AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

DRAFT

In compliance with the provisions of the Federal Clean Water Act, as amended, (33 U.S.C. §§1251 et seq.; the "CWA"), and the Massachusetts Clean Waters Act, as amended, (M.G.L. Chap. 21, §§26-53), the

The City of Worcester
Worcester, Massachusetts

is authorized to discharge storm water discharges and allowable non-storm water discharges from its existing municipal separate storm sewer system ("MS4") through **330 existing outfalls listed in Attachment A (89 major outfalls and 241 minor outfalls)**

to receiving waters (in the Blackstone River Basin): **Beaver Brook, Blackstone River, Broad Meadow Brook, Coal Mine Brook, Coes Pond, Curtis Pond North, Curtis Pond South, 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**

in accordance with effluent limitations, monitoring requirements and other conditions set forth herein.

This permit will become effective on the date of signature if no comments are received during the public notice period. If comments are received during the public notice period, this permit will become effective on the first day of the calendar month immediately following 60 days after the date of signature.

This permit and the authorization to discharge expire at midnight, on the last day of the calendar month preceding five years from the effective date of the permit.

This permit supersedes the permit issued on September 30, 1998, effective on October 30, 1998 and expired on October 30, 2003.

This permit consists of 36 pages in Part I, Attachment A - Existing Separate Storm Sewer Outfall List, Attachment B: City of Worcester's Receiving Waters – Impairments and TMDL Status, and 25 pages in Part II, including General Conditions and Definitions.

Signed this day of

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Stephen S. Perkins, Director Office of Ecosystem Protection U.S. Environmental Protection Agency Boston, MA	Glenn Haas, Director Division of Watershed Management Department of Environmental Protection Commonwealth of Massachusetts Boston, MA

Table of Contents – Part I

Part I. Municipal Separate Storm Sewer System

Part I.A. Discharges Authorized Under This Permit

1. Permit Area. This permit covers all areas within the corporate boundary of the City of Worcester served by, or otherwise contributing to discharges from, the existing municipal separate storm sewer system ("MS4") owned and operated by the City of Worcester (the "Permittee").

2. Authorized Discharges. This permit authorizes existing storm water discharges to Waters of the United States from all existing outfalls (identified in Attachment A) owned or operated by the Permittee, and new storm water discharges subject to Part I.A.4. below.

3. Non-Storm Water Discharges. The following non-storm water discharges need not be addressed by the Permittee unless determined by the Permittee, EPA, or MassDEP to be significant contributors of pollutants to the MS4 or cause or contribute to a water quality standards violation. Any of these discharges that are identified as significant contributor of pollutants to the MS4, or as causing or contributing to a water quality standards violation, must be addressed consistent with the Permittee's legal authorities and illicit discharge and improper disposal practices established pursuant to Part I.E.5 of this permit.

   (a) lawn, landscape, and other irrigation waters provided all pesticides, herbicides, and fertilizers have been applied in accordance with approved labeling;
   (b) diverted stream flows;
   (c) flows from riparian habitats and wetlands;
   (d) springs;
   (e) uncontaminated groundwater infiltration (as defined at 40 CFR 35.2005 (20));
   (f) uncontaminated pumped groundwater;
   (g) potable water sources, including routine water line flushing;
   (h) foundation and footing drains where flows are not contaminated with process materials;
   (i) water from crawl space pumps;
   (j) air conditioning or compressor condensate;
   (k) individual residential car washing;
   (l) dechlorinated swimming pool discharges;
   (m) street wash waters that do not contain detergents and where no non-remediated spills or leaks of toxic or hazardous materials have occurred ; and
   (n) building wash down water which does not contain detergents.

   The Permittee is not expected to evaluate pollutant contributions from discharges associated with emergency fire fighting activities. Therefore, these discharges are authorized as allowable non-storm water discharges, unless identified by EPA, as significant sources of pollutants to Waters of the United States or as causing or contributing to a violation of water quality standards.

4. New or Increased Discharges

(a) The Permittee must notify EPA and MassDEP a minimum of thirty (30) days prior to commencement of a new discharge or increased discharge from its MS4 with a description of the discharge and information demonstrating that the discharge will satisfy the antidegradation provisions of the Massachusetts Surface Water Quality Standards (314 CMR 4.04). Such discharge will become authorized thirty (30) days after the Permittee's notification unless EPA or MassDEP notifies the Permittee that it has failed to demonstrate satisfaction with the antidegradation provisions. Except where permitted by MassDEP pursuant to 314 CMR 4.04(5), new or increased discharges to Outstanding Resource Waters or Special Resource Waters are not authorized by this Permit. Before commencing any new or increased discharge, the Permittee shall identify in its Storm Water Management Program ("SWMP") the best management practices ("BMPs") it will implement to ensure compliance with antidegradation provisions and the terms of this Permit.

(b) Any new or increased discharge to a water quality impaired water as identified in Categories 4a or 5 of the *Final Massachusetts Year 2006 Integrated List of Waters* (or future updates or revisions thereto) will become authorized only if the Permittee demonstrates, before commencement of the discharge, that through the implementation of BMPs or other measures, the discharge is not expected to cause or contribute to an exceedance of a water quality standard for the pollutant(s) of concern. The Permittee shall provide data and other technical information to EPA and MassDEP sufficient to demonstrate one or more of the following:

(1) the pollutant(s) identified as causing an impairment will not be present in the new or increased discharge; or

(2) the pollutant(s) identified as causing an impairment will be present in concentrations that will meet in-stream water quality criteria at the point of discharge to the waterbody; or

(3) there is sufficient remaining waste load allocation in an EPA approved or established TMDL to allow the new or increased discharge, and the existing dischargers into that water are subject to compliance schedules designed to bring the water into compliance with applicable water quality standards.

(c) At the same time that the Permittee submits the required information to EPA and MassDEP, it shall make it available for public inspection at the Worcester Public Library (3 Salem Square, Worcester, MA) and on a publicly accessible internet website. The Permittee shall retain documentation of its demonstration in its SWMP and annual reports.

Unless EPA or MassDEP notifies the Permittee that it has failed to demonstrate that a discharge will not cause or contribute to the existing impairment, the discharge will be deemed authorized 30 days from the latest date on which the information is submitted to EPA and MassDEP and made available at the library or website.

5. This permit does not authorize discharges to the subsurface subject to state Underground Injection Control regulations. Although the permit 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. Information about the UIC program and specific MassDEP requirements is available at http://www.mass.gov/dep/water/resources/groundwa.htm.

Part I.B. [RESERVED]

Part I.C. Water Quality Based Effluent Limits

1. Pursuant to Clean Water Act § 402(p)(3)(B)(iii), this permit includes provisions to ensure that discharges from the Permittee's MS4 do not cause or contribute to exceedances of water quality standards, in addition to requirements to reduce the discharge of pollutants to the maximum extent practicable ("MEP") set forth in Part I.E. The requirements found in Part I.C., along with certain requirements in Part I.E. that related to discharges to impaired waters for which an approved TMDL exits, constitute the water quality-based effluent limitations in this permit.

2. Requirement to Meet Water Quality Standards

   (a) The Permittee's discharges shall not cause or contribute to an exceedance of water quality standards (including numeric and narrative water quality criteria) applicable to the receiving waters. In determining whether its discharges satisfy this requirement, the Permittee shall consider available monitoring data and visual assessment and site inspection reports.

   (b) In the absence of information suggesting otherwise, discharges will be presumed to meet the applicable water quality standards if the Permittee fully satisfies the conditions and effluent limits in this permit.

   (c) Applicable water quality standards for discharges from the Permittee's MS4 are those that are in place upon the effective date of this permit.

   (d) In the event that the Permittee becomes aware, or EPA or MassDEP determines, that a discharge from its MS4 causes or contributes to an exceedence of applicable water quality standards, the Permittee shall within **sixty (60) days** of becoming aware (or notified by EPA or MassDEP) submit to EPA and MassDEP a description of best management practices ("BMPs") that are currently being implemented and additional or modified BMPs that will be implemented to prevent or reduce pollutants sufficient to ensure that the discharge will no longer cause or contribute to an exceedence of

applicable water quality standards. The Permittee shall implement such additional BMPs upon notification by EPA or MassDEP and shall incorporate such measures into its SWMP as described in Part I.G.2. of this permit.

3. Discharges into Impaired Waters

Impaired waters are those that have been identified by MassDEP pursuant to Section 303(d) of the Clean Water Act as not meeting applicable State water quality standards. This may include both waters with EPA approved TMDLs, and those for which a TMDL has not yet been approved. Attachment B to this permit includes a current list of receiving waters located in the City of Worcester indicating for each the associated impairment category, pollutant(s) of concern, and TMDL status.

(a) Existing Discharges to an Impaired Water without an Approved TMDL

Where the Permittee's MS4 discharges to an impaired water without an approved TMDL, the Permittee shall comply with Part I.C.2. of this permit and address in its SWMP and annual reports how the discharge of the pollutant(s) identified as causing the impairment will be controlled such that they do not cause or contribute to the impairment. The Permittee shall:

(1) evaluate discharges to impaired waters;
(2) identify additional or modified BMPs in its SWMP to ensure that discharges do not cause or contribute to the impairment; and
(3) implement such BMPs and include the status of each in its annual report.

(b) Existing Discharges to an Impaired Water with an Approved TMDL

If the Permittee's MS4 discharges to an impaired water with an approved TMDL and a waste load allocation ("WLA") has been established as identified in Attachment B of this permit that applies specifically to its MS4 discharges, or more generally to discharges from MS4s, the Permittee shall comply with the requirements of Part I.C.2. and specific BMPs to support the achievement of the WLA as identified in Attachment B[1]. The Permittee shall include these BMPs in its SWMP and address in its SWMP and annual reports how the discharge of the pollutant(s) identified as causing the impairment will be controlled such that they comply with the requirements of Part I.C.2. If EPA determines more stringent requirements are necessary to support achievement of the WLA, EPA will incorporate such requirements through a modification to this permit pursuant to Part II.A.4. of this permit or by incorporation into the next permit.

[1] Even if information available to the Permittee upon the effective date of the permit suggests that its MS4 discharges to a water that is not specifically identified on the applicable Section 303(d) list, EPA may nevertheless determine, after further examination of the applicable Section 303(d) list, and/or an approved TMDL, that a discharge from the Permittee's MS4 is contributing to a downstream water segment's impairment and that there is a WLA applicable to the Permittee's MS4 discharge.

(1) If the approved TMDL does not include a WLA applicable to discharges from the Permittee's MS4, the Permittee shall comply with Part I.C.2. of this permit and address in its SWMP and annual reports how the discharge of the pollutant(s) identified as causing the impairment will be controlled such that they do not cause or contribute to the impairment. Unless otherwise notified by EPA or MassDEP, compliance with the requirements of Part I.C.2. of this permit shall be presumed to be adequate to meet the requirements of the TMDL.

(2) Applicable TMDLs for discharges from the Permittee's MS4 are those that are approved by EPA as of the effective date of this permit.

(3) The Permittee shall highlight in its annual reports all control measures currently being implemented or planned to be implemented to control the pollutants identified in approved TMDLs. The Permittee shall evaluate whether BMPs in addition to those required by the permit are necessary to achieve the percent reduction in phosphorus identified as waste load allocations applicable to MS4 discharges in Attachment B. The basis of supporting the determination that such controls are adequate to meet the TMDL shall also be included in the SWMP and annual reports.

Part I.D. Storm Water Management Program (SWMP)

1. Within **One hundred eighty (180) days** of the effective date of the permit, the Permittee shall submit to EPA and MassDEP for review and comment, an updated SWMP that satisfies the requirements of this permit. The SWMP update shall include all original components of its February 1999 SWMP that will be continued and all required or proposed modifications thereto. This updated SWMP shall be submitted to the EPA and MassDEP at the addresses listed in Part I.J.1. of this permit.

2. At the time of submittal of the SWMP, the Permittee shall make available a copy of the SWMP at the Worcester Public Library (3 Salem Square, Worcester, MA) and on a publicly accessible internet website, and shall inform the public of its opportunity to review and comment on the program. The public may submit comments on the SWMP within **forty-five (45) days** of its availability on the Permittee's website or at the public library. The Permittee shall indicate that comments shall be submitted to EPA and MassDEP at the addresses provided in Part I.J.1. of this permit, with a copy provided to the Permittee.

3. After receipt of the SWMP, EPA and/or MassDEP will review and comment on the SWMP and may require SWMP modifications pursuant to Part I.G.3. of this permit. The Permittee shall respond to all written comments by U.S. EPA and the MassDEP and shall make all requested changes to the SWMP within **sixty (60) days** of receipt of such comments. Implementation of the requirements of Part I.E. shall occur upon the effective date of this permit.

4. The Permittee shall provide adequate finances, staff, equipment, and support capabilities to fully implement its SWMP, and all requirements of this permit.

Part I.E. Requirements to Reduce Pollutants to the Maximum Extent Practicable

The Permittee shall reduce, to the maximum extent practicable ("MEP"), the discharge of pollutants from its MS4 to receiving waters identified in this permit.

The Permittee shall implement the provisions set forth below and shall incorporate into its SWMP with implementation schedules and measurable goals, at a minimum, all seven (7) elements included in this part.

1. Legal Authority. The Permittee shall ensure that it obtains or maintains the necessary and enforceable legal authority established by statute, ordinance, rules and regulations, permit, easement, contract, order and any other means, to prohibit or control the contribution of pollutants to its MS4, including the authority to:

   (a) prohibit illicit discharges and sanitary sewer overflows ("SSOs") to its MS4 and require removal of such discharges consistent with Part I.E.5 of this permit. For the purposes of this permit, an illicit discharge is any discharge to the Permittee's MS4 that is not composed entirely of storm water, with the exception of SSOs, discharges authorized by another NPDES permit, or discharges described in Part I.A.3 of this permit;

   (b) control the discharge of spills and prohibit the dumping or disposal of materials including but not limited to industrial and commercial wastes, trash, used motor vehicle fluids, food preparation waste, leaf litter, grass clippings, and animal wastes into its MS4;

   (c) optimize the performance and pollutant removal efficiency of privately-owned retention or detention ponds that discharge to or receive discharge from its MS4, by ensuring the performance of adequate inspection and maintenance activities;

   (d) prohibit the installation of drainage infrastructure on unpaved streets that discharges to the Permittee's MS4;

   (e) control the discharge of storm water and pollutants associated with land disturbance and development activities, both during the construction phase and after site stabilization has been achieved (post-construction or operational phase), consistent with Part I.E.4 of this permit.

   (f) require the infiltration or injection of storm water from new development or redevelopment sites, where feasible and appropriate, to approximate the annual recharge of groundwater occurring during pre-development conditions consistent with MassDEP Stormwater Management Standard Nos. 3 or 7, as appropriate, applied pursuant to Part I.E.4. of this permit;

   (g) control through interagency or inter-jurisdictional agreements, the contribution of pollutants between the Permittee's MS4 and MS4s owned or operated by others; and,

(h) enforce against illegal activities involving its MS4, including pursuing all available civil and criminal remedies for such activities.

2. Public Education and Involvement. The Permittee shall continue to implement a public education and involvement program, assess the overall success of the program, and document both direct and indirect measurements of program effectiveness. The program shall include elements that:

(a) increase the public awareness about storm water pollution, its causes and effects, and actions that citizens, commercial, industrial and institutional entities can take to reduce the impact of storm water pollution on water quality;

(b) promote, publicize and facilitate the various elements of its SWMP through varied public education and involvement methods and make information available for non-English speaking residents;

(c) disseminate information to residents regarding the proper handling and disposal of used motor vehicle fluids, household hazardous waste, food preparation waste, grass clippings, car wash waters, and proper use of fertilizers, pesticides, and herbicides. (Including dissemination of educational material emphasizing phosphorus control as it relates to lawn care to residents located in watersheds of receiving waters identified in Attachment B with an approved TMDL and applicable waste load allocation);

(d) educate dog owners about the proper disposal of pet waste and the City's dog waste ordinance (General Ordinances of the City of Worcester, Chapter 8 §14.(9) and §15(c)) by providing written information at the time of dog license renewal. The Permittee shall install signage, pet waste baggies, and disposal receptacles in recreational areas where dog walking is allowed. In order to measure the effectiveness of education measures, the Permittee shall document in its annual report, information regarding the enforcement of the dog waste management ordinance including the number of violations and fines levied;

(e) educate owners and operators of commercial, industrial, and institutional facilities regarding their responsibility to control pollutants in storm water discharges from their property to the Permittee's MS4. Educational requirements are detailed at Part I.E.3.(f)(2) of this permit; and

(f) provide opportunities for the public to participate in the review, modification, and implementation of its SWMP, and sustain partnerships with environmental groups and civic organizations interested in water quality related issues. The Permittee shall host an annual public informational meeting within two months of submittal of each annual report required under Part I.H. of this Permit. The meeting notice shall comply with state public notice requirements and provide a forum for the education and involvement of interested public.

3. Pollution Prevention (Source Controls). The Permittee shall continue to implement, review and enhance its current pollution prevention practices and develop new source control

procedures as detailed in this part to reduce the amount of pollutants in storm water contributing to or discharging from its MS4 to the maximum extent practicable.

(a) The Permittee shall continue to facilitate the proper management, disposal, reuse and recycling of used motor vehicle fluids by educating the public and actively using its used motor oil collection capabilities at the city-owned recycling facility. The Permittee shall continue to inform citizens about the obligation of motor oil retailers to accept back equal quantities of used product purchased (MGL c21 §52A).

(b) The Permittee shall continue to promote and offer at least annually its municipal Household Hazardous Waste (HHW) Collection Program for the reuse, recycling and proper disposal of such waste. The Permittee shall establish as a goal increasing the frequency of the collection days hosted.

(c) The Permittee shall continue to implement procedures to prevent, contain, and respond to spills entering its MS4, including its multi-departmental Integrated Hazardous Materials Incident Response Plan (IHMIRP).

(d) The Permittee shall continue to limit the application of pesticides, herbicides and fertilizers ("PHFs") in public areas by municipal employees or private contractors. The Permittee shall 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"). The Permittee shall establish reduction goals in its SWMP, including consideration of alternatives, for PHFs being used at Parks Department facilities including all city parks, Hope Cemetery, Green Hill Golf Course and areas managed by the Forestry Department. With respect to Green Hill Golf Course, the Permittee shall implement practices that achieve a 38 percent reduction in total phosphorus discharging from its MS4 into Green Hill Pond

(e) In order to prevent exposure to precipitation, the Permittee shall continue to enclose all snow and ice control materials in storage sheds and implement pollution prevention procedures to minimize exposure while handling these materials (sand, salt, anti-caking chemicals, truck body applicants). Tarps or other suitable impervious cover material may be used to prevent exposure of any temporary or interim storage of snow and ice control materials. The Permittee shall develop and implement post-storm vehicle washing and residue disposal practices for city-owned and contractor equipment to reduce to the MEP the discharge of anti- and de-icing materials into its MS4.

