Municipality/Organization: Department of Conservation and Recreation

EPA NPDES Permit Number: MAR043001

MaDEP Transmittal Number:

Annual Report Number & Reporting Period: **No. 6: May 08-April 09**

Department of Conservation and Recreation NPDES PII Small MS4 General Permit Annual Report

Part I. General Information

Contact Person:	Robert Lowell	Title:	Storm Water Manager
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Certification:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature:

Printed Name: Richard K. Sullivan

Title: Commissioner

Date:

Part II. Self-Assessment

The Department of Conservation and Recreation (DCR) has completed the required self-assessment and has determined that we are in compliance with all permit conditions, except as noted in the following tables. DCR received authorization to discharge under the general permit from EPA on November 8, 2007 and from DEP on November 21, 2007.

DCR continued to work hard to implement a comprehensive storm water program in 2008 and 2009 even with limited fiscal and labor resources. DCR storm water management efforts are supported by operating and capital appropriations that that were reduced from total approximately $4.6 million to $3.9 million in FY09 (July 2008 – June 2009 due to DCR and state budget concerns). DCR may receive federal stimulus funds that may supplement certain transportation related projects such as improvements to Nonantum Road and other areas where improved storm water management can be incorporated. DCR expects to utilize all available funds and to implement practices to reduce pollution in runoff from parks and parkways. The Governor's FY10 budget provisions for DCR are currently set at $4.25 million.

Part III. Summary of Minimum Control Measures

The Department of Conservation and Recreation owns and operates many different types of facilities and parkways which are covered by the NPDES Phase II General Permit. In order to accurately reflect the programs DCR has accomplished, both state-wide and for specific facilities, this annual report has been divided into separate tables. Table 1 describes the control measures which are not site specific. Tables 2 through 7 describes site or facility type specific BMPs that are being implemented at water supply/ reservoirs, state forests, state parks, beaches, construction sites or parkways.

A few of the BMPs included in DCR's Storm Water Management Plan (SWMP) are for facilities outside of the urbanized area. Therefore, the facilities addressed by these BMPs are not listed in the site specific tables. We continue to include these BMPs in Table 1 to demonstrate the many diverse programs being implemented by the DCR to raise awareness of storm water and water quality issues in the general public. We have noted these BMPs as facilities that are "outside of the urbanized area" in the table below.

Table 1: State-wide Best Management Practices (BMPs)

1. Public Education and Outreach

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 6	Planned Activities – April 09 to March 10
1-1	DCR Storm Water Web Page	External Affairs/IT Dept. (Wendy Fox)	Develop web page and publish storm water related publications (inc. SWMP and NOI), information and links on web page.	*Goal Met* – The following documents were posted on DCR's web site for public access and review: ▪ Permit Year 5 Annual Report. August 21, 2007 SWMP and NOI ▪ Fall 2008 Catch Basin Cleaning and Parkway Sweeping Report to Conservation Law Foundation ▪ Authorization to discharge letters from EPA posted on website	Continue to update as necessary. Post copy of Permit Year 6 annual report. Post fall and spring Catch Basin Cleaning and Parkway Sweeping Report to Conservation Law Foundation. Post authorization to discharge letter from DEP on website.

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 6	Planned Activities – April 09 to March 10
1-5	Mobile Water Quality Education Seminars *(statewide)*	Operations (Curt Rudge)	Provide storm water/ water quality education educational events at a minimum of nine different locations. These events would be in addition to the facility/ program specific BMPs also listed in this SWMP.	*Goal Met* – DCR offered state-wide Public Education Events including water quality, storm water education (includes forestry practices, healthy ecosystems, water cycle, children's programs) at the following DCR facilities at least once. • Blue Hills Reservation • Breakheart Reservation • Mount Greylock Glen • Pittsfield State Park • Purgatory Chasm State Park • Tolland State Forest • Walden Pond State Reservation • Waquit Bay Natural Resource Reservation • Western Gateway Heritage State Park • Nahant Beach Clean-ups • Revere Beach Clean-ups • Birding in the Belle Island vicinity	Provide educational events at a minimum of nine different locations during the year. Environmental education programs planned in the North Region parks and reservations include: • DCR Coastal Awareness Environmental Education Program on DCR coastal properties; • numerous clean-up days at beaches, marshes and ponds; • canoe trips, • birding trips; • beach activities such as tidepool explorations.
1-6	Charles River Conservancy Volunteer Clean Up Program	Operations (Jack Murray)	Continue to partner with Conservancy on Charles River Clean Up Program	*Goal Met* - DCR assisted with and coordinated support for this clean up program with CRWA and the Esplanade Association. The Tenth Annual Clean Up Day was held on 4/26/08. Approximately 2,200 volunteers participated including over 100 businesses, scout troops, schools, churches, and other groups. Greater than 20 tons of garbage were removed including tires, shopping carts, and a typewriter, and a refrigerator..	Participate in the Clean Up Day schedule for 4/25/09.

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 6	Planned Activities – April 09 to March 10
1-7	Charles River Reservation School Program	Operations (Curt Rudge)	Provide 1 storm water/ water quality related educational program each year.	Environmental education through the Charles River Reservation School Program was cancelled as of June 2007 due to inadequate staffing. There has continued to be a lack of funding for staffing these programs.	No planned activities.
1-8	Camp Nihan	Operations (Curt Rudge)	Provide 1 storm water/ water quality related educational program each year.	Environmental education programs at Camp Nihan were cancelled as of June 2007 due to inadequate staffing. There has continued to be a lack of funding for staffing these programs.	No planned activities.
1-9	Quabbin Educational Programs (*outside of the urbanized area*)	Water Supply Protection (John Scannell)	Continue to provide multi-session watershed related education programs on an annual basis to two schools in the Quabbin Reservoir watershed.	Interpretive Services staff conducted 73 educational programs for 3,200 student and adult participants. In addition, tours were led for a number of local, regional, and even international groups on a variety of watershed-related topics. Staff also served on the Steering Committee for the Massachusetts Envirothon, and as DCR liaison with the Swift River Valley Historical Society, Friends of Quabbin, Valley Environmental Education Collaborative and the Student Conservation Association.	No planned activities.
1-10	Wachusett Educational Programs (*outside of the urbanized area*)	Water Supply Protection (John Scannell)	Continue to provide multi-session watershed related education programs on an annual basis to two schools in the Wachusett Reservoir watershed.	Staff continued to implement the Wachusett Watershed Education Program in five communities: Holden, Boylston, West Boylston, Princeton, and Rutland, with the expansion to an additional school in Rutland.	No planned activities.

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 6	Planned Activities – April 09 to March 10
1-11	Project WET	Water Supply Protection (John Scannell)	Maintain sponsorship of state water education for teachers program.	Program WET was cancelled as of summer 2007. There has continued to be a lack of funding for staffing these programs.	No planned activities.
1-12	"DownStream" Newsletter	Water Supply Protection (John Scannell)	Continue to develop and disseminate newsletter regarding issues relevant to Wachusett Reservoir/ Quabbin Reservoir watersheds twice a year.	*Goal Met* - DCR published and circulated this newsletter. The Spring 2008 issue included discussions on natural landscapes in lieu of lawns, pet waste, and the state's Water Supply Protection Trust. The Fall 2008 issue included discussions on the Asian Longhorned Beetle, new crest gates at the Wachusett Spillway, and new license plates to support land conservation critical to water resource protection. Copies of the newsletters can be found at http://www.mass.gov/dcr/stewardship/greenway/newsletter.htm and as Appendix A of this report. The newsletter is sent to members of the Friends of the Watershed (Wachusett, Quabbin and Ware River) Group.	Publish newsletters in May and November 2009. Place newsletters on web page.
1-13	Massachusetts Drinking Water Education Partnership (MADWEP)	Recreation (Gary Briere)	Maintain membership.	*Goal Met* – DCR is an active member of MADWEP.	Maintain membership.

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 6	Planned Activities – April 09 to March 10
1-14	Low Impact Development Project	Water Resources (Anne Monnelly)	Pursue the inclusion of public education component within the planning, permitting and implementation of one LID project a year.	Lakes & Ponds program sponsored drainage improvements at Miles Standish State Forest. The drainage included the construction of an infiltration catch basin.	Implement one LID parking lot project either for or with Charles River Watershed Association. Install a permeable 1100 ft Flexipave sidewalk and kayak and canoe rental area in Cambridge along Memorial Drive.
1-15	DCR Storm Water Training Workshop	Planning and Engineering (Noel Baratta)	Provide ½ day training program to address storm water management regulation, policies and procedures relevant to DCR staff.	*Measurable Goal Previously Completed.*	Storm Water Handbook Training will provide training to similar group of staff members within six months of being issued.
1-16	Ipswich River Demonstration Projects	Director of Water Resources (Anne Monnelly)	Continue to include public education and outreach in the projects funded through the EPA Watershed Grant, as appropriate.	*Goal Met* – On May 15th, 2008 the Metropolitan Area Planning Council and the Ipswich Planning Department partnered with the Martins Companies to host a tour of **Partridgeberry Place** for interested planners, conservation commissioners, and other interested parties. Also DCR published a final report summarizing the monitoring which occurred at Patridgeberry Place. In June of 2008, DCR held a Raingarden Maintenance Work Day for residents to inform them about the **raingardens** along the streets draining to **Silver Lake** and encourage them to manage the gardens nearest their homes. *(continued below)*	**Whipple Annex Green Roof** results report will be published and DCR will hold a formal presentation to review the results. DCR will publish a pre- and post-construction groundwater data assessment report for the **Silver Lake Permeable Pavement** Demonstration Project. DCR will publish a report analyzing the data from the **Silver Lake Raingardens** in June 2009.

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 6	Planned Activities – April 09 to March 10
1-16 (cont'd)				**Weather Based Irrigation Demonstration project** - A project close-out meeting was held with residential participants in April 2008 to celebrate the conclusion of data collection, listen to preliminary study results, provide feedback about the systems, and hear tips on eco-friendly landscaping techniques. Also, individual "conclusion interviews" were held with each of the 5 municipal partners in the spring of 2008 to present preliminary results and receive feedback on the system.	**Weather Based Irrigation Demonstration project -** Analysis of savings is underway and a report is expected in the spring of 2009.
1-17	Partner with Center for Urban Environmental Studies	Chief Engineer (Noel Baratta)	Partner with Northeastern University to assist development of new pollution control methods for storm water.	*Goal Partially Met* – DCR developed Notice to Partner with Northeastern and National Science Foundation in Permit Year 6. No additional work occurred during this permit year due to attention to other priorities.	Work with Center to develop specific phosphorus reduction methods which could be installed in TMDL areas with DCR properties.

Additional Practices:

- The Stillwater Farm Educational Site continues regularly scheduled open hours. The building is open to the public two days a week.

2. Public Involvement and Participation

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 6	Planned Activities – April 09 to March 10
2-1	Formalize Partnerships with CLF and CRWA	General Counsel (Gary Davis)	Continue to work with CLF and CRWA and abide by Memo of Understanding (MOU)	*Goal Met* - DCR provides CLF/ CRWA with a semi-annual report summarizing the actions taken to meet the criteria outlined in the MOU. Semi-annual meetings are held to discuss the progress. The semi-annual reports are posted on DCR's web page for public access.	Continue to provide semi-annual reports and attend regularly scheduled meetings with CLF/ CRWA to review compliance with MOU.
2-2	UMass/DCR Program to monitor WQ in target areas of Wachusett Reservoir (*outside of the urbanized area*)	Water Supply Protection (John Scannell)	Continue program with UMass.	*Goal Met* - Program is ongoing.	Continue program.
2-3	Public NPDES Meetings to Discuss Annual Report	Planning & Engineering (Noel Baratta)	Hold one meeting at three locations each year for internal staff, interested parties and public. Track and record comments received.	*Goal Not Met*	DCR will hold public meetings related to the new permit to be issued this year. At the meetings will discuss Permit Year 6's Annual Report and plans for changes to meet the new permit requirements.
2-4	Partnership and Friends Database	External Affairs (Suzanne Wilson)	Send an annual letter regarding storm water/ NPDES issues to the watershed advocacy groups included in their Partnership and Friends database.	*Goal Met* - Database has over 346 contacts. Annual letter sent.	Send annual email regarding storm water/ NPDES issues once issued. Maintain database. Send email regarding new MS4 permits once issued.

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 6	Planned Activities – April 09 to March 10
2-5	Storm Water Related Concerns/ Feedback Reported on DCR Web Site	External Affairs (Wendy Fox)	Continue to maintain staffing to forward concerns/ feedback to appropriate department and track response to concerns submitted by the public via DCR's web site.	*Goal Met* - Web site is active. DCR Commissioner has implemented concern/feedback letter tracking and response system.	Continue program.
2-6	DCR Stewardship Council	External Affairs (Wendy Fox)	Continue to participate. Raise storm water issue, as appropriate. Present summary of annual report to council.	*Goal Met* - DCR attends monthly and is an active participant.	Continue participation. Present summary of Annual Report for Permit Year 6.
2-7	Massachusetts Water Resource Commission (MWRC)	Water Supply Protection (John Scannell)	Continue to be involved in program and provide technical and staff support to MWRC.	*Goal Met* - DCR attends monthly and is an active participant.	Continue participation.
2-8	Lakes and Ponds Program	Water Resources (Anne Monnelly)	Continue to sponsor program.	*Goal Met* - DCR continues to sponsor this program. Examples of LID installations and demonstration projects for the Ipswich River watershed are available through http://www.mass.gov/dcr/waterSupply/lakepond/lakepond.htm Lakes & Ponds assisted State Parks with LID installations at Miles Standish State Forest.	Continue sponsorship. Work with Charles River Watershed Association to identify appropriate location for LID installation either on their property or as a joint partnership within the watershed.
2-9	Think Blue Campaign	Planning & Engineering (Noel Baratta)	Explore a partnership with Think Blue. Provide update on program and schedule in annual reports.	*Goal Not Met* – Think Blue has experienced budget and staffing issues and therefore progress did not occur this year.	Prepare recommendation to Secretary to develop broader transportation stormwater message.
2-10	Partnership with MyRWA	Planning & Engineering (Noel Baratta)	Explore a partnership with MyRWA. Include a summary of collaborative activities in annual reports.	*Goal Met* – DCR staff has volunteered to be on MyRWA Science sub-committee.	Further define partnerships and implement water quality monitoring program.

3. Illicit Discharge Detection and Elimination

BMP ID #	BMP Description	Responsible Dept./ Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 6	Planned Activities – April 09 to March 10
3-1	Drainage Outfall Inventory	Planning & Engineering (Noel Baratta)	Locate all known outfalls owned and operated by DCR within urbanized areas. Explore possibility of providing inventory for public review and include "Contact Us" Link.	*Goal Met* - DCR located all known outfalls owned and operated by DCR within urbanized areas by the end of Permit Year 6. The drainage outfall information was gathered from either scanned construction drawings or field surveys. During this past permit year, DCR has continued to add to and update the stormwater infrastructure database by verifying and updating the database during illicit discharge detection field work and catch basin cleaning and maintenance efforts. The database has been converted to a network, providing connectivity information which can be used to determine urban drainage areas and identify features that are connected (ex. pipe system related to a given outfall). *(continued below)*	DCR will continue to verify the location and condition of outfalls located from paper maps during illicit discharge detection field tasks. DCR will share drainage information on infrastructure being handed over to MassDOT. DCR will continue to use the "Contact Us" link as the primary method for the public to request drainage system mapping information. The information will be provided to the public in a timely fashion.

BMP ID #	BMP Description	Responsible Dept./ Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 6	Planned Activities – April 09 to March 10
3-1 (cont'd)	Drainage Outfall Inventory			DCR has provided municipalities with drainage information when requested throughout the year. The "Contact Us" link provides an easy way for the public to reach the stormwater staff to request such information. Examples of information provided include: 1. Drainage information for Muddy River Phase I day lighting project 2. Boston Water& Sewer IDDE Coordination regarding possible illicit discharge at Truman Highway 3. Boston College interconnections at Chestnut Hill.	
3-2	Drainage Inventory Specification	Chief Engineer (Noel Baratta AECOM)	DCR will develop and implement a Drainage Inventory Specification which will require submission of drainage infrastructure information from construction and redevelopment projects to add to the infrastructure database.	*Goal Met* - Drainage specifications have been included in revised contract language and standard contract documents for newly issued contracts. Many of the projects where as-built information was included in the contract are only now finishing construction.	All new construction projects will continue to include the Drainage Inventory Specification. DCR anticipates receiving drainage information from the Mt. Greylock project as it is completed. These plans will be geo-referenced and incorporated into DCR database.
3-3	Illicit Drainage Connection Policy	General Counsel (Gary Davis)	DCR is preparing a policy prohibiting illicit discharges to the DCR storm water system. The Policy will be finalized and issued during Fall 2006. Develop formal agreement with Attorney General's office.	*Goal Not Met* - DCR has developed a drainage connection policy. The draft was circulated last July for comment. The final policy is awaiting final signature from the Director of Policy.	Receive signature and issue drainage connection policy.

BMP ID #	BMP Description	Responsible Dept./ Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 6	Planned Activities – April 09 to March 10
3-4	Drainage Infrastructure Inventory	Chief Engineer (Noel Baratta)	Identify DCR's roadway, parkway and boulevard drainage infrastructure and add to GIS Drainage Outfall Inventory/ database.	Goal Met - At the end of 2008, DCR's consultant had mapped drainage information for each of the urbanized area DCR properties. The drainage information was gathered from either scanned construction drawings or field surveys. DCR has continued to update the drainage inventory during its catch basin cleaning, maintenance, and illicit discharge detection efforts this permit year. Approximately 325 outfalls were visited over Permit Year 6 as part of one of these programs.	The infrastructure database is a dynamic work in progress. Updates are made to the database when new construction takes place. Corrections to the database will be made as areas are visited during the illicit discharge investigation and during catch basin cleaning and maintenance efforts. DCR's infrastructure database is now linked to inspection, maintenance and illicit discharge investigation records, providing consolidated records of the features and all work performed on the feature over the years. In addition, DCR will add features identified during maintenance work that were missed from the infrastructure database.

BMP ID #	BMP Description	Responsible Dept./ Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 6	Planned Activities – April 09 to March 10
3-5	Illicit Connection Sampling Program	Planning & Engineering (Noel Baratta)	Continue to prioritize and review known potential illicit connections. Once DCR, or its consultant, completes large portions of the drainage infrastructure inventory (BMP 3-4), DCR will develop a priority area list and focus on those systems. DCR will summarize the systems reviewed, the outcome of the reviews and any proposed follow up work in each annual report. The annual report will also include the priority areas list for the next permit year.	*Goal Met* - DCR's consultant performed the first year of a five-year rotating illicit discharge inspection program. The urban stormwater system was split spatially into five regions to facilitate inspections. All regions contain approximately 20% of DCR's system and all contain areas of special concern including public beaches impaired waters, etc. Over this past permit year, one region was inspected for illicit discharges according to the Charles River Illicit Discharge Detection and Elimination Protocol. On-site sample analysis was employed to get real-time results to help identify potential sources of illicit flows. Over Permit Year 6, 3,750 stormwater features were inspected on 60 miles and 5,750 acres of DCR property. Twelve cases of dry weather flow were identified with 7 suspected of illicit connections. A copy of the report is included as Appendix B. The drainage inventory was used to systematically locate stormwater features and trace sources of illicit connections. During the inspections, field crew updated the drainage inventory when data was inaccurate.	DCR will inspect 20% of their stormwater system within the urbanized area during the summer and fall of 2009. The Mystic Valley Pkwy and Alewife Brook Pkwy areas will be investigated. DCR will continue to update the drainage inventory and identify needs for maintenance and cleaning as part of this field effort. DCR will follow up on 7 cases of suspect illicit connections from Permit Year 6 inventory.

BMP ID #	BMP Description	Responsible Dept./ Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 6	Planned Activities – April 09 to March 10
3-6	Drainage Tie-In Policy	General Counsel/ Chief Engineer (Gary Davis/ Noel Baratta)	Develop a SOP regarding drainage tie-ins from private entities to DCR's MS4.	*Goal Met* – DCR utilizes their access permit program to "permit" drainage tie-ins when requested or when un-permitted connections are identified in the field.	Continue to review requested drainage connections through access permit program.
3-7	Develop Storm Water Control Agreements with Other MS4s	General Counsel (Gary Davis)	DCR will implement a program to work cooperatively with operators of interconnected MS4s in the instance where storm water discharges impact either system. DCR will develop control agreements with the discharging municipality.	*Goal Not Met* – DCR is waiting for boundary decisions regarding road ownership to be decided by the state legislature before moving forward with agreements between DCR and the municipalities where interconnections have been identified.	Once legislature finalizes the decision of which state entity(s) will own state roads, DCR will move forward with identifying interconnections for municipalities that share a property boundary with DCR owned roads.
3-8	Illegal Dumping	Operations (Curt Rudge)	Continue training of rangers regarding illegal dumping and work with law enforcement when necessary.	*Goal Met* – DCR trained rangers regarding illegal dumping. DCR cleaned the Muddy River in December 2008. They removed $20,000 worth of refuse including traffic control devices and other debris. Asbestos containing material was removed from Miles Standish Forest. DCR picks up and appropriately disposed of waste abandoned on side of road on an on-going basis.	DCR will perform cleaning at the Alewife Culvert along Route 2 in June 2009. Debris such as white good and a safe have been identified for removal. DCR will again perform cleaning and debris removal at Muddy River in 2009. A solid waste dumping investigation will take place at the Bradley Palmer State Forest.

Additional practices outside the urbanized area:

- EQ staff continued with water quality sampling efforts to characterize storm events. Staff completed a report of options for addressing or eliminating the 50 direct discharges to the Reservoir. This report will be used to discuss implementation with MassHighway and Massachusetts Water Resources Authority.

4. Construction Site Stormwater Runoff Control

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 6	Planned Activities – April 09 to March 10
4-2	E&S/ NPDES Contract Bid Item and Special Provisions	Planning & Engineering (Noel Baratta)	Prepare contract bid item and special provisions. Include in all new contracts which disturb more than one acre. Bid item will include erosion control specifications.	*Goal Met* - Erosion and sedimentation control specifications are included in revised contract language and standard contract documents.	Continue to include Erosion and Sediment Control Specification in all new construction projects.
4-3	Construction SWPPP Template	Planning & Engineering (Noel Baratta)	DCR will develop a SWPPP Template for use by Contractors on DCR projects. Template will be placed on DCR website for download by contractors.	DCR is currently instructing consultants and in-house staff to use EPA's template for appropriate projects.	DCR will continue using EPA's template.
4-5	On-going Construction Projects Web Page	External Affairs/ IT Dept. (Wendy Fox)	DCR will maintain the construction related web page that includes information regarding on-going DCR construction projects.	*Goal Partially Met* – The front page of DCR's web site highlights on-going design and construction projects. Information regarding projects that are subject to the Construction GP were not added.	DCR will add a link to EPA's eNOI web site for the public to use in accessing a list of DCR construction sites that exceed 1 acre disturbance.
4-6	Annual Erosion Prevention/ Sediment Control Training	Planning & Engineering (Noel Baratta)	Provide annual training to DCR construction management staff. Report number of attendees, topics covered and dates of training in annual report.	*Goal Not Met* – Training was not performed this year due to staff shortage and agency priorities.	Provide annual training.

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 6	Planned Activities – April 09 to March 10
4-7	Technical Assistance to ConComs	Water Supply Protection (John Scannell)	Continue to provide technical assistance and the staffing level necessary to provide timely responses.	*Goal Met* - Technical assistance was provided to twelve (12) Conservation Commissions regarding projects within the Quabbin and Wachusett Reservoirs. *Wachusett:* EQ continued to attend meetings of local boards and commissions and provide assistance to the volunteer boards. Technical Assistance funds were expended to provide trainings to watershed Planning Boards and Conservation Commissions. Three workshops were held on Riverfront and the Wetlands Protection Act, Review of Development Plans and on DEP revised Stormwater Regulations. *Quabbin:* Staff continued to provide direct technical assistance to a number of watershed communities on zoning, planning and technical engineering issues. In addition, they continued work on development of model wetland bylaws, a permit checklist, and a USFS-funded guidebook on watershed forest management. *(continued below)*	Continue to provide assistance as requested by Conservation Commissions.

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 6	Planned Activities – April 09 to March 10
4-7 (cont'd)	Technical Assistance to ConComs (cont'd)			Also, the limited funds available this year for community technical assistance were used to pay registration fees for Conservation Commission members from watershed communities to attend a wetland conference, and to set up three evening workshops that were offered to planning boards, conservation commissions and select boards in watershed communities.	
4-8	Contract Bid Item and Special Provisions Enforceability	Planning & Engineering (Noel Baratta)	Include notice, which defines the procedure to address storm water related problems identified at construction sites, in all new contracts.	*Goal Met* – Continued to require development of SWPPP and filing of NOI for construction sites which disturb more than one acre.	Continue to implement in all new projects which disturb more than one acre. Coordinate on contracts transferred to MassDOT, such as bridge work.
4-9	Construction Runoff Enforcement from DCR and/or Offsite Construction Pollution	General Counsel (Gary Davis)	Refer offsite/ non-DCR construction projects that are causing construction related pollution on DCR property to Attorney General's office as necessary. Refer to EPA is appropriate.	*Goal Met* – No construction related pollution action was necessary this year.	Refer problems identified to AG or EPA. Document in annual report.
4-10	Utility/ Drainage Tie-In Permit	Permitting (Don Guidobone)	Continue to require all offsite projects which need to tie into a DCR MS4 to receive a permit under this program.	*Goal Met* – Offsite projects are required to receive this permit before tying into a DCR MS4. Eight permits were issued in Permit Year 6. See Appendix C.	Require tie-ins to apply for a permit.

5. Post-Construction Stormwater Management in New Development and Redevelopment

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 6	Planned Activities – April 09 to March 10
5-1	Compliance with MA DEP Stormwater Management Policy	Planning & Engineering (Noel Baratta)	Apply Stormwater Management Policy Guidelines to all development/ redevelopment projects.	*Goal Met* - All new/ redevelopment projects were designed to incorporate the current stormwater best management practices.	All new/ redevelopment projects will be designed to incorporate the most current stormwater best management practices. Storm water discharges to tributaries to the Quabbin or Wachusett watersheds will be reviewed for applicable storm water policy and standards.
5-2	DCR Storm Water Handbook	Planning & Engineering (Noel Baratta)	Develop Handbook and issue department-wide and to Contractors. New projects will be designed in accordance with the Handbook.	Goal Partially Met - Storm Water Handbook has been updated to be consistent with the 2008 Massachusetts DEP Stormwater Policy. The Handbook is still in draft form.	Finalize Handbook.
5-3	Storm Water Handbook Training	Director of Human Resources (Patricia Vantine)	Provide 2 seminars within 6 months of issuing handbook to train internal personnel and consultants. Provide annual seminars thereafter. Record # of attendees and dates of training.	*Goal Met* – No action required since Handbook was not finalized.	Once handbook is finalized, provide two seminars to train internal personnel and consultants on Handbook.

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 6	Planned Activities – April 09 to March 10
5-4	BMP Long-Term Operation and Maintenance	Operations / Planning and Engineering (Jack Murray/ Noel Baratta)	DCR has committed 1.9 million dollars annually to provide long-term maintenance of BMPs on the schedule indicated in the Maintenance Activity Schedule of the SWMP.	*Goal Met* - Long-term operation and maintenance was accomplished using contracts established for pavement resurfacing and deferred maintenance. DCR's storm water management efforts are supported by operating and capital appropriations that totaled approximately $2.8 million in FY09 and expects to utilize all available funds to provide an appropriate level of service and to identify better practices to reduce pollution in runoff from roads and parkways	DCR has requested $2.8 million for long-term operation and maintenance of BMPs in FY10. Budget process/ deliberations are still in process.
5-5	Low Impact Development Projects	Water Resources (Anne Monnelly)	Actively work on the planning, permitting and implementation of one Low Impact Development (LID) project each year.	DCR performed design/ planning/ construction of the Miles Standish State Forest LID project. Also see response to BMP 5-8 and 5-9 below.	Design and permit an LILD project with Charles River Watershed Association (CRWA) and at Fort Phoenix. Also see response to BMP 5-8 and 5-9 below.
5-6	Walden Pond Stormwater Improvements *(outside of urbanized area)*	Planning & Engineering (Noel Baratta)	Complete design of storm water improvements and install.	*Goal Met* – Project complete in Permit Year 5. Parking lot with pervious pavement was vacuum swept to maintain infiltration.	Parking lots with pervious pavement will be cleaned using vacuum sweeping equipment.
5-7	Post Construction Runoff Enforcement from Offsite Pollution	Planning & Engineering (Noel Baratta)	Refer off site projects that runoff to DCR property to Attorney General's office as necessary.	*Goal Met* – No post construction runoff enforcement actions necessary this permit year.	Refer problems identified to AG or EPA. Document in annual report.

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 6	Planned Activities – April 09 to March 10
5-8	Ipswich River EPA Targeted Watershed Grant – Low Impact Development (LID) Subdivision Demonstration Project	Water Resources (Anne Monnelly)	The DCR received a $1.04 million grant from the Environmental Protection Agency's Targeted Watershed program to demonstrate an integrated approach to addressing the problems facing the Ipswich River. This approach encompasses two strategies: • Low-Impact Development (LID) – landscaping and design techniques that capture stormwater and recharge it to the groundwater • Water Conservation – education strategies and technologies that reduce demand on water supplies, and associated groundwater pumping, especially during dry months	DCR selected Partridegeberry Place, a new 20-lot subdivision in Ipswich designed by Meridian Associates, as the LID subdivision demonstration site. The developer, the Martins Companies, completed construction of the key LID features in December 2006. DCR also selected an adjacent conventional subdivision on Hood Farm Road as a basis for comparison for the runoff monitoring. USGS developed a design for monitoring site runoff from both the LID and conventional subdivisions and installed monitoring equipment. Monitoring took place throughout the summer of 2008 and a final report was published in the fall of 2008. On May 15th, 2008 the Metropolitan Area Planning Council and the Ipswich Planning Department partnered with the Martins Companies to host a tour of Partridgeberry Place for interested planners, conservation commissioners, and other interested parties.	For up-to-date planned activities for all Ipswich River Targeted Watershed Grant projects, please visit http://www.mass.gov/dcr/waterSupply/ipswichRiver/index.htm

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 6	Planned Activities – April 09 to March 10
5-8a	Ipswich River EPA Targeted Watershed Grant - Green Roof Demonstration Project	Water Resources (Anne Monnelly)	Monitor quality and quantity of runoff from the green roof at Whipple Annex and conventional roof at Ipswich Town Hall. Summarize results and include in annual report.	The green roof demonstration site, Whipple Annex, is a former school building, which is being redeveloped as affordable housing for seniors, by the North Shore Housing Trust. The green roof covers the entire rooftop, approximately 3,000 square feet, including a steeply-pitched stairwell headhouse. The U.S. Geological Survey is collecting runoff samples from the green roof to assess both the quantity and quality of runoff. Water quality samples will be analyzed for a range of parameters, including conductivity, pH, nitrogen, phosphorus, metals, and total petroleum hydrocarbons. Data from storms was collected throughout the summer of 2008. The data from the green roof will be compared to data from the conventional roof at Ipswich Town Hall to assess the effectiveness of the green roof in reducing rooftop runoff and removing pollutants.	DCR will perform a presentation of the results in May 2009.

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 6	Planned Activities – April 09 to March 10
5-8b	Ipswich River EPA Targeted Watershed Grant - Permeable Paving Demonstration Project	Water Resources (Anne Monnelly)	Continue groundwater quality sampling for one year upon completion of project construction. Summarize results in annual report.	Silver Lake is an important recreational resource; however, the lake had degraded from nutrients, sediment, and bacteria from the surrounding conventional stormwater system and nonpoint source runoff. Beach closures due to high bacteria counts were a repeated occurrence. This project incorporated three LID practices (permeable paving materials, bioretention cells, and vegetated water quality swales) designed to reduce runoff volume, improve water quality, and enhance groundwater recharge. There have been no beach closures, due to fecal bacteria, during 2006, 2007, or 2008. However, there was one closure due to a cyanobacteria bloom. This year, USGS installed seven wells in the parking lot to provide data on groundwater levels and groundwater quality. USGS monitored preconstruction conditions quarterly and after a few large storms. Following construction, USGS began monitoring groundwater levels and collecting samples monthly. Sampling is designed to detect any changes in groundwater quality associated with recharge from the parking lot.	USGS will publish a report of pre- and post- construction groundwater data in June 2009.

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 6	Planned Activities – April 09 to March 10
5-8c	Ipswich River EPA Targeted Watershed Grant - LID at Silver Lake	Water Resources (Anne Monnelly)	Perform sampling of stormwater volumes and water quality for one year upon completion of project construction. Summarize results versus pre-construction in Year 5 annual report.	This project incorporates several LID techniques to replace the conventional stormwater collection system in two streets draining to Silver Lake. Stormwater flow paths were disconnected from the piped drainage system by directing stormwater to rain gardens and porous pavers. Eleven rain gardens are located in the roadway rights-of-way. The roadway edges in three areas along Silver Lake Avenue were resurfaced with porous pavers with underlying infiltration beds. Sampling for changes in water quality and discharge quantity continued for 15 months, post-construction, concluding in October 2007. In June of 2008, a Raingarden Maintenance Work Day was held for residents to inform them and encourage them to manage the raingardens nearest their homes.	Analysis of data is ongoing and a published report is expected in June 2009.

