

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I
1 CONGRESS STREET
BOSTON, MASSACHUSETTS 02114-2023**

FACT SHEET

**DRAFT NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
PERMIT TO DISCHARGE TO THE WATERS OF THE UNITED STATES**

NPDES PERMIT NUMBER: MAS010002

PUBLIC COMMENT PERIOD: June 26, 2008 through August 4, 2008

PUBLIC NOTICE NUMBER: MA-024-08

NAME AND ADDRESS OF APPLICANT:

**City of Worcester
City Hall
455 Main Street
Worcester, Massachusetts 01608**

NAME OF MUNICIPALITY WHERE DISCHARGE OCCURS:

City of Worcester
329 Municipal Separate Storm Sewer System (MS4) Outfalls Listed in Permit
Attachment A.

RECEIVING WATERS: Beaver Brook, Blackstone River, Broad Meadow Brook, Coal Mine Brook, Coes Pond, Curtis Pond, Fitzgerald Brook, Indian Lake, Kendrick Brook, Kettle Brook, Lake Quinsigamond, Leesville Pond, Middle River, Mill Brook Tributary, Tatnuck Brook, Patch Reservoir, Poor Farm Brook, Salisbury Pond, Smith Pond, Weasel Brook, and Williams Millpond.

RECEIVING WATERS CLASSIFICATION: B

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I. PROPOSED ACTION, TYPE OF FACILITY AND DISCHARGE LOCATIONS

The above named applicant has applied to the U.S. Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (MassDEP) to reissue its NPDES Municipal Separate Storm Sewer System (MS4) permit, to discharge storm water and allowable non-storm water from its existing municipal separate storm sewer outfalls as identified in Attachment A, to the receiving waters listed above.

II. DISCHARGES AUTHORIZED BY THE PERMIT

- A. The draft permit authorizes all existing storm water point source discharges to waters of the United States from the City of Worcester's ("the Permittee") Municipal Separate Storm Sewer System (MS4).
- B. The draft permit does not authorize the discharge of storm water from the MS4 commingled with flows contributed by process wastewater, non-process wastewater, or storm water associated with industrial activity, unless such discharges are authorized under separate NPDES permits. This includes individual or general NPDES permits.

Section 402(p)(3)(B) of the Clean Water Act ("CWA") requires controls to reduce the discharge of pollutants from the MS4 to the maximum extent practicable (MEP). In contrast, Section 301(b) of the CWA requires storm water associated with industrial activity to meet compliance with treatment technology (BPT – Best Practical Control Technology Currently Available, BAT- Best Available Technology Economically Achievable for non-conventional and toxic pollutants and BCT – Best Conventional Control Technology for conventional pollutants). The draft permit cannot authorize discharges of storm water associated with industrial activity unless covered under a separate NPDES permit because of the difference in these statutory requirements. The Permittee is responsible for the quality of the combined discharge and has regulatory authority (An Amendment to the Revised Ordinances of 1996 Relative to Sewers and Storm Water Management, Chapter Five, §§20-21) prohibiting storm water discharges associated with industrial activity without a permit.

- C. The draft permit requires illicit discharges to be prevented and eliminated except that the categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) and identified in Part I.A.3. of the draft permit, need not be addressed unless they are determined to be significant contributors of pollutants to the Permittee's MS4 or cause a violation of water quality standards. For a discharge determined by the Permittee, EPA, or MassDEP as a significant contributor of pollutants or causing a water quality standards violation, the Permittee is required to use its legal authorities and illicit discharge improper disposal practices to prohibit or eliminate the unauthorized discharge.
- D. Part I.A.4. of the draft permit authorizes new or increased discharges from the Permittee's MS4 where it can demonstrate that a discharge will satisfy the antidegradation provisions of the Massachusetts Surface Water Quality Standards (314 CMR 4.04). The draft permit does not authorize such discharges into Outstanding Resource Waters or Special Resource Waters unless permitted by MassDEP pursuant to 314 CMR 4.04 (5). Where a new or increased discharge is proposed to a water quality impaired water, the Permittee must satisfy criteria that demonstrate that the discharge is not expected to cause or contribute to an exceedence of water quality standards for the pollutant(s) of concern. Such demonstrations must be made available to the public, and after a review period of at least 30 days, discharges will be deemed authorized unless the Permittee is notified otherwise by EPA or MassDEP.

- E. The draft permit does not authorize the discharge of materials resulting from spills. The Permittee has implemented procedures to prevent, contain, and respond to spills entering its MS4. These procedures include the application of its sewer use ordinance and its Integrated Hazardous Materials Incident Response Plan (IHMIRP). Part I.E.1.(b) of the draft permit requires the Permittee to maintain the necessary legal authority to control the discharge of spills to its MS4. The IHMIRP defines the coordinated operating procedures in the event of an illegal release of hazardous materials. Spill response includes a coordinated effort by the Worcester Department of Public Works and Parks, Fire Department, Police Department, Emergency Medical Services, Civil Defense, Department of Public Health and Code Enforcement. Part I.E.3.(c) of the draft permit requires the Permittee to continue implementation of its IHMIRP.
- F. The draft permit does not authorize discharges to the subsurface subject to state Underground Injection Control regulations. Although the draft includes provisions related to infiltration and groundwater recharge, structural controls that inject stormwater to the ground may be subject to requirements of the Safe Drinking Water Act and EPA's Underground Injection Control (UIC) program. MassDEP implements the federal UIC program in Worcester. Please see <http://www.mass.gov/dep/water/resources/groundwa.htm> for additional information about the UIC program and specific MassDEP requirements.

III. DESCRIPTION OF DISCHARGE

The City of Worcester (the "City") currently maintains a municipal separate storm sewer system consisting of approximately 340 miles of pipe, 15,000 catch basins, and 12,000 manholes. The MS4 collects and transports storm water runoff and other flows, discharging through 330 outfalls ranging in size from 8-inch diameter pipe to 72-inch x 74-inch box culvert. Almost 45 percent (45%) of the drainage area in Worcester is served by a system consisting of twin-invert manholes. These systems carry storm water and sanitary sewage in separate conduits and inverts, but in shared or "common" manhole structures. Though distinct from a combined sewer system, common manhole designs can allow sanitary and storm flows to commingle under certain hydraulic circumstances (see Part XIII.G.2. of this Fact Sheet.) The Permittee maintains a geographic information system (GIS) and databases for managing information on its MS4, including the geographic location of infrastructure, water quality changes, field verification data, and land use changes.

The discharges from the MS4 consist of surface runoff (non-storm water and storm water) and groundwater from various land uses in drainage basins within the City. The quality and quantity of these discharges vary considerably and are affected by the hydrology, geology, land use characteristics of the watersheds, seasonal weather patterns, and frequency and duration of storm events.

During the 1998 Permit term, the Permittee was required to characterize storm water runoff by wet weather monitoring of five storm drain outfalls representative of various land use types (residential, commercial and industrial) and at three in-stream locations. A description of the results of the monitoring program can be found in the *NPDES Permit Term 1 Stormwater Quality Analysis, February 7, 2006*, prepared by the Worcester Department of Public Works & Parks (DPW & P) and available for review at EPA and MassDEP as part of the Administrative Record for the permit. [See Part XIX of this Fact Sheet]

IV. LIMITATIONS AND CONDITIONS

No numeric limitations are proposed at this time. EPA has issued a memorandum titled "Interim Permitting Approach for Water Quality Based Effluent Limitations in Storm Water Permits," dated September 1, 1996 (the "1996 memorandum"). The memorandum explains the rationale being

implemented for the draft permit. As described in the memorandum, the Clean Water Act (CWA) does not always require numeric effluent limitations to meet technology and water quality requirements. Section 502 defines "effluent limitations" to mean any restriction on quantities, rates and concentrations of constituents discharged from point sources. EPA has through regulation, interpreted the statute to allow non-numerical limitations (e.g., "best management practices" or BMPs, see 40 C.F.R. § 122.2) to supplement or replace numeric limitations in specific instances that meet the criteria at 40 C.F.R. § 122.44(k). This is consistent with the court's decision in *NRDC v. Costle*, 568 F.2d 1369 (D.C. Cir. 1977), in which the court held that EPA need not establish numeric effluent limitations where such limitations were infeasible.

EPA continues to believe that numeric limitations for storm water permits can be very difficult to develop because of the existing state of knowledge about the intermittent and variable nature of these types of discharges and their effects on receiving waters.

In accordance with 40 CFR §122.44(k), the U.S. EPA has required a series of Best Management Practices (BMPs), to be incorporated into a comprehensive storm water management program (SWMP), in lieu of numeric limitations. The BMPs and monitoring requirements are found in the draft permit.

V. ABBREVIATED PERMIT HISTORY AND REPORTING CHRONOLOGY

November 1990	U.S. EPA establishes permit application requirements for Phase I MS4s nationwide (populations over 100,000)
May 18, 1992	City of Worcester submits NPDES Permit Application Part I
May 11, 1993	City of Worcester submits NPDES Permit Application Part II
June 6, 1997	U.S. EPA requests supplemental application information
March 25, 1998	Supplemental application material submitted
August 7, 1998	Public notice of draft permit
August 27, 1998	Public information meeting held
September 10, 1998	Public hearing held
September 30, 1998	Final permit issued ("1998 Permit")
October 30, 1998	Permit effective date
January 28, 1999	Proposed sampling plan due date
January 29, 1999	Submittal of sampling plan
February 26, 1999	Submittal of Revised Storm Water Management Program Plan
February 27, 1999	Revised Storm Water Management Program Plan due date
May 6, 1999	Submittal of Demonstration Project proposal (Vortech unit on Belmont Street installed Fall 1997)
April 30, 1999	Submittal of report detailing connections from Massachusetts Highway Department's roadways to City of Worcester's MS4
April 19, 2000	Annual Report submitted for November 1, 1998 to October 31, 1999
April 30, 2001	Annual Report submitted for November 1, 1999 to October 31, 2000
April 1, 2002	Annual Report submitted for November 1, 2000 to October 31, 2001
April 3, 2003	Annual Report submitted for November 1, 2001 to October 31, 2002
August 7, 2003	U.S. EPA requests permit reapplication information
September 4, 2003	Worcester submits reapplication information
April 13, 2004	Annual Report submitted for November 1, 2002 to October 31, 2003
April 11, 2005	Annual Report submitted for November 1, 2003 to October 31, 2004
April 12, 2006	Annual Report submitted for November 1, 2004 to October 31, 2005
April 2007	Annual Report submitted for November 1, 2005 to October 31, 2006
May 2008	Annual Report submitted for November 1, 2006 to October 31, 2007

VI. REGULATORY BASIS OF PERMIT CONDITIONS

Federal and state laws and regulations provide the basis for establishing the conditions of the draft NPDES permit for the discharge of pollutants from the City of Worcester's MS4. As authorized by Clean Water Act § 402(p)(3)(B)(i) of, this draft permit is being proposed on a system-wide basis. The draft permit covers all areas owned and operated by the City of Worcester that are designed to collect and convey storm water, and that are not part of a Publicly Owned Treatment Works (POTW). In 1998, the permit was issued to the City of Worcester's Department of Public Works. This draft permit is issued to the City as a whole, and not any one municipal department or board, to facilitate interdepartmental coordination of multi-disciplinary staff during the implementation of the Permittee's SWMP.

The Permittee's sanitary sewer system consists of approximately 60 miles of combined sewers, which convey a combination of sanitary (domestic and industrial) wastewater and storm water. This permit does not authorize discharges into or from combined sewers. Discharges from the combined sewer system area flow to the Upper Blackstone Water Pollution Abatement District or the Quinsigamond Avenue CSO Storage and Treatment Facility. Discharges from this CSO facility are permitted under NPDES Permit No. MA0102997.

The conditions in the draft permit are established pursuant to CWA § 402(p)(3)(B)(iii) to ensure that pollutant discharges from the Permittee's MS4 are reduced to the maximum extent practicable ("MEP"), protect water quality, and satisfy the appropriate water quality requirements of the Clean Water Act. Part I.E. of the draft permit sets forth the statutory requirements to "...reduce pollutants in discharges from the MS4 to the maximum extent practicable, including management practices, control techniques, and system, design and engineering methods..." MEP is the statutory standard that establishes the level of pollutant reductions that MS4 operators must achieve. In the Preamble to the Phase II Rule (64 FR 68754; December 8, 1999), EPA interprets the statutory standard of MEP to apply to all MS4s, including existing regulated large MS4s such as the City of Worcester. Further, EPA states that the MEP standard will be applied based on the best professional judgment of the permit writer in the case of individual NPDES permits such as current draft permit. EPA believes implementation of BMPs designed to control storm water runoff from the MS4 is generally the most appropriate approach for reducing pollutants to satisfy the technology standard of MEP. Pursuant to 40 CFR §122.44(k), the draft permit contains BMPs, including development and implementation of a comprehensive SWMP, as the mechanism to achieve the required pollutant reductions.