(f) The Permittee shall develop, implement, and enforce 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 when the Permittee determines that a stormwater discharge from a facility is contributing a substantial pollutant loading to the MS4. The Permittee shall report progress made towards reaching the goals of the program in each annual report. The program shall include:

(1) an inventory, mapping, and prioritization of all facilities determined by the Permittee to be contributing a substantial pollutant loading to its MS4 through inspections, monitoring, or other methods conducted by the Permittee, facility operator, or others; and

(2) an education program that informs these facility operators of their obligation to comply with the Permittee's stormwater rules and regulations, encourages pollution prevention, and promotes facility-specific storm water management practices, including appropriate operation and maintenance practices.

4. Land Disturbance and Development

(a) The Permittee shall coordinate all municipal departments and boards with jurisdiction over the review, permitting, or approval of land disturbance and development projects within the City of Worcester. As of the effective date of this permit, the Permittee shall implement and enforce a program to control any storm water contributing to its MS4 associated with land disturbance or development (including re-development) activities. Within two (2) years after the effective date of this permit, the Permittee shall begin implementing and enforcing an updated program that shall include implementation of legal authorities consistent with Part I.E.1. of this permit and shall address storm water management during land disturbing activities (construction phase) and after site stabilization has been achieved (post-construction or operational phase). At a minimum the Permittee's program shall, to the extent allowable by state law, establish by ordinance, bylaw, regulation or other appropriate legal authority requirements equivalent to the Stormwater Management Standards established by the MassDEP in effect upon the effective date of this permit[2], and shall include the additional elements described in Part I.E.4.(c) below.

(b) The Permittee does not need to apply provisions of its program addressing stormwater discharges during the construction phase of projects that receive a waiver from EPA under the provisions of 40 CFR § 122.26(b)(15)(i).

(c) The Permittee's program managing stormwater associated with land disturbance and development activities must include the following elements:

(1) An ordinance, bylaw, regulation, or other appropriate legal authority that requires developers and construction site operators to comply with the equivalent of the MassDEP Stormwater Management Standards, and that includes sanctions to ensure compliance (to the extent allowable under State or local law). Notwithstanding the applicability provisions found in the applicable MassDEP regulations[3], the

[2] Massachusetts Stormwater Management Standards, Vol. 1, Chapter 1 (available at url: http://www.mass.gov/dep/water/wastewater/v1c1.doc)

[3] Revisions to 310 CMR 10.00 and 314 CMR 9.00 promulgated on January 2, 2008; summarized at url: http://www.mass.gov/dep/water/laws/strmreg.pdf, and available at url: http://www.mass.gov/dep/water/laws/310c10p.pdf, and http://www.mass.gov/dep/water/laws/314c9p.pdf, respectively. The Massachusetts Stormwater Management Standards do not apply (or are applied only to the maximum extent practicable) for certain projects or

Permittee's program shall apply standards equivalent to MassDEP's Stormwater Management Standards to any project or activity that results in a disturbance of one or more acres of land, whether considered individually or collectively as part of a larger common plan, and that contributes storm water to the Permittee's MS4.

The MassDEP Stormwater Management Standards require proponents of development or redevelopment projects to consider environmentally sensitive site design that incorporates low impact development techniques. Therefore, the Permittee shall ensure that a proponent's proposed use of low impact development ("LID") techniques identified in the Massachusetts Stormwater Handbook[4] are allowable by right or exception (e.g., special permit or variance) under its regulations. In addition, the Permittee shall identify existing municipal zoning, site planning or street design regulations that address minimal dimensional criteria for the creation of roadways, parking lots, and other impervious cover that may represent barriers to implementing LID practices that involve minimization of impervious cover. Within two (2) years after the effective date of this permit, the Permittee shall make revisions to these regulations necessary to eliminate or reduce potential barriers, or otherwise provide in its annual report(s) required by Part I.H. justification why it is unable to make such modifications.

To address projects that MassDEP regulations exempt from compliance with the Standards (i.e., single family house projects and certain small subdivisions and housing developments), the Permittee's regulatory mechanism(s) may apply its equivalent requirements to the "maximum extent practicable" as defined in the Massachusetts Stormwater Handbook rather than requiring their full application. To address projects or activities located outside of a wetland resource area and that do not require the submission of a Notice of Intent to the Conservation Commission, the Permittee's regulatory mechanism(s) must maintain or establish surrogate procedures for successfully applying and enforcing the MassDEP Storm Water Management Standards[5];

(2) procedures for site plan review and pre-construction review meetings that incorporate consideration of stormwater controls or management practices to prevent or minimize impacts to water quality;

(3) procedures for site inspection and enforcement of control measures, including provisions to ensure proper construction, operation, maintenance, and repair of construction and operational phase control measures;

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activities based on threshold criteria including the number of lots or units developed, assurance of no potential affects to critical areas, and whether the work is an emergency repair.

[4] Available at url: http://www.mass.gov/dep/water/laws/policies.htm#storm

[5] Standards 8, 9, 10 respectively address construction-related impacts, long-term operation and maintenance, and an illicit discharge prohibition. These Standards involve submissions associated with NOIs, Orders of Conditions, and Certificates of Compliance that are filed or issued pursuant to the MA Wetlands Protection Act.

(4) procedures for receipt and consideration of information submitted by the public concerning proposed and ongoing land disturbance and development activities; and

(5) procedures for notifying project applicants of their potential obligation to obtain authorization under an EPA NPDES Permit such as the *General Permit for Storm Water Discharges from Construction Activities* (CGP) if their development or redevelopment project disturbs one more acres of land, either individually or collectively as part of a larger common plan, and discharges storm water to a Waters of the U.S. directly or through the Permittee's MS4. The notification shall convey the Permittee's ability to obtain a copy of the Storm Water Pollution Prevention Plan prepared for projects covered by EPA's CGP.

(d) Within one (1) year after the effective date of this permit, the Permittee shall complete an estimate of the directly connected impervious area (DCIA) that contributes stormwater to each of its MS4 outfalls utilizing its existing geographic information system (GIS). For the purposes of this part, DCIA is that part of the total impervious area that is hydraulically connected to the Permittee's MS4. DCIA typically includes streets, sidewalks, driveways, parking lots, and some roof tops. DCIA typically does not include isolated impervious areas that are not hydraulically connected to the MS4 or otherwise drain to a pervious area. In its initial annual report, the Permittee shall provide the estimated DCIA that contributes stormwater to each MS4 outfall and describe the methodology and assumptions used. The Permittee shall provide the estimated DCIA for each outfall in each subsequent annual report based on development, redevelopment, or retrofit projects that effectively added or removed DCIA to its MS4 during the prior year.

5. Illicit Discharges and Sanitary Sewer Overflows

(a) Illicit discharges to the MS4 are prohibited, and any such discharges violate this permit and remain in violation until they are eliminated. The Permittee shall prohibit from entering its MS4 all illicit discharges as defined in Part I.E.1.(a). Upon detection, the Permittee shall eliminate illicit discharges as expeditiously as possible and require the immediate cessation of improper disposal practices upon confirmation of responsible parties in accordance with its enforceable legal authorities established pursuant to Part I.E.1. of this permit, and its existing notification and cost-sharing procedures. Where elimination of an illicit discharge within thirty (30) days of its confirmation is not possible, the Permittee shall establish an expeditious schedule for its elimination. No later than six (6) months after confirmation, such discharges shall be eliminated or the Permittee shall initiate appropriate enforcement actions shall be initiated. In the interim, the Permittee shall take all reasonable and prudent measures to minimize the discharge of pollutants to its MS4.

(b) The Permittee shall implement outfall screening and an illicit discharge detection protocol pursuant to Part I.F.6. of this permit to identify, prioritize, and investigate separate storm sewer catchments for suspected illicit discharges or improper disposal (e.g. dumping into a catch basin) of pollutants.

(c) The Permittee shall maintain a record of illicit discharge and improper disposal abatement activities including, at a minimum: location, description, method of discovery, date(s) of inspection, action(s) taken, date of removal or repair, responsible party(ies), costs associated with removal or repair, and estimated daily flow or total volume removed. This information shall be included in the Permittee's annual reporting pursuant to Part I.H. of this permit.

(d) Discharges from SSOs to the MS4 are prohibited, and any such discharges violate this permit and remain in violation until they are eliminated. Upon detection, the Permittee shall eliminate SSOs as expeditiously as possible and take all reasonable and prudent interim mitigation measures to minimize the discharge of pollutants to and from its MS4 until elimination is achieved. The Permittee shall continue to update and implement its Capacity, Management, Operations and Maintenance ("CMOM") Plan; Priority Cleaning Plan; Long Term Preventative Maintenance Plan; Fats, Oils, and Grease (FOG) Program; and its Root Control Program to minimize the occurrence and discharge of SSOs into its MS4.

(e) The Permittee shall identify all known SSOs that have not yet been eliminated or for which the underlying cause has not yet been identified or corrected. This shall include SSOs resulting, during dry or wet weather, from inadequate conveyance capacities, or where interconnectivity of the storm and sanitary sewer infrastructure allows for communication of flow between the systems. This shall not include SSOs resulting from isolated episodes of pipe blockages or collapses that have not recurred since addressed. The Permittee shall submit to EPA and MassDEP within sixty (60) days of the effective date of this permit an inventory of the identified SSOs indicating:

(1) location (approximate street crossing/address and receiving water, if any);
(2) date(s) and time(s) (i.e., beginning and end of discharge);
(3) estimated volume(s);
(4) description of the occurrence indicating know or suspected cause(s);
(5) mitigation and corrective measures completed with dates implemented; and
(6) mitigation and corrective measures planned with implementation schedules.

(f) Upon becoming aware of an SSO, the Permittee shall provide oral and written notice to EPA and MassDEP in accordance with Part II.D.1.e. of this permit and 314 CMR 12.03(8). A completed MassDEP *Sanitary Sewer Overflow/Bypass/Backup Notification Form*[6] shall serve as this written notice and shall include an implementation schedule for planned mitigation and corrective measures. The Permittee shall include a summary of this information in its Annual Report required by Part I.H. of this permit.

(g) Schedules for the mitigation or elimination of SSOs shall be established pursuant to EPA Administrative Order (Docket No. 05-21) or subsequent compliance orders issued by EPA or MassDEP. In the absence of a compliance order addressing a particular SSO, the Permittee shall implement mitigation or corrective actions according to schedules established and identified pursuant to Part I.E.5.(e) or I.E.5(f).

[6] Available at url: http://www.mass.gov/dep/water/approvals/ssoform.pdf

(f) The Permittee shall include in its annual reports required by Part I.H. of this permit the status of mitigation and corrective measures implemented by the Permittee to address each SSO identified pursuant to this part.

6. Infrastructure Operations and Maintenance

(a) The Permittee shall continue its ongoing programs to repair and rehabilitate its MS4 infrastructure in a timely manner in order to reduce or eliminate the discharge of pollutants from its MS4 to receiving waters. This shall include refinement of the Permittee's standard operating procedures and good housekeeping practices for management of its MS4.

(b) City-owned public streets, roads and highway rights-of-way shall be maintained by the Permittee in such a manner as to minimize the discharge of pollutants to its MS4.

(c) The Permittee shall continue a street sweeping program that removes sand, sediment and debris and includes year-round (weekly or more often) main line and arterial sweeping, spring city-wide residential sweeping, fall city-wide street sweeping and leaf pick-up program. As a goal, the Permittee shall compress its spring residential sweeping schedule to maximize the quantity of material collected at the end of the winter season. The Permittee shall document results of its sweeping program including, at a minimum: curb miles swept, dates of cleaning, cubic yards of material collected, and method(s) of reuse or disposal.

(d) The Permittee shall sweep all publicly owned parking lots at least twice annually.

(e) The Permittee shall sweep sidewalks in the central business district at least twice annually.

(f) The Permittee shall continue implementation and refinement of its standard operating practices regarding its snow and ice control operations. The Permittee shall establish goals for the optimization of chemical application rates through the use of automated application equipment (e.g. zero-velocity spreaders), anti-icing and pre-wetting techniques, implementation of pavement management systems, and alternate chemicals.

(g) The Permittee shall comply with MassDEP's Snow Disposal Guidance available at url: www.mass.gov/dep/water/laws/snowdisp.htm for the stockpiling or disposal of post-plowing snow.

(h) As of the effective date of the permit, the Permittee shall continue its practice of routine cleaning of all catch basins at least once every other year at a minimum. The Permittee shall continue implementing its catch basin inventory program ("CBIP") that utilizes a geographic information system ("GIS") and an electronic database for mapping and tracking catch basin inspection, maintenance and management information. Utilizing information compiled through its CBIP, operational staff and public complaints, the

Permittee shall optimize routine cleaning frequencies for particular structures or catchment areas as follows to maintain acceptable sediment removal efficiencies:

(1) For those catch basins serving catchment areas tributary to a receiving water identified in Attachment B with an approved TMDL and applicable waste load allocation for total phosphorus, inspections and cleanings shall be performed at a minimum frequency to ensure that no sump shall become more than fifty-percent (50%) full.

(2) For all other catch basins, the Permittee shall 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.

(3) Barring any definite extenuating circumstances (such as excessive erosion from an active construction site), if a catch basin sump is found to be more than fifty-percent (50%) full during each of two consecutive routine cleaning events, the Permittee shall investigate the contributing drainage area for sources of excessive sediment loading, and to the extent practical, abate contributing sources through appropriate measures. Appropriate measures may include stabilization practices, drainage modifications, and increased frequencies of catch basin cleaning and street sweeping, and structural controls suitable for controlling the excessive loading. The Permittee shall describe in its annual report actions taken or its plans to abate areas of persistent sedimentation, including stabilization practices, structural improvements or operational modifications.

(i) The Permittee shall ensure the performance of retention or detention ponds which discharge to, or receive stormwater from, its MS4. This shall include ponds that are owned by the Permittee and all privately-owned ponds where the Permittee maintains an easement or other legal authority pursuant to Part I.E.1.(c) of this permit. At a minimum, the Permittee shall annually inspect all such retention or detention ponds and remove accumulated solids to restore full solids capture design capacity where found to be in excess of 50% design capacity.

(j) The Permittee shall continue a formal employee training program to increase awareness of water quality related issues in management of its sanitary sewers and MS4. In addition to providing key staff with topical training regarding standard operating procedures and other activities necessary to comply with the provisions of this permit, the training program shall include establishing an awareness of the general goals and objectives of the SWMP; identification and reporting of illicit discharges, SSOs, and improper disposal; and spill response protocols and respective responsibilities of involved personnel.

(k) As part of interagency agreements established pursuant to Part E.1.(g) of this permit, the Permittee shall coordinate with operators of interconnected MS4s regarding the contribution of pollutants or operation and maintenance procedures affecting either system.

(l) The Permittee shall continue to inspect, maintain, and monitor the Vortechnics Model 16000 storm water treatment device installed as a demonstration project during the first permit term on the Belmont Street Drain. Sampling methodology and annual reporting will be carried out as directed in Part I.F.7. of this permit.

(m) The Permittee shall continue to inspect, maintain, and monitor the resource restoration project at Salisbury Pond, which included the installation of hydrodynamic separators at two outfalls into the pond, to reduce nutrients and sediment from entering the pond. The project shall include public education elements and the tracking of pollutant removal effectiveness of the separators. Sampling methodology and annual reporting will be carried out as directed in Part I.F.7. and Part I.H. of this permit.

(n) The Permittee shall continue to inspect, maintain, and monitor the resource restoration project at Indian Lake, which included the installation of three hydrodynamic separators to remove sediment and nutrients from entering the Lake. The project shall also include public education elements and ongoing operation and maintenance of the separators. Sampling methodology and annual reporting will be carried out as directed in Part I.F.7. and Part I.H. of the permit.

(o) The Permittee shall maintain the stream day-lighting culvert rehabilitation project at Beaver Brook, and the related reconstruction and the flood plain improvements to Beaver Brook Park. In-stream monitoring shall be performed as described in Part I.F.3. of this permit.

7. Infrastructure Improvements

(a) The Permittee shall continue its ongoing programs to improve its MS4 infrastructure in order to reduce or eliminate the discharge of pollutants to and from its MS4.

(b) The Permittee shall continue to implement its program to retrofit twin-invert manholes with hold-down devices on the metal plates that cover the sanitary sewer inverts; reducing the potential for hydraulic communication between its sanitary sewer and MS4.

(c) The Permittee shall continue its Private Street Conversion Program, converting unpaved private streets to paved streets with proper drainage, following citizen petition for the conversion. The Permittee shall adhere to its construction site and post-construction pollution prevention practices (Part I.E.4) as part of street conversions.

Part I.F. Monitoring and Analysis

1. The Permittee shall implement specific inspection, screening, and monitoring activities of its MS4 and receiving waters to facilitate and inform the implementation of several provisions of this permit and to support the Permittee's required assessments of its SWMP. Monitoring and analysis activities shall include in-stream dry and wet weather monitoring of receiving water quality; wet weather outfall monitoring for storm water quality; dry and wet weather outfall screening for illicit discharges; implementation of an illicit discharge detection

protocol; inspection and performance monitoring of existing hydrodynamic storm water separators; and implementation and monitoring of one or more groundwater recharge/low-impact development retrofit demonstration projects.

2. **Upon the effective date** of this permit, the Permittee shall begin implementation of activities described in this part. Within **One hundred eighty (180) days** of the effective date of this permit the Permittee shall submit as part of its updated SWMP submission pursuant to Part I.D. of this permit, 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. The submission shall include a description of meteorological resources the Permittee intends to utilize to facilitate the required activities.

3. In-stream Dry and Wet Weather Monitoring of Receiving Water Quality

   (a) In-stream dry and wet weather monitoring shall be conducted at a minimum total of eight (8) locations amongst six (6) major headwater tributaries to the Blackstone River: three (3) in Beaver Brook, and one (1) each in the Middle River, Kettle Brook, Tatnuck Brook, Mill Brook, and Poor Farm Brook. Specific monitoring locations shall be established by the Permittee through consideration of monitoring stations utilized by Permittee[7], MassDEP[8], the Blackstone River Coalition[9], or others. Two of the three monitoring locations in Beaver Brook shall be located upstream and downstream of its recently day-lighted reach in Beaver Brook Park. In-stream monitoring shall also be completed at all tributary inlets to impaired waters as described in Part I.F.4.(b) of this permit.

   (b) The Permittee shall perform annual in-stream monitoring in a total of four rounds, performed once in the summer during dry weather conditions, and once each in the spring, summer and fall during wet weather conditions.

   (c) Dry weather monitoring shall be performed only when an antecedent dry period of at least 72 hours after a rain event greater than 0.1 inch in depth is satisfied. Monitoring methodology shall consist of collecting a minimum of four (4) grab samples spaced at a minimum interval of 5 minutes each. Grab samples will be combined into a single composite sample from each station, preserved, and delivered to the laboratory for analysis.

