Betty's Neck/ Pond Complex Pres. Program (SRF ID 1745).* New Bedford

COMMUNITY SEPTIC MANAGEMENT PROGRAM

The enactment of the Open Space Bond Bill in March of 1996 provided new opportunities and stimulated new initiatives to assist homeowners with failing septic systems. The law appropriated \$30 million to the MA DEP to assist homeowners. The Department will use the appropriation to fund loans through the Massachusetts Water Pollution Abatement Trust. The fund will provide a permanent state/local administered revolving fund to assist income-eligible homeowners in financing necessary Title 5 repairs. Working together, the MA DEP and the Trust have created the Community Septic Management Program to help Massachusetts' communities protect threatened ground and surface waters while making it easier to comply with Title 5. This loan program offers three options from which a local governmental unit can choose.

APPENDIX E - DMF SHELLFISH DATA, BUZZARDS BAY WATERSHED

It is the mission of the Division of Marine Fisheries (DMF) to manage, develop, and protect the Commonwealth's renewable living marine resources to provide the greatest public benefit. DMF fosters protection of the marine environment by cooperating with other state and federal agencies on pollution abatement, coastal wetlands protection and other programs concerning coastal waters and marine life. DMF monitors coastal contaminant levels in fish and shellfish, operates a shellfish depuration facility, and evaluates the impacts of coastal development on marine fish and their habitats. DMF provides assistance to local shellfish officers on matters affecting the management of shellfish, and provides expertise on anadromous fish and construction assistance on fishways. Other DMF programs assist commercial and recreational fishermen and educate the public on marine resource issues and values.

The DMF Shellfish Management Program manages shellfish growing areas in compliance with the National Shellfish Sanitation Program (NSSP). The NSSP is a federal/state cooperative program recognized by the U.S. Food and Drug Administration (FDA) and the Interstate Shellfish Sanitation Conference (ISSC). One goal of this program is the sanitary control of shellfish harvested and sold for human consumption. Growing areas are managed with respect to shellfish harvest for direct human consumption, and comprise at least one or more classification areas. The classification areas are the management units, and range from being approved to prohibited (six different classification types in all) with respect to shellfish harvest (Tables E1). Shellfish growing area classifications by subwatershed are provided in Tables E3-E6. Designated shellfish growing areas (as of July 2000) may be viewed using the MassGIS datalayer available from MassGIS at <http://www.state.ma.us/mgis/dsga.htm>.

Table E1. DMF Shellfish Management Program Managed Shellfish Growing Area Classifications.

Classification Type	Definition
Approved	Open for harvest of shellfish for direct human consumption.
Conditionally Approved	During the time the area is approved, it is open for harvest of shellfish for direct human consumption subject to local rules and state regulations.
Conditionally Restricted	During the time the area is restricted, it is only open for the harvest of shellfish with depuration subject to local rules and state regulations.
Restricted	Open for harvest of shellfish with depuration subject to local rules and state regulations for the relay of shellfish.
Management Closure	Closed for the harvest of shellfish. Not enough testing has been done in the area to determine whether it is fit for shellfish harvest or not.
Prohibited	Closed for the harvest of shellfish.

Classification area codes and town names identify each DMF shellfish area. The Buzzards Bay Watershed Water Quality Assessment Report describes each shellfishing area by its classification area code and the assessed region is defined in square miles within the DEP/DWM water body system segment. As of July 2000 DMF classified a total of 261,901.3 acres in the Buzzards Bay Watershed (Table E2).

Table E2. Summary Shellfish Classification Area Information as of July 2000.

Classification Type	Area (acres)
Approved	232559.5
Conditionally Approved	13187.88
Management Closure	230.99
Prohibited	9722.802
Restricted	6200.129

Table E3. Buzzards Bay Watershed DMF - Shellfish Project Classification Area Information as of July 2000.

Town	Classification Area Code	Classification Type	Area (Acres)
Acushnet	BB15.1	Prohibited	51.29
Bourne	BB28.0	Approved	73.784
Bourne	BB28.0	Approved	885.372
Bourne	BB33.0	Approved	0.001
Bourne	BB38.0	Approved	62.551
Bourne	BB39.0	Approved	3.569
Bourne	BB40.0	Approved	82.511
Bourne	BB43.0	Approved	116.369
Bourne	BB43.4	Conditionally Approved	4.404
Bourne	BB43.5	Prohibited	0.461
Bourne	BB43.6	Prohibited	1.931
Bourne	BB43.8	Prohibited	23.214
Bourne	BB44.0	Approved	383.832
Bourne	BB44.2	Conditionally Approved	5.855
Bourne	BB44.7	Prohibited	12.834
Bourne	BB44.8	Conditionally Approved	49.726
Bourne	BB45.1	Prohibited	35.838
Bourne	BB45.2	Approved	135.7
Bourne	CCB35.0	Approved	0.354
Bourne	CCB38.0	Approved	2243.641
Bourne	CCB51.0	Approved	0
Dartmouth	BB10.0	Approved	887.785
Dartmouth	BB10.0	Approved	2715.556
Dartmouth	BB10.2	Prohibited	314.844
Dartmouth	BB10.2	Prohibited	47.675
Dartmouth	BB11.0	Approved	1429.585
Dartmouth	BB11.0	Approved	4645.364
Dartmouth	BB11.2	Prohibited	1.166
Dartmouth	BB11.2	Prohibited	82.849
Dartmouth	BB12.1	Restricted	55.806
Dartmouth	BB12.2	Restricted	2.79
Dartmouth	BB12.20	Conditionally Approved	99.63
Dartmouth	BB12.3	Conditionally Approved	143.123
Dartmouth	BB12.4	Prohibited	66.375
Dartmouth	BB12.5	Approved	237.114
Dartmouth	BB12.6	Approved	5.886
Dartmouth	BB12.7	Conditionally Approved	70.435
Dartmouth	BB13.1	Conditionally Approved	219.431
Dartmouth	BB13.20	Conditionally Approved	173.709
Dartmouth	BB13.21	Conditionally Approved	3.183
Dartmouth	BB13.22	Conditionally Approved	18.42

Town	Classification Area Code	Classification Type	Area (Acres)
Dartmouth	BB13.3	Restricted	92.975
Dartmouth	BB13.4	Restricted	1.468
Dartmouth	BB13.6	Restricted	47.718
Dartmouth	BB13.6	Restricted	7.409
Dartmouth	BB13.7	Prohibited	1.504
Dartmouth	BB13.7	Prohibited	3.982
Dartmouth	BB15.4	Conditionally Approved	329.862
Dartmouth	BB15.5	Conditionally Approved	20.199
Dartmouth	BB15.52	Restricted	69.858
Dartmouth	BB15.7	Restricted	152.551
Dartmouth	BB16.0	Approved	3798.14
Dartmouth	BB5.0	Approved	840.483
Dartmouth	BB6.0	Prohibited	197.078
Dartmouth	BB7.0	Approved	1412.66
Dartmouth	BB8.0	Prohibited	465.689
Dartmouth	BB9.0	Management Closure	115.495
Dartmouth	SC17.0	Approved	792.31
Dartmouth	SC3.0	Approved	780.474
Dartmouth	SC5.0	Approved	2175.899
Dartmouth	SC8.0	Approved	4844.237
Dartmouth	V12.0	Approved	0
Fairhaven	BB14.0	Approved	130.757
Fairhaven	BB14.2	Prohibited	75.694
Fairhaven	BB14.3	Conditionally Approved	63.888
Fairhaven	BB15.1	Prohibited	326.712
Fairhaven	BB15.4	Conditionally Approved	1054.657
Fairhaven	BB15.41	Prohibited	2.504
Fairhaven	BB15.42	Prohibited	20.982
Fairhaven	BB15.43	Prohibited	3.439
Fairhaven	BB15.6	Restricted	21.057
Fairhaven	BB15.7	Restricted	762.363
Fairhaven	BB16.0	Approved	502.2
Fairhaven	BB17.0	Conditionally Approved	568.255
Fairhaven	BB18.0	Approved	174.01
Fairhaven	BB18.1	Conditionally Approved	42.956
Fairhaven	BB18.1R	Approved	13.709
Fairhaven	BB18.20	Approved	52.386
Fairhaven	BB18.24	Approved	73.324
Fairhaven	BB18.3	Prohibited	8.808
Fairhaven	BB18.4R	Approved	6.214
Fairhaven	BB19.0	Approved	1067.197
Fairhaven	BB20.0	Approved	101.552
Fairhaven	BB21.0	Approved	699.146
Fairhaven	BB21.20	Approved	31.959
Fairhaven	BB21.3	Prohibited	18.09
Fairhaven	BB21.4	Approved	26.279
Fairhaven	BB22.1	Prohibited	20.765
Fairhaven	BB22.20	Conditionally Approved	106.189
Fairhaven	BB22.3	Conditionally Approved	172.027
Freetown	MHB2.1	Restricted	232.758
Freetown	MHB2.5	Prohibited	349.825
Marion	BB24.0	Approved	145.925