Section 402(p)(b)(3)(iii) also authorizes EPA to include in an MS4 permit "such other provisions as [EPA] determines appropriate for control of ... pollutants." EPA believes that this provision forms a basis for imposing water quality-based effluent limitations (WQBELs), consistent with the authority in Section 301(b)(1)(C) of the CWA. *See Defenders of Wildlife v. Browner*, 191 F.3d 1159 (9th Cir. 1999); *see also* EPA's preamble to the Phase II regulations, 64 Fed. Reg. 68722, 68753, 68788 (Dec. 8, 1999). Accordingly, Part I.C. of the draft permit contains the water quality-based effluent limitations, expressed in terms of BMPs, which EPA has determined are necessary and appropriate under the CWA.

The BMPs included to satisfy the MEP standard and represent WQBELs encompass a variety of practices and programs focused on pollution prevention and reduction rather than installation of end-of-pipe stormwater treatment systems. EPA does not anticipate the need to install such treatment systems during the term of this draft permit.

Section 401 of the CWA requires that EPA obtain state certification, which ensures that all water quality standards and other appropriate requirements of state law will be satisfied. Regulations governing state certification are set forth in 40 CFR §124.53 and 124.55.

The Massachusetts Clean Waters Act, Chapter 21 of the General Laws, Sections 26-53: 1966, provides the statutory authority for the state program and is implemented through the regulations found at 314 CMR 3.00 (“Surface Water Discharge Permit Program”) and 314 CMR 4.00 (“Surface Water Quality Standards”).

In 1990, EPA promulgated regulations at 40 CFR §122.26(d)(1) and (2), that established permit application requirements for so-called Large and Medium MS4s that served populations of over 100,000. The Permittee was required to submit a two-part application and did so as identified in Part V. of this Fact Sheet. Part 1 of the application required information regarding existing storm water management programs, the means available to the municipality to control pollutants, and field screening analysis of major outfalls to detect illicit connections. Part 2 of the application required collection of a limited amount of representative quantitative data and a description of the applicant’s proposed SWMP. The conditions included in the 1998 permit were based on the SWMP described in the Part 2 application, along with new program elements required by the NPDES regulations.

EPA has not promulgated regulations for the renewal or reissuance of NPDES permits for Large and Medium MS4s. EPA published an *Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems* (the “Policy”) (Federal Register/Vol. 61, No. 155/ Friday, August 9, 1996, page 41698). The Policy, which became effective May 17, 1996, explained that “MS4 permit applicants and NPDES permit writers have considerable discretion to customize appropriate and streamlined reapplication requirements on a case-by-case basis, specifically by using the fourth year annual report as the principal reapplication document.” The Policy states initial applications provided comprehensive information, which was used to create the first term MS4 permits and laid the foundation for the long-term implementation of MS4 SWMPs. The Policy states reapplications should “focus on maintenance and improvement of these programs” and therefore, “first-term permit application requirements are unnecessary for purposes of the second round MS4 permit application.”

On August 7, 2003, EPA notified the Permittee that the existing NPDES permit would expire in September 2003, and consistent with the May 17, 1996 Policy, requested that the Permittee use its fourth year annual report to propose changes to its SWMP, and provide additional information required for reapplication. The Permittee complied with the request and responded by providing reapplication information as part of its Year 4 Annual Report (November 1, 2002 – October 31, 2003). The Permittee stated in the reapplication letter its intent to continue almost all, and expand several, aspects of its SWMP implemented during the 1998 Permit term. The Permittee also requested changes to components of its existing monitoring program. It is in accordance with the reapplication Policy that EPA and MassDEP have considered information submitted by the Permittee to develop the conditions included in the draft permit.

VII. WATERBODY CLASSIFICATION AND DESIGNATED USES

The Permittee’s MS4 discharges to receiving waters that are classified according to the Massachusetts Surface Water Quality Standards as Class B waterbodies. As described in 314 CMR 4.05, Class B waters are designated as a habitat for fish, other aquatic life and wildlife and for primary and secondary contact recreation. Where designated, they shall be suitable as a source of public water supply with appropriate treatment. They shall be suitable for irrigation and other agricultural uses and for compatible industrial cooling and process uses. These waters shall have consistently good aesthetic value.

VIII. WATER QUALITY-BASED EFFLUENT LIMITS

A. General Requirement to Meet Water Quality Standards

Part I.C. of the draft permit describes the water quality based effluent limits to ensure that discharges from the Permittee's MS4 do not cause or contribute to exceedences of water quality standards. This includes specific provisions for meeting water quality standards in waters that are either unimpaired or impaired, and with or without approved TMDLs.

With respect to discharges into waters that are not impaired, the draft permit employs a presumptive approach to ensure that the Permittee's MS4 discharges do not cause or contribute to exceedences of water quality standards. For MS4 discharges into waters that are not impaired, EPA presumes that the conditions in the draft permit will meet applicable water quality standards when fully satisfied. EPA considers this approach valid since, despite ongoing discharges from the Permittee's MS4 and other potential sources, these waters have not been categorized by the MassDEP as impaired and failing to meet water quality standards. During the last decade, the Permittee has implemented a SWMP to comply with the conditions of the 1998 permit. Under the draft permit, the Permittee would continue implementation of an augmented SWMP to comply with several additional and strengthened permit conditions. Therefore, EPA presumes that implementation of an augmented SWMP will at least maintain at present levels the contribution of pollutants from the Permittee's MS4 discharging to unimpaired waters, thereby not causing or contributing to an exceedance of water quality standards.

The draft permit requires the Permittee to consider available monitoring data, visual assessments, and site inspection reports in determining water quality standards exceedences. Furthermore, the draft permit requires that the Permittee identify to EPA and MassDEP the additional or modified BMPs to be implemented to address any discharge from its MS4 in the event the Permittee becomes aware that the discharge causes or contributes to an exceedence of applicable water quality standards. These provisions oblige the Permittee to consider available information, and add or modify BMPs in its SWMP to abate pollutants sufficiently to meet applicable water quality standards in the event that EPA's presumption proves to be incorrect.

B. Requirements for Discharges to Impaired Waters

Section 303(d) of the CWA and EPA's Water Quality Planning and Management Regulations (40 CFR Part 130) requires states to (1) identify impaired waters where required pollution controls are not stringent enough to attain water quality standards and, (2) establish total maximum daily loads (TMDLs) for such waters to reduce pollutants from both point and nonpoint sources and restore and maintain the quality of the waters. A TMDL establishes the maximum allowable load of a pollutant that a waterbody is able to assimilate and still support its designated use. The maximum allowable load is determined on the basis of the relationship between sources and in-stream water quality. The MassDEP has developed a TMDL Strategy that prioritizes all 303(d) listed waterbodies, establishes TMDLs for degraded waters, and formulates cleanup plans. EPA has approved the Massachusetts Year 2006 Integrated List of Waters ("2006 Integrated List"), including the Category 5 waters that represent the 303(d) list of waters requiring the preparation of a TMDL and Category 4a waters for which a TMDL has been completed. The 2006 Integrated List, draft and final TMDL reports, and related guidance documents are available at <http://mass.gov/dep/water/resources/tmdls.htm>. Table A of this Fact Sheet lists receiving waters within the City that receive discharges from the Permittee's MS4, and identifies for each: the impairment category, TMDLs that have been drafted or approved, and pollutant(s) of concern for which a TMDL is required or already approved.

TABLE A – CITY OF WORCESTER’S RECEIVING WATERS - AND TMDL STATUS

Receiving Water	Category ^a	Pollutant(s) of Concern for which TMDL is required or approved ^b	TMDL Status (Draft or Final/Approved by EPA)
Beaver Brook	Category 5	3	Draft Pathogen
Blackstone River	Category 5	3 – 6, 8 – 11	Draft Pathogen
Broad Meadow Brook	Unassessed		
Burncoat Brook	Category 5	2, 11	
Coal Mine Brook	Unassessed		
Coes Pond	Unassessed		
Curtis Pond North	Category 4c	2	Final/Approved Phosphorus
Curtis Pond South	Category 5	1,2	Final/Approved Phosphorus
Fitzgerald Brook	Unassessed		
Green Hill Pond	Category 4a	11	Final/Approved Phosphorus
Indian Lake	Category 4a	2,9	Final/Approved Phosphorus
Kendrick Brook	Unassessed		
Kettle Brook	Category 5	3,8,9	Draft Pathogen
Lake Quinsigamond & Flint Pond	Category 4c	2	Final/Approved Phosphorus
Leesville Pond	Category 4c	8,9	Final/Approved Phosphorus
Middle River	Category 5	3,5,8,9,11,12	Draft Pathogen
Mill Brook Tributary	Category 5	3 – 6, 8 - 11,13,14	Draft Pathogen
Tatnuck Brook	Category 5	11	
Patch Reservoir	Category 2		
Poor Farm Brook	Category 3		
Salisbury Pond	Category 5	2,11,14	Final/Approved Phosphorus
Smiths Pond	Unassessed		
Weasel Brook	Unassessed		
Williams Millpond	Unassessed		

^a Categories of Massachusetts Waters published in *Massachusetts Year 2006 Integrated List of Waters*:

- Category 2 – Attaining some uses; other uses not assessed
- Category 3 – Insufficient information to make assessments for any use
- Category 4a – TMDL is completed
- Category 4b – Impairment caused by pollutant but TMDL not required because other required controls are expected to result in attainment
- Category 4c – Impairment not caused by a pollutant
- Category 5 – Impaired or threatened for one or more uses and requiring a TMDL
- Unassessed – Waters that have never been assessed by MassDEP

^b Pollutants of Concern:

- 1 Siltation, 2 Noxious aquatic plants, 3 Pathogens, 4 Priority organics, 5 Metals, 6 Unionized Ammonia, 7 Chlorine, 8 Nutrients, 9 Organic enrichment/Low Dissolved Oxygen (DO), 10 Suspended Solids, 11 Turbidity, 12 pH, 13 Oil and grease, 14 Taste, odor and color

1. Waters without an approved TMDL

For MS4 discharges into impaired waters for which there exists no EPA approved TMDL as of the effective date of the permit, the draft permit includes the same provisions as discussed above in Part VIII.A. In addition, the draft permit requires the Permittee to address in its SWMP and annual reports how the discharge of the pollutant(s) of concern from its MS4 will be controlled such that the discharges do not cause or contribute to the impairment. By requiring the Permittee to recognize and address the discharge of pollutants of concern from its MS4, EPA believes the draft permit includes adequate emphasis on these impaired waters to ensure that the Permittee will include BMPs necessary to meet applicable water quality standards.

2. Waters with an approved TMDL

For MS4 discharges into impaired waters for which there is an EPA approved TMDL as of the effective date of the permit, the draft permit includes, pursuant to 40 CFR 122.44(d)(vii)(B), effluent limits that are consistent with the assumptions and requirements of available waste load allocations (“WLA”s) included in the TMDLs for the MS4 discharges. As of the date of issuance of this draft permit, phosphorus loading TMDLs with applicable WLAs and load allocations (“LA”s) have been approved for seven (7) waterbodies located in the City of Worcester that receive discharges from the Permittee’s MS4 (see Attachment B of the draft permit). Each approved TMDL report contains an individual waterbody description, problem assessment and recommended BMPs and actions in the form of a TMDL implementation plan to reduce phosphorus loading consistent with established WLAs and LAs. Though EPA does not approve the implementation plans of these or any TMDLs, it did consider the plans in its development of the conditions included in the draft permit it considers necessary to support the achievement of the relevant WLA and LA. In some instances this includes continuation of practices that the Permittee has implemented in some capacity during the 1998 Permit term. In other instances this includes new BMPs, or an increase in the scope or frequency of existing practices. Effluent limits, expressed in terms of BMPs, that support the achievement of the WLA and (when the LA contributes to the MS4) for each of these waterbodies are identified in Attachment B of the draft permit.

Phosphorus is usually present in natural waters, is a plant nutrient needed for growth, and is a fundamental element in the metabolic reactions of plants and animals. Plant growth is limited by the amount of phosphorus available. In most waters, phosphorus functions as a “growth limiting” factor because it is usually present in low concentrations in the natural environment. Excess phosphorus is taken up rapidly by algae and larger plants, causes extensive algae growth called “blooms”, and stimulates the growth of rooted aquatic vegetation. Advanced stages of enrichment can produce anaerobic conditions in which oxygen in the water is completely depleted. Modern society produces rich sources of phosphorus that can be conveyed to waterbodies both directly and indirectly. Treated and untreated wastewaters, fertilizers, de-icing agents, eroded soils, agricultural drainage, and detergents are examples of sources that can contain high concentrations of phosphorus. As a result of many of these sources, phosphorus is a common constituent in stormwater discharges. There is ample information¹ available to support the conclusion that phosphorus is present in Worcester’s stormwater discharges and therefore the discharges are subject to the wasteload allocations in the phosphorus TMDLs. The approved Phosphorus TMDLs for the seven (7) identified waterbodies provide the basis for implementing BMPs to control phosphorus in stormwater discharges. In some instances this

¹ See: City of Worcester, NPDES Permit Term 1 Stormwater Quality Analysis Report. February 7, 2006. Total Maximum Daily Loads of Phosphorus for Indian Lake, Lake Quinsigamond and Flint Pond, Salisbury Pond, Leesville Pond, Select Northern Blackstone Lakes; available at: <http://mass.gov/dep/water/resources/info>.

includes findings from diagnostic/feasibility (D/F) studies funded under the Massachusetts Clean Lakes Program. In other instances, MassDEP's NPSLAKE model was used to develop phosphorus loading estimates.