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 6	Planned Activities – April 09 to March 10
5-8d	Ipswich River EPA Targeted Watershed Grant - Rainwater Harvesting	Water Resources (Anne Monnelly)	Continue data collection of outdoor water use or each participating household with rainwater harvesting systems through the irrigation seasons of 2007 and 2008. Compare use with historic records and summarize in annual report. Install large underground system.	This project funded installation of roughly 40 rainwater harvesting systems in residential settings. The systems consist of a storage tank, a pressure pump to aid in water distribution, a spigot for a hose, and a water meter to measure flow. Three sizes of storage tanks were installed. A project close-out meeting was held with resident participants in May 2008 to celebrate conclusion of data collection, listen to preliminary results, fill out feedback surveys, and hear tips on eco-friendly landscaping techniques.	A large-capacity (8,000-gallon) underground storage vault will be installed at the Boutwell Elementary School in Wilmington, to supply water for irrigating the adjacent ball field. The water meter attached to each rainwater harvesting system provided data on the volume of rainwater pumped from the storage tanks for outdoor use. A portion of this volume was considered potable water conserved, based on recommendations of a technical advisory committee. In addition, Wilmington Water Department records on each residential participant's domestic water use were analyzed to compare domestic water demand before and after installation of the rainwater harvesting system. Analysis of savings from the residential systems is underway and a report is expected in spring 2009.

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 6	Planned Activities – April 09 to March 10
5-8e	Ipswich River EPA Targeted Watershed Grant - LID Ball Field	Water Resources (Anne Monnelly)	Begin data collection of water use and continuous soil moisture retention on field in 2007 and continue through summer of 2008.	A portion of a municipal athletic field complex, located adjacent to the river at Ipswich River Park and totaling eight acres, was redeveloped to maximize infiltration and minimize irrigation requirements and application of fertilizer and pesticides. The town monitored the soil moisture of the amended field and the control fields; and the volumes of water used on each of the four fields in the complex. The watering needs and soil moisture of the amended field were compared to the conventionally treated fields.	Analysis of savings is underway and a report is expected in the spring of 2009.

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 6	Planned Activities – April 09 to March 10
5-8f	Ipswich River EPA Targeted Watershed Grant - Weather Based Irrigation	Water Resources (Anne Monnelly)	Compile and analyze post-installation water use records for the 25 weather-based irrigation controllers through summer 2008. Summarize in annual report.	During Permit Year 6 a total of 25 weather-based irrigation controller switches were installed on both residential properties and municipal athletic fields in five communities. These devices contain an on-site rain gage and receive continuously transmitted wireless data on solar radiation, temperature, relative humidity, and wind which is used to deliver the optimum amount of water needed by the landscape. A project close-out meeting was held with residential participants in April 2008 to celebrate the conclusion of data collection, listen to preliminary study results, provide feedback about the systems, and hear tips on eco-friendly landscaping techniques. Also, individual "conclusion interviews" were held with each of the 5 municipal partners in the spring of 2008 to present preliminary results and receive feedback on the system. Data on water use was recorded using readings from individual water meters dedicated to the irrigation system. These readings were compared to water use at control sites using conventional irrigation technologies and to records on pre-installation water use of project participants.	Analysis of the water savings associated with both the residential and ball field application of this technology is underway and a report is expected in spring 2009.

5. Additional

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 6	Planned Activities – April 09 to March 10
	Breakheart Reservation Pond Improvements Project	Planning & Engineering (Noel Baratta)		DCR's consultant performed site visits, survey and hydrologic analysis of the Breakheart Reservation's pond system (two ponds). During the analysis, DCR discovered that the two ponds are held by poor condition, high hazard dams. DCR stormwater personnel met with DCR dam personnel to discuss the issues at both ponds and possible improvements.	DCR will continue discussions with DCR dam personnel to determine a course of action at the Breakheart Reservation dams/pond to reduce beach erosion and improve the condition of the dams.
	Mt. Greylock	Planning & Engineering (Noel Baratta)		DCR is in the process of designing a lodge/conference center and camp ground at Mt. Greylock. 220 catch basins were installed in compliance with historic parkway guidelines.	As-built plans will be georeferenced and included in the drainage database.
	Mt. Wachusett (out of UA)	Planning & Engineering (Noel Baratta)		DCR recommended construction controls during utility installation at this facility.	Review construction controls during construction. Current project is summit road reconstruction..

6. Pollution Prevention and Good Housekeeping

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 6	Planned Activities – April 09 to March 10
6-1	Vehicle Washing Policy	Operations (Jack Murray)	Maintain practice of washing vehicles at off-site locations into state-wide written policy and implement. Identify off-site commercial (snow plow equipment) vehicle washing facility.	*Goal Met* - Policy implemented in Winter 06-07 for smaller cars and trucks. Pursued locating off-site commercial (snow plow equipment) vehicle washing facility but were not successful.	DCR will coordinate with MassDOT to identify off-site commercial (snow plow equipment) vehicle washing facility/vendor.
6-2	Floor Drain Policy	Planning & Engineering (Noel Baratta)	Maintain plan for floor drain use and servicing.	*Goal Met* - Plan is maintained, staffed and funded under Clean State Initiative.	Maintain plan.
6-3	CB Cleaning Policy	Chief Engineer/ Operations (Noel Baratta/ Jack Murray)	DCR will develop a written plan for regular catch basin cleaning to be implemented in DCR's fiscal year 2006 and thereafter.	*Goal Met* - Policy finalized and implemented statewide.	Continue to implement policy.
6-4	CB Inspection/ Repair Policy	Chief Engineer/ Operations (Noel Baratta/ Jack Murray)	DCR will develop an agency wide policy for implementing a schedule for inspecting catch basins and prioritizing repairs of catch basins and implement.	*Goal Met* – Policy has been finalized. Priority catch basins identified during 2008-2009 were repaired in the same fiscal year and often within two weeks.	Continue to implement policy.

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 6	Planned Activities – April 09 to March 10
6-5	Street Sweeping Policy	Operations (Jack Murray)	Create and implement agency-wide policy on all roads, parkways and parking lots.	*Goal Met* – Policy has been finalized and implemented. From September through December DCR and contractors (American Sweeping) swept Urban Parks and parkways monthly in accordance with DCR's Maintenance Activity Schedule. Along many parkways neighboring residents, businesses and private landscapers raked leaves to the curbing which resulted in a significant burden to street sweeping activities. DCR contractors continued street sweeping into the 3rd week of December but leaves remained in some areas. From September through December, over 1,330 cubic yards of street sweepings were collected from DCR parks and parkways. A total of approximately 6,560 cubic yards of street sweeping were removed from DCR roads and parkways in 2008.	Continue to implement policy. . DCR is planning to purchase several sidewalk vacuums to clean beach parking lots and remove trash in tight areas adjacent to curbs and parked cars this summer. DCR plans to purchase 4 goose waste buster vacuum units this fiscal year. The units will be used at park facilities with significant goose waste. A unit is currently used at Georges Island and found to be effective. DCR is pursuing a new sweeping contract that will require high performance regenerative-air sweepers. The new contract will be used for the sweeping in the Fall of 2009.
6-6	IPM Policy	Water Supply Protection (John Scannell)	Create and implement agency-wide policy.	*Goal Partially Met* - Create draft plan for internal review. Test studies being performed.	Continue to develop policy.

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 6	Planned Activities – April 09 to March 10
6-7	VMP Training	Planning & Engineering (Noel Baratta)	Provide training on DCR Vegetation Management Plan (VMP) to internal maintenance staff once every two years. Provide training, if required, for seasonal workers without prior experience on off years.	*Goal Met* – DCR follows VMPs provided by municipalities to the extent possible.	Provide training for seasonal workers. Training will include review of VMPs prior to seasonal brush cutting.
6-9	EMS	Planning & Engineering (Noel Baratta)	Continue to provide first response for emergency management situations such as spills and/ or coordinate with Mass. State Police, as appropriate. Continue to provide annual training in spill response coordinated with DEP, MWRA, emergency responders and other local responders.	*Goal Met* - DCR coordinates responses with Mass State Police, Coast Guard and DEP as necessary. DCR was contacted by the Coast Guard a few times this year to determine if oil sheens had been identified during DCR bridge inspections in the Charles River.	Continue to coordinate responses and provide annual training.
6-10	Waste Disposal	Planning & Engineering / Operations (Noel Baratta/ Jack Murray)	DCR will continue to properly dispose of waste.	*Goal Met* - DCR has budgeted for disposal of catch basin and street sweeping wastes. Spent $300K on waste disposal.	Continue to properly dispose of waste and include in budgets.
6-11	Beneficial Use Determination (BUD)	Planning & Engineering (Noel Baratta)	DCR will work to determine a beneficial use determination (BUD) for catch basin residuals.	*Goal Partially Met* – DCR is exploring composting street sweepings. DCR has discussed this possibility with a street sweeping contractor who has a facility which composts the street sweeping material.	Continue to evaluate beneficial use of street sweepings, if possible, using state approved service providers.

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 6	Planned Activities – April 09 to March 10
6-14	CB Repair/ Discharge Pipe Cleaning Needs Assessment	Planning & Engineering (Noel Baratta)	Perform an annual state wide assessment of the condition and cleaning requirements of visible proximate DCR lateral piping and catch basin repair needs. Pilot project in 2005. Agency wide program in 2006. Annual reports will summarize piping requiring cleaning and catch basin to be repaired and report on progress.	*Goal Met* - Over the spring and summer, DCR continued to systematically clean catch basins and water jet the associated outlet drain pipes using private contractors overseen daily by DCR staff. From September through December, 1,653 catch basins were cleaned and water jetted and their locations recorded using GPS. (See individual tables for locations) For the fiscal year ending in June 2009, DCR spent $1.6 M to clean and repair catch basins. DCR has begun design and permitting for outfall repairs at the Cambridge Boat Club on the Charles River. DCR has also performed repairs on BU bridge to provide treatment, via Stormceptors, to previously untreated stormwater discharge. DCR has reviewed Quincy Shore Drive at East Squantum Street, Quincy for potential illicit connections.	DCR will continue to systematically clean catch basins and water jet the associated outlet drain pipes, as determined necessary, using private contractors overseen daily by DCR staff. DCR anticipates dedicating similar budget ($1.6 M) and level of effort this year for catch basin cleaning and repair. Complete repair of outfall at Cambridge Boat Club. DCR will investigate additional areas where drainage infrastructure has been identified as obstructed or broken during statewide CB cleaning activities. Use CCTV and / or magnetic probes to identify necessary repairs or remedy. Areas will include: ▪ Morrisey Boulevard ▪ Day Boulevard ▪ McGrath Highway ▪ Embankment Road ▪ Memorial Drive ▪ Soldiers Field Road ▪ Storrow Drive ▪ Charlesgate ▪ Truman Highway

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 6	Planned Activities – April 09 to March 10
6-17	Maintenance Tracking System	Planning & Engineering/ Operations (Noel Baratta/ Jack Murray)	Develop a maintenance tracking system. Add storm water infrastructure information inventoried in BMP 3-4. Include inspection/ maintenance schedule and create reports of BMPs that are "scheduled" for cleaning.	DCR's consultant has developed a global positioning system (GPS) program to work with DCR's GPS operating systems and the existing geospatial stormwater infrastructure database to record maintenance activities. The consultant has begun to train DCR employees in recording and processing data using the new system. The consultant has organized previous DCR maintenance records into a database linked to the stormwater infrastructure database.	DCR's consultant will continue to work with DCR's maintenance team to track maintenance needs and actions.

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 6	Planned Activities – April 09 to March 10
6-18	Maintenance Activity Schedule	Operations (Jack Murray)	Maintain infrastructure and roadways in compliance with maintenance activity schedule.	*Goal Met* – **Street Sweeping**: To insure adequate street sweeping frequency, DCR entered into a three-year renewable contract in 2007 with a street sweeping contractor to clean certain DCR parkways and roads. The contract provides for sweeping roadways that discharge to impaired receiving waters using mechanical and vacuum sweeping equipment at least four times per year, and monthly in areas where cars are allowed to park. Car parking in these areas has restricted access to the curb line thereby reducing the effectiveness of street cleaning. The program is outlined on DCR's web site at http://www.mass.gov/dcr/sweep.htm The DCR street sweeper fleet (nine sweeper units) received maintenance periodically during the year and were operated as necessary by DCR to keep parking lots and roadways parkways as clean and trash free as possible. (*continued below*)	Continue to comply with maintenance activity schedule. **Street Sweeping**: Continue to provide and fund contract for sweeping roadways that discharge to impaired receiving waters using mechanical and vacuum sweeping equipment at least four times per year, and monthly in areas where cars are allowed to park. DCR is also pursuing a new sweeping contract that will require high performance regeneration air sweepers. The new contract will be used for the sweeping in the Fall of 2009.

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 6	Planned Activities – April 09 to March 10
6-18 (cont'd)	Maintenance Activity Schedule			Full size street sweepers and smaller vacuum units are used by Division of Urban Parks and Recreation (DUPR.) mostly on beach parkways and parking lots to keep these seasonal facilities as clean and trash free as possible. Beach sand screener/sanitizers were operated on a daily basis at Revere Beach, Nantasket Beach, Wollaston Beach, Nahant Beach and other high use beach areas to reduce contaminants in the beach sand (cigarette butts, plastic bottles, etc.) that threaten surface water quality and to improve beach experiences for visitors. These beach maintenance services are performed by staff that also operates street sweepers when not operating beach sanitizers. DUPR district managers have the responsibility to prioritize and schedule these tasks. DCR also composted algae pulled from select beaches this last year. *(continued below)*	DCR is planning to purchase several sidewalk vacuums to clean beach parking lots and remove trash in tight areas adjacent to curbs and parked cars this summer. DCR plans to purchase 4 goose waste buster vacuum units this fiscal year. The units will be used at park facilities with significant goose waste. A unit is currently used at Georges Island and found to be effective.

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 6	Planned Activities – April 09 to March 10
6-18 (cont'd)	Maintenance Activity Schedule			**Leaf Removal:** To improve seasonal leaf removal DCR purchased three (3) high efficiency leaf loader machines to assist removal of leaves and debris from urban parkways. This new equipment enables DCR to better clean those roads lined with oaks and other trees that drop their leaves late in the season and often cannot be removed effectively before winter conditions prevent their removal. **Catch Basins**: Over the spring and summer DCR continued to systematically clean catch basins and water jet the associated outlet drain pipes using private contractors overseen daily by DCR staff. From September through April 2009, 1,653 catch basins were cleaned and water jetted with these locations recorded using GPS. For the fiscal year ending in June 2009 DCR spent $1.6 M to clean and repair catch basins. *(continued below)*	**Leaf Removal:** DCR plans to develop and issue a specific leaf removal contract. The individual contract will allow for removal of leafs ahead of the streets being swept and to compost leaves collected. **Catch Basins**: DCR will continue to systematically clean catch basins and water jet the associated outlet drain pipes, as determined necessary, using private contractors overseen daily by DCR staff. DCR anticipates a reduced budget ($1.2 M) and level of effort this year when compared to FY09.

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 6	Planned Activities – April 09 to March 10
6-18 (cont'd)	Maintenance Activity Schedule			**Material Storage Yard Maintenance**: MassHighway has taken over the deicing and snow operations for all DCR roads. Therefore, material storage yard maintenance is no longer relevant. Four urban parks do store street sweeping and catch basin cleaning on-site. The accumulation areas are marked off for collection to reduce illegal dumping. **Fleet Maintenance**: DCR fleet manager (Joe Suppa) oversees the compliance with fleet maintenance. Individual facilities are reviewed in Table 2-7 of this report.	**Material Storage Yard Maintenance:** Not applicable. **Fleet Maintenance:** Fleet manager will review fleet maintenance schedule.
6-19	Winter Storm Plan	Operations (Jack Murray)	Continue to maintain a responsible winter storm program and provide sufficient funding.	*Goal Met* – DCR continued to maintain a winter storm program, where DCR retains responsibility (e.g. sidewalks, parking lots, certain bike paths, etc.). Massachusetts Highway Department has responsibility for snow and ice control on most other DCR roads and parkways.	Continue to maintain winter storm program where DCR retains responsibility. Responsibility for DCR roads and parkways retained by MassHighway will be transferred to MassDOT.

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 6	Planned Activities – April 09 to March 10
6-20	Pet Waste Management	Operations (Jack Murray)	Continue pet waste management program. Continue to train DCR park rangers to monitor this program. Coordinate with law enforcement if necessary.	*Goal Met* – " Mutt Mitt" Dog Waste Collection Stations were maintained at locations including: ▪ Breakheart Reservation ▪ Dorchester Shores Reservation ▪ Fells Reservation (Sheep Fold) ▪ Revere Beach Reservation	Maintain pet waste management program. Install new collection stations at Charles River Reservation.
6-21	Pool Discharge SOP	Planning & Engineering (Noel Baratta)	Update and re-issue SOP. Provide training to pool staff.	*Goal Met* – DCR updated and re-issued SOP including dechlorinization procedures.	Provide training to pool staff, as necessary.

7. BMPs for Meeting Total Maximum Daily Load (TMDL) Waste Load Allocations (WLA)

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 6	Planned Activities – April 09 to March 10
7-1	Wetland Protection Act Compliance	Operations/ Planning & Engineering (Jack Murray / Noel Baratta)	Continue compliance with WPA.	*Goal Met* - Wetlands Protection Act is actively enforced at all DCR properties including those not located within urbanized areas. DCR has staff specifically dedicated to WPA compliance in Wachusett and Quabbin Reservoir watersheds.	Continue compliance.
7-2	401 Water Quality Certification	Operations/ Planning & Engineering (Jack Murray / Noel Baratta)	Continue compliance with 401 WQ Certification.	*Goal Met* - DCR received 401 WQ certifications for the following projects: ▪ Pankapoag Dam ▪ Muddy River Dredging with Army Corps ▪ Upper Mystic Lake Dam ▪ Other dam maintenance programs.	Continue compliance.
7-3	Cultural Resources Review	Chief Archeologist (Tom Mahlstead)	Continue to review potential impact to historic properties during conceptual design stage.	*Goal Met* - DCR reviews all projects for potential impact to historic properties during design phase.	Continue reviews and use subcontractors as necessary.
7-4	Chicopee Basin, French Basin, Mill River Basin, Northern Blackstone and Connecticut River TMDLs	Water Supply Protection/ Chief Forester (John Scannell/ Barbara Black)	Provide summary table of timber harvesting activities, date forest cutting plan was approved and proposed BMPs in each annual report.	*Goal Partially Met* - 384 acres and 7 timber sales were conducted in the Northern Blackstone Basin.	Provide summary report in annual report.
7-5	Connecticut Basin TMDL - Train Conservation Commission on	Chief Forester (Barbara Black)	Present short seminar for each Conservation Commission.	*Goal Met* - Training provided.	Perform presentations during Spring 2009

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 6	Planned Activities – April 09 to March 10
	Timber Harvest BMPs				
7-6	Permit Year TMDL Summary	Planning & Engineering (Noel Baratta)	Include summary of TMDL reports approved by EPA during the previous permit year which include recommendations for actions by DCR in annual report.	*Goal Met* – Section 7b of this annual report includes a summary of the current Final TMDLs and those that include implementation recommendations which impact DCR (Table 8).	Continue to be involved in the development of draft TMDLs and implement recommendations summarized in Table 8.
7-7	Priority Resource Area Review Program	Planning & Engineering (Noel Baratta)	Implement a program to review the outfalls identified in the outfall inventory which discharge to one or more of the resources outlined in Part V and IX of the permit.	*Goal Partially Met* – DCR has updated the receiving water body table (Appendix C of the March 2008 SWMP) to reflect the outfalls identified in the drainage inventory. The table summarizes the number of outfalls by sub-basin number and identifies the impaired waterbody included in the sub-basin. This analysis showed priority areas distributed throughout the state. From this list, DCR has developed a 5-year illicit discharge inspections rotation that groups areas spatially for ease of program operations. DCR has performed illicit discharge inspections on one-fifth of its stormwater system in urban areas which include systems that discharge to impaired waters. *(continued below)*	DCR will continue the illicit discharge inspection program performing inspections on the second one-fifth of the system. This upcoming program will include systems that discharge to several impaired waters including the Mystic River and Lakes.

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 6	Planned Activities – April 09 to March 10
7-7 (cont'd)				**Blair Pond Improvements** -DCR identified the need for improvements to Blair Pond to improve hydrologic function and aesthetics of the pond. Blair Pond receives water from Clay Pit Pond in Belmont which is listed on the Massachusetts 303d list as Category 5 for Pesticides and discharges to Alewife Brook which is Category 5 Impaired Needs TMDL for Metals, Nutrients, Organic enrichment/Low DO, Pathogens, oil and grease, taste +odor + color, and "objectionable deposits". In Permit Year 6, DCR's consultants performed a hydraulic and water quality analysis of Blair Pond and recommend improvements to increase its hydrologic function and aesthetics. **Quincy Shore Reservation Improvements** - DCR identified flooding problems along Quincy Shore Drive near the intersection with East Squantum Street in Quincy. The outlet discharges to Quincy Bay which is listed on the Massachusetts 303d list as Category 5 - Impaired Needs TMDL for priority organics and pathogens. *(continued below)*	**Blair Pond Improvements** - DCR's consultants will develop a final design for improvements at Blair Pond. The design will include dredging and disposal of contaminated sediments and the development of a sediment forebay to collect sediments in incoming water. These improvements will increase water depths in the pond, increase water and sediment quality, and give DCR a way of easily removing future sediment deposits. **Quincy Shore Reservation Improvements -** DCR's consultant will develop final design plans for stormwater improvements to alleviate the flooding. DCR will submit a WPA NOI to the Quincy ConCom to construct the improvements.

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 6	Planned Activities – April 09 to March 10
7-7 (cont'd)				In Permit Year 6, DCR's consultants develope d alternatives for stormwater design improvements that will alleviate flooding in the area. **Lower Charles River Cambridge Boat Club** – eliminate broken leaking sewer lines. Replace sidewalk.	**Lower Charles River Cambridge Boat Club** – install LID permeable pavement in parking lot **Alewife Sediment Sampling and Assessment** – DCR's consultant will evaluate bottom sediments in Alewife Brook in the approximately 3,000 feet between Broadway and the Mystic River in Cambridge, Massachusetts. They will analyze the sediment sample results to determine which disposal methods would likely be permitted if the sediments were to be dredged.

Table 2: Parkway Best Management Practices

Table 2: Parkway Best Management Practices

			Permit Year 6 Activity																				
BMP #			2-1	2-5	2-7	2-8	3-1	3-4	3-5	6-13	6-14	6-15	6-16	6-18									7-7
BMP			Abide by MOU with CLF and CRWA	Public Concerns/ Feedback on DCR Website	Massachusetts Water Resource Commission	Lakes and Ponds Program	Drainage Inventory	Drainage Infrastructure Inventory	Illicit Connection Sampling Program	Roadway and Drainage Infrastructure Assessment	CB Repair/ Discharge Pipe Cleaning Needs Assessment	Wet Weather Review and Repair	Implement Parkways Short Term Measures	Maintenance Activity Schedule									Priority Resource Area Review
Facility/ Town	**Parkway Street Associated With**		**Measurable Goal**	Abide by MOU with CLF as it relates to maintenance of parkway surfaces, curbing and drainage infrastructure	Forward concerns/ feedback received to appropriate dept. Track response to concerns.	Provide technical and staff support to MWRC.	Continue to Sponsor Program.	Locate outfalls	Develop state-wide drainage infrastructure map.	Continue to prioritize and review known potential illicit connections.	Perform state wide assessment of roadways and infrastructure conditions annually.	Perform assessment annually. Create assessment report.	Perform an annual review of roads and parking lots within UA during wet weather conditions to identify ponding or flooding areas.	Implement measures. Continue to note progress to CLF, CRWA and EPA in periodic reports until fully addressed.	Sweep Streets Annually	Clean CB and piping every two years.	Inspect Detention Ponds Annually	Inspect water quality swales annually	Inspect drainage swales annually	Inspect infiltration systems 2x/yr.	Inspect water quality inlets 2x/ yr.	Review for erosion and storm water issues annually.	Review outfalls which discharge to priority resource
Agassiz Road		Boston	In Prog	Met	Met	Met	Met	Met		Met	Met			Met	Cleaned						Met	Not Evaluated
Alewife Brook- Concord Ave Rotary		Cambridge	In Prog	Met	Met	Met	Met	Met		Met	Met			Met	Portion Cleaned						Met	Not Evaluated
Alewife Brook Parkway		Cambridge, Somerville	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned	Retention/ Recharge Basin					Met	Not Evaluated
Arborway	Emerald Necklace Parkways	Boston	In Prog	Met	Met	Met	Met	Met			Met			Swept Monthly	Portion Cleaned						Met	Not Evaluated
Arlington Road		Brookline	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated
Arlington Street		Medford	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated
Arsenal Street	Charles River Reservation Parkways	Watertown	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated
Austin Street		Boston, Cambridge	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated
Babe Ruth Park Drive		Boston	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated
Beach Street		Medford	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Portion Cleaned						Met	Not Evaluated
Beacon Street		Boston	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated
Bellevue Hill Road	Stony Brook Reservation Parkways	Boston	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated
Berkeley Street		Boston	In Prog	Met	Met	Met	Met	Met			Met			Met	Not Cleaned						Met	Not Evaluated
Birmingham Parkway	Charles River Reservation Parkways	Boston	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated
Blue Hill River Road	Blue Hills Reservation	Canton, Milton	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Portion Cleaned						Met	Not Evaluated
Blue Hill Street		Canton	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated
Blue Hills Parkway		Milton	In Prog	Met	Met	Met	Met	Met			Met		In Prog	Swept Monthly	Cleaned						Met	Not Evaluated
Boston University Bridge		Boston, Cambridge	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated
Boulevard Road		Wellesley	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated
Boundary Road	Fellsmere Park Parkways	Malden	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated
Boylston Street		Boston	In Prog	Met	Met	Met	Met	Met			Met			Swept Monthly	Cleaned						Met	Not Evaluated
Broad Sound Avenue		Revere	In Prog	Met	Met	Met	Met	Met			Met			Met	Portion Cleaned						Met	Not Evaluated
Broadway		Chelsea, Revere, Everett	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated
Brook Road		Milton	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated
Brookline Avenue		Boston	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated
Brookline Street		Cambridge	In Prog	Met	Met	Met	Met	Met			Met			Met	Not Cleaned						Met	Not Evaluated
Brooks Street		Boston	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Cleaned						Met	Not Evaluated
Brush Hill Road		Milton	In Prog	Met	Met	Met	Met	Met			In Prog			Swept Monthly	Portion Cleaned						Met	Not Evaluated
Bunker Hill Lane		Quincy	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Portion Cleaned						Met	Not Evaluated
Cambridge Parkway	Chestnut Hill Driveway	Cambridge	In Prog	Met	Met	Met	Met	Met			Met			Swept Monthly	Not Cleaned						Met	Not Evaluated
Cambridge Parkway Connector		Cambridge	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated
Cambridge Street		Boston	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated
Carroll Parkway		Lynn	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated
Casassa Overpass		Revere	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated
Casey Highway (Msgr.)		Boston	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Portion Cleaned						Met	Not Evaluated
Centre Street		Boston	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated
Charles River Dam Road		Boston, Cambridge	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated
Charles River Road	Charles River Reservation Parkways	Watertown	In Prog	Met	Met	Met	Met	Met		Completed repair of fourteen (14) storm water headwalls and drain pipes.	Met			Met	Cleaned						Met	Not Evaluated
Charles Street		Boston	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated
Charlesgate East		Boston	In Prog	Met	Met	Met	Met	Met			Met			Met	Portion Cleaned						Met	Not Evaluated
Charlesgate Overpass		Boston	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated
Charlesgate West		Boston	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated
Charlestown Avenue		Cambridge	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Portion Cleaned						Met	Not Evaluated
Chestnut Street		Boston	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated
Chickatawbut Road	Blue Hills Reservation	Braintree, Milton, Quincy	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated
Columbia Road		Boston	In Prog	Met	Met	Met	Met	Met			Met			Swept Monthly	Cleaned						Met	Not Evaluated
Commandant's Way		Chelsea	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated
Commercial Avenue		Cambridge	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Portion Cleaned						Met	Not Evaluated
Commonwealth Avenue		Boston	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Portion Cleaned						Met	Not Evaluated
Concord Avenue		Cambridge	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated
Connector Mystic Valley Parkway	Mystic Valley Parkway	Medford	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated
Connector To Eliot Bridge	Eliot Bridge	Cambridge	In Prog	Met	Met	Met	Met	Met			Met			Met	Not Cleaned						Met	Not Evaluated
Constitution Beach Road		Boston	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated
Crowell State Forest Road		Sandwich	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Portion Cleaned						Met	Not Evaluated
Dam Road		Southborough	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Portion Cleaned						Met	Not Evaluated
David G Mugar Way		Boston	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated
Day Boulevard Extension		Boston	In Prog	Met	Met	Met	Met	Met			In Prog			Swept Monthly	Portion Cleaned						Met	Not Evaluated
Dedham (Boulevard) Parkway		Boston, Dedham	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated
Deer Park Road		Brewster	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Portion Cleaned						Met	Not Evaluated
Earhart Dam Road		Everett	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated
East Border Road	Fellsway Connector Parkway	Malden, Medford	In Prog	Met	Met	Met	Met	Met			Met			Met	Portion Cleaned						Met	Not Evaluated
East Broadway		Boston	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated
Eastern Avenue		Lynn	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated
Eliot Bridge		Watertown, Brighton	In Prog	Met	Met	Met	Met	Met			Met			Met	Portion Cleaned						Met	Not Evaluated
Eliot Circle		Revere	In Prog	Met	Met	Met	Met	Met			Met				Cleaned						Met	Not Evaluated
Elm Road	Breakhart Reservation Parkways	Saugus	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Portion Cleaned						Met	Not Evaluated
Elm Street	Middlesex Fells Reservation Parkways	Medford,Saugus, Wakefield	In Prog	Met	Met	Met	Met	Met			Met			Met	Not Cleaned						Met	Not Evaluated
Embankment Road		Boston	In Prog	Met	Met	Met	Met	Met			Met			Met	Portion Cleaned						Met	Not Evaluated
Enneking Parkway	Stony Brook Reservation Parkways	Boston	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated
Enneking Parkway Branch		Boston	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated
Everett Street		Boston	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Portion Cleaned						Met	Not Evaluated
Fellsway		Malden, Medford, Somerville, Stoneham	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated
Fellsway East		Malden, Melrose, Stoneham	In Prog	Met	Met	Met	Met	Met			Met			Swept Monthly	Cleaned						Met	Not Evaluated
Fellsway West		Malden, Medford, Somerville, Stoneham	In Prog	Met	Met	Met	Met	Met			Met			Swept Monthly	Cleaned						Met	Not Evaluated
Fenway	Emerald Necklace Parkways	Boston	In Prog	Met	Met	Met	Met	Met		Completed closed-circuit television investigations of several catch basins and drains. Repairs are being evaluated to remedy the problems identified. DCR worked with the Museum of Fine Arts, to coordinate necessary repairs and pipe replacement to address long-term flooding problems along the Fenway near Museum Way.	In Prog		In Prog	Swept Monthly	Portion Cleaned						Met	Not Evaluated
Fenway Connector To Park Drive		Boston	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Portion Cleaned						Met	Not Evaluated
First Street		Cambridge	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated
Forest Grove Road		Waltham	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated
Forest Street	Breakhart Reservation Parkways	Saugus	In Prog	Met	Met	Met	Met	Met			Met			Met	Portion Cleaned						Met	Not Evaluated
Franklin Park Circle		Brookline	In Prog	Met	Met	Met	Met	Met			Met				Portion Cleaned						Met	Not Evaluated

