TOWN OF ADAMS

STORMWATER MANAGEMENT STRATEGIC PLAN

June 2005

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Volume 1

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Prepared by:

Comprehensive Environmental, Inc.
Berkshire Regional Planning Commission
Town of Adams

This project has been financed partially with Federal Funds from the Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (the Department) under Section 604(b) of the Clean Water Act, Project Number 2002-02/604. The contents do not necessarily reflect the views and policies of EPA or of the Department, nor does the mention of trade names or commercial products constitute endorsement or recommendation for use.

Town of Adams Stormwater Management Strategic Plan

Executive Summary

The Town of Adams Stormwater Management Strategic Plan describes the policies and measures the Town will take to address and reduce stormwater-related impacts from land use and development. This Plan enables Adams to comply with Stormwater Phase II Final Rule (Phase II) of the National Pollutant Discharge Elimination System (NPDES) as created by the United States Environmental Protection Agency (EPA.) In addition, the Town will use the Stormwater Management Strategic Plan to assist with the operation of the existing stormwater system, allow for optimization of the existing infrastructure, and plan for future improvements and enhancements to the system.

The Adams Stormwater Management Strategic Plan contains eight sections. Section 1 introduces the Plan, describes Phase II requirements and discusses impacts from stormwater. Section 2 describes basic demographic and land use characteristics of the Town, and identifies historic properties and rare and endangered species and habitats. Section 2 also describes the hydrologic system and recent water quality sampling results. The South Branch Hoosic River and 10 major tributaries form the approximately 100 mile river and stream network in the Town. Section 3 describes characteristics of Adams' stormwater collection system. In addition to natural flow conditions, there are over 30 miles of drain pipe, over 280 storm drain outfalls, and nearly 1,600 catch basins. Dominating the stormwater infrastructure is the flood control project in the center of town built by the United States Army Corps of Engineers in the early 1950s. This project, which has successfully eliminated devastating floods, consists of over two miles of concrete flood control chutes and over 175 other major drainage related structures.

Section 4 of the Plan contains an evaluation of existing stormwater conditions. This comprehensive evaluation consists of a perennial stream assessment, a pollutant loading analysis, and a hot spot analysis (defined as the worst areas in town needing improvement) that included a stormwater sampling program. Conceptual designs for stormwater Best Management Practices (BMPs) for the hot spots were prepared as well. Section 5 examines the local regulatory framework the Town uses to manage stormwater and recommends new regulatory measures to comply with the Phase II requirements. Section 6 evaluates existing municipal operations and presents pollution prevention and good housekeeping practices for water quality protection. This covers Town municipal operations associated with park, cemetery and open space maintenance, road maintenance, winter roadway treatment, waste disposal, snow disposal, maintenance and storage facilities, inspection and maintenance of the stormwater system, and handling and disposing of stormwater residuals. Section 7 describes educational, outreach, and participation activities for the three target audiences most affected by stormwater management and improved water quality - the general public, businesses and institutions, and municipal officials.

Section 8 contains recommended implementation measures leading to a comprehensive, yet achievable, approach for the Town of Adams to improve water quality. The Plan divides these recommendations into the six minimum control measure categories specified in NPDES Phase II. These categories are Public Education and Outreach; Public Participation and Involvement; Illicit Discharge Detection and Elimination; Construction Site Runoff Control; Post-Construction Runoff Control; and Pollution Prevention and Good Housekeeping. An action-oriented table describes a comprehensive program of BMPs. Each recommended BMP contains a list of tasks necessary to accomplish that practice, the responsible party that would take the lead implementing the practice, a way to measure the benefits from that BMP, and a five-year schedule for implementation.

A second volume, Adams Stormwater Management Strategic Plan Volume 2 – Technical Material, accompanies the Stormwater Management Strategic Plan. The second volume contains material used to support the development of the Strategic Plan. That material consists of: a Quality Assurance Project Plan; the Adams Parks Department Management Plan; the Shoreline Survey Report: Perennial Streams in the Town of Adams; and the Stormwater Illicit Discharge Detection and Elimination Plan.

This Plan was prepared under the direction of the Adams Community Development Department with support provided by the Adams Department of Public Works. Comprehensive Environmental Incorporated (CEI) and the Berkshire Regional Planning Commission were hired as technical consultants to the project. EPA provided partial funding for this project. EPA provided funds to the Massachusetts Department of Environmental Protection under Section 604(b) of the Clean Water Act (Project number 2002-02/604.) This Plan was prepared from July 1, 2002 through June 30, 2005.

1.0 Introduction

Falling rain or snow soaks into the ground to become groundwater, evaporates, or flows off over the land surface. The overland flow is called runoff or stormwater and is the primary water source for water bodies, such as streams, rivers, lakes, ponds, wetlands and water-supply reservoirs. Stormwater washes along or dissolves some of the materials in its path. Vegetative surfaces slow the flow, filter out sediments, and can break down or trap pollutants in the root zone. In contrast, buildings, roads, parking areas, and exposed bedrock (also called impervious surfaces) increase the volume and speed of stormwater runoff since none can soak in, and the hard surfaces present little resistance to flow. To prevent flooding and protect property in developed areas, stormwater drainage systems collect stormwater runoff and carry it away from roadways and structures to a discharge point. Most discharges are into natural waters. Stormwater drainage systems consist of curbs, gutters, storm drains, channels, ditches, pipes, and culverts and generally do not treat the stormwater.

Stormwater becomes a transportation system for pollutants. Soil that erodes from a construction site, cigarette butts and other litter from parking lots, pet and animal waste, antifreeze and oil dripped from cars, fertilizers and pesticides from turf management, and grit and salt left from de-icing operations on roadways can be deposited untreated into water bodies. Water can contain and transport sediments, metals (copper, cadmium, chromium, lead, and zinc), nutrients (nitrates, phosphates, and ammonia), salt, petroleum products and coliform bacteria among other materials. This is why stormwater is such a significant contributor to water pollution.

In Massachusetts, polluted stormwater runoff and discharges in urbanized areas cause serious water quality problems. Polluted runoff affects aquatic plant and animal life in streams and lakes, reduces recreational activities such as boating and swimming, and increases existing flooding conditions caused by natural events.

To preserve, protect, and improve water resources from polluted stormwater runoff, the United States Environmental Protection Agency (EPA) created the National Pollutant Discharge Elimination System (NPDES) permit program. This program, commonly referred to as the NPDES Program, is authorized by the Clean Water Act, federal legislation. The NPDES Program, which applies nation-wide, controls water pollution by regulating sources that discharge pollutants into water bodies. One of the most recent components of the NPDES program is the Stormwater Phase II Final Rule. Commonly referred to as NPDES Phase II, this program requires small urbanized areas and small construction sites to implement programs and practices to control polluted stormwater runoff to the maximum extent practicable.

Municipalities covered by the Phase II Rule are required to develop and implement a Stormwater Management Program that reduces the discharge of pollutants. This Stormwater Management Program must include the following areas: public education and outreach; public participation/involvement; illicit discharge detection and elimination; construction site runoff control; post-construction runoff control; and pollution prevention/good housekeeping. Each of the six areas of work should list appropriate Best Management Practices (BMPs), identify who will do the work, and specify when the work will be done.

Larger municipalities are already required to implement the Phase II Rule. Larger construction projects in Adams and elsewhere must also be in compliance with certain provisions of Phase II. In the near future, Adams will be required to develop a Stormwater Management Program consistent with EPA's Phase II stormwater requirements. Rather than wait until required to do so, Adams is proactively preparing this Stormwater Management Strategic Plan. This will allow the Town to address stormwater management in its own way and at its own pace. This Plan has been prepared to comply with all NPDES Phase II requirements.

This Plan also demonstrates Adams' commitment to environmental excellence. In recent years, Adams has made a strong commitment to an economic and community development future that not only meets the needs of current residents but also leaves an improved legacy for future residents.

2.0 Town Characteristics

Characteristics of the Town of Adams provide important base line information needed to develop a Stormwater Management Plan that is tailored to the specific needs of the community. The Town characteristics are presented below.

2.1 Community Information and Demographics

The Town of Adams is located in northwestern Massachusetts, bordered by the City of North Adams to the north, Cheshire to the south, Savoy and Florida on the east, and Williamstown and New Ashford to the west. It is situated 15 miles northeast of Pittsfield, 60 miles east of Albany, 138 miles west of Boston and 158 miles north of New York City.

The Town is located in the valley of the South Branch of the Hoosic River. Adams has Mount Greylock on its western edge and the Hoosac Range on its eastern side. The Hoosic River flows northward through the center of town. State Rt. 8 is the major transportation corridor leading south to Cheshire, a rural-residential community and north to North Adams. Route 8 parallels the Hoosic River. Both the river and the road are the main development corridors in town.

The Town's economy was historically driven by industry. As with many towns in Massachusetts, Adams has close ties with the river that runs through it. At the onset of the industrial revolution, Adams drew upon the power and resources of the Hoosic River to grow and thrive as a mill town. The power of the river was harnessed to allow the early development of industry. The industrial economy was initially driven by textile and paper mills and mining operations. The building of the railroad further accelerated the Town's expansion with the population peaking in 1925. The connection with the Hoosic River was double edged – it was the resource that powered the mills, but its uncontained power also threatened the town itself. Between 1901 and 1938, four major floods destroyed much of the Town and the businesses that relied on the river. To reduce the possibility of the type of devastation experienced by the 1938 flood, in the 1950s the Army Corps of Engineers built the concrete flood control channel that now exists along the downtown stretches of the Hoosic River.

Economic recovery from this confluence of circumstance has been slow and only fractional. The Town's manufacturing base has declined dramatically over the last several decades, as has been typical of the entire Berkshire region. Though a significant amount of manufacturing still occurs in Adams, the Town is transitioning to a service based economy and is trying to capture a portion of the Berkshire tourism and recreation market. The Town is home to an abundance of significant natural, historical and recreational assets, such as Mount Greylock State Reservation, the Hoosic River, numerous historic sites and buildings, and the Ashuwillticook Rail Trail which currently extends southward to Lanesborough from downtown Adams with plans currently underway to extend it northward to North Adams, and eventually Williamstown. An aggressive revitalization process has also been underway in the downtown area. The Town has concentrated on façade and signage repairs through implementation of the Downtown Façade & Signage Improvement Program, with numerous businesses and building owners participating. Rehabilitation of the housing stock in Adams has been a priority as well through the Town's on-going Housing Rehabilitation Program. Adams is also implementing a complete renovation of Renfrew Park, an important regional recreational resource near the downtown area.

The following community information is provided to gain a general sense of the size, community and budget of Adams. This information is useful for the development of a Phase II Plan.

- Total Area = 20.4 square miles *(source: www.city-data.com)*
- 2000 Population = 8,809 *(source: U.S. Census Bureau, Census 2000)*
- Registered Voters = 5,766 *(source: Town Clerk, 2004)*
- 2001 School Enrollment = **1,229 (source: Adams-Cheshire Regional School System)*
- County = Berkshire
- Miles of Roads = 57 miles *(DPW, 2004)*
- Total Stormwater Outfalls = *284 (source: Town of Adams GIS)*
- Miles of Drain Pipes = *~30.7 (source: Town of Adams GIS)*
- Total Catch Basins and Drainage Manholes = *1,927(source: Town of Adams GIS)*
- 1999 Per Capita Income = $18,572 *(source: U.S. Census Bureau, Census 2000)*
- 1999 Median Family Income = $40,559 *(source: U.S. Census Bureau, Census 2000)*
- FY05 Residential Tax Rate = $17.56
  Commercial Tax Rate = $21.58 *(source: Assessors Office)*
- Town Operating Budget = $10,539,981 *(source: Town of Adams)*

* Includes number of students pre-K through Grade 12 in the Adams-Cheshire School District.

Town demographics indicate how public involvement and education about stormwater management and Phase II compliance may best be approached. For instance, the majority of Adams households are owner occupied. Therefore, fliers inserted in utility bills may reach the majority of the population. However, there is still a significant portion of households (40 %) that are renter occupied. An alternative means of reaching this segment of the community will be needed. Based on Census information, fliers and other outreach materials could be printed in English only as this is the predominant language spoken in Adams' households.

Table 2-1 Town of Adams Demographic Information		
2000 Population (U.S. Census Bureau, 2000 Census)		
Age	**Persons**	**Percent of total**
0-14 years	1,610	18.2%
15-24 years	950	10.7%
25-54 years	3,577	40.6%
55-64 years	872	9.9%
65+ years	1,800	20.4%
Total Population	**8,809**	
2000 Housing Tenure (U.S. Census Bureau, 2000 Census)		
	Units	**Percent of total**
Owner-Occupied	2,414	55.3%
Renter Occupied	1,578	36.2%
Vacant	360	8.3%
Seasonal	10	.2%
Total Units	**4,362**	
Race (U.S. Census Bureau, 2000 Census)		
White	8,635	98.0%
Black or African American	32	0.4%
Asian and Pacific Islands	25	0.3%
American Indian	7	>.1%
Other Race	24	0.3%
Persons of two or more races	86	1.0%

2.2 Land Use and Zoning

Zoning

Adams has a mix of zoning districts and regulations, especially along the Route 8 corridor and in the downtown area. Zoning districts are shown on Table 2-2. The Town has a dense "downtown core" mixed-use area as well as suburban areas and rural landscapes. There are four residential districts in Adams (R-1, R-2, R-3, and R-4). Much of the built-up neighborhoods generally around the downtown area are in the R-3 and R-4 zones. These districts have a minimum 12,000 and 10,000 square foot lot area dimensional requirement, respectively, with 90 and 70 feet of frontage required, respectively. Lots in the R-2, R-3, or R-4 zoning districts that are not connected to public sewer must conform to larger lot dimensions (1 acre) and setbacks.

Adams has an Open Space Zoning district that is mostly occupied by state parks. The Zoning Bylaw allows for Cluster Development for parcels in excess of five times the minimum lot size in several residential zones. To be approved under this provision, development must be superior to conventional development in preserving open space and utilizing natural features of the land. Cluster development allows for a density bonus of 20% over the number of dwelling units permitted under standard residential development. The cluster provisions have not been widely used. Planned Development is allowed, with the provision that not less than 20% of the land be preserved for recreation or open space. Adams also has a Planned Unit Resort Development provision, which outlines very specific site development guidelines.

Table 2–2. Adams Zoning Districts

Residence Districts	**Business Districts**
R-1: Rural Residential	B-1: General Business
R-2: Low Density Residential	B-2: Extensive Business
R-3: Medium Density Residential	B-3: Forest recreation
R-4: High Density Residential	
Industrial Districts	**Open Space District**
I: Industrial	OS: Open Space
IP: Industrial Park	

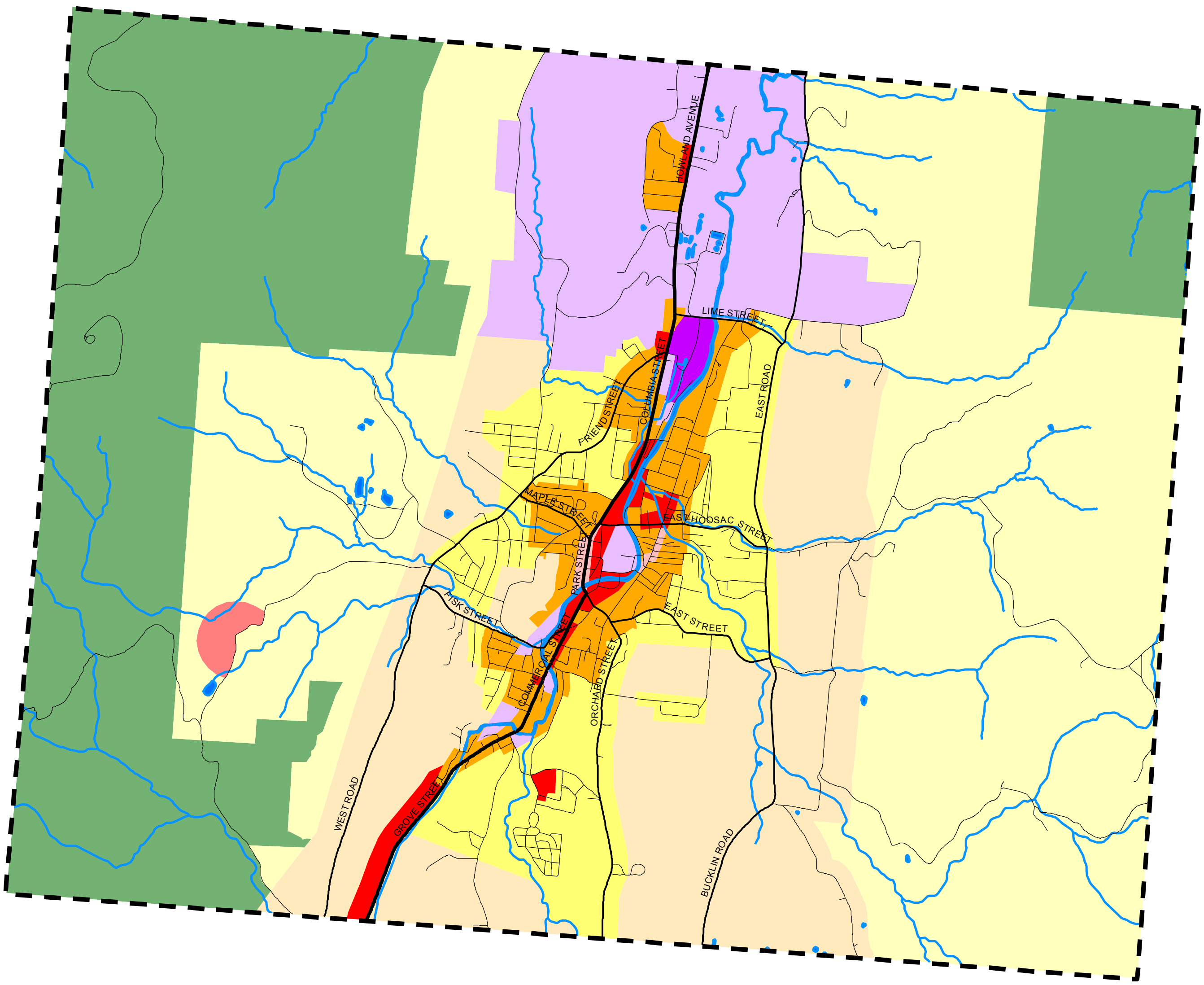
(Source: Town of Adams Zoning Bylaw)

The boundaries of these districts are shown on **Figure 2 – 1.** Table 2-3 shows the Intensity of Use Schedule in the Zoning Bylaw that provides additional details regarding development standards under each zoning district.

Table 2–3. Intensity of Use Schedule—For Principal Use

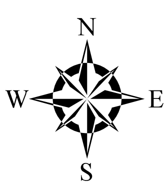
District	**Minimum Lot Area** (sq. ft.)	**Minimum Open Space** (%)	**Maximum Building Height** (ft.)
R-1	43,560	70	30
R-2	21,780	70	30
R-3	12,000	50	30
R-4	10,000	50	30
B-1	0	0	40
B-2	10,000	25	30
B-3	10,000	20	30
IP	43,560	25	40
I	20,000	25	40
OS	2 Acres	85	15

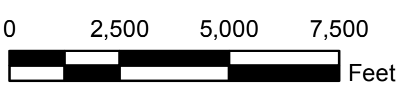
(Source: Town of Adams Zoning Bylaw)



Zoning

- B-1
- B-2
- B-3
- I
- IP
- OS
- R-1
- R-2
- R-3
- R-4





Data Sources: Town of Adams, MassGIS

Figure 2-1

Zoning

Adams, Massachusetts

Current Land Use

Table 2-4 shows acreage by land use category based on an interpretation of 1999 aerial photographs. The pattern of land use within Town is depicted on Figure 2-2. Adams exhibits a compact development pattern with a densely developed downtown area and a mix of commercial and industrial uses, surrounded by a core of high-density residential development. Less dense residential development can be found in the more outlying areas. Topography plays a dominant feature in the land use pattern of the Town, with the east and west parts of Adams defined by the Hoosac Range and Mount Greylock, respectively. In addition to presenting natural barriers to development, much of the land in these outlying areas is protected open space.