As of the date of issuance of the draft permit, MassDEP has developed a draft Pathogen TMDL for the Blackstone River Watershed. Certain bacteria such as fecal coliform, *E. coli* and enterococcus bacteria are indicators of potential contamination from human sewage or the feces of warm-blooded domestic or non-domestic wildlife (mammals and birds). The presence of these bacteria at elevated levels in a waterbody may also indicate the presence of pathogens that may pose a risk to human health. Most bacteria sources in the Blackstone River watershed are believed to be derived from storm water.² Other urban bacteria sources include combined sewer overflows (CSO), sanitary sewer overflows (SSO), sewer pipes connected to storm drains, septic systems, certain recreational activities, wildlife including birds along with domestic pets and animals, and direct overland storm water runoff.

If the draft Pathogen TMDL for the Blackstone River Watershed is finalized and approved prior to the issuance of the final permit, and includes an applicable WLA to the Permittee's MS4 discharges, EPA will incorporate into the final permit, if necessary, any additional BMPs that the Permittee must implement to support the achievement of the WLA. At this time, EPA believes that the conditions included in the draft permit will be satisfactory, with little or no revision, to support the achievement of the WLA.

IX. ENDANGERED SPECIES ACT

The Endangered Species Act of 1973 requires federal agencies, such as EPA, to ensure in consultation with the U.S Fish and Wildlife Service (FWS) and the National Marine Fisheries (NMFS) (collectively referred to as the "Services") that any actions authorized, funded or carried out by the agency are not likely to jeopardize the continued existence of a Federally listed endangered or threatened species or adversely modify or destroy critical habitat of such species (see 16 U.S.C. 1536(a)(2), 50 CFR part 402 and 40 CFR 122.49(c)). The issuance of an NPDES permit by EPA is an action that is subject to the requirements of the ESA. There does not appear to be any threatened or endangered species in the vicinity of the Permittee's MS4 discharges and EPA believes the issuance of the permit will not adversely impact any threatened or endangered species or its critical habitat. EPA has sent a copy of the draft permit to the Services seeking concurrence with this determination.

X. ESSENTIAL FISH HABITAT

Under the 1996 Amendments (PL 104-267) to the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. § 1801 *et seq.* (1998)), EPA is required to consult with the National Marine Fisheries Service (NMFS) if EPA's action or proposed actions that it funds, permits or undertakes, "may adversely impact any essential fish habitat". (16 U.S.C § 1855(b)). The Amendments broadly define "essential fish habitat" (EFH) as "waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity." (16 U.S.C. § 1802(10)). "Adverse impact" means any impact that reduces the quality and/or quantity of EFH. (50 CFR § 600.910(a)). Adverse effects may include direct (e.g. contamination or physical disruption), indirect (e.g. loss of prey, reduction in species fecundity), site specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions. (*Id.*)

² Draft Pathogen TMDL for the Blackstone River Watershed. <http://mass.gov/dep/water/resources/tmdls.htm#info>

Essential fish habitat is only designated for fish species for which federal Fisheries Management Plans exist. (16 U.S.C. § 1855(b)(1)(A)). EFH designations for New England were approved on March 3, 1999. There is no EFH in the vicinity of the discharges, therefore EPA has determined that formal consultation is not required.

XI. HISTORIC PROPERTIES

Section 106 of the National Historic Preservation Act (NHPA) requires Federal agencies to take into account the effects of Federal “undertakings” on historic properties that are either listed on, or eligible for listing on, the National Register of Historic Places. The term Federal “undertakings” is defined in the NHPA regulations 36 CFR 800.16(y). The definition includes a project, activity, or program of a Federal agency including those carried out by or on behalf of a Federal agency, those carried out with Federal financial assistance, and those requiring a Federal permit, license or approval. Historic properties are defined in the NHPA regulations to include prehistoric or historic districts, sites, buildings, structures, or objects that are included, or are eligible for inclusion in, the National Register of Historic Places. The term includes artifacts, records, and remains that are related to and located within such properties. (36 CFR 800.16(1)). The discharge of storm water and the implementation of the SWMP must not result in an impact to any historic properties.

There are several historic properties within the City. At this time, EPA does not believe that the Permittee’s implementation of the requirements of this permit will impact any historic properties. When the Permittee undertakes a new or different activity than those contained in the permit, the Permittee must consult with the state or local historic preservation officer to ensure that the activity does not impact a listed property or a property eligible for listing in the National Register.

XII. STORM WATER MANAGEMENT PROGRAM

A comprehensive SWMP serves as the primary mechanism for the Permittee’s implementation and fulfillment of the permit provisions. The draft permit requires the Permittee to update its SWMP so that it satisfies the water quality-based and MEP-based requirements of the permit and to submit it to EPA and MassDEP within 180 days of the effective date of the permit, while also making it available for public review and comment. EPA and MassDEP will review the updated SWMP and may, after consideration of public comment received, require modifications consistent with the terms of the permit.

The draft permit requires that the Permittee maintain adequate finances, staff, equipment, and support capabilities to implement all activities required by the permit and the updated SWMP. Compliance with this requirement will be demonstrated by the Permittee’s ability to fully implement the SWMP, monitoring programs, and other permit requirements to be documented in the required annual reports. The draft permit does not require specific funding or staffing levels, thus providing the Permittee with the ability, and incentive, to adopt the most efficient and cost effective methods to comply with the permit requirements.

XIII. REQUIREMENTS TO MEET MEP

The draft permit includes the following requirements, all of which must be reflected in the SWMP.

A. Legal Authorities

As part of the original application process (40 CFR §122.26) the Permittee was required to identify and demonstrate the adequacy and enforceability of its legal authorities to successfully control discharges to its MS4. In its permit application and during the 1998 Permit term, the Permittee

demonstrated its legal authority established by statute, ordinance, rules and regulations and any other means, to prohibit or control the contribution of pollutants from storm water discharges to and from the portions of the MS4 which it owns and controls. Regulatory authority related to the SWMP includes: controlling discharges associated with industrial activities; prohibiting illicit discharges and dumping; spill response controls; pet waste management; prohibition of drainage infrastructure serving unpaved streets; and, new construction and redevelopment rules and regulations. The Permittee has adopted a policy to acquire easement rights to privately owned retention/detention ponds that connect to its MS4, to inspect and provide required maintenance to the systems to maximize proper functioning and pollutant removal efficiency. The draft permit requires the Permittee to continue exercising its legal authority and readily obtain any additional authority (see Part XIII.D. of this Fact Sheet) necessary to implement and enforce the provisions of the draft permit and its SWMP.

B. Public Education and Involvement

An informed and involved citizenry is key to the successful implementation of a SWMP and compliance with the permit requirements. Pollution prevention efforts are most effective when there is a heightened awareness of personal responsibilities and the public is knowledgeable about specific actions it can take to ensure that its behaviors are compatible with the SWMP. An informed and motivated public can also yield volunteerism helping to implement elements of the SWMP, and a base of support for instituting necessary regulations or funding initiatives.

The draft permit requires the continuation of the Permittee's public education and involvement programs to increase the public awareness about storm water pollution, its causes and effects and what citizens, commercial, industrial and institutional entities can do to reduce the impact of storm water pollution on the environment. The Permittee has used various public education and involvement methods to promote, publicize and facilitate the various elements of its SWMP. The Permittee's accomplishments in public education and public involvement over the 1998 Permit term include:

1. installation of 78 waterway signs identifying significant waterways within the City;
2. utilizing students and volunteers to stencil or mark approximately 1,480 storm drains and distribute leaflets describing the SWMP and the reason for stenciling to households in the stenciling area;
3. publishing and distributing in the water and sewer bills of 40,000 customers, newsletters on topics including SWMP implementation, the Mill Brook Task Force, sewer division accomplishments, the relationship between catch basins and receiving waters, consequences of grease in sewers, lawn and yard care management, and how the public can help improve water quality in Worcester's lakes and ponds;
4. creation of a web site for posting information about its SWMP;
5. development of educational brochures on topics such as the quality of Worcester's water resources, stopping pollution of waterways, pets waste management, and oil collection and recycling. Brochures were disseminated at City Hall and public events such as the DPW&P Open House, Earth Day at the Ecotarium, at the City's recycling center, and the Massachusetts Audubon Sanctuary;

6. development and presentations of school education programs regarding water quality and storm water management. Background information about storm water issues was provided to students up to and including graduate school level;
7. development of brochures on pet waste and resulting water quality impacts, and mailings to 5,676 registered dog owners and local veterinarians' offices. Information about dog waste disposal and the City's ordinance (City of Worcester General Ordinances, Chapter 8 §14(9) §15(c)) also was included in the newsletter that is sent to all ratepayers as a bill stuffer;
8. partnering with watershed and citizen groups to apply for CWA Section 319 grants for storm water remediation projects at Salisbury Pond and Indian Lake and participating in waterway cleanups; and,
9. coordinating monitoring efforts between City staff, watershed association members and Clark University students, to survey the Mill Brook watershed and the Middle River to find and eliminate illicit connections.

The draft permit requires that public education and involvement methods continue and that the Permittee make educational materials available for non-English speaking residents. The Permittee has proposed to update the DPW&P web site with additional storm water information.

The draft permit requires continuation of the Permittee's pet waste management education efforts. The draft permit requires dog owners be presented with information about waste disposal when they apply for license renewals. The draft permit also requires the Permittee to install signage and pet waste baggies in recreational areas where dog walking is allowed. In order to measure the effectiveness of the education program, the draft permit requires the Permittee to provide information regarding the enforcement of the dog waste management ordinance, including the number of violations and fines levied, in its required annual reports.

The draft permit also requires that information about the SWMP be provided to owners and operators of commercial, industrial, and institutional facilities regarding their responsibility to control pollutants in storm water discharges to the Permittee's MS4. The education program shall inform these facility operators of their obligation to comply with the Permittee's stormwater rules and regulations, promote pollution prevention, and promote facility-specific storm water management practices, including appropriate operation and maintenance practices. The draft permit requires the Permittee to continue coordinating with environmental groups and civic organizations implementing water quality improvements and to provide opportunities for the public to participate in the implementation and review of the SWMP.

The draft permit requires the Permittee to assess the overall success of its public education and involvement program by measuring the effectiveness of its program elements. Demonstrating the value of implementing programs can be shown through both direct and indirect measures.

Direct measures using environmental indicators can include reduction in:

1. pollutant loadings as a result of structural BMPs;
2. pollutant loadings from the elimination of illicit discharges;
3. sediment loadings from construction sites due to erosion and sediment control plans correctly implemented and maintained; and
4. frequency and duration of beach and recreational water closings.

Indirect measures of program effectiveness can include:

1. percent public participation and quantities of waste collected at household hazardous waste (HHW) collection days;
2. utilization of Permittee's recycling facility for waste oil collection
3. percentage of public and business community reached by educational materials;
4. number of volunteers participating in SWMP implementation;
5. number of storm drain inlets stenciled;
6. number of erosion and sediment control (ESC) plans submitted and approved and permits issued;
7. number of enforcement citations issued for construction violations; and,
8. number of hot line calls or complaints received.