   (d) Wet weather monitoring shall be performed only when the predicted rainfall depth of a storm event is greater than 0.25 inches and an antecedent dry period of at least 48 hours after a rain event greater than 0.1 inch in depth is satisfied. Monitoring methodology will consist of collecting a minimum of four (4) grab samples spaced at a minimum interval of 15 minutes each. Individual grab samples shall be preserved and delivered to the

[7] NPDES Permit Term 1 Stormwater Quality Analysis (City of Worcester, 2006)
[8] Blackstone River Basin -1998 Water Quality Assessment (MassDEP, 2001; available at url: http://www.mass.gov/dep/water/resources/wqassess.htm#wqar
[9] http://www.zaptheblackstone.org/whatwedoing/water_quality/wqm.shtml

laboratory where samples will be combined into a single composite sample from each outfall, weighted by respective flow rate estimated at the time of sample collection.

(e) At the time of sampling, the Permittee shall record any observed erosion of stream banks, scouring, or sedimentation in streams, such as sand bars or deltas.

(f) Samples collected during the dry and wet weather monitoring shall be analyzed for the following parameters in the field (indicated by "*") or laboratory:

Dissolved Oxygen (DO)*
pH*
Temperature*
Conductivity*
Total Suspended Solids (TSS)
Total Petroleum Hydrocarbons (TPH)
Surfactants
Total Phosphorus
Nitrate-Nitrogen
Copper
Lead
Zinc
Chloride
Biochemical Oxygen Demand (BOD)
E. coli

(g) The Permittee shall analyze all monitoring results in combination with relevant data collected during the 1998 permit term to assess any changes or trends in observed receiving water quality.

4. Wet Weather Outfall Monitoring for Storm Water Quality

(a) Permittee shall perform storm water quality monitoring at each of its MS4 outfalls a minimum of twice during the permit term. The first round of outfall monitoring shall be completed within the first two (2) years after the effective date of this permit. The second round of outfall monitoring shall be completed within the final two (2) years prior to the expiration date of this permit.

(b) For storm water and tributary inlet discharges into water bodies identified as impaired by a known pollutant in Attachment B (Categories 4a and 5), the Permittee shall perform the following additional storm water and in-stream water quality monitoring and analyses for all pollutant(s) of concern (or appropriate precursors) causing use impairment(s)[10]. For storm water and tributary inlet discharges to impaired waters identified in Attachment B, with or without an approved TMDL, monitoring shall be performed a minimum of once

[10] For the purposes of this part, total phosphorus shall be the precursor analyzed where the pollutant of concern on Attachment B is identified as: (2) noxious aquatic plants, (8) nutrients, (9) organic enrichment/low dissolved oxygen, (11) turbidity, or (14) taste, odor and color.

per year. For the purposes of this part, a "storm water discharge to an impaired water" includes any discharge from the Permittee's MS4 flowing directly into the impaired water, and does not include discharges from its MS4 located in the upstream tributary area to an impaired water. For the purposes of this part, a "tributary inlet" includes the point at which any natural water course discharges into another water body. The Permittee may combine implementation of the monitoring required in this part with the monitoring required by Part I.F.4.(a) to simultaneously satisfy requirements of both parts during a singular storm event.

(c) Monitoring methodology at each outfall or tributary inlet shall consist of a single grab sample, collected during any portion of the outfall's discharge hydrograph (i.e., first flush, rising limb, peak, and falling limb) or discernable increase in flow at the tributary inlet. In order to accommodate the timely completion of all required monitoring, no minimum rainfall depth or antecedent dry period criterion need be established beyond the requirement that qualifying storm events be sufficient in depth to generate storm water runoff and resultant discharge at the outfalls or discernable increased flow at tributary inlets to be monitored.

(d) Individual grab samples collected pursuant to Part I.F.4.(a) shall be analyzed using field (indicated by "*") and laboratory instrumentation to measure the following physical, chemical, and biological water quality indicator parameters:

Dissolved Oxygen (DO)*
pH*
Temperature*
Conductivity*
Total Suspended Solids (TSS)
Total Petroleum Hydrocarbons (TPH)
Surfactants
Total Phosphorus
Nitrate-Nitrogen
Copper
Lead
Zinc
Chloride
Biochemical Oxygen Demand (BOD)
E. coli

(e) Monitoring performed at the New Bond Street outfall shall be coordinated with an investigation of the elevated concentrations of copper recorded during the 1998 permit term at this outfall. Within two (2) years after the effective date of this permit, the Permittee shall complete the investigation of this outfall. Based on the results of the investigation, the Permittee shall direct any contributing property owner or responsible party to abate its discharge of copper in accordance with the Permittee's sewer and storm water management ordinance and, if applicable, its pollution prevention program developed pursuant to Part I.E.3.(f) of this permit.

5. Dry and Wet Weather Outfall Screening for Illicit Discharges and SSOs

(a) The Permittee shall screen discharges from its MS4 outfalls during dry and wet weather conditions for physical, chemical, and biological indicators of the presence and relative magnitude of sanitary or non-stormwater influence in tributary subcatchment areas. Whether documented by EPA, MassDEP, the Permittee, or others, drainage catchments or alignments with known or highly suspected contributions of illicit discharges or SSOs may have already been identified. Screening of outfalls serving such portions of the MS4 is not required for the purpose of prioritization as required in Part I.F.5.(b), and the Permittee shall continue or initiate isolation and removal procedures for illicit discharges and SSOs in these areas based on the Permittee's priority ranking established pursuant to Part I.F.6.(b) of this permit. Within sixty (60) days of the effective date of this permit the Permittee shall submit to EPA and MassDEP an inventory of all MS4 subcatchments for which the Permittee deems outfall screening is not required pursuant to this part. For each subcatchment or alignment, the Permittee shall provide:

(1) all available documented evidence, including monitoring results, of illicit discharges and SSOs;
(2) completed, ongoing or planned corrective measures addressing the documented illicit discharges and SSOs; and
(3) a schedule for completing and verifying measures correcting the documented illicit discharges and SSOs.

(b) Screening of outfalls during dry and wet weather periods shall be completed to facilitate the priority ranking of individual separate storm sewer subcatchment areas for investigation using the Permittee's Illicit Discharge Detection Protocol ("IDDP") described in Part I.F.6. of this permit. Analysis of screening results, including comparisons with benchmark values for parameters included in Table 1 and Figure 1 on Page 27 of this permit, shall support such prioritization. Screening of outfalls during dry and wet weather periods after implementation of the Permittee's IDDP shall serve to verify that the correction of all illicit discharges have been completed.

(c) The Permittee shall develop a priority ranking for the purpose of scheduling its outfall screening activities required by this part. EPA and MassDEP recommend that the Permittee consider the current or intended uses of receiving waters, existence of use impairments, and the relative likelihood of the presence of illicit discharges and SSOs in the development of its priority ranking.

(d) Except where excluded by Part I.F.5.(a), MS4 outfalls shall be screened a minimum of twice during the permit term, once in accordance with the dry weather methodology and once in accordance with the wet weather methodology described in Part I.F.5.(e) and Part I.F.5.(f) of this permit, respectively. Outfall screening to facilitate priority ranking shall be completed at a rate that will permit timely execution of the Permittee's IDDP as described in Part I.F.6.(a) of this permit (i.e., an incremental twenty-five percent (25%) of MS4 subcatchment areas completed by the end of permit years 1, 2, 3, and 4). As

described in Part I.F.6.(d)(8), an additional round of dry and wet weather screening is required at any outfall serving a subcatchment found to be influenced by one or more illicit discharges or SSOs, and shall be completed no more than sixty (60) days after the Permittee has subsequently verified removal of all such discharges contributing to the outfall's subcatchment in accordance with Part I.F.6.(d)(7).

(e) Dry Weather Methodology. Dry weather outfall screening shall proceed only when no more than 0.1 inches of rainfall has occurred in the previous 24-hour period. The duration of the antecedent period may be shortened or lengthened by the Permittee as necessary or appropriate dependent upon rainfall depth or the relative extent, slope, storage, and other influences on the particular subcatchment served by the outfall. In order to maintain consistency, screening shall be performed according to substantially the same procedures as described in the 1998 permit as follows:

(1) Locate the outfall, and take a photograph. At outfalls where photographs were previously taken, new photographs shall be taken from the same approximate orientation to facilitate comparison and determination of any changes.

(2) Collect data on physical condition of the outfall, including evidence of collapse and structural defects, and evidence of erosion or deposition in the vicinity of the outfall.

(3) Record any indicators of illicit discharges or SSOs such as odors, oil sheen, soap suds, slimes, or presence of sanitary floatables or solids.

(4) If the outfall is inaccessible or submerged, proceed to the first accessible upstream manhole or structure.

(5) If flow is observed, estimate flow using the product of flow area and velocity or the quotient of volume discharged over time, perform field analyses described in Part I.F.5.(e)(6), and collect grab sample for enumeration of *E.coli* indicator bacteria in the laboratory. If the outfall is not flowing, but shows evidence of recent intermittent flow (e.g. a residue unrelated to a storm water discharge), return in 4 to 24 hours and screen again; completing flow estimation, field analyses, and grab sampling for indicator bacteria analysis if flow is subsequently observed. If no flow is observed initially and upon return, or no evidence of intermittent flow is present, proceed to the next outfall.

(6) Field analyses of dry weather flow samples shall include measurement of the following parameters:

- Conductivity
- Turbidity
- Dissolved Oxygen
- pH
- Chlorine
- Temperature

- Surfactants as (MBAS)
- Potassium
- Ammonia

(f) Wet Weather Methodology. In order to accommodate the timely completion of all required monitoring, no minimum rainfall depth need be established beyond the requirement that storm events be sufficient in depth to generate stormwater runoff and subsequent discharge at the outfalls to be monitored No antecedent dry period criterion will apply to the wet weather screening and sampling; as a goal of the effort is to evaluate outfalls during wetter periods when many illicit discharges and SSOs are more likely to activate and manifest at an outfall. In order to maintain consistency with dry weather screening described above, wet weather screening will be performed in a similar manner as follows:

(1) Record any indicators of illicit discharges or SSOs such as odors, oil sheen, soap suds, slimes, or presence of sanitary floatables or solids.

(2) If the outfall is inaccessible or submerged, proceed to the first accessible upstream manhole or structure to complete screening and monitoring.

(3) Estimate flow using the product of flow area and velocity or the quotient of volume discharged over time, perform field analyses described in Part I.F.5.(f)(4), and collect grab sample for enumeration of *E. coli* indicator bacteria in the laboratory.

(4) Field or laboratory analyses of wet weather flow samples shall include measurement of the following parameters:

- Conductivity
- Turbidity
- Dissolved Oxygen
- pH
- Chlorine
- Temperature
- Surfactants (as MBAS)
- Potassium
- Ammonia

6. Illicit Discharge Detection Protocol ("IDDP")

(a) Implementation. The Permittee shall implement an IDDP according to the priorities developed pursuant to Part I.F.6.(b), and consistent with the methodology described in Part I.F.6.(d) of this permit. The Permittee shall complete implementation of its IDDP throughout its entire MS4 no later than **five (5) years** from the effective date of this permit; such shall be completed in minimum increments of twenty-five percent (25%) of its total MS4 service area no later than **2, 3, 4, and 5 years** from the effective date of this

permit. The Permittee shall cause the removal of all identified illicit discharges and SSOs pursuant to Part I.E.5.(a) and Part I.E.5.(g) of this permit, respectively.

(b) Prioritization**.** The Permittee shall use the results from its dry and wet weather outfall screening required by Part I.F.5. to develop a priority ranking for the purpose of scheduling its IDDP implementation. EPA and MassDEP recommend that the Permittee consider the perceived severity of the pollution, the current or intended uses of receiving waters, and impairment status, in the development of its priority ranking.

(c) Mapping. Through a geographic information system or other methods, the Permittee shall prepare mapping to facilitate implementation of its IDDP. Mapping shall provide a comprehensive depiction of key infrastructure and factors influencing proper system operation and the potential for illicit sanitary sewer discharges. Mapping themes shall include: key sanitary and storm sewer infrastructure, investigation and study findings, monitoring data, cleaning and repair activities, capital projects, and water resource and topographic features. The required number, scale and detail of the maps shall be appropriate to facilitate a rapid understanding of the system by the Permittee, EPA and MassDEP. In addition, the mapping shall serve as a planning tool for the implementation and phasing of the IDDP, demonstration of the extent of complete and planned investigations and corrections, and other related capital projects. To ensure legible mapping, information shall be grouped appropriately and represented thematically (e.g. by color) with legends or schedules where possible. Mapping shall be updated as necessary to reflect newly discovered information, corrections or modifications, and progress made. The following information and features shall be included in the mapping:

(1) Infrastructure

- Municipal separate storm sewer system (including inter-municipal and private connections where available)
- Municipal sanitary sewer system (including inter-municipal connections)
- Municipal combined sewer system
- Thematic representation of sewer material, size, and age
- Sewer flow direction and flow type (e.g., pressure, vacuum, gravity)
- Select rim and invert elevations (for comparison with water table and vertical separation between systems)
- Aerial delineations of major separate storm sewer catchment areas, sanitary sewersheds, combined sewersheds, and areas served by on-site subsurface disposal systems
- Common/twin-invert manholes or structures (i.e., structures serving or housing both separate storm and sanitary sewers)
- Sanitary and storm sewer alignments served by known or suspected underdrain systems
- Sewer alignments with common trench construction and major crossings representing high potential for communication due to water table influence
- Lift stations (public and private), siphons, and other key sewer appurtenances

- Sewersheds or sewer alignments experiencing inadequate level of service (LOS) (with indication of reason(s))
- Location(s) of known sanitary sewer overflows (SSO) (with indication of cause(s))

(2) Water Resources and Topographic Features

- Water bodies and watercourses identified by name
- Seasonal high water table elevations impacting sanitary sewer alignments
- Topography
- Orthophotography

(3) O&M, Investigations, Remediation, and Capital Projects

- Alignments, dates, and thematic representation of work completed (with legend) of past illicit discharge investigations (e.g. flow isolation, dye testing, CCTV)
- Locations of suspected, confirmed, and corrected illicit discharges (with dates and flow estimates)
- Water quality monitoring locations with representation of water quality indicator concentrations
- Recent and planned sewer infrastructure cleaning and repair projects
- Alignments and dates of past and planned I/I investigations and sanitary sewer remediation work
- Planned capital projects relative to utility and roadway rehabilitation or replacement
- Proposed phasing of future illicit discharge investigations

(d) IDDP Methodology. The IDDP shall utilize methodologies adapted from BWSC (2004) and Pitt (2004) (see Part XI.C.9 of Fact Sheet) described in this part to perform a thorough top-down investigation of separate storm sewer catchments that relies on results from visual observation, field test kits, and portable instrumentation during dry weather conditions to isolate areas or alignments with likely sanitary or non-storm water contributions. Internal plumbing inspections, dye or smoke testing, CCTV inspections, or other methods consistent with the Permittee's established procedures shall then employed to confirm the illicit and non-stormwater flow source(s).

(1) Infrastructure Verification and Preparation. Infrastructure and junction manhole mapping, and subcatchment delineations, shall be verified in the field and corrected prior to investigations as necessary. Separate storm sewer infrastructure shall be evaluated for the need to be cleaned to remove debris or blockages that could compromise investigations. Such material shall be removed to the extent possible prior to investigation, however, some cleaning may occur concurrently.

(2) Dry Weather Criteria. In order to prevent or limit the influence of storm water runoff during the investigations, an antecedent dry weather period of 24 hours after cessation of a precipitation event greater than 0.1 inches will be observed prior to

commencement of manhole inspections and field monitoring discussed in Part I.F.6.(e)(3) below. The duration of the antecedent period may be shortened or lengthened by the Permittee as necessary or appropriate dependent upon rainfall depth or the relative extent, slope, storage, and other influences on the particular subcatchment under investigation.

(3) Manhole Inspection Methodology. All junction manholes or structures serving the subcatchment shall be opened and inspected for visual evidence of illicit discharges during a period when the antecedent dry weather criterion has been satisfied (e.g., after 24 hours of dry weather). Inspections shall be completed in a "top-down" progression, beginning with the most upstream junction manhole(s) in each subcatchment.

Where **flow is observed** in any junction manhole and determined to be contaminated through visual observation (e.g., excrement, toilet paper, or sanitary products present) or field monitoring (see Part I.F.6.(d)(4)), the contributing tributary storm sewer alignment shall be identified for investigations to isolate the source(s) in accordance with Part I.F.6.(d)(5).

Where **flow is not observed** in a junction manhole, all non-flowing inlets to the structure shall be partially dammed for the next 48 hours when no precipitation is forecast. Inlets shall be damned by blocking a minimal percentage (approximately 20% +/- depending on pipe slope) of the pipe diameter at the invert using sandbags, caulking, weirs/plates, or other temporary barriers. Manholes shall thereafter be re-inspected (prior to any precipitation or snow melt) for the capture of periodic or intermittent flows behind any of the inlet dams. The same visual observations and field testing shall be completed on any captured flow to identify alignments for isolation investigations. Though isolation investigations of multiple lateral alignments of a subcatchment can occur simultaneously, downstream investigations of mainline alignments (after the confluence with lateral alignments) cannot proceed until any confounding influence of upstream illicit discharges or SSOs have been eliminated.