Town	Classification Area Code	Classification Type	Area (Acres)
Marion	BB28.0	Approved	849.814
Marion	BB28.0	Approved	3459.394
Marion	BB31.0	Approved	221.805
Marion	BB31.1	Prohibited	22.485
Marion	BB32.0	Approved	1502.768
Marion	BB32.1	Prohibited	9.08
Marion	BB32.11	Prohibited	0.308
Marion	BB32.13	Conditionally Approved	224.784
Marion	BB32.21	Approved	5.93
Marion	BB32.22	Approved	16.304
Marion	BB32.23	Approved	33.917
Marion	BB32.3	Prohibited	10.817
Marion	BB32.4	Prohibited	0.71
Marion	BB32.5	Prohibited	0.772
Marion	BB32.9	Prohibited	0.422
Marion	BB33.0	Approved	1260.822
Marion	BB34.0	Approved	203.575
Marion	BB35.0	Approved	73.924
Marion	BB35.4	Prohibited	27.075
Marion	BB35.5	Conditionally Approved	53.744
Mattapoiet	BB20.0	Approved	425.555
Mattapoiet	BB21.0	Approved	715.905
Mattapoiet	BB21.4	Approved	0
Mattapoiet	BB23.0	Approved	137.339
Mattapoiet	BB23.2	Conditionally Approved	0.598
Mattapoiet	BB24.0	Approved	471.116
Mattapoiet	BB25.0	Approved	1651.971
Mattapoiet	BB25.11	Prohibited	66.89
Mattapoiet	BB25.2	Conditionally Approved	55.467
Mattapoiet	BB25.20	Approved	1.59
Mattapoiet	BB25.4	Prohibited	2.246
Mattapoiet	BB25.6	Prohibited	0.352
Mattapoiet	BB25.7	Prohibited	2.242
Mattapoiet	BB25.9	Prohibited	0.694
Mattapoiet	BB26.1	Conditionally Approved	8.917
Mattapoiet	BB26.2	Restricted	21.102
Mattapoiet	BB26.3	Restricted	1.015
Mattapoiet	BB27.0	Prohibited	26.884
Mattapoiet	BB28.0	Approved	698.751
Mattapoiet	BB29.0	Approved	121.916
Mattapoiet	BB30.0	Approved	56.231
Mattapoiet	BB30.1	Prohibited	3.931
Mattapoiet	BB30.2	Prohibited	0.251
Mattapoiet	BB31.0	Approved	75.391
Mattapoiet	BB31.1	Prohibited	5.888
New Bedford	BB11.2	Prohibited	152.573
New Bedford	BB13.1	Conditionally Approved	240.272
New Bedford	BB13.21	Conditionally Approved	36.953
New Bedford	BB13.22	Conditionally Approved	69.794
New Bedford	BB13.3	Restricted	0.076
New Bedford	BB13.4	Restricted	135.437
New Bedford	BB13.5	Prohibited	0.297

Town	Classification Area Code	Classification Type	Area (Acres)
New Bedford	BB13.6	Restricted	93.132
New Bedford	BB13.7	Prohibited	68.748
New Bedford	BB14.2	Prohibited	176.077
New Bedford	BB15.1	Prohibited	625.93
New Bedford	BB15.5	Conditionally Approved	364.259
New Bedford	BB15.51	Prohibited	15.382
New Bedford	BB15.52	Restricted	142.905
New Bedford	BB15.6	Restricted	107.179
New Bedford	BB15.7	Restricted	305.342
Plymouth	CCB38.0	Approved	0.159
Plymouth	CCB39.0	Approved	15224.417
Plymouth	CCB39.1	Prohibited	166.214
Plymouth	CCB41.0	Approved	18241.233
Plymouth	MB1.0	Approved	1449.072
Sandwich	CCB35.0	Approved	11865.387
Wareham	BB28.0	Approved	7.487
Wareham	BB33.0	Approved	2161.739
Wareham	BB33.0	Approved	863.079
Wareham	BB35.0	Approved	68.096
Wareham	BB35.1	Prohibited	20.045
Wareham	BB35.2	Prohibited	123.817
Wareham	BB35.4	Prohibited	29.239
Wareham	BB35.5	Conditionally Approved	108.21
Wareham	BB36.0	Approved	422.577
Wareham	BB36.1	Prohibited	27.244
Wareham	BB36.11	Prohibited	15.479
Wareham	BB36.20	Approved	14.274
Wareham	BB36.21	Approved	21.444
Wareham	BB36.3	Prohibited	292.972
Wareham	BB36.4	Prohibited	3.08
Wareham	BB36.5	Prohibited	4.21
Wareham	BB36.6	Prohibited	1.237
Wareham	BB36.7	Prohibited	3.797
Wareham	BB36.8	Conditionally Approved	63.733
Wareham	BB36.9	Prohibited	24.663
Wareham	BB37.0	Approved	153.864
Wareham	BB38.0	Approved	188.915
Wareham	BB39.0	Approved	187.115
Wareham	BB40.0	Approved	393.935
Wareham	BB40.20	Conditionally Approved	8.569
Wareham	BB40.21	Approved	12.95
Wareham	BB40.22	Approved	29.186
Wareham	BB40.3	Conditionally Approved	95.816
Wareham	BB41.0	Approved	76.204
Wareham	BB41.2	Conditionally Approved	21.373
Wareham	BB42.1	Prohibited	1.546
Wareham	BB42.2	Conditionally Approved	62.496
Wareham	BB42.3	Conditionally Approved	48.881
Wareham	BB42.4	Prohibited	0.117
Wareham	BB43.0	Approved	173.816
Wareham	BB43.1	Prohibited	1.265
Wareham	BB43.2	Prohibited	0.662

Town	Classification Area Code	Classification Type	Area (Acres)
Wareham	BB43.4	Conditionally Approved	2.514
Wareham	BB44.0	Approved	44.651
Wareham	BB44.3	Prohibited	7.474
Wareham	BB44.4	Prohibited	1.462
Wareham	BB44.5	Prohibited	26.58
Westport	BB1.0	Approved	3228.357
Westport	BB1.0	Approved	12747.859
Westport	BB2.0	Prohibited	46.43
Westport	BB3.0	Approved	790.703
Westport	BB3.11	Conditionally Approved	152.122
Westport	BB3.12	Conditionally Approved	228.922
Westport	BB3.13	Approved	3.682
Westport	BB3.2	Prohibited	0.459
Westport	BB3.3	Prohibited	114.163
Westport	BB3.4	Prohibited	0.162
Westport	BB3.5	Conditionally Approved	23.091
Westport	BB3.6	Prohibited	8.258
Westport	BB3.7	Prohibited	0.958
Westport	BB3.8	Prohibited	102.816
Westport	BB4.0	Approved	360.041
Westport	BB4.1	Prohibited	3.386
Westport	BB4.11	Prohibited	1.235
Westport	BB4.13	Conditionally Approved	18.863
Westport	BB4.2	Prohibited	410.628
Westport	BB4.20	Conditionally Approved	10.435
Westport	BB4.21	Approved	23.213
Westport	BB4.23	Approved	2.19
Westport	BB4.24	Approved	18.255
Westport	BB4.4	Prohibited	1.705
Westport	BB4.5	Prohibited	1.013
Westport	BB4.6	Prohibited	0.781
Westport	BB4.7	Conditionally Approved	532.736
Westport	BB4.8	Conditionally Approved	407.72
Westport	BB4.9	Conditionally Approved	180.218
Westport	BB5.0	Approved	80.391
Westport	BB5.0	Approved	4128.721
Westport	BB7.0	Approved	88.547
Westport	E4.0	Approved	0.026

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APPENDIX F- SUMMARY OF WMA PERMITTING INFORMATION, BUZZARDS BAY WATERSHED

Segment	Permit	Registration	PWSID	System Name	Registered Volume (MGD)	20 Year Permitted Volume (MGD)	Source Name	Location
95-04	9P242431003	42431033		A.D. Makepeace Company	12.36	0.73	Churchill Reservoir	
95-04	9P242431003	42431033		A.D. Makepeace Company	12.36	0.73	Lincoln Reservoir	Carver
95-04	9P242431003	42431033		A.D. Makepeace Company	12.36	0.73	Pinewood Lake Reservoir	
95-04	9P242431003	42431033		A.D. Makepeace Company	12.36	0.73	Round Swamp Reservoir	
95-04	9P242431003	42431033		A.D. Makepeace Company	12.36	0.73	South Howes Reservoir	Carver
95-06	9P242431003	42431033		A.D. Makepeace Company	12.36	0.73	Morse Swamp Reservoir	Rochester
95-06	9P242431003	42431033		A.D. Makepeace Company	12.36	0.73	Pierceville Reservoir	
95-06	9P242431003	42431033		A.D. Makepeace Company	12.36	0.73	Tremont Reservoir	
95-28	9P242431003	42431033		A.D. Makepeace Company	12.36	0.73	Besse Reservoir	
95-28	9P242431003	42431033		A.D. Makepeace Company	12.36	0.73	East Branch Reservoir	
95-28	9P242431003	42431033		A.D. Makepeace Company	12.36	0.73	East Wareham Mill Pond	Wareham
95-28	9P242431003	42431033		A.D. Makepeace Company	12.36	0.73	Engine House Reservoir	
95-28	9P242431003	42431033		A.D. Makepeace Company	12.36	0.73	Fawn Pond	Plymouth
95-28	9P242431003	42431033		A.D. Makepeace Company	12.36	0.73	Glen Charlie Reservoir	
95-28	9P242431003	42431033		A.D. Makepeace Company	12.36	0.73	Glen Charlie Reservoir	Wareham
95-28	9P242431003	42431033		A.D. Makepeace Company	12.36	0.73	Halfway Pond	
95-28	9P242431003	42431033		A.D. Makepeace Company	12.36	0.73	Kennard-Eagle Hill Res.	Plymouth
95-28	9P242431003	42431033		A.D. Makepeace Company	12.36	0.73	Long Pond	
95-28	9P242431003	42431033		A.D. Makepeace Company	12.36	0.73	West Branch Reservoir	
95-30	9P242431003	42431033		A.D. Makepeace Company	12.36	0.73	A. D. Makepeace Well #2	Carver
95-30	9P242431003	42431033		A.D. Makepeace Company	12.36	0.73	Alice Reservoir	
95-30	9P242431003	42431033		A.D. Makepeace Company	12.36	0.73	Carver Reservoir	
95-30	9P242431003	42431033		A.D. Makepeace Company	12.36	0.73	East Head Reservoir	
95-30	9P242431003	42431033		A.D. Makepeace Company	12.36	0.73	Frog Foot Main Reservoir	Plymouth
95-30	9P242431003	42431033		A.D. Makepeace Company	12.36	0.73	Frog Foot West Reservoir	Carver
95-30	9P242431003	42431033		A.D. Makepeace Company	12.36	0.73	Golden Field Pond	
95-30	9P242431003	42431033		A.D. Makepeace Company	12.36	0.73	Hammond Reservoir	Carver