C. Pollution Prevention (Source Controls)

The draft permit requires the implementation of source control and pollution prevention practices to reduce the amount of pollutants exposed to storm water runoff and impacting receiving waters. Pollution prevention practices are a critical component of a SWMP as they can reduce or entirely eliminate the introduction of a pollutant into a MS4, minimizing the challenge and cost of removing the pollutant from the storm water flow stream. The Permittee implemented several pollution prevention practices during the 1998 Permit term and the draft permit requires the continuation of all of these practices with the addition of others as noted:

1. The Permittee owns and operates three (3) covered sheds (two of which are located in areas tributary to its combined sewer system) which store salt for roadway deicing operations. Though explicit provisions related to the storage and housekeeping of deicing materials are not included in the expired permit, the Permittee does refer to refined and improved housekeeping procedures at these facilities in its 1999 SWMP. The draft permit includes a provision that requires enclosure of all snow and ice control materials in storage sheds, or impervious covers (e.g. tarps) where storage of such materials is on an interim or temporary basis. The draft permit also requires implementation of procedures that minimize exposure of deicing materials during handling. Recognizing that residues from vehicles and equipments used for deicing operations can be mobilized and discharge to receiving waters, the draft permit requires the Permittee to develop and implement practices to address post-storm vehicle washing and residue disposal for city-owned and contractor vehicles and equipment used for deicing operations.
2. The requirement to facilitate the proper management, disposal, reuse and recycling of used motor vehicle fluids by the public has been accomplished by informing citizens through public education vehicles (newsletters mailed in water and sewer bills and in pamphlets) about the obligation of motor oil retailers to accept back equal quantities of the used product (MGL c21 §52A). The draft permit requires the Permittee to continue to manage its Recycling Facility, constructed in 2002-2003, to accept used motor oil from the public.
3. The draft permit requires the continuation of the Permittee's municipal HHW Collection program to reuse, recycle and properly dispose of material. The program has been held at least annually and sometimes twice a year. Quantities of waste collected have been reported in each year's annual report; examples given have been twenty-four (24) 55-gallon drums collected during two events in 2004, one hundred two (102) 55-gallon drums collected at two events in 2005, and forty-three (43) 55-gallon drums collected at one event in 2006. The draft permit requires the Permittee to host HHW Collection events annually but EPA and MassDEP strongly recommend that biannual collections be held during the Spring and Fall seasons, due to the City's relatively large population and the previous participation and success of biannual collections.

4. The Permittee has legal authority (An Amendment to the Revised Ordinances of 1996 Relative to Sewers and Storm Water Management, Chapter Five, §§20-21) to prohibit discharges of hazardous materials from spills to the MS4. The Permittee has coordinated several municipal departments in preparing, revising and implementing a city-wide Spill Prevention and Response Program, including an Integrated Hazardous Materials Incident Response Plan, to prevent, contain, and respond to spills that may discharge to its MS4. Based on findings from the August 2006 MS4 Audit³, Part I.E.6.(j) of the draft permit requires that the Permittee's formal employee training program include educating City staff about spill response protocols and respective responsibilities. The draft permit also requires the Permittee to continue providing spill response reports with each annual report.

In August 2005, following a heating oil spill from a municipal building to the MS4, MassDEP ordered the City (ACOP-CE-05-IN002) to inspect municipal facilities for compliance with federal Oil Pollution Prevention Regulations (40 CFR Part 112), and correct drains and illicit connections from all municipal buildings to the City's storm drain system. These activities will take place during the term of the draft permit and are required to be integrated into the Permittee's Illicit Discharge Detection and Elimination Program described in Part I.E.5. of the draft permit. The ACOP requires status reporting to MassDEP and EPA.

5. During the 1998 Permit term, the Permittee eliminated the use of pesticides in municipal practice and limited the use of herbicides to applications within roadway median strips only. In 2005, departmental reorganization merged the Department of Public Works with the Parks Department ("DPW & P"). All city parks, Hope Cemetery, the properties managed by the Forestry Department and the Green Hill Golf course, (previously managed by the Parks Department), have limited pesticide, herbicide and fertilizer use. A private contractor operates the municipally-owned Green Hill Golf Course. The draft permit requires the Permittee to continue its minimization of the use of pesticides, herbicides and fertilizers ("PHFs") on public property and the proper storage and transport of these chemicals to reduce exposure to storm water or discharge to its MS4. Based on findings from the August 2006 MS4 Audit, the draft permit requires that the Permittee develop and implement standard operating practices for the handling, storage, application, and disposal of PHFs in compliance with applicable state and federal laws, including state-approved vegetation management plans (VMPs). In addition, the Permittee is required to establish reduction goals in its SWMP, including consideration of alternatives, for PHFs used on city property.

The draft permit requires the Permittee to continue its public education and involvement program to inform citizens about the importance of reducing or eliminating the use of PHFs on their private property. During the previous permit term, the Permittee provided educational information about minimizing the use of these chemicals along with other storm water management techniques through the use of printed materials such as pamphlets, the newsletter *On the Waterfront* sent to ratepayers, during classroom presentations, and public displays at Worcester's Earth Day celebration and during the annual DPW&P Open House.

6. The draft permit does not authorize the discharge of storm water from the Permittee's MS4 commingled with flows contributed by process wastewater, non-process wastewater, or storm water discharges associated with an industrial activity (as defined at 40 CFR §122.26(b)(14)), unless such discharges are authorized under a separate NPDES permit. The Permittee has

³ Municipal Separate Storm Sewer System (MS4) Audit, Worcester Massachusetts, August 1 – 3, 2006 (SAIC, September 29, 2006)

regulatory authority (An Amendment to the Revised Ordinances of 1996 Relative to Sewers and Storm Water Management, Chapter Five, §§20-21) prohibiting storm water discharges to its MS4 associated with industrial activity without a permit.

During the 1998 Permit term, the Permittee was required to implement a program to identify, monitor and control pollutants in storm water discharges to its MS4 from municipal landfills, hazardous waste storage, disposal and recovery facilities and facilities subject to EPCRA Title III, Section 313, and any other industrial or commercial discharge the Permittee determined contributed to substantial pollutant loading to the MS4. While EPA is the primary agency regulating storm water discharges associated with industrial activities, under Federal jurisdiction of the NPDES permitting program, the draft permit requires the Permittee to continue its regulation of storm water discharges from industrial facilities where it has clear and independent jurisdiction through its ordinances and regulations.

7. The draft permit requires the Permittee to develop and implement a program to control pollutants in storm water discharges to its MS4, not otherwise authorized by an NPDES permit, from commercial, industrial, municipal, institutional or other facilities that the Permittee determines are contributing a substantial pollutant loading to its MS4. The program must include an inventory, mapping and prioritization of all facilities it determines are contributing a substantial pollutant loading to its MS4 through inspections, monitoring, or any other method conducted by the Permittee, facility owner or others. The program must also include an education component to inform facility operators of their obligation to comply with the Permittee's stormwater rules and regulations, promote pollution prevention, and promote facility-specific storm water management practices, including appropriate operation and maintenance practices.

D. Land Disturbance and Development

The Permittee currently administers several existing programs and regulations addressing storm water management during and after site development. The responsibility for land use planning and permitting, to reduce the discharge of pollutants from active construction sites and newly developed or redeveloped land is shared between several city departments and boards. During the 1998 Permit term, the Permittee had difficulty controlling or enforcing against several development projects that impacted local water quality with polluted runoff and other discharges. This occurred due to the inability of the Permittee's current municipal ordinances to adequately regulate discharges from development and redevelopment sites, during active land disturbance and after stabilization. In response, the Permittee convened for a brief period of time, an Erosion Control Task Force. Although a task force subcommittee was assigned to develop a new ordinance to address the issue, it did not issue a draft ordinance or any recommendations.

The draft permit requires that the Permittee coordinate all municipal departments and boards that have jurisdiction to permit, review, or approve construction or land development projects. By two (2) years from the effective date of the final permit, the Permittee is required to develop, implement and enforce an updated program to reduce pollutants in any storm water runoff to its MS4 from land disturbance and development activities disturbing one or more acres of land. The draft permit requires the Permittee to establish comprehensive and fully enforceable authority to regulate land disturbance activities that minimizes or eliminates adverse effects of storm water pollutants during and after land development activities. As it appears that the Permittee does not currently possess such comprehensive authority, development and adoption of necessary ordinances or other regulatory mechanism to the extent allowable by state law is a required element of its program.

The draft permit also requires the Permittee to update its program to include, to the extent allowable by state law, requirements on discharges to its MS4 that are equivalent to the MassDEP Stormwater Management Standards. The Stormwater Management Standards establish the level of control required to address water quality and quantity of runoff from certain new development and redevelopment sites in the Commonwealth. The standards were originally published as policy in 1996 and prior to the beginning of 2008 were applied through existing state regulatory programs; specifically, the Wetlands Protection Act and 401 Water Quality Certification Program for storm water discharges from new or redeveloped parcels, and on a case-by-case basis under the Clean Waters Act for discharges from existing development. In January 2008, the standards were revised and promulgated into the Massachusetts Wetlands Protection Act regulations (310 CMR 10.00) and Water Quality Certification (314 CMR 9.00) regulations. The standards apply only to storm water discharges from activities that are subject to the Wetlands Protection Act or which require a § 401 certification for a CWA § 404 permit from the Corps of Engineers for the discharge of dredged or fill material to surface waters. The draft permit requires the City to adopt similar standards for new development and redevelopment activities that are not subject to those regulations but that discharge to the MS4. This will ensure a more comprehensive and effective storm water control program within the City for new and redeveloped sites. The draft permit (Part I.E.4.(b)) also requires the City to apply such standards to storm water discharges to its MS4 from any project disturbing one or more acres of land, irrespective of the MassDEP standards' applicability criteria.⁴ This threshold is consistent with other requirements in the draft permit, which generally apply to storm water discharges activities that disturb one or more acres of land.

The Stormwater Management Standards are available at MassDEP's website⁵. The City must adopt requirements that are equivalent to the standards for storm water discharges to its MS4 from new and redeveloped sites. Some of the standards (or portions thereof) apply specifically to storm water discharges directly to surface waters of the Commonwealth (e.g., Standard #1 and part of #6). This permit does not require the City to adopt requirements for discharges that do not go to the MS4, but the City may choose to do so voluntarily. The MassDEP Stormwater Management Standards are as follows:

1. No new stormwater conveyances (e.g. outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.
2. Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates. (Note that language related to coastal storm flowage is not included here.)
3. Loss of annual recharge to groundwater shall be eliminated or minimized through the use of infiltration measures including environmentally sensitive site design, low impact development techniques, stormwater best management practices, and good operation and maintenance. At a minimum, the annual recharge from the post-development site shall approximate the annual recharge from pre-development conditions based on soil type. This Standard is met when the stormwater management system is designed to infiltrate the required recharge volume as determined in accordance with the Massachusetts Stormwater Handbook.

⁴ The MassDEP Stormwater Management Standards do not apply to projects involving single family homes, subdivisions of four or fewer lots not affecting defined critical areas, and emergency repairs to roads and drains. The standards apply to the MEP for subdivisions of four or fewer lots potentially affecting "critical areas," and five to nine lots not affecting a critical area.

⁵ Massachusetts Stormwater Handbook, Volume 1, Chapter 1: The Stormwater Management Standards, available at url: <http://www.mass.gov/dep/water/laws/v1c1.doc>

4. Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of Total Suspended Solids (TSS). This standard is met when:
 - a. Suitable practices for source control and pollution prevention are identified in a long-term pollution prevention plan, and thereafter are implemented and maintained;
 - b. Structural stormwater best management practices are sized to capture the required water quality volume determined in accordance with the Massachusetts Stormwater Handbook; and
 - c. Pretreatment is provided in accordance with the Massachusetts Stormwater Handbook.
5. For “land uses with higher potential pollutant loads” (as that term is defined in 310 CMR 9.00; it includes such things as gas stations; exterior fleet storage areas; exterior vehicle service and equipment cleaning areas; marinas and boatyards; parking lots with high intensity use), source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable. If through source control and/or pollution prevention all land uses with higher potential pollutant loads cannot be completely protected from exposure to rain, snow, snow melt, and stormwater runoff, the proponent shall use the specific structural stormwater BMPs determined by the Department to be suitable for such uses as provided in the Massachusetts Stormwater Handbook. Stormwater discharges from land uses with higher potential pollutant loads shall also comply with the requirements of the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26-53 and the regulations promulgated thereunder at 314 CMR 3.00, 314 CMR 4.00 and 314 CMR 5.00.
6. Stormwater discharges within the Zone II or Interim Wellhead Protection Area of a public water supply, and stormwater discharges near or to any other “critical area,” (defined to include Outstanding Resource Waters as designated in 314 CMR 4.00, Special Resource Waters as designated in 314 CMR 4.00, recharge areas for public water supplies as defined in 310 CMR 22.02 (Zone Is, Zone IIs and Interim Wellhead Protection Areas for groundwater sources and Zone As for surface water sources), bathing beaches as defined in 105 CMR 445.000, cold-water fisheries as defined in 310 CMR 10.04 and 314 CMR 9.02, and shellfish growing areas as defined in 310 CMR 10.04 and 314 CMR 9.02) require the use of the specific source control and pollution prevention measures and the specific structural stormwater best management practices determined by the Department to be suitable for managing discharges to such areas, as provided in the Massachusetts Stormwater Handbook. A discharge is near a critical area if there is a strong likelihood of a significant impact occurring to said area, taking into account site-specific factors. Stormwater discharges to Outstanding Resource Waters and Special Resource Waters shall be removed and set back from the receiving water or wetland and receive the highest and best practical method of treatment. A “storm water discharge” as defined in 314 CMR 3.04(2)(a)1 or (b) to an Outstanding Resource Water or Special Resource Water shall comply with 314 CMR 3.00 and 314 CMR 4.00. Stormwater discharges to a Zone I or Zone A are prohibited unless essential to the operation of a public water supply.
7. A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural best management practice requirements of Standards 4, 5, and 6. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions.
8. A plan to control construction-related impacts including erosion, sedimentation and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation, and pollution prevention plan) shall be developed and implemented.
9. A long-term operation and maintenance plan shall be developed and implemented to ensure that stormwater management systems function as designed.
10. All illicit discharges to the stormwater management system are prohibited

In the Preamble to the NPDES Permit Application Regulations for Storm Water Discharges (Final Rule 55 FR 48054; November 16, 1990), EPA describes that of equal importance to the pollutants

washed into receiving waters from residential and commercial areas is “...the volume of storm water runoff leaving urban areas during storm events. Large intermittent volumes of runoff can destroy aquatic habitat. As the percentage of paved surfaces increases, the volume and rate of runoff and the corresponding pollutant loads also increase. Thus, the amount of storm water runoff from commercial and residential areas and the pollutant loadings associated with storm water runoff increases as development progresses; and they remain at an elevated level for the lifetime of the development.” EPA’s *Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems* (61 FR 41698; August 9, 1996) provides guidance with respect to modifications to the Permittee’s SWMP upon permit re-issuance. In particular, it states that “[t]he components of the original stormwater program which are found to be effective should be continued ... [s]uch components may include: ...-continued, if not greater emphasis on addressing impacts of new development/construction; [and] –proper storm design criteria for all new developments;...”.