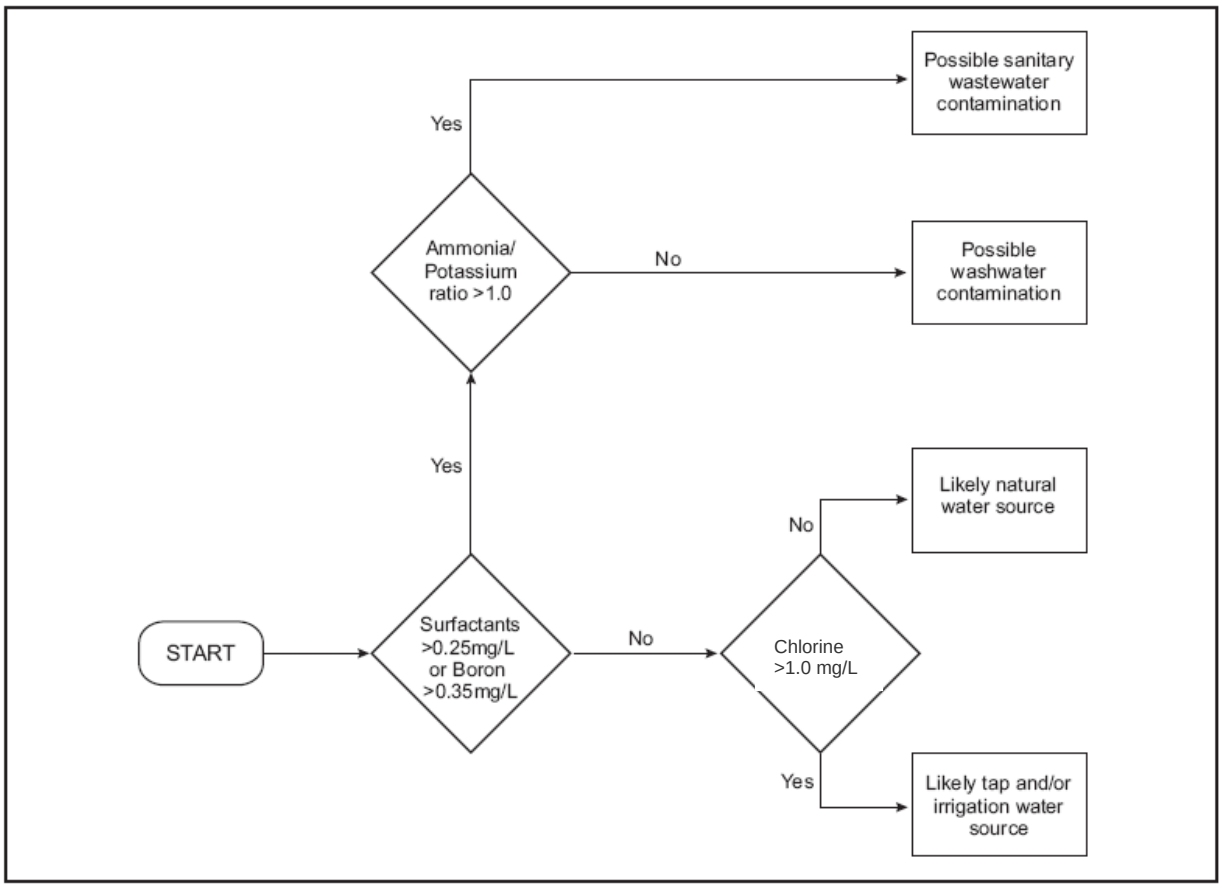
(4) Field Monitoring. Where flow is observed that does not demonstrate obvious physical or olfactory evidence of an illicit discharge or SSO, a sample shall be collected and analyzed with the field kits and instrumentation as identified in Table 1. The Permittee shall compare the measured values with benchmark values using the flow chart in Figure 1 to determine the likely prominent source of the flow. Where surfactant concentrations are measured in the flow above the benchmark, ammonia and potassium shall be measured and results used in a ratio analysis to determine if the flow is likely to be governed by a sanitary or wash water component. Where surfactants are not detected above the benchmark concentration, a flow sample shall be analyzed for chlorine in an attempt to determine if the likely source is natural surface water or groundwater; or possibly a potable water source, a swimming pool, or an industrial discharge. However, the results of this analysis may not always prove conclusive as the chlorine demand found in the storm sewer may diminish or

Table 1 - Field Measurements, Benchmarks, and Instrumentation

Analyte	Benchmark	Instrumentation[1]
Surfactants (as MBAS)	>0.25 mg/L	MBAS Test Kit (e.g. CHEMetrics K-9400)
Potassium (K)	(ratio below)	Portable Ion Meter (e.g. Horiba Cardy C-131)
Ammonia (NH_3)	$NH_3/K > 1.0$	Portable Colorimeter or Photometer (e.g. Hach DR/890, CHEMetrics V-2000)
Chlorine	>0.1 mg/L	Portable Colorimeter or Photometer (e.g. Hach DR/890, CHEMetrics V-2000)
Temperature	Abnormal	Thermometer
pH	Abnormal	pH Meter

[1] Instrumentation manufacturers and models provided for informational purposes only. Mention of specific products does not constitute or imply EPA endorsement of same.

Figure 1. Flow Chart - Determining Likely Source of Discharge (Adapted from Pitt, 2004)



eliminate any chlorine present. The Permittee may need to adjust benchmark values found in Table 1 during the course of investigations after a comparison and calibration of data with actual incidences of observed flow sources.

(5) Isolation and Confirmation of Illicit Discharges. Where physical evidence or field monitoring has identified storm sewer alignments to be influenced by sanitary flows, washwaters, or other illicit discharges, the Permittee shall isolate the tributary area for implementation of more detailed investigations. Additional manholes along the alignment shall be inspected to refine the location of potential contamination sources (e.g., an individual home or block of homes). Targeted internal plumbing inspections, dye or smoke testing, CCTV inspections, or other methods consistent with the Permittee's established procedures shall then employed to confirm the flow source(s).

(6) Removal of Illicit Discharges. Where an illicit discharge is verified, the Permittee shall exercise its authority as necessary to require its removal pursuant to Part I.E.5.(a) of this permit, including prompt notification and any appropriate cost-sharing arrangements.

(7) Verification of Illicit Discharge Removals. After completing the removal of all illicit discharges from a particular alignment or portion of an MS4 subcatchment, the Permittee shall verify that all necessary corrections have been made. Depending on the extent and timing of corrections made, verification monitoring may be accomplished at the original junction manhole or the closet downstream MS4 structure to each correction. Verification shall be accomplished by using the same visual inspection, field monitoring, or damming techniques as described in Parts I.F.6.(e)(3) and I.F.6.(e)(4) above. Investigation of those portions of downstream alignments confounded by the identified illicit discharge(s) shall not proceed until removal or elimination has been verified.

(8) Verification of IDDP Completion in MS4 Subcatchments. A completed verification at the outfall (or the first accessible upstream structure from an inaccessible MS4 outfall) of an MS4 subcatchment shall serve to demonstrate that the IDDP has been fully implemented for that entire subcatchment. This subcatchment verification shall include both the techniques described in Parts I.F.6.(e)(3) and I.F.6.(e)(4), as well as completion of the dry and wet weather screening methodologies described in Parts I.F.5.(e) and I.F.5.(f).

(9) Work Progression & Schedule. Since the IDDP requires verification of illicit discharge removals prior to progressing to affected portions of downstream MS4 subcatchments, the Permittee shall maintain capacity to mobilize investigations to other subcatchments or unaffected lateral alignments within the same subcatchment, to facilitate suitable progress while awaiting correction of illicit discharges or sanitary sewer overflows confounding downstream investigations. Since work progress may be further constrained by the persistence of precipitation and snow melt events, the

Permittee shall provide for adequate staffing and equipment resources to perform concurrent investigations in multiple areas as necessary to complete all investigations within **five (5) years** from the effective date of this permit.

(10) Reporting and Evaluation. The Permittee shall document in its annual reports required by Part I.H. its progress implementing the provisions of Part I.F.6., including the results and status of its outfall screening and monitoring, mapping, and IDDP implementation. The Permittee shall evaluate its progress by tracking, at a minimum, the percentage of MS4 catchment areas or outfalls screened and/or monitored, percentage of structures inspected, and the footage or percentage of MS4 cleaned and inspected by CCTV.

(11) Modifications. Though the IDDP is applicable to most storm sewers, modifications to methods and materials may be required to address situations where groundwater or backwater conditions or other issues preclude adequate implementation as described herein. In such instances, the Permittee shall make necessary modifications to the IDDP in accordance with Part I.G. of this permit.

7. Hydrodynamic Storm Water Separator Monitoring

(a) Pollutant Removal Effectiveness. The Permittee shall monitor the pollutant removal effectiveness of a total of three hydrodynamic separator units installed and maintained at Belmont Street (Lake Quinsigamond), Salisbury Pond, and Indian Lake. Monitoring results, analyses and conclusions shall be incorporated into the Permittee's annual reports submitted to EPA and MassDEP.

(1) Belmont Street Vortechnics Unit. The Permittee shall continue monitoring and analyzing water quality data collected upstream and downstream of this unit for total suspended solids (TSS), oil and grease and total phosphorus during dry and wet weather. To ensure the validity of the results, monitoring will be conducted only when 100% of flow in the 48-inch storm sewer is confirmed by visual inspection to be diverted to the separator unit. Monitoring "rounds" shall be comprised of single grab samples collected from the influent, effluent, and bypass flows to the unit. Dry weather monitoring shall include one round of sampling, once per year during the five-year permit term. Wet weather monitoring shall be conducted twice per year, once each during the spring and fall. Four rounds of samples shall be collected during each wet weather event; one during the first flush and one each fifteen minutes thereafter, for a total duration of one hour. Instantaneous flow estimates shall be made and recorded during each round.

(2) Salisbury Pond. The Permittee shall monitor the pollutant removal effectiveness of the BMP's (hydrodynamic separator units) installed and maintained at Salisbury Pond. Dry weather sampling shall be conducted once per year and wet weather sampling shall be conducted twice per year, during the five-year permit term at one unit. Water quality analysis of total suspended solids ("TSS"), *E. coli* and total phosphorus shall be conducted. For each dry weather event, one round of samples

shall be collected. For each wet weather event, four rounds of samples shall be collected: one round during the first flush and one round every 15 minutes thereafter, for a total duration of one hour.

(3) Indian Lake. The Permittee shall monitor the pollutant removal effectiveness of the BMP's installed and maintained at Indian Lake. Dry weather sampling shall be conducted once per year and wet weather sampling shall be conducted twice per year during the five-year permit term at one unit. Water quality analysis of total suspended solids (TSS), *E.coli*, and total phosphorus shall be conducted. For each dry weather event, one round of samples shall be collected. For each wet weather event, four rounds of samples shall be collected: one round during the first flush and one round every 15 minutes thereafter, for a total duration of one hour.

(b) Operation and Maintenance Optimization. The Permittee shall implement an inspection program to facilitate the Permittee's refinement and implementation of a long term operation and maintenance plan for city owned and operated underground hydrodynamic storm water separators (Downstream Defender, Vortechnics and Vortcentury). The Permittee shall visually inspect all of its devices and record sediment accumulation depths in each throughout the permit term to facilitate the development and refinement of individual maintenance programs that strive for maximum operational effectiveness. Inspection frequencies shall be adequate to facilitate a qualitative understanding of the variability in solids and floatable accumulation rates in the devices as impacted by land use, road sanding, land disturbing construction activities, or other factors.

(1) For the first year of the permit term, inspections shall be conducted quarterly at a minimum, including before and after a predicted storm event (rainfall) that is greater than two (2) inches in depth in a twenty-four (24) hour period to assess how the units capture and retain sediment, or may be compromised, at higher rates of flow. Inspections may be conducted coincidently with the water quality monitoring performed as required by Part I.F.3. – I.F.5. of this permit. After the first year of monitoring, and following the Permittee's assessment of its inspection data and the resulting derived maintenance and cleaning schedules for each device, the Permittee shall modify as necessary the inspection frequencies and operation and maintenance practices for each unit pursuant to Part I.G.2 of this permit. Maintenance and cleaning schedules shall be optimized based on observations of factors such as expected versus actual sediment deposition depth, sediment wash-out at certain deposition depths, or sediment accumulation variations during different seasons.

8. Groundwater Recharge/Low-Impact Development Retrofit Demonstration Project

(a) The Permittee shall implement a retrofit demonstration project to inform and facilitate the application of groundwater recharge as a low-impact development practice in the city as required by Part I.E.1.(f) and Part I.E.4.(a) of this permit.

(b) The Permittee shall select a minimum of one municipally-owned and developed parcel on which to retrofit one or more low-impact development stormwater management practices

that encourage groundwater recharge and reduce surface water runoff. In selecting candidate parcels, the Permittee shall consider subwatersheds that discharge to impaired waters; that are significantly urbanized and discharge to smaller tributaries; or that represent opportunities to encourage or integrate with a phased implementation of other public and private low-impact development retrofits within a subwatershed.

(c) The demonstration project shall be designed and monitored by the Permittee in a manner to allow it to assess the feasibility, cost effectiveness, performance, maintenance requirements and environmental benefits of the retrofit(s).

(d) The project shall adhere to the Stormwater Management Standards established by the MassDEP in effect upon the effective date of this permit and guidance related to groundwater recharge[11]. The Permittee shall include in its annual reports the status of project implementation, and an assessment as described in Part I.F.8.(c) of this permit.

(e) The schedule for this project shall be as follows:

- **Year 1**: Select location(s) for retrofit. This may entail a review of existing and proposed land uses on municipal properties, coordination with other uses and projects on municipal properties, sites evaluations for soil type, topography, and interagency agreements. Selected location(s) must be currently served by the Permittee's MS4.
- **Year 2**: Design and Secure Funding. Potential recharge applications shall be evaluated with possible assistance from qualified consultants. Project design shall include establishment of monitoring and evaluation protocols. Funding to implement a minimum of one type of retrofit at one location shall be secured.
- **Year 3**: Implementation. Selected design components shall be installed or constructed.
- **Year 4**: Monitoring and Assessment. Retrofit(s) shall be inspected and monitored to determine maintenance needs and performance. Maintenance shall be performed as necessary.
- **Year 5**: Evaluation and Reporting. Retrofit(s) shall be evaluated in terms of cost and level of effort to design, construct and maintain. Performance and maintenance requirements shall be evaluated through visual inspections and recharge volumes estimated through falling head tests or other methods. The Permittee shall evaluate the demonstration project and include findings of its assessment in its annual report for the final year of the permit term.

[11] Massachusetts Stormwater Management Standards, Interim Guidance Handbook, Vol. 1, Chapter 1 (available at: http://www.mass.gov/dep/water/wastewater/v1c1.doc)

9. Implementation Schedule

The Permittee shall implement the activities required by Part I.F. of this permit in accordance with the following schedule.

	Year 1	Year 2	Year 3	Year 4	Year 5
In-stream Dry & Wet Weather Monitoring	One dry and three wet weather composite samples collected annually from each of eight stations located in six major headwater tributaries to the Blackstone River				
Wet Weather Outfall Monitoring	Two rounds of single grab samples at all outfalls during permit term analyzed for a suite of water quality parameters; completed once during the first two years of the permit term and once during the final two years of the permit term. Plus monitoring an additional once per year for pollutant(s) of concern in direct discharges into impaired waters (with or without an approved TMDL)				
Dry & Wet Weather Outfall Prioritization Screening (Pre-IDDP)	Complete screening of 25% of MS4 Outfalls	Complete screening of 50% of MS4 Outfalls	Complete screening of 75% of MS4 Outfalls	Complete screening of 100% of MS4 Outfalls	
Implementation of IDDP	Complete IDDP in 25% of MS4		Complete IDDP in 50% of MS4	Complete IDDP in 75% of MS4	Complete IDDP in 100% of MS4
Dry & Wet Weather Outfall Verification Screening (Post-IDDP)	Complete screening of 25% of MS4 Outfalls		Complete screening of 50% of MS4 Outfalls	Complete screening of 75% of MS4 Outfalls	Complete screening of 100% of MS4 Outfalls
Hydrodynamic Storm Water Separators	One dry and two wet weather performance monitoring rounds each year				
	Quarterly inspection of all units to establish schedule	Inspection and cleaning of all units based on schedules established during Year 1			
Groundwater Recharge/LID Retrofit Demonstration Project	Select Location(s)	Design & Secure Funds	Construct	Monitoring & Assessment	Evaluation & Reporting

10. Evaluation and Reporting. All data collected related to activities required by Part I.F. of this permit shall be evaluated and presented with findings in the Permittee's annual reports required by Part I.H. This shall include a comparison with data collected by the Permittee in each prior year, including those data collected pursuant to the 1998 permit (e.g., City of Worcester, NPDES Permit Term I Stormwater Quality Analysis Report, February 7, 2006).

11. Program Modifications. Modifications to the monitoring and analysis activities required by Part I.F. shall be made pursuant to the Part I.G. of this permit.

Part I.G. Storm Water Management Program Review and Modification

1. Program Review. The Permittee shall conduct an annual review of its SWMP in conjunction with preparation of its annual report required by Part I.H. of this permit. Results of the review shall be discussed in the annual report and shall include an assessment of:

    a). SWMP implementation, progress in achieving measurable goals, and compliance with program elements and other permit conditions;

    b). the effectiveness of its SWMP, and any necessary modifications, in complying with the permit, including requirements to reduce the discharge of pollutants to the maximum extent practicable (MEP), and to comply with water quality standards and any applicable approved TMDLs.

    c). the adequacy of staff and funding levels to fully implement the SWMP and comply with the permit conditions.

2. Program Modification. The Permittee may modify its SWMP with prior notification or request to EPA or MassDEP in accordance with this part.

    (a) Modifications adding, but not eliminating, replacing, or jeopardizing fulfillment of any component of its SWMP may be made by the Permittee at any time during the permit term. The Permittee shall notify EPA and MassDEP in writing and document all such modifications in its annual reports required by Part I.H. of this permit.

    (b) Modifications replacing or eliminating ineffective or unfeasible components of the Permittee's SWMP, including monitoring and analysis requirements described in Part I.F. of this permit, may be requested in writing to EPA and MassDEP at any time, including through its annual reporting. Unless denied, by EPA or MassDEP within **sixty (60) days** of receipt of a modification request, the Permittee may implement the requested SWMP modifications. If the request is denied, EPA or MassDEP, as applicable, will send a written explanation of the denial. Modification requests must include the following information:

        (1) a description of why the SWMP component is ineffective, unfeasible (including cost prohibitions), or unnecessary to support compliance with the permit;

        (2) expectations on the effectiveness of any proposed replacement components; and

(3) an analysis of how proposed replacement components are expected to achieve the goals of the component to be replaced.

(c) Modification notifications and requests must be made in writing and signed in accordance with the requirements in Part I.I. of this permit.

3. Modifications Required by the Permitting Authorities. EPA or MassDEP may require the Permittee to modify its SWMP as needed to comply with the terms of this permit.

4. Requests by EPA or MassDEP for SWMP modifications shall be made in writing and set forth a time schedule for the Permittee to develop the SWMP modification(s) and afford the opportunity to propose alternative program changes to meet the objective of the requested modifications.

Part I.H. Reporting Requirements

The Permittee shall prepare and submit annual reports no later than September 30 of each year. The first annual report shall include the reporting period from November 1, 2006 to June 30, 2008. Thereafter, annual reports will include the reporting period from July 1 to June 30 from the previous year. The report shall cover the previous permit year from July 1 to June 30. The Permittee shall include in its report all information required by specific parts of this permit and the following information:

1. the status of storm water management program implementation, including progress made toward achieving measurable goals and compliance with schedules established by this permit;

2. the status of adopting the MassDEP Stormwater Management Standards and other required provisions into its program to control stormwater discharges to its MS4 from land disturbance and development projects.

3. actual and proposed modifications to its storm water management program;

4. a current list of all interconnections with other MS4s operated by others, whether through open or closed conveyance, identifying location, size, materials of construction and owner;

5. a fiscal analysis of annual expenditures for the reporting period, with a breakdown of the major elements relating to the storm water management program and programs contributing to the water quality improvement of storm water discharges from its MS4;

6. a sewer and drain construction annual report providing information about installation, renewal or replacement of sanitary and surface drains, catch basins and manholes by both the Permittee and developers;

7. a summary describing the number and nature of enforcement actions, inspections, and spill response activities by the Permittee related to its MS4;

8. an assessment of the overall success of its public education and involvement programs, providing both direct and indirect measurements of program effectiveness; and

9. a summary of all training activities implemented or completed.