Segment	Permit	Registration	PWSID	System Name	Registered Volume (MGD)	20 Year Permitted Volume (MGD)	Source Name	Location
95-30	9P242431003	42431033		A.D. Makepeace Company	12.36	0.73	Harwich Lower Reservoir	
95-30	9P242431003	42431033		A.D. Makepeace Company	12.36	0.73	Harwich Upper Reservoir	
95-30	9P242431003	42431033		A.D. Makepeace Company	12.36	0.73	Locke Reservoir	Wareham
95-30	9P242431003	42431033		A.D. Makepeace Company	12.36	0.73	New Mosquito Dam	Wareham
95-30	9P242431003	42431033		A.D. Makepeace Company	12.36	0.73	Oak Swamp Reservoir	Plymouth
95-30	9P242431003	42431033		A.D. Makepeace Company	12.36	0.73	Parker Mills Pond Res.	Plymouth
95-30	9P242431003	42431033		A.D. Makepeace Company	12.36	0.73	Racoon Pond	
95-30	9P242431003	42431033		A.D. Makepeace Company	12.36	0.73	Tihonet Pond	Wareham
95-30	9P242431003	42431033		A.D. Makepeace Company	12.36	0.73	Tihonet Pond	Wareham
95-30	9P242431003	42431033		A.D. Makepeace Company	12.36	0.73	Tihonet Pond Reservoir	Wareham
95-30	9P242431003	42431033		A.D. Makepeace Company	12.36	0.73	A. D. Makepeace Well #1	Carver
95-30	9P242431003	42431033		A.D. Makepeace Company	12.36	0.73	Bartlett's Marsh Pond	
95-30	9P242431003	42431033		A.D. Makepeace Company	12.36	0.73	Edwards Reservoir	
95-30	9P242431003	42431033		A.D. Makepeace Company	12.36	0.73	Slug Stream	
95-30	9P242431003	42431033		A.D. Makepeace Company	12.36	0.73	White Island Pond	
95-30	9P242431003	42431033		A.D. Makepeace Company	12.36	0.73	Marsh Bog	Wareham
95-31	9P242400301			Acushnet River Golf Course		0.1	Irrigation Well	Acushnet
95-04	9P242403602	42403603		Agawam Cranberry Company	0.51	0.06	South Meadow Bogs	Carver
95-30	9P242403602	42403603		Agawam Cranberry Company	0.51	0.06	C P Bogs	Wareham
95-30	9P242403602	42403603		Agawam Cranberry Company	0.51	0.06	Laine Bog	Wareham
95-30	9P242403602	42403603		Agawam Cranberry Company	0.51	0.06	Reservoir (upper & Lower)	Buzzards Bay
95-28		42431024		Alan Grassi	0.09	0	Grassi Bog #1	Wareham
95-28		42431024		Alan Grassi	0.09	0	Grassi Bog #2	East Wareham
95-15?		42203604		John M. Alden	0.12	0	C-1 Surface Supply	Monument Beach
95-04		42405233		Alex Johnson & Sons	0.34	0	Bates Pond Bog	So. Carver
95-04		42405233		Alex Johnson & Sons	0.34	0	Company Bogs	Carver
95-04		42405233		Alex Johnson & Sons	0.34	0	Maki Bog	Carver

Segment	Permit	Registration	PWSID	System Name	Registered Volume (MGD)	20 Year Permitted Volume (MGD)	Source Name	Location
95-04		42418201		Anna's Bogs	0.23	0	Beach Street Reservoir #1	Middleborough
95-04		42418201		Anna's Bogs	0.23	0	Beach Street Reservoir #2	Middleborough
95-04		42429301		Annawon Council, Boy Scouts - America	0.02	0	Darby Pond	Plymouth
95-04		42405228		Austin B. Mason III	0.08	0	Sampson's Pond	South Carver
95-01	9P442423903			Atlantic Country Club		0.13	Well #1 and well #2	Plymouth
95-04		42423905		B & B Bogs	0.05	0	B&B Bogs	Plymouth
95-05		42405286		Bailey Bogs, Inc.	0.26		Cranebrook	South Carver
95-05		42405286		Bailey Bogs, Inc.	0.26		Pond (Wareham St.)	South Carver
95-05		42405286		Bailey Bogs, Inc.	0.26		Reservoir (Cranberry Rd)	South Carver
95-05		42405286		Bailey Bogs, Inc.	0.26		Well #1	South Carver
95-04		42405259		Barry and Lorraine Olson	0.37	0	Cranberry Bogs #1	Carver
95-04		42405259		Barry and Lorraine Olson	0.37	0	Cranberry Bogs #3	Carver
95-06		42405259		Barry and Lorraine Olson	0.37	0	Cranberry Bogs #2	Middleboro
95-04		42416902		Bartholomew Bogs	0.38	0	Weweantic River Bog	Plymouth
95-30		42416902		Bartholomew Bogs	0.38	0	Taber-Randall Reservoir	So. Carver
95-30		42416902		Bartholomew Bogs	0.38	0	Taber-Randall Well	So. Carver
95-35	9P442417301			Bay Club at Mattapoisett		0.26	Irrigation Well E-3	Mattapoisett
953-35	9P442417301			Bay Club at Mattapoisett		26	Irrigation Well E-5	Mattapoisett
95-05		42431032		Bayside Agricultural Inc.	0.7	0	Horseshoe Pond	Wareham
95-06		42431032		Bayside Agricultural Inc.	0.7	0	Eldridge Reservoirs	Rochester
95-06		42431032		Bayside Agricultural Inc.	0.7	0	Fran Le Baron Sump	Rochester
95-06		42431032		Bayside Agricultural Inc.	0.7	0	Sippican River	Rochester
95-07		42431032		Bayside Agricultural Inc.	0.7	0	14 Acre Well	Wareham
95-07		42431032		Bayside Agricultural Inc.	0.7	0	Blackmore Pond	Wareham
95-07		42431032		Bayside Agricultural Inc.	0.7	0	Eagle Holt Sumps	Wareham
95-07		42431032		Bayside Agricultural Inc.	0.7	0	Harju Reservoir	Wareham
95-07		42431032		Bayside Agricultural Inc.	0.7	0	Sippican River (Marion)	Marion

Segment	Permit	Registration	PWSID	System Name	Registered Volume (MGD)	20 Year Permitted Volume (MGD)	Source Name	Location
95-08		42431032		Bayside Agricultural Inc.	0.7	0	Marion Bog Reservoirs	Marion
95-29		42431032		Bayside Agricultural Inc.	0.7	0	Parker Mills Reservoirs	Wareham
95-04		42405278		Beaton & LeBaron (Lind bogs)	0.11	0	Big Lind Reservoir	Middleborough
95-04		42405278		Beaton & LeBaron (Lind bogs)	0.11	0	Little Lind Reservoir	Middleborough
95-04		42405248		Beaver Dam Bog	0.05	0	Beaver Dam Bog	Carver
95-04		42405283		Benson Pond, Inc.	0.17		Benson Pond Bogs	Middleboro
95-09		42416904		Betsy C. Grassi	0.1	0	Rocky Nook Bog	Marion
95-04		V42431034		Betty L Myers	0.04	0	Weweantic River	Wareham
95-06		V42431034		Betty L Myers	0.04	0	High St. Bog(Rochester)	Rochester
95-04		42418214		Big Rock Farm, Inc.	0.14	0	Big Rock Bogs	So. Middleboro
95-16	9P42203601	42203602	4036000	Bourne Water District	0.73	0.67	Pump Sta. #1(has 4 wells)	Monument Beach
95-18	9P42203601	42203602	4036000	Bourne Water District	0.73	0.67	Pump Station #2	Cataumet
95-16	9P42203601	42203602	4036000	Bourne Water District	0.73	0.67	Pump Sta. #3 State forest	Monument Beach
95-16	9P42203601	42203602	4036000	Bourne Water District	0.73	0.67	Pump Station #4	Monument Beach
95-18	9P42203601	42203602	4036000	Bourne Water District	0.73	0.67	Pump Station #5	Cataumet
95-16	9P42203601	42203602	4036000	Bourne Water District	0.73	0.67	Pump Station #6	Pocasset
95-30		42405260		Bowers and Russell	0.3	0	East Head Reservoir	Plymouth/ Carver
95-36		42425022		Bryan Sherman	0.05	0	Gifford St.	Rochester
95-04		42405280		Burgess Bog Company, Inc.	0.23	0	Burgess Bog	Carver
95-04		42405280		Burgess Bog Company, Inc.	0.23	0	Burgess Well	Carver
95-01	9P42403601	42403606	4036001	Buzzards Bay Water District	0.37	0.16	Pumping Station #1	Buzzards Bay
95-01	9P42403601	42403606	4036001	Buzzards Bay Water District	0.37	0.16	Pumping Station #2	Buzzards Bay
95-01	9P42403601	42403606	4036001	Buzzards Bay Water District	0.37	0.16	Pumping Station #3	Buzzards Bay
95-01	9P42403601	42403606	4036001	Buzzards Bay Water District	0.37	0.16	Pumping Station #4	Buzzards Bay
95-06		42418206		C & L Trust-Stanley Lowell	0.18	0	Wareham Street Reservoir	So. Middleboro

Segment	Permit	Registration	PWSID	System Name	Registered Volume (MGD)	20 Year Permitted Volume (MGD)	Source Name	Location
95-01		42403604		Cape American Cranberry Corporation	0.12	0	McMahon Bog	Buzzards Bay
		42417303		Carl Hubacheck	0.14			
95-06		42425009		Carr Family Limited Partnership	0.15	0	Leonards' Pond	Rochester
95-06		42425009		Carr Family Limited Partnership	0.15	0	Mary's Pond	Rochester
95-04		42423907		Carter Cranberry	0.04	0	Pinewood Lane Bogs	Plymouth
		42405231		Carver Cranberries, Corporation	0.09	0	Edaville RR Bogs	Carver
95-04	9P242405205	42431044		Carver/Middleboro Cranberry Co., Inc	0.33	0.16	Bog Pond	Middleboro
95-07		42431030		Cedar Meadows Trust of 1990	0.05	0	S-1 Reservoir	West Wareham
95-07		42431030		Cedar Meadows Trust of 1990	0.05	0	S-2 Reservoir	West Wareham
95-07		42431030		Cedar Meadows Trust of 1990	0.05	0	S-3 Reservoir	West Wareham
95-04		42405210		Cedar Swamp Bog Company	0.08	0	Cedar Swamp Bog	Carver
95-04		42405210		Cedar Swamp Bog Company	0.08	0	Formerly Pierce Bog	South Carver
95-04		42405244		Cedarbrook Cranberry Harvest	0.09	0	Cedarbrook Reservoir	Carver
95-04		42405218		Charles R. Johnson	0.23	0	Fosdick Road Bogs	Carver
95-04		42405256		Charles W. Garnett	0.21	0	Popes Point Bog	Carver
95-04		42431027		Clear Pond Bogs	0.15	0	Clear Pond #1 Well	So. Carver
95-04		42431027		Clear Pond Bogs	0.15	0	Clear Pond Bogs	So. Carver
95-04		42431027		Clear Pond Bogs	0.15	0	Lincoln's Duck Dinner	So. Carver
95-11	9P42407202			Country Club of New Bedford		0.19		
95-06		42431037		County Road Bog	0.05	0	County Road Bog	Rochester
95-06		42431037		County Road Bog	0.05	0	High Street Bog	Rochester
		42405284		Cousins Cranberry Company LLC	0.05			
95-04		V42405281		Craig Weston (Simeone Bog)	0.04	0	Simeone Bog	Carver
95-04		42405252		Cranberry Country Bogs	0.21	0	Cranberry Country Bogs	Carver
95-05		42431051		Cross Neck Bog (Frank Cerkovitz)	0.05	0	Cross Neck Bog	Marion
95-04		42405212		Curtis T. Young	0.06	0	Bates Pond	Carver