In EPA’s best professional judgment, the MassDEP’s revised Stormwater Management Standards represent a set of design and engineering methods, that when properly applied, provide a nearly comprehensive framework for reducing to the MEP the discharge of pollutants in storm water, while controlling the volume and rate discharge, associated with land development activities. Adoption of these standards or equivalent requirements should enable the Permittee to provide consistent and streamlined city-wide procedures for managing storm water discharges to its MS4 from land development activities during and after construction, regardless if development occurs in a wetland buffer zone or an upland area. EPA considers the adoption and application of the standards (or equivalent) to be practicable in light of Worcester’s existing municipal processes for applying the former and existing standards under its administration of the Massachusetts Wetlands Protection Act. Numerous communities regulated under the Phase II Small MS4 Permit have already adopted or apply the MassDEP Stormwater Management Standards in their existing land development regulations or new stormwater management bylaw or ordinance.

In addition to requiring the Permittee to adopt requirements equivalent to the MassDEP Stormwater Management Standards, the draft permit requires that the Permittee’s program include requirements for site plan review and pre-construction review meetings; construction phase inspection and enforcement procedures; and procedures for the receipt and consideration of information and comments submitted by the public regarding storm water management concerning land disturbance and development activities.

The draft permit also requires the Permittee to notify project applicants of the potential obligation to obtain authorization under EPA’s NPDES *Storm Water General Permit for Discharges from Construction Activities* (“CGP”) if the development or redevelopment project disturbs one (1) acre or more of land, either individually or as part of a larger common plan of development. In May 2006, EPA’s Office of Water issued a memo to EPA regions and states encouraging them to take advantage of provisions in the NPDES regulations, which allow for streamlined implementation of the storm water program⁶. The “Qualifying Local Program” (QLP) provision offers the opportunity to increase administrative efficiencies in the storm water program by formally recognizing local construction management programs that meet or exceed the provisions of EPA’s construction general permit (CGP). When a local sediment and erosion control program meets the requirements of 40 CFR 122.44(s), EPA may incorporate the municipality’s program by reference in its CGP. When this occurs, the municipality’s local program is then a “qualifying program” and a construction site operator’s compliance with the local requirements constitutes compliance with the NPDES CGP permit requirements. Though not a requirement, EPA encourages the Permittee to seek QLP status

⁶ Memo dated May 8, 2006, from B. Grumbles to R. Varney. http://www.epa.gov/npdes/pubs/qlp_memo.pdf

for its program with EPA once it has developed the requisite program. Alternatively, EPA may identify the Permittee's program as a QLP upon EPA's determination that the Permittee's program meets or exceeds the provisions of EPA's construction general permit (CGP).

The draft permit also requires the Permittee to estimate, and report annually, the directly connected impervious area (DCIA) to each of its MS4 outfalls. As discussed above, as the percentage of impervious surfaces increases, the volume and rate of runoff and the corresponding pollutant loads also increase. The Preamble to the Phase II Rule (64 FR 68725; December 8, 1999) summarizes findings from several studies that demonstrate the positive correlation between increased impervious area and degraded receiving water quality. EPA believes that tracking DCIA serves three important purposes. First, it provides an objective measure of the effectiveness of the Permittee's efforts to reduce impervious area and resulting pollutant load and flow volumes through application of its stormwater management regulations. Second, it serves as a powerful educational tool to inform the public and other stakeholders of the degree to which this basin characteristic is likely affecting tributary water bodies. Third, it will support future implementation of planned TMDLs that will utilize reduction in effective impervious coverage to support achievement of waste load allocations.

E. Illicit Discharges and Sanitary Sewer Overflows

The Permittee identified, tracked and eliminated approximately 100 illegal connections to its MS4 during the 1998 Permit term and a total of approximately 140 since 1993. The City's identification of illegal connections has been facilitated through dry and wet weather monitoring, by educating staff to identify suspected flow during normal operation and maintenance of the system, and through responding to citizen inquiries. The Permittee developed an approach to locate illegal connections through outfall-to-source searches, inspecting manholes, conducting closed-circuit television inspections, and dye testing. Once an illegal connection is identified, a letter is sent to the property owner and a contract is generated between the Permittee and the owner to execute the repair on a 50-50% cost-share basis. The Permittee hires and oversees a utility contractor to repair the connection. In its most recent three annual reports, the Permittee indicates that the average repair is done three to six months after the initial dye test confirming the presence of an illicit connection. The average repair time reported in the prior two annual reports was approximately 3 months. During the August 2006 Audit, the Permittee reported that repairs are typically completed in five to six weeks, but can take longer, with 10-15 percent of the connections requiring an enforcement action to correct.

The Permittee has reviewed its illicit connection program during the 1998 Permit term and reports no clear trends observed in the occurrence of the illicit connections identified to date. The Permittee reports that the occurrence of illicit connections do not appear to correlate to the age of the structure or sewer service, construction materials, geographic location, or other obvious factors. The Permittee has provided in its annual reports, the estimated gallons of wastewater removed from its MS4 and receiving waters based on estimated contributions from the type of property where each illegal connection was found (i.e., single or multi-family home, commercial or industrial).

During the 1998 Permit term, the Permittee incorporated procedures into its inspection and permitting process for new construction and redevelopment projects to prevent inappropriate connections to its MS4. An occupancy permit is not issued until the Engineering Division of the DPW&P performs a dye test to verify installation of a proper sanitary sewer connection.

The draft permit prohibits all illicit discharges and requires the City to continue to eliminate them. It also requires the Permittee to supplement its existing illicit connection program with a more aggressive and comprehensive illicit discharge detection protocol ("IDDP") to locate and eliminate illicit discharges and improper disposal into its MS4. As described in Part I.F.6. of the draft permit,

the IDDP incorporates techniques currently utilized by the Boston Water and Sewer Commission (BWSC)⁷, enhanced with indicators developed by Dr. Robert Pitt at the University of Alabama and the Center for Watershed Protection under an EPA Cooperative Assistance Agreement⁸. The IDDP relies primarily on visual observations and the use of field test kits and portable instrumentation during dry weather conditions to identify illicit discharges throughout MS4 alignments. The IDDP is implemented in the upper reaches of MS4 subcatchments first, proceeding in a downstream direction as segments are confirmed to be absent of illicit discharges or all identified discharges are eliminated.

EPA considers the IDDP to represent a best management practice that will reduce illicit discharges contributing to the Permittee's MS4 to the maximum extent practical. EPA believes that the IDDP is far less subject to the shortcomings of more conventional approaches that rely mostly or entirely on MS4 outfall screening or monitoring to indicate potential illicit influences. By observing and monitoring flows in upper portions of MS4 subcatchments, inappropriate connections, discharges, or evidence of dumping can be identified that may likely go undetected otherwise. In many cases an illicit discharge present in the upper portion of an MS4 subcatchment may not manifest at an outfall except under certain seasonal, hydrologic, or operational conditions. Further, due to the inherent variability and randomness of most illicit discharges, anything less than continuous outfall screening and monitoring will likely result in undiscovered discharges. In both instances, investigations conducted more proximate to the potential sources of an illicit discharge yields a greater likelihood of observance or evidence of a discharge. This may occur, for example, where flow from an illicit discharge exfiltrates from a joint in the MS4 prior to reaching an outfall under certain conditions. In other instances, while indicators of sanitary discharges may be diluted or have experienced significant decay in the case of indicator bacteria organisms, these same indicators are often present at or near the point of entry into the MS4. Indeed, the Permittee acknowledges such occurrences in its annual report, stating that "[p]arts of Worcester's storm drain system are influenced by ground water and streams that enter it. This high clean flow can mask any illicit connection that might be present." (City of Worcester Stormwater Management Plan Annual Report, April 2006, p. 5-1).

Pursuant to CWA §402(p)(3)(B)(ii), the draft permit includes a requirement to effectively prohibit non-stormwater discharges into its MS4. It distinguishes illicit discharges from sanitary sewer overflows (SSOs) into the MS4 for the purposes of reporting, prioritization, and abatement schedules. Pursuant to 40 CFR §122.47, the draft permit sets forth a schedule for the Permittee to implement its IDDP informed by outfall screening results to establish priorities. Efficiencies are included in the draft permit to allow the Permittee to minimize its outfall screening burden for catchments where illicit discharges or SSOs are known or highly suspected; allowing the Permittee to proceed directly to isolation or removal. EPA recognizes that variations to the IDDP may be required in some situations and affords the Permittee the ability to request revisions accordingly. Where the IDDP indicates suspect MS4 alignments, the Permittee is required to exercise its authorities to implement its existing programs and measures to verify (e.g. dye test) the connection, and repair it or cause its removal, in accordance with a schedule provided in Part I.E.5., of the draft permit.

⁷ Boston Water & Sewer Commission, 2004, *A systematic Methodology for the Identification and Remediation of Illegal Connections*. 2003 Stormwater Management Report, chap. 2.1.

⁸ Pitt, R. 2004 *Methods for Detection of Inappropriate Discharge to Storm Drain Systems*. Internal Project Files. Tuscaloosa, AL, in The Center for Watershed Protection and Pitt, R., *Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments*: Cooperative Agreement X82907801-0, U.S. Environmental Protection Agency, variously paged. Available at: <http://www.cwp.org>.

F. Infrastructure Operations and Maintenance

1. In order for a storm water management system to function as designed and constructed, it must be maintained properly and upgraded with capital improvements when necessary. The Permittee's current maintenance program includes routine and remedial maintenance activities performed according to its standard operating procedures. The draft permit requires implementation of maintenance programs to prevent or reduce pollutants from entering the MS4. This includes regular system cleaning of captured or deposited materials to maintain system performance and timely infrastructure repairs to ensure proper system operation. Specifically, the draft permit includes provisions requiring the review and necessary modification to standard operating procedures for street sweeping, parking lot and sidewalk sweeping, catch basin cleaning, snow and ice control, maintenance of private retention/detention ponds connected to the Permittee's MS4 and for which the Permittee has acquired easement rights, and the coordination with operators of interconnected MS4 systems. Employee training requirements are included to increase awareness of water quality related issues in management of sewer and surface drainage systems, including how to identify and report illicit connections and discharges.
2. The existing street sweeping program covers 950 curb-miles of streets; some 560 miles (nearly 60 percent) of which are residential. Street sweeping is performed by using mechanical rotary brush sweepers and vacuum sweepers. Residential streets are swept once in the fall to maximize leaf collection, and once in the spring to maximize collection of de-icing materials. Sweeping of downtown arterial streets is performed weekly and more frequently as necessary. The Permittee provides in its annual reports the number of curb-miles swept and cubic yards of material (sweepings) removed from the streets. For example, for the period November 1, 2004 to October 31, 2005, a total of 2,922 lane-miles were swept, collecting 85,654 cubic yards of material. For the period November 1, 2005 to October 1, 2006, approximately 71,502 cubic yards of material was collected from sweeping 10,478 curb-miles. The draft permit requires the Permittee to continue its current street sweeping program, but as a goal, compress its spring cleanings to maximize the collection of winter deicing materials. The street sweeping frequencies in the draft permit are consistent with recommendations in implementation plans that accompany approved TMDLs for Curtis Pond, Indian Lake, Lake Quinsigamond, Leeville Pond, and Salisbury Pond. Copies of these TMDL Plans can be found at <http://mass.gov/dep/water/resources/info>. As proposed by the Permittee, the draft permit includes an augmented program that includes sweeping all publicly owned parking lots and sidewalks in the central business district at least twice annually.
3. The Permittee is currently responsible for the maintenance of approximately 15,000 catch basins. Along with street sweeping, the Permittee utilizes catch basins as the primary means for preventing the transport of sediments and other contaminants through its MS4 and into receiving waters. The Permittee provided annual reporting of the number of catch basins cleaned and the approximate tonnage of material (screenings) removed. For the period November 1, 2004 to October 31, 2005, a total of 7,397 catch basins were cleaned, removing approximately 7,267 tons of material from the catch basin sumps. For the period November 1, 2005 to October 1, 2006, approximately 9,553 tons of material were removed from the cleaning of 9,989 catch basins. The 1998 Permit requires that each catch basin be cleaned at least every other year and that an automated database be used to record information including the date of cleaning and an estimate of how full each catch basin was when cleaned. For those catch basins found to be more than approximately fifty percent (50%) full, the existing permit requires that a subsequent inspection be conducted within three to six months and cleaning schedules be modified as appropriate.