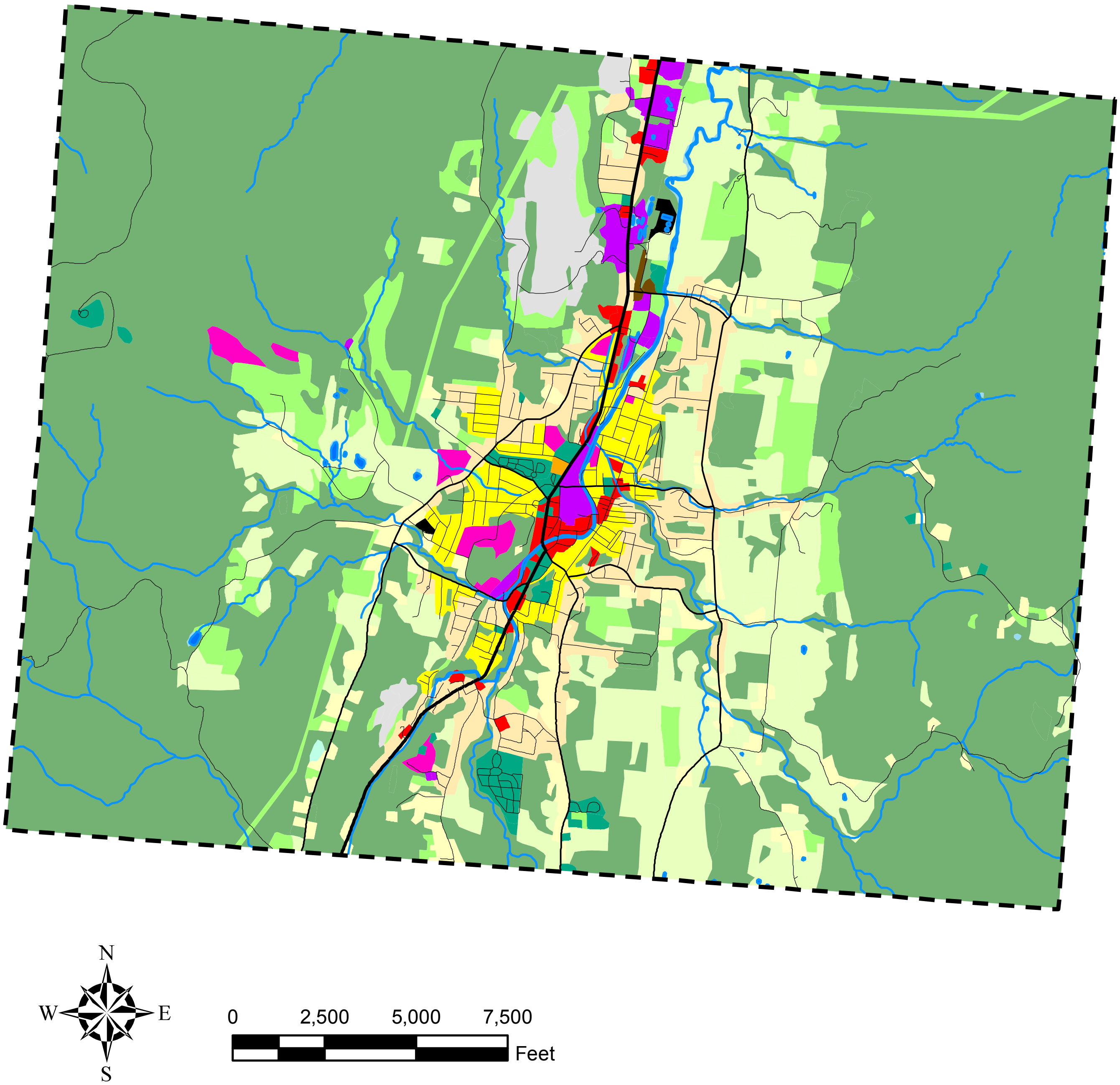
Table 2-4. Land Use

Land Use Category	Acres
Cropland	3,815.70
Forest	9,758.51
Wetland	3.56
Mining	229.40
Open Land	777.19
Participation Recreation	89.53
Multi-Family Residential	4.29
Residential less then 1/4 acre lots	341.72
Residential between 1/4 and 1/2 acre lots	682.63
Residential greater then 1/2 acre lots	386.00
Commercial	109.56
Industrial	133.71
Urban Open	148.50
Transportation	8.81
Waste Disposal	13.37
Water	35.37
Total	14,663.68

(Source: MassGIS)

Buildable Land Analysis

An assessment of buildable land, also commonly referred to as a buildout analysis, was conducted to predict where future development might occur in Adams. Such an analysis is an important tool for the Town to allow proactive planning to accommodate and better manage that development. The buildout analysis was conducted at the parcel level. Parcel data was combined and compared with land use data. The area of existing developed land and the area of protected open space were removed from the parcels. Remaining areas were then examined to determine if individual parcels were large enough to be subdivided into a



- Crop Land
- Forest
- Wetland
- Mining
- Open Land
- Participation Recreation
- Multi-Family Residential
- Residential less then 1/4 acre lots
- Residential between 1/4 and 1/2 acre lots
- Residential greater then 1/2 acre lots
- Commercial
- Industrial
- Urban Open
- Transportation
- Waste Disposal
- Water
- Stream, Brook
- Lake, Pond

Figure 2-2

Land Use

Adams, Massachusetts

Data Sources: MassGIS

second parcel. If a parcel was not large enough to be subdivided, it was removed from consideration for future development. Parcels suitable to be subdivided were then analyzed for environmental constraints. These remaining parcels had the area of wetlands, river protection areas, floodplains, and slopes greater than 25% removed from consideration for future development. The parcels that were left were reviewed again to ensure that there were no small polygons that were not buildable. The remaining area was considered buildable for future development. Table 2–5 shows the potential developable area by zoning district.

Table 2–5. Buildable Land by Zoning District

Zone	Total Acreage	Buildable Acreage	% Buildable
B-1	10.46	0.12	1.15%
B-2	170.14	11.27	6.63%
B-3	244.94	29.66	12.11%
I	1,284.17	685.77	53.40%
IP	11.36	5.98	52.64%
OS	313.69	6.83	2.18%
R-1	5,307.72	2,877.69	54.22%
R-2	4,041.66	1,544.28	38.21%
R-3	1,701.64	287.01	16.87%
R-4	63.69	23.26	36.51%
Total	13,149.45	5,471.87	41.61%

Buildable Land and Stormwater Management

Table 2-6 contains a brief analysis of the relationship between the remaining buildable land in Adams and the existing stormwater infrastructure. This analysis will allow the Town to better plan for future development including planning for infrastructure expansion or other non-structural Best Management Practices, such as enhanced regulations.

Table 2–6. Buildable Land and Stormwater Management

Zone	Consideration for Stormwater Management
B-1	Only .12 acres on B-1 are buildable for new development. There are no future stormwater considerations.
B-2	The remaining buildable land in the B-2 zone is off Grove Street and has full access to an existing stormwater infrastructure.
B-3	The B-3 buildable area is located in the area known as Greylock Glen. It currently does not have a stormwater system. A stormwater collection system will need to be part of the future development plan for the site.
I	Most of the Industrial Zoning is comprised by Specialty Minerals, Inc. property. Most of the buildable land would have access to stormwater infrastructure along Howland Avenue. There are portions of the Industrial Zone off Line Street and

Table 2–6. Buildable Land and Stormwater Management	
Zone	Consideration for Stormwater Management
	East Road. This smaller area would need to have the system upgraded.
IP	The IP zone has full access to the stormwater infrastructure.
OS	The small portion of OS that is buildable is off West Road and has no access to the stormwater infrastructure.
R-1	Most of the remaining buildable land in the R-1 zone does not have access to the stormwater infrastructure. Land off of East Hoosac Street has some access.
R-2	The remaining buildable land in the R-2 zone has partial access to the stormwater infrastructure. The portions that are closer to the downtown and are abutting a street tend to have the needed infrastructure while those areas that are farther away from the downtown core do not.
R-3	The remaining buildable land in the R-3 zone has good access to the stormwater infrastructure. Most of the buildable land is in the southern portion of Town close to roads that already have developed infrastructure.
R-4	The remaining buildable land in the R-4 zone has good access to existing stormwater infrastructure. The buildable land is scattered around the downtown area and in the northern section of Town.

Potential Growth Areas

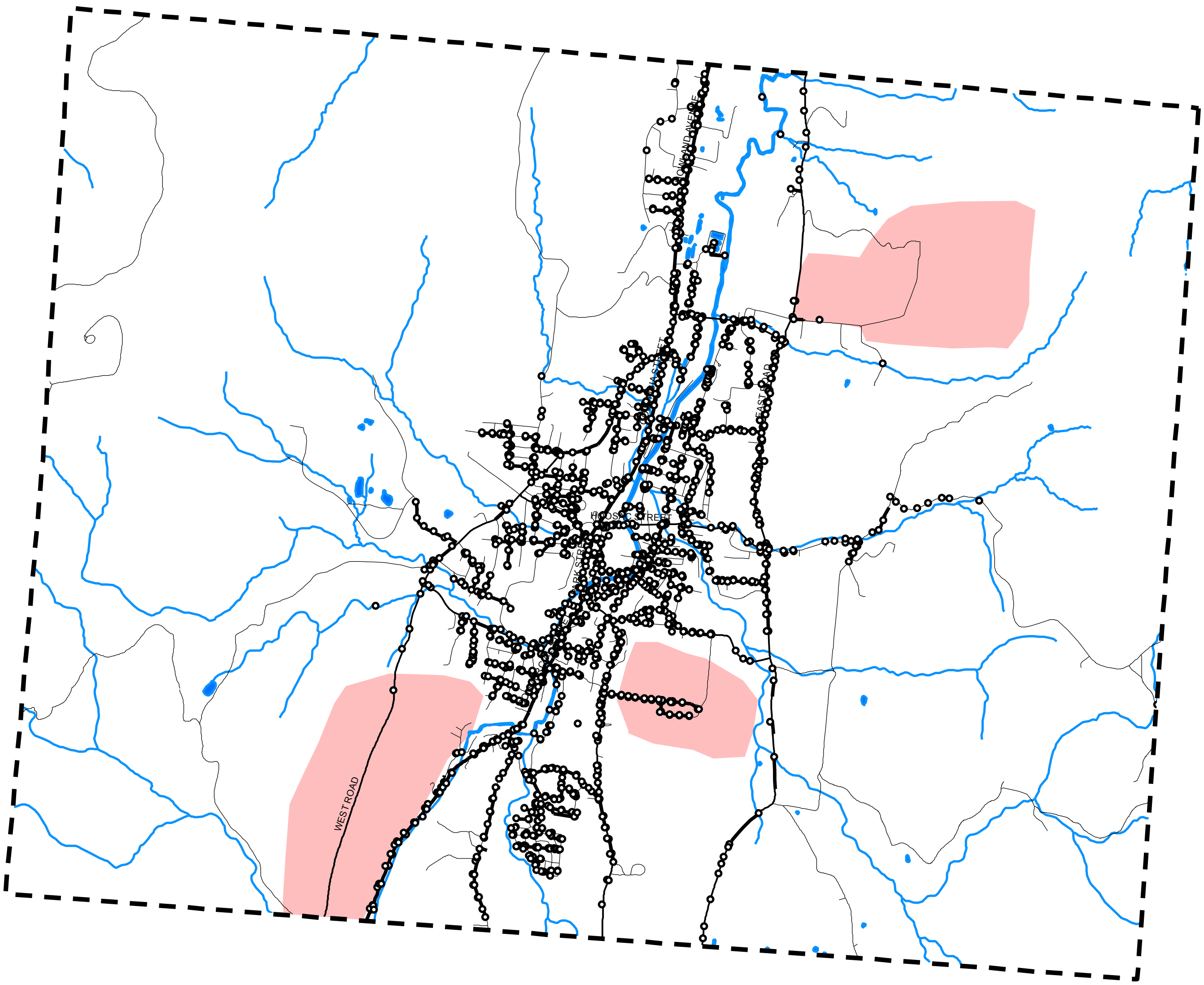
Several locations in Adams have been identified that could accommodate future growth. They are:

- Northern Area – off East Road and Spring Road
- Southern Area 1 – East Orchard Terrace
- Southern Area 2 – off West Road

These areas are shown on Figure 2-3.

A brief description of each area and implications for stormwater management is contained below.

- Northern Area – off East Road and Spring Road
  The storm drain system in this area consists of a few catch basins that drain the water across East Road and Spring Road. The area is generally undeveloped consisting mostly of forest and farmland where stormwater can infiltrate into the ground. The terrain slopes towards East Road. If developed, the stormwater system would have to be upgraded to handle the stormwater flow that would be flowing off the developed land.



Catch Basin
Storm Drain
GrowthAreas

Data Sources: Town of Adams, MassGIS

N
W E
S

0 2,500 5,000 7,500
Feet

Figure 2-3

Potential Growth Areas

Adams, Massachusetts

- Southern Area 1 – East Orchard Terrace
  East Orchard Terrace has an existing storm drain system established that flows down towards Orchard Street. Future development of this area would most likely tie into this existing system. Portions of East Orchard Terrace are already developed, while the remaining area is comprised of forest and farmland. The terrain generally slopes towards the northwest. Stormwater not captured on East Orchard Terrace can flow northwest towards existing systems on Orchard Street and East Street.

- Southern Area 2 – Off West Road
  There is no stormwater collection system on West Road. This area is characterized by several small hills and the stormwater flows in several directions throughout the area. The area is mostly wooded; however, there are a number of residences already on West Road. Stormwater infrastructure would need to be built to accommodate future development.

2.3 Water Bodies, Classification, Impairments and Existing Water Quality

The goal of the Phase II program is to improve the quality of receiving waters (waters that receive stormwater discharges) by preventing and/or minimizing pollutant loadings from stormwater discharges.

The federal Clean Water Act requires each state to review, establish, and revise water quality standards. Water quality standards must designate a use for a given body of water, as well as appropriate criteria for those uses. Criteria include such parameters as dissolved oxygen, temperature, pH, bacteria, color and turbidity, oil and grease, and taste and color. In Massachusetts, inland waters are designated as belonging to Class A (public water supply), Class B (habitat for aquatic life and suitable for primary contact recreation), or Class C (habitat for aquatic life and suitable for secondary contact recreation.) Additionally, states may designate sub-categories of a use with appropriate criteria. In Massachusetts, the subcategory “cold-water” is used to define waters where “dissolved oxygen and temperature criteria for cold water fisheries apply (314 C.M.R. 4.05).” Cold-water fisheries in Massachusetts are defined as, “waters in which the maximum mean monthly temperature generally does not exceed 68 degrees F (20 degrees C) and, when other ecological factors are favorable (such as habitat), are capable of sustaining a year-round population of cold water stenothermal aquatic life such as trout (314 C.M.R. 4.02).” The state is also required to develop and adopt an antidegradation policy to ensure that existing levels of water quality and use are maintained.

The Massachusetts Water Quality Standards can be found in the Code of Massachusetts Regulations: 314 CMR. 4.00. Waterbodies not listed in the tables in 314 CMR 4.00 are presumed to have specified designations. Stream segments identified below are presumed to be designated Class B High Quality Waters.

Section 303(d) of the Clean Water Act and the implementing regulations at 40 CFR 130.7 require states to identify those waterbodies that are not expected to meet surface water quality standards after the implementation of technology-based controls and to prioritize and schedule them for the development of a total maximum daily load (TMDL). A TMDL is the greatest amount of a pollutant that a waterbody can accept and still meet water quality standards for protecting public health and maintaining the designated beneficial uses of those waters for drinking, swimming, recreation, and fishing. A TMDL is implemented by specifying how much of that pollutant can come from point, nonpoint, and natural sources.

The entire portion of the Hoosic River in Adams is on the Massachusetts Year 2004 Integrated List of Waters as a Category 5 Water, "Waters requiring a TMDL." The listed cause of the pollution is pathogens. Historical studies indicate that nonpoint source pollution from stormwater is currently the greatest contributor to the degradation of water quality in the Hoosic River and its tributaries. The required TMDL is supposed to be prepared for the Hoosic River prior to 2012.

This portion of the Hoosic River is also one of the few remaining self-sustaining trout habitats in Massachusetts making it an important natural habitat for preservation. In the *Adams Downtown Development Plan* (2003) restoration of the Hoosic River was identified as key to developing the economic vitality, future growth, and the cultural based tourism potential of the Town.

The following major stream networks flow into the Hoosic River in Adams[1] or are important tributaries.

Dry Brook	*Tophet Brook*	*Reed Brook*
Miller Brook	*Pecks Brook*	*Hoxie Brook*
Southwick Brook	*Patton Brook*	*Unnamed Brook*
Cheesbro Brook		

[1] The headwaters of Bassett Brook, Class A, are located in Adams and flows into the Hoosic River in Cheshire.

Segment Descriptions

Hoosic River (segment MA11-03)[2] (Class B, Cold Water Fishery, High Quality Water[3]) (Category 5[4])(Pathogens)[5] This segment, the first of the mainstream Hoosic River (locally known as the *South Branch Hoosic River),* begins at the outlet of Cheshire Reservoir in Cheshire and ends at the Adams WWTP discharge in northern Adams. Nine tributaries drain to this segment of the Hoosic River including Dry, Pecks, Hoxie, Tophet, and Southwick brooks in Adams.

Hoosic Rover (segment MA11-04) (Class B, Warm Water Fishery) (Category 5)(Pathogens) This segment, the second of the mainstream Hoosic River, encompasses the remainder of the river between Adams WWTP discharge and the confluence with the North Branch Hoosic River. Cheesboro Brook drains to this segment of the Hoosic River in Adams. This segment of the Hoosic River flows in a northerly direction through the floodplain between the Hoosic and Taconic ranges. At the upstream segment of this segment, the Hoosic River receives the effluent from the Adams WWTP. A little further north, the Specialty Minerals, Inc. facility discharges quarry water and stormwater runoff into the Hoosic River.

Dry Brook (segment MA11-13) (Class B) (Category 3) Dry Brook, a Class B water, originates near the Windsor/Savoy line west of Jackson Road in Windsor. The brook flows southwest through a small wetland and continues to flow west along Cheshire Road, Windsor and Sand Mill Road, in Cheshire. The brook continues in a northwesterly direction, past the Hoosac Valley High School in Cheshire to its confluence with the Hoosic River just upstream of the USGS gage (01331500) in Adams.

Tophet Brook (MA11-19) (Class B High Quality Water) (Category 3) Tophet Brook originates in the Hoosac Range along the Savoy/Adams municipal boundary. The brook flows due south and crosses under East Hoosac Street/Adams Road and then turns southwest. Here the brook flows down a steep ravine and receives the flow from Patton Brook. Tophet Brook turns northwest towards its confluence with the Hoosic River in Adams. Two other tributaries, Reed and Miller Brooks also join Tophet Brook in its lower reach.

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[2] Refers to the Massachusetts Department of Environmental Protection waterbody identification number.
[3] Refers to The Massachusetts Water Quality Standards, Code of Massachusetts Regulations: 314 CMR. 4.00
[4] Refers to Massachusetts Year 2004 Integrated List of Waters. Category 1, "Waters attaining all uses;" Category 2, "Attaining some uses; other uses not assessed;" Category 3, No uses assessed;" Category 4, "Impairment not caused by a pollutant;" Category 5, Waters requiring a TMDL"
[5] Refers to cause of listing on the Massachusetts Year 2004 Integrated List of Waters.

Miller Brook: (Class B High Quality Water) The stream begins at a wooded spring in a wet areas in the Hoosac Range on the southwest side of East Hoosac Street. Flow is minimal in the small channel as it flows through a thickly forested area. A small tributary joins from the northeast. After the brook passes under East Hoosac Street, the riverbed becomes wider. At the East Street Bridge, the river is channelized. Below the bridge, the stream returns to a more natural step-pool state, and once again becomes forested with deciduous trees along its bank. Just above Richmond Street, the stream becomes channelized by the flood control chute. Miller Brook soon flows into Tophet Brook.

Reed Brook: (Class B High Quality Water) Reed Brook begins in a forested area in the Hoosac Range near the Savoy/Adams town line. It crosses under Walling Road and East Road before its confluence with Tophet Brook immediately northwest of the intersection with East Road and East Street.

Patton Brook (Class B High Quality Water) Patton Brook begins in a forested area in the Hoosac Range in Savoy and is largely in pristine condition until its confluence with Tophet Brook.

Pecks Brook (MA11-18) (Class B High Quality Water) (Category 2) (Aquatic Life, Aesthetics) Pecks Brook, a Class B High Quality Water, originates on the eastern slope of Saddle Ball Mountain in the Mount Greylock State Reservation in Adams. The brook flows southeast down a steep ravine, then turns northeast, and parallels West Mountain Road. It then flows through Dean's Pond (a small old mill pond), crosses under West Road, and joins with the Hoosic River in downtown Adams.