Part I.I. Certification and Signature of Reports

1. All reports required by this permit, and other information requested by the EPA and MassDEP shall be signed and certified in accordance with the General Conditions – Part II of this permit.

Part I.J. Report Submission

1. All original, signed notifications and reports required herein, shall be submitted to the Director and the State at the following addresses:

Environmental Protection Agency
Water Technical Unit
P.O. Box 8127
Boston, MA 02114

Massachusetts Department of Environmental Protection
Division of Watershed Management-Surface Water Discharge Permit Program
627 Main Street, 2nd Floor
Worcester, MA 01608
Attn: Paul Hogan

2. Annual reports required by the permit shall also be submitted to the State at the following address:

Massachusetts Department of Environmental Protection
Central Regional Office
Bureau of Resource Protection
627 Main Street
Worcester, MA 01608
Attn: Warren Kimball

Part I.K. Retention of Records

1. The Permittee shall retain records of all monitoring information, copies of all reports required by the permit and records of all other data required by or used to demonstrate compliance with the permit, until at least six years after coverage under the permit

terminates. This period may be modified by alternative provisions of the permit or extended by request of EPA and MassDEP at any time. The Permittee shall retain the latest approved version of its SWMP developed in accordance with Part I.E. of the permit until at least three years after coverage under the permit terminates.

Part I.L. State Permit Conditions

1. The U.S. Environmental Protection Agency and the Massachusetts Department of Environmental Protection issue this discharge permit jointly under federal and state law, respectively. As such, all the terms and conditions of the permit are hereby incorporated into and constitute a discharge permit issued by the Massachusetts Department of Environmental Protection pursuant to M.G.L., Chap. 21, §43.

2. Each agency shall have the independent right to enforce the terms and conditions of this permit. Any modification, suspension, or revocation of the permit shall be effective only with respect to the agency taking such action, and shall not affect the validity or status of the permit as issued by the other agency, unless and until each agency has concurred in writing with such modification, suspension, or revocation. In the event any portion of the permit is declared invalid, illegal, or otherwise issued in violation of state law such permit shall remain in full force and effect under federal law as an NPDES permit issued by the U.S. Environmental Protection Agency. In the event the permit is declared invalid, illegal, or otherwise issued in violation of federal law, the permit shall remain in full force and effect under state law as a permit issued by the Commonwealth of Massachusetts.

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 (Vortechnics 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 information[1] 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 Audit[3], 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 website[5]. 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 program[6]. 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 Agreement[8]. 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.

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[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 literature[9] 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 Vortechnics 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 established specific locations for the total of eight (8) stations in consideration of historic monitoring stations utilized by Permittee[10], MassDEP[11], the Blackstone River Coalition[12], 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 and 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 Permitee 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, Vortechnics 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 pubic 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:

David J. Gray, P.E.
Office of Ecosystem Protection
U.S. EPA, Region 1
1 Congress St., Suite 1100
Boston, MA 02114-2023
617-918-1577
gray.davidj@epa.gov

Paul Hogan
MA Department of Environmental Protection
627 Main Street, 2nd Floor
Worcester, MA 01608
(508) 792-7475
paul.hogan@state.ma.us

Date

Stephen S. Perkins, Director
Office of Ecosystem Protection
U.S. Environmental Protection Agency

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
COMMONWEALTH OF MASSACHUSETTS
1 WINTER STREET
BOSTON, MASSACHUSETTS 02108

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF ECOSYSTEM PROTECTION
REGION I
BOSTON, MASSACHUSETTS 02114

JOINT PUBLIC NOTICE OF A DRAFT NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND ASSOCIATED PUBLIC HEARING TO DISCHARGE INTO THE WATERS OF THE UNITED STATES UNDER SECTION 301 AND 402 OF THE CLEAN WATER ACT (THE "ACT"), AS AMENDED, AND REQUEST FOR STATE CERTIFICATION UNDER SECTION 401 OF THE ACT.

DATE OF NOTICE: June 26, 2008 through August 4, 2008

PERMIT NUMBER: MAS010002

PUBLIC NOTICE NUMBER: MA-024-08

NAME AND MAILING ADDRESS OF APPLICANT:

Honorable Konstantina B. Lukes
City Hall Room 305
455 Main Street
Worcester, MA 01608

LOCATION WHERE DISCHARGES OCCUR:

330 municipal separate storm sewer system (MS4) outfalls within Worcester

RECEIVING WATERS:

Beaver Brook, Blackstone River, Broad Meadow Brook, Coal Mine Brook, Coes Pond, North Curtis Pond, South 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: Class B

PREPARATION OF THE DRAFT PERMIT:

The U.S. Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (MassDEP) have cooperated in the development of a permit for the above identified municipality. The effluent limits and permit conditions imposed have been drafted to assure that State Water Quality Standards and provisions of the Clean Water Act will be met. EPA has formally requested that the State certify this draft permit pursuant to Section 401 of the Clean Water Act and expects that the draft permit will be certified.

INFORMATION ABOUT THE DRAFT PERMIT:

A fact sheet (describing the discharges; the basis for the draft permit conditions; and significant factual, legal and policy questions considered in preparing this draft permit) and the draft permit may be obtained at no cost at http://www.epa.gov/region1/npdes/draft_permits_listing_ma.html or by inquiring with the EPA or MassDEP contact person named below:

David J. Gray, P.E.
U.S. EPA
1 Congress Street, Suite 1100 (CIP)
Boston, MA 02114-2023
Telephone: (617) 918-1577
gray.davidj@epa.gov

Paul Hogan
MassDEP
627 Main Street, 2nd Floor
Worcester, MA 01608
Telephone: (508) 792-7475
paul.hogan@state.ma.us

The administrative record containing all documents relating to this draft permit is on file and may be inspected at the offices of EPA or MassDEP as indicated above between 9:00 a.m. and 5:00 p.m., Monday through Friday, except holidays.

PUBLIC COMMENT AND PUBLIC HEARING:

All persons, including applicants, who believe any condition of this draft permit is inappropriate, must raise all issues and submit all available arguments and all supporting material for their arguments in full by midnight, August 4, 2008, to the U.S. EPA, 1 Congress Street, Suite 1100, Boston, Massachusetts 02114-2023. Based on the anticipated significance of public interest, EPA has scheduled a public hearing to receive comments on the draft permit as follows:

DATE: July 30, 2008
TIME: 10:00 a.m.
LOCATION: Worcester Public Library
3 Salem Square
Worcester, MA 01608

The following is a summary of procedures that shall be followed at the public hearing:

a. the Presiding Officer shall have the authority to open and conclude the hearing and to maintain order;

b. any person appearing at the hearing may submit oral or written statements and data concerning the draft permit; and

c. the Presiding Officer may close the hearing prior to the published closing time if all persons wishing to provide statements or data have previously done so.

FINAL PERMIT DECISION:

Following the close of the comment period, 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. In reaching a final decision on this draft permit the Regional Administrator will respond to all significant comments and make the responses available to the public at EPA's Boston office.

GLENN HAAS, DIRECTOR
DIVISION OF WATERSHED MANAGEMENT
MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

STEPHEN S. PERKINS, DIRECTOR
OFFICE OF ECOSYSTEM PROTECTION
ENVIRONMENTAL PROTECTION AGENCY – REGION 1

Attachment A: Existing Outfall List

(Source: City of Worcester Stormwater Management Plan, Annual Report (Year 8), April 2008

Waterway
Beaver Brook

USEPA Class

Outfall Details

major	Outfall #	Address	Acres	size inches	date screened
	bb01	1094 Main Street	119.20	18x27	08-Sep-05
	bb07	534 Park Avenue	89.80	30	08-Aug-05
	bb09	113 May Street	65.50	18	08-Aug-05
	bb10	121 Maywood Street	242.80	60	08-Aug-05
	bb18*	100 Mayfield Street	154.90	33x48	19-Aug-05
	bb19	300 Chandler Street	481.80	48	06-Sep-05
	bb21	31 Mann Street	136.10	42	19-Aug-05
	bb22	12 Saint Paul Drive	168.30	42	06-Sep-05
	bb23	12 Saint Paul Street	8.50	72	
	bb25	300 Chandler Street	62.90	24	19-Aug-05
	bb27	16 June Street	56.00	30	
	bb29	633 Salisbury Street	21.60	36	09-Sep-05
	bb30	2 June Street	128.10	28x42	12-Sep-05
	bb35	431 Salisbury Street	67.70	20	09-Sep-05
	bb36	23 Suburban Road	87.50	54x45 box	
	bb41	18 Dick Drive	52.60	12	09-Sep-05
	bb45	28 Spring Valley Rd.		30	09-Sep-05
	bb52	46 Westbrook Road	59.10	30	12-Sep-05
	bb55	431 Salisbury street	233.20	36	09-Sep-05
minor	Outfall #	Address	Acres	size inches	date screened
	bb02	1090 Main Street	2.30	15	08-Aug-05
	bb03	38 Mill Street	17.40	21 Oval	08-Aug-05
	bb04	645 Park Avenue	12.50	12	08-Aug-05
	bb05	98 Beaver Street	15.60	18	08-Aug-05
	bb08	148 Beaver Brook Parkway	25.50	20	
	bb11	16 Thayer Street	1.40	10	08-Aug-05
	bb12	18 Friedel Street	5.80	10	09-Aug-05
	bb13	111 Maywood Street	7.60	18	19-Aug-05
	bb14	23 Maybrook Place	5.40	12	08-Aug-05
	bb15	6 Spring Vally Road	7.90	12	19-Aug-05
	bb16	26 Spring Valley Road	2.80	12	
	bb17	109 May Street	0.40	10	19-Aug-05
	bb20	64 Beaver Brook Parkway	1.90	10	19-Aug-05
	bb24	12 Saint Paul Drive	12.70	12	06-Sep-05
	bb26	171 Flagg Street	3.30	15	06-Sep-05
	bb28	141 Coolidge Road	9.10	10	19-Aug-05
	bb31	83 Coolidge Road	0.80	10	19-Aug-05
	bb32	12 June Street	39.50	24	12-Sep-05
	bb33	17 Meadow Brook Road	18.50	18	09-Sep-05
	bb37	12 Charmers Road	13.90	24	06-Sep-05
	bb38	1 South Kinnicut Road South	15.90	10	

Waterway | USEPA Class | Outfall Details

Beaver Brook

minor	Outfall #	Address	Acres	size inches	date screened
	bb39	54 Amherst Street	27.60	18	12-Sep-05
	bb40	6 Chippewa Road	6.80	15	12-Sep-05
	bb42	268 Moreland Street	24.90	30	
	bb44	12 Flower Hill Drive	30.00	24	09-Sep-05
	bb46	32 Amherst		24	
	bb47	35 Kinnicutt Road	5.70	18	12-Sep-05
	bb48	12 Newton Avenue	0.50	10	06-Sep-05
	bb49	23 Suburban Road	6.20	12	06-Sep-05
	bb50	338 Highland Street	8.20	20	06-Sep-05
	bb51	1 Coombs Road	1.80	10	19-Aug-05
	bb53	12 Rollingwood Drive	7.40	15	12-Sep-05
	bb54	25 Woodhaven Ln	3.00	24	12-Sep-05
	bb56	8 Willowbrook Ln	2.00	10	09-Sep-05
	bb58	21 Elmwood Street	0.80	15	06-Sep-05
	bb59	112 Barry Rd Ext.		24	

Waterway | USEPA Class | Outfall Details

Burncoat Pond

minor	Outfall #	Address	Acres	size inches	date screened
	cm10	Wawecus Rd		12	16-Oct-06

Coal Mine Brook

major	Outfall #	Address	Acres	size inches	date screened
	cm04	105 Wayside Road	63.20	36+-	08-Sep-06
	cm05	525 Lincoln Street	225.00	20	16-Oct-06
	cm06	630 Plantation Street	174.80	36	08-Sep-06
minor	Outfall #	Address	Acres	size inches	date screened
	cm01	616 Plantation Street	15.00	15	08-Sep-06
	cm02	570 Lincoln Street	24.90	24	08-Sep-06
	cm07	570 Lincoln Street	14.80	18	16-Oct-06
	cm08	41 Davidson Road	43.60	12	16-Oct-07
	cm09	31 Trinity Avenue	8.90	12	01-Sep-06

Waterway | USEPA Class | Outfall Details

Fitzgerald Brook

major	Outfall #	Address	Acres	size inches	date screened
	lq13*	240 Coburn Avenue	670.30	60	17-Aug-06

Lake Quinsigamond

major	Outfall #	Address	Acres	size inches	date screened
	lq09	83 Lake Avenue	109.10	36	08-Aug-06
	lq10	365 Plantation Street	170.80	60	17-Aug-06
	lq11	35 Bird Street	62.90	42	12-Sep-06
	lq14	8 North Lake Ave.	205.30	60	27-Sep-06
	lq19	382 Plantation Street	68.30	30	17-Aug-06
minor	Outfall #	Address	Acres	size inches	date screened
	lq01	292 Lake Avenue	10.40	15	08-Aug-06
	lq02	395 Bridal Path	7.60	12+-	08-Aug-06
	lq03	212 Lake Avenue	14.70	10	09-Aug-06
	lq04	284 Lake Avenue	14.10	24	
	lq05	123 Westborough Street	2.00	12	08-Aug-06
	lq06	98 Pineland Avenue	13.90	24	09-Aug-06
	lq07	43 Pineland Avenue	28.80	12	09-Aug-06
	lq08	5 Suntaug Road	20.40	21	28-Sep-06
	lq12	10 North Lake Ave.	18.30	24	17-Aug-06
	lq15	301 Bridal Path	3.50	12	17-Aug-06
	lq17	4 Suntaug Road	15.00	21	17-Aug-06
	lq18	8 Flint Pond Road	27.90	27	17-Aug-06
	lq20	333 Bridal Path	47.30	30	17-Aug-06
	lq21	25 Valente Drive	4.90	16	17-Aug-06
	lq22	157 Lake Ave		24"	08-Aug-06
	lq23	157 Lake Ave		8	08-Aug-06

Waterway | USEPA Class | Outfall Details

O'Hara Brook

major	Outfall #	Address	Acres	size inches	date screened
	ob01	376 Sunderland Road	80.20	18	23-Aug-06
	ob07	9 Brandt Lane	42.30	36	12-Sep-06
	ob09	20 Jolma Road	76.40	42	12-Sep-06
	ob11	1038 Grafton Street	22.80	36+-	23-Aug-06
	ob14	6 Crane Street	81.70	30	23-Aug-06
minor	Outfall #	Address	Acres	size inches	date screened
	ob02	20 Pine Hill Road	40.40	15	12-Sep-06
	ob03	11 Whitla Drive	24.30	12	23-Aug-06
	ob04	6 Ideal Terrace	4.00	12	27-Sep-06
	ob05	10 Crane Street	12.80	12	23-Aug-06
	ob06	430 Sunderland Road	19.50	12	23-Aug-06
	ob10	35 Burghardt Street	4.10	15	23-Aug-06
	ob13	37 Whitla Drive	2.20	12	23-Aug-06
	ob15	4 O'Hara Circle	1.20	12	23-Aug-06

Waterway
Poor Farm Brook

USEPA Class

Outfall Details

major	Outfall #	Address	Acres	size inches	date screened
	pfb04	26 Apthorp Street	100.50	24	01-Sep-06
	pfb06	124 Tacoma Street	118.60	42	10-Oct-06
	pfb12	100 East Mountain Street	63.80	36	12-Sep-06
	pfb13	17 Pompano Road	121.70	36 & 24	27-Sep-06
	pfb14	730 Plantation Street	107.00	30	08-Sep-06
	pfb15	275 Clark Street	85.30	36	01-Sep-06
minor	Outfall #	Address	Acres	size inches	date screened
	pfb01	610 Burncoat Street	2.00	12	27-Sep-06
	pfb02	660 Burnoat Street	24.70	24	12-Sep-06
	pfb03	572 Burncoat Street	0.60	12	12-Sep-06
	pfb05	6 Livermore Street	42.50	24	01-Sep-06
	pfb07	26 Apthorp Street	24.70	24	01-Sep-06
	pfb08	275 Clark Street	5.50	12	01-Sep-06
	pfb09	100 East Mountain Street	7.30	30	12-Sep-06
	pfb10	115 North East Cut-off	11.70	18	08-Sep-06
	pfb11	51 Governors Street	42.10	15	10-Oct-06
	pfb16	321 Saint Nicholas Ave.	40.10	24	10-Oct-06
	pfb17	239 Tacoma Street	12.30	24+-	10-Oct-06

Waterway
Indian Lake

USEPA Class

Outfall Details

major	Outfall #	Address	Acres	size inches	date screened
	fb02	193 Holden Street	54.10	30	
	il01	14 Shorham Road	16.40	42	
	il02	78 Holden Street	41.30	36	
	il04	124 Forest Street	118.80	36	
	ilt01	97 Parkton Avenue	131.50	24	
minor	Outfall #	Address	Acres	size inches	date screened
	fb01	166 Holden Street	35.40	24	
	fb03	156 Ararat Street	2.80	12	
	fb04	165 Ararat Street	1.10	12	
	fb05	1 Brookman Street	4.10	12	
	fb06	2 Hingham Road	9.30	18	
	fb07	14 Stoneleigh Road	28.40	15	
	fb08	65 Indian Hill Road	23.30	27	
	fb09	70 Brookhaven Road	3.50	21	
	fb10	70 Brookhaven Road	8.40	30	
	fb12	116 Holden Street	34.00	24	
	il03	557 Grove Street	12.30	12	
	il05	54 Hunntington Avenue	9.70	12	
	il06	37 Hastings Avenue	0.60	10	
	il07	49 Sherburne Avenue	10.50	12	
	il08	2 Holden Street	28.20	15	
	il09	Grove St		12	
	il10	Grove St		12	
	il11	Grove St		8	
	il12	Grove St		12	
	il13	Grove St		8	
	il14	Pickwick's Circle		8	
	wab1	9 Nelson Place	40.80	30	
	wab2	Holden St.		15	

Waterway | USEPA Class | Outfall Details

Kendrick Brook

minor	Outfall #	Address	Acres	size inches	date screened
	kb08	54 Lanesboro Road	2.80	30	