Segment	Permit	Registration	PWSID	System Name	Registered Volume (MGD)	20 Year Permitted Volume (MGD)	Source Name	Location
95-04		42405212		Curtis T. Young	0.06	0	Weweantic River	Carver
95-04		42419602		D. Melville Cranberry Bogs	0.02	0	Melville Bog #1	Plymouth
95-04		42419602		D. Melville Cranberry Bogs	0.02	0	Melville Bog #2	Plymouth
95-04		42431006		Dana C. Johnson	0.08	0	D. Johnson Reservoir	Middleboro
95-04		42405232		Daniel J Bryden	0.03	0	Shurtleff Corner Bog	Carver
95-04		42431021		Daniel Johnson Cranberry Bogs	0.14	0	France Street Bog	Middleboro
95-04		42431021		Daniel Johnson Cranberry Bogs	0.14	0	Shurtleff Bog	Carver & Wareham
95-12	9P242407203	42420102		Dartmouth Cranberry Company	0.11	0.1	Dartmouth Bogs	Dartmouth
95-12	9P242407203	42420102		Dartmouth Cranberry Company	0.11	0.1	Reservoir	New Bedford
95-40	9P242407201	42407202	4072000	Dartmouth Water Department	1.35	2.11	Route 6 Well	Dartmouth
95-11	9P242407201	42407202	4072000	Dartmouth Water Department	1.35	2.11	Chase Road D	North Dartmouth
95-11	9P242407201	42407202	4072000	Dartmouth Water Department	1.35	2.11	Chase Road E-1	North Dartmouth
95-11	9P242407201	42407202	4072000	Dartmouth Water Department	1.35	2.11	Chase Road E-2	North Dartmouth
95-11	9P242407201	42407202	4072000	Dartmouth Water Department	1.35	2.11	Chase Road Well A	Dartmouth
95-11	9P242407201	42407202	4072000	Dartmouth Water Department	1.35	2.11	Chase Road Well B	Dartmouth
95-11	9P242407201	42407202	4072000	Dartmouth Water Department	1.35	2.11	Chase Road Well C	Dartmouth
95-11	9P242407201	42407202	4072000	Dartmouth Water Department	1.35	2.11	Violetta #2	North Dartmouth
95-11	9P242407201	42407202	4072000	Dartmouth Water Department	1.35	2.11	Violetta #3	North Dartmouth
95-11	9P242407201	42407202	4072000	Dartmouth Water Department	1.35	2.11	Violetta Well	Dartmouth
95-11	9P242407201	42407202	4072000	Dartmouth Water Department	1.35	2.11	Well F-1	North Dartmouth
95-11	9P242407201	42407202	4072000	Dartmouth Water Department	1.35	2.11	Well F-2	North Dartmouth
95-04		42405263		Dave M. Cowan	0.04	0	So. Meadow Brook Pond	Carver
95-04		42405243		David A. Lawson	0.04	0	South Meadow Road Well	Carver
95-04		V42418217		David J. Erickson	0.04	0	David J. Erickson	Middleboro

Segment	Permit	Registration	PWSID	System Name	Registered Volume (MGD)	20 Year Permitted Volume (MGD)	Source Name	Location
95-04		42431041		David W & Eleanor M. Eldredge	0.16	0	Eldredge Bogs	So. Carver
95-04		42405261		Davison Partners	0.23	0	Mayflower Road Reservoir	Carver
95-04	9P442431004	42431016		Decas Cranberry Company, Inc.	3.06	0.11	Carver 5+7	Carver
95-04	9P442431004	42431016		Decas Cranberry Company, Inc.	3.06	0.11	Decas #2	Carver
95-04	9P442431004	42431016		Decas Cranberry Company, Inc.	3.06	0.11	Decas #3	Carver
95-04	9P442431004	42431016		Decas Cranberry Company, Inc.	3.06	0.11	Decas #4	Carver
95-04	9P442431004	42431016		Decas Cranberry Company, Inc.	3.06	0.11	Decas Reservoir #1	Carver
95-04	9P442431004	42431016		Decas Cranberry Company, Inc.	3.06	0.11	Decas Well #1	Carver
95-04	9P442431004	42431016		Decas Cranberry Company, Inc.	3.06	0.11	Decas Well #2	Carver
95-04	9P442431004	42431016		Decas Cranberry Company, Inc.	3.06	0.11	Dunham Pond	Carver
95-04	9P442431004	42431016		Decas Cranberry Company, Inc.	3.06	0.11	Swamp Reservoir	Carver
95-04	9P442431004	42431016		Decas Cranberry Company, Inc.	3.06	0.11	Unnamed Irrigation Pond	Wareham
95-04	9P442431004	42431016		Decas Cranberry Company, Inc.	3.06	0.11	Unnamed Reservoir	Wareham
95-06	9P442431004	42431016		Decas Cranberry Company, Inc.	3.06	0.11	Clapp Road Reservoir	Rochester
95-06	9P442431004	42431016		Decas Cranberry Company, Inc.	3.06	0.11	Mary's Pond	Rochester
95-06	9P442431004	42431016		Decas Cranberry Company, Inc.	3.06	0.11	Mary's Pond	Wareham
95-06	9P442431004	42431016		Decas Cranberry Company, Inc.	3.06	0.11	Pierceville Reservoir	Rochester
95-06	9P442431004	42431016		Decas Cranberry Company, Inc.	3.06	0.11	Stuart Pond #2	Rochester
95-36	9P442431004	42431016		Decas Cranberry Company, Inc.	3.06	0.11	Long Pond	Rochester
95-36	9P442431004	42431016		Decas Cranberry Company, Inc.	3.06	0.11	Long Pond #2	Rochester
95-36	9P442431004	42431016		Decas Cranberry Company, Inc.	3.06	0.11	Long Pond #3	Rochester
95-36	9P442431004	42431016		Decas Cranberry Company, Inc.	3.06	0.11	Mattapoisett #1	Mattapoisett
95-36	9P442431004	42431016		Decas Cranberry Company, Inc.	3.06	0.11	Mattapoisett #2	Mattapoisett
95-36	9P442431004	42431016		Decas Cranberry Company, Inc.	3.06	0.11	Mattapoisett #3	Mattapoisett
95-36	9P442431004	42431016		Decas Cranberry Company, Inc.	3.06	0.11	Stuart Pond	Rochester
95-31		42423904		Dietlin Bogs, Inc.	0.13	0	Dietlin Bogs	E. Freetown
95-01		42431017		Donald F. Grassi Cranberries	0.2	0	Little Rocky-Whites Pond	Plymouth
95-01		42431017		Donald F. Grassi Cranberries	0.2	0	Long Duck Pond	West Wareham

Segment	Permit	Registration	PWSID	System Name	Registered Volume (MGD)	20 Year Permitted Volume (MGD)	Source Name	Location
95-01		42431017		Donald F. Grassi Cranberries	0.2	0	Well #1	West Wareham
95-04		42431003		Double Brook Cranberry Corporation	0.15	0	Double Brook Reservoir	Middleboro
95-06		42431019		Double M Cranberry Company, Inc.	0.34	0	Double M Well #1	Rochester
95-36		42431019		Double M Cranberry Company, Inc.	0.34	0	Double M Reservoir #1	Rochester
95-36		42431019		Double M Cranberry Company, Inc.	0.34	0	Double M Reservoir #2	Rochester
95-36		42431019		Double M Cranberry Company, Inc.	0.34	0	Double M Well #2	Rochester
95-36		42431019		Double M Cranberry Company, Inc.	0.34	0	Double M Well #3	Rochester
	9P242405204			Double T Bog Co, Inc.		0.04	Double T Bog	South Carver
95-06		42425020		EAC SEMASS (Cranberry Bog)	0.06	0	Semass Reservoir	Rochester
		42431062		Eagle Holt Company, Inc.	1.1			
		42425023		Edgewater Bogs Realty Trust	0.08	0	Snipatuit Pond-Maxim Bog	Rochester
95-04	9P242405207	42405267		Edgewood Bogs	1.76	0.01	Atwood Bog A&B-Edgewood	Carver
95-04	9P242405207	42405267		Edgewood Bogs	1.76	0.01	Cranebrook Bog-Edgewood	Carver
	9P242405207	42405267		Edgewood Bogs	1.76	0.01	South Meadow Bog	Carver
95-04		42424001		Edgewood bogs, LLC	0.5	0	Queen Bog	Carver
95-30		42425001		Edward Ashley	0.62	0	Rosebrook Well	Wareham
95-30		42425001		Edward Ashley	0.62	0	Alley Bog	Rochester
95-30		42425001		Edward Ashley	0.62	0	Clark Bog	Rochester
95-30		42425001		Edward Ashley	0.62	0	Rosebrook Bog	Rochester
95-04		42405238		Edward Silva Jr.	0.09	0	Old Center Street Bog	Carver
95-04		42405219		Edwin K. & Elaine J. Harju	0.04	0	Popes Point Road Bog	Carver
95-04		42405241		Eino F. Harju Trust	0.14	0	Tremont Street Pond	Carver
95-04		42405257		Ellis D. Atwood, Inc.	2.33	0	Atwood Bogs	So. Carver
95-04		42405257		Ellis D. Atwood, Inc.	2.33	0	Shoe String Bog	So. Carver