Hoxie Brook (Class B High Quality Water) Hoxie Brook begins on the forested slopes of Mount Greylock and runs east, parallel to Thiel Road, and crosses Friend Street, where it enters a residential section of Adams. Through much of the downtown, it is channelized and underground, emerging briefly near the new Adams Visitors Center before it runs beneath a parking lot and re-emerges near its confluence with the Hoosic River. Between Hoosac Street and the convergence of Hoxie Brook and the Hoosic River, the river flows through a broad concrete culvert topped by pavement. Abutting the Hoosic River flood chutes, Hoxie Brook emerges in a naturally vegetated stream bank.

Southwick Brook (Class B High Quality Water) Southwick Brook begins as a small stream, flowing out of the Savoy State Forest in the Hoosac Range. In its upper reaches the stream flows through a wooded landscape in a deep, scenic gully, trickling over and through large boulders. Southwick Brook crosses under East Road. Downstream, the brook changes in character, and is channelized in many places with concrete and stone riprap. The stream parallels Lime Street. Along Lime Street, many small bridges cross the stream, primarily to permit driveway access to houses on the north side of the brook. Erosion and efforts at bank stabilization are evident in this section immediately upstream of the confluence with the Hoosic River, just north of Lime Street.

Unnamed Brook (Class B High Quality Water) Unnamed Brook begins as an intermittent stream above the Specialty Minerals, Inc. property north of Adams. The upper section is primarily pools and riffles. It crosses under Notch Road through a culvert by a gate. A dam was observed below the culvert, followed by a series of small cascades. Just west of Friend Street the river runs through a concrete channel beneath a garage. Below this it is channelized in a ditch, and makes a sharp bend north at Pine Street. It disappears into a pipe underneath Howland Avenue. It then runs in a ditch beside Route 8 North and disappears in a pipe before Lime Street, making it impossible to determine its confluence with the Hoosic River.

Cheesbro Brook (Class B High Quality Water) Cheesbro Brook originates in the lower foothills of the Hoosac Range in the northwest corner of Town. It crosses under East Road before its confluence with the Hoosic River.

Existing Water Quality

A general summary of existing water quality in Adams is provided below, followed by more specific information based on recent and historical studies:

1. Water quality is best in the upper reaches of tributaries to the Hoosic River, originating in the forested hillsides of Mount Greylock and the Hoosac Range.
2. Based on historical stream monitoring data, the Hoosic River and contributing waterways appear to be relatively clean during dry weather conditions.
3. Water quality during non-storm conditions is slightly impacted as it enters the Hoosic River in downtown Adams.
4. Overall, water quality for the Hoosic River has improved greatly in the past 40 years, but further improvement is hindered due to stormwater impacts associated with impervious surfaces, increased runoff volumes and stormwater pollution.
5. Water quality is greatly affected during storm events due to elevated pollutants (namely bacteria) present in stormwater, as shown by the results of the stormwater sampling program.

Historical monitoring and water quality assessment efforts by MA DEP, the Berkshire Regional Planning Commission (BRPC) and the Hoosic River Watershed Association (HooRWA) highlight nonpoint sources of pollution as the largest contributors of pollutants to the Hoosic River and its tributaries. These studies emphasize the need to evaluate the characteristics and impacts of urban runoff. Based on historical reports and data from the 2004 stormwater sampling and illicit discharge investigations undertaken for this Plan, a summary list of water quality characteristics is provided below:

- The Hoosic River in Adams is impaired due to pathogens and the leading cause of pollution is bacteria from the storm drain system during rain or runoff events.
- Stormwater discharges result in significant bacteria loadings to the Hoosic River and its tributaries. These loadings are attributable to nonpoint sources of bacteria (e.g., pet waste, wildlife), potential sanitary sewer cross-connections, and damaged/failed sewer areas.
- As an example of the change in water quality conditions during a storm event, an *E. coli* concentration of 120,300 colonies/100 ml was measured at Hoxie Brook (downstream of Depot Street) during the September 17, 2004 stormwater sampling event. The highest recorded *E. coli* concentration at this location during previous dry weather in-stream assessments was 320 colonies/100 ml in August 2002 (HooRWA, 2003).
- Illicit discharges from sanitary sewer sources are present along the Hoosic River, as identified during outfall field screening undertaken for this Plan.

Historical water quality sampling data (1997-2002) and a map of sample locations are provided in **Appendix 2A**. A brief summary of the historical water quality reports is provided below:

- The DEP and its former Division of Water Pollution Control, Technical Services Branch conducted water quality surveys for the Hoosic River Basin in 1965, 1973, 1977, 1978, 1982, 1985, 1986, and 1991. The surveys showed steady progress in the improvement of water quality, particularly during the period of 1973 to 1985, which is largely attributed to the implementation of basin-wide wastewater treatment facilities. Water quality in the basin from 1986 to 1991 showed a slight decrease due to nutrient loadings and bacteria inputs, the sources of which were attributed to runoff from highly developed town centers along the river, such as Adams.

- DEP conducted a water quality assessment of the Hudson River Basin in 1997 to provide an assessment of aquatic life support, aesthetics, and to make recommendations for future water quality monitoring and assessments. The assessment included the Hoosic River Watershed that drains into the Hudson River in New York. The 1997 report outlined several recommendations for two sections of the Hoosic River in Adams and four Hoosic River sub-basins: Bassett Brook, Dry Brook, Pecks Brook, and Tophet

Brook. The majority of these sub-basins lie within Adams; however, portions lie within the towns of New Ashford, Cheshire, and Savoy. The recommendations for these river segments and sub-basins point to few point sources of pollution and focus heavily on nonpoint sources and the need for additional water quality sampling for the Hoosic River and its tributaries. The report also expresses the need for further land use evaluation.

- In 1998, the Berkshire Regional Planning Commission (BRPC) conducted an assessment of land use and nonpoint source pollution in the Hoosic River Watershed and determined the sources and types of pollutants that may be contributing to the Hoosic River due to current land activities in the watershed. This information would later be used in BRPC's "Stormwater Assessment in the Hoosic and Housatonic Watersheds" that was conducted from 1999 to 2000. The 2000 Stormwater Assessment in the Hoosic River Watershed did not include water quality sampling; however, it provided a detailed qualitative analysis of stormwater issues in the watershed so that appropriate BMPs could be chosen and implemented. The 2000 Stormwater Assessment also included an analysis of the relationship between land use/imperviousness and stormwater problems. The 2000 report concluded that there are significant water quality problems attributed to urban stormwater.

- In 2001, the Hoosic River Watershed Association (HooRWA) conducted bacteria sampling for two locations along the Hoosic River in Adams. Samples were collected on five separate days upstream of the Lime Street Bridge (monitoring location HR23.72) and upstream of the Route 8 Bridge opposite of the Old Stone Mill (monitoring location HR27.81). The sampling events consisted of four dry weather events in May, July, August, and September and one wet weather event in June. Analytical results showed that bacteria levels exceeded the DEP primary recreation threshold of 400 colonies/100 mL for both locations in June and HR27.81 in July. It is important to note that the July sample was a dry weather sample. The sampling study concluded that there is a need for more information on water quality during and immediately after storm events due to concerns about nonpoint source pollution.

- MA DEP conducted water quality monitoring in 2002 for the Hoosic River and its tributaries in Adams. Sample locations included upstream on Peck's Brook and Tophet Brook, downstream of Leonard Street on Dry Brook, and upstream of Lime Street on the Hoosic River. Water quality data has not been assessed or released; however, samples were analyzed for bacteria (fecal coliform and *E. coli*), total phosphorous, total suspended solids, ammonia nitrogen, dissolved oxygen, percent saturation, pH, conductivity, temperature, and total dissolved solids.

- HooRWA conducted a follow-up monitoring program in 2002 for the Hoosic River in accordance with the April 20, 2002 Final Quality Assurance Project Plan For Hoosic River Monitoring in 2002, DEP Project Number 2002-09/MWI. The sampling program included three sample locations in Adams for bacteria (fecal coliform and *E. coli*), total phosphorous, dissolved oxygen, total suspended solids, temperature, pH, conductivity, nitrate nitrogen, and turbidity. The study was designed to supplement and complement the 2002 DEP monitoring program for the Hoosic. The locations sampled by HooRWA in Adams were upstream and downstream on Hoxie Brook and on Peck's Brook.

  As presented in the 2003 report "Monitoring the Hoosic in 2002: Adams and North Adams," bacteria levels exceeded the 400 colonies/100 mL threshold for Peck's Brook and the downstream sample for Hoxie Brook on one occasion each for the six samples collected monthly from May through October. The August sample (490 colonies/100 mL) for Peck's Brook was considered a dry weather sample (less than 0.5 inches rainfall in last 24 hours). The May sample (600 colonies/100 mL) for the downstream location on Hoxie Brook was considered a wet weather sample.

  Almost all other monitoring rounds (wet weather and dry weather) for Hoxie Brook showed an increase in *E. coli* counts from the upstream to the downstream sites. The 2002 Monitoring Report concluded that the overall condition of the Hoosic River appears to be slightly better in 2002 than it was in 2001. The report also points out that there is an apparent degradation in water quality between the upstream and downstream sites on Hoxie Brook, illustrated by the majority of monitoring parameters.

2.4 Water Supplies

The municipal water supply in the town of Adams is the responsibility of the Adams Fire and Water District. The Fire District services over 90% of the population. The rest of the town's population receives its water supply from private wells. The Fire District provides water to lower elevations through a base system, while fourteen pumping stations, which draw from the base level system, serve higher elevations. The Adams Water District is supplied by four gravel-packed wells. The District draws an average of 1.7 million gallons per day (mgd) from this source. The District also maintains a surface supply as an emergency source.

The wells, called the Cheshire Harbor well field, are located on the east side of Route 8 in the Town of Cheshire, and are numbered one through four. Well #1 is inactive and is not expected to be used again. Well #2A, an 87 feet deep well, has an approved pumping rate of 860,000 gallons per day (gpd.) Well #3 is 101 feet deep and has a safe yield of 2.016 mgd and an approved pumping rate of 1.96 mgd. Well #4, the newest well, is approximately 81 feet deep with a safe yield of 2.3 mgd and an approved pumping rate of 2.3 mgd.

Well #4, which is presently used as the main source, is activated when the water level in the West Maple storage tank drops below the 34-foot mark. Well #4 can satisfy 100% of the town's needs. Well #3, which can supply approximately 85% of the town's needs is alternated with Well #4 on a monthly basis.

The Bassett Brook Reservoir, which the Water District decided to discontinue in 1995, is located west of Route 8 directly across from the wells. The Reservoir has a surface area of .33 acres, a total storage capacity of 2.4 million gallons per day, and a safe yield of .375 million gallons per day at an overflow elevation of 1049.42 above mean sea level. The reservoir has a tributary drainage area of approximately 2.5 square miles, which is largely forested and unpopulated. This source cannot be used without prior approval by the Department of Environmental Protection.

Treatment of the water supply consists of chemical pumps at each well. A Calciquest treatment system was installed at each well to sequester elevated levels of calcium found in the wells. The system is electrically wired to go on when the well pump is activated.

The distribution system has a total of 55 miles of cast iron pipe ranging in diameter from 4 inch to 20 inch. Pressure in the system ranges from 30 to 135 pounds per square inch (psi.) There are three pump stations and two storage tanks on the distribution system to augment pressure in the higher elevations of Town.

The three storage tanks are located on Glen Street, East Hoosac Street, and West Maple Street. The Glen St. tank has a capacity of 100,000 gallons, as does the East Hoosac St. tank. The West Maple tank, constructed in 1995, has a capacity of two million gallons.

Adams has tried, unsuccessfully, to implement wellhead protection zoning for the Cheshire Harbor well field in the Town of Cheshire.

2.5 Rare or Endangered Species, Critical Habitat and Essential Fish Habitat

Requirements for approval of the NPDES General Permit for Storm Water Discharges state that no federally listed endangered or threatened species or critical habitat be adversely affected by storm water flows, MS4's or discharge areas.

The United States Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NOAA Fisheries) share responsibility for administration of the Endangered Species Act. Before a plant or animal species can receive protection under the Endangered Species Act, it must first be placed on the Federal list of endangered and threatened wildlife and plants. An "endangered" (E) species is one that is in danger of extinction throughout all or a significant portion of its range. A "threatened" (T) species is one that is likely to become endangered in the foreseeable future. The USFWS also maintains a list of plant and animals native to the United States that are candidates or proposed candidates for possible addition to the Federal list. All of the USFWS actions, from proposals to listings to removals ("delisting"), are announced through the Federal Register.

Massachusetts – Federally Listed Threatened and Endangered Species

Animals – 20

Status	Listing
E	Beetle, American burying (*Nicrophorus americanus*)
E	Cooter (=turtle), northern redbelly (=Plymouth) (*Pseudemys rubriventris bangsi*)
T	Eagle, bald (lower 48 States) (*Haliaeetus leucocephalus*)
T	Plover, piping (except Great Lakes watershed) (*Charadrius melodus*)
E	Puma (=cougar), eastern (*Puma (=Felis) concolor couguar*)
E	Sea turtle, hawksbill (*Eretmochelys imbricata*)
E	Sea turtle, Kemp's ridley (*Lepidochelys kempii*)
E	Sea turtle, leatherback (*Dermochelys coriacea*)
T	Sea turtle, loggerhead (*Caretta caretta*)
E	Sturgeon, shortnose (*Acipenser brevirostrum*)
E	Tern, roseate (northeast U.S. nesting pop.) (*Sterna dougallii dougallii*)
T	Tiger beetle, northeastern beach (*Cicindela dorsalis dorsalis*)
T	Tiger beetle, Puritan (*Cicindela puritana*)
T	Turtle, bog (=Muhlenberg) (northern) (*Clemmys muhlenbergii*)
E	Wedgemussel, dwarf (*Alasmidonta heterodon*)
E	Whale, blue (*Balaenoptera musculus*)
E	Whale, finback (*Balaenoptera physalus*)
E	Whale, humpback (*Megaptera novaeangliae*)
E	Whale, right (*Balaena glacialis (incl. australis)*)
E	Whale, Sei (*Balaenoptera borealis*)

Massachusetts – Federally Listed Threatened and Endangered Species

Plants – 3

Status	Listing
E	Gerardia, sandplain (*Agalinis acuta*)
T	Pogonia, small whorled (*Isotria medeoloides*)
E	Bulrush, Northeastern (*Scirpus ancistrochaetus*)

Source: Listings by State and Territory as of 09/22/2005 http://ecos.fws.gov/tess_public/TESSWebpageUsaLists?state=MA

The State of Massachusetts maintains a list of rare and endangered species as well. The following list of rare and endangered species comes from the Massachusetts Natural Heritage and Endangered Species Program (NHESP). The State Rank indicates, Special Concern (SC) species are natives that have suffered a decline which could threaten the species, or have a small number, limited distribution, or specialized habitat. Threatened (T) species are likely to become endangered in the future. Endangered (E) species are in danger of extinction.

Wildlife and fisheries

As a result of Adams' dramatic natural setting, remote location, and abundance of protected land, it is home to a variety of unique aquatic and upland wildlife species, including some threatened, rare, and endangered species. Indigenous to the Adams area and particularly affected by water quality are the Longnose Sucker fish (*Catostomus catostomus*); the amphibian, Spring salamander (*Gyrinophyilus porphyriticus*); the crustacean, Appalachaian Brook Crayfish (*Cambarus bartonii*); and the Dragonfly/Damselfly, Lake Emerald (*Somatochlora cingulata*); all are considered by the NHESP to be of "special concern".

Below is a list of all fish, amphibians, birds, mammals and crustaceans that fall into the special concern category that have been identified in the Adams area:

Rare, Endangered and Threatened Species

Taxonomic Group	Scientific Name	Common Name	State Rank	Most Recent Observation
Fish	Catostomus catostomus	Longnose Sucker	SC	1991
Amphibian	Gyrinophilus porphyriticus	Spring Salamander	SC	1995
Bird	Accipiter striatus	Sharp-Shinned Hawk	SC	1945

Taxonomic Group	Scientific Name	Common Name	State Rank	Most Recent Observation
Bird	Dendroica striata	Blackpoll Warbler	SC	1997
Bird	Oporornis philadelphia	Mourning Warbler	SC	1990
Mammal	Sorex dispar	Long-Tailed Shrew	SC	2000
Crustacean	Cambarus bartonii	Appalachian Brook Crayfish	SC	1995
Dragonfly/Damselfly	Somatochlora cingulata	Lake Emerald	SC	1973
Beetle	Desmocerus palliatus	Elderberry Long-Horned Beetle	SC	1997

Source: Adams Open Space and Recreation Plan - 2003

Vegetation

The town of Adams has a varied landscape of large and small forest patches, open fields, and developed areas. The contrasting landscape is rich with a wide variety vegetation types. Below is a list of rare, endangered and threatened species that are indigenous to Adams. While many are found on State protected land there are areas where rare species and critical habitat exist along the banks of Miller Brook, Tophet Brook, Patton Brook, and Pecks Brook in a more urban setting. Special interest in identifying and protecting these species and habitats from storm water runoff should be paid to these areas.

Rare and Endangered Species of Vegetation

Scientific Name	Common Name	State Rank	Most Recent Observation
Acer nigrum	Black Maple	SC	1986
Amelanchier bartramiana	Bartram's Shadbush	T	1999
Arabis laevigata	Smooth Rock-Cress	T	1986
Blephilia hirsuta	Hairy Wood-Mint	E	1995
Carex baileyi	Bailey's Sedge	E	1995
Carex hitchcockiana	Hitchcock's Sedge	SC	1918
Carex tetanica	Fen Sedge	SC	1995

Scientific Name	Common Name	State Rank	Most Recent Observation
Conioselinum chinense	Hemlock Parsley	SC	1982
Equisetum scirpoides	Dwarf Scouring-Rush	SC	1998
Galium boreale	Northern Bedstraw	E	1995
Huperzia appalachiana	Appalachian Clubmoss	E	1909
Luzula parviflora ssp melanocarpa	Black-Fruited Woodrush	E	1999
Malaxis brachypoda	White Adder's-Mouth	T	No Date Recorded
Milium effusum	Woodland Millet	T	1997
Ribes lacustre	Bristly Black Currant	SC	1995
Rosa acicularis	Northern Prickly Rose	E	1919
Solidago macrophylla	Large-Leaved Goldenrod	T	1999
Sorbus decora	Northern Mountain-Ash	E	1997
Spiranthes romanzoffiana	Hooded Ladies'-Tresses	E	1903
Vaccinium vitis-idaea ssp minus	Mountain Cranberry	E	1999
Waldsteinia fragarioides	Barren Strawberry	SC	1922

Source: Adams Open Space and Recreation Plan - 2003

2.6 Historic Properties

Phase II and the NPDES General Permit for Stormwater Discharges requires that no adverse affects to historic sites via stormwater runoff be permitted.

Adams has numerous culturally and historically significant properties. Nationally significant are those that are listed on the National Park Service's National Register of Historic Places either as individual property listings or as Historic Districts. The National Register is the nation's official list of buildings, sites, structures, and objects important in American history, culture, architecture, or archaeology. A listing on the National Register must be associated with a historically significant event or person, must embody a distinct aspect of the built environment or must contain the likelihood of yielding information about recent history or pre-history.

National Register of Historic Places: Individual Property Listings

Numerous houses and buildings in Adams are identified as being historically significant at the national level. Table 2-7 lists the individual property listings which are mapped on Figure 2-4.

Table 2-7. National Register of Historic Places – Individual Property Listings

Listing Name	Location
Susan B. Anthony Birthplace	67 East Road
The Armory Block	39 - 45 Park Street
P.J. Barrett Block	70 – 76 Park Street
Berkshire Mill #1	1 Berkshire Square
Hoosac Street School	20 Hoosac Street
Jones Block	49 – 53 Park Street
Maple Street Cemetery (includes the cemetery as an individual property listing as well as numerous other items such as monuments, markers, gates, and walls associated with the cemetery.) (This was designated in June 2004. It is listed on the Massachusetts Cultural Resource Information System site http://mhc-macris.net/index.htm but is not listed on the National Park Service Site.)	Maple Street
Mausert Block	19 – 27 Park Street
Adams Ambulance Service (Firehouse)	47 Park Street
Phillips Woolen Mills (includes associated structures)	71 Grove Street

Table 2-7. National Register of Historic Places – Individual Property Listings	
Listing Name	**Location**
Pittsfield and North Adams Passenger Station and Baggage & Express House	10 Pleasant Street
Quaker Meetinghouse	Maple St. Cemetery
Simmons Block	86- 90 Park Street

(Source: National Park Service, http://nationalregisterofhistoricplaces.com, May 2005)

National Register of Historic Places: Historic Districts

In addition to individual property listings, there are two nationally significant historic districts in Adams.