Mill Brook

major	Outfall #	Address	Acres	size inches	date screened
	mb05	Gold Star Blvd.		48	
	mb13	10 Ballard Street	251.70	42	
	mb21	682 Cambridge Street	71.50	84	
	mb22	468 Harding Street	134.90	72x74	
	mb24	10 Lincoln Square	57.20	42	
	mb28	98 Union Street	14.80	36	
	mb31	200 Front Street	47.60	54	
	mb36	20 Washington Square	20.70	36	
minor	Outfall #	Address	Acres	size inches	date screened
	kb09	Lanesboro Road		12	
	mb14	681 Millbury Street	1.80	10	
	mb15	605 Millbury Street	6.40	10	
	mb16	575 Millbury Street	3.60	10	
	mb18	431 Millbury Street	19.80	18	
	mb19	403 Millbury Street	2.50	12	
	mb20	513 Millbury Street	2.20	12	
	mb23	38 Prescott Street	24.60	30	
	mb25	34 Grove Street	3.40	24	
	mb26	10 Lincoln Square	19.80	18x27	
	mb27	44 School Street	12.80	26x39	
	mb29	1 Worcester Center Blvd.	1.10	18	
	mb30	50 Foster Street	7.90	27	
	mb32	95 Prescott Street	32.40	18	
	mb37	38 Prescott Street	0.80	30	
	mb38	33 Milton Street	0.50	12	

Waterway | USEPA Class | Outfall Details

Salisbury Pond

major	Outfall #	Address	Acres	size inches	date screened
	mb02	47 Milton Street	97.00	66	
	mb03	11 Distribution Road	97.10	36	
	sp01	111 Park Avenue	153.90	22x33	
	sp05	278 Grove Street	72.20	32	
	wb02	151 West Boylston Drive	60.30	48	
minor	**Outfall #**	**Address**	**Acres**	**size inches**	**date screened**
	mb04	55 Millbrook Street	6.00	20	
	mb07	160 Gold Star Blvd	0.60	18	
	mb08	135 Gold Star Blvd.	0.60		
	mb09	39 West Boylston Drive	24.80	24	
	mb10	160 Gold Star Blvd.	32.80	24	
	mb33	7 Neponset Street	6.50	12	
	mb35	278 Grove Street	26.10	15	
	sp02	75 Park Avenue	11.90	12	
	sp03	82 Salisbury Street	5.60	24	
	sp04	82 Salisbury Street	13.90	18	
	wb01	151 West Boylston Drive	6.80	12	
	wb12	2 Stowell Avenue	5.60	30	
	wb14	300 Barber Avenue	5.80	12	

Weasle Brook

major	Outfall #	Address	Acres	size inches	date screened
	kb01	20 Rockdale Street	96.60	36	
	kb02	54 Rockdale Street	59.50	28x42	
	kb03	140 Higgins Street	62.40	30	
	kb04	60 Pulman Street	175.10	34x48	
	kb05	228 Brooks Street	11.30	36	
	kb06	228 Brooks Street	11.70	60	
	wb04	8 New Bond Street	105.10	39	
	wb05	8 New Bond Street	141.10	42	
	wb07	8 Ararat Street	64.00	30	
	wb10	23 Indian Hill Road	55.30	36	
minor	**Outfall #**	**Address**	**Acres**	**size inches**	**date screened**
	kb07	197 West Boylston Street	40.60	12	
	mbt01	81 Randolf Road	13.10	24	
	mbt02	81 Randolf Road	28.50	24	
	wb03*	10 New Bond Street	13.30	24	
	wb06	8 New Bond Street	30.20	20	
	wb08	8 Ararat Street	17.60	30	
	wb09	6 Shawnee Road	8.60	18+-	
	wb11	23 Indian Hill Road	18.10	18	
	wb15	10 New Bond Street	0.60	10	

Waterway | USEPA Class | Outfall Details

Mill Brook

minor	Outfall #	Address	Acres	size inches	date screened
	mb01	29 Glennie Street	20.50	15	

Blackstone River

major	Outfall #	Address	Acres	size inches	date screened
	br01	831 Millbury Street	113.30	24	
	br02	5 Wiser Avenue	115.70	30	
	brt01	207 Greenwood Street	96.80	36	
	brt02	347 Greenwood Street	107.90	30	
minor	**Outfall #**	**Address**	**Acres**	**size inches**	**date screened**
	brt03	1 Upland Gardens Drive	14.70	24	
	brt04	1 Upland Gardens Drive	26.90	12	
	brt05	52 Saint Anthony Street	15.30	30	
	brt06	457 Granite Street	5.70	15	
	brt07	23 Cliff Street	1.00	15+-	

Broad Meadow Brook

major	Outfall #	Address	Acres	size inches	date screened
	bmb04	76 Dunkirk Avenue	419.00	60	
	bmb07	61 Sandra Drive	114.70	36+-	
minor	**Outfall #**	**Address**	**Acres**	**size inches**	**date screened**
	bmb01	504 Massasoit Road	6.40	12	
	bmb02	326 Southwest Cutoff	11.90	12	
	bmb03	1 Tiffany Avenue	4.00	15	
	bmb05	31 Vincent Circle	11.10	12	
	bmb06	6 Woodcliffe Avenue	23.50	30	
	bmb08	35 Vincent Circle	4.60	12	
	bmb09	20 Balin Drive	7.30	18	
	bmbt01	204 Granite Street	20.60	12+-	

Waterway | USEPA Class | Outfall Details

Middle River

major	Outfall #	Address	Acres	size inches	date screened
	mr04	960 Southbridge Street	14.60	54	
	mr07*	2 Brussles Street	30.30	36	
	mr11	804 Southbridge Street	90.40	24	
	mr12	804 Southbridge Street	69.50	24	
minor	**Outfall #**	**Address**	**Acres**	**size inches**	**date screened**
	mr01	29 Webster Street	33.20	18	
	mr02	84 Freemont Street	7.90	18	
	mr03	100 Freemont Street	1.20	18+-	
	mr05	953 Southbridge Street	32.80	24	
	mr06	961 Southbridge Street	31.10	24	
	mr08	111 McKeon Road	24.50	12	
	mr09	2 Brussells Street	17.00	18	
	mr10	69 Webster Court	3.20	15	
	mr13	27 Knowton Avenue	37.60	24	
	mr14	25 Mckeon Road	21.10	?	
	mr15	75 McKeon Road	20.70	?	

Waterway | USEPA Class | Outfall Details

Coes Pond

minor	Outfall #	Address	Acres	size inches	date screened
	cop1	24 Lakeside Avenue	12.20	21	

Coes Resivoir

minor	Outfall #	Address	Acres	size inches	date screened
	cr01	350 June Street	9.60	24	
	cr02	18 Merriweather Road	1.60	12	
	cr03	19 Souther Drive	1.30	12	
	cr04	14 Bergin Lane	34.50	24	
	cr05	254 Mill Street	22.50	30	
	cr06	225 Mill Street	3.00	+-	
	cr07	225 Mill Street	3.40	24	
	cr08	173 Mill Street	2.30	30	
	cr09	173 Mill Street	1.10	15	
	cr10	80 Circut Avenue	4.20	12	
	cr11	159 Mill Street	9.80	18	
	cr12	141 Mill Street	1.40	15	
	cr13	268 June Street	26.40	24	
	cr14	21 Hemlock Street	1.30	12	
	crt01	2 Passway Four	0.80	18	
	crt02	93 Outlook Drive	24.50	18	
	crt03	93 Outlook Drive	1.60	24	
	crt04	93 Outlook Drive	1.50	15	

Waterway | USEPA Class | Outfall Details

Curtis Pond

major	Outfall #	Address	Acres	size inches	date screened
	cp02	19 Heard Street	62.00	15	
	cp03	91 Stafford Street	314.90	48	
	cpt03	51 Goddard Memorial Drive	19.10	36	
minor	Outfall #	Address	Acres	size inches	date screened
	cp01	59 Lyman Street	13.80	24	
	cp04	91 Stafford Street	10.60	30	
	cpt01	51 Goddard Memorial Drive	16.40	30	
	cpt02	48 Parsons Hill Drive	27.00	15	
	cpt04	3 Coppage Drive	17.00	15	
	cpt05	8 Teddy Road	9.40	24	
	cpt06	2 West Monticello Drive	5.30	15	
	cpt07	9 Ledgecrest Drive	4.60	15	
	cpt08	15 Nutmeg Drive	2.30	24	
	cpt09	2 Coppage Drive	2.50	12	

Kettle Brook

major	Outfall #	Address	Acres	size inches	date screened
	ktb01	220 Webster Street	54.80	15	
	ktb03	219 James Street	81.20	36	
	ktb05	232 Stafford Street	98.90	39	
minor	Outfall #	Address	Acres	size inches	date screened
	ktb02	234 Webster Street	30.00	24	
	ktb04	243 Stafford Street	7.70	30	
	ktb06	1551 Main Street	7.50	10	
	ktb08	219 James Street	0.90	12	
	kttb01	77 Clover Street	17.80	15	
	kttb02	87 Clover Street	15.00	18	

Waterway | USEPA Class | Outfall Details

Patch Pond

major	Outfall #	Address	Acres	size inches	date screened
	morb01	486 Chandler Street	207.90	48	
	pr14	328 Mill Street	4.30	60+-	
minor	Outfall #	Address	Acres	size inches	date screened
	pp01	21 Glendale Street	1.40	12	
	pp02	437 Mill Street	2.90	42	
	pp03	8 June Street Terrace	6.90	12	
	pr03	11 Sweet Briaar Lane	20.40	18	
	tb14	57 Glendale Street	2.90	18	

Patch Reservoir

minor	Outfall #	Address	Acres	size inches	date screened
	pr06	16 Arletta Ave.	4.70	10	
	pr07	8 Hunthurst Circle	8.20	12	
	pr08	96 Chicopee Street	0.90	12	
	pr09	518 Mill Street	6.80	18	
	pr10	478 Mill Street	9.00	12	
	pr11	478 Mill Street	0.20	12	
	pr12	464 Mill Street	0.30	12	
	pr13	562 Chandler Street	1.40	10	

Waterway
Tatnuck Brook

USEPA Class

Outfall Details

major	Outfall #	Address	Acres	size inches	date screened
	tb05*	61 Mower Street	106.20	42	
	tb09	1320 Pleasant Street	146.80	72	
	tb15	1130 Pleasant Street	120.20	48	
	tb24	1350 Pleasant Street	60.40	30	
minor	Outfall #	Address	Acres	size inches	date screened
	pr05	24 Greybert Lane	44.60	27	
	tb01	50 Mower Street	0.60	15	
	tb02	19 Tory Fort Lane	4.50	12	
	tb03	23 Tory Fort Lane	1.60	12	
	tb04	6 Kinney Drive	4.10	12	
	tb06	3 Prouty Lane	40.70	30	
	tb07	1226 Pleasant Street	20.70	12	
	tb08	17 Joppa Road	2.20	12	
	tb10	37 Firglade Street	10.50	12	
	tb12	556 Mill Street	8.30	18	
	tb13	14 Ada Street	7.40	12	
	tb16	8 Dawson Road	4.20	12	
	tb17	103 Olean Street	3.90	20	
	tb18	1250 Pleasant Street	13.50	24	
	tb19	29 Quaboag Street	11.70	12	
	tb20	Airport Drive	4.50	12	
	tb21	580 Park Avenue	4.50	10	
	tb22	600 Mill Street	1.50	12	
	tbt01	4 Glenbrook Lane	2.20	12+-	
	tbt02	5 Pinewood Lane	4.90	15+-	
	tbt03	38 Moreland Green Drive	39.90	24+-	
	tbt05	170 Goddard Memorial Drive	3.80	24	
	tbt06	11 Ledgewood Lane	9.50	18+-	
	tbt10	Airport Drive	4.60	24	
	tbt11	Airport Drive	2.50	36+-	
	tbt12	Airport Drive	12.60	n/a	
	tbt13	Airport Drive	13.00	n/a	
	tbt15	Airport Srive	9.00	n/a	
	tbt16	52 Sussex Lane	1.80	12	

Outfall abbreviation	*Name*
bb	Beaver Brook
bmb	Broad Meadow Brook
bmbt	Broad Meadow Brook Tributary
br	Blackstone River
brt	Blackstone River Tributary
cm	Coal Mine Brook
cop	Coes Pond
cp	Curtis Pond
cpt	Curtis Pond Tributary
cr	Coes Reservoir
crt	Coes Reservoir Tributary
fb	Ford Brook
il	Indian Lake
ilt	Indian Lake Tributary
kb	Kendrick Brook
ktb	Kettle Brook
kttb	Kettle Brook Tributary
lq	Lake Quinsigamond
mb	Mill Brook
mbt	Mill Brook Tributary
morb	Moore Brook
mr	Middle River
ob	O'Hara Brook
pfb	Poor Farm Brook
pp	Patch Pond
pr	Patch Reservoir
sp	Salisbury Pond
tb	Tatnuck Brook
tbt	Tatnuck Brook Tributary
wab	Waldo Brook
wb	Weasle Brook

Attachment B: City of Worcester's Receiving Waters – Impairments 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)	TMDL WLA Applicable to sources that contribute to MS4 Discharges[c]	TMDL LA Applicable to sources that contribute to MS4 Discharges[c]	BMPs Supporting Achievement of WLA and the TMDL
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	5% reduction in TP commercial and industrial land use	5% reduction in TP residential and open land use	Permit Parts I.E.2.(c), I.E.6.(c), I.E.6.(h)(1), I.E.6.(i), and I.F.4.(b)
Curtis Pond South	Category 5	1,2		7% reduction in TP commercial and industrial land use	7% Reduction in TP residential and open land use	
Fitzgerald Brook	Unassessed					
Green Hill Pond	Category 4a	11	Final/Approved Phosphorus		38% reduction in TP from golf course and open land	Permit Part I.E.3.(d)
Indian Lake	Category 4a	2,9	Final/Approved Phosphorus	46% TP reduction in watershed export		Permit Parts I.E.2.(c), I.E.6.(c), I.E.6.(h)(1), I.E.6.(i), I.E.6.(n), I.E.7., I.F.4.(b) , I.F.7.(a)(3), I.F.7.(b)
Kendrick Brook	Unassessed					
Kettle Brook	Category 5	3,8,9	Draft Pathogen			
Lake Quinsigamond & Flint Pond	Category 4c	2	Final/Approved Phosphorus	52% reduction in available P from storm flow		Permit Parts I.E.2.(c), I.E.6.(c), I.E.6.(h)(1), I.E.6.(i), I.E.6.(l), I.E.7., I.F.4.(b), I.F.7.(a)(1), I.F.7.(b)

Leesville Pond	Category 4c	8,9	Final/Approved Phosphorus	50% Reduction in TP from H.D. residential, commercial, and industrial land uses	50% Reduction in TP from L.D. residential, and open land uses	Permit Parts I.E.2.(c), I.E.6.(c), I.E.6.(h)(1), I.E.6.(i), I.F.4.(b)
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	Reduction in TP Twin Culvert: - 70% from sewage - 20% from runoff Drain #4: - 17% from runoff		Permit Parts I.E.2.(c), I.E.5., I.E.6.(c), I.E.6.(h)(1), I.E.6.(i), I.E.6.(m), I.E.7., I.F.4.(b) , I.F.7.(a)(2), I.F.7.(b)
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 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

[c] Indicates the percent reduction target or goal identified in the TMDL document for sources of total phosphorus (TP) or available phosphorus (P) contributing to the MS4. This percent reduction is provided as information for the Permittee to consider as it develops and implements its SWMP and monitoring programs.

NPDES PART II STANDARD CONDITIONS
(January, 2007)

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PART II. A. GENERAL REQUIREMENTS

1. Duty to Comply

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

a. The permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions, even if the permit has not yet been modified to incorporate the requirements.

b. The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA or any permit condition or limitation implementing any of such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402 (a)(3) or 402 (b)(8) of the CWA is subject to a civil penalty not to exceed $25,000 per day for each violation. Any person who negligently violates such requirements is subject to a fine of not less than $2,500 nor more than $25,000 per day of violation, or by imprisonment for not more than 1 year, or both. Any person who knowingly violates such requirements is subject to a fine of not less than $5,000 nor more than $50,000 per day of violation, or by imprisonment for not more than 3 years, or both.

c. Any person may be assessed an administrative penalty by the Administrator for violating Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.

Note: See 40 CFR §122.41(a)(2) for complete “Duty to Comply” regulations.

2. Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or notifications of planned changes or anticipated noncompliance does not stay any permit condition.

3. Duty to Provide Information

The permittee shall furnish to the Regional Administrator, within a reasonable time, any information which the Regional Administrator may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Regional Administrator, upon request, copies of records required to be kept by this permit.

4. Reopener Clause

The Regional Administrator reserves the right to make appropriate revisions to this permit in order to establish any appropriate effluent limitations, schedules of compliance, or other provisions which may be authorized under the CWA in order to bring all discharges into compliance with the CWA.

For any permit issued to a treatment works treating domestic sewage (including "sludge-only facilities"), the Regional Administrator or Director shall include a reopener clause to incorporate any applicable standard for sewage sludge use or disposal promulgated under Section 405 (d) of the CWA. The Regional Administrator or Director may promptly modify or revoke and reissue any permit containing the reopener clause required by this paragraph if the standard for sewage sludge use or disposal is more stringent than any requirements for sludge use or disposal in the permit, or contains a pollutant or practice not limited in the permit.

Federal regulations pertaining to permit modification, revocation and reissuance, and termination are found at 40 CFR §122.62, 122.63, 122.64, and 124.5.

5. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from responsibilities, liabilities or penalties to which the permittee is or may be subject under Section 311 of the CWA, or Section 106 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA).

6. Property Rights

The issuance of this permit does not convey any property rights of any sort, nor any exclusive privileges.

7. Confidentiality of Information

a. In accordance with 40 CFR Part 2, any information submitted to EPA pursuant to these regulations may be claimed as confidential by the submitter. Any such claim must be asserted at the time of submission in the manner prescribed on the application form or instructions or, in the case of other submissions, by stamping the words "confidential business information" on each page containing such information. If no claim is made at the time of submission, EPA may make the information available to the public without further notice. If a claim is asserted, the information will be treated in accordance with the procedures in 40 CFR Part 2 (Public Information).

b. Claims of confidentiality for the following information will be denied:

(1) The name and address of any permit applicant or permittee;
(2) Permit applications, permits, and effluent data as defined in 40 CFR §2.302(a)(2).

c. Information required by NPDES application forms provided by the Regional Administrator under 40 CFR §122.21 may not be claimed confidential. This includes information submitted on the forms themselves and any attachments used to supply information required by the forms.

8. Duty to Reapply

If the permittee wishes to continue an activity regulated by this permit after its expiration date, the permittee must apply for and obtain a new permit. The permittee shall submit a new application at least 180 days before the expiration date of the existing permit, unless permission for a later date has been granted by the Regional Administrator. (The Regional Administrator shall not grant permission for applications to be submitted later than the expiration date of the existing permit.)

9. State Authorities

Nothing in Part 122, 123, or 124 precludes more stringent State regulation of any activity covered by these regulations, whether or not under an approved State program.