Segment	Permit	Registration	PWSID	System Name	Registered Volume (MGD)	20 Year Permitted Volume (MGD)	Source Name	Location
95-04		42405230		Elsie J. Johnson	0.09	0	Main Street Bog	Carver
95-30		42405230		Elsie J. Johnson	0.09	0	Southwest Line Bog	Plymouth
95-04		42423903		Eric Haarala	0.13	0	France and Pope Pond	Carver
95-04		42423903		Eric Haarala	0.13	0	France Street Pond	Middleboro
95-04		42418215		Erickson Bogs	0.23	0	Erickson Bogs	Middleboro
95-35	9P42409401	42409401	4094000	Fairhaven Water Department	1.07	0.69	Mattapoissett-Tubular	Mattapoissett
NA	9P42409401	42409401	4094000	Fairhaven Water Department	1.07	0.69	Nasketucket Tubular Wells	Fairhaven
95-36	9P42409401	42409401	4094000	Fairhaven Water Department	1.07	0.69	Tinkham Lane GP	Fairhaven
95-36	9P42409401	42409401	4094000	Fairhaven Water Department	1.07	0.69	Well #1-Wolf Island Road	Mattapoissett
95-36	9P42409401	42409401	4094000	Fairhaven Water Department	1.07	0.69	Well #2-Wolf Island Road	Mattapoissett
95-36	9P42409401	42409401	4094000	Fairhaven Water Department	1.07	0.69	Well #3-Wolf Island Road	Mattapoissett
95-43		42409501	4095000	Fall River Water Department	6.37	0	4095000-03S	
95-23 95-24	9P42209601	42209607	4096000	Falmouth Water Department	2.95	1.36	Long Pond Reservoir	Falmouth
95-23?	9P42209601	42209607	4096000	Falmouth Water Department	2.95	1.36	Mares Pond Well	Falmouth
95-22	9P42209601	42209607	4096000	Falmouth Water Department	2.95	1.36	Crooked Pond Well	Falmouth
---	9P42209601	42209607	4096000	Falmouth Water Department	2.95	1.36	Fresh Pond Well & Coonamesett Pond Well	Cape Cod Watershed
95-07		42416903		Farrell Cranberry Company	0.06	0	Sippican River Bog	Marion
95-01		42405209		Federal Furnace Cranberry Company	2.14	0	Bourne Road Well	Plymouth
95-01		42405209		Federal Furnace Cranberry Company	2.14	0	Ware Bog	Plymouth
95-04		42405209		Federal Furnace Cranberry Company	2.14	0	Federal Pond	Carver
95-04		42405246		Fiilus Harju Cranberry Co.	0.05	0	Meadow Street Bog	Carver
95-04		42405249		Flax Pond Cranberry Company	0.22	0	Flax Pond	Carver
95-04		42405217		Francis V. Johnson	0.07	0	Cross Street Bog	Carver
95-04		42405217		Francis V. Johnson	0.07	0	Forest Street Bog	Carver
95-07		42431010		Frank & Patricia Kaasinen	0.07	0	Squirrel Island Bog	West Wareham

Segment	Permit	Registration	PWSID	System Name	Registered Volume (MGD)	20 Year Permitted Volume (MGD)	Source Name	Location
95-07		42431010		Frank & Patricia Kaasinen	0.07	0	Squirrel Island Reservoir	West Wareham
95-31		42410205		Frank H. Ashley	0.04	0	Ashley Reservoir	East Freetown
95-04		42405214		Frederick & Virginia Weston	0.15	0	Holmes Street Reservoir	Carver
95-04		42405214		Frederick & Virginia Weston	0.15	0	Wade Street Well	Carver
95-04		42405214		Frederick & Virginia Weston	0.15	0	Wade Street Bog	Carver
95-31		42410209		Fruit of the Vine Cranberry Co.	0.14	0	Acushnet Bog	Acushnet
95-31		42410209		Fruit of the Vine Cranberry Co.	0.14	0	Freetown Bog	East Freetown
95-04		42405268		Gary F. Weston	0.27	0	Weston Reservoir #1	Carver
95-04		42405268		Gary F. Weston	0.27	0	Weston Reservoir #2	Carver
95-04		42405268		Gary F. Weston	0.27	0	Weston Reservoir #3	Carver
95-04		42405268		Gary F. Weston	0.27	0	Weston Reservoir #4	Carver
95-04		42405268		Gary F. Weston	0.27	0	Weston Well	Carver
95-06		42418202		Gates Cranberry L.L.C.	0.31	0	Spruce Street Bogs	So. Middleborough
95-31		42418202		Gates Cranberry L.L.C.	0.31	0	Braley Bogs	Freetown
95-04	9P242405206	42405226		Gilmore Cranberry Co., Inc.	0.51	0.13	South Carver Bog	South Carver
95-04	9P242405206	42405226		Gilmore Cranberry Co., Inc.	0.51	0.13	Thomas Bog-B. Gilmore	S. Carver
95-36	9P242405206	42405226		Gilmore Cranberry Co., Inc.	0.51	0.13	Gilmore Bogs 1, 2 & 3	Rochester
95-36	9P242405206	42405226		Gilmore Cranberry Co., Inc.	0.51	0.13	Snows Pond Bog-Gilmore	Rochester
	9P242405206	42405226		Gilmore Cranberry Co., Inc.	0.51	0.13	S. Carver Bogs-B. Gilmore	S. Carver
	9P242405206	42405226		Gilmore Cranberry Co., Inc.	0.51	0.13	Thomas Bog	South Carver
95-06	9P242425002	42431049		Great Bear Farms, Inc.	0.3	0.18	Great Neck Bogs	Rochester
95-06	9P242425002	42431049		Great Bear Farms, Inc.	0.3	0.18	Bogs 5 - 13 (Pond #3)	Rochester
95-06	9P242425002	42431049		Great Bear Farms, Inc.	0.3	0.18	Bogs 5 -13 (Pond #4)	Rochester
95-06	9P242425002	42431049		Great Bear Farms, Inc.	0.3	0.18	Bogs 5 -13 (Pond 1 & 2)	Rochester
95-04		42405247		Griffith Cranberry Company, Inc.	0.23	0	Indian Street Bog	So. Carver
95-18		42209609		Handy Cranberry Trust	2.08	0	Wells #1 & #2	Cataumet
---		42209609		Handy Cranberry Trust	2.08	0	Cranberry Bog s (11G & 2S)	Cape Cod Watershed

Segment	Permit	Registration	PWSID	System Name	Registered Volume (MGD)	20 Year Permitted Volume (MGD)	Source Name	Location
95-04		42418212		Harju Bros. Cranberries, Inc.	0.24	0	Beaver Dam River	Carver
95-04		42418212		Harju Bros. Cranberries, Inc.	0.24	0	Bent Bog	Carver
95-07		42416907		Harju Cranberry Bogs	0.09	0	County Road Reservoir	Marion
95-07		42416907		Harju Cranberry Bogs	0.09	0	Squirrel Island Reservoir	W. Wareham
	9P342425003			Hartley-Rhodes, Inc.		0.07	Hartley-Rhodes Bogs	Rochester
95-04		42405269		Heikkila Cranberry Bogs	0.14	0	Heikkila Well #2	Carver
95-04		42405269		Heikkila Cranberry Bogs	0.14	0	Heikkita Bog #1	Carver
95-04		42405269		Heikkila Cranberry Bogs	0.14	0	Heikkita Bog #2	Carver
95-04		42405269		Heikkila Cranberry Bogs	0.14	0	Heikkita Bog #3	Carver
95-04		42405269		Heikkila Cranberry Bogs	0.14	0	Heikkita Well #1	Carver
95-04		42405269		Heikkila Cranberry Bogs	0.14	0	Heikkita Well #3	Carver
95-04		42418203		Heinz Cranberries, Inc.	0.06	0	Heinz Bogs	Carver
95-29		42431035		Herbert Ashley	0.55	0	Mill Pond	E. Wareham
95-04		42431038		High Line Bog	0.05	0	High Line Bog	W. Wareham
95-06		42425007		Hiller Brothers, Inc.	0.9	0	Hathaway Mill Pond	Rochester
95-06		42425007		Hiller Brothers, Inc.	0.9	0	Leonards Pond	Rochester
95-06		42425007		Hiller Brothers, Inc.	0.9	0	Leonards' Pond	Rochester
95-04		42425008		Hiller Cranberries, Inc.	0.42	0	Wenham Pond	Carver
95-04		42425008		Hiller Cranberries, Inc.	0.42	0	Weweantic River	Carver
95-29		42431048		James Ashley	0.82	0	Bangs Bog	Wareham
95-04		42418216		James DiBurgo	0.58	0	Rocky Meadow Bog #1	Middleboro
95-04		42418216		James DiBurgo	0.58	0	Rocky Meadow Bog #2	Middleboro
95-04		42418216		James DiBurgo	0.58	0	Rocky Meadow Bog #3	Middleboro
95-04		42418216		James DiBurgo	0.58	0	Rocky Meadow Bog #4	Middleboro
95-04		42431061		James E Croke	0.22	0	James Croke-Weweantic R.	Wareham
95-04		42405251		James F. & Maureen M. Shephard Jr.	0.07	0	Bow Street Bog	Carver
95-04		42405251		James F. & Maureen M. Shephard Jr.	0.07	0	Bow Street Well #1	Carver