Table 2: Parkway Best Management Practices

			Permit Year 6 Activity																					
		BMP #	2-1	2-5	2-7	2-8	3-1	3-4	3-5	6-13	6-14	6-15	6-16	6-18									7-7	
		BMP	Abide by MOU with CLF and CRWA	Public Concerns/ Feedback on DCR Website	Massachusetts Water Resource Commission	Lakes and Ponds Program	Drainage Inventory	Drainage Infrastructure Inventory	Illicit Connection Sampling Program	Roadway and Drainage Infrastructure Assessment	CB Repair/ Discharge Pipe Cleaning Needs Assessment	Wet Weather Review and Repair	Implement Parkways Short Term Measures	Maintenance Activity Schedule									Priority Resource Area Review	
Facility/ Town	**Parkway Street Associated With**	**Measurable Goal**	Abide by MOU with CLF as it relates to maintenance of parkway surfaces, curbing and drainage infrastructure	Forward concerns/ feedback received to appropriate dept. Track response to concerns.	Provide technical and staff support to MWRC.	Continue to Sponsor Program.	Locate outfalls	Develop state-wide drainage infrastructure map.	Continue to prioritize and review known potential illicit connections.	Perform state wide assessment of roadways and infrastructure conditions annually.	Perform assessment annually. Create assessment report.	Perform an annual review of roads and parking lots within UA during wet weather conditions to identify ponding or flooding areas.	Implement measures. Continue to note progress to CLF, CRWA and EPA in periodic reports until fully addressed.	Sweep Streets Annually	Clean CB and piping every two years.	Inspect Detention Ponds Annually	Inspect water quality swales annually	Inspect drainage swales annually	Inspect infiltration systems 2x/yr.	Inspect water quality inlets 2x/ yr.	Review for erosion and storm water issues annually.	Review outfalls which discharge to priority resource
Fresh Pond Parkway		Cambridge	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated
Furnace Brook Parkway		Quincy	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated
Furnace Brook Rotary (Rt. 3 Circle)		Quincy	In Prog	Met	Met	Met	Met	Met						Met	Not Cleaned						Met	Not Evaluated
Gallivan Boulevard		Boston	In Prog	Met	Met	Met	Met	Met			In Prog			Swept Monthly	Portion Cleaned						Met	Not Evaluated
Green Street	Blue Hills Reservation	Canton, Milton	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated
Greenough Boulevard	Charles River Reservation Parkways	Cambridge, Watertown	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated
Grove Street		Watertown	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Portion Cleaned						Met	Not Evaluated
Grove Street Extension		Watertown	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Portion Cleaned						Met	Not Evaluated
Hammond Pond Parkway		Brookline, Newton	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated
Harvard Avenue		Arlington, Medford	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated
Hawthorn Street		Cambridge	In Prog	Met	Met	Met	Met	Met			In Prog			Swept Monthly	Portion Cleaned						Met	Not Evaluated
Hayden Street		Quincy	In Prog	Met	Met	Met	Met	Met			Met			Met	Not Cleaned						Met	Not Evaluated
Hemlock Road	Breakhart Reservation Parkways	Saugus, Wakefield	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated
Higgins Pond Road		Orleans	In Prog	Met	Met	Met	Met	Met													Met	Not Evaluated
High Street		Medford	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated
Highland Avenue		Malden, Medford	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated
Hillcrest Parkway	Middlesex Fells Reservation Parkways	Winchester	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated
Hillside Street	Blue Hills Reservation	Canton, Milton	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated
Horace James Circle		Brookline	In Prog	Met	Met	Met	Met	Met													Met	Not Evaluated
Hull Shore Drive	Nantasket Beach Reservation Parkways	Hull	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Portion Cleaned						Met	Not Evaluated
Humphrey Street		Swampscott	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated
Hyde Park Avenue		Boston	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated
Jamaicaway	Emerald Necklace Parkways	Boston	In Prog	Met	Met	Met	Met	Met			Met		In Prog	Swept Monthly	Portion Cleaned						Met	Not Evaluated
Jamaicaway Frontage Road		Boston	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Portion Cleaned						Met	Not Evaluated
James Shea Circle		Boston	In Prog	Met	Met	Met	Met	Met						Met							Met	Not Evaluated
JFK-UMass Station Road		Boston	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated
John F Kennedy Street		Cambridge	In Prog	Met	Met	Met	Met	Met			Met			Met	Portion Cleaned						Met	Not Evaluated
Jordan Marsh Service Center Area (served by Cmdr. Shea Blvd)		Quincy	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Portion Cleaned						Met	Not Evaluated
Kelley Circle		Boston	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated
Kozciuszko Circle		Boston	In Prog	Met	Met	Met	Met	Met						Met							Met	Not Evaluated
Land Boulevard		Cambridge	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated
Lagrange Street Ext.		Boston	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Portion Cleaned						Met	Not Evaluated
Longfellow Bridge		Boston	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated
Lynn Fells Parkway		Melrose, Saugus	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated
Lynn Shore Drive		Lynn, Nahant, Swampscott	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated
Lynnway		Lynn, Revere	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Portion Cleaned						Met	Not Evaluated
Lynnway Underpass - Rt 1A Sb To Lynnway		Revere	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Portion Cleaned						Met	Not Evaluated
Main Street		Cambridge	In Prog	Met	Met	Met	Met	Met			Met			Met	Portion Cleaned						Met	Not Evaluated
Main Street		Everett	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Cleaned						Met	Not Evaluated
Massachusetts Avenue		Boston, Cambridge	In Prog	Met	Met	Met	Met	Met			Met			Met	Portion Cleaned						Met	Not Evaluated
Mcgrath Highway		Somerville	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Cleaned						Met	Not Evaluated
Medford Street		Arlington	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated
Medford Veterans Memorial Highway		Medford	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Portion Cleaned						Met	Not Evaluated
Memorial Drive	Chestnut Hill Driveway	Cambridge	In Prog	Met	Met	Met	Met	Met	Reviewed 4 mile section in Cambridge - no dry weather flows	Completed closed-circuit television investigations of several catch basins and drains. Repairs are being evaluated to remedy the problems identified.	Met			Swept Monthly	Portion Cleaned						Met	Not Evaluated
Memorial Drive Underpass		Cambridge	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Portion Cleaned						Met	Not Evaluated
Metropolitan District Commission Road		Southborough	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Portion Cleaned						Met	Not Evaluated
Metropolitan Road	Bever Brook Reservation	Waltham, Lexington	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated
Metropolitan Road		Medford	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated
Middle Street		Randolph	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Portion Cleaned						Met	Not Evaluated
Middlesex Avenue		Medford	In Prog	Met	Met	Met	Met	Met			Met			Swept Monthly	Cleaned						Met	Not Evaluated
Middlesex Rotary		Medford	In Prog	Met	Met	Met	Met	Met						Met							Met	Not Evaluated
Middleton Street		North Andover	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Portion Cleaned						Met	Not Evaluated
Milton Street		Boston	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated
Monsanto Road		Everett	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Portion Cleaned						Met	Not Evaluated
Morrissey Service Road		Boston	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated
Morton Street		Boston	In Prog	Met	Met	Met	Met	Met			In Prog			Swept Monthly	Portion Cleaned						Met	Not Evaluated
Mount Auburn Street		Cambridge	In Prog	Met	Met	Met	Met	Met			Met			Met	Portion Cleaned						Met	Not Evaluated
Mount Vernon Street		Dorchester	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated
Murray Circle		Boston	In Prog	Met	Met	Met	Met	Met						Met							Met	Not Evaluated
Mystic River Road		Medford	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated
Mystic Valley Parkway		Arlington, Medford, Somerville, Winchester	In Prog	Met	Met	Met	Met	Met			Met			Met	Portion Cleaned	8 stilling basins					Met	Not Evaluated
Mystic Valley Parkway Ext.		Arlington	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated
Mystic Valley - Alewife Brook Rotary		Medford	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Cleaned						Met	Not Evaluated
Nahant Beach Boulevard		Nahant	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated
Nahant Circle		Nahant	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Cleaned						Met	Not Evaluated
Nantasket Avenue	Nantasket Beach Reservation Parkways	Hull	In Prog	Met	Met	Met	Met	Met			Met			Met	Not Cleaned						Met	Not Evaluated
Nash Hill Reservoir Road		Ludlow	In Prog	Met	Met	Met	Met	Met			Met			Met	Portion Cleaned						Met	Not Evaluated
Neponset Avenue		Boston	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Portion Cleaned						Met	Not Evaluated
Neponset Valley Parkway		Boston, Milton	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Cleaned						Met	Not Evaluated
New South Street		Stoneham	In Prog	Met	Met	Met	Met	Met			Met			Met	Portion Cleaned						Met	Not Evaluated
Noble Street		Revere	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Portion Cleaned						Met	Not Evaluated
Nonantum Road	Charles River Reservation Parkways	Boston, Newton, Watertown	In Prog	Met	Met	Met	Met	Met		Completed repair of fourteen (14) storm water headwalls and drain pipes.	In Prog			Met	Not Cleaned						Met	Not Evaluated
Nonantum Road Branch		Newton	In Prog	Met	Met	Met	Met	Met			Met			Met	Not Cleaned						Met	Not Evaluated
North Beacon Street	Charles River Reservation Parkways	Boston, Watertown	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated
North Border Road		Stoneham	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated
North Harvard Street		Boston	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated
North Shore Road		Revere	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated
Norumbega Road	Charles River Reservation Parkways	Weston	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated
Oak Island Street		Revere	In Prog	Met	Met	Met	Met	Met			Met			Met	Not Cleaned						Met	Not Evaluated
O'Brien Highway (Msgr.)		Cambridge, Somerville	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Portion Cleaned						Met	Not Evaluated
Ocean Avenue		Revere	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated
Ocean Street		Lynn, Swampscott	In Prog	Met	Met	Met	Met	Met	2 mile section reveiwed - 3 dry weather discharges identified		In Prog			Met	Not Cleaned						Met	Not Evaluated
Old Colony Avenue		Boston	In Prog	Met	Met	Met	Met	Met			Met			Swept Monthly	Cleaned						Met	Not Evaluated
Quincy Shore Drive		Quincy	In Prog	Met	Met	Met	Met	In Prog - Under Construction			Met			Met	Cleaned						Met	Not Evaluated

Table 2: Parkway Best Management Practices

			Permit Year 6 Activity																					
BMP #			2-1	2-5	2-7	2-8	3-1	3-4	3-5	6-13	6-14	6-15	6-16	6-18									7-7	
BMP			Abide by MOU with CLF and CRWA	Public Concerns/ Feedback on DCR Website	Massachusetts Water Resource Commission	Lakes and Ponds Program	Drainage Inventory	Drainage Infrastructure Inventory	Illicit Connection Sampling Program	Roadway and Drainage Infrastructure Assessment	CB Repair/ Discharge Pipe Cleaning Needs Assessment	Wet Weather Review and Repair	Implement Parkways Short Term Measures	Maintenance Activity Schedule									Priority Resource Area Review	
Facility/ Town	**Parkway Street Associated With**		**Measurable Goal**	Abide by MOU with CLF as it relates to maintenance of parkway surfaces, curbing and drainage infrastructure	Forward concerns/ feedback received to appropriate dept. Track response to concerns.	Provide technical and staff support to MWRC.	Continue to Sponsor Program.	Locate outfalls	Develop state-wide drainage infrastructure map.	Continue to prioritize and review known potential illicit connections.	Perform state wide assessment of roadways and infrastructure conditions annually.	Perform assessment annually. Create assessment report.	Perform an annual review of roads and parking lots within UA during wet weather conditions to identify ponding or flooding areas.	Implement measures. Continue to note progress to CLF, CRWA and EPA in periodic reports until fully addressed.	Sweep Streets Annually	Clean CB and piping every two years.	Inspect Detention Ponds Annually	Inspect water quality swales annually	Inspect drainage swales annually	Inspect infiltration systems 2x/yr.	Inspect water quality inlets 2x/ yr.	Review for erosion and storm water issues annually.	Review outfalls which discharge to priority resource	
Quinobequin Road	Charles River Reservation Parkways	Newton	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated	
Park Entrance Road		Chicopee	In Prog	Met	Met	Met	Met	Met						Met							Met	Not Evaluated	
Park Drive	Emerald Necklace Parkways	Boston	In Prog	Met	Met	Met	Met	Met			In Prog			Swept Monthly	Portion Cleaned						Met	Not Evaluated	
Park Road		Weston	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated	
Park Street		Stoneham	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated	
Parkman Drive		Boston	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated	
Pelton Street		Boston	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Portion Cleaned						Met	Not Evaluated	
Perkins Street		Boston	In Prog	Met	Met	Met	Met	Met			Met			Swept Monthly	Cleaned						Met	Not Evaluated	
Pine Tops Road	Breakhart Reservation Parkways	Saugus	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Portion Cleaned						Met	Not Evaluated	
Pond Street	Middlesex Fells Reservation Parkways	Stoneham	In Prog	Met	Met	Met	Met	Met			Met			Met	Portion Cleaned						Met	Not Evaluated	
Ramp to Charles Circle		Boston	In Prog	Met	Met	Met	Met	Met						Met							Met	Not Evaluated	
Ramp-Berkeley St to Rt 28 NB		Boston	In Prog	Met	Met	Met	Met	Met						Met							Met	Not Evaluated	
Ramp-Bu Bridge to Memorial Dr EB		Cambridge	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Cleaned						Met	Not Evaluated	
Ramp-Cambridgeport Circle to BU Bridge		Cambridge	In Prog	Met	Met	Met	Met	Met						Met	Cleaned						Met	Not Evaluated	
Ramp-Cambridgeport Circle to Mem Dr WB		Cambridge	In Prog	Met	Met	Met	Met	Met						Met	Cleaned						Met	Not Evaluated	
Ramp-Casassa Overpass to Rt 107 NB		Revere	In Prog	Met	Met	Met	Met	Met						Met	Cleaned						Met	Not Evaluated	
Ramp-Charles St to Longfellow Bridge		Boston	In Prog	Met	Met	Met	Met	Met						Met	Cleaned						Met	Not Evaluated	
Ramp-Charlesgate Overpass to Charlesgate		Boston	In Prog	Met	Met	Met	Met	Met						Met	Cleaned						Met	Not Evaluated	
Ramp-Jamaicaway to Rt 9		Boston	In Prog	Met	Met	Met	Met	Met						Met	Portion Cleaned						Met	Not Evaluated	
Ramp-Main Street to Rt 16 WB		Medford	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated	
Ramp-Memorial Dr to Cambridgeport Circle EB		Cambridge	In Prog	Met	Met	Met	Met	Met						Met	Cleaned						Met	Not Evaluated	
Ramp-Memorial Dr to Cambridgeport Cir WB		Cambridge	In Prog	Met	Met	Met	Met	Met						Met							Met	Not Evaluated	
Ramp-N Harvard St to Soldiers Field EB		Boston	In Prog	Met	Met	Met	Met	Met						Met							Met	Not Evaluated	
Ramp-N Harvard St to Soldiers Field WB		Boston	In Prog	Met	Met	Met	Met	Met						Met							Met	Not Evaluated	
Ramp-Roosevelt Circle to Valley St		Medford	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated	
Ramp-Rt 107 NB to Rt 16 EB		Revere	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated	
Ramp-Rt 16 WB to Rt 99		Everett	In Prog	Met	Met	Met	Met	Met						Met							Met	Not Evaluated	
Ramp-Rt 3 to Rt 28 SB		Boston	In Prog	Met	Met	Met	Met	Met						Met							Met	Not Evaluated	
Ramp-Rt 9 to Jamaicaway		Boston	In Prog	Met	Met	Met	Met	Met						Met	Cleaned						Met	Not Evaluated	
Ramp-Soldiers Field EB to N Harvard St		Boston	In Prog	Met	Met	Met	Met	Met						Met							Met	Not Evaluated	
Ramp-Soldiers Field Rd EB to Western Ave		Boston	In Prog	Met	Met	Met	Met	Met						Met							Met	Not Evaluated	
Ramp-Soldiers Field Rd WB to Birmingham		Boston	In Prog	Met	Met	Met	Met	Met						Met							Met	Not Evaluated	
Ramp-Soldiers Field Rd WB to Western Ave		Boston	In Prog	Met	Met	Met	Met	Met						Met							Met	Not Evaluated	
Ramp-Soldiers Field WB to N Harvard St		Boston	In Prog	Met	Met	Met	Met	Met						Met							Met	Not Evaluated	
Ramp-Somerville Ave to Rt 28 SB		Somerville	In Prog	Met	Met	Met	Met	Met						Met							Met	Not Evaluated	
Ramp-Storrow Dr to Rt 2A WB		Boston	In Prog	Met	Met	Met	Met	Met						Met	Cleaned						Met	Not Evaluated	
Ramp-Western Ave to Soldiers Field Rd EB		Boston	In Prog	Met	Met	Met	Met	Met						Met							Met	Not Evaluated	
Ramp-Western Ave to Soldiers Field Rd WB		Boston	In Prog	Met	Met	Met	Met	Met						Met							Met	Not Evaluated	
Recreation Road		Weston	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated	
Reid Rotary		Cambridge	In Prog	Met	Met	Met	Met	Met			Met			Met	Portion Cleaned						Met	Not Evaluated	
Reservation Road	Stony Brook Reservation Parkways	Boston	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated	
Reservoir Street		Winchester	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated	
Revere Beach Boulevard		Revere	In Prog	Met	Met	Met	Met	In Prog - Under Construction			Met			Met	Cleaned						Met	Not Evaluated	
Revere Beach Parkway		Chelsea, Everett, Medford, Revere	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated	
Revere Street		Revere	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Portion Cleaned						Met	Not Evaluated	
River Street		Boston, Cambridge	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated	
Riverdale Road		Upton	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Portion Cleaned						Met	Not Evaluated	
Riverway	Emerald Necklace Parkways	Boston	In Prog	Met	Met	Met	Met	Met			Met		In Prog	Swept Monthly	Portion Cleaned						Met	Not Evaluated	
Riverway Frontage Road		Boston	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated	
Rocky Woods Reservation Road		Medfield	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Portion Cleaned						Met	Not Evaluated	
Roosevelt Circle		Medford	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated	
Saint Thomas Moore Road		Boston	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated	
Santilli Circle		Everett	In Prog	Met	Met	Met	Met	Met						Met							Met	Not Evaluated	
Santilli Circle Connector		Everett	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated	
Sawmill Lane		Dedham	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated	
Shirley Avenue		Revere	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Portion Cleaned						Met	Not Evaluated	
Shore Drive		Somerville	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Portion Cleaned						Met	Not Evaluated	
Shore Road		Boston	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated	
Smith Field Road	Stony Brook Reservation Parkways	Boston	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated	
Soldiers Field Road	Charles River Reservation Parkways	Boston	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Portion Cleaned						Met	Not Evaluated	
Soldiers Field Road Extension		Boston	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Portion Cleaned						Met	Not Evaluated	
Soldiers Field Service Road Eastbound		Boston	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Portion Cleaned						Met	Not Evaluated	
South Border Road	Middlesex Fells Reservation Parkways	Medford, Winchester	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated	
South Street	Middlesex Fells Reservation Parkways	Stoneham	In Prog	Met	Met	Met	Met	Met			Met			Met	Not Cleaned						Met	Not Evaluated	
Sozio Road		Cambridge	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated	
State Beach Road		Salisbury	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Portion Cleaned						Met	Not Evaluated	
State Park Road		Ashland	In Prog	Met	Met	Met	Met	Met			Met			Met	Portion Cleaned						Met	Not Evaluated	
Storrow Drive	Chestnut Hill Driveway	Boston	In Prog	Met	Met	Met	Met	Met		Completed closed-circuit television investigations of flood control pumping stations serving road. Repairs are being evaluated to remedy the problems identified.	Met			Swept Monthly	Portion Cleaned						Met	Not Evaluated	
Sumner Street		Milton	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Portion Cleaned						Met	Not Evaluated	
Sweetser Circle		Everett	In Prog	Met	Met	Met	Met	Met						Met							Met	Not Evaluated	
Terminal Road		Cambridge	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated	
Truman Highway		Boston, Milton	In Prog	Met	Met	Met	Met	Met			In Prog			Swept Monthly	Cleaned						Met	Not Evaluated	

Table 2: Parkway Best Management Practices

			Permit Year 6 Activity																						
		BMP #	2-1	2-5	2-7	2-8	3-1	3-4	3-5	6-13	6-14	6-15	6-16	6-18										7-7	
		BMP	Abide by MOU with CLF and CRWA	Public Concerns/ Feedback on DCR Website	Massachusetts Water Resource Commission	Lakes and Ponds Program	Drainage Inventory	Drainage Infrastructure Inventory	Illicit Connection Sampling Program	Roadway and Drainage Infrastructure Assessment	CB Repair/ Discharge Pipe Cleaning Needs Assessment	Wet Weather Review and Repair	Implement Parkways Short Term Measures	Maintenance Activity Schedule										Priority Resource Area Review	
Facility/ Town	**Parkway Street Associated With**	**Measurable Goal**	Abide by MOU with CLF as it relates to maintenance of parkway surfaces, curbing and drainage infrastructure	Forward concerns/ feedback received to appropriate dept. Track response to concerns.	Provide technical and staff support to MWRC.	Continue to Sponsor Program.	Locate outfalls	Develop state-wide drainage infrastructure map.	Continue to prioritize and review known potential illicit connections.	Perform state wide assessment of roadways and infrastructure conditions annually.	Perform assessment annually. Create assessment report.	Perform an annual review of roads and parking lots within UA during wet weather conditions to identify ponding or flooding areas.	Implement measures. Continue to note progress to CLF, CRWA and EPA in periodic reports until fully addressed.	Sweep Streets Annually	Clean CB and piping every two years.	Inspect Detention Ponds Annually	Inspect water quality swales annually	Inspect drainage swales annually	Inspect infiltration systems 2x/yr.	Inspect water quality inlets 2x/ yr.	Review for erosion and storm water issues annually.	Review outfalls which discharge to priority resource	
Truman Parkway		Boston, Milton	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated	
Turtle Pond Parkway	Stony Brook Reservation Parkways	Boston	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated	
Turtle Pond Parkway Branch		Boston	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated	
Unnamed Road		Boston	In Prog	Met	Met	Met	Met	Met						Met							Met	Not Evaluated	
Unnamed Road		Malden	In Prog	Met	Met	Met	Met	Met						Met							Met	Not Evaluated	
Unquity Road	Blue Hills Reservation	Milton	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated	
Upper Arborway		Boston	In Prog	Met	Met	Met	Met	Met			Met			Met	Portion Cleaned						Met	Not Evaluated	
Veterans Of Foreign Wars Parkway		Boston, Brookline	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated	
Wave Avenue		Revere	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Not Cleaned						Met	Not Evaluated	
West Border Road	Fellsmere Park Parkways	Malden	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated	
West Boundary Road		Boston	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Portion Cleaned						Met	Not Evaluated	
West Roxbury Centre Street Rotary		Boston	In Prog	Met	Met	Met	Met	Met						Met							Met	Not Evaluated	
West Roxbury Parkway		Boston, Brookline	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated	
West Roxbury VFW Parkway Rotary		Boston	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated	
Westland Ave (Entrance)		Boston	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated	
West Line Road		Carver	In Prog	Met	Met	Met	Met	Met						Met							Met	Not Evaluated	
Western Avenue		Boston	In Prog	Met	Met	Met	Met	Met						Met							Met	Not Evaluated	
Wharf Avenue		Hull	In Prog	Met	Met	Met	Met	Met						Met							Met	Not Evaluated	
Willard Street		Quincy	In Prog	Met	Met	Met	Met	Met						Met							Met	Not Evaluated	
William Day Boulevard		Boston	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Portion Cleaned						Met	Not Evaluated	
William T. Morrisey Boulevard		Boston	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated	
Willow Pond Road		Boston	In Prog	Met	Met	Met	Met	Met			Met			Met	Cleaned						Met	Not Evaluated	
Winthrop Parkway		Revere	In Prog	Met	Met	Met	Met	Met			Met			Swept Monthly	Cleaned						Met	Not Evaluated	
Winthrop Shore Drive		Winthrop	In Prog	Met	Met	Met	Met	Met						Swept Monthly							Met	Not Evaluated	
Wompatuck Road	Blue Hills Reservation	Quincy	In Prog	Met	Met	Met	Met	Met			Met			Met	Not Cleaned						Met	Not Evaluated	
Woodland Road	Middlesex Fells Reservation Parkways	Stoneham	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Portion Cleaned						Met	Not Evaluated	
Wyoming Avenue		Melrose	In Prog	Met	Met	Met	Met	Met			In Prog			Met	Portion Cleaned						Met	Not Evaluated	
Permit Year 6 Notes			DCR provides CLF/ CRWA with a semi-annual report summarizing the actions taken to meet the criteria outlined in the MOU. Semi-annual meetings are held to discuss the progress. DCR is working towards meeting each of the twelve requirements in the MOU.	Web site is active. DCR Commissioner has implemented concern/ feedback letter tracking and response system.	DCR attends monthly and is an active participant.	DCR continues to sponsor this program and it now has its own web link on DCR's web site.	DCR has located outfalls from all facilities owned and operated by DCR within urbanized areas.	At the end of 2008, DCR's consultant had mapped drainage information for each of the urbanized area DCR properties. The drainage information was gathered from either scanned construction drawings or field surveys. DCR has continued to update the drainage inventory during its catch basin cleaning, maintenance, and illicit discharge detection efforts this permit year. Approximately 325 outfalls were visited over Permit Year 6 as part of one of these programs.	DCR's consultant performed the first year of a five-year rotating illicit discharge inspection program. The urban stormwater system was split spatially into five regions to facilitate inspections. All regions contain approximately 20% of DCR's system and all contain areas of special concern including public beaches impaired waters, etc. Over this past permit year, one region was inspected for illicit discharges according to the Charles River Illicit Discharge Detection and Elimination Protocol.	DCR inspects roadways and drainage infrastructure annually. Drainage infrastructure is assessed during catch basin cleaning. Maintenance is performed as determined necessary during the inspection.	Between September and December 2008, contractors cleaned and water jetted 1,653 catch basins with these locations recorded using GPS.	DCR inspects roadways for signs of ponding and icing in freezing conditions. DCR makes immediate repairs where ponding causes safety concerns.	DCR submitted semi-annual reports to CLF/ CRWA noting progress on CB cleaning, street sweeping and drainage repairs.	To insure adequate street sweeping frequency, DCR entered into a three-year renewable contract in 2007 with a street sweeping contractor to clean certain DCR parkways and roads. Roads which discharge to impaired receiving waters are cleaned using mechanical and vacuum sweeping equipment at least four times per year, and monthly in areas where cars are allowed to park. All roads were swept at least once this year.	DCR continued to systematically clean catch basins and water jet the associated outlet drain pipes using private contractors overseen daily by DCR staff. Contractors cleaned and water jetted 1,653 catch basins with these locations recorded using GPS. For the fiscal year ending in June 2009 DCR spent $1.6M to clean and repair catch basins.	Unable to comprehensively report on detention basins, water quality swales and infiltration basins since a comprehensive facility specific database is not available. BMPs shown reflect the current database. The database will be finalized upon completion of the drainage system infrastructure inventory. DCR has begun to develop web-based reporting format to better track regional compliance with MAS.					Met MAS schedule.	DCR has updated the receiving water body table (Appendix C of the March '08 SWMP) to reflect the outfalls identified in the drainage inventory. The table summarizes the number of outfalls by sub basin number and identifies the impaired waterbody included in the sub-basin.
Planned Activities - May 2009 to April 2010			Continue to provide semi-annual reports and attend regularly scheduled meetings with CLF/ CRWA to review compliance with MOU. Continue to implement and complete programs which address each of the twelve requirements in the MOU.	Continue system.	Continue participation.	Continue sponsorship.	Verify the location and condition of outfalls located from paper maps during illicit discharge detection field tasks.	The infrastructure database is a dynamic work in progress which is updated when new construction takes place. Corrections to the database will be made as areas are visited during the illicit discharge investigation and during catch basin cleaning and maintenance efforts. In addition, DCR will add features identified during maintenance work that were missed from the infrastructure database.	DCR will inspect 20% of their stormwater system within the urbanized area during the summer and fall of 2009. The Mystic Valley Pkwy and Alewife Brook Pkwy areas will be investigated. DCR will continue to update the drainage inventory and identify needs for maintenance and cleaning as part of this field effort. DCR will follow up on 7 cases of suspect illicit connections from Permit Year 6 inventory.	Perform state wide assessment of roadways and infrastructure conditions.	DCR will continue to systematically clean catch basins and water jet the associated outlet drain pipes, as determined necessary, using private contractors overseen daily by DCR staff. .	Perform review of roads and parking lots within UA during wet weather conditions to identify ponding or flooding areas.	DCR will continue to submit semi-annual reports to CLF/ CRWA noting progress on CB cleaning, street sweeping and drainage repairs.	Sweep all streets at least once. Continue to provide and fund contract for sweeping roadways that discharge to impaired receiving waters using mechanical and vacuum sweeping equipment at least four times per year, and monthly in areas where cars are allowed to park.	DCR will continue to systematically clean catch basins and water jet the associated outlet drain pipes, as determined necessary, using private contractors overseen daily by DCR staff. DCR anticipates a reduced budget ($1.2 M) and level of effort this year when compared to FY09.	Continue to meet Maintenance Activity Schedule (MAS). Complete drainage system infrastructure inventory. Develop web-based reporting format to more effectively track regional compliance with MAS.						Identify outfalls which discharge to priority resources. Summarize projects to address impairments in annual reports.

Goal Not Met
Goal in Progress
Goal Achieved
Goal Not Applicable
Goal Metrics Not Available

Table 3: State Park Facilities Best Management Practices

Table 3: Park Facility Best Management Practices

		Permit Year 6 Activity																Permit Year 6 Activity													
BMP #		1-2	1-4	1-5	1-7	1-8	1-9	2-1	2-5	2-7	2-8	3-1	3-4	3-5	6-12	6-13	6-14	6-15	6-18												7-7
BMP		CB Stenciling/ Plaques	Interactions with Boat Club Programs	Mobile Water Quality Education Seminars	Charles River Conservancy Clean Up Program	Charles River Reservation School Program	Camp Nihan	Abide by MOU with CLF and CRWA	Public Concerns/ Feedback on DCR Website	Massachusetts Water Resource Commission	Lakes and Ponds Program	Drainage Inventory	Drainage Infrastructure Inventory	Illicit Connection Sampling Program	SPCC Plans	Roadway and Drainage Infrastructure Assessment	CB Repair/ Discharge Pipe Cleaning Needs Assessment	Wet Weather Review and Repair	Maintenance Activity Schedule (MAS)													Priority Resource Area Review
Facility	**Town**	**Measurable Goal**	CB cleaning and repair contractor will maintain stencil/ plaque each spring as necessary.	Add to boat club permits that they must post and monitor "No Wake" zones.	Provide storm water/ wq education events.	Partner with Charles River Conservancy Clean Up Program.	Provide 1 storm water/ water quality related educational program each year.	Provide 1 storm water/ water quality related educational program each year.	Abide by MOU with CLF as it relates to maintenance of park facilities and drainage infrastructure	Forward concerns/ feedback received to appropriate dept. Track response to concerns.	Provide technical and staff support to MWRC.	Continue to Sponsor Program.	Locate outfalls	Develop state-wide drainage infrastructure map.	Continue to prioritize and review known potential illicit connections.	Continue to maintain compliance with the requirements in these plans.	Perform state wide assessment of roadways and infrastructure conditions annually.	Perform assessment annually. Create assessment report.	Perform an annual review of roads and parking lots within UA during wet weather conditions to identify ponding or flooding areas.	Sweep Streets Annually.	Clean CB and piping every two years.	Inspect Detention Ponds Annually	Inspect water quality swales annually	Inspect drainage swales annually	Inspect infiltration systems 2x/yr.	Inspect water quality inlets 2x/ yr.	Review for erosion and storm water issues annually.	Perform fleet maintenance twice a year.	Inspect buildings for compliance with good housekeeping measures weekly.	Review outfalls which discharge to priority resource	
Abigail Adams State Park	Hingham, Weymouth	Not Met						In Prog	Met	Met	Met	Met	Met				In Prog		Met	Not Cleaned					SW Chamber	Met		Met	Not Evaluated	
Alewife Brook Reservation	Arlington, Belmont, Cambridge, Somerville	Not Met						In Prog	Met	Met	Met	Met	Met				In Prog		Met	Met						Met		Met	Not Evaluated	
Ames Nowell State Park	Abington	Not Met						In Prog	Met	Met	Met	Met	Met				Met		Met	Met						Met		Met	Not Evaluated	
Ashland State Park	Ashland	Not Met						In Prog	Met	Met	Met	Met	Met				Met		Met	Not Cleaned	Retention/ Recharge Basin					Met		Met	Not Evaluated	
Beaver Brook Reservation	Waltham, Belmont	Not Met						In Prog	Met	Met	Met	Met	Met				Met									Met		Met	Not Evaluated	
Belle Isle Marsh Reservation	Boston, Winthrop	Not Met		Met				In Prog	Met	Met	Met	Met	Met				Met									Met		Met	Not Evaluated	
Blackstone River & Canal HSP	Blackstone, Millville, Northbridge, Uxbridge	Not Met						In Prog	Met	Met	Met	Met	Met				Met		Met	Not Cleaned						Met		Met	Not Evaluated	
Blue Hills Reservation	Braintree, Canton, Milton, Quincy, Randolph	Not Met		Met				In Prog	Met	Met	Met	Met	Met		Met - Labor Yard and Punkapoag Golf Course		Met		Met	Not Cleaned	2 detention basins					Met	Met	Met	Not Evaluated	
Boston Harbor Islands State Park	Hingham	Not Met						In Prog	Met	Met	Met	Met	Met				Met		Met	Not Cleaned						Met		Met	Not Evaluated	
Breakheart Reservation	Saugus, Wakefield	Not Met		Met			Met	In Prog	Met	Met	Met	Met	Met				Met		Met	Met						Met		Met	Category 4C – TMDL Not Needed	
Cape Cod Rail Trail	Eastham	Not Met						In Prog	Met	Met	Met	Met	Met				In Prog		Met	Not Cleaned						Met		Met	Not Evaluated	
Charles River Reservation	Medfield	Not Met			Met	Met		In Prog	Met	Met	Met	Met	Met		Met - Central Services Cambridge		In Prog		Met	Not Cleaned	Detention Basin					Met	Met	Met	Not Evaluated	
Charles River Reservation, Lower Basin	Boston, Cambridge	Not Met	In Prog		Met	Met		In Prog	Met	Met	Met	Met	Met				In Prog		Met	Not Cleaned						Met		Met	Not Evaluated	
Charles River Reservation, New Basin	Boston, Cambridge	Not Met			Met	Met		In Prog	Met	Met	Met	Met	Met				In Prog		Met	Not Cleaned						Met		Met	Not Evaluated	
Charles River Reservation, Upper Basin	Boston, Cambridge, Brighton, Watertown	Not Met			Met	Met		In Prog	Met	Met	Met	Met	Met		Met - Upper Basin Labor Yard		In Prog		Met	Not Cleaned						Met	Met	Met	Not Evaluated	
City Square Park	Charlestown	Not Met						In Prog	Met	Met	Met	Met	Met				In Prog		Met	Not Cleaned						Met		Met	Not Evaluated	
Cochituate State Park	Framingham, Natick, Sherborn, Wayland	Not Met						In Prog	Met	Met	Met	Met	Met				Met		Met	Met	Detention Basin					Met		Met	Not Evaluated	
Columbia Road Park	Boston	Not Met						In Prog	Met	Met	Met	Met	Met				In Prog		Met	Met						Met		Met	Not Evaluated	
Commercial Point	Boston	Not Met						In Prog				Met	Met				In Prog		Met	Not Cleaned						Met		Met	Not Evaluated	
Dunn Pond State Park	Gardner	Not Met						In Prog	Met	Met	Met	Met	Met				In Prog		Met	Not Cleaned						Met		Met	Not Evaluated	
Elm Bank	Dover, Wellesley	Not Met						In Prog				Met	Met						Met	Not Cleaned						Met		Met	Not Evaluated	
Fall River Heritage State Park	Fall River	Not Met						In Prog	Met	Met	Met	Met	Met				Met		Met	Met						Met		Met	Not Evaluated	
Fellsmere Park	Malden	Not Met						In Prog	Met	Met	Met	Met	Met				In Prog		Met	Not Cleaned						Met		Met	Not Evaluated	
Fort Phoenix State Reservation	Fairhaven	Not Met						In Prog	Met	Met	Met	Met	Met				Met		Met	Cleaned						Met		Met	Not Evaluated	
Foss Park	Somerville	Not Met						In Prog	Met	Met	Met	Met	Met				In Prog		Met	Not Cleaned						Met		Met	Not Evaluated	
Franklin Park Zoo	Boston	Not Met						In Prog	Met	Met	Met	Met	Met				Met		Met	Not Cleaned						Met		Met	Not Evaluated	
Hammond Pond Reservation	Newton	Not Met						In Prog	Met	Met	Met	Met	Met				In Prog		Met	Not Cleaned						Met		Met	Not Evaluated	
Hampton Ponds State Park	Westfield	Not Met						In Prog	Met	Met	Met	Met	Met				Met		Met	Not Cleaned						Met		Met	Not Evaluated	
Holyoke Heritage State Park	Holyoke	Not Met						In Prog	Met	Met	Met	Met	Met				Met		Met	Not Cleaned						Met		Met	Not Evaluated	
J. Elwell Conservation Area	Northampton	Not Met						In Prog	Met	Met	Met	Met	Met				Met		Met	Not Cleaned						Met		Met	Not Evaluated	
Lawrence Riverfront State Park	Lawrence	Not Met						In Prog	Met	Met	Met	Met	Met				In Prog		Met	Not Cleaned						Met		Met	Not Evaluated	
Leo J. Martin Memorial Golf Course	Weston	Not Met						In Prog	Met	Met	Met	Met	Met				Met		Met	Not Cleaned						Met		Met	Not Evaluated	
Lowell Heritage State Park	Lowell	Not Met						In Prog	Met	Met	Met	Met	Met				Met		Met	Met	Created Wetland, Detention Basin and Field for Overflow					Met		Met	Not Evaluated	
Lowell Park	Cambridge	Not Met						In Prog	Met	Met	Met	Met	Met				In Prog		Met	Not Cleaned						Met		Met	Not Evaluated	
Lynn Heritage State Park	Lynn	Not Met						In Prog	Met	Met	Met	Met	Met				In Prog		Met	Not Cleaned						Met		Met	Not Evaluated	
Lynn Shore Reservation	Lynn	Not Met						In Prog	Met	Met	Met	Met	Met				In Prog		Met	Not Cleaned		Created Swale				Met		Met	Not Evaluated	
Mary O'Malley State Park	Chelsea	Not Met						In Prog	Met	Met	Met	Met	Met				Met		Met	Not Cleaned						Met		Met	Not Evaluated	
Medfield State Hospital	Medfield	Not Met						In Prog	Met	Met	Met	Met	Met				In Prog		Met	Not Cleaned						Met		Met	Not Evaluated	
Middlesex Fells Reservations	Malden, Medford, Melrose, Stoneham, Winchester	Not Met						In Prog	Met	Met	Met	Met	Met		Met - Stoneham Labor Yard		In Prog		Met	Not Cleaned						Met	Met	Met	Not Evaluated	
Mother Brook Reservation	Boston, Dedham	Not Met						In Prog	Met	Met	Met	Met	Met				In Prog		Met	Not Cleaned						Met		Met	Not Evaluated	
Museum of Science	Boston, Cambridge	Not Met						In Prog				Met	Met				Met		Met	Not Cleaned						Met		Met	Not Evaluated	
Mystic River Reservation	Arlington, Everett, Medford, Somerville	Not Met	In Prog					In Prog	Met	Met	Met	Met	Met				In Prog		Met	Not Cleaned	6 stilling basins					Met		Met	Not Evaluated	
Nashua Street Park	Boston	Not Met						In Prog	Met	Met	Met	Met	Met				In Prog		Met	Not Cleaned						Met		Met	Not Evaluated	
Neponset River Reservation	Boston, Canton, Dedham, Milton	Not Met						In Prog	Met	Met	Met	Met	Met		Met - Old Colony Labor Yard		In Prog		Met	Not Cleaned						Met	Met	Met	Not Evaluated	
Nickerson State Park	Brewster, Orleans	Not Met						In Prog	Met	Met	Met	Met	Met				Met		Met	Met						Met		Met	Not Evaluated	
North Point Park	Cambridge	Not Met						In Prog	Met	Met	Met	Met	Met				In Prog		Met	Not Cleaned						Met		Met	Not Evaluated	
Old Harbor Reservation	Boston							In Prog	Met	Met	Met	Met	Met				In Prog		Met	Not Cleaned						Met		Met	Not Evaluated	
Pilgrim Memorial State Park	Plymouth											Met	Met																Not Evaluated	
Quincy Shore Reservation (Incl. Caddy Park, Wollaston Beach)	Quincy	Not Met						In Prog	Met	Met	Met	Met	Met				In Prog		Met	Met						Met		Met	Not Evaluated	
Quinsigamond State Park	Shrewsbury, Worcester	Not Met						In Prog	Met	Met	Met	Met	Met				Met		Met	Met						Met		Met	Not Evaluated	
Riverwalk Park	Waltham	Not Met						In Prog	Met	Met	Met	Met	Met				Met		Met	Not Cleaned						Met		Met	Not Evaluated	
Robinson State Park	Agawam, West Springfield, Westfield	Not Met						In Prog	Met	Met	Met	Met	Met				Met		Met	Met	Detention Basins, Retention/ Recharge Basin					Met		Met	Not Evaluated	
South Watuppa Boat Ramp	Fall River	Not Met						In Prog	Met	Met	Met	Met	Met				Met		Met	Not Cleaned						Met		Met	Not Evaluated	
Southwest Corridor	Boston	Not Met						In Prog	Met	Met	Met	Met	In Prog - Under Construction		Met - Southwest Corridor Park		In Prog		Met	Not Cleaned						Met		Met	Not Evaluated	
Squantam Point Park/ Dorchester Shore Reservation (Incl. Malibu, Tenean and Savin Hill Beaches)	Dorchester/ Quincy	Not Met						In Prog	Met	Met	Met	Met	Met				In Prog		Met	Not Cleaned						Met		Met	Not Evaluated	
State Fish Pier	Gloucester	Not Met						In Prog	Met	Met	Met	Met	Met				Met		Met	Not Cleaned						Met		Met	Not Evaluated	
Stone Zoo	Stoneham											Met	Met																Not Evaluated	
Stony Brook Reservation	Boston, Dedham	Not Met						In Prog	Met	Met	Met	Met	Met		Met		In Prog		Met	Not Cleaned						Met	Met	Met	Not Evaluated	