- Summer Street National Register Historic District: This district along Crandall, Center, East, Liberty, Orchard and Summer Street is about 350 acres and contains 75 properties. This residential area contains a number of unique and architecturally distinctive private homes dating from the 1890s; the majority of these are in excellent condition.
- Mount Greylock Summit National Register Historic District: Five buildings, 10 structures and about 1,200 acres of the summit of the State Reservation make up this district. The designation is based on historic events at the site and the architecture of Bascom Lodge.
  (Source: National Park Service, http://nationalregisterofhistoricplaces.com

Locally Significant Historic Properties

The Town has recognized numerous historically and culturally significant properties in addition to nationally significant properties or areas. The following items were listed in the Town of Adams 2003 *Open Space* and Recreation Plan.

Proposed Local Historic Districts

- Park Street Historic District
- McKinley Square Historic District
- Summer Street Historic District (Commercial)
- Renfrew Historic District
- Thunderbolt Ski Trail

Locally Significant Historic Properties

- Joshua Lapham House Marker, Crandall Street
- Hale-Parker House, 100 Orchard Street
- Eleazer Browne House, 135 Orchard Street
- Edmund Jenks House, Orchard Street
- Jeremiah Bucklin House, Bucklin Road
- Burlingame House, Walling Road
- Captain Philip Mason House, East Road
- Staples Houses, East Lime and Lime Street
- Daniel MacFarlane House, 238 Columbia Street

- Town Meeting House, Old Columbia Street
- Abraham Howland Mansion, 378 Old Columbia Street
- Benjamin Lapham House, 91 Friend Street
- The Upton Houses, 140 Friend Street and the corner of Friend and Cross Streets
- Zacheus Hathaway House, 62 Notch Road
- The Isaac Killey House, 11 West Road
- Joseph Shove House, 12 West Road
- The Dean Grist Mill and Cotton Batting Factory, West Road
- Israel Cole Homestead and Underground Railroad Graves, West Road
- Bob's Hill, west of Park Street and just north of the Hoosac River

Churches

- First Baptist Church, 13 Commercial Street
- First Congregational Church, 42 Park Street
- St. Mark's Episcopal Church, Commercial and River Streets
- Notre Dame Roman Catholic Church, Columbia and Maple Streets
- St. Stanislaus Kostka Roman Catholic Church, Hoosac and Summer Streets
- St. Thomas Aquinas Roman Catholic Church, 2 Columbia Street

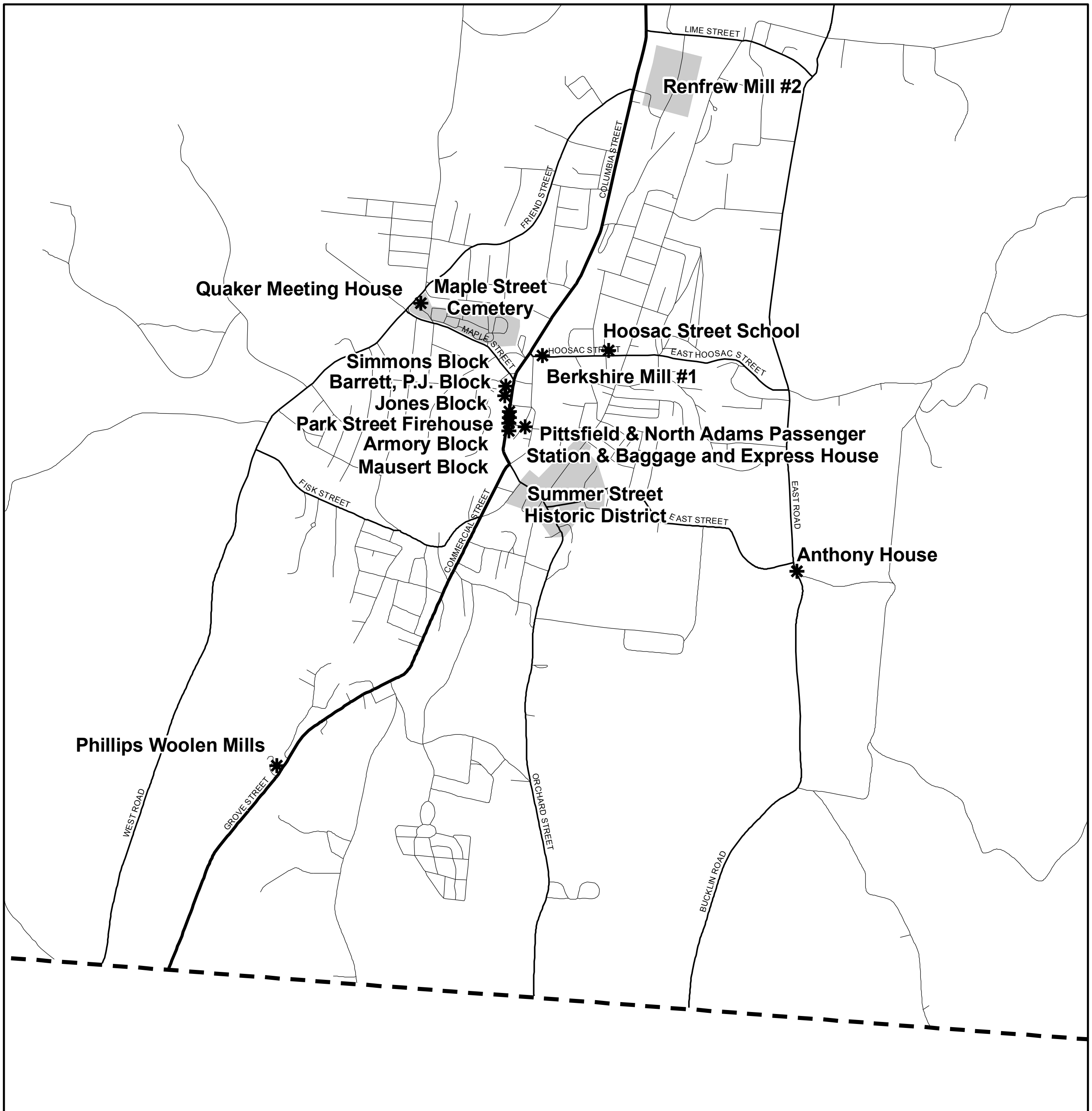
Cemeteries

- St. Stanislaus Kostka Cemetery and Grotto
- Bellevue Cemetery
- Cole Family Cemetery
- East Road Cemetery
- Daniel's Court Cemetery
- Orchard Street Burial Ground
- East Mountain Road Cemetery
- Maple Street Cemetery

Historic Resources and Stormwater Management

- Due to the large number of properties and size of the districts, an individual site assessment was not conducted for historic properties to determine if they are being affected by stormwater problems. Such an individual site assessment should be conducted.
- Most of the historic properties are located in the densely developed downtown area. The downtown area is characterized by a large impervious surfaces. It has been identified as a priority area for improved stormwater management. Historic property interests will need to be integrated into the implementation of stormwater management BMPs.

- The residents of Adams have a strong interest in historic preservation. There is an opportunity to employ "soft" BMPs to manage stormwater that appropriately fit into the historic nature of the property better than more "hard" engineered solutions.



✱ Historic Properties

Historic Properties

Data Sources: MassGIS

N
W E
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0 2,500 5,000 7,500

Feet

Figure 2-4

Historic Properties

Adams, Massachusetts

2.7 Personnel, Organizations, and Interest Groups

Town of Adams

Stormwater management and control is intricately linked to land use management and development. Being within a "Home Rule" state, a number of municipal boards and departments are involved in local land use (and correspondingly, stormwater) management and regulation. Key Town departments and boards that will be involved with the implementation and success of the Stormwater Management Plan are:

- Planning Board

  Mass. General Laws c. 41, § 81A establishes Planning Boards. Planning Boards are responsible for the development and adoption of a Master Plan and an official map of the town.

  Mass. General Laws c. 41, § 81K—81GG, the Subdivision Control Act, delegates municipal powers chiefly to the Planning Board. The board adopts subdivision rules for the town. The Planning Board is the primary review board which reviews definitive subdivision plans. Mass. GeneraL Laws c. 40A, the Zoning Act, places the Planning Board in several key roles that may affect stormwater management. The Planning Board is authorized to draft and submit zoning amendments for consideration by the town. When a zoning amendment has been put forward, the Planning Board holds the public hearing and may report its recommendations to the local legislature. An unfavorable report by the Planning Board about a proposed zoning amendment means that proposed zoning amendment cannot be re-considered for Town Meeting vote should it fail at an initial Town Meeting.

  Planning Boards' other diverse roles in zoning include:

  - serving as the special permit granting authority;
  - are always a "party in interest" in administrative appeals, special permit applications, and variance petitions within the town and in adjacent cities and towns;
  - must consent whenever a repetitive petition is considered within two years after initial rejection; and
  - the Planning Board usually serves as site plan review authority, where applicable.

- Board of Health (BOH)

  BOH are established by Mass. General Laws c. 111, § 26 and Mass. General Laws c. 41, § 1. The Board of Health has a wide range of responsibilities but two main functions in the land use /

stormwater management area. First, the BOH has a role in the review of definitive subdivision plans pursuant to Mass. General Laws c. 41, § 81U. Case law has established that the BOH is chiefly concerned in this capacity with the on-site disposal of wastewater and drainage of the site.

Second, a BOH has broad powers, pursuant to Mass. General Laws c. 111, § 31, to enact reasonable regulations for the public welfare. This authority includes the power to abate or suppress activities that constitute a nuisance and to address other aspects of the development of land likely to raise a health concern.

In many towns, BOHs are often asked to provide advisory reviews in zoning applications.

- Board of Selectmen

  The Board of Selectmen may play a role in land use regulations. The Zoning Act empowers Boards of Selectmen to serve as special permit granting authorities. The Board may serve as licensing authority for various land use activities, from sale of used cars to earth removal

- Building Inspector

  Mass. General Laws c. 143, § 3 established the municipal post of Building Inspector. The Inspector takes a front-line position in zoning matters, overseeing the construction and safety of buildings. Mass. General Laws c. 40A, § 7 designates the building inspector as zoning enforcement agent. The building inspector issues or withholds permits, reviews enforcement requests, ensures compliance with municipal regulations, and administers the State Building Code.

  The building inspector, or building commissioner, must possess certain minimum qualifications, as described by 780 CMR 107.3. Because of 1992 Mass. Acts 168, § 1, every building inspector shall be certified by the board of building regulations and standards. The Building Inspector acts in an advisory role to the Planning Board over site plan approval.

- Conservation Commission

  Mass. General Laws c. 40, § 8C established Conservation Commissions. The Conservation Commission's chief responsibility is the local administration of the Massachusetts Wetlands Protection Act, Mass. General Laws. c. 131, § 40. Many Conservation Commissions have been delegated parallel authority under municipal ordinances or bylaws to protect wetlands. Adams does not have a local wetland protection bylaw. Typically, these rules are adopted pursuant to Mass. General Laws c. 40, § 21(1) and the Home Rule Amendment.

The Conservation Commission wears other important hats. In zoning matters, it may serve as an advisory board in the review of a special permit application. The Commission is responsible for town forests.

- Department of Community Development

  The Department of Community Development is the primary planning and development department responsible for environmental and community planning, and economic development. It provides technical assistance to the Board of Health, Zoning Board of Appeals, Planning Board, Conservation Commission, Historical Commission, and the Downtown Development Committee.

- Department of Public Works

  The Department of Public Works (DPW) oversees highways; DPW equipment and maintenance; parks and grounds (including the cemetery), and wastewater treatment. The DPW maintains town streets, sewers, parks, and flood control chutes. The DPW has many opportunities to improve the quality and impact of stormwater runoff.

Organizations and Interest Groups

Water is a regional resource that affects and is affected by others in the larger area. Other organizations or agencies are available to assist the Town to carry out a comprehensive stormwater management plan.

- Berkshire Conservation District
  The Berkshire Conservation District, BCD, is one of Massachusetts' sixteen conservation districts. BCD works in partnership with a number of federal, state, and local agencies and organizations to address soil erosion, water quality protection, and other natural resource and land management concerns.
- Berkshire Regional Planning Commission
  The Berkshire Regional Planning Commission (BRPC) is a public body corporate established under Massachusetts General Laws Chapter 40B, Regional Planning Law, and is the official area-wide planning agency in Berkshire County with comprehensive responsibilities which include, land use, environmental management, economic development, and transportation. BRPC provides technical planning services, including stormwater management. BRPC provides a stormwater education program, NEMO (Nonpoint Education for Municipal Officials), that could be used by the Town.
- Hoosic River Watershed Association

  The Hoosic River Watershed Association (HooRWA) is an advocacy group, working to promote the natural resources of the

Hoosic River waterways, protect and improve water quality, and increase the recreational opportunities for local residents. Since its creation in 1986, HooRWA has consistently challenged municipalities, industries, and farm operations to employ BMP's on their properties and minimize the impacts of their activities on the river. HooRWA works closely with other organizations and the Town of Adams on proposing management options for the future use of the Hoosic River. HooRWA has an active educational and outreach component and has established volunteer monitoring programs with local schools. They have also established Stream Teams to investigate and monitor distinct sections of the Hoosic River. These teams were involved in data collection for the Adams Stormwater Management Strategic Plan. They organize public activities such as Riverfest, an annual festival designed to improve awareness of the river.

- Trout Unlimited

  Trout Unlimited (TU) is a national organization, made up of small local chapters. The main objective of TU is to promote and protect clean waterways that will support recreational fishing. TU works closely in water quality monitoring efforts with HooRWA.

State Agencies

- Executive Office of Environmental Affairs (EOEA)

  EOEA is a state executive agency whose mission is to "protect and conserve natural resources in Massachusetts". EOEA is the parent organization of Department of Environmental Protection, Massachusetts Environmental Policy Act (MEPA), Department of Conservation and Recreation (DCR), and Department of Fish and Game (DFG), among others. EOEA has an important role in setting overall state policy related to stormwater.

- Department of Environmental Protection (DEP)

  DEP is the main environmental agency in the state responsible for administering laws concerning natural resources, waste, and hazardous materials. DEP has several sets of regulations that address the impact of stormwater discharges and was instrumental in developing the *Stormwater Management Policy Handbook*. DEP is also a major funding source of conservation, pollution abatement, and mitigation programs, including holding BMP workshops for members of the regulated community. Funding programs include Section 319 Nonpoint Source Pollution Grants and 604(b) Water Quality Management & Planning Grants, under which this assessment project was funded.

- Department of Conservation and Recreation (DCR)

The Department of Conservation and Recreation (DCR) is responsible for managing 4,016.8 acres in Adams. DCR's focus is on conducting educational programs, protecting environmental quality, maintaining park facilities, and prioritizing improvement projects. DCR administers the Massachusetts Forest Cutting Practices Act that affects stormwater runoff related to land clearing.

- Department of Fish and Game

  The Department of Fish and Game (DFG) is a regulatory agency responsible for administering state fish and game laws.

- Massachusetts Highway Department (MHD)

  MHD is the leading transportation agency in the state. MHD has responsibility for construction and maintenance of state highways. Roadways that parallel waterways and the management and maintenance practices that accompany them, such as Route 8 adjacent to the Hoosic River, impact water quality. In addition, MHD is also very important in setting policies for local DPWs.

Federal Agencies

- Environmental Protection Agency (EPA)

  EPA is the regulatory agency responsible for administering federal environmental regulations. The Hoosic River Watershed is located in EPA Region I, administered from Boston. EPA introduced Phase I and Phase II stormwater programs under the Clean Water Act (CWA) to preserve, protect and improve the quality of the Nation's rivers. EPA has oversight of National Pollutant Discharge and Elimination System (NPDES) permits.

- Natural Resources Conservation Service (NRCS)

  NRCS provides technical support to farmers who request help on farming and conservation issues. The NRCS has the opportunity to play a role in mitigating nonpoint source (NPS) pollution in the Hoosic River related to agriculture. NRCS is the agency through which USDA conservation programs are channeled and funded in Berkshire County.

- United States Army Corps of Engineers (USACE)

  The USACE is responsible for the construction of the concrete flood structure in Adams. Adams is responsible for maintenance of the structures according to an Operations and Maintenance Manual. Final jurisdiction for any possible modifications to the structure rests with the USACE. Any pollution mitigation efforts that alter the physical configuration of the structure or its function must be approved by USACE.

APPENDIX 2A

Historical Water Quality Data Summary (1997-2002)
Sample Location Map

Summary of Adams Historical Water Quality Data (1997-2002)

Location ID	HR 07A				MA0100315			HR23.72					HR27.81				
Description	Hoosic River, ~50 feet upstream/ south of Lime Street Bridge				Adams WWTP Outfall, ~2000 feet downstream of Lime Street Bridge			Hoosic River, Upstream of the Lime St. Bridge					Hoosic River, Upstream of Route 8 Bridge opposite the Old Stone Mill				
Collected By:	MA DEP				MA DEP			Hoosic River Watershed Association									
Sampling Date	8-Jul-97	12-Aug-97	16-Sep-97	9/16/1997 Duplicate	Jul-97	Aug-97	Sep-97	May-01	Jun-01	Jul-01	Aug-01	Sep-01	May-01	Jun-01	Jul-01	Aug-01	Sep-01
Wet or Dry Weather Classification	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Wet	Dry	Dry	Dry	Dry	Wet	Dry	Dry	Dry
Analysis (mg/L) unless otherwise noted																	
Fecal Coliform (colonies/100 mL)	1,400	-	120	1,500	-	-	-	~175	~1000	~300	~100	~375	~100	~875	~425	~75	~25
E. coli (colonies/100 mL)	180	-	2,200	340	-	-	-	-	-	-	-	-	-	-	-	-	-
Alkalinity	88	120	123	127	180	-	187	-	-	-	-	-	-	-	-	-	-
Hardness	<0.7	127	134	140	201	-	227	-	-	-	-	-	-	-	-	-	-
pH (standard units)	8.3	8.7	8.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Temperature (^{o}C)	20.5	19.9	16.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Oxygen	9.8	10.8	11.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Oxygen %	107	116	115	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Conductivity (us/cm)	233	303	313	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloride	15	19	22	22	52	-	61	-	-	-	-	-	-	-	-	-	-
Suspended Solids	11	2.8	<2.5	<2.5	-	<2.5	-	-	-	-	-	-	-	-	-	-	-
Total Dissolved Solids (g/L)	0.1	0.2	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Turbidity (NTU)	-	0.7	0.8	0.8	2.2	-	5.1	-	-	-	-	-	-	-	-	-	-
Total Kjeldahl Nitrogen	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ammonia	<0.02	<0.02	<0.02	<0.02	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate	0.19	0.41	0.45	0.44	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Phosphorous	0.02	0.016	0.01	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-

Location ID	PK00.21												
Description	On Peck's Brook upstream of the Ashuwillicook Trail bridge												
Collected By:	Hoosic River Watershed Association												
Sampling Date	6-May-02	14-May-02	10-Jun-02	18-Jun-02	15-Jul-02	23-Jul-02	12-Aug-02	20-Aug-02	30-Aug-02	16-Sep-02	24-Sep-02	7-Oct-02	15-Oct-02
Wet or Dry Weather Classification	Dry	Wet	Dry	Dry	Dry	Dry	Dry	Dry	Wet	Wet	Dry	Dry	Dry
Analysis (mg/L) unless otherwise noted													
Fecal Coliform (colonies/100 mL)	-	30	-	30	-	220	-	500	-	-	340	-	110
E. coli (colonies/100 mL)	-	20	-	20	-	280	-	490	-	-	330	-	70
Alkalinity	-	-	-	-	-	-	-	-	-	-	-	-	-
Hardness	-	-	-	-	-	-	-	-	-	-	-	-	-
pH (standard units)	8.24	-	8.23	-	7.88	-	7.52	-	8.1	7.85	-	7.78	-
Temperature (^{o}C)	8.5	-	12.1	-	15.4	-	15.9	-	14.1	16.3	-	11.6	-
Dissolved Oxygen	12.3	-	10.6	-	9.51	-	9.28	-	10.4	9.48	-	10.26	-
Dissolved Oxygen %	105	-	98.5	-	95.1	-	93.7	-	93.3	96.7	-	94.6	-
Conductivity (us/cm)	140	-	210	-	180	-	250	-	230	160	-	220	-
Chloride	-	-	-	-	-	-	-	-	-	-	-	-	-
Suspended Solids	-	9	-	mdl	-	mdl		mdl		-	2	-	3
Total Dissolved Solids (g/L)	-	-	-	-	-	-	-	-	-	-	-	-	-
Turbidity (NTU)	0.7	-	0.29	-	0.16	-	0.04	-	0.28	7	-	mdl	-
Total Kjeldahl Nitrogen	-	-	-	-	-	-	-	-	-	-	-	-	-
Ammonia	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate	0.24	-	0.17	-	0.24	-	0.36		0.32	0.33	-	0.2	-
Total Phosphorous	-	0.02	-	0.01	-	0.04	-	0.02	-	-	0.01	-	mdl