Segment	Permit	Registration	PWSID	System Name	Registered Volume (MGD)	20 Year Permitted Volume (MGD)	Source Name	Location
95-04		42405251		James F. & Maureen M. Shephard Jr.	0.07	0	Bow Street Well #2	Carver
95-31		42410207		James L. Lopes	0.05	0	Lapes Reservoir	East Freetown
95-04		42419603		John G. Shurtleff, Jr.	0.05	0	Weweantic River	
95-04		42405282		Joseph Krystofolski	0.2	0	Meadow Street Bog	Carver
95-04		42405282		Joseph Krystofolski	0.2	0	Pine Street Bog	Carver
		42405287		Jungle Bog (Roger W. Shores)	0.07			
95-04		42405211		Kallio Bogs	0.66	0	Kallio Bog #1	So. Carver
95-04		42405211		Kallio Bogs	0.66	0	Kallio Bog #2	So. Carver
95-04		42405211		Kallio Bogs	0.66	0	Kallio Well #2	So. Carver
95-04		42405211		Kallio Bogs	0.66	0	Tremont Street Well #1	So. Carver
95-06		42425024		Karl J. Ashley III & Wendy Ashley	0.43		Rosebrook Bog	Rochester
		V42400303		Keith' Tree Farm & Nursery	0.06	0		
95-04		42418205		Ken Harju & Sons Cranberries, Inc.	0.66	0	France Street Reservoir	Middleboro
95-04		42418205		Ken Harju & Sons Cranberries, Inc.	0.66	0	Old Center St. Bogs	Carver
	9P242407202			King Fisher Corp.		0.11	Pond A (Bogs 1-6 &9)	Dartmouth
	9P242407202			King Fisher Corp.		0.11	Pond B (Bogs 7 & 8)	Dartmouth
95-04		42405216		Lakeville Redi-Mix/Lakeside Crushin	0.28	0	Tremont Street Well	South Carver
95-04		42405216		Lakeville Redi-Mix/Lakeside Crushin	0.28	0	Tremont Street Reservoir	South Carver
95-31		42410203		Lakewood Cranberry Co., Inc.	0.23	0	Freetown Bog Reservoir	East Freetown
95-31		42410203		Lakewood Cranberry Co., Inc.	0.23	0	Lakewood Reservoir	Acushnet
95-06		42418210		Laurance S. Cowan	0.04	0	Cowan Reservoir	Middleboro
95-04		42405220		Leonard A. Pierce	0.07	0	Rocky Meadow Reservoir	Middleboro
95-04		42405220		Leonard A. Pierce	0.07	0	Wareham Street Bog	South Carver
95-06		42405220		Leonard A. Pierce	0.07	0	Route 28 and 429 Bog	South Middleboro

Segment	Permit	Registration	PWSID	System Name	Registered Volume (MGD)	20 Year Permitted Volume (MGD)	Source Name	Location
95-04		42431018		Line Bog Cranberries	0.13	0	Line Bog Reservoir	Carver
95-04		42431018		Line Bog Cranberries	0.13	0	Line Bog Well Pump	Carver
95-31		42400301		Long Plain Cranberry Company, Inc.	0.04	0	Weston Bogs	Acushnet
95-04		42426401		Lunar Berries Company	0.14	0	Lunar Bogs	Carver
95-06		42416908		Magnolia Cranberry Company	0.05	0	Wiles Irrigation Sump	Marion
95-29		42431014		Makepeace FH Acquisition Corp.	0.9	0	Agawam Bog Reservoir	Wareham
95-29		42431014		Makepeace FH Acquisition Corp.	0.9	0	Fuller Well #31	Wareham
95-30		42431014		Makepeace FH Acquisition Corp.	0.9	0	Smalley Bog Reservoir	Wareham
95-30		42431014		Makepeace FH Acquisition Corp.	0.9	0	Fuller Well #1	Wareham
95-01		42403605		Mann Farms Inc.	1.22	0	Bay Road Reservoir #1	Buzzards Bay
95-01		42403605		Mann Farms Inc.	1.22	0	Bay Road Reservoir #2	Buzzards Bay
95-01		42403605		Mann Farms Inc.	1.22	0	Bay Road Reservoir #3	Buzzards Boy
95-01		42403605		Mann Farms Inc.	1.22	0	Bay Road Reservoir #4	Buzzards Bay
95-01		42403605		Mann Farms Inc.	1.22	0	Bay Road Reservoir #5	Buzzards Bay
95-01		42403605		Mann Farms Inc.	1.22	0	Bay Road Well #1	Buzzards Bay
95-01		42403605		Mann Farms Inc.	1.22	0	Bay Road Well #2	Buzzards Bay
95-01		42403605		Mann Farms Inc.	1.22	0	Bay Road Well #3	Buzzards Bay
95-05		42403605		Mann Farms Inc.	1.22	0	Route 6 Reservoir #2	Wareham
95-05		42403605		Mann Farms Inc.	1.22	0	Route 6 Reservoir #3	Wareham
95-05		42403605		Mann Farms Inc.	1.22	0	Route 6 Well	Wareham
95-30		42403605		Mann Farms Inc.	1.22	0	Route 6 Reservoir #1	Wareham
95-28		42431040		Maple Park Properties, Inc.	0.29	0	Maple Park Reservoir	E. Wareham
95-06		42425012		Maranatha Growers	0.06	0	Maranatha Bog	Rochester
95-06	9P42416901	42416910	4169000	Marion Water Division	0.56	0.18	East Well	Rochester
95-06	9P42416901	42416910	4169000	Marion Water Division	0.56	0.18	Main Water Station #1	Marion
95-06	9P42416901	42416910	4169000	Marion Water Division	0.56	0.18	Mary's Pond Station	Rochester
95-36	9P42416901	42416910	4169000	Marion Water Division	0.56	0.18	North Well	Marion

Segment	Permit	Registration	PWSID	System Name	Registered Volume (MGD)	20 Year Permitted Volume (MGD)	Source Name	Location
95-36	9P42416901	42416910	4169000	Marion Water Division	0.56	0.18	South Well	
95-06	9P42416901	42416910	4169000	Marion Water Division	0.56	0.18	West Well	Rochester
95-36	9P42416901	42416910	4169000	Marion Water Division	0.56	0.18	Wolf Island Station	Rochester
95-09		42416901		Marion, Town of (Cranberry Bogs)	0.06	0	Goldovitz Bog	Marion
95-04		42405255		Mark F. Weston	0.11	0	France Street Bog #1	Middleboro
95-04		42405255		Mark F. Weston	0.11	0	France Street Bog #2	Carver
95-04		42405255		Mark F. Weston	0.11	0	Main Street Bog	Carver
95-06		42431009		Mary Fava	0.12	0	Fava Reservoir	So. Middleborough
95-36	9P42417301	42417301	4173000	Mattapoisett Water & Sewer Dept.	0.42	0.39	Station #2	Mattapoisett
95-36	9P42417301	42417301	4173000	Mattapoisett Water & Sewer Dept.	0.42	0.39	Station #3	Mattapoisett
95-36	9P42417301	42417301	4173000	Mattapoisett Water & Sewer Dept.	0.42	0.39	Station #4	Mattapoisett
95-36	9P42417301	42417301	4173000	Mattapoisett Water & Sewer Dept.	0.42	0.39	Station #5	Mattapoisett
95-36	9P42417301	42417301	4173000	Mattapoisett Water & Sewer Dept.	0.42	0.39	4173000-01G	Mattapoisett
95-02		42431050		Matthew N. Rhodes	0.05	0	Rhodes Well	Wareham
95-02		42431050		Matthew N. Rhodes	0.05	0	Rhodes Bogs	Wareham
95-04		42405225		Meadow Pond Farm	0.09	0	Ward Street Reservoir	Carver
95-04		42405225		Meadow Pond Farm	0.09	0	Ward Street Well	Carver
95-06		42425017		Mello-Wilson Cranberry Corporation	0.18	0	Burgess Avenue Bog	Rochester
95-14		42425017		Mello-Wilson Cranberry Corporation	0.18	0	Neck Pond Bog	Rochester
95-35		42425017		Mello-Wilson Cranberry Corporation	0.18	0	County Road Bog #1	Mattapoisett
95-35		42425017		Mello-Wilson Cranberry Corporation	0.18	0	County Road Bog #2	Mattapoisett
95-11		42410204		Michael G. Ashley	0.4	0	Ashley Bog #1	New Bedford

Segment	Permit	Registration	PWSID	System Name	Registered Volume (MGD)	20 Year Permitted Volume (MGD)	Source Name	Location
95-12		42410204		Michael G. Ashley	0.4	0	Ashley Bog #2	No. Dartmouth
95-14		42226109		Mirant Canal, LLC	0.45	0	Freezer Rd Well #1 Freezer Rd Well #2	Sandwich
	9P242400303			Moniz Estates		0.14	Headwater Reservoir	Acushnet
	9P242400303			Moniz Estates		0.14	Reservoir/Tailwater Pond	Acushnet
95-06		42425006		Morse Bros. Inc.	0.49	0	Morse Brothers Bog	Rochester
95-06		42431039		Morse Swamp Bog	0.14	0	Morse Swamp Bog #1	Rochester
95-06		42431039		Morse Swamp Bog	0.14	0	Morse Swamp Bog #2	Marion
95-06		42425021		N.H.T. Corporation	0.08	0	West Branch Sippican R.	Rochester
95-04		42405227		Nathaniel F. Shurtleff, Jr.	0.23	0	Rochester Road Reservoir	South Carver
95-04	9P242405203	42405270		Oiva Hannula & Sons, Inc.	1	0.15	Bailey Bog	Carver
95-04	9P242405203	42405270		Oiva Hannula & Sons, Inc.	1	0.15	Goddard Bogs	Middleboro
95-04	9P242405203	42405270		Oiva Hannula & Sons, Inc.	1	0.15	Home Bogs	Carver
95-04	9P242405203	42405270		Oiva Hannula & Sons, Inc.	1	0.15	Jungle Bog	Carver
95-04	9P242405203	42405270		Oiva Hannula & Sons, Inc.	1	0.15	Jungle Bog Well	Carver
95-04	9P242405203	42405270		Oiva Hannula & Sons, Inc.	1	0.15	Shaw Bog	Carver
	9P242405203	42405270		Oiva Hannula & Sons, Inc.	1	0.15	New Shaw Bog	Carver
95-04		42405202		Oiva Harju	0.14	0	France Street Reservoir	Middleboro
95-06		42431001		Old Tuck Cranberry Corporation	0.37	0	Old Tuck Reservoir	Rochester
95-02		42431029		Onset Bogs -P & M Piscitelli	0.21	0	Onset Bog #1	Wareham
95-02		42431029		Onset Bogs -P & M Piscitelli	0.21	0	Onset Bog #2	Wareham
	9P42431001	42431031	4310003	Onset Fire District	0.49	0.64	Sand Pond/Station 1	Onset
95-01	9P42431001	42431031	4310003	Onset Fire District	0.49	0.64	Well #3	Onset
95-01	9P42431001	42431031	4310003	Onset Fire District	0.49	0.64	Well #4	Onset
95-02	9P42431001	42431031	4310003	Onset Fire District	0.49	0.64	4310003-03G	Wareham
95-02	9P42431001	42431031	4310003	Onset Fire District	0.49	0.64	4310003-04G	Wareham
95-04		42431004		P & S Cranberry Service Inc.	0.12	0	P&S Bogs	W. Wareham
95-04		42431011		Patterson Brook Corp	0.12	0	S-Curve Bog	W. Wareham