Table 3: Park Facility Best Management Practices

			Permit Year 6 Activity																**Permit Year 6 Activity**											
		BMP #	1-2	1-4	1-5	1-7	1-8	1-9	2-1	2-5	2-7	2-8	3-1	3-4	3-5	6-12	6-13	6-14	6-15	6-18										7-7
		BMP	CB Stenciling/ Plaques	Interactions with Boat Club Programs	Mobile Water Quality Education Seminars	Charles River Conservancy Clean Up Program	Charles River Reservation School Program	Camp Nihan	Abide by MOU with CLF and CRWA	Public Concerns/ Feedback on DCR Website	Massachusetts Water Resource Commission	Lakes and Ponds Program	Drainage Inventory	Drainage Infrastructure Inventory	Illicit Connection Sampling Program	SPCC Plans	Roadway and Drainage Infrastructure Assessment	CB Repair/ Discharge Pipe Cleaning Needs Assessment	Wet Weather Review and Repair	Maintenance Activity Schedule (MAS)											Priority Resource Area Review
Facility	**Town**	**Measurable Goal**	CB cleaning and repair contractor will maintain stencil/ plaque each spring as necessary.	Add to boat club permits that they must post and monitor "No Wake" zones.	Provide storm water/ wq education events.	Partner with Charles River Conservancy Clean Up Program.	Provide 1 storm water/ water quality related educational program each year.	Provide 1 storm water/ water quality related educational program each year.	Abide by MOU with CLF as it relates to maintenance of park facilities and drainage infrastructure	Forward concerns/ feedback received to appropriate dept. Track response to concerns.	Provide technical and staff support to MWRC.	Continue to Sponsor Program.	Locate outfalls	Develop state-wide drainage infrastructure map.	Continue to prioritize and review known potential illicit connections.	Continue to maintain compliance with the requirements in these plans.	Perform state wide assessment of roadways and infrastructure conditions annually.	Perform assessment annually. Create assessment report.	Perform an annual review of roads and parking lots within UA during wet weather conditions to identify ponding or flooding areas.	Sweep Streets Annually.	Clean CB and piping every two years.	Inspect Detention Ponds Annually	Inspect water quality swales annually	Inspect drainage swales annually	Inspect infiltration systems 2x/yr.	Inspect water quality inlets 2x/ yr.	Review for erosion and storm water issues annually.	Perform fleet maintenance twice a year.	Inspect buildings for compliance with good housekeeping measures weekly.	Review outfalls which discharge to priority resource
Permit Year 6 Notes			CB Stenciling assessment was not performed. Received stencils late in year.	Permits are issued for five year term. Requirement will be added when permit is renewed.	DCR offered state-wide Public Education Events including water quality, storm water education (includes forestry practices, healthy ecosystems, water cycle, children's programs).	Environmental education through the Charles River Reservation School Program was cancelled as of June 2007 due to inadequate staffing. There has continued to be a lack of funding for staffing these programs.	see above	see above	DCR provides CLF/ CRWA with a semi-annual report summarizing the actions taken to meet the criteria outlined in the MOU. Semi-annual meetings are held to discuss the progress. DCR is working towards meeting each of the twelve requirements in the MOU.	Concern/ feedback tracking and response system implemented.	DCR attends monthly and is an active participant.	DCR continues to sponsor this program and it now has its own web link on DCR's web site.	DCR has located outfalls from all facilities owned and operated by DCR within urbanized areas.	At the end of 2008, DCR's consultant had mapped drainage information for each of the urbanized area DCR properties. The drainage information was gathered from either scanned construction drawings or field surveys. DCR has continued to update the drainage inventory during its catch basin cleaning, maintenance, and illicit discharge detection efforts this permit year. Approximately 325 outfalls were visited over Permit Year 6 as part of one of these programs.	DCR's consultant performed the first year of a five-year rotating illicit discharge inspection program. The urban stormwater system was split spatially into five regions to facilitate inspections. All regions contain approximately 20% of DCR's system and all contain areas of special concern including public beaches impaired waters, etc. Over this past permit year, one region was inspected for illicit discharges according to the Charles River Illicit Discharge Detection and Elimination Protocol.	Compiled with SPCCC requirements.	DCR inspects roadways and drainage infrastructure annually. Drainage infrastructure is assessed during catch basin cleaning. Maintenance is performed as determined necessary during the inspection.	Between September and December 2008, contractors cleaned and water jetted 1,653 catch basins with these locations recorded using GPS.	DCR inspects roadways for signs of ponding and icing in freezing conditions. DCR makes immediate repairs where ponding causes safety concerns.	To insure adequate street sweeping frequency, DCR entered into a three-year renewable contract in 2007 with a street sweeping contractor to clean certain DCR parkways and roads. Roads which discharge to impaired receiving waters are cleaned using mechanical and vacuum sweeping equipment at least four times per year, and monthly in areas where cars are allowed to park. All roads were swept at least once this year. In June 2007, DCR purchased three new full size street sweepers and six smaller vacuum units for use by Division of Urban Parks and Recreation (DUPR.)	DCR continued to systematically clean catch basins and water jet the associated outlet drain pipes using private contractors overseen daily by DCR staff. Contractors cleaned and water jetted 1,653 catch basins with these locations recorded using GPS. For the fiscal year ending in June 2009 DCR spent $1.6M to clean and repair catch basins.	Unable to comprehensively report on detention basins, water quality swales and infiltration basins since a comprehensive facility specific database is not available. BMPs shown reflect the current database. The database will be finalized upon completion of the drainage system infrastructure inventory. DCR has begun to develop web-based reporting format to better track regional compliance with MAS.							Met MAS schedule.	Met MAS schedule.	Met MAS schedule.	DCR has updated the receiving water body table (Appendix C of the March '08 SWMP) to reflect the outfalls identified in the drainage inventory. The table summarizes the number of outfalls by sub basin number and identifies the impaired waterbody included in the sub-basin.
Planned Activities - May 2009 to April 2010			Park managers will review if their facilities have catch basins and, if appropriate, request a cleaning through the DCR's asset management system. CB cleaning contract will include inspection of stencil/ plaque message and update as necessary.	Continue to include in permits when they are renewed.	Region parks and reservations include DCR Coastal Awareness Environmental **Education** Programs, clean up days, canoe trips, birding trips and beach activities.	No planned activities.	Provide diverse environmental education curricula including water quality.	Provide diverse environmental education curricula including water quality.	Continue to provide semi-annual reports and attend regularly scheduled **meetings with** CLF/ CRWA to review compliance with MOU. Continue to implement and complete programs which address each of the twelve requirements in the MOU.	Continue system.	Continue participation.	Continue sponsorship.	Verify the location and condition of outfalls located from paper maps during illicit **discharge** detection field tasks.	The infrastructure database is a dynamic work in progress which is updated when new construction takes place. Corrections to the database will be made as areas are visited during the illicit discharge investigation and during catch basin cleaning and maintenance efforts. In addition, DCR will add features identified during maintenance work that were missed from the infrastructure database.	DCR will inspect 20% of their stormwater system within the urbanized area during the summer and fall of 2009. DCR will continue to update the drainage inventory and identify needs for maintenance and cleaning as part of this field effort. DCR will follow up on 7 cases of suspect illicit connections from Permit Year 6 inventory.	Continue to comply with SPCCC requirements.	Perform state wide assessment of roadways and infrastructure conditions.	DCR will continue to systematically clean catch basins and water jet the associated outlet drain pipes, as determined necessary, using private **contractors overseen daily** by DCR staff.	Perform review of roads and parking lots within UA during wet weather conditions to identify ponding or flooding areas.	Sweep all streets at least once. Continue to provide and fund contract for sweeping roadways that discharge to impaired receiving waters using mechanical and vacuum sweeping equipment at least four times per year, and monthly in areas where cars are allowed to park.	DCR will continue to systematically clean catch basins and water jet the associated outlet drain pipes, as determined necessary, using private contractors overseen daily by **DCR staff. DCR anticipates a** reduced budget ($1.2 M) and level of effort this year when compared to FY09.	Continue to meet Maintenance Activity Schedule (MAS). Complete drainage system infrastructure inventory. Develop web-based reporting format to more effectively track regional compliance with MAS.							Identify outfalls which discharge to priority resources. Summarize projects to address impairments in annual reports.

Goal Not Met
Goal in Progress
Goal Achieved
Goal Not Applicable
Goal Metrics Not Available

Table 4: Beach Facilities Best Management Practices

Table 4: Beach Facility Best Managment Practices

			Permit Year 6 Activity																
		BMP #	1-3	1-5	3-1	3-4	6-12	6-13	6-14	6-15	6-18								7-7
		BMP	Publish Water Quality Reports and Post Beaches	Mobile Water Quality Education Seminars	Drainage Inventory	Drainage Infrastructure Inventory	SPCC Plans	Roadway and Drainage Infrastructure Assessment	CB Repair/ Discharge Pipe Cleaning Needs Assessment	Wet Weather Review and Repair	Maintenance Activity Schedule (MAS)								Priority Resource Area Review
Facility	**Town**	**Parent Facility**	**Measurable Goal**	Publish WQ reports daily on website.	Provide storm water/ wq education events.	Locate Outfalls	Develop state-wide drainage infrastructure map.	Continue to maintain compliance with the requirements in these plans.	Perform state wide assessment of roadways and infrastructure conditions annually.	Perform assessment annually. Create assessment report.	Perform an annual review of roads and parking lots within UA during wet weather conditions to identify ponding or flooding areas.	Sweep streets monthly (or more frequently as needed).	Clean CB and piping every two years.	Inspect Detention Ponds Annually	Inspect water quality swales annually	Inspect drainage swales annually	Inspect infiltration systems 2x/yr.	Inspect water quality inlets 2x/ yr.	Review outfalls which discharge to priority resource
Ashland Reservoir	Ashland	Ashland State Park		Met		Met	Met			Met		Met	Not Cleaned						Not Evaluated
Carson Beach	Boston	Old Harbor Reservation		Met		Met	Met			Met		Met	Cleaned						Not Evaluated
Constitution Beach	Boston			Met		Met	Met			Met		Met	Not Cleaned					2 Oil Grit Seperators	Not Evaluated
City Point Beach	Boston	Old Harbor Reservation		Met		Met	In Prog			In Prog		Met	Not Cleaned						Not Evaluated
Cliff Pond	Brewster	Nickerson State Park		Met		Met	Met			Met		Met	Not Cleaned						Not Evaluated
Havey Beach	Boston			Met		Met	Met			Met		Met	Not Cleaned						Not Evaluated
King's Beach	Lynn	Lynn Shores Reservation		Met		Met	In Prog			In Prog		Met	Not Cleaned						Not Evaluated
Lynn Beach	Lynn	Lynn Shores Reservation		Met		Met	In Prog			In Prog		Met	Not Cleaned						Not Evaluated
M Street Beach	Boston	Old Harbor Reservation		Met		Met	In Prog			In Prog		Met	Not Cleaned						Not Evaluated
Malibu Beach	Boston			Met		Met	Met			Met		Met	Not Cleaned						Not Evaluated
Nahant Beach	Nahant	Lynn Shores Reservation		Met	Met	Met	Met	Met - Nahant Labor Yard		Met		Met	Not Cleaned						Not Evaluated
Nantasket Beach	Hull			Met		Met	In Prog	Met - Nantasket Beach Labor Yard		In Prog		Swept Daily During Season	Not Cleaned						Not Evaluated
Pleasure Bay Beach	Boston	Old Harbor Reservation		Met		Met	In Prog			In Prog		Met	Not Cleaned						Not Evaluated
Revere Beach Reservation	Revere	Revere Beach Reservation		Met	Met	Met	In Prog			In Prog		Swept Daily During Season	Not Cleaned						Not Evaluated
Sandy Beach	Winchester	Mystic River Reservation		Met		Met	In Prog			In Prog		Met	Not Cleaned						Not Evaluated
Savin Hill Beach	Quincy	Squantum Point Park/ Dorchester Shores Reservation		Met		Met	In Prog			In Prog		Met	Not Cleaned						Not Evaluated
Short Beach	Revere, Winthrop			Met		Met	In Prog			In Prog		Met	Not Cleaned						Not Evaluated
Tenean Beach	Boston			Met		Met	In Prog			In Prog		Met	Not Cleaned						Not Evaluated
Winthrop Beach Reservation	Winthrop	Winthrop Shore Reservation		Met		Met	In Prog			In Prog		Met	Not Cleaned						Not Evaluated
Wollaston Beach	Quincy	Quincy Shore Reservation		Met		Met	In Prog			In Prog		Met	Not Cleaned						Not Evaluated
Permit Year 6 Notes				Weekly beach water quality monitoring and reporting through 2006 season (June through September).	DCR offered state-wide Public Education Events including water quality, storm water education (includes forestry practices, healthy ecosystems, water cycle, children's programs).	DCR has located outfalls from all facilities owned and operated by DCR within urbanized areas.	DCR has continued to add to and update the stormwater infrastructure database. DCR's consultant performed the field survey over the past year, using two crews daily at the peak of survey in the summer of 2008. Over 6,000 points and 6,000 linear features were recorded, completing coverage of the infrastructure database.	Complied with SPCC requirements.	DCR inspects roadways and drainage infrastructure annually. Drainage infrastructure is assessed during catch basin cleaning. Maintenance is performed as determined necessary during the inspection.	Between September and December 2008, contractors cleaned and water jetted 1,653 catch basins with these locations recorded using GPS.	DCR inspects roadways for signs of ponding and icing in freezing conditions. DCR makes immediate repairs where ponding causes safety concerns.	To insure adequate street sweeping frequency, DCR entered into a three-year renewable contract in 2007 with a street sweeping contractor to clean certain DCR parkways and roads.	DCR continued to systematically clean catch basins and water jet the associated outlet drain pipes using private contractors overseen daily by DCR staff. Contractors cleaned and water jetted 1,653 catch basins with these locations recorded using GPS. For the fiscal year ending in June 2009 DCR spent $1.6M to clean and repair catch basins.	Unable to comprehensively report on detention basins, water quality swales and infiltration basins since a comprehensive facility specific database is not available. BMPs shown reflect the current database. The database will be finalized upon completion of the drainage system infrastructure inventory. DCR has begun to develop web-based reporting format to better track regional compliance with MAS.					DCR has updated the receiving water body table (Appendix C of the March '08 SWMP) to reflect the outfalls identified in the drainage inventory. The table summarizes the number of outfalls by sub basin number and identifies the impaired waterbody included in the sub-basin.
Planned Activities - May 2009 to April 2010				Provide wq reports on web for all beaches throughout the season.	Region parks and reservations include DCR Coastal Awareness Environmental Education Programs, clean up days, canoe trips, birding trips and beach activities.	Verify the location and condition of outfalls located from paper maps during illicit discharge detection field tasks.	The infrastructure database is a dynamic work in progress. Updates will be made to the database when new construction takes place. Corrections to the database will be made as areas are visited during the illicit discharge investigation.	Continue to comply with SPCC requirements.	Perform state wide assessment of roadways and infrastructure conditions.	DCR will continue to systematically clean catch basins and water jet the associated outlet drain pipes, as determined necessary, using private contractors overseen daily by DCR staff.	Perform review of roads and parking lots within UA during wet weather conditions to identify ponding or flooding areas.	Continue to provide and fund contract for sweeping.	DCR will continue to systematically clean catch basins and water jet the associated outlet drain pipes, as determined necessary, using private contractors overseen daily by DCR staff. DCR anticipates a reduced budget ($1.2 M) and level of effort this year when compared to FY09.	Continue to meet Maintenance Activity Schedule (MAS). Complete drainage system infrastructure inventory. Develop web-based reporting format to more effectively track regional compliance with MAS.					Identify outfalls which discharge to priority resources. Summarize projects to address impairments in annual reports.

Goal Not Met
Goal in Progress
Goal Achieved
Goal Not Applicable
Goal Metrics Not Available

Table 5: Water Supply/ Reservoir Facilities Best Management Practices

Table 5: Water Supply/ Reservoir Facility Best Managment Practices

		Permit Year 6 Activity																		
		BMP #	1-12	2-5	2-7	2-8	3-1	3-4	4-7	6-8	6-13	6-15	6-18							7-7
		BMP	"Downstream" Newsletter	Public Concerns/ Feedback on DCR Website	Massachusetts Water Resource Commission	Lakes and Ponds Program	Drainage Inventory	Drainage Infrastructure Inventory	Technical Assistance to Conservation Commissions	Chemical Applications Review Meetings	Roadway and Drainage Infrastructure Assessment	Wet Weather Review and Repair	Maintenance Activity Schedule (MAS)							Priority Resource Area Review
Facility	**Town**	**Measurable Goal**	Continue to develop and disseminate newsletter regarding issues relevant to Wachusett Reservoir/ Quabbin Reservoir watersheds.	Forward concerns/ feedback received to appropriate dept. Track response to concerns.	Provide technical and staff support to MWRC.	Continue to Sponsor Program.	Locate Outfalls	Develop state-wide drainage infrastructure map.	Provide technical assistance and the staffing level necessary to provide timely responses.	Meet with railroad and utility companies which have property, easements or access privileges within the Division of Water Supply Protection's (DWSP) watershed lands each two years.	Perform state wide assessment of roadways and infrastructure conditions annually.	Perform an annual review of roads and parking lots within UA during wet weather conditions to identify ponding or flooding areas.	Sweep streets annually.	Clean CB and piping every two years.	Inspect detention ponds annually, clean per inspection recmndn.	Inspect water quality swales annually, clean per inspection recmndn.	Inspect drainage swales annually, clean per inspection recmndn.	Inspect water quality inlets 2x/yr, clean per inspection recmndn.	Inspect infiltration systems 2x/yr, clean per inspection recmndn.	Building maintenance weekly, clean per inspection recmndn.	Review outfalls which discharge to priority resource
Brighton Upper Basin Facility (Charles River Reservation)	Brighton		Met	Met	Met	Met	Met	In Prog					Met	Not Cleaned						Met	Priority Resource - Water Supply
Charles River Dam (Charles River Reservation)	Newton, Waltham, Cambridge		Met	Met	Met	Met	Met	In Prog					Met	Not Cleaned						Met	Priority Resource - Water Supply
New Charles River Dam	Boston		Met	Met	Met	Met	Met	Met					Met	Not Cleaned				Pretreatment Chamber		Met	Priority Resource - Water Supply
Chestnut Hill Reservoir	Boston		Met	Met	Met	Met	Met	In Prog					Met	Not Cleaned						Met	Priority Resource - Water Supply
Medfield Charles River Street Reservation	Medfield		Met	Met	Met	Met	Met	In Prog					Met	Not Cleaned						Met	Priority Resource - Water Supply
Middlesex Fells Reservoir	Stoneham		Met	Met	Met	Met	Met	In Prog					Met	Not Cleaned						Met	Priority Resource - Water Supply
Nash Hill Reservoir	Ludlow		Met	Met	Met	Met	Met	Met	Met	Met			Met	Not Cleaned						Met	Priority Resource - Water Supply
Permit Year 6 Notes			DCR published and circulated this newsletter. The Spring 2008 issue included discussions on natural landscapes in lieu of lawns, pet waste, and the state's Water Supply Protection Trust. The Fall 2008 issue included discussions on the Asian Longhorned Beetle, new crest gates at the Wachusett Spillway, and new license plates to support land conservation critical to water resource protection.	Concern/ feedback tracking and response system implemented.	DCR attends monthly and is an active participant.	DCR continues to sponsor this program and it now has its own web link on DCR's web site.	DCR has located outfalls from all facilities owned and operated by DCR within urbanized areas.	DCR has continued to add to and update the stormwater infrastructure database. DCR's consultant performed the field survey over the past year, using two crews daily at the peak of survey in the summer of 2008. Over 6,000 points and 6,000 linear features were recorded, completing coverage of the infrastructure database.	Technical assistance was provided to 12 of 17 Conservation Commission regarding projects within the Quabbin and Wachusett Reservoirs, as requested by Conservation Commissions.	DWSP meets with railroad annually to review Yearly Operation Plan and vegetation management plans.	DCR inspects roadways and drainage infrastructure annually. Drainage infrastructure is assessed during catch basin cleaning. Maintenance is performed as determined necessary during the inspection.	DCR inspects roadways for signs of ponding and icing in freezing conditions. DCR makes immediate repairs where ponding causes safety concerns.	To insure adequate street sweeping frequency, DCR entered into a three-year renewable contract in 2007 with a street sweeping contractor to clean certain DCR parkways and roads. Roads which discharge to impaired receiving waters are cleaned using mechanical and vacuum sweeping equipment at least four times per year, and monthly in areas where cars are allowed to park. All roads were swept at least once this year. In June 2007, DCR purchased three new full size street sweepers and six smaller vacuum units.	DCR continued to systematically clean catch basins and water jet the associated outlet drain pipes using private contractors overseen daily by DCR staff. Contractors cleaned and water jetted 1,653 catch basins with these locations recorded using GPS. For the fiscal year ending in June 2009 DCR spent $1.6M to clean and repair catch basins.	Unable to comprehensively report on detention basins, water quality swales and infiltration basins since a comprehensive facility specific database is not available. BMPs shown reflect the current database. The database will be finalized upon completion of the drainage system infrastructure inventory. DCR has begun to develop web-based reporting format to better track regional compliance with MAS.			Met MAS schedule.	DCR has updated the receiving water body table (Appendix C of the March '08 SWMP) to reflect the outfalls identified in the drainage inventory. The table summarizes the number of outfalls by sub basin number and identifies the impaired waterbody included in the sub-basin.
Planned Activities - May 2009 to April 2010			Publish issues in May and November 2009. Place issues on web page.	Continue system.	Continue participation.	Continue sponsorship.	Verify the location and condition of outfalls located from paper maps during illicit discharge detection field tasks.	The infrastructure database is a dynamic work in progress. Updates will be made to the database when new construction takes place. Corrections to the database will be made as areas are visited during the illicit discharge investigation.	Continue to provide technical assistance.	Continue to meet with railroad yearly and review Yearly Operation and Vegetation Management Plan.	Perform state wide assessment of roadways and infrastructure conditions.	Perform review of roads and parking lots within UA during wet weather conditions to identify ponding or flooding areas.	Sweep all streets at least once. Continue to provide and fund contract for sweeping roadways that discharge to impaired receiving waters using mechanical and vacuum sweeping equipment at least four times per year, and monthly in areas where cars are allowed to park.	DCR will continue to systematically clean catch basins and water jet the associated outlet drain pipes, as determined necessary, using private contractors overseen daily by DCR staff. DCR anticipates a reduced budget ($1.2 M) and level of effort this year when compared to FY09.	Continue to meet Maintenance Activity Schedule (MAS). Complete drainage system infrastructure inventory. Develop web-based reporting format to more effectively track regional compliance with MAS.				Identify outfalls which discharge to priority resources. Summarize projects to address impairments in annual reports.

Goal Not Met
Goal in Progress
Goal Achieved
Goal Not Applicable
Goal Metrics Not Available

Table 6: State Forest Facilities Best Management Practices

Table 6: State Forest Best Management Practices

		Permit Year 6 Activity															
	BMP #	2-5	2-7	2-8	3-1	3-4	6-13	6-14	6-15	6-18							
	BMP	Public Concerns/ Feedback on DCR Website	Massachusetts Water Resource Commission	Lakes and Ponds Program	Drainage Inventory	Drainage Infrastructure Inventory	Roadway and Drainage Infrastructure Assessment	CB Repair/ Discharge Pipe Cleaning Needs Assessment	Wet Weather Review and Repair	Maintenance Activity Schedule (MAS)							
Facility	**Town**	**Measurable Goal**	Forward concerns/ feedback received to appropriate dept. Track response to concerns.	Provide technical and staff support to MWRC.	Continue to Sponsor Program.	Locate Outfalls	Develop state-wide drainage infrastructure map.	Perform state wide assessment of roadways and infrastructure conditions annually.	Perform assessment annually. Create assessment report.	Perform an annual review of roads and parking lots within UA during wet weather conditions to identify ponding or flooding areas.	Sweep streets annually.	Clean CB and piping every two years.	CB rehabilitation and repair annually and clean per inspection recmndn.	Inspect detention ponds annually, clean per inspection recmndn.	Inspect water quality swales annually, clean per inspection	Inspect drainage swales annually, clean per inspection recmndn.	Inspect water quality inlets 2x/yr, clean per inspection recmndn.	Inspect infiltration systems 2x/yr, clean per inspection recmndn.	Building maintenance weekly, clean per inspection recmndn.
Lowell-Dracut-Tyngsboro State Forest	Lowell, Dracut, Tyngsboro		Met	Met	Met	Met	Met		Met		Met	In Prog							Met
Shawme-Crowell State Forest	Bourne, Sandwich		Met	Met	Met	Met	Met		Met		Met	In Prog		Created Wetland					Met
Permit Year 6 Notes			Concern/ feedback tracking and response system implemented.	DCR attends monthly and is an active participant.	DCR continues to sponsor this program and it now has its own web link on DCR's web site.	DCR has located outfalls from all facilities owned and operated by DCR within urbanized areas.	DCR has continued to add to and update the stormwater infrastructure database. DCR's consultant performed the field survey over the past year, using two crews daily at the peak of survey in the summer of 2008. Over 6,000 points and 6,000 linear features were recorded, completing coverage of the infrastructure database.	DCR inspects roadways and drainage infrastructure annually. Drainage infrastructure is assessed during catch basin cleaning. Maintenance is performed as determined necessary during the inspection.	Between September and December 2008, contractors cleaned and water jetted 1,653 catch basins with these locations recorded using GPS.	DCR inspects roadways for signs of ponding and icing in freezing conditions. DCR makes immediate repairs where ponding causes safety concerns.	To insure adequate street sweeping frequency, DCR entered into a three-year renewable contract in 2007 with a street sweeping contractor to clean certain DCR parkways and roads. Roads which discharge to impaired receiving waters are cleaned using mechanical and vacuum sweeping equipment at least four times per year, and monthly in areas where cars are allowed to park. All roads were swept at least once this year. In June 2007, DCR purchased three new full size street sweepers and six smaller vacuum units.	DCR continued to systematically clean catch basins and water jet the associated outlet drain pipes using private contractors overseen daily by DCR staff. Contractors cleaned and water jetted 1,653 catch basins with these locations recorded using GPS. For the fiscal year ending in June 2009 DCR spent $1.6M to clean and repair catch basins.	Unable to report on detention basins, water quality swales and infiltration basins since a comprehensive facility specific data base is not available. Drainage system infrastructure inventory proposed will make this possible. Begun to develop web-based reporting format to better track regional compliance with MAS.						Met MAS schedule.
Planned Activities - May 2009 to April 2010			Continue system.	Continue participation.	Continue sponsorship.	Verify the location and condition of outfalls located from paper maps during illicit discharge detection field tasks.	The infrastructure database is a dynamic work in progress. Updates will be made to the database when new construction takes place. Corrections to the database will be made as areas are visited during the illicit discharge investigation.	Perform state wide assessment of roadways and infrastructure conditions.	DCR will continue to systematically clean catch basins and water jet the associated outlet drain pipes, as determined necessary, using private contractors overseen daily by DCR staff.	Perform review of roads and parking lots within UA during wet weather conditions to identify ponding or flooding areas.	Sweep all streets at least once. Continue to provide and fund contract for sweeping roadways that discharge to impaired receiving waters using mechanical and vacuum sweeping equipment at least four times per year, and monthly in areas where cars are allowed to park.	DCR will continue to systematically clean catch basins and water jet the associated outlet drain pipes, as determined necessary, using private contractors overseen daily by DCR staff. DCR anticipates a reduced budget ($1.2 M) and level of effort this year when compared to FY09.	Continue to meet Maintenance Activity Schedule (MAS). Complete drainage system infrastructure inventory. Develop web-based reporting format to more effectively track regional compliance with MAS.						