As reported in its annual reports and during the 2006 MS4 Audit, the Permittee typically cleans and inspects all of its catch basins on a two-year cycle, resulting in approximately fifty percent (50%) of the total cleaned and inspected annually. Though the Permittee reported in its most current annual report that it has done so, results of the 2006 MS4 Audit suggest that the Permittee does not have an automated database as required by the permit that tracks whether a catch basin sump is more than fifty percent (50%) full when it is cleaned. Rather, it appears that the Permittee only records the number of catch basins that are found more than fifty percent (50%) full out of the total number of catch basins cleaned on a given day. Therefore, the Permittee does not have the information it needs to facilitate the required follow-up inspections and cleaning frequency modifications.

A review of the limited literature⁹ investigating catch basin performance suggests a reduction in the removal of suspended solids and related pollutants when sump depth is effectively reduced by approximately one-half due to cumulative sediment deposition. Once approximately 50% full, a catch basin may reach a steady state condition where no more suspended solids are retained and resuspension of bottom solids in the sump may occur during large or intense storms. A 2002 USGS investigation of deep-sumped hooded catch basins along the Southeast Expressway in Boston observed resuspension of bottom solids during several storms even when catch basin sumps were less than 25% full. Besides reducing effective sump depth, Butler concluded that during dry weather the bottom solids can drive biochemical reactions resulting in anaerobic conditions and the subsequent release of oxygen demanding soluble organics, ammonium, and possibly sulfides. Furthermore, the phase and bioavailability of heavy metals can change in the bottom sediments and standing water. During wet weather, inflows could displace standing water and bottom sediments enriched with trace elements in the dissolved phase. Therefore, catch basin cleaning frequencies that consistently maintain available sump volume at or above 50% should be a goal of the Permittee's maintenance program.

The draft permit requires the Permittee to refine and utilize its Catch Basin Inventory Program ("CBIP") to maintain inspection and maintenance information as required by the 1998 Permit. The draft permit requires that the Permittee should, as a goal, increase its regular cleaning frequencies such that no catch basin sump is found to be more than fifty-percent (50%) full during routine cleaning events. If a catch basin's sump is found to be more than fifty-percent (50%) full during each of two consecutive routine cleaning events, the Permittee is required to investigate the contributing drainage area for sources of excessive sediment loading, and to the extent practical, abate contributing sources through appropriate measures. For those catch basins serving catchment areas tributary to a receiving water with an approved TMDL (see Attachment B of the draft permit), the Permittee must implement cleaning frequencies that ensure no sump is filled beyond fifty-percent (50%) of its capacity.

4. The draft permit requires the Permittee to perform required maintenance of privately owned retention/detention ponds which connect to its MS4, and for which the Permittee has acquired easement rights. The Permittee currently maintains privately owned ponds in order to maximize proper functioning and pollutant removal efficiency, and to minimize the impacts to its MS4 and receiving water quality. The Permittee discovered that maintenance of these facilities was rarely,

⁹ Pitt, R. and Bissonnette, P., 1984, Nationwide Urban Runoff Program, Bellevue Urban Runoff Program, Washington, Summary Report, R805929-01-0, 183 p.; Lager, J. A., Smith, W. G., and Tchobanoglous, G., 1977, Catchbasin Technology Overview And Assessment, U.S. Environmental Protection Agency, (EPA/600/2-77/051), 128 p.; Smith, K.P., 2002, Effectiveness of Three Best Management Practices for Highway-Runoff Quality along the Southeast Expressway, Boston, Massachusetts: U.S. Geological Survey Water-Resources Investigations Report, 62 p., + 1 CD-ROM; Butler, D., et.al., 1995, The Gully Pot as a Physical, Chemical and Biological Reactor, Wat. Sci. Tech. Vol 31, No. 7, pp. 219-228.

if ever, performed because typically, the responsibility was left to homeowner associations or a particular homeowner who was unaware of the maintenance obligations or did not have the capacity to maintain the pond. A City policy now requires developers to grant the Permittee a permanent easement to any new facilities. The Permittee is pursuing easement rights for additional privately owned ponds located in existing subdivisions that the Permittee has determined are not being properly maintained.

5. In September 2005, the City of Worcester was ordered by U.S. EPA (Administrative Order Docket No. 05-21) to eliminate unauthorized wastewater collection system discharges (i.e., sanitary sewer overflows, (SSOs)) through implementation of several programs including a Capacity, Management, Operations and Maintenance (CMOM) Plan; Priority Cleaning Plan; Long Term Preventative Maintenance Plan; Fats, Oils, and Grease (FOG) Program; and a Root Control Program. Besides pipe blockages, sanitary sewer overflows can be caused by a variety of circumstances including infrastructure design (e.g. twin invert structures), collapsed or broken sewer pipes, mechanical or electrical failures, or insufficient conveyance capacity. The draft permit requires the Permittee to implement programs required by the Administrative Order to minimize the occurrence and discharge of SSOs to and from its MS4.
6. The draft permit requires the Permittee to continue revising and refining, as necessary, its standard operating procedures and good housekeeping practices, for management of its sanitary sewer system and MS4. The Permittee credits prior education of employees about storm water management as a major reason why the illicit discharge detection and elimination program has been so successful. Employees have been trained to recognize the causes and effects of sanitary sewer overflows, combined sewer overflows, illicit connections, illicit discharges, silt and sand blockages, and overall system-related concerns. Therefore, the draft permit requires continued training of its staff to maintain awareness of storm water quality related issues that may arise during operation and maintenance activities, and to reemphasize the objectives and goals of its SWMP.

G. Infrastructure Improvements

1. The draft permit requires the continuation of ongoing programs to repair, rehabilitate and improve the Permittee's MS4 infrastructure to reduce the discharge of pollutants from its MS4 to the maximum extent practicable.
2. The draft permit requires the Permittee to continue to implement its program to install hold-down devices on the metal plates that cover sanitary inverts of twin-invert manholes, and reduce cross-contamination from the sanitary sewer into the MS4. Twin-invert manholes provide access to both the sanitary sewer and MS4 through a common structure. A dividing wall separates the two inverts; one invert conveys sanitary sewage and the other conveys storm water. The two inverts typically are located at different elevations, with the sanitary sewer usually situated lower. Under certain flow conditions or if blockages occur in either system, flows can surcharge over the top of the dividing wall and commingle with the other system. Before the issuance of the first storm water permit in 1998, the Permittee retrofitted most of its twin-invert manholes with a metal plate set in mortar enclosing the sanitary sewer invert. The plates proved ineffective because they often were lifted by excessive surcharge pressure or were sometimes not properly replaced after being removed by staff to access the invert for inspection or maintenance.

In order to rectify this problem, the Permittee began retrofitting the twin-invert manholes with hold-down devices that provide a reliable mechanism for preventing the commingling of sanitary and storm flows while permitting access when required. In its original permit application (May

18, 1992), the Permittee estimated that there were approximately 2,579 twin-invert manholes in Worcester. Over the past seven (7) years, the Permittee has identified approximately 500 additional twin-invert manholes. To date, Ninety-nine percent (99%) of the original 2,579 plus some of the additional 500 twin-invert manholes have been retrofitted with hold-down devices. The program will continue until one hundred percent (100%) of the twin-invert manholes have been modified with the hold-down devices. The Permittee estimates less than 100 twin-invert manholes remain to be retrofitted; all of which are currently under contract for completion.

3. The draft permit requires the continuation of the Permittee's Private Street Conversion Program. Preventing erosion and silt-laden runoff will provide water quality improvement to receiving waters. Approximately 100 miles of Worcester streets are considered private. Most private streets in Worcester are unpaved "dirt" roads that were not constructed to acceptable standards. The origin of these roads can be traced to the days before sub-division control laws regulated land development. The enactment of the Massachusetts Sub-division Control Law, in conjunction with city regulations, has effectively eliminated the creation of substandard, dirt private streets that were commonplace years ago. Any service provided by the City for private roads needs to be in full accordance with state statutes that regulate how Worcester can spend public funds on private roads. Unpaved private streets in the City are converted into paved streets with proper drainage following citizen petition under conversion or betterment programs. The construction cost to convert a street is paid entirely by the abutters under different payment structures. During the 1998 Permit term, the Permittee documented in its annual reports that 21 streets were improved with pavement and storm water infrastructure as a result of citizen petitions.
4. The draft permit requires the Permittee to continue to operate and maintain its Vortech Model 16000 storm water treatment device, which was independently installed as a demonstration project during the 1998 Permit term (1997) on its 48-inch Belmont Street drain. The Belmont Street Drain services 226 acres of heavily urbanized area on the eastern boundary of the City and discharges into Lake Quinsigamond. The unit was installed to help reduce pollutant loads to the lake. The structure was designed and installed offline from the Belmont Street Drain in order to optimize the grit chamber swirling action and prevent washout during large precipitation events. Flow is diverted from the Belmont Street Drain only within the design flow of the treatment unit, while any excess flow beyond this design flow is conveyed by the Belmont Street Drain, bypassing the unit.

During the 1998 Permit term, annual dry weather samples of influent and effluent were collected to establish baseline conditions. Annual wet weather samples were collected in the spring and the fall. Samples were taken during first flush and every 15 minutes thereafter for one hour. Flow measurements on influent samples and rainfall data were recorded. Grab samples were collected and analyzed for total suspended solids (TSS), oil and grease. Sampling was conducted only when 100% of flow in the 48-inch Belmont Street Drain was being diverted to the separator. All monitoring data was submitted annually in the Permittee's annual reports. The structure was cleaned each year and observed sediment accumulation ranging from ten (10) to eighteen (18) tons was reported. The draft permit requires monitoring as described in Part XV.E. of this fact sheet. Sampling methodology and annual reporting will be conducted as directed in Part I.F.7. and Part I.H. of the draft permit.

5. Three additional BMP projects have been independently initiated by the Permittee during the 1998 Permit term. These include the Salisbury Pond and Indian Lake Watershed Resource Restoration projects and the Beaver Brook Stream Culvert Rehabilitation Project. All projects received funding under CWA Section 319 Nonpoint Source Grants. Total project costs for all

three projects, including matching funds from the Permittee and other funding sources, equals \$1,568,234.

An approved TMDL for Salisbury Pond has identified high phosphorus loadings as the cause of excessive algae blooms and aquatic macrophytic vegetation. The pond is also impaired by pathogen indicators due in part from suspected illicit connections, and exhibits significant sediment deposition. The restoration project includes the installation, and maintenance of two underground hydrodynamic separators located on two inlets to Salisbury Pond, to reduce phosphorus and sediment loadings to the pond. The separators were installed in the fall of 2006. The project also includes public education elements through installation of kiosks and storm drain stenciling, and monitoring the pollutant removal effectiveness of the BMPs. Sampling methodology and annual reporting will be carried out as directed in Part I.F.7. and Part I.H. of the draft permit.

The Indian Lake Watershed Resource Restoration project is an effort to improve water quality and recreational opportunities at Indian Lake and its surrounding watershed by treating polluted urban storm water runoff. Sedimentation and high phosphorus loads have led to eutrophication of the lake, placing it on the 303d list of impaired waters. An approved TMDL has been established that includes an implementation plan for reducing phosphorus loadings. Three hydrodynamic separators were installed in 2005 to reduce sediment and nutrient loading to the lake. The project also includes public educational elements (kiosks and storm drain stenciling), and ongoing operation and maintenance of the sediment/contaminant removal systems. Sampling methodology and annual reporting will be carried out as directed in Part I.F.7. and Part I.H. of the draft permit.

The Beaver Brook stream restoration project includes the recent daylighting of 1,175 linear feet of Beaver Brook within Beaver Brook Park. Daylighting is a practice that restores a brook or stream to a natural open channel from underground culvert construction. Beaver Brook is listed as Category 5 water in MassDEP's 2006 *Integrated List of Waters*, impaired by habitat alteration, pathogens and objectionable deposits. The goal of the project is to restore the functional value of the brook and improve its water quality by exposing the brook to air and light. A new stream channel has been constructed to include stone and habitat structures, and the banks have been partially vegetated with native plants. This is part of a larger project to improve recreational fields within the park that are frequently flooded during storm events as a result of overflows from a failed portion of the existing culvert through the lower sidewalls adjacent to the playing fields. Elimination of the culvert and daylighting the brook is expected to abate flooding and address the water quality impairments by restoring habitat and destroying pathogens through exposure to UV light. In order to assess the effects of the daylighting project, the draft permit requires in-stream water quality sampling above and below the daylighted segment according to the methodology described in Part I.F.3. of the draft permit.