Location ID	HX00.33												
Description	On Hoxie Brook downstream of the pipe that carries the brook beneath Adams												
Collected By:	Hoosic River Watershed Association												
Sampling Date	6-May-02	14-May-02	10-Jun-02	18-Jun-02	15-Jul-02	23-Jul-02	12-Aug-02	20-Aug-02	30-Aug-02	16-Sep-02	24-Sep-02	7-Oct-02	15-Oct-02
Wet or Dry Weather Classification	Dry	Wet	Dry	Dry	Dry	Dry	Dry	Dry	Wet	Wet	Dry	Dry	Dry
Analysis (mg/L) unless otherwise noted													
Fecal Coliform (colonies/100 mL)	-	480	-	70	-	70	-	350	-	-	280	-	80
E. coli (colonies/100 mL)	-	600	-	80	-	60	-	320	-	-	280	-	80
Alkalinity	-	-	-	-	-	-	-	-	-	-	-	-	-
Hardness	-	-	-	-	-	-	-	-	-	-	-	-	-
pH (standard units)	8.31	-	8.2	-	8.02	-	7.72	-	8.16	7.94	-	8.05	-
Temperature (^{o}C)	10	-	12.5	-	16	-	17	-	14.6	17	-	12.2	-
Dissolved Oxygen	11.19	-	10.21	-	9.18	-	8.86	-	9.37	9.21	-	10.05	-
Dissolved Oxygen %	99.4	-	95.6	-	92.7	-	91.6	-	92.3	95.3	-	93.7	-
Conductivity (us/cm)	160	-	220	-	180	-	280	-	260	180	-	290	-
Chloride	-	-	-	-	-	-	-	-	-	-	-	-	-
Suspended Solids	-	8	-	1	-	mdl		2		-	mdl	-	mdl
Total Dissolved Solids (g/L)	-	-	-	-	-	-	-	-	-	-	-	-	-
Turbidity (NTU)	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Kjeldahl Nitrogen	-	-	-	-	-	-	-	-	-	-	-	-	-
Ammonia	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate	0.29	-	0.25	-	0.38	-	0.51		0.46	0.3	-	0.38	-
Total Phosphorous	-	0.02	-	0.02	-	mdl	-	0.01	-	-	0.01	-	mdl

Location ID	HX00.91												
Description	On Hoxie Brook off West St. and upstream of the pipe												
Collected By:	Hoosic River Watershed Association												
Sampling Date	6-May-02	14-May-02	10-Jun-02	18-Jun-02	15-Jul-02	23-Jul-02	12-Aug-02	20-Aug-02	30-Aug-02	16-Sep-02	24-Sep-02	7-Oct-02	15-Oct-02
Wet or Dry Weather Classification	Dry	Wet	Dry	Dry	Dry	Dry	Dry	Dry	Wet	Wet	Dry	Dry	Dry
Analysis (mg/L) unless otherwise noted													
Fecal Coliform (colonies/100 mL)	-	20	-	40	-	150	-	90	-	-	20	-	70
E. coli (colonies/100 mL)	-	40	-	20	-	130	-	100	-	-	30	-	60
Alkalinity	-	-	-	-	-	-	-	-	-	-	-	-	-
Hardness	-	-	-	-	-	-	-	-	-	-	-	-	-
pH (standard units)	8.3	-	8.14	-	7.89	-	7.27	-	8.09	7.86	-	7.51	-
Temperature (^{o}C)	9.6	-	12.6	-	16.1	-	16.2	-	14.6	16.8	-	12.2	-
Dissolved Oxygen	11.7	-	10.63	-	9.65	-	9	-	9.57	9.46	-	9.72	-
Dissolved Oxygen %	102.3	-	99.7	-	98.3	-	91.2	-	94.3	97.6	-	90.4	-
Conductivity (us/cm)	160	-	220	-	190	-	250	-	250	180	-	270	-
Chloride	-	-	-	-	-	-	-	-	-	-	-	-	-
Suspended Solids	-	mdl	-	mdl	-	mdl		7		-	mdl	-	1
Total Dissolved Solids (g/L)	-	-	-	-	-	-	-	-	-	-	-	-	-
Turbidity (NTU)	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Kjeldahl Nitrogen	-	-	-	-	-	-	-	-	-	-	-	-	-
Ammonia	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate	0.22	-	0.26	-	0.36	-	0.49	-	0.42	0.28	-	0.37	-
Total Phosphorous	-	0.02	-	0.02	-	0.01	-	0.01	-	-	0.01	-	mdl

Notes:

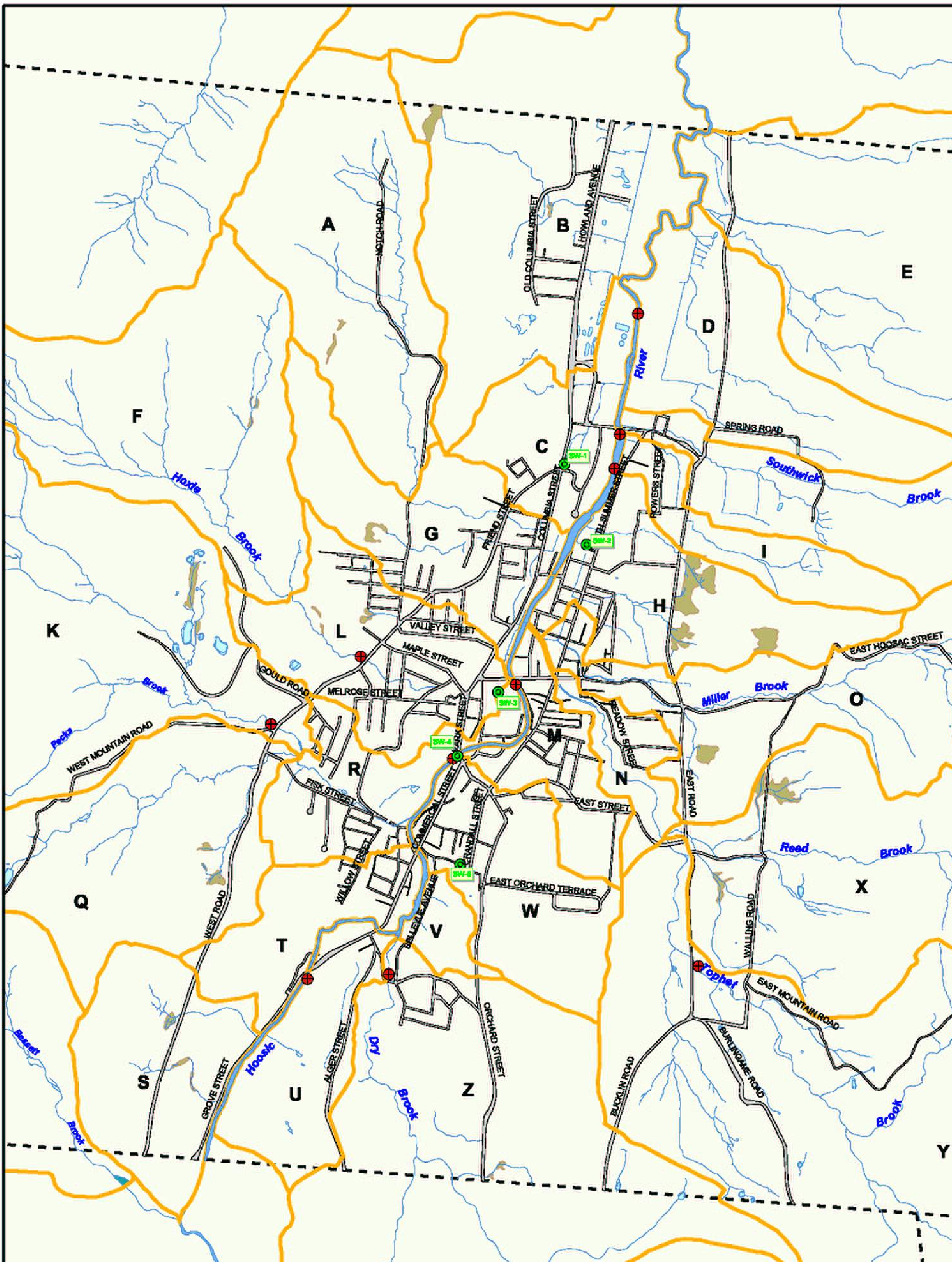
MDL - concentration is below the Minimum Detectable Level

Data Sources:

Commonwealth of Massachusetts. 1997. Hudson River Basin 1997 Assessment Report. Executive Office of Environmental Affairs, Massachusetts Department of Environmental Protection, Bureau of Resource Protection, Division of Watershed Management.

Hoosic River Watershed Association. November 28, 2001. Monitoring the Hoosic: North Branch and Main Stem in 2001.

Hoosic River Watershed Association. February 3, 2003. Monitoring the Hoosic in 2002: Adams and North Adams.



LEGEND

- Stormwater Sample Locations
- Historical Monitoring Locations
- Drainage Subwatersheds
- Town Boundary

Hydrography

- Reservoir
- Wetland
- River
- Lake, Pond
- Stream, Brook

2000 0 2000 4000 Feet

SCALE: 1:24000

N W E S

Historical Water Quality Sample Locations

Adams, Massachusetts

Comprehensive Environmental Inc.

Data Sources: MassGIS, Berkshire Regional Planning Commission (BRPC), CEI

3.0 Characteristics of Stormwater Collection System

Natural and man-made flow conveyance systems can have significant impact on water quality. Topography, soil types and vegetation all play a role in the volume and rate of runoff that reaches a water body. Development also plays a large role in flow characteristics, since more runoff is generated and conveyed through man-made structures directly into surface waters. This section discusses the characteristics of the natural and man-made flow conveyance systems in Adams, how they impact water quality, and the general condition of existing infrastructure.

3.1 Natural Flow Conditions

The Town of Adams is situated between Mount Greylock to the west and the Hoosac range to the east. Till and bedrock dominate soils in the area. The Hoosic River is located in a valley traversing the length of the Town, which is fed through a network of streams that originate in the steep slopes characterizing the Town's east and west sides. There are seven major tributary streams that flow into the Hoosic River in Adams.[1] These are listed below:

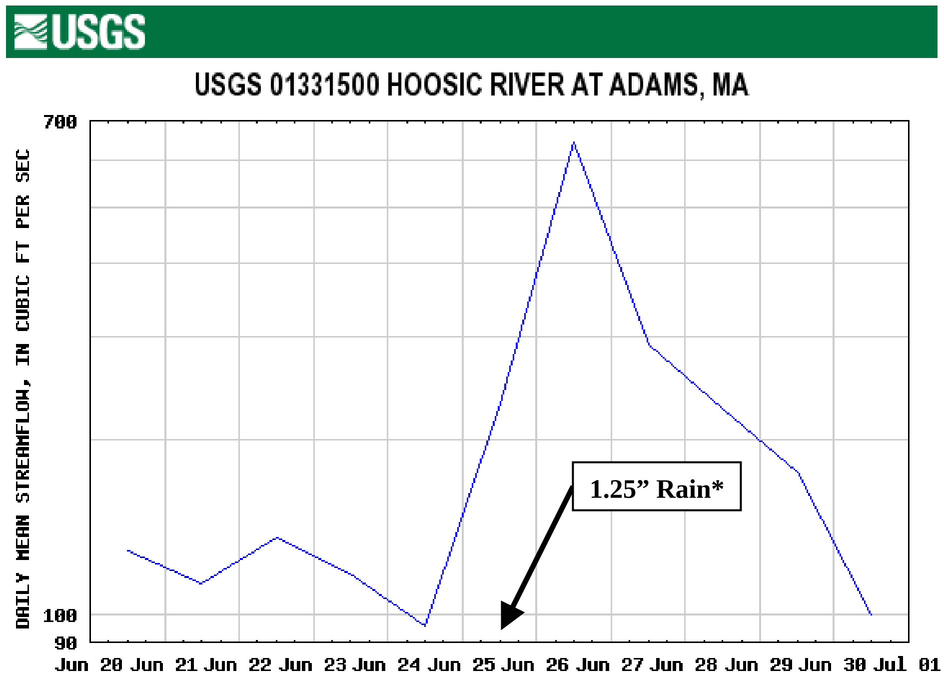
Dry Brook	*Tophet Brook*	*Reed Brook*
Miller Brook	*Pecks Brook*	*Hoxie Brook*
Southwick Brook		

Together, these tributaries and the Hoosic River comprise roughly 100 miles of streams and rivers (source: MA GIS). As shown on **Figure 3-1**, these stream networks have large drainage areas or subwatersheds that drain from the steep hillsides of the Hoosac Range and Mount Greylock into the valley and the Hoosic River. An overview of the stream networks in Adams is provided in **Figure 3-2**.

The upper reaches of drainage areas within Adams are mostly forested with commingled agricultural areas and grassy meadows from historical agricultural practices.[2] There are few significant wetland impoundments (approximately 0.3% of the land area in town or 54 acres, source: MA GIS) and lowland floodplains are limited. The steep slopes, hard soils, and limited natural floodplain storage result in quick, flashy flows to the

[1]Bassett Brook is located in Adams and flows into the Hoosic River in Cheshire.
[2]Agriculture was a dominant feature of the Adams landscape and economy in the early 1900s (approximately 40 farms) and continued to support the major expansion of industry in Town until the late 1950s when supermarkets became the cornerstone for food supply. Farm lands were settled with single-family houses and some land eventually became forested land, changing the Adams landscape. Source: In This Valley, A Concise History of Adams, Massachusetts. Eugene F. Michalenko. September 2000, rev. July 2002.

Hoosic River. This "quick draining" effect is quite unique to Adams due to its hydrographic setting and causes large flow fluctuations in the Hoosic River. As shown below, in June 2000 the flow of the Hoosic River in Adams changes drastically during a rain event, when compared to normal base flow.



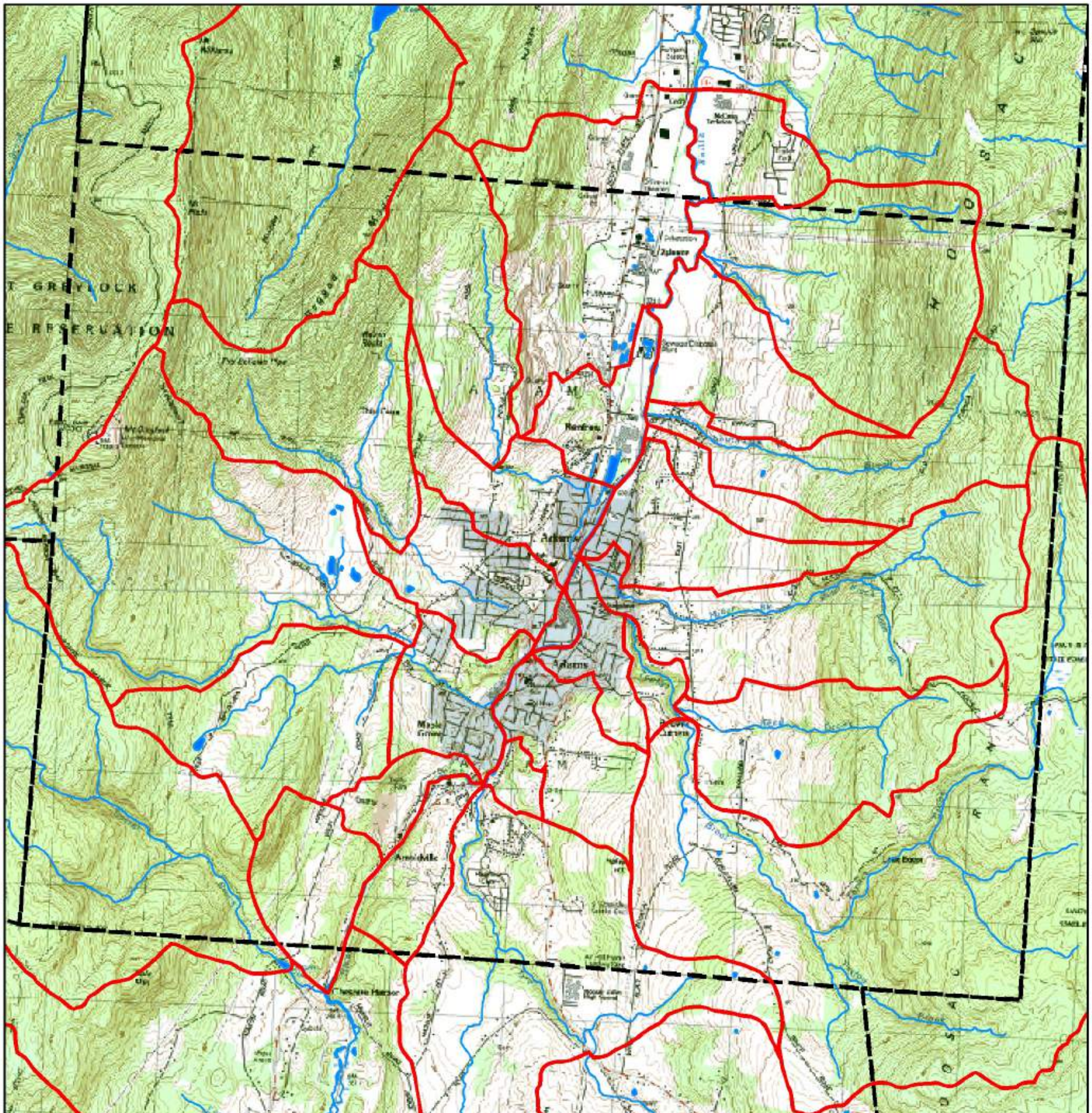
**Data source: weatherunderground.com, daily history, North Adams weather station, June 25, 2000.*

3.2 Man-made Stormwater Infrastructure Conditions

Development in Adams focused along the Hoosic River Valley, leaving the upper reaches of the river's drainage area in relatively virgin conditions. Stormwater infrastructure, consisting of flood control chutes and engineered conveyance systems to quickly divert flows from developed areas to streams and the river, was built to manage stormwater flows and alleviate flooding conditions. Perhaps the most dominant stormwater feature in the urban landscape of Adams is the Hoosic River's flood control chutes.

Flood Control Chutes

Originally built in the early 1950s by the U.S. Army Corps of Engineers, the flood control chutes were designed to protect property and lives due to the devastating floods of 1901, 1927, 1936, 1938 and 1948. The Army Corps project confined the Hoosic River in a concrete channel for 2.2 miles of its 5.7 mile stretch through Adams. The lower portion of Tophet Brook is similarly confined.



Drainage Subwatershed
Stream, Brook
Lake, Pond
Town Boundary

Data Sources: MassGIS, USGS

0 2,500 5,000 7,500
Feet

N
W E
S

Figure 3-1

USGS Quadrangle with Subwatershed Boundaries

Adams, Massachusetts

Comprehensive Environmental Inc.