Goal Not Met
Goal in Progress
Goal Achieved
Goal Not Applicable
Goal Metrics Not Available

Table 7: Construction Sites Best Management Practices

Table 7: Construction Site Best Management Practices

			Permit Year 6 Activity		
		BMP #	1-2	2-5	3-4	4-1
		BMP	CB Stenciling/ Plaques	Public Concerns/ Feedback on DCR Website	Drainage Infrastructure Inventory	NPDES Storm Water Construction General Permit
Facility	**Town**	**Measurable Goal**	Install catch basin grates with integrated plaques on all park facilities where construction includes drainage systems.	Forward concerns/ feedback received to appropriate dept. Track response to concerns.	Develop state-wide drainage infrastructure map.	All projects which exceed one acre will file for coverage.
Bryan/Roche Rink & Parking	West Roxbury			Met	In Prog	
Canton Airport (superfund site)	Canton			Met	In Prog	
Charles River Basin Master Plan construction	Boston			Met	In Prog	
Constitution Beach Bathhouse	Boston			Met	Met	
Cronin Rink Redevelopment	Revere			Met	In Prog	
Dorchester Shores Restoration	Dorchester			Met	In Prog	Met
Horseneck Beach Building & Septic	Westport			Met	In Prog	In Prog
Magazine Beach Improvements	Cambridge			Met	In Prog	
Middlesex Fells Tudor Barn	Stoneham			Met		
Mount Greylock Road	Lanesboro			Met		In Prog
Mystic Valley Parkway	Arlington, Somerville			Met	In Prog	
Nahant Beach Bathhouse	Nahant			Met		
Nantasket Beach Seawall	Hull			Met	In Prog	
Revere Beach Improvements	Revere			Met	In Prog	
Rocky & Short Beaches	Revere, Winthrop			Met	In Prog	
Salisbury Beach Construction	Salisbury			Met	In Prog	
Scusset Beach Improvements	Sandwich			Met	In Prog	
Spectacle Island Improvements	Boston			Met	In Prog	
Upper Charles Master Plan, Watertown	Waltham, Newton			Met	In Prog	
West Link Park	Boston			Met	In Prog	
Permit Year 6 Notes				Concern/ feedback tracking and response system implemented. DCR Construction Activity Updates: http://www.mass.gov/dcr/construction.htm	Drainage infrastructure constructed as part of construction projects after Spring 2006 will require submission of drainage infrastructure as-builts which will be added to GIS database.	Projects which exceed on acre of disturbance filed for coverage under the Construction GP and developed a SWPPP for the site. All projects were reviewed in Fall 2008 and DCR filed for coverage for all those which disturb more than an acre and were not covered under a Construction General Permit currently.
Planned Activities - May 2009 to April 2010				Continue system.	Require submittal of as-builts.	Continue to file for coverage for construction sites which disturb more than one acre.

	Goal Not Met
	Goal in Progress
	Goal Achieved
	Goal Not Applicable

7b. WLA Assessment

TMDL reports were reviewed for discussion of implementation activities which may impact or directly mention DCR's facility or roadways and are summarized in Table 8. DCR will continue to review compliance with these recommended activities. Table 8 summarizes the final TMDLs approved as of March 31, 2009 and the implementation recommendations which impact DCR facilities.

Table 8 TMDL Summary

Table 8: MA TMDL Reports with DCR Related Implementation Recommendations

Watershed/TMDL	Specific Waterbodies	Pollutant of Concern	Does TMDL include a WLA?	Does the TMDL include BMP recommendations or performance requirement regarding DCR (or former DEM/ MDC)?	If yes, what are the recommendations?	Is Agency meeting these recommendations through existing or proposed programs?	How is Agency currently meeting these recommendations or how does Agency plan to meet them in the future?
Nashua River/ Final TMDL for Bare Hill Pond	Bare Hill Pond	Phosphorus (Nuisance Aquatics)	Yes	Yes	1. The MA DEP will endorse in-lake remediation efforts that meet all environmental concerns, however, instituting such measures will rest with communities and the Clean Lakes Program now administered by EPA and, in Massachusetts, the DEM.	Yes	Refer to BMP 2-8.
					2. DEM forester should check that an approved forest cutting plan is in place and BMP's for erosion are being followed.	Yes	Refer to BMP 7-4
Chicopee River/ Final Phosphorus TMDL for Selected Chicopee Basin Lakes	Browning Pond, Oakham Long Pond, Springfield Sugden Reservoir, Spencer Mona Lake, Springfield Minechoag Pond, Ludlow Spectacle Pond, Wilbraham Wickaboag Pond, Brookfield	Phosphorus	Yes	Yes	1. The MA DEP will endorse in-lake remediation efforts that meet all environmental concerns, however, instituting such measures will rest with communitites and the Clean Lakes Program now administered by EPA and, in Massachusetts, the DEM.	Yes Yes	Refer to BMP 2-8. Refer to BMP 7-4
					2. DEM forester should check that an approved forest cutting plan is in place and BMP's for erosion are being followed.		
Cape Cod/Final TMDL Report of Bacteria for Frost Fish Creek, Chatham	Frost Fish Creek	Bacteria	Yes	No	--	--	--

Table 8: MA TMDL Reports with DCR Related Implementation Recommendations

Watershed/TMDL	Specific Waterbodies	Pollutant of Concern	Does TMDL include a WLA?	Does the TMDL include BMP recommendations or performance requirement regarding DCR (or former DEM/ MDC)?	If yes, what are the recommendations?	Is Agency meeting these recommendations through existing or proposed programs?	How is Agency currently meeting these recommendations or how does Agency plan to meet them in the future?
Cape Cod/Final TMDL Report of Bacteria for Muddy Creek, Chatham	Muddy Creek	Bacteria	Yes	No	--	--	--
Cape Cod/Final Nitrogen TMDL for Oyster Pond	Oyster Pond	Total Nitrogen	Yes	No	--	--	--
Cape Cod/Final Nitrogen TMDL for Little Pond	Little Pond Embayment System	Total Nitrogen	Yes	No	--	--	--
Connecticut Basin/ Final TMDLs of Phosphorus for Selected Connecticut Basin Lakes	Aldrich Lake East, Granby Aldrich Lake West, Granby Leverett Pond, Leverett Lake Wyola, Shutesbury Loon Pond, Springfield Lake Warner, Hadley	Phosphorus	Yes	Yes	1. The MA DEP will endorse in-lake remediation efforts that meet all environmental concerns, however, instituting such measures will rest with communities and the Clean Lakes Program now administered by EPA and, in Massachusetts, the DEM.	Yes	Refer to BMP 2-8.
					2. DEM forester should check that an approved forest cutting plan is in place and BMPs for erosion are being followed. Also, DEM should provide training to local ConComms on harvesting BMPs.	Yes	Refer to BMP 7-4
French River/ Final TMDLs of Phosphorus for Selected French Basin Lakes	Buffumville Lake, Charlton Cedar Meadow Pd, Leicester Dresser Hill Pond, Charlton Dutton Pond, Leicester Gore Pond, Charlton/Dudley Granite Reservoir, Charlton Greenville Pond, Leicester Hudson Pond, Oxford Jones Pond, Charlton/Spencer Larner Pond, Dudley Lowes Pond, Oxford	Phosphorus	Yes	Yes	1. The MA DEP will endorse in-lake remediation efforts that meet all environmental concerns, however, instituting such measures will rest with communities and the Clean lakes Program now administered by EPA and, in Massachusetts, the DEM.	Yes	Refer to BMP 2-8.

Table 8: MA TMDL Reports with DCR Related Implementation Recommendations

Watershed/TMDL	Specific Waterbodies	Pollutant of Concern	Does TMDL include a WLA?	Does the TMDL include BMP recommendations or performance requirement regarding DCR (or former DEM/ MDC)?	If yes, what are the recommendations?	Is Agency meeting these recommendations through existing or proposed programs?	How is Agency currently meeting these recommendations or how does Agency plan to meet them in the future?
Selected French Basin Lakes (cont'd)	McKinstry Pond, Oxford Mosquito (Tobins) Pond, Dudley New Pond, Dudley Peter Pond, Dudley Pierpoint Meadow Pond, Dudley/Charlton Pikes Pond, Charlton Robinson Pond, Oxford Rochdale Pond, Leicester Shepherd Pond, Dudley Texas Pond, Oxford Wallis Pond, Dudley Cedar Meadow Pond, Leicester Dresser Hill Pond, Charlton Gore Pond, Charlton/Dudley Granite Reservoir, Charlton Hudson Pond, Oxford Jones Pond, Charlton/Spencer Larner Pond, Dudley New Pond, Dudley Peter Pond, Dudley Robinson Pond, Oxford Shepherd Pond, Dudley Mosquito (Tobins) Pd, Dudley Wallis Pond, Dudley				2. DEM forester should check that an approved forest cutting plan is in place and BMPs for erosion are being followed.	Yes	Refer to BMP 7-4
Blackstone River/ Final TMDLs for Phosphorus for Indian Lake	Indian Lake, Worcester	Phosphorus	Yes	Yes	The MA DEP will endorse in-lake remediation efforts that meet all environmental concerns, however, instituting such measures will rest with communities and the Clean Lakes Program now administered by EPA and, in Massachusetts, the DEM.	Yes	Refer to BMP 2-8.

Table 8: MA TMDL Reports with DCR Related Implementation Recommendations

Watershed/TMDL	Specific Waterbodies	Pollutant of Concern	Does TMDL include a WLA?	Does the TMDL include BMP recommendations or performance requirement regarding DCR (or former DEM/ MDC)?	If yes, what are the recommendations?	Is Agency meeting these recommendations through existing or proposed programs?	How is Agency currently meeting these recommendations or how does Agency plan to meet them in the future?
SuAsCo/ Final TMDLs of Phosphorus for Lake Boon (Boons Pond)	Lake Boon, Hudson/Stow	Phosphorus	Yes	Yes	1. The MA DEP will endorse in-lake remediation efforts that meet all environmental concerns, however, instituting such measures will rest with communities and the Clean lakes Program now administered by EPA and, in Massachusetts, the DEM.	Yes	Refer to BMP 2-8.
					2. DEM forester should check that an approved forest cutting plan is in place and BMPs for erosion are being followed.	Yes	Refer to BMP 7-4.
Blackstone River/ Final TMDLs of Phosphorus for Lake Quinsigamond and Flint Pond	Flint Pond, Grafton/ Worcester/ Shrewsbury Lake Quinsigamond, Worcester/ Shrewsbury	Phosphorus	Yes	Yes	The MA DEP will endorse in-lake remediation efforts that meet all environmental concerns, however, instituting such measures will rest with communities and the Clean Lakes Program now administered by EPA and, in Massachusetts, the DEM.	Yes	Refer to BMP 2-8.
Blackstone River/ Final TMDLs of Phosphorus for Leesville Pond	Leesville Pond, Auburn/Worcester	Phosphorus	Yes	Yes	The MA DEP will endorse in-lake remediation efforts that meet all environmental concerns, however, instituting such measures will rest with communities and the Clean Lakes Program now administered by EPA and, in Massachusetts, the DEM.	Yes	Refer to BMP 2-8.

Table 8: MA TMDL Reports with DCR Related Implementation Recommendations

Watershed/TMDL	Specific Waterbodies	Pollutant of Concern	Does TMDL include a WLA?	Does the TMDL include BMP recommendations or performance requirement regarding DCR (or former DEM/ MDC)?	If yes, what are the recommendations?	Is Agency meeting these recommendations through existing or proposed programs?	How is Agency currently meeting these recommendations or how does Agency plan to meet them in the future?
Millers River/ Final TMDLs of Phosphorus for Selected Miller River Basin Lakes	Bents Pond Bourn-Hadley Pond Brazell Pond Lake Ellis Greenwood Pond Lake Monomonac Ramsdall Pond Reservoir No. 1 Wallace Pond Whitney Pond Beaver Flowage Pond Cowee Pond Davenport Pond Lake Denison Depot Pond Hilchey Pond Lower Naukeag Lake Minott Pond South Minott Pond Parker Pond Reservoir No. 2 Riceville Pond South Athol Pond Stoddard Pond Ward Pond Whites Mill Pond Wrights Reservoir	Phosphorus	Yes	Yes	1. The MA DEP will endorse in-lake remediation efforts that meet all environmental concerns, however, instituting such measures will rest with communities and the Clean lakes Program now administered by EPA and, in Massachusetts, the DEM.	Yes	Refer to BMP 2-8.
					2. DEM forester should check that an approved forest cutting plan is in place and BMPs for erosion are being followed.	Yes	Refer to BMP 7-4.

Table 8: MA TMDL Reports with DCR Related Implementation Recommendations

Watershed/TMDL	Specific Waterbodies	Pollutant of Concern	Does TMDL include a WLA?	Does the TMDL include BMP recommendations or performance requirement regarding DCR (or former DEM/ MDC)?	If yes, what are the recommendations?	Is Agency meeting these recommendations through existing or proposed programs?	How is Agency currently meeting these recommendations or how does Agency plan to meet them in the future?
Boston Harbor/ Final TMDLs of Bacteria for Neponset River Basin	Beaver Meadow Brook East Branch, Outlet Forge Pond Germany Brook Gulliver Creek Hawes Brook Massapoag Brook Mill Brook Mine Brook Mother Brook Neponset River Pequid Brook Pine Tree Brook Ponkapoag Brook Purgatory Brook School Meadow Brook Traphole Brook Unquity Brook	Bacteria	Yes	No	--	--	--
Blackstone River/ Final TMDL for Northern Blackstone Lakes	Auburn Pond, Auburn Curtis Pond North, Worcester Curtis Pond South, Worcester Dorothy Pond, Millbury Eddy Pond, Auburn Pondville Pond, Auburn Smiths Pond, Leicester Southwick Pond, Leicester Stoneville Pond, Auburn Brierly Pond, Millbury Green Hill Pond, Worcester Howe Reservoir, Millbury Jordan Pond, Shrewsbury Mill Pond, Shrewsbury Newton Pond, Shrewsbury Shirley St Pond, Shrewsbury	Phosphorus	Yes	Yes	1. The MA DEP will endorse in-lake remediation efforts that meet all environmental concerns, however, instituting such measures will rest with communities and the Clean lakes Program now administered by EPA and, in Massachusetts, the DEM. 2. DEM forester should check that an approved forest cutting plan is in place and BMPs for erosion are being followed.	Yes Yes	Refer to BMP 2-8. Refer to BMP 7-4.

Table 8: MA TMDL Reports with DCR Related Implementation Recommendations

Watershed/TMDL	Specific Waterbodies	Pollutant of Concern	Does TMDL include a WLA?	Does the TMDL include BMP recommendations or performance requirement regarding DCR (or former DEM/ MDC)?	If yes, what are the recommendations?	Is Agency meeting these recommendations through existing or proposed programs?	How is Agency currently meeting these recommendations or how does Agency plan to meet them in the future?
Blackstone River/ Final TMDLs of Phosphorus for Salisbury Pond	Salisbury Pond, Worcester	Phosphorus	Yes	Yes	The MA DEP will endorse in-lake remediation efforts that meet all environmental concerns, however, instituting such measures will rest with communities and the Clean Lakes Program now administered by EPA and, in Massachusetts, the DEM.	Yes	Refer to BMP 2-8.
Shawsheen River/ Final TMDLs of Bacteria for Shawsheen River Basin	Shawsheen River	Bacteria Stormwater	Yes Yes	No No	-- --	-- --	-- --
South Coastal/ Final TMDL of Bacteria for Little Harbor, Cohasset	Little Harbor, Cohassett	Fecal Coliform	No	No	--	--	--
SuAsCo/ Final Nutrient TMDL Report for the Assabet River	Assabet River	Phosphorus	Yes	No	--	--	--
Cape Cod/ Final Nitrogen TMDL Report for Five Sub-Embayments of Popponesset Bay	Mashpee River Shoestring Bay Popponesset Bay	Total Nitrogen	Yes	No	--	--	--
Multi-State/ Final Bacteria and Total Phosphorus TMDL Report for the Kickemuit River (Rhode Island-Massachusetts)	Kickemuit Reservoir Upper Kickemuit River Kickemuit River	Bacteria, Phosphorus	Yes	No	--	--	--
Multi-State/ Final Northeast Regional Mercury TMDL	Fresh waters in CT, MA, ME, NH, NY, RI, VT	Mercury	Yes	No	--	--	--

Table 8: MA TMDL Reports with DCR Related Implementation Recommendations

Watershed/TMDL	Specific Waterbodies	Pollutant of Concern	Does TMDL include a WLA?	Does the TMDL include BMP recommendations or performance requirement regarding DCR (or former DEM/ MDC)?	If yes, what are the recommendations?	Is Agency meeting these recommendations through existing or proposed programs?	How is Agency currently meeting these recommendations or how does Agency plan to meet them in the future?
Cape Cod/ Final Nutrient TMDL for Centerville River/East Bay	Centerville River Bumps River	Total Nitrogen	Yes	Yes	MassDEP will work with the towns to develop specific implementation strategies to reduce N loadings, and will assist in developing a monitoring plan for assessing the success of the nutrient reduction strategies.		Refer to BMP 5-1, 5-2 and 3-5.
Cape Cod/ Final Nitrogen TMDL for Phinneys Harbor	Phinneys Harbor Back River Eel Pond	Total Nitrogen	Yes	No	--	--	--
Cape Cod/ Final Nitrogen TMDL for Pleasant Bay System	Pleasant Bay Crows Pond Frost Fish Creek Ryder Cove Muddy Creek	Total Nitrogen	Yes	No	--	--	--
Cape Cod/ Final Nitrogen TMDL Report for the Quashnet River, Hamblin Pond, Little River, Jehu Pond, and Great River in the Waquoit Bay System	Quashnet River Hamblin Pond Little River Jehu Pond Great River	Total Nitrogen	Yes	No	--	--	--
Cape Cod/ Final Nitrogen TMDL Report for Three Bays System	Cotuit Bay North Bay Prince Cove Seapuit River West Bay	Total Nitrogen	Yes	No	--	--	--
Cape Cod/ Final Nitorgen TMDL West Falmouth Harbor	Harbor Head West Falmouth Harbor	Total Nitrogen	Yes	No	--	--	--
Cape Cod/ Final TMDLs of Nitrogen for Great, Green, and Bournes Pond Embayment Systems	Great Pond Perch Pond Green Pond Bounes Pond	Total Nitrogen	Yes	No	--	--	--

Table 8: MA TMDL Reports with DCR Related Implementation Recommendations

Watershed/TMDL	Specific Waterbodies	Pollutant of Concern	Does TMDL include a WLA?	Does the TMDL include BMP recommendations or performance requirement regarding DCR (or former DEM/ MDC)?	If yes, what are the recommendations?	Is Agency meeting these recommendations through existing or proposed programs?	How is Agency currently meeting these recommendations or how does Agency plan to meet them in the future?
Charles River/ Final Phosphorus TMDL Report for the Lower Charles River Basin	Lower Charles River	Total Phosphorus	Yes	Yes	1. DCR is subject to the Phase II MS4 stormwater permit regulations, as is any other state or federal facility with a separate storm sewer system with the identified urbanized areas. 2. Initially DCR will need to collect source monitoring data and additional drainage area information to better target source areas for controls and also evaluate the effectiveness of on-going control practices. 3. DCR's existing stormwater management program should be enhanced to optimize reductions in nutrient loadings with initial emphasis on source controls and pollution prevention practices.	Yes	DCR has received authorization to discharge under the NPDES Phase II MS4 permit. Refer to BMP 3-5. Refer to BMP 5-1 and 5-2.
Charles River/ Final Pathogen TMDL Reports for the Charles River Watershed	Beaver Brook Bogastow Brook Charles River Cheese Cake Brook Fuller Brook Muddy River Rock Meadow Brook Rosemary Brook Sawmill Brook South Meadow Brook Stop River Unnnamed tributaries	Pathogens	Yes	No	--	--	--

Table 8: MA TMDL Reports with DCR Related Implementation Recommendations

Watershed/TMDL	Specific Waterbodies	Pollutant of Concern	Does TMDL include a WLA?	Does the TMDL include BMP recommendations or performance requirement regarding DCR (or former DEM/ MDC)?	If yes, what are the recommendations?	Is Agency meeting these recommendations through existing or proposed programs?	How is Agency currently meeting these recommendations or how does Agency plan to meet them in the future?
Chicopee River/ Final TMDLs of Phosphorus for Quaboag and Quacumquasit Ponds	Quaboag Pond Quacumquasit Pond	Total Phosphorus	Yes	No	The MADEP will support in-lake remediation efforts that are cost-effective, long-term and meet all environmental concerns, however, instituting such measures will depend on continued Federal support via EPA and State support via the MA DEM. DEM forester should check that an approved forest cutting plan is in place and BMPs for erosion are being followed.		Refer to BMP 2-8. Refer to BMP 7-4.
Narragansett Bay/ Final Bacteria TMDL for Palmer River Basin	Palmer River - West Branch Palmer River - East Branch Rumney Marsh brook Beaver Dam Brook Bad Luck Brook Fullers Brook Clear Run Torrey Creek Old Swamp Brook Rocky Run	Bacteria	Yes	No	--	--	--
Buzzards Bay/ Final Pathogen TMDL for the Buzzards Bay Watershed	Acushnet River Agawam River Apponagansett Bay Aucoot Cove Beaverdam Creek Broad Marsh River Buttermilk Bay Buttonwood Brook Cedar Island Creek Clarks Cove Crooked River	Bacteria	Yes	No	--	--	--

Table 8: MA TMDL Reports with DCR Related Implementation Recommendations

Watershed/TMDL	Specific Waterbodies	Pollutant of Concern	Does TMDL include a WLA?	Does the TMDL include BMP recommendations or performance requirement regarding DCR (or former DEM/ MDC)?	If yes, what are the recommendations?	Is Agency meeting these recommendations through existing or proposed programs?	How is Agency currently meeting these recommendations or how does Agency plan to meet them in the future?
Buzzards Bay Watershed (cont'd)	East Branch Westport River Hammett Cove Mattapoisett Harbor New Bedford Inner Harbor Onset Bay Outer New Bedford Harbor Sippcan Harbor Sippican River Slocums River Snell Creek Wankinco River Wareham River West Branch Westport River Westport River Wewantic River						
Cape Cod/ Final Nitrogen TMDL Report for Five Chatham Embayments (Stage Harbor, Sulphur Springs, Taylors Pond, Bassing Harbor and Muddy Creek)	Oyster Pond Oyster Pond River Stage Harbor Mill Pond	Nutrients and Pathogens	Yes	No	--	--	--
	Harding Beach Pond Bucks Creek	Pathogens	Yes	No	--	--	--
	Taylors Pond Mill Creek	Pathogens	Yes	No	--	--	--
Islands/ Final TMDLs of Total Nitrogen for Nantucket Harbor	Nantucket Harbor Polpis Harbor	Nitrogen	Yes	No	--	--	--

Part IV. Summary of Information Collected and Analyzed

No additional information collected and/or analyzed.

Part V. Program Outputs & Accomplishments

All programs and accomplishments are summarized in the appropriate tables.

Appendix A:

Down Stream Newsletters

The Gulls of Massachusetts

Tracking Their Habits

Quabbin and Wachusett Reservoirs, located in central Massachusetts, are the water supply source for the greater metropolitan Boston area; more than 2 million people rely on these reservoirs for their drinking water. The Department of Conservation and Recreation, Division of Water Supply Protection (the Division) administers a variety of watershed protection programs to maintain and enhance the reservoirs' water quality. The vast resources of water and the surrounding landscape are habitat for a wide array of wildlife, which can pose a risk to water quality when they are:

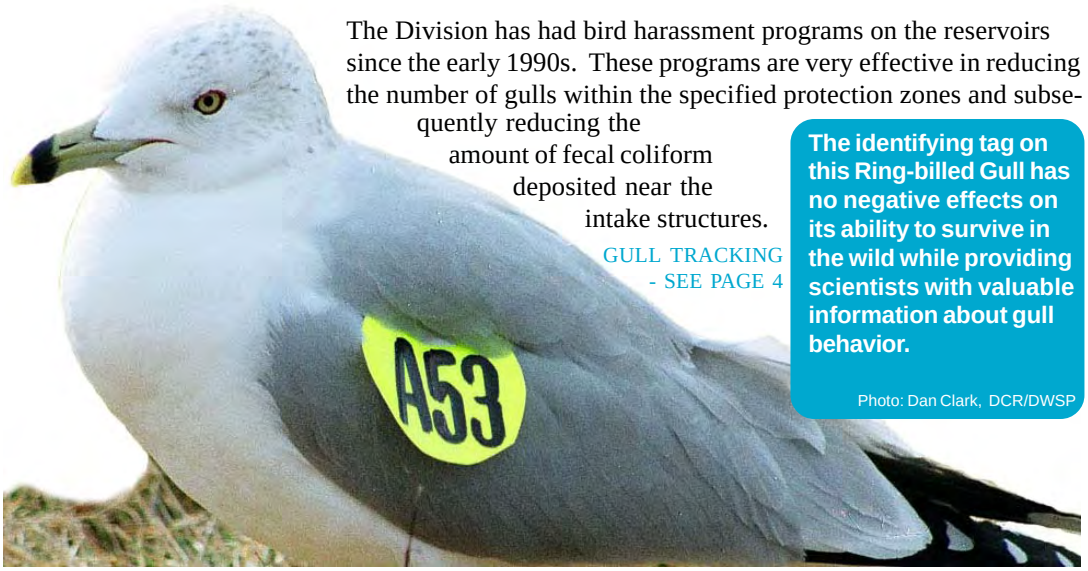
1. Located in critical areas around reservoir intake structures.
2. Concentrated in numbers that pose a health risk.
3. A combination of both 1 and 2.

An assortment of birds utilize the reservoirs for breeding, migratory stops, roosting, and feeding. Some species (e.g., common loons – see *Downstream #10*) occur in such low numbers that they pose little threat to water quality. Gulls, ducks, and geese, on the other hand, can concentrate in large numbers for an extended period of time. These concentrations can occur seasonally (migrations) or temporally (night-time roosts). Geese and other waterfowl can negatively impact water quality and are considered a priority species to control. Gulls, however, remain the Division's top concern because of their constant presence loafing or roosting, their life history (in particular feeding at landfills), and their documented link to water quality degradation.

Purpose of the Study

The Division has had bird harassment programs on the reservoirs since the early 1990s. These programs are very effective in reducing the number of gulls within the specified protection zones and subsequently reducing the amount of fecal coliform deposited near the intake structures.

GULL TRACKING - SEE PAGE 4



The identifying tag on this Ring-billed Gull has no negative effects on its ability to survive in the wild while providing scientists with valuable information about gull behavior.

Photo: Dan Clark, DCR/DWSP

In This Issue:

Gulls have long been known to affect water quality; controlling their presence is a top priority for DCR's Office of Watershed Management. This issue of *Downstream* shares initial findings from a study that is underway to better understand the likes (and dislikes) of the gull population that frequents the DCR reservoir system. There is also important information on the latest potential threat to the Quabbin Reservoir ecosystem.

dcr
Massachusetts

NUMBER 21
Spring 2009

Department of Conservation and Recreation
Division of Water Supply Protection
www.mass.gov/dcr/waterSupply.htm

Anglers Alert!

Spiny Water Flea is a New Threat

Spiny water flea, shown in this enlarged photo, is spreading from the Great Lakes eastward, toward the Quabbin Reservoir. Its arrival will pose a threat to water quality and your Quabbin fishing experience.

Photo: MN Dept. of Natural Resources

What is spiny water flea?

Spiny water flea (alien species *Bythotrephes longimanus*) is a tiny crustacean related to native forms among Quabbin zooplankton, such as *Daphnia*, but ranges up to about ½ inch in size – over ten times larger than native water fleas! The elongated, barbed tail of this non-native organism protects it against predation by small juvenile fish that have difficulty ingesting the tail spine.

Where did it come from?

Spiny water flea is native to Eurasia and was introduced into the Great Lakes via freighter ballast in the mid-1980s. It was discovered in Great Sacandaga Lake, N.Y., in September 2008, just 108 miles northwest of Quabbin. Currently known U.S. distribution is shown in red on the map below.

Why is spiny water flea a threat to Quabbin fishing?

This non-native organism threatens Quabbin fishing in two ways:

(1) Spiny water fleas compete with juvenile sport fish for food. Both the spiny water flea and young fish prey almost entirely on native water fleas and other zooplankton. Research has shown that spiny water flea predation is capable of reducing the diversity and density of native zooplankton, thus impoverishing the food chain that sustains adult fish.

(2) The barbed tail of this organism catches on fishing gear, especially fishing lines and downrigger cables. Masses of the organism can accumulate as gelatinous, cotton-like clumps, fouling gear, and interfering with fishing (see photo below).

How does spiny water flea spread from one water body to another?

Research has shown that human recreation involving boats is the principle mechanism of transfer of non-native species between water bodies. Boating is an activity that is extremely vulnerable to "hitch-hiking" by non-native organisms because so many surfaces, nooks, and crannies of nautical gear are immersed in water. This is especially true of the spiny water flea because it produces thick-walled "resting" eggs that can remain dormant for long periods of time and are resistant to environmental extremes. These eggs even survive passage through the digestive tracts of fish.

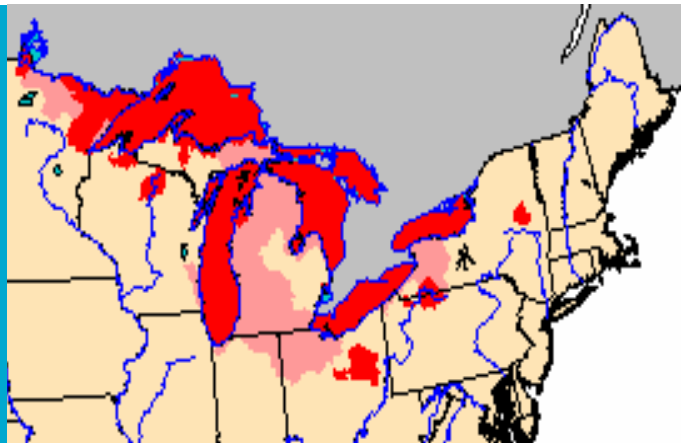
Adult spiny water fleas snagged during boating or fishing may contain resting eggs. These eggs can survive for extended periods after being tangled with downriggers, anchor lines, trailer parts, and fishing gear. Consequently, resting eggs are insidious "stowaways" and contribute greatly to the rapid dispersal of this non-native organism from infested lakes to clean ones. There is no way to eradicate spiny water flea once it is introduced into Quabbin.

What can you do to keep spiny water flea out of Quabbin Reservoir?

The only hope for excluding spiny water flea from Quabbin is personal vigilance on the part of each and every visiting boater and angler. **This means EVERYONE who fishes at Quabbin!**

If you move your boat among various water bodies, you are the most likely carrier of non-native organisms. The most protective measure boaters can adopt is to dedicate their boat and fishing gear for use exclusively in Quabbin.

If you visit other waters, please scour your boat, trailer, bait buckets, fishing gear, and anything else exposed to outside waters and remove all plant fragments, mud, and debris. Drain water from bilge, engine, and live wells and allow all of the above to dry completely for at least five days before visiting Quabbin.



First discovered in the Great Lakes in the 1980s, Spiny Water Flea was sighted in 2008 at Great Sacandaga Lake in eastern New York state. This species can be an unoticed hitchhiker to Quabbin on boats and fishing gear.

Map:USGS

SPINY WATER FLEA - SEE PAGE 6

Wachusett Reservoir Fishing Line Recycling Update

Last Season's Success, This Season's Prospects

The 2008 fishing season was the second year of recycling monofilament fishing line at the Wachusett Reservoir — it was an even greater success than the fantastic initial year! Approximately 18 miles of line was collected at 10 locations. This program was started because of the large amount of line found along the shore of the reservoir. Fishing line does not readily break down and, therefore, persists in the environment for many years. Birds, animals, and even turtles often get caught in discarded fishing line. An ensnared animal is usually unable to free itself and it dies because of exposure, starvation, or predatation. Discarded line has also been found in bird's nests, with dire consequences for the young birds. Collected fishing line is not destined for the landfill; instead, it is recycled into other useful products. By recycling line, it is safely removed from the ecosystem and will unlikely cause harm to wildlife.

This coming fishing season, DCR plans to place five additional canisters in the following locations: Gate 17, Gate WB 33 (Trestle Gate), Stillwater River near John Dee Road, Gate 36, and Canada Mills in Holden. Thanks to everyone who has helped with this very successful program…keep up the good work in 2009!

- Paula Packard, DCR Aquatic Biologist

Reservoir Watch - MWRA Contract for PCB Remediation of Wachusett Dam Face and Soils

The final phase of the $5.5 million capital improvements at the Wachusett Dam will remove polychlorinated biphenyl (PCB) contamination from the mortar joints and accumulated effloresence (crystallized salts that have migrated out from the concrete mortar) on the granite face of the dam. As background, in January 2006 during initial tests for the crest gate construction, it was discovered that concrete joint caulking used in the mid-1960s contained PCBs. PCBs had never been found in the DCR/MWRA water supply; MWRA nevertheless immediately developed and performed (under US EPA guidance and regulatory authority) a detailed water sampling plan in the reservoir and in the water entering the intake. ***PCBs were not found in any water sample.***

MWRA subsequently initiated an exhaustive evaluation to assess the presence of PCBs around the dam. A detailed remediation plan was developed once the extent of the problem was characterized. The surface walkway of the dam was recently completed. The last phase is the remediation of the dam face and soils at the base of the dam.

Work will begin with a pilot test of efflorescence removal methods. The remediation will require an MWRA and EPA approved Work Plan; work is expected to start in early summer 2009. Riggers will set up apparatus across the dam face, and then systematically move up and down to remove the efflorescence and clean the granite and mortar. Granite joints will be repointed as needed; the upper masonry spillway will also be repointed as part of this contract.