6. Part I.F.5. and I.F.6. of the draft permit requires the Permittee to screen its MS4 outfalls and inspect a significant portion of its MS4 outfalls as part of new monitoring and analysis requirements included in the draft permit. Screening completed by the Permittee during the 1998 Permit term resulted in the development of structural drainage improvement projects such as point repairs of sanitary and storm lines, infiltration and exfiltration abatement, infrastructure reconstruction or replacement, sewer pump station rehabilitation, sewer reconstruction, culvert replacement, and flood reduction projects such as sewer separation and redesigning drainage systems. Annual reports submitted by the Permittee during the 1998 Permit term detail examples of how specific projects were identified and the scope of work completed. The Permittee includes a sewer and drain construction report in each annual report that provides information about installation, renewal or replacement of sanitary and surface drains, catch basins and

manholes by both the Permittee and developers. The draft permit requires the continuation of annual reporting on sewer and drain construction.

7. The draft permit requires annual reporting of capital expenditures dedicated to the SWMP. Information provided in each annual report during the 1998 Permit term included a cost breakdown for funding elements of the SWMP and a description of items from the Sewer Capital Improvement Program that contributed to the improvement of the quality of storm water discharging from the Permittee's MS4. During the first seven years of the 1998 Permit term, the Permittee's average annual permit compliance cost was approximately \$200,000. This cost excludes annual expenditures of approximately \$2 million for pre-existing activities or programs that supported the Permittee's SWMP, such as street sweeping, catch basin maintenance, twin invert repairs, and paving. Also not included were related capital improvement project expenditures ranging from \$2.5 million in year 1 to 5.6 million in year 7.

XIV. 1998 PERMIT TERM SCREENING AND MONITORING PROGRAMS

During the 1998 Permit term, the Permittee was required pursuant to 40 CFR §122.26(d)(2)(iii)(C) and (D) to monitor discharges from its MS4 to provide data necessary to assess the effectiveness and adequacy of SWMP control measures; estimate annual cumulative pollutant loadings from the MS4; estimate event mean concentrations and seasonal pollutants in discharges from all major outfalls; identify and prioritize portions of the MS4 requiring additional controls; and identify resultant water quality improvements or degradation. The Permittee was responsible for conducting any additional monitoring necessary to accurately characterize the quality and quantity of pollutants discharged from the MS4. The SWMP contained three elements to the monitoring program: dry and wet weather screening of all outfalls, wet weather monitoring of outfalls in representative land use areas, and wet weather in-stream monitoring of receiving waters.

A. Dry and Wet Weather Screening of Outfalls

Rather than wet and dry weather screening of only major MS4 outfalls during the 1998 Permit term as required by the existing permit, the Permittee identified five priority watersheds within the City and designated one watershed per year for targeted dry and wet weather screening of all outfalls. The Permittee did not complete dry weather screening and characterization of all outfalls during the first 5 year permit term to detect the presence of illicit connections and improper discharges to its MS4. Dry weather screening took place in July, August and September each year, as these months typically represent the driest times of the year. During July, field screening was conducted after a sustained period of no more than 0.1 inches of rain in the previous 4-day period. This dry period was reduced to a 3-day antecedent dry period in August and to a 2-day period in September. Data was collected on the physical condition of the outfall, including evidence of collapse or structural defects and evidence of erosion or deposition in the vicinity of the outfall.

The existing permit required wet weather screening of all major MS4 outfalls at least once during the permit term. As described in the Permittee's SWMP, the wet weather screening was performed to assess the condition of the MS4, observe whether dual manholes were contributing pollutant loads to the MS4, and evaluate if pollutant loads decreased after dual manholes were repaired. Screening was conducted at any time of the year (snowstorms and snow melt were avoided) and within two hours after rainfall events exceeding 0.5 inches in depth, until September, when the criterion was relaxed to events exceeding 0.2 inches to ensure completion of the program. As documented in the 2006 MS4 Audit, the Permittee conducted screening from 1999 to 2003, but did not complete screening of all major MS4 outfalls within the first 5 years of the permit term. The Permittee reported that it found no significant problems with wet weather screening and that dry weather screening has been more

helpful in this regard. As described in its SWMP, results from the dry and wet weather screening programs were to be incorporated into the Permittee's GIS in order to observe trends, help establish the effectiveness of dual manhole repairs, and prioritize future repairs.

The Permittee's dry and wet weather screening procedures included flow estimation and field analyses of temperature, dissolved oxygen, conductivity, pH, turbidity, copper, and chlorine. Presence of odors and visual observations for oil sheen, soapsuds, and sewage also were noted. The observations and field analyses were repeated during a return trip to each outfall four to twenty-four hours after the initial outfall screening had been completed.

Since 1993, the Permittee has successfully located and repaired approximately 140 illegal connections to its MS4, many of which were identified as a result of dry and wet weather screening. In order to more efficiently identify inappropriate discharges, the Permittee made revisions during the 1998 Permit term to its dry weather screening and wet weather sampling programs. In year two (November 1, 1999 – October 31, 2000), portable meters were used to measure specific conductivity, chlorine, dissolved oxygen, turbidity and pH for wet weather sampling. In year five (November 1, 2002 – October 31, 2003), ammonia-nitrogen was added to the list of parameters for dry weather monitoring to be initiated in the subsequent permit year. In year three (November 1, 2000 – October 31, 2001), the Permittee extended dry weather screening from June 1 through September 30th into October to allow a full five months to perform the requirement.

The dry and wet weather screening programs assisted the Permittee in identifying the locations of 330 MS4 outfalls by year eight of the 1998 Permit term. The number of outfalls has increased over the permit term due to infrastructure being installed. The outfall list was revised every year and information associated with outfalls was recorded into two databases, one is linked directly to all dry weather screening records and the other is linked to its GIS. The Permittee has recorded all privately owned outfalls that were approved, inspected and constructed to DPW&P standards.

B. Representative Land Use Outfall Monitoring

The Permittee was required under its existing permit to annually monitor storm water quality during wet weather from MS4 outfalls serving areas representative of different land use. Monitoring was required at five outfall locations in the City, three times a year. Locations represented outfalls servicing residential, commercial and mixed land use (combination of commercial, residential and industrial).

Water quality samples were collected during 11 storms between the years 2000 - 2003. No sampling occurred during 1999 due to the timing of the Permittee's submittal and EPA's approval of the revised Sampling and Monitoring Plan. The Plan was not approved and in effect until May 30, 1999, leaving a window of only five months for sampling and screening. The area also suffered an extreme drought period in the spring and summer of 1999. The full sampling window became available in year two of the permit term (November 1, 1999 – October 31, 2000).

Composite storm water samples were collected and analyzed for a total of sixteen parameters that can be characterized as effluent measurements including metals and other inorganics, nutrients, hydrocarbons, indicator bacteria and biochemical oxygen demand. The median concentrations of each parameter from the outfall monitoring were compared with the results reported from the National Urban Runoff Program (NURP), as required by the permit, and the National Stormwater Quality Database (NSQD).

The EPA established the NURP program in 1978 to characterize the water quality of urban runoff and the potential for water quality impacts in receiving waters. Storm event monitoring was performed in 28 cities across the U.S between 1978 and 1982. The study evaluated the extent to which urban runoff contributes to water quality problems across the nation.

The National Stormwater Quality Database (NSQD) is currently being developed and evaluated by the University of Alabama and the Center for Watershed Protection under an EPA grant (http://www.cwp.org/NPDES_research_report.pdf and <http://rpitt.eng.ua.edu/Research/ms4/Paper/Mainms4paper.html>). The project has been collecting and analyzing storm water monitoring data from municipalities authorized by the Phase I NPDES MS4 permit in 17 U.S. states. Information has been submitted by 66 different agencies and municipalities representative of data collected during 3,770 separate storm events. These data have been evaluated and initial conclusions have been reported, including comparisons with data collected during EPA's NURP study.

Based on the comparative analysis of its storm water quality data collected, the Permittee concluded and MassDEP has concurred, that the water quality measured during the 1998 Permit term generally was consistent with NURP and NSQD results for urban storm water runoff. One exception was the high median concentration of copper measured at the New Bond Street outfall that collects storm water from an area representative of commercial land use. The draft permit requires investigation of this site to identify possible source(s) of copper discharging through this outfall via the MS4 outfall as described in Part 1.F.4.

Results from the water quality monitoring at the five representative land use sites can be found in the *NPDES Permit Term 1 Stormwater Quality Analysis, February 7, 2006* prepared by the Worcester DPW&P and available for review at MassDEP as part of the Administrative Record. (See Part XIX of this Fact Sheet)

C. In-Stream Wet Weather Monitoring of Receiving Waters

The Permittee was required during the 1998 Permit term to perform in-stream wet weather water quality sampling at two locations during the spring and summer: Beaver Brook, downstream of its confluence with Tatnuck Brook; and, Middle River, near its confluence with the Old Mill Brook. Additionally, in-stream wet weather (grab) sampling was required at the mouth of Old Mill Brook in the spring and summer for fecal coliform bacteria and zinc, during the first two hours of a rain event, only when there was no discharge from the City's Quinsigamond Avenue CSO treatment facility.

Water quality samples were collected during 11 storms between the years 2000 - 2003 at the Beaver Brook and Middle River sites. In general, the grab and composite samples were collected during first flush, and randomly throughout the storm event. Exceedences of Massachusetts Water Quality Standards were observed for copper and fecal coliform bacteria in both waterbodies. Levels of total suspended solids (TSS), bio-chemical oxygen demand (BOD), and total phosphorus were elevated, although there are no numerical water quality criteria for these parameters.

The existing permit requires in-stream sampling at the mouth of the Old Mill Brook downstream of the CSO Storage and Treatment Facility during the spring and summer each year. Collection of samples for analysis of fecal coliform bacteria and zinc during the first two hours of the rain event was required unless the CSO facility was discharging. No samples have been collected to-date during the 1998 Permit term since rainfall events greater than 0.5 inches in depth or during consecutive rain events cause the CSO facility to activate and discharge a mix of wastewater and storm water to Old Mill Brook within the first two hours of the event.

Results from the in stream water quality monitoring can be found in the *NPDES Permit Term 1 Stormwater Quality Analysis, February 7, 2006* prepared by the Worcester DPW&P and available for review at EPA and MassDEP as part of the Administrative Record. (See Part XIX of this Fact Sheet)

XV. DRAFT PERMIT SCREENING AND MONITORING PROGRAMS

The draft permit includes conditions that require the Permittee to complete specific inspection, screening, and monitoring activities of its MS4 and receiving waters to facilitate and inform the implementation of several permit provisions and to support the Permittee's assessment of its SWMP. These conditions are included pursuant to Section 308 and 402(a)(2) of the CWA, 40 CFR 122.44(i), and the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26 through 53. The program includes in-stream receiving water quality monitoring; wet weather outfall monitoring for storm water quality; dry and wet weather outfall screening and monitoring for illicit discharges; implementation of an illicit discharge detection protocol; inspection and performance monitoring of existing storm water treatment devices; and implementation and monitoring of one or more groundwater recharge/low-impact development retrofit demonstration projects. The program includes both the continuation of monitoring required during the 1998 Permit and the addition of new monitoring requirements to facilitate demonstration that the Permittee is complying with the terms of the permit.

EPA believes the elements of the screening and monitoring programs included in the draft permit are necessary and appropriate to facilitate and inform the implementation of several permit provisions and to support the Permittee's assessment of its SWMP. EPA is aware that there may exist alternate monitoring program designs or methodologies that could be employed to accomplish some or all of these needs. Therefore, EPA specifically invites comment from the Permittee and the public with respect to the inspection, screening, and monitoring conditions included in Part I.F. of the draft permit.

The draft Permit requires the Permittee to immediately begin implementing the monitoring and analysis requirements and to submit as part of its updated SWMP a description of the means, methods, quality assurance and control protocols, and schedule for successfully implementing the required screening, field monitoring, laboratory analysis, investigations, and analysis and evaluation of data collected. Elements of and basis for the required monitoring and analyses include:

- In-Stream Dry and Wet Weather Monitoring of Receiving Water Quality - to assess potential changes and trends in observed surface water quality as a result of the Permittee's implementation of its SWMP.
- Wet Weather Outfall Monitoring for Storm Water Quality - to collect system-wide storm water quality data, both early and late in the permit term, to facilitate the Permittee's required assessment of the effectiveness and adequacy of its SWMP.
- Dry and Wet Weather Outfall Screening for Illicit Discharges - to identify and prioritize drainage catchments potentially influenced by unauthorized non-storm water discharges, including sanitary waste from leaking sewers, illicit connections, and sanitary sewer overflows.
- Illicit Discharge Detection Protocol - to implement a systematic methodology for identifying and isolating illicit discharges.