10. Other Laws

The issuance of a permit does not authorize any injury to persons or property or invasion of other private rights, nor does it relieve the permittee of its obligation to comply with any other applicable Federal, State, or local laws and regulations.

PART II. B. OPERATION AND MAINTENANCE OF POLLUTION CONTROLS

1. Proper Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit and with the requirements of storm water pollution prevention plans. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when the operation is necessary to achieve compliance with the conditions of the permit.

2. Need to Halt or Reduce Not a Defense

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

3. Duty to Mitigate

The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

4. Bypass

a. Definitions

(1) *Bypass* means the intentional diversion of waste streams from any portion of a treatment facility.

(2) *Severe property damage* means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can be reasonably expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

b. Bypass not exceeding limitations

The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provision of Paragraphs B.4.c. and 4.d. of this section.

c. Notice

(1) Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of the bypass.
(2) Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in paragraph D.1.e. of this part (Twenty-four hour reporting).

d. Prohibition of bypass

Bypass is prohibited, and the Regional Administrator may take enforcement action against a permittee for bypass, unless:

(1) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
(2) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance; and
(3) i) The permittee submitted notices as required under Paragraph 4.c. of this section.
ii) The Regional Administrator may approve an anticipated bypass, after considering its adverse effects, if the Regional Administrator determines that it will meet the three conditions listed above in paragraph 4.d. of this section.

5. Upset

a. Definition. *Upset* means an exceptional incident in which there is an unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

b. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the requirements of paragraph B.5.c. of this section are met. No determination made during

administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

c. Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

(1) An upset occurred and that the permittee can identify the cause(s) of the upset;
(2) The permitted facility was at the time being properly operated;
(3) The permittee submitted notice of the upset as required in paragraphs D.1.a. and 1.e. (Twenty-four hour notice); and
(4) The permittee complied with any remedial measures required under B.3. above.

d. Burden of proof. In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

PART II. C. MONITORING REQUIREMENTS

1. Monitoring and Records

a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

b. Except for records for monitoring information required by this permit related to the permittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five years (or longer as required by 40 CFR Part 503), the permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report or application except for the information concerning storm water discharges which must be retained for a total of 6 years. This retention period may be extended by request of the Regional Administrator at any time.

c. Records of monitoring information shall include:

(1) The date, exact place, and time of sampling or measurements;
(2) The individual(s) who performed the sampling or measurements;
(3) The date(s) analyses were performed;
(4) The individual(s) who performed the analyses;
(5) The analytical techniques or methods used; and
(6) The results of such analyses.

d. Monitoring results must be conducted according to test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, unless other test procedures have been specified in the permit.

e. The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by

imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both.

2. Inspection and Entry

The permittee shall allow the Regional Administrator or an authorized representative (including an authorized contractor acting as a representative of the Administrator), upon presentation of credentials and other documents as may be required by law, to:

a. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

d. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location.

PART II. D. REPORTING REQUIREMENTS

1. Reporting Requirements

a. Planned Changes. The permittee shall give notice to the Regional Administrator as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is only required when:

(1) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR§122.29(b); or
(2) The alteration or addition could significantly change the nature or increase the quantities of the pollutants discharged. This notification applies to pollutants which are subject neither to the effluent limitations in the permit, nor to the notification requirements at 40 CFR§122.42(a)(1).
(3) The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition or change may justify the application of permit conditions different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan.

b. Anticipated noncompliance. The permittee shall give advance notice to the Regional Administrator of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

c. Transfers. This permit is not transferable to any person except after notice to the Regional Administrator. The Regional Administrator may require modification or revocation and reissuance of the permit to change the name of the permittee and

incorporate such other requirements as may be necessary under the CWA. (See 40 CFR Part 122.61; in some cases, modification or revocation and reissuance is mandatory.)

d. Monitoring reports. Monitoring results shall be reported at the intervals specified elsewhere in this permit.

(1) Monitoring results must be reported on a Discharge Monitoring Report (DMR) or forms provided or specified by the Director for reporting results of monitoring of sludge use or disposal practices.

(2) If the permittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, or as specified in the permit, the results of the monitoring shall be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the Director.

(3) Calculations for all limitations which require averaging or measurements shall utilize an arithmetic mean unless otherwise specified by the Director in the permit.

e. Twenty-four hour reporting.

(1) The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances.

A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

(2) The following shall be included as information which must be reported within 24 hours under this paragraph.

(a) Any unanticipated bypass which exceeds any effluent limitation in the permit. (See 40 CFR §122.41(g).)
(b) Any upset which exceeds any effluent limitation in the permit.
(c) Violation of a maximum daily discharge limitation for any of the pollutants listed by the Regional Administrator in the permit to be reported within 24 hours. (See 40 CFR §122.44(g).)

(3) The Regional Administrator may waive the written report on a case-by-case basis for reports under Paragraph D.1.e. if the oral report has been received within 24 hours.

f. Compliance Schedules. Reports of compliance or noncompliance with, any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date.

g. Other noncompliance. The permittee shall report all instances of noncompliance not reported under Paragraphs D.1.d., D.1.e., and D.1.f. of this section, at the time monitoring reports are submitted. The reports shall contain the information listed in Paragraph D.1.e. of this section.

h. Other information. Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Regional Administrator, it shall promptly submit such facts or information.

2. Signatory Requirement

a. All applications, reports, or information submitted to the Regional Administrator shall be signed and certified. (See 40 CFR §122.22)

b. The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 2 years per violation, or by both.

3. Availability of Reports.

Except for data determined to be confidential under Paragraph A.8. above, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the State water pollution control agency and the Regional Administrator. As required by the CWA, effluent data shall not be considered confidential. Knowingly making any false statements on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the CWA.

PART II. E. DEFINITIONS AND ABBREVIATIONS

1. Definitions for Individual NPDES Permits including Storm Water Requirements

Administrator means the Administrator of the United States Environmental Protection Agency, or an authorized representative.

Applicable standards and limitations means all, State, interstate, and Federal standards and limitations to which a “discharge”, a “sewage sludge use or disposal practice”, or a related activity is subject to, including “effluent limitations”, water quality standards, standards of performance, toxic effluent standards or prohibitions, “best management practices”, pretreatment standards, and “standards for sewage sludge use and disposal” under Sections 301, 302, 303, 304, 306, 307, 308, 403, and 405 of the CWA.

Application means the EPA standard national forms for applying for a permit, including any additions, revisions, or modifications to the forms; or forms approved by EPA for use in "approved States", including any approved modifications or revisions.

Average means the arithmetic mean of values taken at the frequency required for each parameter over the specified period. For total and/or fecal coliforms and Escherichia coli, the average shall be the geometric mean.

Average monthly discharge limitation means the highest allowable average of "daily discharges" over a calendar month calculated as the sum of all "daily discharges" measured during a calendar month divided by the number of "daily discharges" measured during that month.

Average weekly discharge limitation means the highest allowable average of "daily discharges" measured during the calendar week divided by the number of "daily discharges" measured during the week.

Best Management Practices (BMPs) means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of "waters of the United States." BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Best Professional Judgment (BPJ) means a case-by-case determination of Best Practicable Treatment (BPT), Best Available Treatment (BAT), or other appropriate technology-based standard based on an evaluation of the available technology to achieve a particular pollutant reduction and other factors set forth in 40 CFR §125.3 (d).

Coal Pile Runoff means the rainfall runoff from or through any coal storage pile.

Composite Sample means a sample consisting of a minimum of eight grab samples of equal volume collected at equal intervals during a 24-hour period (or lesser period as specified in the section on Monitoring and Reporting) and combined proportional to flow, or a sample consisting of the same number of grab samples, or greater, collected proportionally to flow over that same time period.

Construction Activities - The following definitions apply to construction activities:

(a) Commencement of Construction is the initial disturbance of soils associated with clearing, grading, or excavating activities or other construction activities.

(b) Dedicated portable asphalt plant is a portable asphalt plant located on or contiguous to a construction site and that provides asphalt only to the construction site that the plant is located on or adjacent to. The term dedicated portable asphalt plant does not include facilities that are subject to the asphalt emulsion effluent limitation guideline at 40 CFR Part 443.

(c) Dedicated portable concrete plant is a portable concrete plant located on or contiguous to a construction site and that provides concrete only to the construction site that the plant is located on or adjacent to.

(d) Final Stabilization means that all soil disturbing activities at the site have been complete, and that a uniform perennial vegetative cover with a density of 70% of the cover for unpaved areas and areas not covered by permanent structures has been established or equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed.

(e) Runoff coefficient means the fraction of total rainfall that will appear at the conveyance as runoff.

Contiguous zone means the entire zone established by the United States under Article 24 of the Convention on the Territorial Sea and the Contiguous Zone.

Continuous discharge means a "discharge" which occurs without interruption throughout the operating hours of the facility except for infrequent shutdowns for maintenance, process changes, or similar activities.

CWA means the Clean Water Act (formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972) Pub. L. 92-500, as amended by Pub. L. 95-217, Pub. L. 95-576, Pub. L. 96-483, and Pub. L. 97-117; 33 USC §§1251 et seq.

Daily Discharge means the discharge of a pollutant measured during the calendar day or any other 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurements, the "daily discharge" is calculated as the average measurement of the pollutant over the day.

Director normally means the person authorized to sign NPDES permits by EPA or the State or an authorized representative. Conversely, it also could mean the Regional Administrator or the State Director as the context requires.

Discharge Monitoring Report Form (DMR) means the EPA standard national form, including any subsequent additions, revisions, or modifications for the reporting of self-monitoring results by permittees. DMRs must be used by "approved States" as well as by EPA. EPA will supply DMRs to any approved State upon request. The EPA national forms may be modified to substitute the State Agency name, address, logo, and other similar information, as appropriate, in place of EPA's.

Discharge of a pollutant means:

(a) Any addition of any "pollutant" or combination of pollutants to "waters of the United States" from any "point source", or

(b) Any addition of any pollutant or combination of pollutants to the waters of the "contiguous zone" or the ocean from any point source other than a vessel or other floating craft which is being used as a means of transportation (See "Point Source" definition).

This definition includes additions of pollutants into waters of the United States from: surface runoff which is collected or channeled by man; discharges through pipes, sewers, or other conveyances owned by a State, municipality, or other person which do not lead

to a treatment works; and discharges through pipes, sewers, or other conveyances leading into privately owned treatment works.

This term does not include an addition of pollutants by any "indirect discharger."

Effluent limitation means any restriction imposed by the Regional Administrator on quantities, discharge rates, and concentrations of "pollutants" which are "discharged" from "point sources" into "waters of the United States", the waters of the "contiguous zone", or the ocean.

Effluent limitation guidelines means a regulation published by the Administrator under Section 304(b) of CWA to adopt or revise "effluent limitations".

EPA means the United States "Environmental Protection Agency".

Flow-weighted composite sample means a composite sample consisting of a mixture of aliquots where the volume of each aliquot is proportional to the flow rate of the discharge.

Grab Sample – An individual sample collected in a period of less than 15 minutes.

Hazardous Substance means any substance designated under 40 CFR Part 116 pursuant to Section 311 of the CWA.

Indirect Discharger means a non-domestic discharger introducing pollutants to a publicly owned treatment works.

Interference means a discharge which, alone or in conjunction with a discharge or discharges from other sources, both:

(a) Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal; and

(b) Therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent State or local regulations): Section 405 of the Clean Water Act (CWA), the Solid Waste Disposal Act (SWDA) (including Title II, more commonly referred to as the Resources Conservation and Recovery Act (RCRA), and including State regulations contained in any State sludge management plan prepared pursuant to Subtitle D of the SDWA), the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection Research and Sanctuaries Act.

Landfill means an area of land or an excavation in which wastes are placed for permanent disposal, and which is not a land application unit, surface impoundment, injection well, or waste pile.

Land application unit means an area where wastes are applied onto or incorporated into the soil surface (excluding manure spreading operations) for treatment or disposal.

Large and Medium municipal separate storm sewer system means all municipal separate storm sewers that are either: (i) located in an incorporated place (city) with a population of 100,000 or more as determined by the latest Decennial Census by the Bureau of Census (these cities are listed in Appendices F and 40 CFR Part 122); or (ii) located in the counties with unincorporated urbanized

populations of 100,000 or more, except municipal separate storm sewers that are located in the incorporated places, townships, or towns within such counties (these counties are listed in Appendices H and I of 40 CFR 122); or (iii) owned or operated by a municipality other than those described in Paragraph (i) or (ii) and that are designated by the Regional Administrator as part of the large or medium municipal separate storm sewer system.

Maximum daily discharge limitation means the highest allowable "daily discharge" concentration that occurs only during a normal day (24-hour duration).

Maximum daily discharge limitation (as defined for the Steam Electric Power Plants only) when applied to Total Residual Chlorine (TRC) or Total Residual Oxidant (TRO) is defined as "maximum concentration" or "Instantaneous Maximum Concentration" during the two hours of a chlorination cycle (or fraction thereof) prescribed in the Steam Electric Guidelines, 40 CFR Part 423. These three synonymous terms all mean "a value that shall not be exceeded" during the two-hour chlorination cycle. This interpretation differs from the specified NPDES Permit requirement, 40 CFR § 122.2, where the two terms of "Maximum Daily Discharge" and "Average Daily Discharge" concentrations are specifically limited to the daily (24-hour duration) values.

Municipality means a city, town, borough, county, parish, district, association, or other public body created by or under State law and having jurisdiction over disposal of sewage, industrial wastes, or other wastes, or an Indian tribe or an authorized Indian tribe organization, or a designated and approved management agency under Section 208 of the CWA.

National Pollutant Discharge Elimination System means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 402, 318, and 405 of the CWA. The term includes an "approved program".

New Discharger means any building, structure, facility, or installation:

(a) From which there is or may be a "discharge of pollutants";

(b) That did not commence the "discharge of pollutants" at a particular "site" prior to August 13, 1979;

(c) Which is not a "new source"; and

(d) Which has never received a finally effective NPDES permit for discharges at that "site".

This definition includes an "indirect discharger" which commences discharging into "waters of the United States" after August 13, 1979. It also includes any existing mobile point source (other than an offshore or coastal oil and gas exploratory drilling rig or a coastal oil and gas exploratory drilling rig or a coastal oil and gas developmental drilling rig) such as a seafood processing rig, seafood processing vessel, or aggregate plant, that begins discharging at a "site" for which it does not have a permit; and any offshore rig or coastal mobile oil and gas exploratory drilling rig or coastal mobile oil and gas developmental drilling rig that commences the discharge of pollutants after August 13, 1979, at a "site" under EPA's permitting jurisdiction for which it is not covered by an individual or general permit and which is located in an area determined by the Regional Administrator in the issuance of a final permit to be in an area of biological concern. In determining whether an area is an area of biological concern, the Regional Administrator shall consider the factors specified in 40 CFR §§125.122 (a) (1) through (10).

An offshore or coastal mobile exploratory drilling rig or coastal mobile developmental drilling rig will be considered a "new discharger" only for the duration of its discharge in an area of biological concern.

New source means any building, structure, facility, or installation from which there is or may be a "discharge of pollutants", the construction of which commenced:

(a) After promulgation of standards of performance under Section 306 of CWA which are applicable to such source, or

(b) After proposal of standards of performance in accordance with Section 306 of CWA which are applicable to such source, but only if the standards are promulgated in accordance with Section 306 within 120 days of their proposal.

NPDES means "National Pollutant Discharge Elimination System".

Owner or operator means the owner or operator of any "facility or activity" subject to regulation under the NPDES programs.

Pass through means a Discharge which exits the POTW into waters of the United States in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation).

Permit means an authorization, license, or equivalent control document issued by EPA or an "approved" State.

Person means an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof.

Point Source means any discernible, confined, and discrete conveyance, including but not limited to any pipe ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel, or other floating craft, from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff (see 40 CFR §122.2).

Pollutant means dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials (except those regulated under the Atomic Energy Act of 1954, as amended (42 U.S.C. §§2011 et seq.)), heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water. It does not mean:

(a) Sewage from vessels; or

(b) Water, gas, or other material which is injected into a well to facilitate production of oil or gas, or water derived in association with oil and gas production and disposed of in a well, if the well is used either to facilitate production or for disposal purposes is approved by the authority of the State in which the well is located, and if the State determines that the injection or disposal will not result in the degradation of ground or surface water resources.

Primary industry category means any industry category listed in the NRDC settlement agreement (Natural Resources Defense Council et al. v. Train, 8 E.R.C. 2120 (D.D.C. 1976), modified 12 E.R.C. 1833 (D. D.C. 1979)); also listed in Appendix A of 40 CFR Part 122.

Privately owned treatment works means any device or system which is (a) used to treat wastes from any facility whose operation is not the operator of the treatment works or (b) not a "POTW".

Process wastewater means any water which, during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, byproduct, or waste product.

Publicly Owned Treatment Works (POTW) means any facility or system used in the treatment (including recycling and reclamation) of municipal sewage or industrial wastes of a liquid nature which is owned by a "State" or "municipality".

This definition includes sewers, pipes, or other conveyances only if they convey wastewater to a POTW providing treatment.

Regional Administrator means the Regional Administrator, EPA, Region I, Boston, Massachusetts.

Secondary Industry Category means any industry which is not a "primary industry category".

Section 313 water priority chemical means a chemical or chemical category which:

(1) is listed at 40 CFR §372.65 pursuant to Section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) (also known as Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986);

(2) is present at or above threshold levels at a facility subject to EPCRA Section 313 reporting requirements; and

(3) satisfies at least one of the following criteria:

(i) are listed in Appendix D of 40 CFR Part 122 on either Table II (organic priority pollutants), Table III (certain metals, cyanides, and phenols), or Table V (certain toxic pollutants and hazardous substances);
(ii) are listed as a hazardous substance pursuant to Section 311(b)(2)(A) of the CWA at 40 CFR §116.4; or
(iii) are pollutants for which EPA has published acute or chronic water quality criteria.

Septage means the liquid and solid material pumped from a septic tank, cesspool, or similar domestic sewage treatment system, or a holding tank when the system is cleaned or maintained.

Sewage Sludge means any solid, semisolid, or liquid residue removed during the treatment of municipal wastewater or domestic sewage. Sewage sludge includes, but is not limited to, solids removed during primary, secondary, or advanced wastewater treatment, scum, septage, portable toilet pumpings, Type III Marine Sanitation Device pumpings (33 CFR Part 159), and sewage sludge products. Sewage sludge does not include grit or screenings, or ash generated during the incineration of sewage sludge.

Sewage sludge use or disposal practice means the collection, storage, treatment, transportation, processing, monitoring, use, or disposal of sewage sludge.

Significant materials includes, but is not limited to: raw materials, fuels, materials such as solvents, detergents, and plastic pellets, raw materials used in food processing or production, hazardous substance designated under section 101(14) of CERCLA, any chemical the facility is required to report pursuant to EPCRA Section 313, fertilizers, pesticides, and waste products such as ashes, slag, and sludge that have the potential to be released with storm water discharges.