After finishing the dam face, several hundred cubic yards of contaminated soil will be removed from the base of the dam. All materials will be secured and hauled to a federally-approved disposal site. The soil will be replaced with clean loam and seeded to restore the grass cover. The final component of the contract will see the replacement of existing piezometers and observation wells at the base of the Dam. DCR will monitor the piezometers, which are used to ensure dam integrity by measuring pore pressures behind the Dam.

During this final phase of the Dam capital work, the Lower Gatehouse and fountain area will continue to be closed to the public because it is both a construction and hazardous material site. This project is expected to be concluded by fall 2009. Upon completion, the restored grounds will be reopened for public access.

- John Gregoire, MWRA, Program Manager, Reservoir Operations

Reservoir Levels and 6-month Precipitation

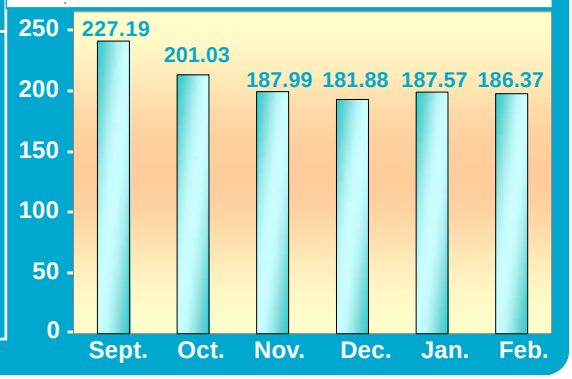
(September 2008 to February 2009)

Reservoir	Quabbin	Wachusett
Minimum*	527.68'	388.45'
Percent Full	95.6%	86.8%
Date	9/5/08	2/27/09
Maximum*	530.21'	393.89'
Percent Full	100.4%	97.7%
Date	1/11/09	1/1/09
Precipitation	28.37"	22.42"
Seasonal Avg.	23.29"	22.37"

*Reservoir Depth in Feet Above Mean Sea Level

Data provided by MWRA

2009 System-wide 6-Month Water Usage (Million Gallons Per Day)



The Gulls of the DCR Study

The *ring-billed gull* is the smallest of the three common gulls on the reservoirs. It is characterized by a black circle around the tip of its yellow bill. They are typically 17-21 inches long with a wingspan of 41-46 inches. Adults weigh between .5 - 1.5 pounds (300-700 grams).

Ring-billed gulls are extremely adept at finding and exploiting food resources. They are commonly found in parking lots near malls, restaurants, and department stores where garbage or hand-outs are readily available. In addition, ring-billed gulls can be seen in large recreation fields feeding on worms, agricultural fields after plowing, near waste-water treatment plants, and, very rarely, in landfills.

Ring-billed gulls are predominately inland nesters. There are currently no known nesting sites in Massachusetts. A small group (< 20 pairs) attempted to establish a nesting colony on an island at Wachusett Reservoir during the summer of 1997. Approximately 10 nests with 16 eggs were discovered on Cunningham Ledge; the colony was quickly controlled, and no further nesting attempts were made. Most breeding currently occurs in the northern maritime providences of Canada, the Great Lakes, and Lake Champlain.

The *herring gull* is the species often associated with the ocean and the beach. It is a medium to large gull with a yellow bill that has a red dot near the tip of the lower mandible. The wing tips are black with white spots. Herring gulls are 22-26 inches long, with a wingspan of 54-57 inches. They weigh between 1.75 - 2.75 pounds (800 - 1,250 grams).

Herring gulls can be found feeding along beaches and mudflats, in association with fishing boats, and inland at landfills, sewage treatment plants, and occasionally in parking lots. Herring gulls are one of the most common gulls found at inland landfills.

Historically, herring gulls only nested along the coast on islands with rocky or sandy substrate. They have expanded their nesting range and now also nest inland on roof tops, lakes, rivers, and reservoirs.

The *great black-backed gull* is the largest gull in the world. Although historically found only along the coast and at sea, today they can be seen inland foraging and breeding. It is a large bird with a pure white breast and belly. Its wings and back are a dark sooty black. Black-backed gulls are 28-31 inches long, with a wingspan of 57-63 inches. They weigh between 3 - 4.5 pounds (1,300 - 2,000 grams).

The great black-backed gull has been expanding its historical range southward since the turn of the century. In the 1920s, Nova Scotia was its southern limit. They made it to Massachusetts by 1931, where they were found nesting in Salem. There are several current breeding sites in Massachusetts, all along the coast.

Image source: www.wildbird.com

GULL TRACKING - FROM PAGE 1

Regrettably, they do not address the number of gulls roosting elsewhere on the reservoirs. The harassment programs also do not influence the population of gulls found in central Massachusetts.

Ideally, the Division would like to see the number of gulls roosting on the reservoirs substantially reduced or eliminated. Even though the Division has been focusing on gull harassment for many years, very little is actually known about the life history, movements, or feeding behavior of these birds in Massachusetts. The Division concluded that in order to achieve a more comprehensive bird control program, it was important to identify other ways to control gull populations, through restricting food sources, understanding roosting behavior, or eliminating roosting gulls from the reservoirs.

The DCR Gull Research program was created to try and find answers to these questions:

1. What and where are the seasonal food resources for each gull species?
2. What are the seasonal movement patterns between feeding and roosting sites, between reservoirs, and between reservoirs and "alternate roosts"?
3. What are the population dynamics of gulls in Massachusetts?
   a. Where do they nest?
   b. How do they die?
   c. What is their lifespan?
4. What are the responses of gulls to various harassment techniques?
   a. What is the response to full-reservoir harassment?
   b. What is the response to increased harassment efforts?

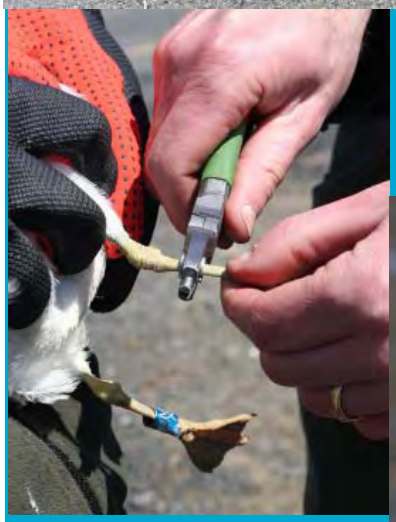
Methodology

Gulls have been captured for this study using a variety of techniques, including walk-in traps, Steele's net, rocket net, and a net launcher. Since the fall of 2008, captures have been done almost exclusively using the net launcher. Bait is placed in front of the launcher, and a net is propelled out and over the birds. The net can effectively and safely capture up to 20 birds at one time.

Once captured, all birds are tagged with a combination of bands and tags. All birds receive both a silver federal band and a color-coded metal band on their legs. In addition, most birds receive individually coded colored wing-tags. These wing-tags are folded over the leading edge of the wing and held in place with a single rivet. The rivet is punched through a loose flap of skin much like getting an ear pierced. The wing-tags do not affect the birds' ability to fly or survive. A small number of gulls were not fitted with wing-tags; instead they were given a satellite transmitter that was harnessed onto their backs. These solar powered transmitters provide up to six locations per day from anywhere in the world.

Almost 650 sightings of wing-tagged gulls have been reported to date (see table on page 6).

GULL TRACKING - SEE PAGE 6



These images show the net launcher (top left) used for trapping birds, biologists preparing to capture Gulls (middle right), close work tagging a captured Gull (middle left) and a tagged Gull (bottom), spotted in Maryland, flying freely in the wild.

Photos: Dan Clark, DCR/DWSP

After a gull is captured, a colored, individually numbered wing-tag is attached to each wing. These wing-tags make long-distance identification possible, particularly when it is difficult to see or read the leg bands. Wing-tags are color-coded based on the capture site's proximity to either Wachusett or Quabbin Reservoir. They also have a letter key that identifies the species of gull. If you see a wing-tagged bird, please try to obtain the alpha-numeric combination on the tag (e.g., A57) and report it using the contact information on page six. Please keep a lookout for any wing-tagged birds while birding, grocery shopping, or at the kids' soccer games. Common places to find these wintering gull species are at landfills, parking lots, and ball fields. DCR will be happy to provide you with capture information about a specific bird. Reports on the project, when available, will be posted on the DCR website.

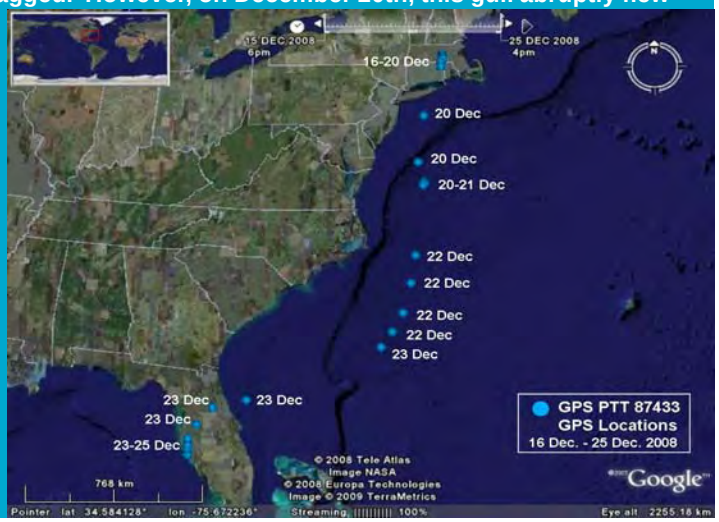
GULL TRACKING - FROM PAGE 5

Gull Study Sightings

Massachusetts	477
Connecticut	63
Rhode Island	19
Maryland	8
New Hampshire	8
New York	16
Pennsylvania	10
New Jersey	10
Newfoundland	6
Maine	4
Virginia	4
Prince Edward Island	3
Quebec	3
North Carolina	3
Labrador	2
Delaware	1
Georgia	1
Manitoba	1
Nova Scotia	1
TOTAL	642

Most of these sightings were recorded by the general public. While a majority of the sightings have been from Massachusetts, study birds have ventured far and wide, having been seen from Georgia to Labrador and Manitoba, Canada. Several gulls that were captured in Massachusetts during the fall of 2008 left the state and were seen in Pennsylvania and New Jersey. These birds have recently started making their way back to Massachusetts and have been spotted in the same locations where they were captured and tagged last year.

The Division was able to deploy satellite transmitters on 7 ring-billed gulls, 10 herring gulls, and 1 great black-back gull. Information received from these transmitters has been a phenomenal success. Some of the larger transmitters were equipped with GPS, allowing accuracy levels within a few meters. Like the wing-tagged gulls, the satellite tagged gulls also displayed tremendous movement out of Massachusetts. Several made their way south to New Jersey and Georgia; two gulls traveled all the way to Florida (see figure above).



This map shows the adventure of Herring Gull 87433. It was captured on November 5, 2008 at a water treatment plant in central Massachusetts, and then spent the rest of November and much of December near the capture point where it was first tagged. However, on December 20th, this gull abruptly flew some distance out to sea and within three days had flown nearly 1,500 miles to Florida. After the long flight, this gull spent the remaining winter months in a relatively small area on the western side of the Floridian penninsula.

Map courtesy of Google Earth.

The Future

The Division has completed the first full year of work on this three-year study. The field season will wind down in late spring as gulls move out of central Massachusetts toward their breeding grounds along the coast or further inland. Active trapping will commence next fall as gull numbers start to increase in the region. The Division plans to deploy several more satellite transmitters and many more wing tags. The public's help in reporting sightings is always welcome. If you see a wing-tagged gull, please contact: dan.clark@state.ma.us or 508-792-7423 ext. 215 with the date and time of the sighting, the color of the wing-tag, and if possible, the alpha-numeric combination. For more information, go to www.mass.gov/dcr/waterSupply/watershed/study/index.htm.

- Dan Clark, DCR/DWSP Director of Natural Resources

SPINY WATER FLEA - FROM PAGE 2

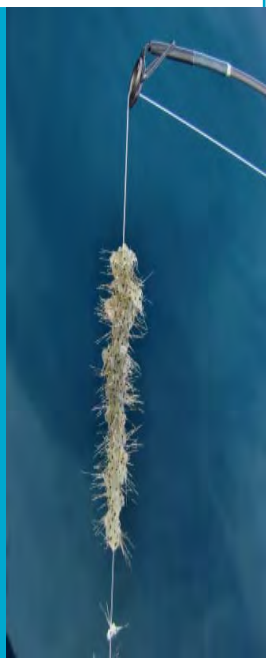
Complete this checklist after visiting any water body:

- **Inspect** – boat, trailer, and fishing gear
- **Remove** – plant fragments, mud, debris (hot wash or pressure wash boat/trailer if possible; clean fishing gear)
- **Drain** – any standing water (bilge, etc.)
- **Dry** – allow at least 5 days of complete dryness (longer if possible) before visiting a different water body.

The precautions identified in this article help prevent the spread of all non-native aquatic species, including plants (e.g., Eurasian Water-milfoil) and animals (e.g., zebra mussel), as well as spiny water flea.

- Dave Worden, DCR/DWSP Aquatic Biologist

***CLEAN** and **DRY** is the only way to keep the spiny water flea at bay, don't transport a stowaway for once in Quabbin it's here to stay!*



This image shows how masses of Spiny Water Flea can group together to fowl fishing gear.

Photo: Jeff Gunderson, Minnesota Sea Grant

For More Information About Gulls

Check out this book:

Peterson Reference Guide, Gulls of the Americas. Steven N. G. Howell, John Dean. 2007 Houghton Mifflin.

For Birds in General

See these sources:

The Sibley Guide to Birds. David Allen Sibley, 2000 National Audubon Society.

Mass Audubon:
www.massaudubon.org/Birds_and_Birding/index.php

National Zoo Bird Page for Kids:
http://nationalzoo.si.edu/Animals/Birds/ForKids/default.cfm

Cornell Lab of Ornithology:
www.birds.cornell.edu/AllAboutBirds/

For More Information About Spiny Water Flea

See these websites:

Aquatic Nuisance Species (ANS) Task Force "Stop Aquatic Hitchhikers" Campaign
www.protectyourwaters.net

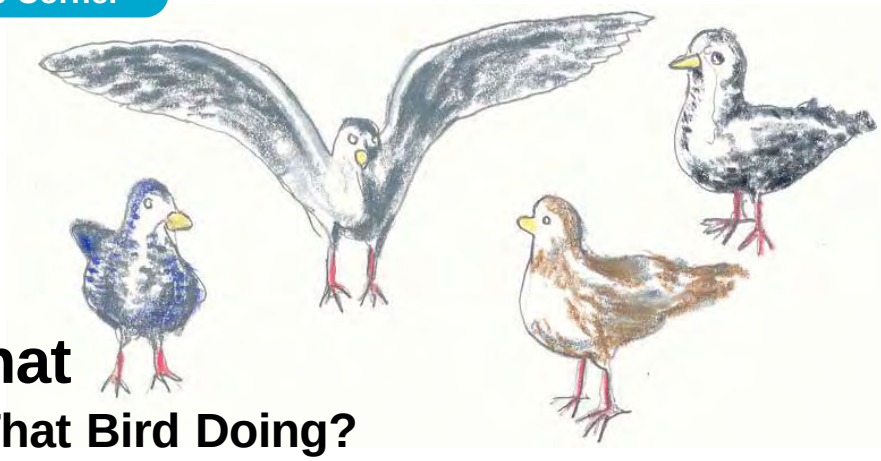
United States Geological Survey Nonindigenous Aquatic Species (NAS) Information Resource
http://nas.er.usgs.gov

And Another Thing...

by J. Taylor

Well, if red won't do, they are giving out green ones at Quabbin.

Kids Corner



What Is That Bird Doing?

Birds are fascinating creatures with behavior that is often easy to observe. Spring has arrived. The local birds are singing and calling throughout the day, and the migrating birds are feeding, preening, and resting during the day.

You can watch many different types of birds doing a variety of actions by looking out into your yard, taking a walk in your neighborhood, or traveling to public open spaces, like Wachusett Reservoir. Scientists often use lists of bird activities to record what the bird is doing.

Materials you will need: A list of possible bird behaviors (see below), a clipboard or cardboard, and a pencil. Optional materials include binoculars and a bird identification book.

Procedure: Find an area where you can observe a variety of birds. Identifying the bird is not as important as watching what the bird is doing. Once you figure out what a bird is doing, check your list and mark off the behavior you are observing.

Look for a bird on the ground, in the bushes and trees, in the air, or on the water. Check your list carefully to see if you can find an activity that seems to be what the bird is doing. Record it on your list.

If you have the time and interest, you can also try to identify the bird. Binoculars and a bird identification book will make this easier and more fun. The assistance of an adult interested in birds will help with this activity enjoyed by people around the world.

Items you could include on your bird behavior list:

- Singing or calling
- Preening
- Taking a water bath
- Taking a dust bath
- Flying
- Soaring
- Perching in a tree
- Feeding
- Swimming
- Walking or on the ground
- Walking in the water
- Flying with food in its beak
- Building a nest
- Climbing a tree trunk
- Hammering on a tree
- Chasing another bird.

- Jim Lafley, DCR/DWSP Wachusett Education Coordinator

Quabbin and Wachusett, How They Got Their Names

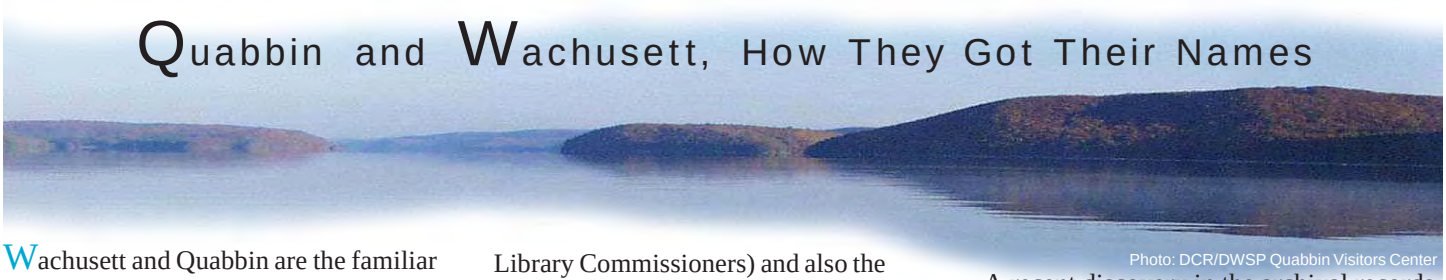


Photo: DCR/DWSP Quabbin Visitors Center

Wachusett and Quabbin are the familiar names of the two drinking water reservoirs cared for by the DCR Division of Water Supply Protection. However, when construction began (1895 and 1926 respectively), they had different titles.

The reservoir to be constructed at the headwaters of the Nashua River by the Metropolitan Water Board (MWB), was initially called the Nashua Reservoir. The MWB changed this name on January 1, 1898, to the Wachusett Reservoir (the dam and aqueduct also got the new name). Wachusett was the name of the area's native inhabitants. DCR Archives staff have found records of 1897 communication between MWB Chairman Henry P. Walcott and the MA Free Public Library Commission (today's MA Board of Library Commissioners) and also the Massachusetts Historical Society. These two hand-written letters, sent in response to inquiries by the MWB about the possibility of re-naming the Nashua Reservoir, confirmed the literal meaning of "Wachusett" as "by the great hill."

Between 1926 and 1931, the Metropolitan District Water Supply Commission (MDWSC) called the new reservoir being built in the Swift River Valley west of Wachusett the Swift River Reservoir. The largest reservoir in the world at that time was renamed the Quabbin on October 25, 1932. The region had been known as the Quabbin Territory as early as 1736. There is general agreement that Quabbin is a Nipmuk word meaning "meeting of many waters."

A recent discovery in the archival records of the engineer in charge of the Swift River Reservoir construction raises another interpretation. A Nov. 6, 1930, typescript memorandum addressed to Chief Engineer Frank Winsor entitled, "On the Meaning and Derivation of the Indian Word 'Quabbin'," suggests the name is from the Quabog chief "Naniquabbin" – Nani meaning chief and the "in" suffix implying a personal name rather than a place name – who lived in the Swift River Valley around 1700. The memo also questions a 1909 book, *Dictionary of American Indian Place and Proper Names in New England*, that provides the familiar "many waters" meaning. DCR staff will continue to research the validity of this newly found Quabbin definition.

- Sean Fisher, DCR Archivist

DOWNSTREAM
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Downstream is produced twice a year by the Massachusetts Department of Conservation and Recreation, Division of Water Supply Protection. It includes articles of interest to residents of the watershed system communities. Our goal is to inform the public about watershed protection issues and activities, provide a conduit for public input, and promote environmentally responsible land management practices.

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dcr Massachusetts

The Asian Longhorned Beetle

A Threat to Our Forests

The recent Asian Longhorned Beetle (ALB*; Anoplophora glabripennis*) detection in Worcester marks only the fourth infestation of its kind in the United States. What makes this infestation stand apart from its predecessors — to Bay Staters, anyway — is that it strikes all too close to home.

Unlike the more distant New York, New Jersey and Chicago infestations detected in earlier years, Worcester is not a faraway place. The trees being damaged by ALB here are local trees. The forests that ALB could potentially infest tomorrow are not 500 or 1,000 miles away, but just a short distance from where the beetle was first found in Worcester. Not only is the Worcester ALB infestation already affecting local trees with very real consequences, it has the potential of spreading to nearby forests in Massachusetts, and beyond, if left unchecked.

Scientists and forest health managers are attempting to pin down where, when, and how the insect first arrived in Worcester, though some of those details might never be known. What is known is that the prospect for eradication of the ALB locally will take years. A timetable for eradication will be better understood upon completion of delimiting surveys to determine the scope of the Massachusetts infestation.

The ALB is estimated to have arrived in the United States sometime in the 1980s, likely coming directly from Asia as a stow-away in solid wood packing material. ALB was first detected infesting trees in 1996 in Brooklyn, NY. It has since been found in Manhattan, Queens, Staten Island, an uninhabited island off Staten Island in New York City, and on Long Island, NY.

In 1998, the insect was detected in Chicago, IL. That infestation was declared eradicated in April 2008. In 2002, ALB was found in Jersey City, NJ. Another infestation was later detected in New Jersey's

ASIAN LONGHORNED BEETLE - SEE PAGE 4

An enlarged view of the Asian Longhorned Beetle shows details of this destructive pest that has been found south of the Wachusett Reservoir. Aggressive measures are being undertaken to stop the spread of this invasive species, which could cause widespread harm to the region's trees and forests.

dcr Massachusetts

NUMBER 20
Fall 2008

In This Issue:

The recent discovery of the Asian Longhorned Beetle in Worcester is a serious threat to the ecosystem, and economics, of the region. This issue of *Downstream* focuses on how federal, state, and local governmental agencies are responding to this latest invasive species found in central Massachusetts.

Department of Conservation and Recreation
Division of Water Supply Protection
www.mass.gov/dcr/waterSupply.htm

Constructing Quabbin

Efforts to Preserve Documentation of the Past

A 1946 still image of water passing over the spillway at the newly completed Quabbin Reservoir. Quabbin Visitors Center

As part of its function to construct Quabbin Reservoir, Dam, and Aqueduct, the Metropolitan District Water Supply Commission (MDWSC) Engineering Department began taking motion pictures in the 1930s to document the construction work. The MDWSC's filming was partly inspired by the exhibit it was planning with the Metropolitan District Commission (MDC) for the September 1930 Tercentenary Exposition of the founding of Massachusetts, which would feature exhibits from state agencies.

According to the 1930 MDWSC Annual Report, "The Commission also took and exhibited motion pictures of its construction work and of other activities of the Metropolitan District Commission. Members of the engineering force were present to show the pictures and explain the exhibits."

The MDWSC likely showed three films at the Tercentenary Exposition: "How Boston Gets its Water Supply" (15 minutes); "Construction Work, Shaft 8 – Shaft 1" (10 minutes); and "Mixing Concrete for Tunnel Lining" (15 minutes).

The filming was assigned to engineer Albert S. Genaske (1898-1990), who was appointed to the MDWSC in the agency's first months of existence in 1926. Beginning in 1930, and continuing for the next twenty-five years, Genaske took and edited most of the MDWSC and MDC motion pictures. Genaske retired from the MDC in 1967.

Tercentenary Exposition of Governmental Activities of the Commonwealth of Massachusetts, 1930, Print No. 153, Photograph by Paul E. Genereux . DCR Archives

While the MDWSC shot film footage of mostly construction work, there was some effort to document the towns on film. Much of this film, however, is missing from the collection. The MDWSC had various reels with such titles as "Quabbin Reservoir Project: Views in the Valley (10 minutes)"; "Historical Quabbin (25 minutes)"; "Swift River Reservoir Project – Views in the Valley"; and "Swift River Valley in Color." DCR continues to search for these films.

While portions of the MDWSC/MDC film collection were transferred to VHS in the mid-1980s, it was not until 2006 that the opportunity arose to preserve and transfer the entire collection. The Association of Moving Image Archivists and the National Film Preservation Foundation can be credited with educating archivists on how to properly preserve and make accessible motion picture film. The Foundation's 2004 *Film Preservation Guide: The Basics for Archives, Libraries, and Museums* guided this initiative.

Over time, the natural shrinkage and brittleness of film make motion picture film unable to be projected. Through the fall of 2005 and winter of 2006, the beginning frames of each reel of film (105 reels of various lengths) were manually reviewed over a light table and through a magnifying loop. From this work, a preliminary inventory and organization of the films, film stock identification, and other characteristics of the films were compiled.

There are basically two levels of archival film preservation: mid-grade and high-grade. A low-grade is generally used at the retail level for personal home movies (done at a quality lab, the results are good for home movies, and a mini-master should be provided). The high-level grade is a master onto new 35mm film stock (very expensive; no lab in MA can do this work). The DCR Archives selected a mid-grade level, where the film is transferred to an analog master on broadcast-rated magnetic tape.

The Bell & Howell Filmo Model 129B 16mm projector purchased by the MDWSC in 1935; photographed by the MDC Archives in 1994. DCR Archives

While the procurement process for professional film transfer work was complicated, quality vendors were fortunately identified. One vendor provided the master tape stock, a second vendor provided the duplication service to make the DVD copies, and a third vendor undertook the film inspection, cleaning, splice repair, tonal/color correction, and transfer work. Archival

FILM PRESERVATION - SEE PAGE 6

Payments in Lieu of Taxes

An Overview of the DCR PILOT Program

Massachusetts General Laws c. 59, §5G mandates that DCR's Division of Water Supply Protection make Payments in Lieu of Taxes (PILOT) on the 100,000 acres of Commonwealth property managed by the Office of Watershed Management. The current law was ratified in 1984 for the Quabbin Reservoir and Ware River Watersheds and was amended in 1987 to include communities in the Wachusett and Sudbury Reservoir Watersheds.

The base information used for determining DCR PILOT, as with all other State Owned Land PILOT, is the valuation performed every four years by the Department of Revenue (DOR); the next revaluation is scheduled for 2009. It is strictly DOR's responsibility to set the value for this land following their guidelines on segmenting lands into prime lots (the requisite frontage and area needed to build a single family home in each community), rear acreage and unbuildable acreage, along with discount adjustments for total number of prime lots and total acreage.

There are, however, several differences between the DCR PILOT and other State Owned Land reimbursements that are

PILOT PROGRAM - SEE PAGE 6

Reservoir Watch - Wachusett Reservoir Crest Gate Project

Under an MWRA Capital Improvement Project, a 100 ft. long, 6 ft. high bottom-hinged crest gate was installed at the Wachusett Reservoir to replace the 100 year old stoplog system of spillway control. The crest gate was designed to operate across a reservoir elevation range of 390 ft to 395 ft., which is the top of the adjacent masonry upper spillway. The gate offers better and safer control options for reservoir operators. The crest gate project also included the construction of an auxiliary spillway.

Combined, these improvements satisfy current state of design requirements for passing a Probable Maximum Flood (PMF) while protecting the main Wachusett Dam. The PMF is a theoretical situation resulting from a Probable Maximum Precipitation (or PMP) event of 28 inches of rainfall on the reservoir watershed over a 72 hour storm period. This is not a likely occurrence, but current regulations for dam and downstream safety require a design to this standard.

New hydraulically operated crest gates at the Wachusett Dam are shown above in the "up" position. Shown below in the "down" position the new crest gates can allow spillway flows of up to 600 million gallons of water per day.

The peak inflow of water to the reservoir from this storm is calculated at about 82,000 cubic feet per second (cfs). After routing through the reservoir, the peak outflow of water through the new spillway improvements is 62,000 cfs.

Dry and wet testing of the crest gate occurred over the summer. It will be officially accepted once MWRA is satisfied that all components of the crest gate project have been addressed and appropriate staff have been trained in operation of the gate. The project also included structural enhancements to the Wachusett Reservoir North Dike and restoration of public access paths through the spillway area. Final site landscaping is currently underway.

- John Gregoire, MWRA
Program Manager, Reservoir Operations

Reservoir Levels and 6-month Precipitation

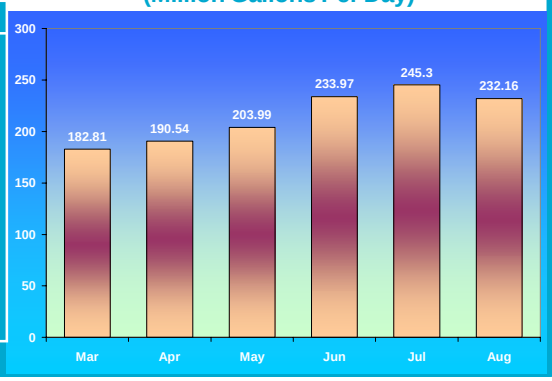
(March 2008 to August 2008)

Reservoir	Quabbin	Wachusett
Minimum*	526.76'	389.16'
Percent Full	94.0%	88.2%
Date	3/1/08	5/12/08
Maximum*	530.10'	394.99'
Percent Full	100.2%	100.0%
Date	5/4/08	3/12/08
Precipitation	29.58"	19.57"
Seasonal Avg.	24.88"	23.16"

*Reservoir Depth in Feet Above Mean Sea Level

Data and photos provided by MWRA

2008 System-wide 6-Month Water Usage (Million Gallons Per Day)



Life Cycle and Identification of the Asian Longhorned Beetle

The Adult Asian Longhorned Beetle (Image 1) measures about 3/4 to 1 1/2 inches in length and has a shiny black shell with numerous white to yellow spots. The beetle

chews out round pits in the bark of host trees where it lays a single egg (Image 2). During summer, sap may flow from the egg site as the larve feeds inside the tree (pointed out in Image 3).

Another indication of beetle activity is the accumulation of coarse wood dust, created by the boring of the beetle larve, around the base or on branches of the infested tree (Image 4).

As the larve matures into the adult form (Image 5) it bores its way out of the tree and leaves behind a hole about 3/8 inches in diameter (Image 6). Resulting damage to the host tree is very likely fatal. This cycle repeats every 12 - 18 months; in a few short years the infestation can leave wide-spread devastation.

USDA Forest Service Photos

ASIAN LONGHORNED BEETLE - FROM PAGE 1

Middlesex/Union Counties in 2004. Forest health officials subsequently declared the Jersey City infestation eradicated in April 2008. ALB was also found in Toronto, Canada, in 2003.

The anticipated ALB eradication date for New York is 2034 and 2015 for New Jersey's Middlesex/Union Counties. More than 40,000 trees have been removed from the infested areas to date. It is important to note these eradications came only after considerable cost, not only in dollars, but in years of planning, research, multi-agency coordination, hard work, and tough decisions. According to the US Dept. of Agriculture Animal and Plant Health Inspection Service (APHIS), damage from infestations in New York, Illinois, and New Jersey resulted in the removal of thousands of trees. Costs to state and federal governments since its initial discovery in 1996 is in excess of $168 million. ALB has the potential to wreak havoc nationwide, affecting lumber, maple syrup, nursery, and tourism industries and accumulating more than $41 billion in losses.

Adult ALB are ¾ –1½ inches long. They are shiny black in color with irregular white spots on their backs. Asian longhorned beetles also have black and white alternating bands of color on their antennae. Their antennae are quite long, about 1½ – 2½ times the lengths of their bodies.

ALB damage disrupts the flow of nutrients and water to a tree, eventually killing it. Heavy infestations can kill a tree in one to two years, though seven to 10 years is more common.

On their own, ALB spread very slowly. The natural spread of ALB is greatly supplemented by human-aided movement, such as through yard waste, firewood and logs. The insect is a native of China and Korea. There are no known native predators or parasitoids of the ALB. Unlike many other invasive species, it is considered a serious pest in its native range. In China, the beetle's favored tree is the poplar, which was often planted in rows as a windbreak.

State and Federal agencies are working together to stem the threat. Here, an inspector assesses damage in a Worcester neighborhood.

USDA Photo

The Worcester detection, reported August 1, 2008, by a concerned resident, was a troubling discovery. ALB is one of the most destructive invasive insects in the country today. Unlike the similarly destructive emerald ash borer that only infests and kills ash trees, the ALB infests a wide variety of hardwoods, many of which are found in nearby forests. If left unchecked, ALB poses a serious threat to our urban and rural hardwood forests in North America.

ALB host species include maple, willow, elm, ash, poplar, birch, horsechestnut and others. Worcester ALB program managers plan to remove infested and selected high risk trees. Remaining host trees will be treated with the insecticide imidacloprid by trunk or soil injections. This practice has been successful in limiting tree loss from the beetle. If the Worcester ALB infestation does spread outside the city area to forested areas, there will be an ample and diverse variety of suitable host trees awaiting them.

"The bad news is that ALB has one of the most diverse ranges of hardwood host trees for an invasive insect," said Massachusetts Dept. of Conservation and Recreation Forest Health Program Leader Charlie Burnham. "The good news is early detection means the impact to forest resources could be reduced."