Segment	Permit	Registration	PWSID	System Name	Registered Volume (MGD)	20 Year Permitted Volume (MGD)	Source Name	Location
95-04		42405203		Paul + Linda Rinta	0.43	0	Beach Street Reservoir	Middleboro
95-04		42405203		Paul + Linda Rinta	0.43	0	Holding Pond #1	West Wareham
95-04		42405203		Paul + Linda Rinta	0.43	0	Weweantic River	Carver/Wareham
95-06		42405203		Paul + Linda Rinta	0.43	0	High Street Reservoir	Rochester
95-04		42431052		Perry Cranberry Company, Inc.	0.13	0	Perry Bog (River)	So. Middleboro
95-04		42431052		Perry Cranberry Company, Inc.	0.13	0	Perry Bog (Street)	So. Middleboro
95-30		42431052		Perry Cranberry Company, Inc.	0.13	0	Perry Reservoir	Wareham
95-04		42405205		Perry's Berries Incorporated	0.18	0	Center Street Reservoir	Carver
95-04		42405205		Perry's Berries Incorporated	0.18	0	Rochester Road Reservoir	Carver
95-04		42405258		Peter A. and Susan J. Webb	0.1	0	Wenham Pond	Carver
	9P242400302			Pine Hill Farm		0.06	Reservoir A (Bogs 5 & 6)	Acushnet
	9P242400302			Pine Hill Farm		0.06	Reservoir B (Bogs 1-4)	Acushnet
95-04		42431022		Piney Wood Cranberries	0.54	0	Big George Well	Plymouth
95-04		42431022		Piney Wood Cranberries	0.54	0	Piney Wood Reservoir #1	Plymouth
95-04		42431022		Piney Wood Cranberries	0.54	0	Piney Wood Reservoir #2	Plymouth
95-04		42431022		Piney Wood Cranberries	0.54	0	Piney Wood Reservoir #3	Plymouth
95-04		42423913		Pitch Pine Trust	0.04	0	Pitch Pine Trust Bog	Plymouth
95-04	9P42423901		4239000	Plymouth DPW-Water Division		6.36	Darby Pond Well	Plymouth
95-04	9P42423901		4239000	Plymouth DPW-Water Division		6.36	Federal Furnace Well	Plymouth
95-01	9P442423905		4239045	Plymouth Water Company		0.22	Well #1	Plymouth
95-01	9P442423905		4239045	Plymouth Water Company		0.22	Well #2	Plymouth
95-17		42203601		Pocasset Golf Club (average withdrawal over <365 days)	0.09	0	Well #1	Pocasset
95-29		42431055		Popes Pond Cranberry Co., Inc.	0.05	0	Popes Pond Cranberry	East Wareham
95-06		42431026		Porter Bog Company, Inc.	0.29	0	Leonards Pond	Rochester
95-06		42431026		Porter Bog Company, Inc.	0.29	0	Porter Bog #1	Rochester
95-04		42405221		Pratt Cranberry Bogs	0.06	0	Wenham Pond	Carver
95-01		42423901		R & B Farms, Inc.	0.05	0	R & B Farms Reservoir	Plymouth

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95-06		42425010		R.H. Bogs, Inc.	0.27	0	Leonards' Pond	Rochester
95-06		42425010		R.H. Bogs, Inc.	0.27	0	Marys' Pond	Rochester
95-04		42418204		Ragnar & Karen Bjornson	0.24	0	Purchase Street Bog	Middleboro
95-06		42418204		Ragnar & Karen Bjornson	0.24	0	County Street Bog	Rochester
95-04		42405250		Ralph and Judith Kivi	0.07	0	Rochester Road Bogs	Carver
95-04		42405234		Ralph Peltola	0.27	0	Cranberry Bogs	Carver
		42418217		Reginald C & Lyn Petty	0.12		Francis Street Bog	Middleboro
		42418217		Reginald C & Lyn Petty	0.12		Pine Street	Middleboro
95-42		42420101		Revere Copper Products, Inc.	0.08	0	Rodman Pond	New Bedford
95-06		42431042		Richard A. Fielding	0.05	0	Richard Fielding	Rochester
95-31		42410202		Richard H. Kendrick	0.08	0	Korpy Bog Reservoir	East Freetown
95-06		42410208		Richard H. Kendrick, Jr.	0.1	0	Kendrick Bog #2	Rochester
95-31		42410208		Richard H. Kendrick, Jr.	0.1	0	Kendrick Bog #1	East Freetown
		42410211		Richard T. Berndt	0.21	0		
95-31		42410210		Ridge Hill Cranberry Company	0.21	0	Ridge Hill Bogs	East Freetown
	9P242423902			Ring Road Realty Trust Cranberry	0	0.12	Bog Pond	Carver
95-06		42425014		Robert & Donald Merry Cranberry Bog	0.18	0	Merry Blacks Bogs	Rochester
95-06		42425014		Robert & Donald Merry Cranberry Bog	0.18	0	Merry Howes Bog	Rochester
95-04		42431005		Robert E. Johnson	0.14	0	R. Johnson Reservoir	Middleboro
95-07		42431045		Robert F. Pajunen	0.01	0	Pajunen Bog #2	W. Wareham
95-30		42423912		Robert Meharg	0.43	0	Meharg Bog #1	Wareham
95-31		V42400302		Roger Braley Orchards	0.03	0	Acushnet River	Acushnet
95-31		V42400302		Roger Braley Orchards	0.03	0	New Bedford Reservoir	Acushnet
95-02		42431060		Rounsville, Hammond and Rounsville	0.28	0	Agawam River	East Wareham
95-02		42431060		Rounsville, Hammond and Rounsville	0.28	0	Dick's Pond	East Wareham

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95-02		42431060		Rounsville, Hammond and Rounsville	0.28	0	Sand Pond	East Wareham
95-02		42431060		Rounsville, Hammond and Rounsville	0.28	0	Sand Pond	East Wareham
95-02		42431060		Rounsville, Hammond and Rounsville	0.28	0	Sand Pond	East Wareham
95-02		42431060		Rounsville, Hammond and Rounsville	0.28	0	Spectacle Pond	East Wareham
95-04		V42418209		Russell Bradbury	0.04	0	Russell Bradbury	Middleboro
95-06		42425002		Ryder Bog & Sherman Bog	0.33	0	Sherman Bog	Rochester
95-36		42425002		Ryder Bog & Sherman Bog	0.33	0	Ryder Bog	Rochester
95-04		42405237		S.K. Wainio Bogs, Inc.	0.14	0	Wainio Bog	Carver
95-04		42405207		Salmi Bogs	0.05	0	Salmi Bogs	South Carver
95-04		42405207		Salmi Bogs	0.05	0	Tremont Street Well	South Carver
95-05	9P242425003			SEMASS Partnership		0.33	Industrial Well A	West Wareham
95-05	9P242425003			SEMASS Partnership		0.33	Industrial Well B	West Wareham
95-05	9P242425003			SEMASS Partnership		0.33	Industrial Well C	West Wareham
95-05	9P242425003			SEMASS Partnership		0.33	Potable Well B	Rochester
95-05	9P242425003			SEMASS Partnership		0.33	Potable Well A	Rochester
95-06		42425016		Shakey Acres Cranberries	0.04	0	Shakey Acres Bogs	Rochester
95-07		42431063		Sheila R Perry	0.03		Pond	West Wareham
95-04		V42405264		Shoestring Bogs	0.04	0	Water Hole	Carver
95-04		42419601		Shurtleff Cranberry Bogs, Inc.	0.17	0	Benson Pond Bog #1	Middleboro
95-04		42419601		Shurtleff Cranberry Bogs, Inc.	0.17	0	Benson Pond Bog #2	Middleboro
95-04		42419601		Shurtleff Cranberry Bogs, Inc.	0.17	0	Benson Pond Bog #3	Middleboro
95-04		42419601		Shurtleff Cranberry Bogs, Inc.	0.17	0	Benson Pond Bog #4	Middleboro
95-04		42405224		Slocum-Gibbs Cranberry Co., Inc.	1.73	0	Wareham Street Reservoir	South Carver
95-06		42405224		Slocum-Gibbs Cranberry Co., Inc.	1.73	0	Red Gate Reservoir	Rochester