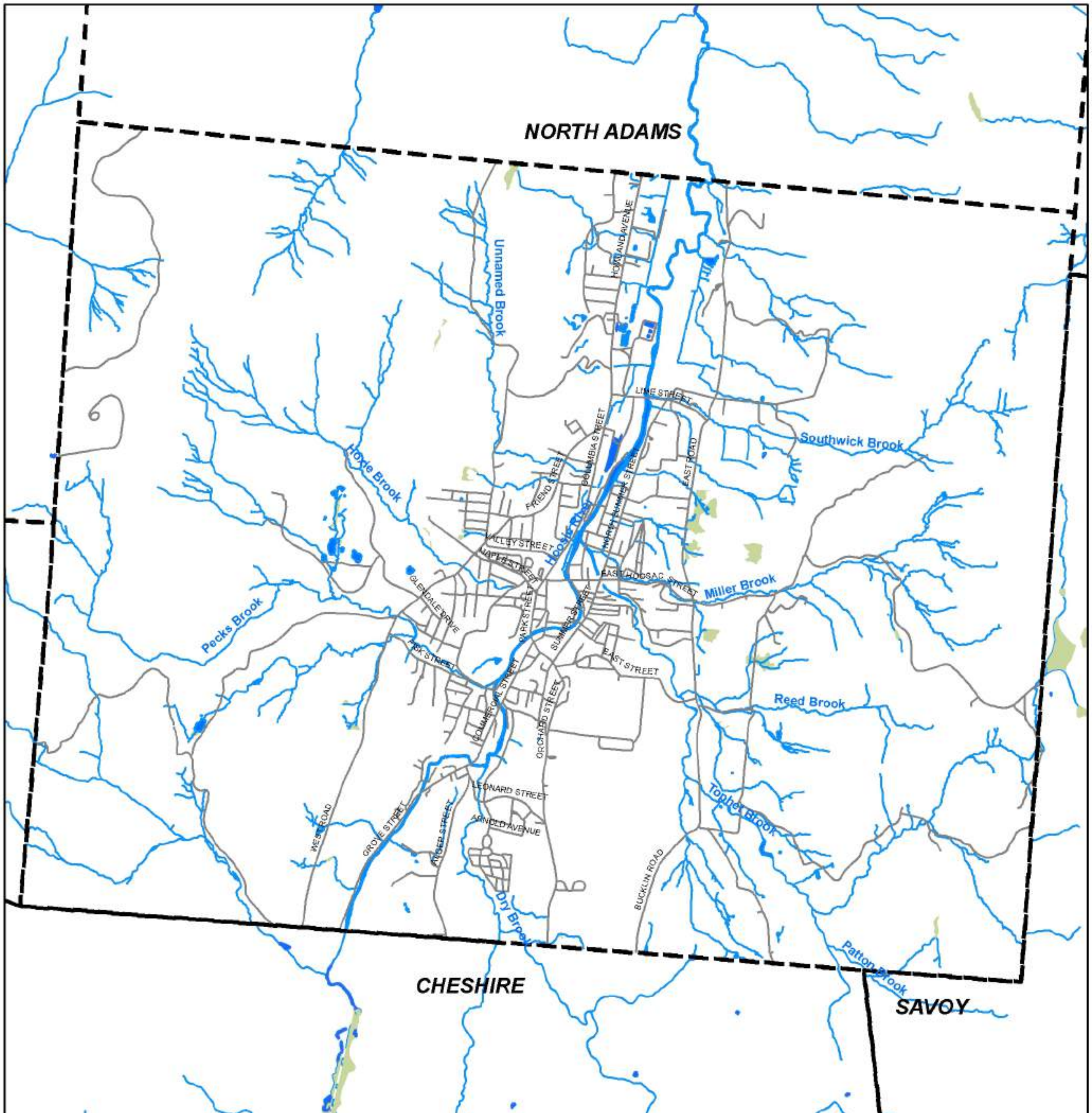


Figure 3-2

Hydrographic Characteristics

Adams, Massachusetts

- Stream, Brook
- Lake, Pond
- Wetland

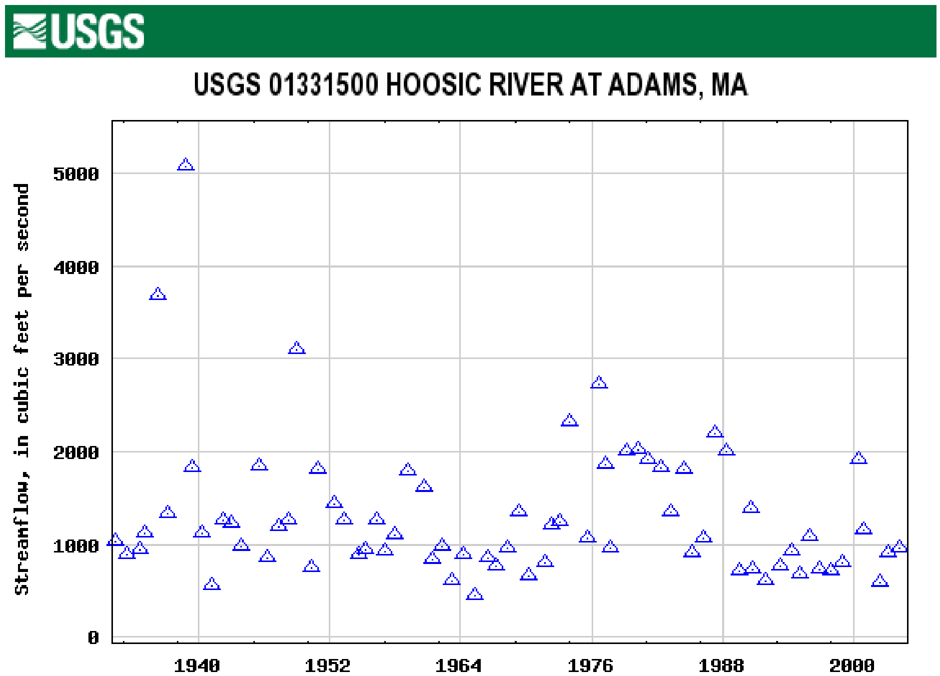
Data Sources: MassGIS, USGS

0 2,500 5,000 7,500 Feet

N W E S

Comprehensive Environmental Inc.

The Hoosic River flood control chutes are designed to provide protection against a flood discharge about 50% greater than the maximum flood of record (5,500 cfs), which occurred in September 1938 (1959 Operation & Maintenance Manual, U.S. Army Corps of Engineers, New York). Since construction of the flood control chutes, Adams has not experienced a major flood event comparable to the Town's history. The annual peak flows for the Hoosic River in Adams are illustrated below.



The flood control chutes comprise the most significant infrastructure, with more than 175 major drainage-related structures that consist of stormwater outfalls, dikes, levees, stilling basins, weirs, diversion channels, and sluice gates. A schematic layout of the flood control chutes is provided as **Figure 3-3** illustrating these structures and the extensive infrastructure in Adams.

Prior to the construction of the Hoosic River flood control chutes, the Hoosic River was heavily used by local industry, resulting in numerous diversions and detention ponds for process and cooling waters. **Figures 3-4** and **3-5** illustrate how the Hoosic River has changed since 1876 in contrast to today's conditions. These historic maps illustrate the overall infrastructure development in Adams associated with the Hoosic River and surrounding storm drain systems over the last century.

Stormwater Collection System

The majority of rainfall and runoff from urban areas in Adams is handled using standard stormwater collection systems such as catch basins, drainage manholes, and concrete pipes. In most cases, these pipes discharge directly to waterways and the Hoosic River. Stormwater is also conveyed by drainage swales and ditches along roads, some of which have been paved or lined with concrete due to high stormwater velocities and steep drainage areas. An example of a swale that is partially lined with concrete is provided below.

This site is a drainage swale along Glenn Street that is partially lined with concrete before it enters a 32" pipe that eventually discharges to the Hoosic River.

Some basic characteristics[3] of the Town's stormwater collection system are:

- 284 storm drain outfalls
- 1,596 catch basins
- 331 drainage manholes
- 161,885 linear feet (~30.7 miles) of drain pipe

A Town-wide Drainage System Map showing these characteristics is provided in **Appendix 3A**. The condition of some drainage structures were inspected as part of this Plan's initial investigations of potential illicit discharges and evaluation of BMP sites. The analysis was not a comprehensive drainage system inspection, rather a field screening effort to assess the overall condition of the drainage system, identify significant problem areas, and evaluate how these conditions affect water quality. The results of field efforts are outlined below, many of which are discussed further in subsequent sections of this report:

- Stormwater pollutants from roadways, parking lots, and buildings in the downtown area discharge to these drainage systems and enter the Hoosic River and its tributaries with little treatment.

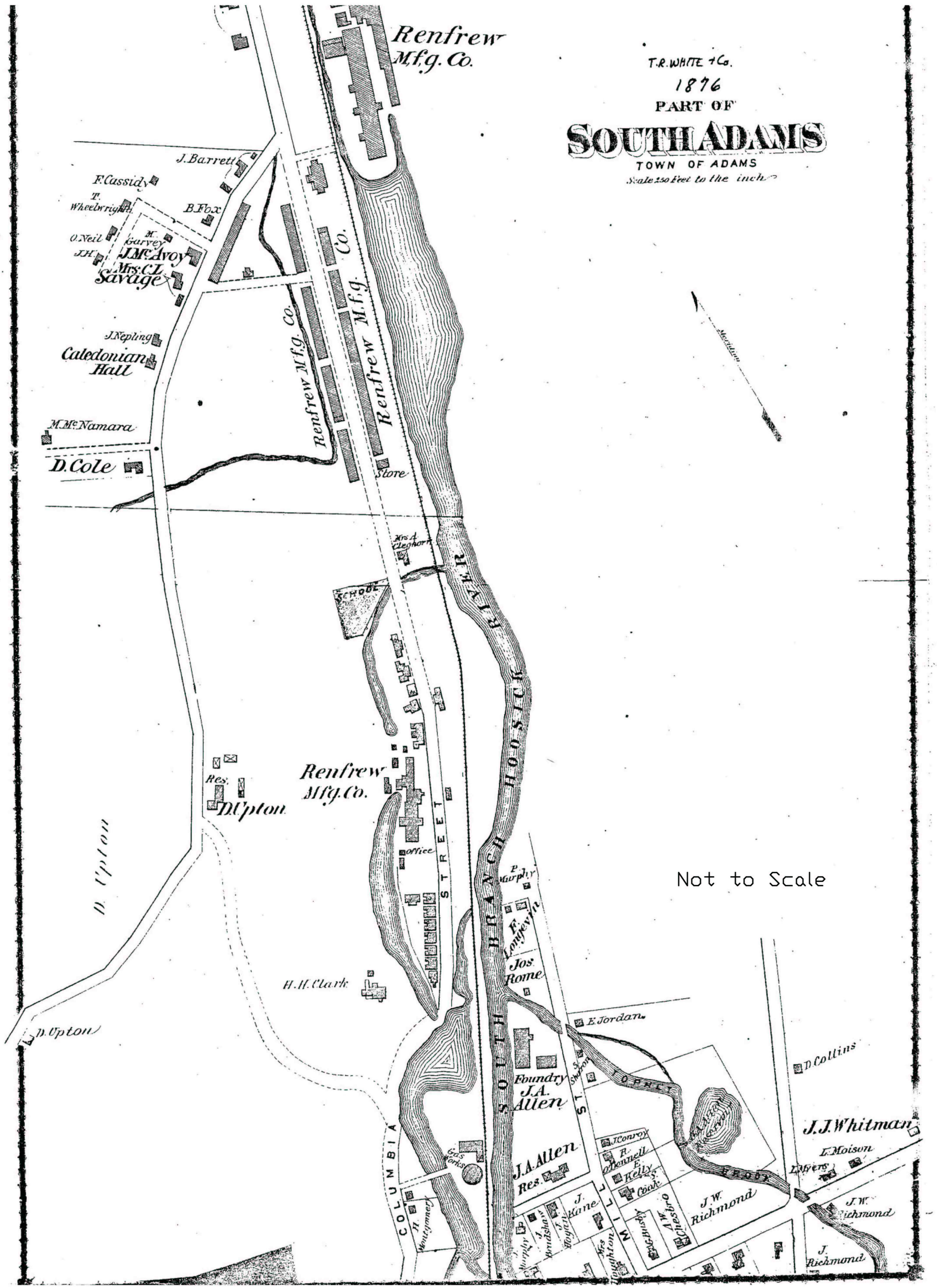
- Catch basins in Town have sumps to collect solids (sediment, sand, debris) that settle out of the stormwater flow. However, many of these sumps are relatively shallow and only allow minimal settling of solids before the structure becomes full and

[3] Drainage characteristics are based on the Adams drainage system GIS data, generated by Cartographic Associates, Inc. (2003).

FIGURE 3-3. ADAMS FLOOD CONTROL CHUTES SCHEMATIC DIAGRAM

Source: Adams Flood Protection Works Operation & Maintenance Manual, 1959.

COMPREHENSIVE ENVIRONMENTAL INCORPORATED
64 DILLA STREET
MILFORD, MA 01757



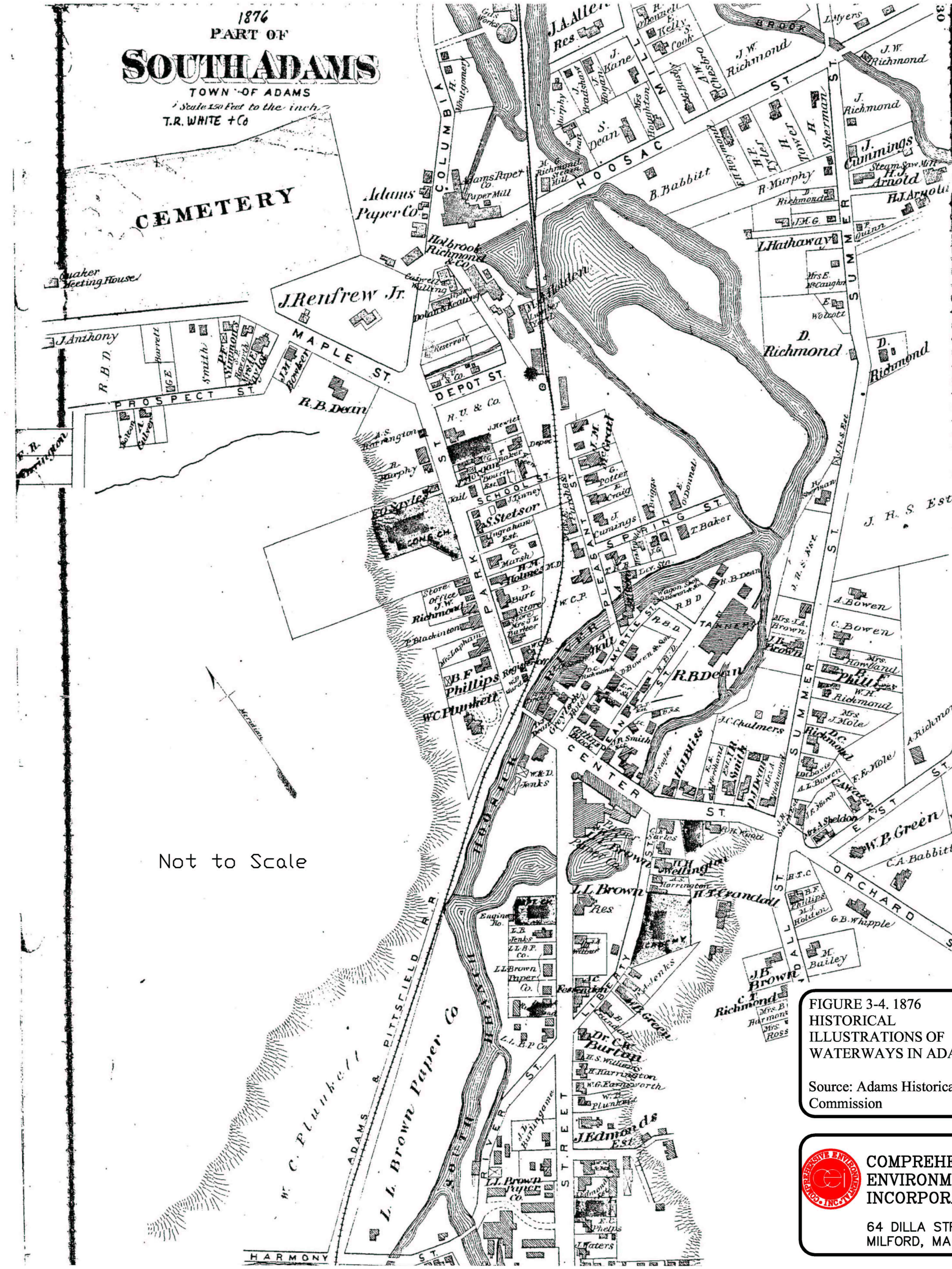


FIGURE 3-4. 1876 HISTORICAL ILLUSTRATIONS OF WATERWAYS IN ADAMS

Source: Adams Historical Commission

COMPREHENSIVE ENVIRONMENTAL INCORPORATED
64 DILLA STREET
MILFORD, MA 01757

FIGURE 3-5. 1894 HISTORICAL VIEW OF WATERWAYS IN ADAMS

Source: Adams Historical Commission

COMPREHENSIVE ENVIRONMENTAL INCORPORATED
64 DILLA STREET
MILFORD, MA 01757

COMPREHENSIVE
ENVIRONMENTAL
INCORPORATED

64 DILLA STREET
MILFORD, MA 01757

FIGURE 3-6. AERIAL VIEW OF DOWNTOWN ADAMS ALONG THE HOOSIC RIVER

Image Source: Pictometry® International Corp., 11/14/02.

sediments are re-suspended or washed downstream into waterways.

- Additionally, due to the steep slopes and the large contributing drainage areas, stormwater quickly flows through the drainage system and sediments are re-suspended from the last storm and transported downstream. Examples of sediment transport through the drainage system are shown below shortly after a thunderstorm and during normal flow conditions.

Turbid water in Hoxie Brook shortly after a thunderstorm in the downtown area. To the right is the same location during normal "non-storm" conditions.

The effects of upstream erosion and sediment transport observed at a stormwater discharge to the Hoosic River at Spring Street.

- Stormwater infiltration systems are minimal and consist primarily of leaching brick/concrete block manholes or open bottom catch basins.

- The exact age of most stormwater structures is not well known. The majority of drainage structures along the Hoosic River are approximately 50 years old since they were built at the time of flood chute construction. Drainage structures upstream of the Hoosic River are likely much older (75-100 years old) and may be as old as the streets where they are located. However, drainage systems have changed over the years and there are no records that succinctly and accurately show these changes. Historically, sewer and drainage pipes were most likely one of the same that discharged directly to waterways, but there systems were disconnected and upgraded in the early 1900s up until the construction of the flood control chutes.

- The storm drainage system in Adams appears to be in relatively good physical condition based on field screening at stormwater inlets and outlets. Some storm drain structures, such as brick manholes, deteriorate over time and are repaired or replaced as needed. Pre-cast structures are used for new construction projects.

- The U.S. Army Corps of Engineers indicated that the flood control chutes and drainage system along the Hoosic River are in good condition and are functioning as designed. The Army Corps inspects the flood control chutes on an annual basis and submits an inspection report to the Town of Adams. The most common inspection issues are the growth of woody vegetation and the buildup of sediment that may damage concrete structures and restrict flows, thus decreasing the chute's flood capacity. The Adams DPW is responsible for following up on these recommendations and maintaining the flood control chutes, which also includes some land adjacent to the river and grassy levees.

- The results of outfall inspections conducted during the November 18, 2004 illicit discharge investigations indicated that most outfalls appear to be in good condition; however, some cracked, corroded and damaged pipes were observed. These conditions do not pose a threat to water quality but some structures require repair, such as outfall HO-P2, where the box culvert appears to be partially collapsed or the drainage system was previously abandoned at this location. This outfall is a 48" discharge to the Hoosic River from the west, immediately upstream of Park Street. Additional information is provided in Section 4.5 with field inspection sheets and maps in Appendix 4D.

- Many stormwater outfalls do not have outlet protection to prevent scouring and erosion downstream. In many cases, the discharge point for outfalls is a stream bed, bank, or a concrete chute and these direct stormwater discharges result in flashy stream flows. An example of significant bank erosion due to a combination of flashy stream flows and stormwater discharges is located on Hoxie Brook at the Gilead Street crossing. Bank erosion is occurring at this location and the culvert structure (stone arch and concrete wing wall) is damaged. Additional areas of concern are discussed in the Perennial Stream Assessment (Section 4.1), Hot Spot Analysis (Section 4.3) and Warm Spot evaluation (Stormwater QAPP, Technical Appendix).

- The most common condition observed at stormwater structures throughout Town is accumulated sediment and/or debris (see also Section 6.2 for storm drain maintenance). In some cases there are no structures to trap and collect any sediment before it is discharged from streets to waterways. For example, some catch basins in the downtown area along Park Street and Maple Street are located directly on top of the culvert that carries Hoxie Brook underground.

- The 1987 Infiltration/Inflow (I/I) Study of the sanitary sewer system identified numerous sources of infiltration and inflow due to direct catch basins connected to the sanitary sewer system, cracked and damaged pipes, damaged and leaking manholes, groundwater surcharging, potential inflow from streams, etc. A significant portion of the sanitary sewer system in Adams is constructed with vitrified clay pipe with some sections as much as 100 years old. A Sanitary Sewer System Map is provided in Appendix 3A. The Adams DPW indicates that many of the inflow sources were removed; however, not all of the I/I findings were addressed. Based on recent illicit discharge investigations and the results of the stormwater sampling program, it appears that direct and indirect cross connections between the drainage system and sanitary sewer system are present and are significantly impacting water quality. Surcharging of the sanitary sewer system and backflow may be entering the drainage system and waterways in Adams. This information is discussed further in Sections 4.4 and 4.5 with recommendations and additional information from the 1987 I/I Study provided in Appendix 4C.