Citing the potential for widespread forest damage throughout New England, state forest health managers in New Hampshire, Vermont, Rhode Island and Connecticut are making public pleas for support. They are asking for the public's cooperation in keeping an eye out for the insect and to report it when they find suspect beetles. So far, no ALB have been spotted in New England states surrounding Massachusetts.

"The more eyes we have looking for one of these invasives, the better chance we have of early detection allowing us the possibility of containing or eradicating the problem," Burnham added. Landowners and residents in Massachusetts are urged to keep an eye out for the ALB and report any suspected finds to 1-866-702-9938. See the sidebar on page 7 for websites and other sources of information on the Asian Longhorned Beetle.

- Glenn Rosenholm, USDA Forest Service, Northeastern Area
Adapted from State and Private Forestry Release No. DFO-14-08

These two images show the actual size of the adult male (at left) and female (at right) Asian Longhorned Beetle. Typically they will measure between 3/4 to 1 1/4 inches long and the male is distinguished by long antennae. Both are shiny black with random white spots that may also have bluish or yellowish tinges.

USDA Photo

DCR Cooperates in ALB Eradication Efforts

Since the ALB was first detected in Worcester in August 2008, there has been a tremendous effort to survey, identify, and control the infestation. The Massachusetts Cooperative Asian Longhorned Beetle Eradication Project is a coordinated effort by federal, state, and local agencies: The USDA Animal and Plant Health Inspection Service (APHIS) is coordinating this effort and providing 18 staff; DCR is contributing 11 people; and the City of Worcester is providing four people. The US Forest Service and the MA Department of Agricultural Resources are also part of this team.

Events change weekly. As of October 4, 2008, survey crews have been sent into four areas of Worcester. Close to 5,000 trees have been surveyed; 1,447 infested trees have been identified, all in Worcester except one in West Boylston. 91% of the surveys have been conducted from the ground; 441 trees were either climbed or surveyed from a bucket truck. An infested tree from Ararat Street was removed in September; sections of the tree are being tested in hopes of determining exactly when the tree first became infested. Local newspapers and the internet (see page 7) are the best sources for up-to-minute information.

DCR's Division of Water Supply Protection (DWSP) is acutely aware of the threat posed by ALB. DWSP is the manager of 900 acres of land within the quarantine area, and over 90,000 acres of adjacent forest, encompassing the Wachusett Reservoir, Ware River, and Quabbin Reservoir watersheds, that contains a significant amount of the ALB's preferred host species. DWSP is taking the following steps in response to this risk:
1) Temporarlily suspending all forestry operations in the quarantine area.
2) Training staff in early detection of ALB.
3) Utilizing daily presence in the watershed system's forests to look for the presence of ALB. 4) Assigning two staff to the ALB Eradication Project.

The goal of DWSP's land management strategy is to provide a multi-age forest cover that maintains the quantity and quality of a world renowned, unfiltered drinking water supply. Keeping ALB from spreading into the watershed system's forests is an agency priority.

- Dan Clark, DCR/DWSP Natural Resources Director

PILOT PROGRAM - FROM PAGE 3

made by the Commonwealth under MGL c. 58, §§13-17:

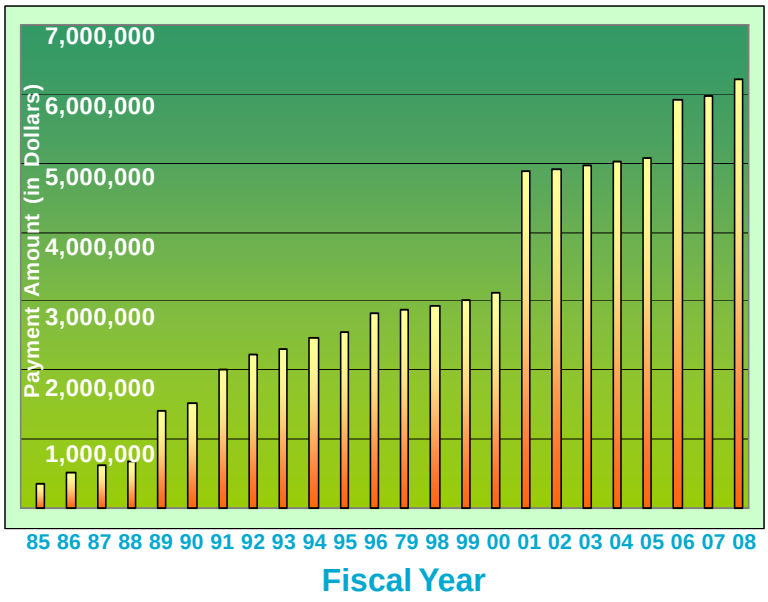
1. MWRA ratepayers pay the bill.
Funds for the DCR PILOT payments come from Massachusetts Water Resources Authority (MWRA) rate payers who use the reservoir waters; the MWRA provides funding to the DCR to make PILOT payments to the watershed towns. Unlike other PILOT programs for state-owned lands, which are disbursed through the State's Local Aid program ("Cherry Sheets") and are subject to legislative appropriation (75% of full value in FY2008), the DCR program is paid in full directly to each community. The DCR payment does not appear on the Cherry Sheet.

2. DCR PILOT utilizes the local commercial tax rate.
The PILOT which is distributed through the "Cherry Sheet" is based on a state-wide average of residential tax rates calculated by DOR. DCR PILOT is required to utilize each community's commercial tax rate in calculating the PILOT obligation.

3. The payment can never be less than the previous year.
MGL c. 59, §5G states that Watershed Management PILOT can never be less than the previous year's payment. This "hold harmless" clause provides the watershed communities the security of level funding even if a drop in valuation or tax rate combines to lower the calculated PILOT. This requirement provided watershed communities close to $1 million in FY2008.

Since 1985, over $74 million has been distributed in watershed protection PILOT payments (see bar chart). Fiscal Year 2008 PILOT was $6.2 million, representing a 23% increase from the amount prior to the last revaluation in 2005. This increase takes into account land acquisition as well as changes in land values. Ten active supply communities now receive $250,000 or more from DCR (see table). DCR will be working closely with DOR and the watershed communities on the 2009 revaluation, which will take effect in FY2010. For complete PILOT listing of each watershed community, go to www.mass.gov/dcr/waterSupply/watershed/pilot.htm.

- Joel Zimmerman - DCR/DWSP Planner



Community	Fiscal Year 2008 PILOT
Holden	$710,155
West Boylston	$569,752
Boylston	$500,000
Sterling	$489,630
Petersham	$380,147
New Salem	$353,126
Rutland	$329,798
Ware	$320,224
Shutesbury	$250,019
Hubbardston	$249,984

The average PILOT per acre varies considerably across the Watershed System. Factors involved in creating this scenario include:

1. Land values are significantly higher closer to Boston.
2. PILOT is calculated using each community's tax rate.
3. The number of higher value prime lots is dependent on the amount of frontage owned by DCR in a particular community.
4. DOR's land and segmentation discount schedule more prominently affects towns in which DCR owns large blocks of property.
5. The towns of Belchertown, Hardwick, New Salem, Pelham, and Ware receive a separate payment for lands annexed after the disincorporation of Dana, Greenwich, Enfield, and Prescott.

FILM PRESERVATION - FROM PAGE 2

film cans were purchased from an archival supplier to rehouse the original films. The film transfer work by the vendors was completed in June 2006 (Fiscal Year 2006). In total, $11,300 was spent on the transfer work and $371 on the archival film cans.

Throughout FY07, each film on the DVD access copies was reviewed, the length timed, and developed shot lists. The MDCWSC/MDC Annual Reports and other MDC records were consulted to identify specific scenes and dates. The complete shot list runs 61 pages. The approximately 30,000 linear feet of film equated into approximately 16 hours of film.

DVD copies of the films have been distributed to specific DCR offices where staff are utilizing film scenes in larger public presentations. The films are also available to film producers making documentaries.

- Sean Fisher - DCR Archivist
DCR Archives is a section in the Bureau of Planning & Resource Protection, Office of Cultural Resources.

For More Information About Asian Longhorned Beetles

Check out these websites:

US National Forest Service: *www.na.fs.fed.us/pubs/palerts/alb/alb_pa.pdf*

US Department of Agriculture, Animal and Plant Health Inspectional Service: *www.aphis.usda.gov/plant_health/plant_pest_info/asian_lhb/index.shtml*

MA Dept. of Agricultural Resources and UMass Extension: *http://massnrc.org/pests/alb/*

Worcester Telegram and Gazette: *www.telegram.com/apps/pbcs.dll/section?Category=BEETLES*

City of Worcester: *www.ci.worcester.ma.us/cmo/beetles.htm*

Universtiy of Vermont: *www.uvm.edu/albeetle*

or these books:

National Audubon Field Guide to North American Insects & Spiders. Alfred A. Knopf, New York, 1998.

Beetles, A Peterson Field Guide. Richard E. White, Houghton, Mifflin Co. 1983.

Landscapers Guide to the ALB and its Host Trees. Pamphlet available from Charlie Burnham, MA State Forester at (413) 253 -1798 ex.204

To report an infestation call the ALB Hotline: (617) 626-1779 or (866) 702-9938

And Another Thing...

by J. Taylor

Kids Corner

Insects -
The Good, the Bad & the Bugly

Over time humans have found insects both beneficial and destructive. This activity will help you learn about various insects and their positive and negative impacts on us.

Materials: Index cards or paper, pen, insect list, resource materials or internet

Procedure: Below is a list of insects with some of the ways they have interacted with humans over the years. Write each insect name on an index card or slip of paper and place them in a container. Have each member of your family that is interested in participating select a card from the container. The members can then use a variety of resources, such as the books around the house, the library or the internet, to find out about the effects – good, bad or both – that their particular insect has had on people.

The following ideas and questions can be used when sharing the information about each person or group's insect:

- Does the insect have the same impact, positive or negative, on us today that it has had in the past? Why or why not?
- How might the insect's role in human society change in the future?
- How does the insect affect animals or plants?
- In what ways would the world be different if the insect had never existed?

List of Insects:

- Fruit Fly (use in genetic research, Mediterranean fruit fly attacks crops)
- Gypsy Moth (attacks trees during outbreaks, spraying controversy)
- Honey Bee (produces honey & wax, pollinator, allergy to sting, killer bee scare)
- Ants (household pests, fire ant expanding range)
- Mosquitoes (malaria, yellow fever, dog heartworm)
- Ladybug Beetles (used as a biological control, household pests)
- Fleas (historic outbreaks of disease – bubonic plague, pest on pets)
- Silkworm Moths (production of silk)
- Butterflies (beauty, enjoyable to observe, art subject)
- Flour Beetles (eats grains, serious pest in flour mills, household pest)
- Grasshoppers/Locusts (food for birds & mammals, historical crop destruction)
- Woolly Adelgid (attacks hemlock trees)

- Jim Lafley - DCR/DWSP Wachusett Education Coordinator

Support Land and Water Conservation

The Massachusetts Environmental Trust is launching a new "Land and Water Conservation" license plate that will support the conservation of land critical to the protection of the Commonwealth's water resources. Similar plates in other states have conserved tens of thousands of acres in recent years. This new land conservation tool is needed more than ever.

For more information and to reserve your plate, go to www.MassLandAndWater.info.

Development near our lakes, ponds, rivers and coasts - and the fertilizer, storm water run-off and other non-point source pollution it brings - is the greatest single threat to Massachusetts waters.

Conservation and protection of supporting land is the most effective strategy for protecting the region's water quality, fish, and other rare aquatic species and habitat. Protecting buffers along our rivers, lakes, and ponds is essential to keep these waters clean for drinking water, recreation and wildlife.

Proceeds from the new Land and Water Conservation license plate will be segregated in a separate fund dedicated to the acquisition, stewardship and restoration of land affecting 9,000 miles of streams and rivers, 1,100 lakes and ponds and over 1,500 miles of coastline - of which many thousands of acres are unprotected. By purchasing this plate, you help protect core terrestrial and wetlands habitat and other priority watershed areas.

The Massachusetts Environmental Trust protects the lakes, rivers and coastal waters of Massachusetts. Proceeds from the Trust's Right Whale, Brook Trout and Blackstone Valley Mill plates have funded over $16 million in water protection initiatives throughout the Commonwealth.

DOWNSTREAM
Department of Conservation & Recreation
Division of Water Supply Protection
Office of Watershed Management
180 Beaman Street
West Boylston, MA 01583

(508) 835-4816 ex.363

Downstream is produced twice a year by the Massachusetts Department of Conservation and Recreation, Division of Water Supply Protection. It includes articles of interest to residents of the watershed system communities. Our goal is to inform the public about watershed protection issues and activities, provide a conduit for public input, and promote environmentally responsible land management practices.

Governor:	Deval L. Patrick
Lt. Governor:	Timothy P. Murray
EOEEA Secretary:	Ian A. Bowles
DCR Commissioner:	Richard K. Sullivan Jr.
DWSP Director:	Jonathan L. Yeo
Downstream Editor:	James E. Taylor

Appendix B:

Potential Illicit Discharge Detection and Elimination Report

Prepared for:
Department of Conservation and Recreation
Boston, MA

AECOM

Illicit Discharge Detection Report
Permit Year 5 - 2008

DRAFT

AECOM, Inc.
April 2009
Document No.: 10400-003

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1.0 Introduction

At the request of Massachusetts Department of Conservation and Recreation (DCR), AECOM Environment developed and performed an illicit discharge detection (IDD) program to identify possible illicit discharge sources in urbanized portions of the DCR's stormwater collection system. This project supports the provisions of Minimum Control Measure No. 3 of DCR's NPDES Small MS4 General Permit. Minimum Control Measure No. 3 mandates the development and implementation of an illicit discharge detection and elimination plan to identify potentially hazardous releases into the stormwater system and establish the means to eliminate these discharges.

Illicit discharges are defined by the EPA as any non-permitted discharge to a storm sewer system that is not composed entirely of stormwater. Sources for these flows include direct connections to a sanitary sewer line, a piped floor drain from a garage or basement, and illegally dumped fluids like motor oil and paint. These discharges can result in serious consequences for the ultimate receiving waterbody, including decreased water quality, the destruction of wildlife habitat, and the decrease in aesthetic value of the waterbody. Illicit discharges are of particular concern in urbanized areas because of the high concentration of development and increased industrial and commercial facilities. However, many non-permitted discharges are not considered illicit including culverted streams, groundwater seepage, irrigation water and potable water.

AECOM performed the following tasks to assess DCR's stormwater systems for illicit discharges:

- Produced a five year inspection schedule and rotation
- Developed an illicit discharge identification and testing protocol
- Performed illicit discharge inspections on 20% of the DCR's stormwater systems in urban areas

The next sections detail the procedure and summarize the results from the 2008 IDD program.

2.0 Methods

This section presents the methods AECOM used to develop and implement an IDD program for DCR. First we divided DCR's urban stormwater systems into five inspection zones, as presented in Section 2.1. Then we developed protocol for inspecting DCR's stormwater features and efficiently documenting results as explained in Section 2.2. Section 3.0 presents AECOM's implementation of these procedures for year one of this program.

2.1 Five Year Inspection Rotation

In support of NPDES requirements, AECOM designed a rotating schedule to ensure that each stormwater system will be investigated once every five years. AECOM previously mapped DCR's stormwater infrastructure in urban areas using digitized scanned drainage plans and field recorded global positioning system (GPS) data. Several aspects of these data were analyzed to establish five comparable IDD zones including:

- Spatial continuity
- Number of stormwater features
- Total road miles
- Proportion of data from drainage plans versus GPS surveys

Prior to developing an inspection rotation, AECOM examined priority areas listed in the Stormwater Management Plan including suspected illicit connections based on previous site visits and direct discharges to impaired waterbodies. With DCR, AECOM determined that these priority areas have a state-wide spatial distribution that would hinder IDD program implementation. Therefore, each rotation zone contains approximately 4,000 stormwater features and 55 road miles of DCR property (Figure 2-1) grouped by spatial location. Approximately 50 percent of the map data for features in each zone came from scanned plan data and therefore have not been field verified.

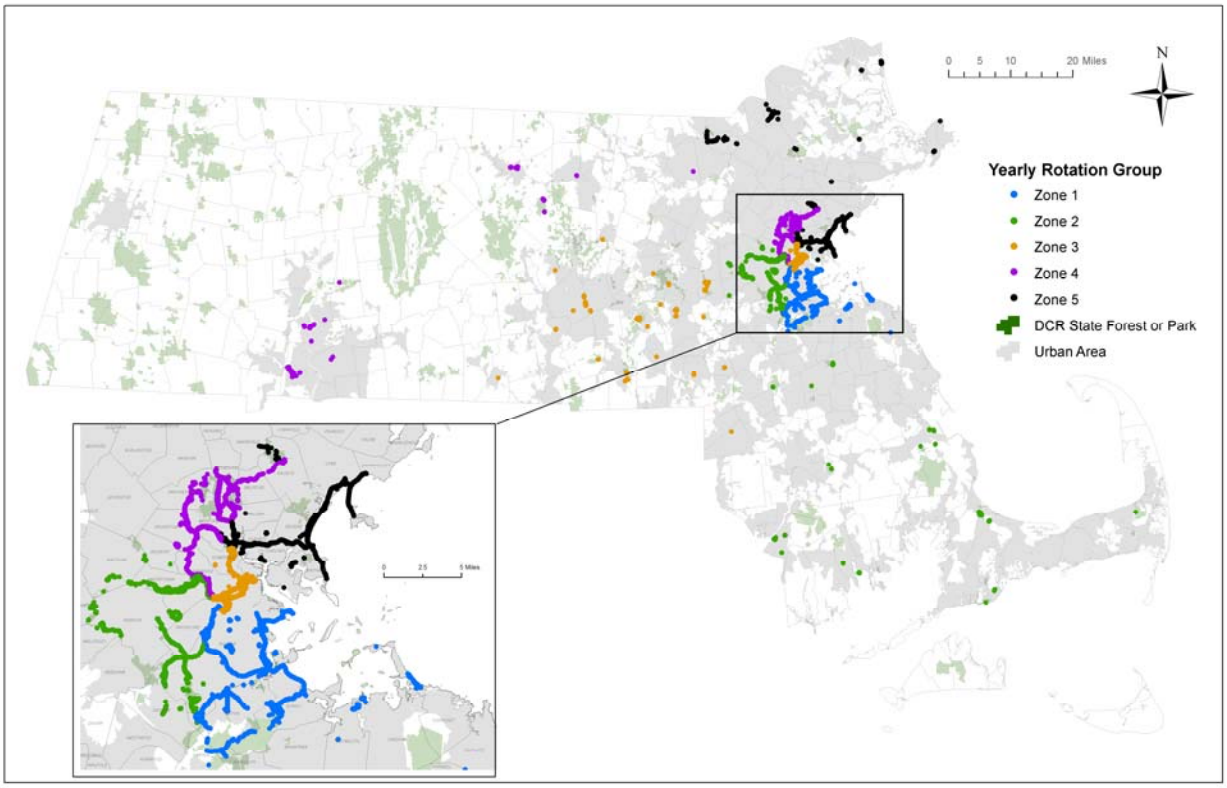


Figure 2-1 IDD Five-Year Inspection Rotation

2.2 Illicit Discharge Detection Protocol

AECOM developed an illicit discharge identification and testing procedure based on the *Charles River Illicit Discharge Detection and Elimination Protocol*, adopted from BWSC (2004) and Pitt (2004). The *Protocol* relies primarily on visual observations and the use of field test kits and portable instrumentation during dry weather to complete a thorough inspection of stormwater systems. AECOM compiled a field analytical kit in reference to the analytes and benchmarks outlined in the Protocol. The field tests helped to isolate the general source of a discharge based on its chemical characteristics. This process of testing samples and reviewing results in real-time provides a significant advantage in allowing field crews to perform further field reconnaissance and potentially identify the source of flow as a sewer line, industrial process, or domestic residence. This section summarizes AECOM's Standard Operating Procedure which is provided in entirety in Appendix A.

The AECOM team attempted to schedule field investigation activities to occur at times with less than a tenth of an inch of rain in the preceding 48 hours to ensure observed flows were the result of non-stormwater discharges. However, in cases when surveys took place within 48 hours of a rain event, field teams noted any observed flows and then revisited those stormwater systems during dry weather conditions at a later date. Using the stormwater base maps as a guide, field crews visited each feature in a drainage system, removed catch basin lids and manhole covers and performed a thorough visual inspection. Notable visual indicators of illicit discharges consisted of dry weather flow, suspicious pipes, or any evidence to suggest potential contamination from intermittent sources. Signs of potential contamination included odors, staining, floatables, and foaming. Odors, staining, or foamy water could indicate the presence of sewage or wash water; non-debris floatables could also indicate the presence of sanitary waters.

The field crew recorded illicit discharge observations and updates to the drainage system layout in real-time on hand-held GPS units (Trimble GeoXH 2005 Series Pocket PC). The GPS uses a Satellite Based Augmentation System (SBAS) for positioning and had sub-meter real-time accuracy. AECOM designed specific forms and associated data tables for the GPS units using ESRI ArcPad version 7.1.1 to record and store IDD program data. The GPS units also contained aerial photographs, road maps, and the existing drainage maps for reference and editing purposes. In areas where the drainage system had been previously surveyed, the field crew only recorded IDD program specific observations. When the information regarding a mapped drainage system came from scanned plans, the GPS program prompted the field crew to take GPS coordinates and update attributes for all features within that system. GPS and illicit discharge data were then downloaded into ESRI ArcGIS 9.2 to update the existing stormwater geodatabase.

The AECOM field crew followed the method outlined in AECOM's Standard Operating Procedure (Appendix A) to evaluate the likely source of any encountered dry weather flows. The field crew traced the drainage network upstream until a sample could be taken as close to the point of discharge as possible to ensure that the test results were representative of the suspect flow. To collect a sample of the dry weather flow, a field technician doned nitrile gloves and safety glasses and lowered a 0.5-liter plastic sample bottle directly into the discharge. Existing water in the catch basin sump was excluded from the sample to eliminate potential dilution or contamination of the target analytes.

Immediately following sample collection, the field crew recorded temperature and pH using an YSI Ecosense pH10 meter (S/N JC003607, Lot code 08E1). Temperature and pH measurements allowed for instantaneous comparison of the sample values to typical stormwater ranges. The meter measured pH between 0.0 and 14.0 with an accuracy of ±0.1 and temperatures between 0.0 and 99.9°C with an accuracy of ±0.3°C. Calibration of the YSI meter occurred monthly throughout the field effort and involved a three-point method with 4.01, 7.00, and 10.00 pH solutions. The field crew recorded the results of the pH and temperature measurements in the GPS unit and photographed the suspected illicit discharge and surrounding area. The field crew documented the photo information on the GPS unit and in a field book.

Technicians then tested the collected sample for a series of analytes in a specific order. Figure 2-2 demonstrates the order of analyte testing and the process used to determine the likely origin of the sampled discharge. Although the IDD procedure precludes certain tests based on the presence of boron; technicians performed the entire suite of tests on each sample and recorded the values in a table related to the spatial location of the stormwater feature on the GPS unit and in the field book. If site conditions or further stormwater investigations delayed analysis of the samples the field crew repeated temperature and pH measurements prior to performing the subsequent tests.

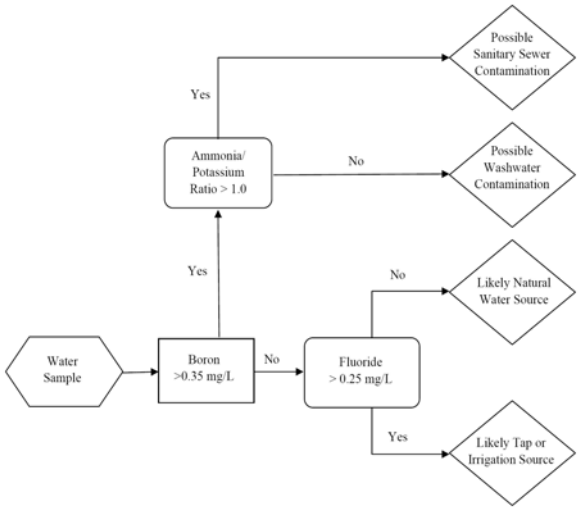


Figure 2-2 IDD Flow Diagram

Meters used to test for the target analytes included a HACH DR/890 Colorimeter and a HORIBA CARDY ION C-131. The field team used the appropriate HACH standard operating procedure (Edwards, 2007) to analyze samples for Boron, Ammonia and Fluoride with the colorimeter.

The team measured Potassium on a HORIBA ion meter calibrated at the start of the field effort using a two-point calibration technique (Standard 20 X 100 ppm, Slope 15 X 100 ppm) and again before each use using a one-point calibration method (Standard 20 X 100 ppm). After calibration and cleaning with dionized water the field technician placed a few drops of sample on the diode and the meter displayed an instant readout of the sample's potassium concentration.

AECOM notified the DCR Stormwater Program Manager of the results of any identified illicit discharges. Evidence of illicit discharges, including staining and odors, noted during the field effort will be available to future field and maintenance crews to help identify potentially problem areas.

3.0 Results

AECOM implemented the IDD protocol outlined in Section 2.2 and began field investigations of DCR's drainage systems on July 29th 2008. The effort focused on the DCR parks and parkways of IDD Zone 1 located in the southern Boston metro area (Figure 3-1). This zone encompasses several large parks including the Blue Hills Reservation and Old Harbor Reservation along with major roads like the Furnace Brook Parkway, Morrissey Boulevard and the JamaicaWay. This section presents AECOM's inspection activities and results.

Figure 3-1 2008 IDD Inspection Area

During the 2008 field season, the AECOM field crew investigated nearly 60 miles of roadway and 49 different parks in seven towns. Table 3-1 shows the towns in Zone 1 along with the number of stormwater features, road miles, parks and total park area visited.

Table 3-1 Summary of Work

Town	Stormwater Features	Road Miles	Parks	Park Area (acre)
Hingham	27	N/A	3	36
Weymouth	53	0.2	3	75
Canton	58	N/A	1	327
Hull	174	1.6	3	238
Milton	471	9.4	6	1,593
Quincy	650	11.5	8	2,780
Boston	2,316	36.8	25	700
Total	**3,753**	**59.4**	**49**	**5,749**

Table 3-2 Investigated Features

Feature	Total
Catchbasins	2,260
Manholes	952
Outlets	325
Inlets	99
Other	117
Total	**3,753**

Within these towns, the crew inspected 3,753 features for indications of illicit discharges. As Table 3-2 shows, stormwater systems are comprised primarily of catch basins, manholes, and outfalls but also include other features such as scuppers, drywells, and oil/grit separators.

Of these features, the crew found 12 features that had dry-weather flow and field tested the flow for the presence of a series of analytes according to the IDD protocol, outlined in Section 2.2. Table 3-3 details the visual observations and analytical results for each flow.

Table 3-3 Summary of IDD Field Tests

Feature ID	Flow	Turbidity	Floatables	pH	Temp (°C)	Boron (mg/L)	NH3 (mg/L)	K (mg/L)	NH3/K Ratio	Fluoride (mg/L)
1848	Trickle	Clear	None	7.03	16.0	0.04	2	1	2.0	1.01
13218	1/2 Full	Slightly Cloudy	None	7.40	20.7	0.24	N/A	N/A	N/A	1.50
17063	1/4 Full	None	None	7.13	21.9	0.03	1	9	0.1	0.28
18300	Trickle	Clear	Other	7.18	19.0	1.80	2	280	0.0	1.00
18313	1/2 Full	Cloudy	None	7.14	20.3	0.75	12	30	0.4	0.77
18480	Trickle	Slightly Cloudy	Other	7.12	22.2	1.80	1	38	0.0	0.11
18571	1/2 Full	Slightly Cloudy	None	7.44	16.4	N/A	N/A	N/A	N/A	N/A
21786	1/4 Full	None	None	7.26	20.1	0	1	5	0.2	0.14
21790	Trickle	None	None	7.26	20.1	N/A	N/A	N/A	N/A	N/A
2921	Trickle	None	Oil Sheen	7.21	22.9	0.03	0	7	0.0	0.22
18703	Trickle	Cloudy	None	7.02	18.5	0.37	13	22	0.6	0.99
27772	1/4 Full	Cloudy	None	6.99	24.5	0.27	0	0	0.0	0.12

Notes: N/A = not available. Features 18571 and 21790 were not tested for Boron, NH_3, Potassium or Fluoride as they were determined to be downstream flows of other features. Feature 13218 was not tested for NH_3 or Potassium.

Based upon test results and field observations, we categorized the flows as

- Potentially illicit,
- Natural flows, or
- Not part of the stormwater system (Table 3-4).

The following sections outline the source determination process for natural flows (Section 3.1) and potentially illicit (Section 3.2) flows based on EPA criteria. Stormwater features that the field crew noted as having suspect characteristics such as odors or staining, but no dry weather flow, are not summarized in this report but can be identified using the stormwater infrastructure database.

Table 3-4 Determination of Source

Feature ID	Source	Illicit	Justification
1848	Tap or Irrigation	Possible	See Summary
13218	Tap or Irrigation	Possible	See Summary
17063	Tap or Irrigation	Possible	See Summary
18300	Wastewater	Possible	See Summary
18313	Wastewater	Possible	See Summary
18480	Wastewater	Possible	See Summary
18571	Tap or Irrigation	Possible	Same Flow as Feature 13218
21786	Culverted Stream	No	Visual Observation
21790	Culverted Stream	No	Same Flow as Feature 21786
2921	Culverted Stream	No	Visual Observation
18703	Sewer Manhole	No	Visual Observation
27772	Culverted Stream	No	Visual Observation

3.1 Summary of Non-Illicit Discharges

The following section summarizes the results of the field tests and source determination for the discharges believed **not** to be illicit.

Features 21786/21790

The results from the analyte tests suggest the source of this flow is natural water (Figure 3-2). Field observations support this conclusion as the field crew determined that the manhole contained a stream running through culverts under the road.

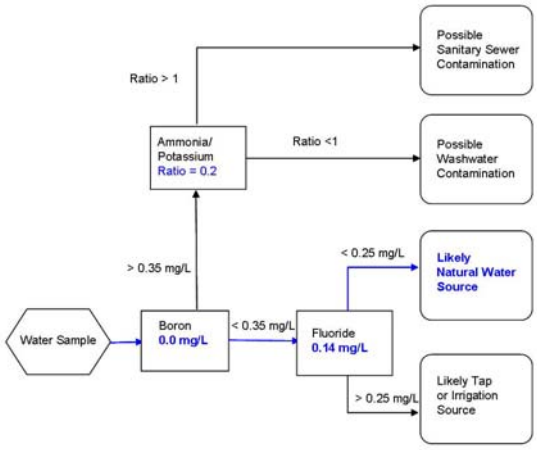


Figure 3-2 Results for Features 21786/21790

Feature 2921

The results from the analyte tests suggest the source of this flow is natural water (Figure 3-3). Field observations support this conclusion as the field crew determined that the manhole contained a stream running through culverts under the road.

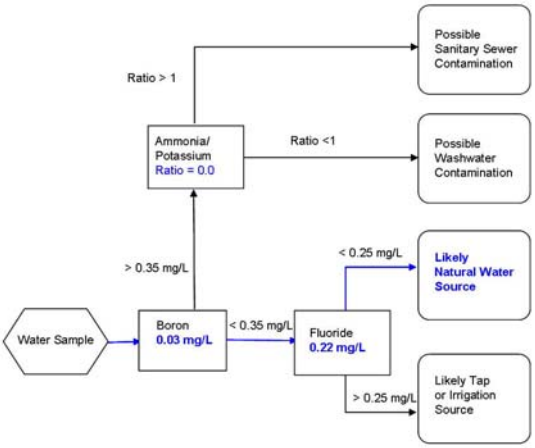


Figure 3-3 Results for Feature 2921

Feature 18703

The results from the field analyte tests suggest the source of this flow is washwater (Figure 3-4). However, observations made after testing lead the field crew to determine that drainage plans of the area were inaccurate and that the feature was actually a sewer manhole and not part of the stormwater system.

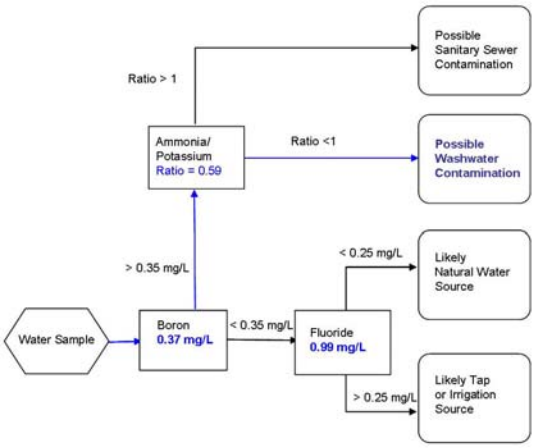


Figure 3-4 Results for Feature 18703

Feature 27772

The results from the analyte tests suggest the source of this flow is natural water (Figure 3-5). Field observations support this conclusion as the field crew determined that the manhole contained a stream running through culverts under the road.

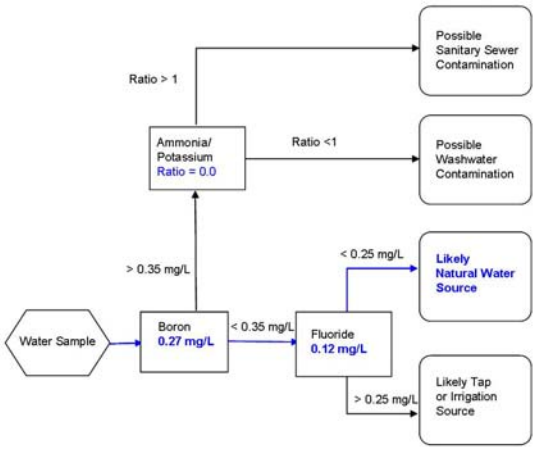


Figure 3-5 Results for Feature 27772

3.2 Summary of Suspected Illicit Discharges

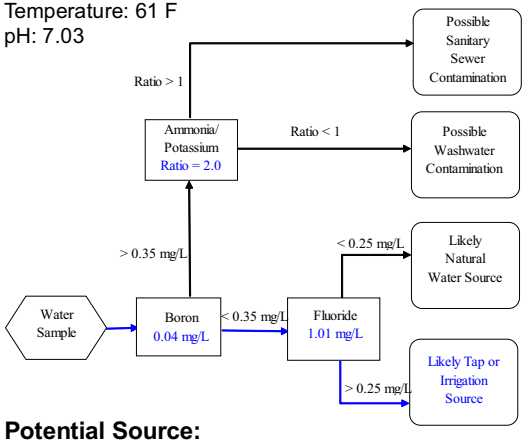
The following figures summarize the results of the field tests and source determination for the discharges believed to be illicit. The location of the features, the associated drainage line, and a photograph of each feature is also included in the summaries.