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95-06		42405224		Slocum-Gibbs Cranberry Co., Inc.	1.73	0	Red Gate Well #1	Rochester
95-30		42405224		Slocum-Gibbs Cranberry Co., Inc.	1.73	0	Tihonet Road Reservoir	South Carver
95-30		42405224		Slocum-Gibbs Cranberry Co., Inc.	1.73	0	Tihonet Road Well #1	South Carver
95-30		42405224		Slocum-Gibbs Cranberry Co., Inc.	1.73	0	Wareham Street Well #1	South Carver
95-30		42405224		Slocum-Gibbs Cranberry Co., Inc.	1.73	0	Off Rt. 28	West Wareham
95-30		42405224		Slocum-Gibbs Cranberry Co., Inc.	1.73	0	Wareham Street Well #2	South Carver
95-04		42405222		South Meadow Brook Trust	0.04	0	South Meadow Brook	Carver
95-04	9P42405202		4052001	South Meadow Village		0.19	Wellfield #2	Carver
95-04		42423909		Southers Marsh Cranberry Bogs	0.25	0	Southers Marsh Bogs	Plymouth
95-04		42423909		Southers Marsh Cranberry Bogs	0.25	0	Southers Marsh Well #1	Plymouth
95-04		42423909		Southers Marsh Cranberry Bogs	0.25	0	Southers Marsh Well #2	Plymouth
95-04		42423909		Southers Marsh Cranberry Bogs	0.25	0	Southers Marsh Well #3	Plymouth
95-04		42423909		Southers Marsh Cranberry Bogs	0.25	0	Southers Marsh Well #4	Plymouth
95-06		42418208		Spring Brook Cranberries	0.05	0	County Road Bog	Rochester
95-31		42410201		Squinns Brook Corporation	0.11	0	Squinns Brook Bog	East Freetown
95-04		42405223		Stanley E. & Anne-Marie Lowell	0.29	0	Lowell Bogs	Carver
95-04		42405223		Stanley E. & Anne-Marie Lowell	0.29	0	Lowell Well	Carver
95-04		42405229		Stephen Peltola	0.09	0	Peltola Bogs	Carver
95-04		42431053		Suominen Inc.	0.09	0	Northern Bens Pond	Carver
95-04		42431053		Suominen Inc.	0.09	0	Southern Bens Pond	Carver
95-04		42431053		Suominen Inc.	0.09	0	Suominen Reservoir #1	Carver
95-04		42431053		Suominen Inc.	0.09	0	Suominen Well	Carver
95-04		42423906		Susan & Nancy Meharg	0.09	0	Meharg Bogs	Carver
95-06		42425015		Suzanne M. Bauer-Maintein Bog	0.09	0	Mountain Bog Sump	Rochester
95-14		42403601		Tassinari Cranberries	0.08	0	Tassinari Reservoir	Buzzards Bay

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95-14		42403601		Tassinari Cranberries	0.08	0	Tassinari Well	Buzzards Bay
95-06		42425011		Thomas Gayoski, Jr.	0.18	0	Thomas Gayoski	Rochester
95-06		42431054		Thomas I. Morse	0.07	0	Morse Bog #1	Rochester
95-06		42431054		Thomas I. Morse	0.07	0	Morse Bog #2	Rochester
95-06		42431054		Thomas I. Morse	0.07	0	Morse Bog #3	Rochester
95-06		42431054		Thomas I. Morse	0.07	0	Morse Bog #4	Rochester
95-36		V42417302		Tinkham Cranberry Bog	0.03	0	Tinkham Bog	Mattapoisett
95-04		42431013		Tremont Cranberry Co., LLC	0.04	0	Weweantic River	Wareham
95-18		42209608		Tupper, Ralph S.	0.04	0	Cranberry Bogs (C1, C2, C3)	Cataumut
95-21		42209608		Tupper, Ralph S.	0.04	0	Cranberry Bogs (C4, C5, C6)	West Falmouth
---		42209608		Tupper, Ralph S.	0.04	0	Cranberry Bogs (7 others)	Cape Cod Watershed
95-04		42431025		Tweedy & Barnes Company	1.17	0	Pierceville Sumps	Wareham
95-04		42431025		Tweedy & Barnes Company	1.17	0	Weweantic River	Wareham
95-05		42431025		Tweedy & Barnes Company	1.17	0	Mendall Irrigation Sump	Marion
95-29		42431025		Tweedy & Barnes Company	1.17	0	North of 25 Well	Wareham
95-29		42431025		Tweedy & Barnes Company	1.17	0	Sandusky Irrigation Sump	Wareham
95-30		42431025		Tweedy & Barnes Company	1.17	0	Sandusky Bog	Wareham
95-30		42431025		Tweedy & Barnes Company	1.17	0	Harlow Brook Sump	Wareham
95-30		42431025		Tweedy & Barnes Company	1.17	0	Harlow Vineyard Sump	Wareham
95-02		42431020		UMass-Cranberry Experiment Station	0.1	0	Spectacle Pond Bogs	East Wareham
95-04		42431020		UMass-Cranberry Experiment Station	0.1	0	Rocky Pond	Plymouth
95-02		42431023		W.D. Ames, Inc.	0.09	0	Beaver Dam Pond	Wareham
95-29		42431023		W.D. Ames, Inc.	0.09	0	Gracia Bog	Wareham
95-04		42405276		W.D. Bog, Inc.	0.06	0	W.D. Bog	Carver
95-04		42405245		Ward Cranberry Bogs	0.08	0	South Meadow Brook	Carver

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95-04		42405245		Ward Cranberry Bogs	0.08	0	Wenham Pond	Carver
95-04		42405274		Ward Richard Hannula	0.1	0	Paduch Bog	Carver
95-28	9P42431002	42431012	4310000	Wareham Fire District	1.31	0.64	4310000-05G	Wareham
95-28	9P42431002	42431012	4310000	Wareham Fire District	1.31	0.64	Maple Spring Well #1	Wareham
95-29	9P42431002	42431012	4310000	Wareham Fire District	1.31	0.64	Maple Spring Well #2	Wareham
95-28	9P42431002	42431012	4310000	Wareham Fire District	1.31	0.64	Maple Spring Well #3	Wareham
95-28	9P42431002	42431012	4310000	Wareham Fire District	1.31	0.64	Maple Spring Well #4	Wareham
95-29	9P42431002	42431012	4310000	Wareham Fire District	1.31	0.64	Seawood Springs #7	Wareham
95-28	9P42431002	42431012	4310000	Wareham Fire District	1.31	0.64	Seawood Springs Well #6	Wareham
95-04		42405201		Warren & Nancy Martin	0.09	0	France Street Bog	South Middleboro
95-04		42405272		Wayne A. Hannula	0.16	0	Melville Bog	Middleboro
95-04		42405272		Wayne A. Hannula	0.16	0	Roderick Bog	Middleboro
95-04		42405285		Weston Brothers Cranberries	0.68		Crane Brook	Carver
95-04		42405285		Weston Brothers Cranberries	0.68		Indian Rd. Bog	Carver
95-09		42416906		White Eagle Realty Trust	0.22	0	Sippican Reservoir	Marion
95-04		42405254		White Springs Bogs	0.2	0	0 & 1 Irrigation Sump	So. Carver
95-04		42405254		White Springs Bogs	0.2	0	0 & 1 Well	So. Carver
95-30		42405254		White Springs Bogs	0.2	0	2 & 3 Irrigation Sump	So. Carver
95-30		42405254		White Springs Bogs	0.2	0	4 & 5 Irrigation Sump	So. Carver
95-30		42405254		White Springs Bogs	0.2	0	6 Irrigation Sump	So. Carver
95-30		42405254		White Springs Bogs	0.2	0	Barretts Pond	So. Carver
95-04		42405236		Wilho E. Harju	0.19	0	Weweantic River Bog	Middleboro
95-04		42423910		William B. Stearns, III & IV	0.09	0	Indian Brook Well #1	Plymouth
95-04		42423910		William B. Stearns, III & IV	0.09	0	Indian Brook Well #2	Carver
95-04		42423910		William B. Stearns, III & IV	0.09	0	Indian Brook Well #3	Carver
95-29		42403607		William F. Atwood	0.19	0	Bang's Bog	Wareham
95-04		42405275		William F. Pierce, Sr.	0.05	0	Pierce Bog	Carver

Segment	Permit	Registration	PWSID	System Name	Registered Volume (MGD)	20 Year Permitted Volume (MGD)	Source Name	Location
95-04		42405235		William L. Remes	0.06	0	Tilson Brook	South Carver
95-04		42405262		Williams & Alger, Inc.	0.27	0	Big Bog Reservoir	So. Carver
95-04	9P342431005	42423914		Willows Cranberries	0.11	0.09	Darby Pond	Plymouth
95-04	9P342431005	42423914		Willows Cranberries	0.11	0.09	Pump at Reservoir	Wareham
95-04	9P342431005	42423914		Willows Cranberries	0.11	0.09	Pump at Tailwater Pond	Plymouth
95-36		42425013		Wolf Island Bog	0.04	0	Wolf Island Bogs	Rochester
95-25		42209606		Woods Hole Golf Club (average withdrawal over <365 days)	0.08	0	Wells #1 & #2	Woods Hole
95-14		42226109		Mirant Canal, LLC	0.45	0	Freezer Rd Well #1 Freezer Rd Well #2	Sandwich
95-17		42203601		Pocasset Golf Club*	0.09	0	Well #1	Pocasset
95-16	9P42203601	42203602	4036000	Bourne Water District	0.73	0.67	Pump Sta. #1(has 4 wells)	Monument Beach
95-18	9P42203601	42203602	4036000	Bourne Water District	0.73	0.67	Pump Station #2	Cataumet
95-16	9P42203601	42203602	4036000	Bourne Water District	0.73	0.67	Pump Sta. #3 State forest	Monument Beach
95-16	9P42203601	42203602	4036000	Bourne Water District	0.73	0.67	Pump Station #4	Monument Beach
95-18	9P42203601	42203602	4036000	Bourne Water District	0.73	0.67	Pump Station #5	Cataumet
95-16	9P42203601	42203602	4036000	Bourne Water District	0.73	0.67	Pump Station #6	Pocasset
95-15?		42203604		John M. Alden	0.12	0	C-1 Surface Supply	Monument Beach
95-25		42209606		Woods Hole Golf Club*	0.08	0	Wells #1 & #2	Woods Hole
95-23 95-24	9P42209601	42209607	4096000	Falmouth Water Department	2.95	1.36	Long Pond Reservoir	Falmouth
95-23?	9P42209601	42209607	4096000	Falmouth Water Department	2.95	1.36	Mares Pond Well	Falmouth
95-22	9P42209601	42209607	4096000	Falmouth Water Department	2.95	1.36	Crooked Pond Well	Falmouth
---	9P42209601	42209607	4096000	Falmouth Water Department	2.95	1.36	Fresh Pond Well & Coonamesett Pond Well	Cape Cod Watershed
95-18		42209608		Ralph S. Tupper	0.04	0	Cranberry Bogs (C1, C2, C3)	Catamut
95-21		42209608		Ralph S. Tupper	0.04	0	Cranberry Bogs (C4, C5, C6)	West Falmouth

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---		42209608		Ralph S. Tupper	0.04	0	Cranberry Bogs (7 others)	Cape Cod Watershed
95-18		42209609		Handy Cranberry Trust	2.08	0	Cranberry Bog Wells (#1, #2)	Cataumet
---		42209609		Handy Cranberry Trust	2.08	0	Cranberry Bog s (11G & 2S)	Cape Cod