- Hydrodynamic Storm Water Separator Monitoring - to facilitate the development and refinement of optimized maintenance programs and to assess pollutant removal efficiencies for city-owned storm water treatment systems.
- Groundwater Recharge/Low-Impact Development Retrofit Demonstration Project - to inform and facilitate the application of groundwater recharge as a low-impact retrofit practice implemented or regulated by the Permittee.

A. In-stream Dry and Wet Weather Monitoring of Receiving Waters

1. The draft permit requires the continuation and expansion of the in-stream wet weather monitoring required during the 1998 Permit term. In addition to reinitiating discontinued monitoring at the Beaver Brook and Middle River stations, the draft permit requires the Permittee to establish monitoring stations in the other major headwater tributaries to the Blackstone River, including Kettle Brook, Tatnuck Brook, Mill Brook, and Poor Farm Brook. Except for Poor Farm Brook (which is currently on “alert status” based on MassDEP’s 1998 Water Quality Assessment), the uses of each of these waters is impaired to some extent by urban runoff, amongst other suspected sources. Regular collection of water quality data in these tributaries, coupled with storm water data collected at outfalls will support an assessment of the adequacy of the Permittee’s SWMP in complying with the terms of the permit, reducing, to the maximum extent practicable, the discharge of pollutants to and from its MS4, and protecting water quality.
2. The Permittee is required to establish specific locations for the total of eight (8) stations in consideration of historic monitoring stations utilized by Permittee¹⁰, MassDEP¹¹, the Blackstone River Coalition¹², or others. Monitoring will consist of four rounds per year at each station, including dry weather sampling in the summer and wet weather sampling in the spring, summer and fall during each year of the permit term.
3. Beaver Brook Culvert Rehabilitation and Improvements to Beaver Brook Park. As described in Part XIII.G.5 of this Fact Sheet, the primary purpose of the project was replacement of the former metal arch culvert conveying Beaver Brook between Chandler Street and Maywood Street. The former culvert was a corrugated steel arch culvert with a maximum width of approximately twenty-five feet and a maximum rise of seven feet. The culvert had a history of collapses that have occurred during or immediately after heavy rainfall. Flooding occurred in Beaver Brook Park during most large rainstorm events. The flooding would inundate the park for several hours and the waters would recede gradually when the rain event ended. Daylighting of the brook was selected as the preferred option for many reasons, including improvements to upstream sanitary sewer system facilities, re-establishing flowing water in a natural setting through the park, and improved water quality of Beaver Brook itself. The project was substantially completed in early 2007. The draft permit requires the same frequency of annual wet and dry water quality monitoring above and below the day-lighted portion of Beaver Brook during the first two years of the permit term to measure the presumed water quality benefits of the project.

¹⁰ NPDES Permit Term 1 Stormwater Quality Analysis (City of Worcester, 2006)

¹¹ Blackstone River Basin -1998 Water Quality Assessment (MassDEP, 2001; available at url: <http://www.mass.gov/dep/water/resources/wqassess.htm#wqar>

¹² http://www.zaptheblackstone.org/whatwedoing/water_quality/wqm.shtml

B. Wet Weather Outfall Monitoring for Storm Water Quality

1. The draft permit requires the Permittee to reinitiate and significantly expand wet weather outfall monitoring required by the 1998 Permit and discontinued by the Permittee in 2003. In its letter to EPA dated September 4, 2003 reapplying for MS4 permit coverage, the Permittee proposed to eliminate its wet weather sampling program, including representative outfall monitoring and in-stream monitoring as required during the 1998 Permit. In its letter and in its subsequent report entitled *NPDES Permit Term 1 Stormwater Quality Analysis, February 7, 2006*, the Permittee concludes that additional wet weather monitoring would offer little insight to its SWMP and may not be worthwhile. Instead, the Permittee suggested implementation of a more targeted sampling program that more effectively evaluates the effectiveness of BMPs and subsequent water quality improvements. EPA recognizes the value of more targeted programs to facilitate such an evaluation and has included requirements for the Permittee to monitor its hydrodynamic storm water separators and its groundwater Recharge/Low-Impact Development Demonstration Project, as discussed in Parts XV.E. and XV.F. of this Fact Sheet. Though EPA expects that the results and conclusions from these targeted programs to be informative, variations in land use, flow conditions, pollutant loading characteristics, or other variables can limit the applicability of the findings to other portions of the Permittee's MS4. Therefore, EPA has determined it appropriate to also collect storm water quality data throughout the entire MS4 to facilitate an assessment of the effectiveness of the Permittee's SWMP. This includes the addition of more frequent monitoring at all outfalls and inlets to impaired waterbodies specifically for identified pollutant(s) of concern; supporting an assessment of the relative pollutant contributions to impaired waters and progress towards achievement of any applicable WLA as discussed in Part XII. of this Fact Sheet.
2. The draft permit requires an investigation of elevated median concentrations of copper, identified during wet weather monitoring at the New Bond Street outfall. This outfall represents storm water collected from an area of predominately commercial land use and the observed median copper concentration was many times greater at this outfall than that observed at the other four representative outfalls. Based on the results of the investigation, the Permittee shall direct any contributing property owner or responsible party to abate its discharge of copper to the Permittee's MS4.

C. Dry and Wet Weather Outfall Screening for Illicit Discharges

The draft permit requires the Permittee to screen its MS4 outfalls to support implementation of its IDDP discussed Parts XV.D. and XIII.E. of this Fact Sheet.. Screening involves field and laboratory analyses of dry and wet weather discharges to detect the presence and relative significance of potential illicit discharges. The screening will enable the Permittee to develop a priority ranking for implementing its IDDP and provide verification that any resulting abatement actions were successful in removing illicit discharges identified in each subcatchment. Part I.F.5. of the draft permit describes the required elements of the program. EPA anticipates that the Permittee will coordinate outfall screening and monitoring required by Part I.F.5. with wet weather outfall monitoring required by Part I.F.4. of the draft permit.

D. Illicit Discharge Detection Protocol

Part I.F.6. of the draft permit requires the Permittee to implement a systematic methodology for identifying, isolating, and confirming the removal of illicit discharges to and from its MS4. Part

XII.E. of this Fact Sheet describes the purpose of and basis for requiring this new permit requirement.

E. Hydrodynamic Storm Water Separator Monitoring

1. The draft permit requires the Permittee to monitor the pollutant removal effectiveness of a total of three hydrodynamic separator units installed and maintained at MS4 discharges to Lake Quinsigamond, Salisbury Pond, and Indian Lake. All three waterbodies are impaired and have approved TMDLs with applicable WLAs for phosphorus loading.
2. A description of the installations is found in Parts XIII.G.4. and XIII.G.5. of this Fact Sheet and sampling parameters and protocol are identified in Part I.F.7. of the draft permit.
3. EPA has incorporated into the draft permit a proposal by the Permittee to develop and implement a plan for operation and maintenance of underground hydrodynamic storm water separators (Downstream Defender, Vortechincs and Vortcentury) owned and operated by the Permittee and located at various locations in the City. These units use vortex settling to remove sediment, trap debris and trash, and separate floatable oil and grease. The devices can be used either by themselves or as pretreatment system in conjunction with other storm water management BMPs. They require appropriate inspection and cleaning to maintain effectiveness. The goal of the project is to monitor sediment accumulation for each device and develop individual maintenance plans and cleaning schedules based on monitoring results collected over the permit term. The draft permit requires the Permittee to inspect these devices throughout the permit term to facilitate the development and refinement of maintenance programs that are essential to maximize operational effectiveness. Part I.F.7 of the draft permit describes the required methodology for accomplishing the inspections and subsequent derivation or refinement of maintenance frequencies.

F. Groundwater Recharge/Low-Impact Development (LID) Retrofit Demonstration Project

EPA has incorporated into the draft permit a proposal by the Permittee to develop and implement a project to encourage groundwater recharge while reducing storm water runoff from one or more currently developed properties owned by the Permittee. EPA encourages the use of infiltration and other groundwater recharge techniques, wherever practical and appropriate, as a favorable practice for managing storm water runoff. EPA believes it essential for the City to become experienced with the application of infiltration techniques, in terms of both performance and maintenance requirements, so that it may best apply these practices to both public and private land development as will be required pursuant to Part I.E.1.(f) and I.E.4.(a) of the draft permit. The draft permit requires the Permittee to select a minimum of one municipally-owned and developed parcel, and install one or more LID practices to encourage groundwater recharge and reduce storm water runoff. During the five-year permit term, the Permittee is required to assess the feasibility, cost effectiveness, performance, maintenance requirements and environmental benefits of the retrofit(s). The draft permit requires the Permittee to design its project consistent with MassDEP Stormwater Performance Standard No. 3 in effect upon the effective date of this permit and related guidance included in the Massachusetts Stormwater Handbook. Required project elements and schedule are included in Part I.F.8. of the draft permit.

XVI. STORM WATER MANAGEMENT PROGRAM REVIEW AND MODIFICATION

Program Review. Part I.G of the draft permit requires the Permittee to undertake an annual review of its SWMP in conjunction with preparation of the annual report required under Part I.H. of the draft permit. As part of its review, the Permittee must include an assessment of the effectiveness of the SWMP in complying with permit conditions and any necessary modifications.

Program Modification. The Permittee's SWMP is not intended to remain as a static set of practices or activities implemented by the Permittee during the entire permit term. In fact, modifications to individual elements of the SWMP may be necessary during the permit term to facilitate the Permittee's compliance with the permit provisions and satisfaction of the MEP standard, water quality standards, or TMDL requirements. Modifications may be requested by the Permittee or required by EPA or MassDEP at any time during the permit term. Part I.G. of the draft permit describes the required procedure for the Permittee to request modification to its SWMP. EPA and MassDEP shall review modification requests by the Permittee, and within sixty (60) days after submission, will inform the Permittee whether a requested modification is approved or will require a formal permit modification.

XVII. REPORTING REQUIREMENTS

The Permittee is required pursuant to 40 CFR §122.42 (c)(1) to prepare and submit a system-wide report annually. The draft permit requires annual reports be submitted no later than December 31 of each year. The first annual report shall include the reporting period from November 1, 2006 to June 30, 2007. Thereafter, annual reports will include the reporting period from July 1 to June 30 from the previous year. The reporting period and due dates have been changed from the previous permit term based on the Permittee's request to have it coincide with its fiscal year.

The annual report shall include information necessary to assess the Permittee's compliance status relative to the permit requirements including implementation of the SWMP components, the effectiveness of permit requirements on storm water quality to the maximum extent practicable, analysis of water quality monitoring data, fiscal analysis of annual expenditures, descriptions of controls that will be used for 303(d) listed impaired waters with and without approved TMDLs, and water quality improvements or degradation. The report is required to satisfy all the requirements detailed in Part I.H. of the draft permit.

XVIII. STATE CERTIFICATION REQUIREMENTS

Pursuant to section 401 of the CWA, EPA may not issue a permit unless the Massachusetts Department of Environmental Protection with jurisdiction over the receiving waters certifies that the permit conditions are stringent enough to assure that the discharge will not cause the receiving water to violate Massachusetts Water Quality Standards, or waives such certification. The staff of the Massachusetts Department of Environmental Protection has reviewed the draft permit and advised EPA that the draft permit requirements are adequate to protect water quality. EPA has requested permit certification by the State and expects that the draft permit will be certified.

XIX. COMMENT PERIOD AND PROCEDURES FOR FINAL DECISIONS

All persons, including applicants, who believe any condition of the draft permit is inappropriate must raise all issues and submit all available arguments and all supporting materials for their arguments in full by the close of the public comment period, to the U.S. EPA, MA Office of Ecosystem Protection (CIP), 1 Congress Street, Suite 1100, Boston, Massachusetts 02114-2023; and MassDEP, 627 Main Street, 2nd Floor, Worcester, MA 01608. A public hearing to consider the draft permit has been scheduled for

July 30, 2008 at 10:00 AM at the Worcester Public Library, 3 Salem Square, Worcester, Massachusetts. In reaching a final decision on the draft permit, the Regional Administrator will respond to all significant comments and make these responses available to the public at EPA's Boston Office.

Following the close of the comment period, and after a public hearing, if such hearing is held, the Regional Administrator will issue a final permit decision and forward a copy of the final decision to the applicant and each person who has submitted written comments or requested notice.

XX. ADMINISTRATIVE RECORD AND EPA AND MASSDEP CONTACTS

The Administrative Record for the draft permit is available for review at EPA and MassDEP at the addresses below. Additional information concerning the draft permit may be obtained between the hours of 9:00 a.m. and 5:00 p.m., Monday through Friday, excluding holidays from:

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Date

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