- The stormwater collection system in Adams is designed to convey large stormwater flows with little consideration for water quality. Past practice for stormwater management was putting it in a pipe and sending it downstream and, if needed, making the pipe bigger to handle more stormwater from more developed areas. Average annual rainfall in Adams is about 38.26 inches (last 30 years) and results in an estimated 790 million gallons of runoff from urban areas in Adams (see runoff calculations – QAPP, Technical Appendix). **Figure 3-6** illustrates the large impervious surfaces in the downtown area that generate runoff with discharge to the Hoosic River. These large impervious surfaces also result in significant temperature increases for runoff that can affect local waterways and fish habitat.

3.3 Recommendations

A summary of key recommendations is provided below based on existing information for the drainage system and field observations. This information is also incorporated into the Recommendations and Implementation Plan in Section 8.0.

- Inspect stormwater outfalls for structural conditions and illicit discharges in accordance with the proposed Adams Illicit Discharge Detection and Elimination (IDDE) Plan (see also Technical Appendix) to develop a comprehensive database of outfall conditions to address maintenance needs. This should include more detailed reviews of the upgradient drainage network in areas that appear to be deteriorated or damaged due to age or excessive stormwater flows.

- Incorporate BMPs into the repair and upgrade of drainage systems (see also Section 4.6.3 for BMPs with redevelopment). Deep sump catch basins or leaching structures should be used if a drainage manhole has to be repaired or replaced. Vegetated swales or rip rap swales are preferred to the use of a concrete swale or pipe to convey runoff. BMPs for urban runoff should be incorporated into Town redevelopment projects and developers should be encouraged to incorporate BMPs into new projects.

- Evaluate the feasibility for maintenance dredging of flood control chute structures to maintain flow capacity and provide additional storage for future stormwater treatment and sediment removal. The U.S. Army Corps of Engineers inspects the condition of the flood control chutes annually and reports that vegetative and sediment maintenance are needed. The following areas require further evaluation for maintenance dredging/sediment removal and project coordination with the U.S. Army Corps (refer to **Figure 3-3** for locations):

    - Drop structure and stilling basin west of the Miller Street Bridge on Tophet Brook, just before its confluence with the Hoosic River, where a large sand/gravel bar has formed.
    - Pumping station and storage basin adjacent to Hoosac Street and to the west of the Hoosic River that is laden with sediment. The pumping station and basin were originally designed to provide water storage for fire protection at the nearby mills and are no longer in service.

A conceptual stormwater BMP was designed to include this area (refer to Section 4.6.2, *Hoxie Brook Downtown – Stream Restoration & Urban Runoff BMPs*).

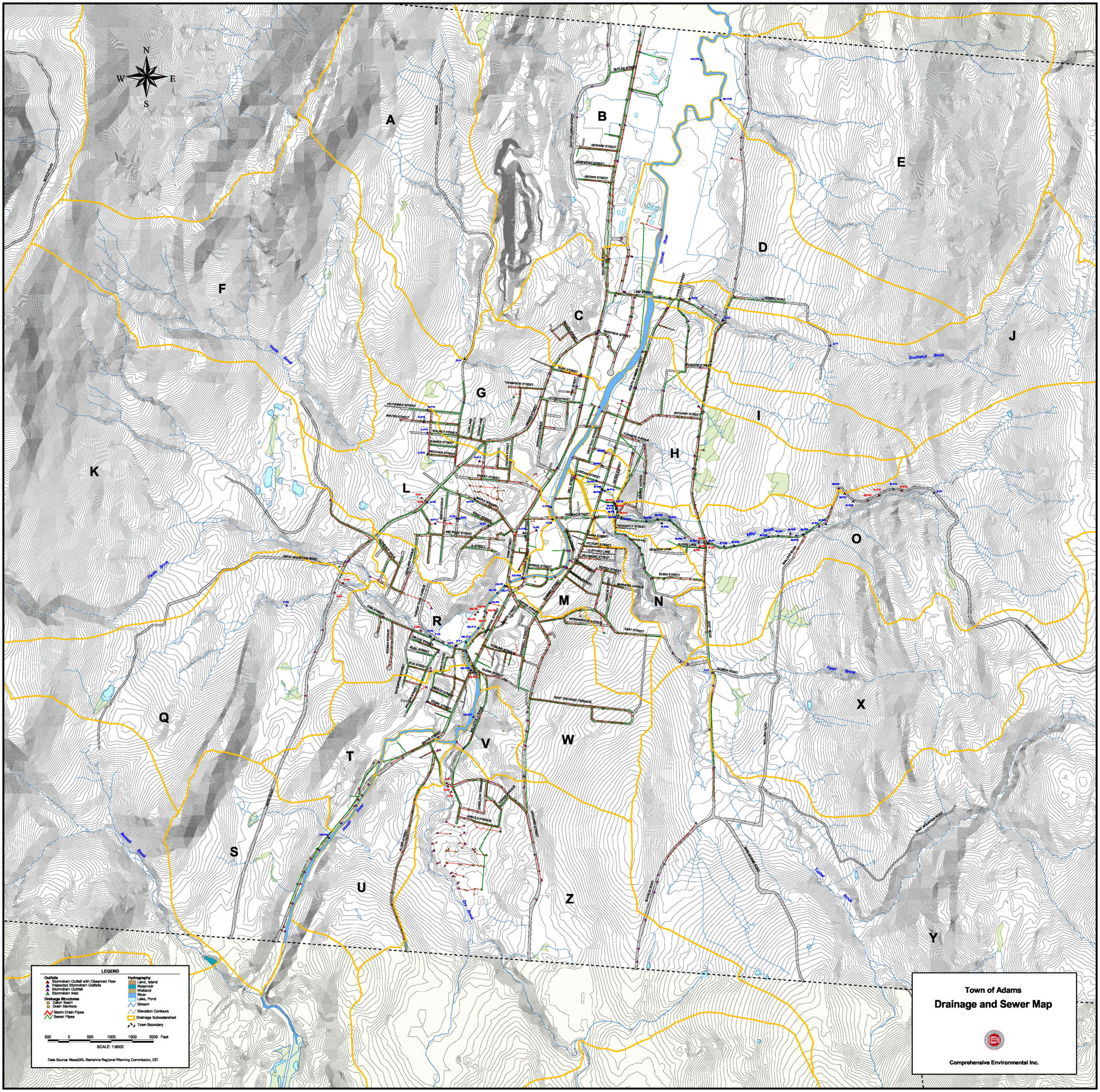
  - Other structures worth noting: weir upstream of Commercial Street; stilling basin on Hoosic River upstream of Tophet Brook; and stilling basin on Hoosic River west of North Summer Street, downstream of Crotteau Street and Adams DPW Yard.

- The 1959 Operation and Maintenance (O&M) Manual for the Hoosic River flood control chutes is designed to maintain the integrity of the flood control chutes and history demonstrates its effectiveness; however, there is little consideration for water quality. The O&M Manual should be evaluated in relation to water quality and current maintenance practices/requirements to determine if any modifications are warranted or possible. This will require coordination with the U.S. Army Corps of Engineers to adequately address topics such as maintenance dredging and future improvements, if any. As an example, the manual currently calls for cutting woody vegetation along the flood control chutes and levees. Modifications to allow woody vegetation along designated portions of the flood control chutes would provide some shade, resulting in lower water temperatures for aquatic life.

APPENDIX 3A

Town-Wide Drainage System Map

Sanitary Sewer System Map



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LEGEND
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Stormdrain Outfall with Observed Flow
Inspected Stormdrain Outfalls
Stormdrain Outfall
Stormdrain Inlet
Drainage Structures
Catch Basin
Drain Manhole
Storm Drain Pipes
Sewer Pipes
Hydrography
Land, Island
Reservoir
Wetland
River
Lake, Pond
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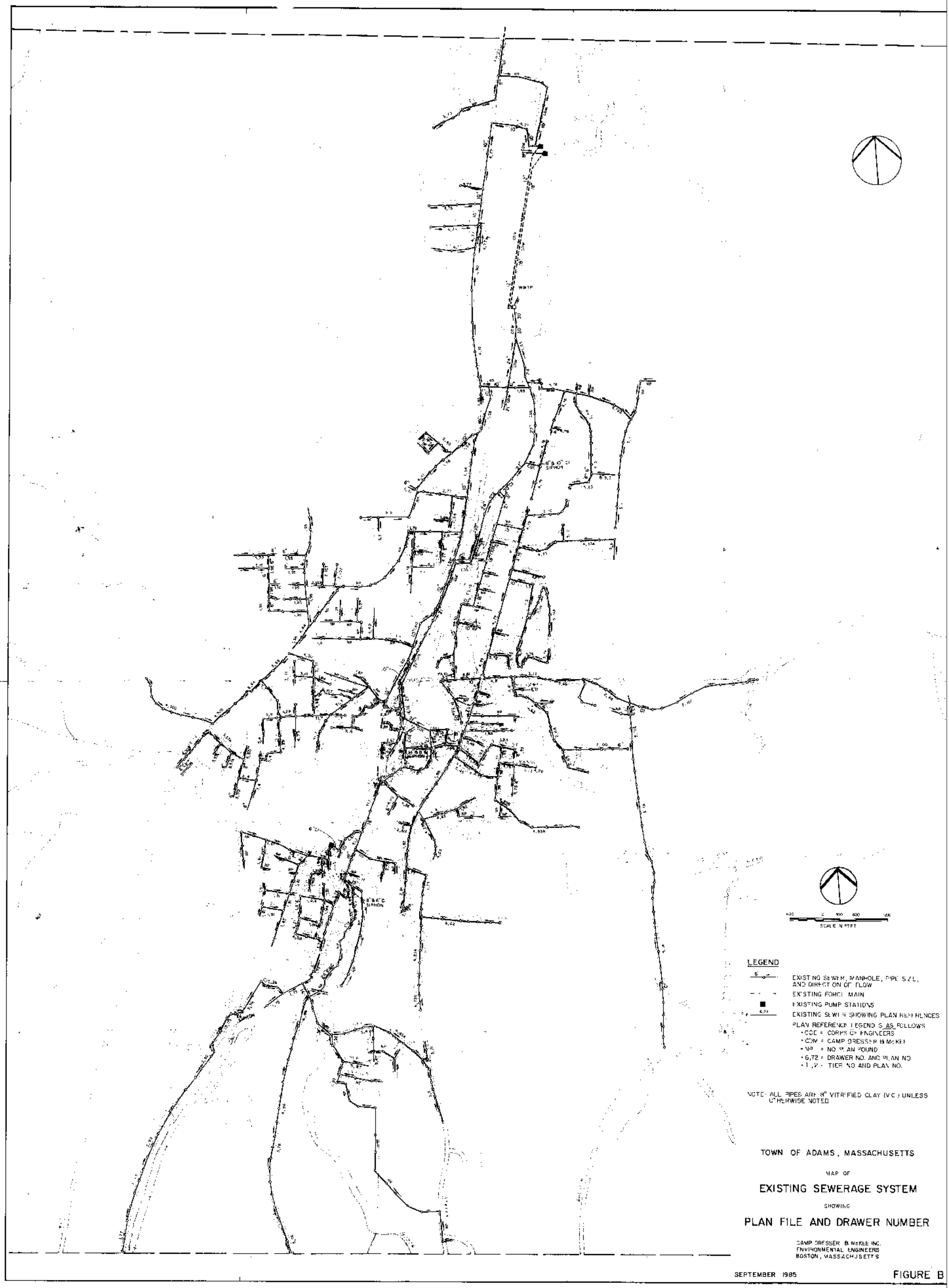
SCALE: 1:9000
Data Source: MassGIS, Berkshire Regional Planning Commission, CEI
Town of Adams
Drainage and Sewer Map
Comprehensive Environmental Inc.



DR. 5
PL. 100 A

General Notes

1. This map has not been modified from its original version and has been provided in support of the Adams Stormwater Mangement Strategic Plan, June 2003.

DATA SOURCES:

1. This map was generated from a scanned image of the original "Town of Adams, Massachusetts Map of Existing Sewerage System Showing Plan File and Drawer Number" by Camp Dresser & McKee Inc., September 1985. The scanned image was provided to CEI by the Town of Adams Department of Public Works.

No.	Revision/Issue	Date

COMPREHENSIVE ENVIRONMENTAL INCORPORATED
64 DILLA STREET
MILFORD, MA 01757

TOWN- WIDE SEWER MAP

ADAMS, MASSACHUSETTS

Project: 184–1
Sheet: 1 of 1
DRAWN BY:
CHECKED BY:
Scale: As Shown
Date: 6–5–03

4.0 Stormwater Assessment

A stormwater assessment was conducted to evaluate existing stormwater conditions and related water quality issues in Adams. This included:

- **A Perennial Stream Assessment** to evaluate the condition of the natural stream network made up of numerous perennial streams in Adams and identifies improvements needed at specific sites.
- **A Pollutant Loading Analysis** to determine areas with the greatest potential phosphorous loadings to surface waters. Phosphorous loads are an indicator of potential water quality impacts. The analysis was used to identify areas of concern or "hot spots" in Adams and develop the protocols of the Adams Stormwater Sampling Program to obtain additional water quality data within prioritized areas of concern.
- **A Hot Spot Analysis** through an evaluation of existing water quality data, field surveys, stormwater inspections and the pollutant loading analysis to identify locations in Adams that were suspected of having particular water quality problems. Hot spots are identified as the worst areas needing improvements.
- **A Stormwater Sampling Program** to characterize the water quality of actual stormwater flows in Adams which will help determine needed Best Management Practices.
- **An Illicit Discharge Detection and Elimination Program** to layout a method for finding and correcting illicit discharges, consistent with EPA's Phase II Stormwater Regulations.
- **Recommendations** for stormwater BMPs that the Town of Adams can implement to improve water quality.

These are discussed below along with findings, recommendations, and how they relate to the Phase II requirements.

4.1 Perennial Stream Assessment

A perennial stream assessment, commonly referred to as a stream team survey, is a useful way to assess and evaluate the condition of rivers and streams in a community. Water quality related problems such as bank erosion areas, illicit discharges, and illegal dumping areas can be identified. Water related opportunities, such as enhanced recreational access, can be identified as well. Data gathered during a stream team assessment can help identify sites for such activities as water quality monitoring, river clean-ups, installation of Best Management Practices, and river access. Bank erosion, riparian health, riparian buffer conditions, in-stream obstructions, and potential illicit discharges, spills or leaks were of particular interest for the Town of Adams' stormwater planning project. Another important aspect of a stream team survey is the involvement of volunteers. Engaging volunteers is a way to increase public awareness about a community's natural stream network. An engaged public can then advocate for improved management activities.

A stream team survey was completed for the perennial stream network in the Town of Adams in the summer and early fall 2002. The Massachusetts Riverways Program's training for Stream Teams methodology, also known as an "Adopt a Stream Shoreline Survey," was used. The Hoosic River Watershed Association (HooRWA) coordinated the survey, and worked with Town volunteers and employees and staff at the Berkshire Regional Planning Commission (BRPC) to assess stream conditions and prepare maps showing the findings. Summary results of that assessment are shown below. A copy of the full report, "Shoreline Survey Report: Perennial Streams in the Town of Adams" is contained in Volume 2 – Technical Material.

For the purposes of this assessment, the Adams perennial stream network was divided into the following segments:

Hoosic River, Section 1, Leonard Street / Route 8 to
Cheshire/Adams town line
Hoosic River, Section 2, Aladco to Leonard Street (Route 8)
Hoosic River, Section 3, Post Office to Aladco
Hoosic River, Section 4, Hodges Cross Road to Center Street
Dry Brook, Hoosic River to town line
Tophet Brook
Patton Brook
Miller Brook
Southwick Brook
Pecks Brook
Hoxie Brook
Unnamed Brook

Summary Results
Overall, the natural stream network within Adams is an important resource to the Town. The network of tributary streams is also an underutilized asset. In the survey, many beautiful sections were explored that could host walking trails, swimming holes, and fishing spots. Access to many of them is limited, though the Ashuwillticook Rail Trail which follows segments of the Hoosic River in Adams, is a wonderful example of riverside recreational development.

Many of the more remote sections of the Town's streams are lightly used and appear to be in near-pristine condition. At the same time, many stretches of rivers and streams in Adams have been altered and channelized. There was evidence of dumping and discharges to the rivers.

Flood Control Channel

The Hoosic River is channelized by a flood control chute for over two miles through the center of town. Many of the tributaries are also channelized in these concrete structures as they approach the Hoosic River. In many other cases, individuals have attempted to stabilize the banks of tributaries and the Hoosic River using rip-rap, old tires, and retaining walls. Volunteers located many instances of these stabilization efforts to protect property. In many cases these structures are slowly eroding and becoming undermined by the river and streams.

This channelization is problematic in many ways. Although retaining walls might keep an individual piece of property from flooding or becoming damaged, it also increases the rate of runoff, which adds to the flooding and erosion problems downstream, and causes the streams to transport more sediment. The flood control structures, which include concrete bottoms, also severely inhibit the cleansing functions of a river. Because they are inhospitable to aquatic life and water flows smoothly, with little turbulence or aeration, contaminants are not broken down as swiftly as they might in a natural river. Also of concern is the lack of shading and vegetative buffer in these areas. Without shading, the river is prone to excessive heating and cooling, and minimal buffers don’t help mitigate many of the problems caused by storm runoff.

Debris and Dumping

Debris and dumping is a major problem in Adams’ streams and rivers. The most problematic areas are essentially dumping grounds. Many of these are old sites that contain old pipes, hunks of metal, and old cars and motorcycles. There is also evidence of more recent dumping, which suggests this is an ongoing problem. Volunteers located several dumps in or near streams that need immediate attention. Some of these are beyond the scope of a simple volunteer river clean-up and would require heavy equipment.

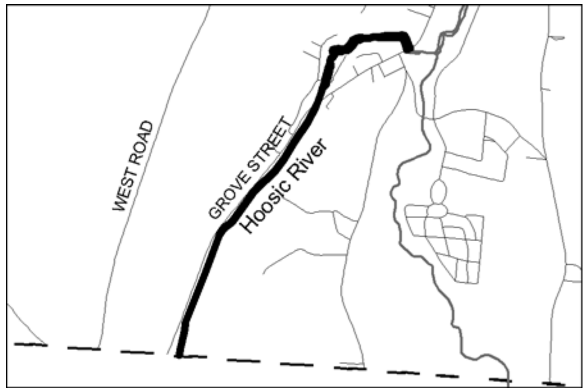
Pipes and Discharges

Many pipes were found that may discharge into the Hoosic River and tributaries. The Stream Team Survey performed a single visit to each pipe. It was therefore difficult to identify which of these were discharging harmful effluent, which were storm drains, and which were inactive or disconnected. Nevertheless, certain pipes had notable scum or discoloration. These were identified as warranting additional investigation.

Segment Summaries

Below are narrative descriptions of the segment summaries with assets, problems, and priority actions.

Hoosic River, Section 1, Leonard Street/ Route 8 to Cheshire/Adams town line



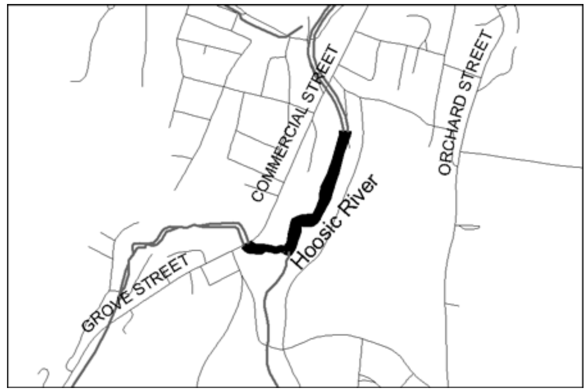
Narrative: After it crosses under Route 8, the river passes near old industrial/commercial sites on the south side. A great deal of trash was observed in this area. The north side is a good distance away from a residential area, where it was extensively shaded. The condition of the river in this area was good. There was strong flow. The river was 1- 2 feet deep in most parts and contained numerous pools.

Where the river crossed under the rail trail, the same conditions existed, although it was not as wooded. The Ashuwillticook Trail follows the stream from the upstream terminus of the section. Route 8 runs on the west side of the river in this area. The land use is residential. There is evidence of trash and home-made rip-rap, including tires in some sections, stabilizing the bank. The Ashuwillticook trail is located on the east side of the river and immediately beyond that another heavily wooded area. There was no agricultural land and no rip-rap. The river takes a nice shape and has some relatively steep banks, approximately 5-7 feet high, along the rail trail. Vegetation and wildlife were not evident when the section was surveyed, but in the summer this section is a fishing destination.