Significant spills includes, but is not limited to, releases of oil or hazardous substances in excess of reportable quantities under Section 311 of the CWA (see 40 CFR §110.10 and §117.21) or Section 102 of CERCLA (see 40 CFR § 302.4).

Sludge-only facility means any "treatment works treating domestic sewage" whose methods of sewage sludge use or disposal are subject to regulations promulgated pursuant to Section 405(d) of the CWA, and is required to obtain a permit under 40 CFR §122.1(b)(3).

State means any of the 50 States, the District of Columbia, Guam, the Commonwealth of Puerto Rico, the Virgin Islands, American Samoa, the Trust Territory of the Pacific Islands.

Storm Water means storm water runoff, snow melt runoff, and surface runoff and drainage.

Storm water discharge associated with industrial activity means the discharge from any conveyance which is used for collecting and conveying storm water and which is directly related to manufacturing, processing, or raw materials storage areas at an industrial plant. (See 40 CFR §122.26 (b)(14) for specifics of this definition.

Time-weighted composite means a composite sample consisting of a mixture of equal volume aliquots collected at a constant time interval.

Toxic pollutants means any pollutant listed as toxic under Section 307 (a)(1) or, in the case of "sludge use or disposal practices" any pollutant identified in regulations implementing Section 405(d) of the CWA.

Treatment works treating domestic sewage means a POTW or any other sewage sludge or wastewater treatment devices or systems, regardless of ownership (including federal facilities), used in the storage, treatment, recycling, and reclamation of municipal or domestic sewage, including land dedicated for the disposal of sewage sludge. This definition does not include septic tanks or similar devices.

For purposes of this definition, "domestic sewage" includes waste and wastewater from humans or household operations that are discharged to or otherwise enter a treatment works. In States where there is no approved State sludge management program under Section 405(f) of the CWA, the Regional Administrator may designate any person subject to the standards for sewage sludge use and disposal in 40 CFR Part 503 as a "treatment works treating domestic sewage", where he or she finds that there is a potential for adverse effects on public health and the environment from poor sludge quality or poor sludge handling, use or disposal practices, or where he or she finds that such designation is necessary to ensure that such person is in compliance with 40 CFR Part 503.

Waste Pile means any non-containerized accumulation of solid, non-flowing waste that is used for treatment or storage.

Waters of the United States means:

(a) All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of tide;

(b) All interstate waters, including interstate "wetlands";

(c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands", sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters:

(1) Which are or could be used by interstate or foreign travelers for recreational or other purpose;

(2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or

(3) Which are used or could be used for industrial purposes by industries in interstate commerce;

(d) All impoundments of waters otherwise defined as waters of the United States under this definition;

(e) Tributaries of waters identified in Paragraphs (a) through (d) of this definition;

(f) The territorial sea; and

(g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in Paragraphs (a) through (f) of this definition.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the CWA (other than cooling ponds as defined in 40 CFR §423.11(m) which also meet the criteria of this definition) are not waters of the United States.

Wetlands means those areas that are inundated or saturated by surface or ground water at a frequency and duration to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

Whole Effluent Toxicity (WET) means the aggregate toxic effect of an effluent measured directly by a toxicity test. (See Abbreviations Section, following, for additional information.)

2. Definitions for NPDES Permit Sludge Use and Disposal Requirements.

Active sewage sludge unit is a sewage sludge unit that has not closed.

Aerobic Digestion is the biochemical decomposition of organic matter in sewage sludge into carbon dioxide and water by microorganisms in the presence of air.

Agricultural Land is land on which a food crop, a feed crop, or a fiber crop is grown. This includes range land and land used as pasture.

Agronomic rate is the whole sludge application rate (dry weight basis) designed:

(1) To provide the amount of nitrogen needed by the food crop, feed crop, fiber crop, cover crop, or vegetation grown on the land; and

(2) To minimize the amount of nitrogen in the sewage sludge that passes below the root zone of the crop or vegetation grown on the land to the ground water.

Air pollution control device is one or more processes used to treat the exit gas from a sewage sludge incinerator stack.

Anaerobic digestion is the biochemical decomposition of organic matter in sewage sludge into methane gas and carbon dioxide by microorganisms in the absence of air.

Annual pollutant loading rate is the maximum amount of a pollutant that can be applied to a unit area of land during a 365 day period.

Annual whole sludge application rate is the maximum amount of sewage sludge (dry weight basis) that can be applied to a unit area of land during a 365 day period.

Apply sewage sludge or sewage sludge applied to the land means land application of sewage sludge.

Aquifer is a geologic formation, group of geologic formations, or a portion of a geologic formation capable of yielding ground water to wells or springs.

Auxiliary fuel is fuel used to augment the fuel value of sewage sludge. This includes, but is not limited to, natural gas, fuel oil, coal, gas generated during anaerobic digestion of sewage sludge, and municipal solid waste (not to exceed 30 percent of the dry weight of the sewage sludge and auxiliary fuel together). Hazardous wastes are not auxiliary fuel.

Base flood is a flood that has a one percent chance of occurring in any given year (i.e. a flood with a magnitude equaled once in 100 years).

Bulk sewage sludge is sewage sludge that is not sold or given away in a bag or other container for application to the land.

Contaminate an aquifer means to introduce a substance that causes the maximum contaminant level for nitrate in 40 CFR §141.11 to be exceeded in ground water or that causes the existing concentration of nitrate in the ground water to increase when the existing concentration of nitrate in the ground water exceeds the maximum contaminant level for nitrate in 40 CFR §141.11.

Class I sludge management facility is any publicly owned treatment works (POTW), as defined in 40 CFR §501.2, required to have an approved pretreatment program under 40 CFR §403.8 (a) (including any POTW located in a state that has elected to assume local program responsibilities pursuant to 40 CFR §403.10 (e) and any treatment works treating domestic sewage, as defined in 40 CFR § 122.2,

classified as a Class I sludge management facility by the EPA Regional Administrator, or, in the case of approved state programs, the Regional Administrator in conjunction with the State Director, because of the potential for sewage sludge use or disposal practice to affect public health and the environment adversely.

Control efficiency is the mass of a pollutant in the sewage sludge fed to an incinerator minus the mass of that pollutant in the exit gas from the incinerator stack divided by the mass of the pollutant in the sewage sludge fed to the incinerator.

Cover is soil or other material used to cover sewage sludge placed on an active sewage sludge unit.

Cover crop is a small grain crop, such as oats, wheat, or barley, not grown for harvest.

Cumulative pollutant loading rate is the maximum amount of inorganic pollutant that can be applied to an area of land.

Density of microorganisms is the number of microorganisms per unit mass of total solids (dry weight) in the sewage sludge.

Dispersion factor is the ratio of the increase in the ground level ambient air concentration for a pollutant at or beyond the property line of the site where the sewage sludge incinerator is located to the mass emission rate for the pollutant from the incinerator stack.

Displacement is the relative movement of any two sides of a fault measured in any direction.

Domestic septage is either liquid or solid material removed from a septic tank, cesspool, portable toilet, Type III marine sanitation device, or similar treatment works that receives only domestic sewage. Domestic septage does not include liquid or solid material removed from a septic tank, cesspool, or similar treatment works that receives either commercial wastewater or industrial wastewater and does not include grease removed from a grease trap at a restaurant.

Domestic sewage is waste and wastewater from humans or household operations that is discharged to or otherwise enters a treatment works.

Dry weight basis means calculated on the basis of having been dried at 105 degrees Celsius (°C) until reaching a constant mass (i.e. essentially 100 percent solids content).

Fault is a fracture or zone of fractures in any materials along which strata on one side are displaced with respect to the strata on the other side.

Feed crops are crops produced primarily for consumption by animals.

Fiber crops are crops such as flax and cotton.

Final cover is the last layer of soil or other material placed on a sewage sludge unit at closure.

Fluidized bed incinerator is an enclosed device in which organic matter and inorganic matter in sewage sludge are combusted in a bed of particles suspended in the combustion chamber gas.

Food crops are crops consumed by humans. These include, but are not limited to, fruits, vegetables, and tobacco.

Forest is a tract of land thick with trees and underbrush.

Ground water is water below the land surface in the saturated zone.

Holocene time is the most recent epoch of the Quaternary period, extending from the end of the Pleistocene epoch to the present.

Hourly average is the arithmetic mean of all the measurements taken during an hour. At least two measurements must be taken during the hour.

Incineration is the combustion of organic matter and inorganic matter in sewage sludge by high temperatures in an enclosed device.

Industrial wastewater is wastewater generated in a commercial or industrial process.

Land application is the spraying or spreading of sewage sludge onto the land surface; the injection of sewage sludge below the land surface; or the incorporation of sewage sludge into the soil so that the sewage sludge can either condition the soil or fertilize crops or vegetation grown in the soil.

Land with a high potential for public exposure is land that the public uses frequently. This includes, but is not limited to, a public contact site and reclamation site located in a populated area (e.g., a construction site located in a city).

Land with low potential for public exposure is land that the public uses infrequently. This includes, but is not limited to, agricultural land, forest and a reclamation site located in an unpopulated area (e.g., a strip mine located in a rural area).

Leachate collection system is a system or device installed immediately above a liner that is designed, constructed, maintained, and operated to collect and remove leachate from a sewage sludge unit.

Liner is soil or synthetic material that has a hydraulic conductivity of 1×10^{-7} centimeters per second or less.

Lower explosive limit for methane gas is the lowest percentage of methane gas in air, by volume, that propagates a flame at 25 degrees Celsius and atmospheric pressure.

Monthly average (Incineration) is the arithmetic mean of the hourly averages for the hours a sewage sludge incinerator operates during the month.

Monthly average (Land Application) is the arithmetic mean of all measurements taken during the month.

Municipality means a city, town, borough, county, parish, district, association, or other public body (including an intermunicipal agency of two or more of the foregoing entities) created by or under State law; an Indian tribe or an authorized Indian tribal organization having jurisdiction over sewage sludge management; or a designated and approved management agency under section 208 of the CWA, as amended. The definition includes a special district created under state law, such as a water district, sewer district, sanitary district, utility district, drainage district, or similar entity, or an integrated waste management facility as defined in section 201 (e) of the CWA, as amended, that has as one of its principal responsibilities the treatment, transport, use or disposal of sewage sludge.

Other container is either an open or closed receptacle. This includes, but is not limited to, a bucket, a box, a carton, and a vehicle or trailer with a load capacity of one metric ton or less.

Pasture is land on which animals feed directly on feed crops such as legumes, grasses, grain stubble, or stover.

Pathogenic organisms are disease-causing organisms. These include, but are not limited to, certain bacteria, protozoa, viruses, and viable helminth ova.

Permitting authority is either EPA or a State with an EPA-approved sludge management program.

Person is an individual, association, partnership, corporation, municipality, State or Federal Agency, or an agent or employee thereof.

Person who prepares sewage sludge is either the person who generates sewage sludge during the treatment of domestic sewage in a treatment works or the person who derives a material from sewage sludge.

pH means the logarithm of the reciprocal of the hydrogen ion concentration; a measure of the acidity or alkalinity of a liquid or solid material.

Place sewage sludge or sewage sludge placed means disposal of sewage sludge on a surface disposal site.

Pollutant (as defined in sludge disposal requirements) is an organic substance, an inorganic substance, a combination or organic and inorganic substances, or pathogenic organism that, after discharge and upon exposure, ingestion, inhalation, or assimilation into an organism either directly from the environment or indirectly by ingestion through the food chain, could on the basis on information available to the Administrator of EPA, cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunction in reproduction) or physical deformations in either organisms or offspring of the organisms.

Pollutant limit (for sludge disposal requirements) is a numerical value that describes the amount of a pollutant allowed per unit amount of sewage sludge (e.g., milligrams per kilogram of total solids); the amount of pollutant that can be applied to a unit of land (e.g., kilograms per hectare); or the volume of the material that can be applied to the land (e.g., gallons per acre).

Public contact site is a land with a high potential for contact by the public. This includes, but is not limited to, public parks, ball fields, cemeteries, plant nurseries, turf farms, and golf courses.

Qualified ground water scientist is an individual with a baccalaureate or post-graduate degree in the natural sciences or engineering who has sufficient training and experience in ground water hydrology and related fields, as may be demonstrated by State registration, professional certification, or completion of accredited university programs, to make sound professional judgments regarding ground water monitoring, pollutant fate and transport, and corrective action.

Range land is open land with indigenous vegetation.

Reclamation site is drastically disturbed land that is reclaimed using sewage sludge. This includes, but is not limited to, strip mines and construction sites.

Risk specific concentration is the allowable increase in the average daily ground level ambient air concentration for a pollutant from the incineration of sewage sludge at or beyond the property line of a site where the sewage sludge incinerator is located.

Runoff is rainwater, leachate, or other liquid that drains overland on any part of a land surface and runs off the land surface.

Seismic impact zone is an area that has 10 percent or greater probability that the horizontal ground level acceleration to the rock in the area exceeds 0.10 gravity once in 250 years.

Sewage sludge is a solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works. Sewage sludge includes, but is not limited to:, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment processes; and a material derived from sewage sludge. Sewage sludge does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screening generated during preliminary treatment of domestic sewage in treatment works.

Sewage sludge feed rate is either the average daily amount of sewage sludge fired in all sewage sludge incinerators within the property line of the site where the sewage sludge incinerators are located for the number of days in a 365 day period that each sewage sludge incinerator operates, or the average daily design capacity for all sewage sludge incinerators within the property line of the site where the sewage sludge incinerators are located.

Sewage sludge incinerator is an enclosed device in which only sewage sludge and auxiliary fuel are fired.

Sewage sludge unit is land on which only sewage sludge is placed for final disposal. This does not include land on which sewage sludge is either stored or treated. Land does not include waters of the United States, as defined in 40 CFR §122.2.

Sewage sludge unit boundary is the outermost perimeter of an active sewage sludge unit.

Specific oxygen uptake rate (SOUR) is the mass of oxygen consumed per unit time per unit mass of total solids (dry weight basis) in sewage sludge.

Stack height is the difference between the elevation of the top of a sewage sludge incinerator stack and the elevation of the ground at the base of the stack when the difference is equal to or less than 65 meters. When the difference is greater than 65 meters, stack height is the creditable stack height determined in accordance with 40 CFR §51.100 (ii).

State is one of the United States of America, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, the Trust Territory of the Pacific Islands, the Commonwealth of the Northern Mariana Islands, and an Indian tribe eligible for treatment as a State pursuant to regulations promulgated under the authority of section 518(e) of the CWA.

Store or storage of sewage sludge is the placement of sewage sludge on land on which the sewage sludge remains for two years or less. This does not include the placement of sewage sludge on land for treatment.

Surface disposal site is an area of land that contains one or more active sewage sludge units.

Total hydrocarbons means the organic compounds in the exit gas from a sewage sludge incinerator stack measured using a flame ionization detection instrument referenced to propane.

Total solids are the materials in sewage sludge that remain as residue when the sewage sludge is dried at 103 to 105 degrees Celsius.

Treat or treatment of sewage sludge is the preparation of sewage sludge for final use or disposal. This includes, but is not limited to, thickening, stabilization, and dewatering of sewage sludge. This does not include storage of sewage sludge.

Treatment works is either a federally owned, publicly owned, or privately owned device or system used to treat (including recycle and reclaim) either domestic sewage or a combination of domestic sewage and industrial waste of a liquid nature.

Unstable area is land subject to natural or human-induced forces that may damage the structural components of an active sewage sludge unit. This includes, but is not limited to, land on which the soils are subject to mass movement.

Unstabilized solids are organic materials in sewage sludge that have not been treated in either an aerobic or anaerobic treatment process.

Vector attraction is the characteristic of sewage sludge that attracts rodents, flies, mosquitoes, or other organisms capable of transporting infectious agents.

Volatile solids is the amount of the total solids in sewage sludge lost when the sewage sludge is combusted at 550 degrees Celsius in the presence of excess air.

Wet electrostatic precipitator is an air pollution control device that uses both electrical forces and water to remove pollutants in the exit gas from a sewage sludge incinerator stack.

Wet scrubber is an air pollution control device that uses water to remove pollutants in the exit gas from a sewage sludge incinerator stack.

3. Commonly Used Abbreviations

BOD	Five-day biochemical oxygen demand unless otherwise specified
CBOD	Carbonaceous BOD
CFS	Cubic feet per second
COD	Chemical oxygen demand
Chlorine	
Cl_2	Total residual chlorine
TRC	Total residual chlorine which is a combination of free available chlorine (FAC, see below) and combined chlorine (chloramines, etc.)

TRO	Total residual chlorine in marine waters where halogen compounds are present
FAC	Free available chlorine (aqueous molecular chlorine, hypochlorous acid, and hypochlorite ion)
Coliform	
Coliform, Fecal	Total fecal coliform bacteria
Coliform, Total	Total coliform bacteria
Cont. (Continuous)	Continuous recording of the parameter being monitored, i.e. flow, temperature, pH, etc.
Cu. M/day or M^3/day	Cubic meters per day
DO	Dissolved oxygen
kg/day	Kilograms per day
lbs/day	Pounds per day
mg/l	Milligram(s) per liter
ml/l	Milliliters per liter
MGD	Million gallons per day
Nitrogen	
Total N	Total nitrogen
NH_3-N	Ammonia nitrogen as nitrogen
NO_3-N	Nitrate as nitrogen
NO_2-N	Nitrite as nitrogen
NO_3-NO_2	Combined nitrate and nitrite nitrogen as nitrogen
TKN	Total Kjeldahl nitrogen as nitrogen
Oil & Grease	Freon extractable material
PCB	Polychlorinated biphenyl
pH	A measure of the hydrogen ion concentration. A measure of the acidity or alkalinity of a liquid or material
Surfactant	Surface-active agent

Temp. °C	Temperature in degrees Centigrade
Temp. °F	Temperature in degrees Fahrenheit
TOC	Total organic carbon
Total P	Total phosphorus
TSS or NFR	Total suspended solids or total nonfilterable residue
Turb. or Turbidity	Turbidity measured by the Nephelometric Method (NTU)
ug/l	Microgram(s) per liter
WET	"Whole effluent toxicity" is the total effect of an effluent measured directly with a toxicity test.
C-NOEC	"Chronic (Long-term Exposure Test) – No Observed Effect Concentration". The highest tested concentration of an effluent or a toxicant at which no adverse effects are observed on the aquatic test organisms at a specified time of observation.
A-NOEC	"Acute (Short-term Exposure Test) – No Observed Effect Concentration" (see C-NOEC definition).
LC_{50}	LC_{50} is the concentration of a sample that causes mortality of 50% of the test population at a specific time of observation. The LC_{50} = 100% is defined as a sample of undiluted effluent.
ZID	Zone of Initial Dilution means the region of initial mixing surrounding or adjacent to the end of the outfall pipe or diffuser ports.