Figure 3-6 Summary for Feature 1848
Truman Highway, Boston
Inspection Date: 8/26/08

Dry weather flow was observed discharging into a catchbasin on the Truman Highway in Boston. The flow was light but constant and was also noted during a survey in 2007. Low Boron and high Fluoride levels indicate a tap water source from the direction of the residential neighborhood on Pleasant St. The outlet of this system may be on DCR property but was not located during either field survey.

IDDE Test Results:

Days since last rain event: 9, (0.26")
Temperature: 61 F
pH: 7.03

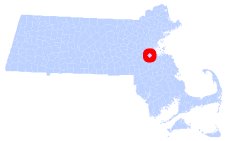


Potential Source:

Unknown/Off DCR property

Recommended Actions:

-Follow up with City of Boston

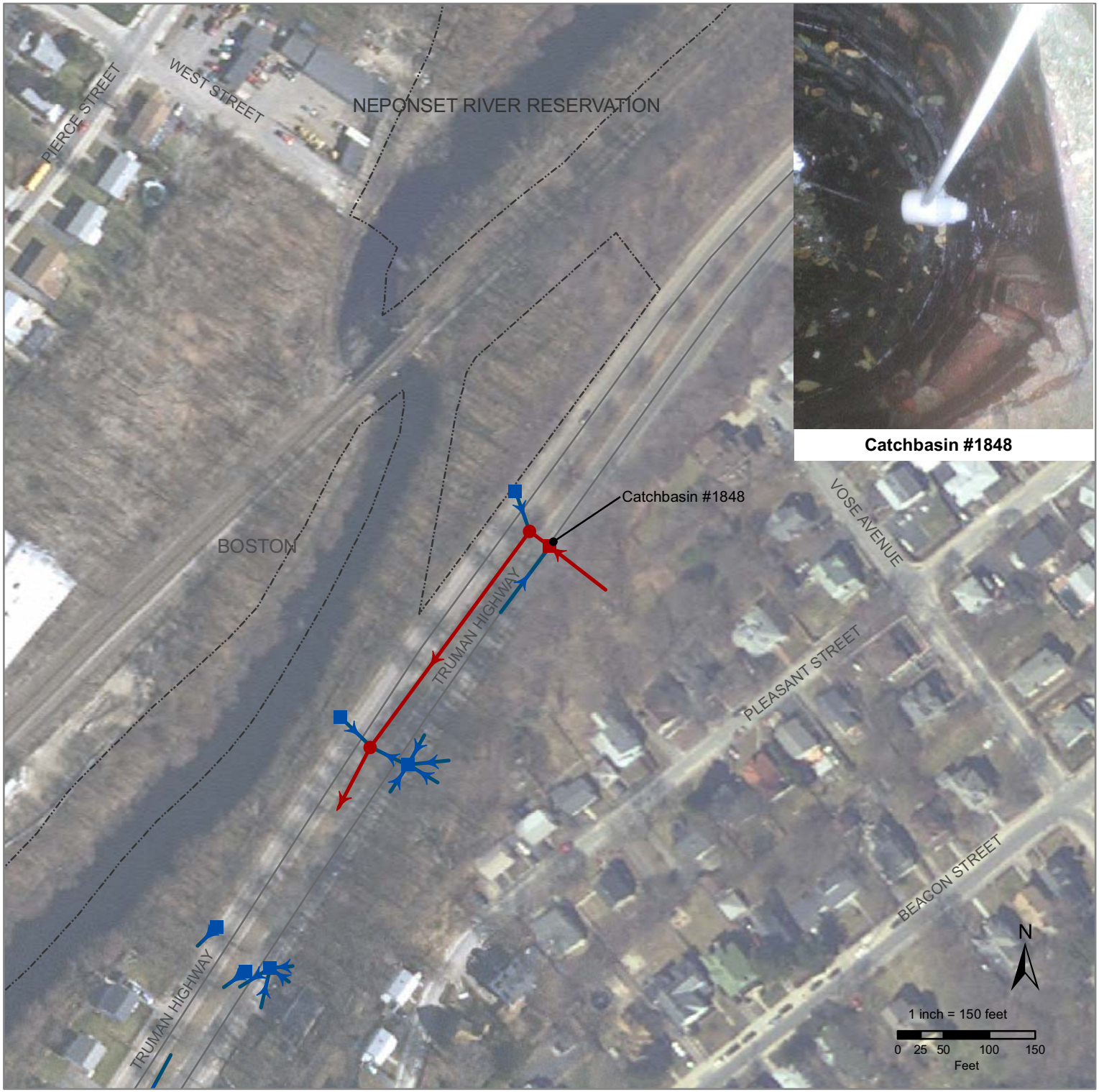


dcr

AECOM

- CatchBasin
- Manhole
- Inlet
- Outlet
- Other
- Conveyance (Pipe)
- Retention/Detention Feature
- DCR Parkway in Urban Area
- DCR Property in Urban Area
- Town Boundary

Note: Red features represent observed dry weather flow path



Catchbasin #1848

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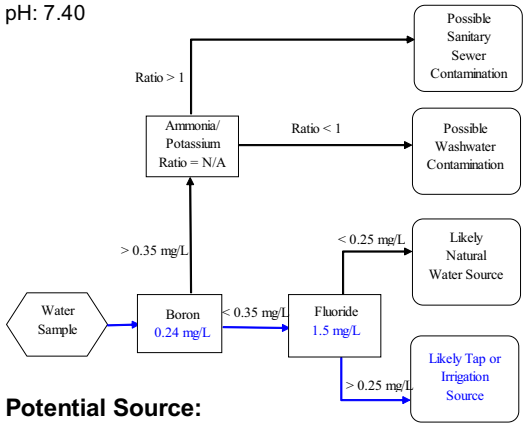
Figure 3-7 Summary for Features 13218/18571
JamaicaWay, Boston
Inspection Date: 9/18/08

Dry weather flow was noted at manhole #13218 in a park area adjacent to the JamaicaWay in Boston. The flow was traced downstream to an oufall on Leverett Pond, discharge was confirmed at the outfall. The source of the flow is off DCR property from the direction of the residential neighborhood on Bynner St. Field observations suggest a possible sewer source for the flow while chemical testing indicates tap water.

IDDE Test Results:

Days since last rain event: 4, (0.21")
Temperature: 69 F
pH: 7.40

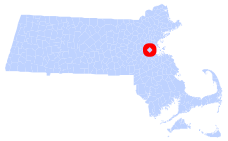


Potential Source:

Unknown/Off DCR property

Recommended Actions:

-Source determination with City of Boston



- CatchBasin
- Manhole
- Inlet
- Outlet
- Other
- Conveyance (Pipe)
- Retention/Detention Feature
- DCR Parkway in Urban Area
- DCR Property in Urban Area
- Town Boundary

dcr

AECOM

Note: Red features represent observed dry weather flow path

Manhole #13218

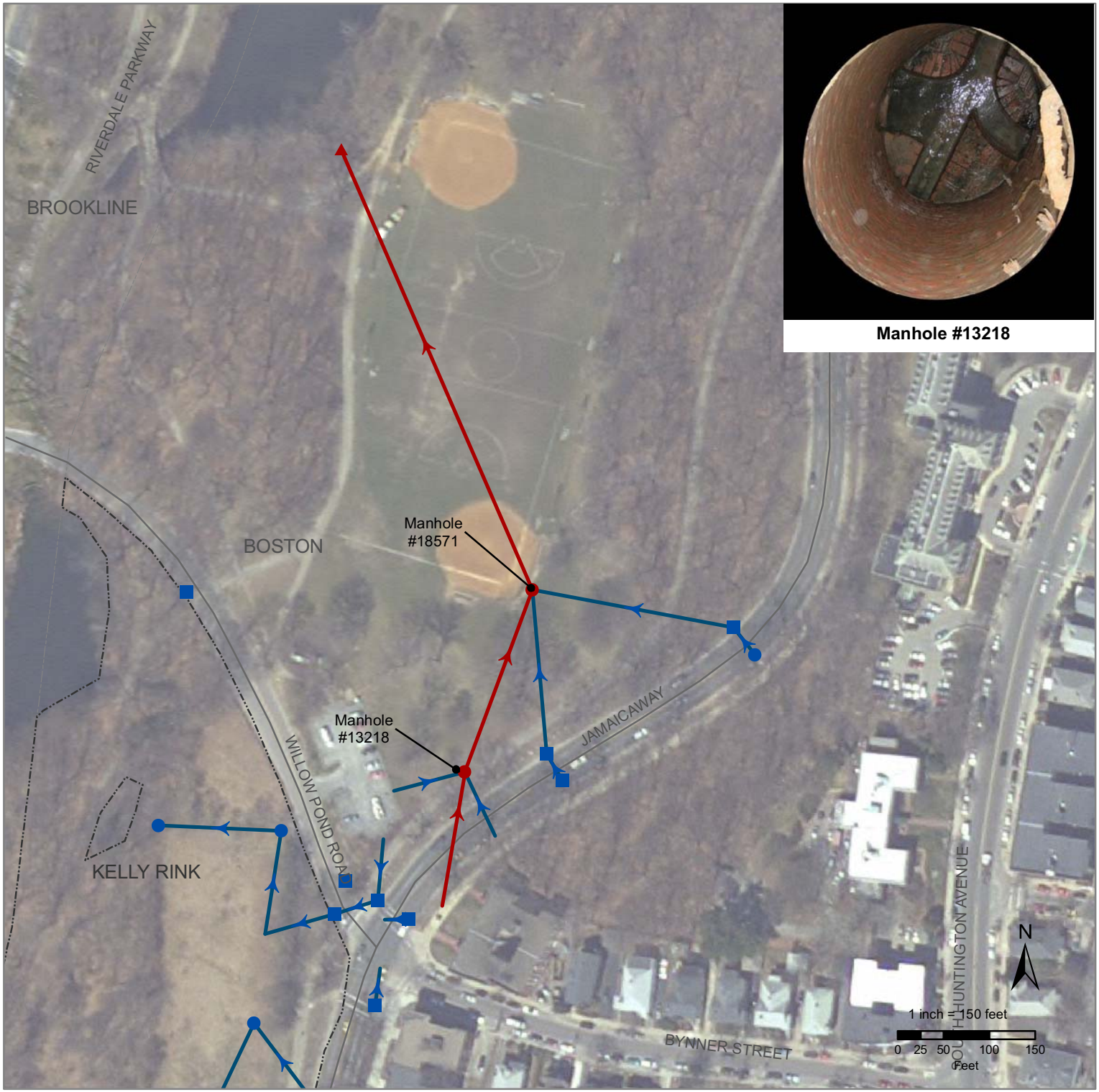
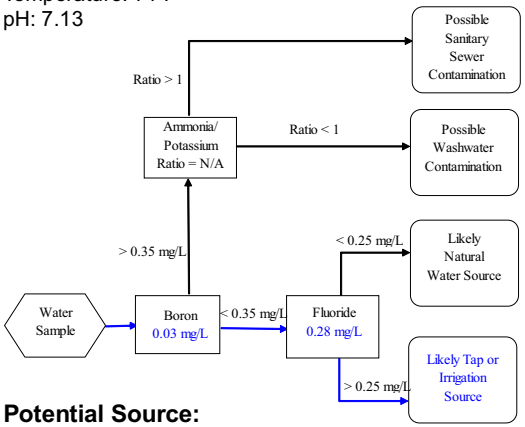


Figure 3-8 Summary for Feature 17063
Furnace Brook Parkway, Quincy
Inspection Date: 9/4/08

Dry weather flow was noted at manhole #17063 on the Furnace Brook Parkway in Quincy. The discharge flows from an unknown source off DCR property in the direction of the residential neighborhood on Malden St. Orange staining was noted on the manhole where the flow discharges to a culverted portion of the Furnace Brook. Field testing indicates a possible tap water source for the flow.

IDDE Test Results:

Days since last rain event: 16, (0.10")
Temperature: 71 F
pH: 7.13

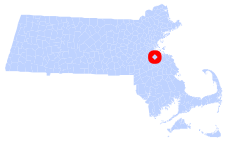


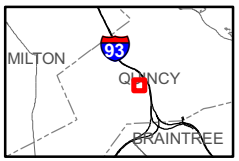
Potential Source:

Unknown/Off DCR property

Recommended Actions:

-Source determination with City of Quincy





- CatchBasin
- Manhole
- Inlet
- Outlet
- Other
- Conveyance (Pipe)
- Retention/Detention Feature
- DCR Parkway in Urban Area
- DCR Property in Urban Area
- Town Boundary

dcr

AECOM

Note: Red features represent observed dry weather flow path

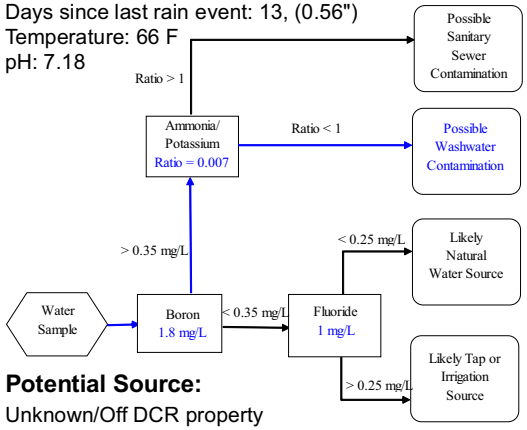
Discharge to Manhole #17063

Figure 3-9 Summary for Feature 18300
Malibu Beach, Boston
Inspection Date: 10/14/08

Part of the Dorchester Shores Reservation, Malibu Beach is a popular swimming and boating area for local residents. Point #18300 is an outfall at the edge of the parking lot that is subject to tidal exchange with Boston Harbor. The 36 inch corrugated metal pipe that discharges at the outfall originates at an unknown source beyond the DCR property. The flow observed on 10/14/08 was a clear trickle with no odor or floatables. The sample results most likely represent saltwater mixing with the discharge and do not indicate a possible source. This site may require further investigation including bacterial testing due to primary contact recreation activities in the receiving water.

IDDE Test Results:

Days since last rain event: 13, (0.56")
Temperature: 66 F
pH: 7.18

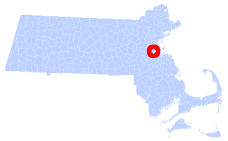


Potential Source:

Unknown/Off DCR property

Recommended Actions:

-Bacterial testing
-Source determination with City of Boston and/or Mass Highway Department

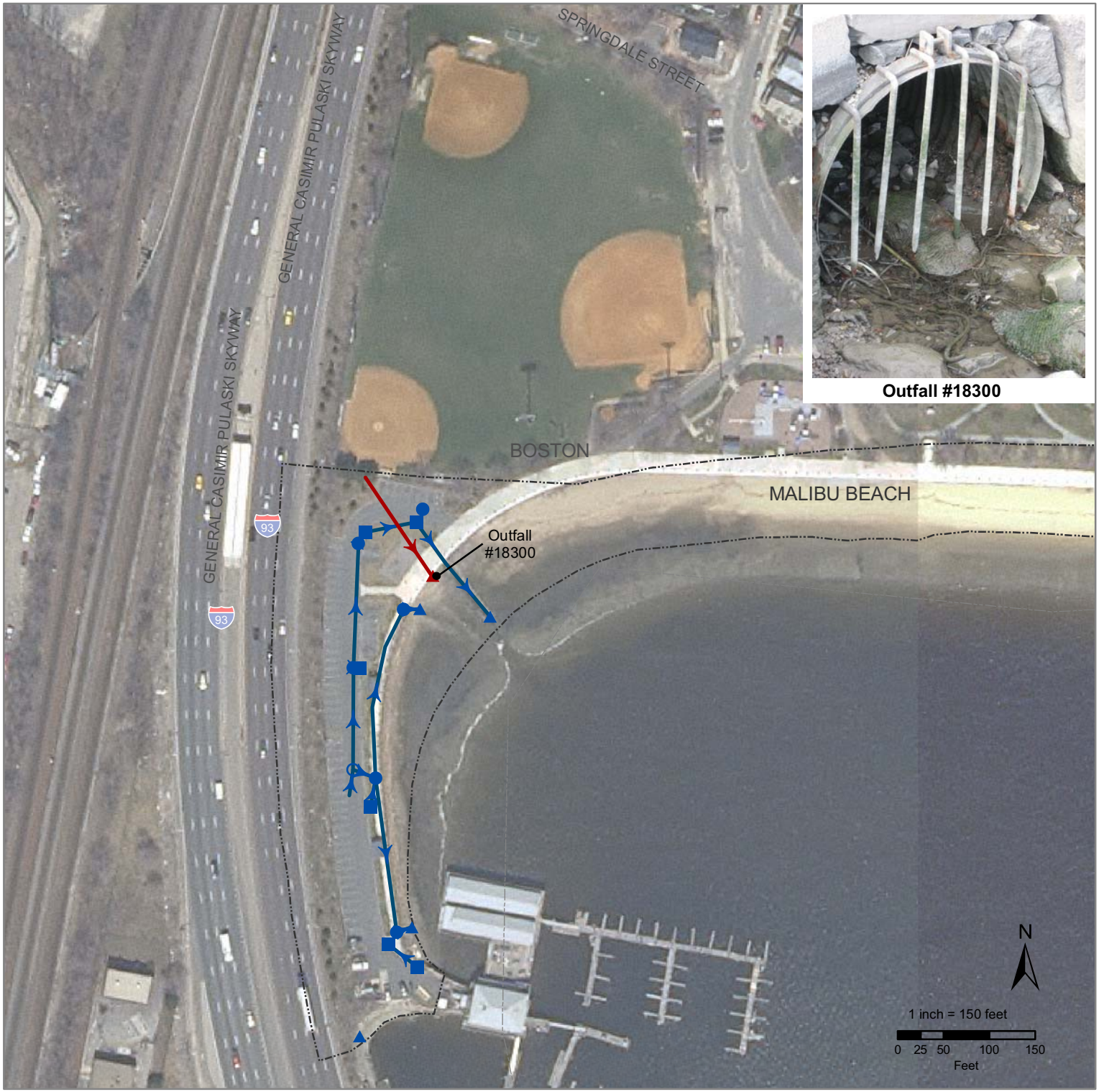


- CatchBasin
- Manhole
- Inlet
- Outlet
- Other
- Conveyance (Pipe)
- Retention/Detention Feature
- DCR Parkway in Urban Area
- DCR Property in Urban Area
- Town Boundary

dcr

AECOM

Note: Red features represent observed dry weather flow path



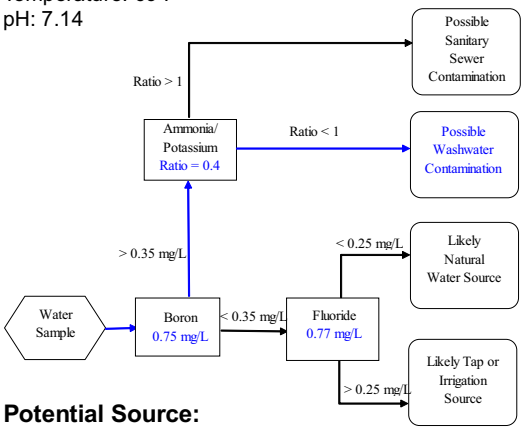
Outfall #18300

Figure 3-10 Summary for Feature 18313
Devine Rink, Boston
Inspection Date: 10/16/08

Discharge from a 2 inch plastic hose was observed at the Devine Rink in Boston. The hose originated from the rink foundation and emitted a rusty, orange colored irregular flow. Field testing indicated possible wash water contamination. The outlet of the system flows off DCR property to a City of Boston park.

IDDE Test Results:

Days since last rain event: 15, (0.56")
Temperature: 69 F
pH: 7.14

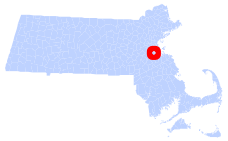


Potential Source:

Devine Rink (DCR)

Recommended Actions:

-Follow up with Devine Rink Manager (DCR) to identify and/or eliminate discharge

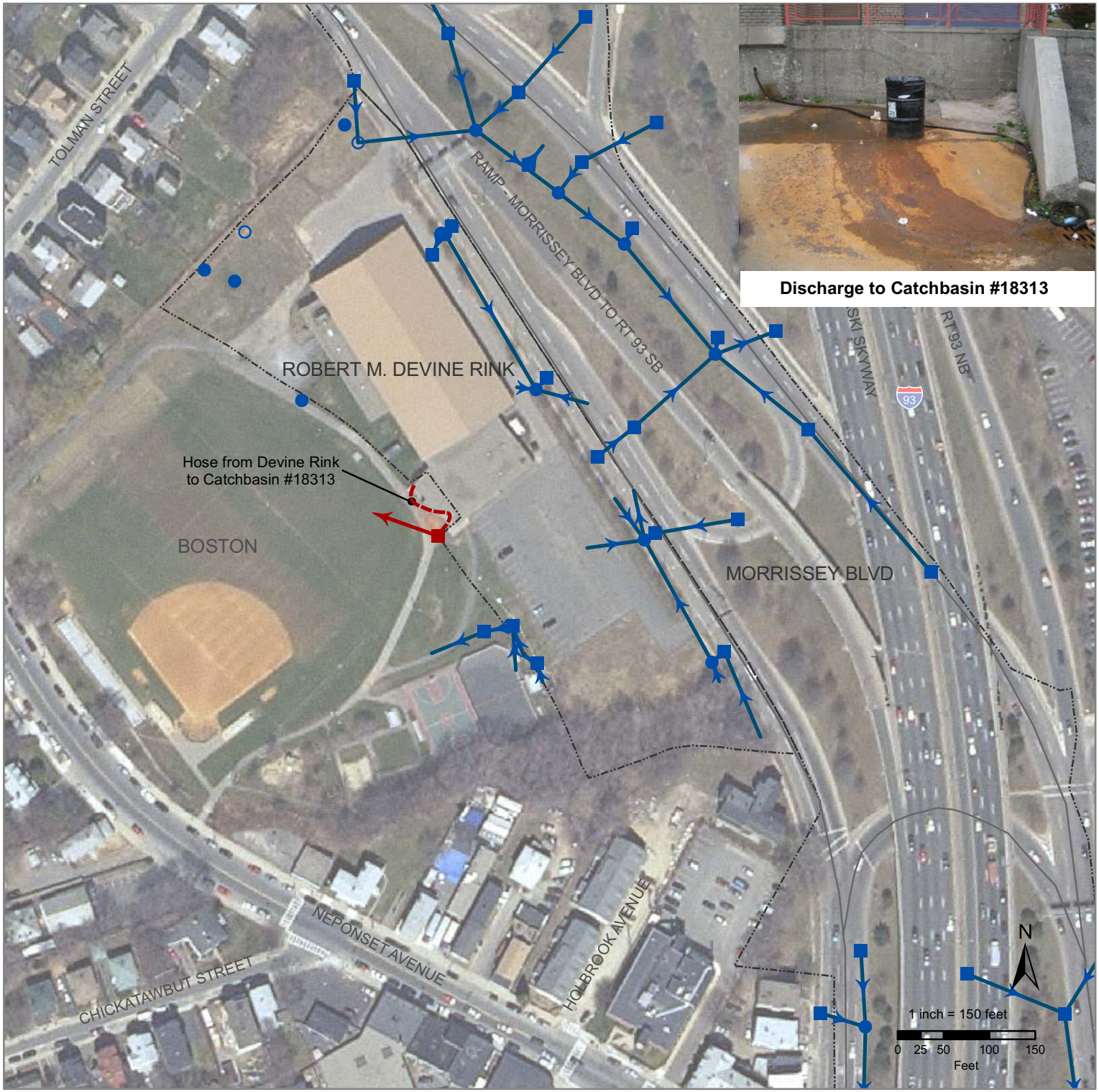


dcr

AECOM

- CatchBasin
- Manhole
- Inlet
- Outlet
- Other
- Conveyance (Pipe)
- Retention/Detention Feature
- DCR Parkway in Urban Area
- DCR Property in Urban Area
- Town Boundary

Note: Red features represent observed dry weather flow path



Discharge to Catchbasin #18313

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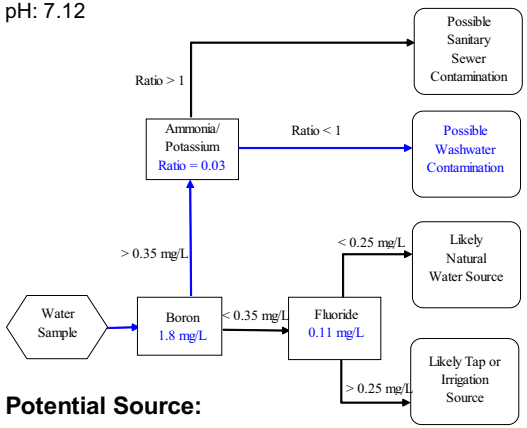
Figure 3-11 Summary for Feature 18480
Old Harbor Reservation, Boston
Inspection Date: 10/23/08

A 3 inch hose was observed discharging to a catchbasin behind the South Boston Police barracks in the Old Harbor Reservation. The hose orriginated from an excavation pit in an adjacent construciton area that is believed to be part of the MWRA South Boston Tunnel Project. The flow was constant and cloudy with large particulate flakes. Source testing indicated possible wash water contamination.

IDDE Test Results:

Days since last rain event: 22, (0.56")
Temperature: 72 F
pH: 7.12

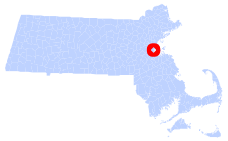


Potential Source:

Construction area (MWRA)

Recommended Actions:

-Follow up with MWRA to identify and/or eliminate discharge



- CatchBasin
- Manhole
- Inlet
- Outlet
- Other
- Conveyance (Pipe)
- Retention/Detention Feature
- DCR Parkway in Urban Area
- DCR Property in Urban Area
- Town Boundary

dcr

AECOM

Note: Red features represent observed dry weather flow path

Discharge to Catchbasin #18480

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4.0 Discussion and Conclusions

The AECOM field team identified twelve drainage features with dry weather flow within the 2008 survey area. Analytical results and detailed investigations at five of these systems suggest natural sources for the observed flows. Field test results and observations at seven of the identified flows suggest potential illicit sources for the discharges. AECOM recommends further investigation at these seven discharges, including additional sampling and extended surveys of the stormwater system in conjunction with adjacent property owners to identify and eliminate the illicit flows.

The first year of illicit discharge investigations of DCR's urban stormwater conveyance systems revealed a low occurrence of suspected illicit discharges: 7 out of 3,753 features (0.19%). Six of these flows represent water originating from beyond DCR's property and emphasize the importance of working with local municipalities to achieve illicit discharge elimination. AECOM notified DCR's Stormwater Program Manager and the Shore District Manager about the one discharge that originates from a DCR facility (Devine Rink, Boston) for immediate action. In addition, AECOM identified several other suspicious features for special consideration and inspection during subsequent cleaning and maintenance activities.

The Illicit Discharge Detection Program developed by AECOM effectively designated five equivalent survey zones to support an inspection rotation and created an illicit discharge identification and sampling protocol for future studies. The program allowed a field crew to investigate over 3,700 features along nearly 60 miles of roadway in a single year and efficiently accomplished the goals of locating and characterizing illicit discharges to DCR's stormwater drainage system.

5.0 References

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

Datasheet for GeoXH handheld 2005 series, 2005, Trimble Navigation Limited, Westminster, CO. Available at: http://www.trimble.com

Edwards, P. 2007, HACH DR/890 Colorimeter Procedures Manual, 8th edition, HACH Company, Loveland, CO

Massachusetts Department of Environmental Protection, 2004. Lower Charles River Illicit Discharge Detection & Elimination (IDDE) Protocol Guidance for Consideration. Available at: www.mass.gov/dep/water/resources/appendxa.doc

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.

Appendix A

Illicit Discharge Detection Protocol and SOP

DCR Illicit Discharge Detection and Elimination
Field Investigation
Standard Operating Procedure
2008

This standard operating procedure (SOP) is designed to support AECOM's illicit discharge detection and elimination (IDDE) program for the Massachusetts Department of Conservation and Recreation (DCR) stormdrain system. There is anticipation of situations occurring in the field which the current SOP does not directly address. Notify Theresa McGovern (x3376), Aaron Hopkins (x3019) or Ryan Lizewski (x3731) concerning any variation to the SOP or with any other questions.

1.0 Site Characterization

- Review stormwater infrastructure map of area and determine most effective approach for IDDE survey.
- Establish safe working area using traffic control contractor and state police detail.
- Open stormwater feature and confirm/update attributes in database including barrel dimensions and pipe details. If the data is from plans you will be prompted to collect a GPS location for the feature.
- Both point and line features are edited from the database. Line features to a specific point will not relocate when point feature is moved.

2.0 GPS Notes

- Must be in editor mode to change point/record data and must click "OK" to save GPS form.
- The GPS unit must be turned off during lunch and at the end of the day.
- The GPS unit needs to be charged every night; either in the office or at home (make sure you have the charger).

3.0 Illicit Discharge Detection

- Examine stormwater feature for dry weather flow.
- If no flow is present look for signs of potential contamination from intermittent sources (staining, floatables, foam etc.), input observations on the IDDE page of the GPS form and photograph the evidence (noting the photo filename in the IDDE record).
- If dry weather flow present don latex gloves and safety glasses and collect a water sample using the remote collection device. Use caution to only sample the dry weather flow and avoid sampling water from the sump.
- Immediately measure pH and temperature using the YSI pH10. Record the results, along with physical observations of the flow, on the GPS form.
- Cap, label with feature ID and store the sample jar. Label the sample by the ENSR ID provided on the GPS unit. Note on the maps and in the field book the location of any samples taken.
- Photograph the discharge and any additional relevant characteristics of the feature and note the filename of the photos on the GPS form. Save the GPS data by clicking "OK".
- Continue to survey the remaining features of the system. Trace the dry weather flow upstream until the source is discovered, the drainage comes from off DCR property, or the flow disappears.

- Collect, label and retain the most upstream water sample of the dry weather flow. The previous downstream flow samples are not required and can be emptied into the stormdrain.
- Once the most upstream location of the discharge has been identified, edit the feature point which will create another IDDE record for that feature, perform chemical analysis on this sample and enter the new temperature and sample analysis results in the form.

4.0 Calibration of Equipment

- Calibrate the YSI pH10 at least once a month (or as needed) and record the calibration results in the field notebook.
- The Horiba Compact Ion meter must be calibrated using the 1-point calibration daily before use, record the calibration results in the field notebook.
- The 2-point calibration for the Horiba Compact Ion meter should be preformed once a month, record the calibration results in the field notebook.

5.0 Chemical Analysis

- Temperature and pH of the sample is taken a second time proceeding subsequent testing.
- Test the selected sample for Boron and follow the flow chart to determine subsequent analysis based on results. For Boron, Ammonia and Fluoride, test using the DR/890 Colorimeter and follow the appropriate HACH procedures included in the field kit. For Potassium, test using the Horiba Compact Ion Meter.
- If Ammonia and Potassium are tested press the "Ratio" button the GPS form to calculate the NH_3/K Ratio for comparison with the benchmark.
- Visually inspect surroundings and note the land use, buildings and utilities in the area. Also note any non-stormwater surface water; landscaping, irrigation, streams, etc.
- If possible, determine the likely source of the discharge using the chemical results, physical conditions and visual observations.
- Notify Theresa McGovern or Aaron Hopkins about the location, characteristics and likely source of any illicit discharges encountered during the survey.

6.0 Contaminated Equipment and Disposal

- All samples and liquids exposed to testing chemicals must be stored in an appropriate waste holding container for proper disposal and ***not*** discharged back into the stormdrain.
- The ammonia test 'n tubes do not need to be emptied; instead, place capped test tube back into holder and bring to the office for proper disposal.
- Any remaining sample which has not been tested can be placed back into the stormdrain.
- Contaminated testing supplies should be rinsed once with tap water and separated from the remaining equipment. Place the rinse water in the waste container for proper disposal.
- Supplies which need to be used multiple times per field day must be thoroughly cleaned. Wash twice with tap water then a third time using deionized water.
- At the end of the day, properly dispose all chemicals down a sink drain with running water to dilute. If appropriate, the waste container can be emptied directly into a sewer main in the field.
- Before reuse, all used equipment should be thoroughly washed with Liquinox detergent in the office, rinsed three times and allowed to air dry.

Appendix C:

Utility/ Drainage Tie-In Permit

DRAINAGE TIE-IN PERMITS ISSUED IN PERMIT YEAR 6				
Permittee	**Location**	**Reason**	**Date Issued**	**Permit Number**
HSH	Alewife Brook Pkwy	Water connection	05/30/08	23175
Allen & Major Associates	Spot Pond, Melrose	Relocation drainage easement	06/04/08	23185
City of Melrose	Lynn Fells Pkwy	Drain connection, Bennetts Pond	11/24/08	23191
Walsh Corp	Columbia Road	Install drainage system	08/20/08	23227
Columbia Design Group	Charles River , Watertown	Connect to DCR drainage pipe	11/17/08	23283
J Derenzo	Memorial Drive	Drain and sewer connection	12/03/08	23309
Barberry Homes, Inc.	Lake Cochituate, Natick	Install drain line and catch basins	03/06/08	23322
Nitseh Engineering	Neponset	Re-use of storm drain	04/27/09	23369