Assets	**Problems**	**Priority Actions**
Visually attractive, with excellent access provided by the rail trail	Trash and debris near Route 8	River clean-up
Fishing		

Hoosic River, Section 2, Aladco to Leonard Street (Route 8)

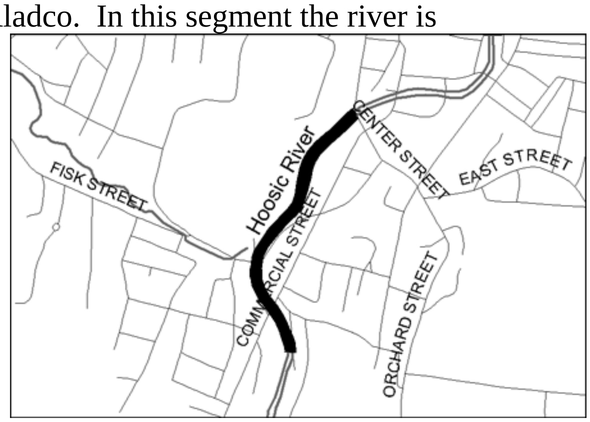
Narrative: This segment begins as the river regains its natural characteristics behind Aladco Laundry on Route 8. The east bank of the river is extremely steep as the river runs behind residences on Bellevue Ave. This area is characterized by heavy trash that may come from the houses above: mattresses, garbage, toys, metal, concrete blocks. This steep bank is severely eroded in sections. The river bends sharply to the west, providing very little access due to high, rocky bank conditions. Extensive vegetation cover was present—including in the middle of the river, which seemed to create pools but not constrict the water flow. Dry Brook enters from the east near a substantial pool created by an abandoned dam. On the west bank is the US Geologic Survey gauging station. Access to the gauging station is by a town right of way behind Grove Street. The area along an abandoned property by Leonard Street is also marred by extensive trash and debris. Apart from the trash, this is an attractive, secluded section of river, characterized by boulders, sand and cobbles, and heavy vegetation on the banks. The river runs clear, at a depth of greater than one foot, with only sparse pockets of foam.



Assets	Problems	Priority Actions
Attractive and secluded	Erosion on steep bank	Evaluate bank
	Lots of trash and debris	River clean up

<u>Hoosic River, Section 3, Post Office to Aladco</u>

Narrative: The segment begins behind the Adams Post Office, and continues, upstream, to Aladco. In this segment the river is channelized in a concrete flood control chute. Overall, the water runs swiftly, and the volume was somewhat high for this time of year due to recent rains. In several spots, leafy debris and grass was seen growing in the cracks in the concrete. There was also a sparse coating of algae. The Ashuwillticook Trail runs parallel to the river on the west side, approximately twenty yards back, providing visual access to the river. Behind the rail trail the land use is forested, or covered with vegetation. Land use on the east side of the river is residential and commercial, until it passes beneath Route 8 near Aladco. Trash is minimal along this segment, and the overall river condition is good. As it passes along the MacDermid Graphics building, the river is inaccessible on the west side. Just north of the MacDermid plant, a small, unnamed tributary enters the main stem from the west. This stream is marked by heavy iron rust/oxide along the bottom of the



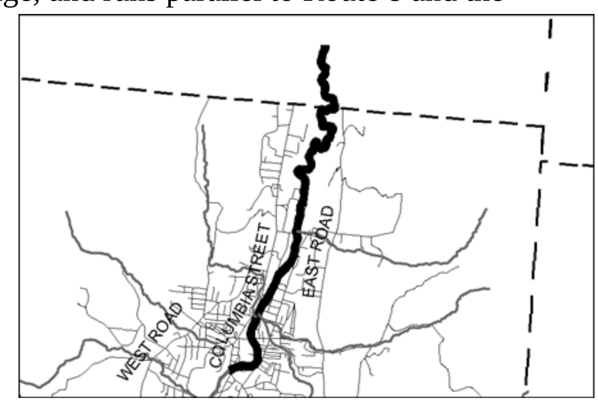
stream. Upstream on this tributary is a small wetland that is heavily vegetated, and largely clean of trash and debris. Nearby, Pecks Brook joins the Hoosic from the west.

The river is inaccessible on the west side as it passes Aladco. Behind the Aladco parking lot is a small roll dam in the chute. Across from Aladco, the walls of the chute become higher as the river makes a sharp bend. On the west side of the river, a small wetland has become established along the bank. Just upstream, the flood chute and the walls disappear. The substrate becomes cobble.
In this section, very little of the river is shaded by vegetation. Many pipes enter the river in this section, and during storm events some of them likely add runoff to the river. Since much of the land in this area is covered by impervious surfaces, the quality of the runoff may be impaired.

Assets	Problems	Priority Action
Visual access from rail trail	Debris and algae	Investigate water quality during storm events
Small wetland	Storm drains from impervious surfaces	

<u>Hoosic River, Section 4, Hodges Cross Road to Center Street</u>

Narrative: This section begins near McCann Technical School at the Hodges Cross Road Bridge, and runs parallel to Route 8 and the railroad tracks through a wide flood plain used for agriculture into the Town of Adams. From the beginning of the section to the start of the flood control chute, the river meanders a great deal, completing a 270 degree bend in one section. Although the surrounding land is agricultural, the river is shaded through much of this section, and there is heavy vegetation on the banks— both willows and brush.



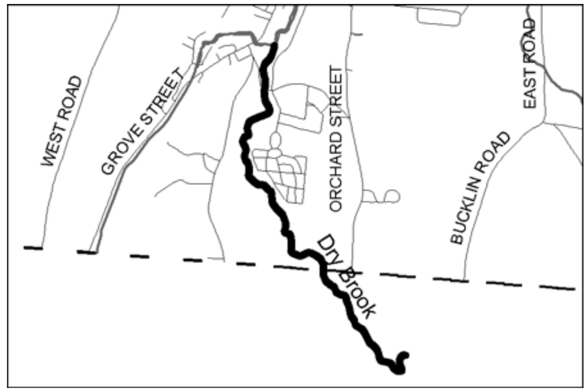
Near roads and access points, trash and debris were found. A ladder, cement blocks, mattress, iron beams and appliances were all found near the beginning of the section. Also, a cable used to support a high tension electricity tower has trapped a large amount of debris that has formed a dam that impedes flow near the Zylonite substation. Erosion was also well-documented. In several areas the silty clay banks were eroding into the river. In other spots, there was evidence of attempts to stabilize the banks with rip-rap and concrete blocks. As the river approaches downtown Adams, it becomes channelized into a concrete flood control chute which prevents access to the river.

Several pipes protrude in this section, the most notable being the Adams Wastewater Treatment Plant, which had a noticeable odor. Downstream, a milky discharge entered from a canal on the west side of the river—this is likely calcium carbonate from the SMI plant. Overall, this is a pleasant section of river, with potential for canoeing, though access points are quite limited. Fish and other aquatic life were spotted, and there were signs of large mammals using the river in this area. Much of the substrate consists of cobble, with occasional boulders and smaller sediment in the pools. Though the segment is primarily quick-water, there are occasional small rapids that could be negotiated in a canoe.

Assets	**Problems**	**Priority Actions**
Lots of shade, some areas good for picnicking	Water treatment plant is odorous	Evaluate water treatment plant discharge
Stream bed variable	Milky discharge within 200' of treatment plant steps	Evaluate Lime Street pipe discharge
Signs of animal life	Some foam near debris jam/island	Clear debris-trapping cable and debris jams to facilitate boating
Good for recreational boating and tubing in most locations	Low water upstream of plant (and crayfish a different color there)	Secure access points for boating
	Cow manure on Barnett's farm	
	At Lime Street bridge, dirty runoff from pipe	
	Past the high tension power lines– a cable is in the stream tangled in woody debris	

<u>Dry Brook, Hoosic River to town line</u>

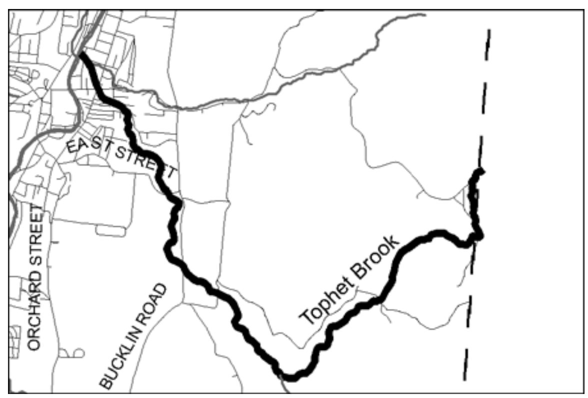
Narrative: Dry Brook is a beautiful stream, surprisingly debris-free in the way of natural construction and trash even as it passes through residences off of Leonard Street up to the cemetery. Near the cemetery it's fairly secluded on both sides. There is a steep ravine coming down from the cemetery, with some erosion, but the other side has a nice flat bank that reaches 20-30 yards out at some points with intermittent streams that feed in from the north. A nice swimming hole exists about halfway up through the cemetery that is between seven and eight feet deep. The stream is pretty wide in some spots, mostly a foot deeper or more. The stream is rocky, with boulders, cobbles and gravel. Water was clear and high quality, without odors. Frequent pools make this a particularly attractive section



Asset	Problem	Priority Action
High water quality, pools	Some trash	Clean up is a low priority

Tophet Brook

Narrative: Upstream of East Hoosac Street, Tophet Brook begins as a series of wetlands in the Savoy Mountain State Forest. Beaver activity was noted in several locations, though no beavers were observed. The river winds slowly through wetlands, agricultural land, and woods. Foam was observed in several locations at the edges of pools. Some siltation was also noted. The stream passes under a driveway through a culvert here, but downstream, the brook is remote and seems far from human activity. Below the driveway, the stream enters the deciduous woods in a steep valley, and has primarily a cobble bottom, with occasional bedrock portions. As the stream becomes steeper, it trickles through boulders, creating sizeable cascades. Just above High Bridge, some erosion was observed on the steep banks, and a debris jam had formed in the river.



The most spectacular site on Tophet Brook is the High Bridge Cascade. The cascade lies where a tributary enters from the west, in the area known as Little Egypt. Access to the stream here is difficult, since the bridge has been inoperable for many years. Nevertheless, this would be a prime parcel of land for protection and public access. The road that has replaced High Bridge is gated, making the pasture-land on the south side of the stream inaccessible to the public. Below High Bridge, the foundation of a millrace was noted, and nearby, a small tributary entered that was highly turbid—it seemed to be carrying a great deal of sediment from the gravel road on the north side of the stream. Much of the land on the north side of the river is in use as pasture. Upstream of the Patton Brook confluence, Tophet Brook tumbles over a series of large limestone ledges, and briefly passes through pasture land (a barbed wire fence is strung across the stream).

Immediately below where Patton Brook enters, the stream is spanned by a wooden bridge. It remains primarily strewn with cobbles and boulders, with periodic bedrock ledges until it becomes channelized in the flood control chute, approximately .75 miles above its confluence with the Hoosic. Until it reaches Walling Road, the south bank is primarily wooded with hemlocks, and the north bank is pasture and residential land. Near a man-made swimming hole, an island has formed and erosion was noted. Many blow-downs were present downstream, along with human debris, and even a car in the stream. There is a small vegetated buffer in this section, and in several spots livestock have access to the river. The East Road Bridge has an opening that is too small for Tophet Brook at high flows, and it has backed up the stream, resulting in gravel deposition above the bridge.

Below Bowens Corners, the river enters a section with steep banks, where it is well- shaded by willows and other trees. Although there is siltation in sections, in others, the river has scoured bedrock, and has created an outstanding swimming hole and a small waterfall. Many other cascades and deep pools exist, separated by sections of cobbles and gravel. From Bowens Corners to the start of the flood chute would be an excellent candidate for trail access—as of now, no formal access exists.

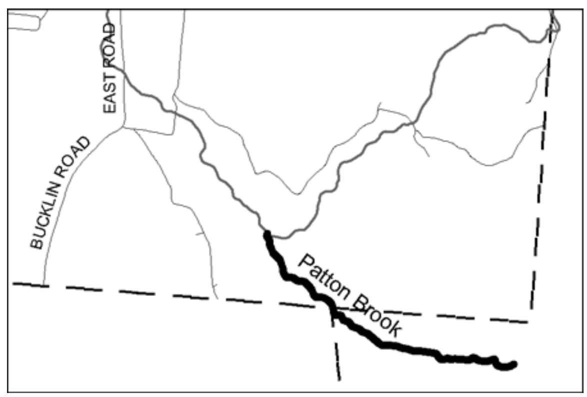
Above Summer Street, Tophet Brook becomes channelized within low concrete walls with a concrete bottom. Although the area is densely populated, the right bank is about fifty percent shaded. The stream runs under Summer Street and a parking lot before it re-emerges near the Miller Brook confluence. In this section, Tophet brook seems to carry much less water than it did upstream—perhaps it is losing water in the chute. Near its confluence with the Hoosic River, cobbles, vegetation and debris were noted in the flood control chute. Just south of the confluence is a church-owned park that might find more use as a municipal park.

Assets	**Problems**	**Priorities**
Gorgeous cascades and pools, including a downtown swimming hole and High Bridge	Road runoff upstream of Tophet Brook Farm	Mitigate sedimentation caused by road runoff near Tophet Brook Farm

Assets	Problems	Priorities
falls and pools		
High Bridge stonework	Near Walling Road, cows in stream; on Tophet Brook Farm, cows in riparian zone	Investigate fencing cattle out of stream
Church-owned park at confluence with Hoosic	One “green discharge” pipe	Investigate public access to Cascade
Trout	Bridge too small and askew of Brook at East Road	River clean-up on north bank near East Road.
	Flood chute inhospitable to aquatic life	Investigate trail access below Bowens Corners
	Trash and debris in river	

<u>Patton Brook</u>

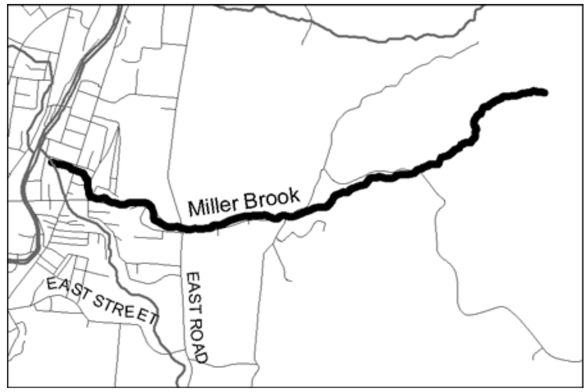
Narrative: Patton Brook originates high in the hills, and is largely in pristine condition. Most of its length is shaded by deciduous forest, with several patches of hemlock (perhaps 98% of the bank is shaded). The streambed is primarily cobbles, with gravel in the pools separated by miscellaneous boulders. In one spot, flow was blocked by a natural log jam. Although largely undisturbed, an old logging road parallels the stream on the east side, and there looked like active grazing near the tributary stream. Several small tributaries run through pasture land, and might carry sediment during storm events.



Assets	Problems	Priority Actions
Very picturesque	Evidence of cows	
Trout		
Some cascades/pools		
Heavily forested		

<u>Miller Brook</u>

Narrative: The stream begins at a wooded spring in a swampy area at approximately 550 feet of elevation. Flow is minimal in the small channel as it flows through a thickly forested area, and becomes steep. This section is characterized by large boulders. After a small tributary joins from the northeast (which on the day of the survey carried more water than Miller Brook), flow becomes steadier, and gravel bottoms in the many pools are visible through the clear water. After the brook passes under East Hoosac Street, the land is no longer primarily forested, the river bed became wider and bank erosion was visible in several locations. There was also trash and debris in this section of river.

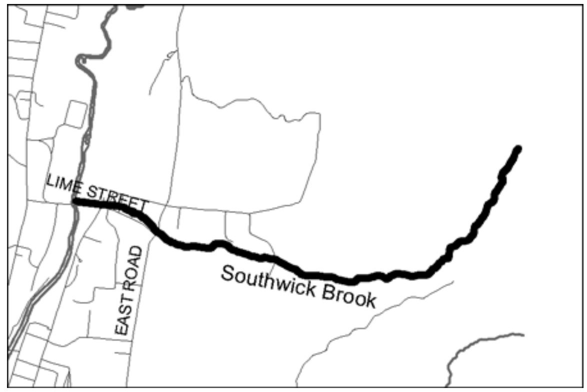


At the East Street Bridge, the river is channelized, and the bank has been stabilized by rip-rap and rocks on the west side of the river downstream of the bridge. Several pipes were noted at this location. Below the bridge the stream morphology returns to a more natural step-pool state, and once again becomes forested with deciduous trees. At approximately 270 feet elevation, banks become quite steep, and houses are built close to the stream. Just above Richmond Street, the stream becomes channelized by a flood control chute. It is shaded in places and open to the sun in others. Below Richmond Street some vegetation can be observed within the chute, and many roof drains empty into the river. Despite a rainfall event the day prior to the survey, there was no flow through this section. Flow is re-established downstream, and below Summer Street there are natural cobbles in the chute and vegetation. Miller Brook soon flows into Tophet Brook. (Note: It rained the night before the stream was surveyed. Despite this, the flow was observed to be no higher than normal.)

Assets	Problems	Priority Actions
Step/pool morphology – pretty. Clean, clear water	Steep driveways yield sediments in runoff	Prevention of street/stormwater runoff pollution
Little erosion despite steep banks	Flood control chute inhospitable to aquatic creatures	flood chute remediation
Reports of trout	Some garbage	River clean-up

<u>Southwick Brook</u>

Narrative: Southwick Brook begins as a small stream, flowing out of the Savoy State Forest, and the survey began where Spring Road crosses the brook, east of Adams. Through the first part of this section, the stream runs through the woods in a deep, scenic gully, trickling over and between large boulders. Some erosion was noted in this section

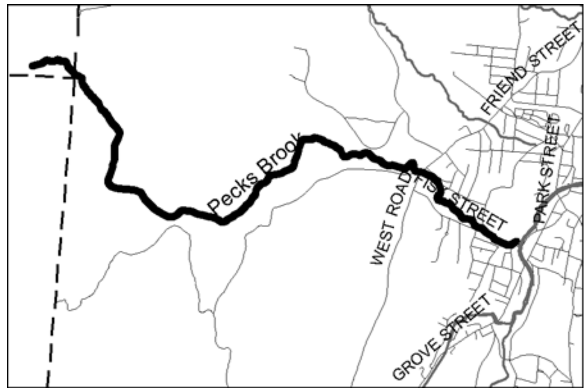


due to steep banks. One large concrete wall was noted near the stream bank. Downstream, a barbed wire fence paralleled the brook. A gravel road, maneuverable by a four wheel drive vehicle is able to cross the river. Nearby was a cache of trash bags full of debris. Where Southwick Brook crosses under East Road, it is channelized beneath a stone bridge, with a culvert entering from one side.

Downstream, the brook changes in character, and is channelized in many places with concrete, stone rip-rap and even old tires. In one section, trees have fallen into the river, which might impede flow at higher water. Along Lime Street, many small bridges cross the stream, primarily to permit driveway access to houses on the north side of the brook. Stream stability is clearly an important issue in the lower section of Southwick Brook—there is a great deal of erosion, and property owners have attempted to stabilize their banks by any means possible. There are many reports of property damage and flooding during high water. Stormwater seems to be more a problem of quantity than quality, since there are no suspect pipes, and land use is primarily forested and residential, rather than impervious. The bottom section was nearly dry on the day this was surveyed.

Assets	**Problems**	**Priority Actions**
Upper section very pretty cascading stream	Extensive erosion and rip-rap in lower section	Investigate strategies to stabilize banks and prevent erosion
High water quality	Bridges, and channelization may impede flow	Investigate strategies to prevent extensive flooding
	Some large debris – cars, metal, fallen trees from Springhill Farm downstream	Clean-up
	No public access	Investigate public access points
	Dry from Charles Street to Hoosic	
	Near Charles Street, a collapsing retaining wall and lots of industrial trash	
	Algae near Arbor Street	

Pecks Brook



Narrative: Pecks Brook was surveyed from the Hoosic River upstream. Dead fish were noted, as well as some litter and stone walls falling into the river. Erosion was observed under the bridge, along with Tyvek material and old, non-functioning pipes. In this segment of the river the streambed began as a flood control chute. Upstream it was primarily boulders and cobbles. Green algae and mosses seemed more prevalent here than in the upper headwaters. Near Fisk Street an old dam is present, with orange deposits that could be caused by rust from iron at the dam. Litter was observed here. Also in this area an old metal fence was observed, with trees falling into the river and bank erosion present. An odor was observed between Fisk Street and West Road. Just upstream the river splits into two branches.

On the South branch, there was evidence of deer. Several pipes were present. A cement spillway and orange scum were also observed. On the west side of West Road there was a sizeable log jam, but upstream the brook was in a more natural state. Bedrock ledges created habitat for fish, although "pool scum" was also noted. Above this area, a pipe crossed the river, but it did not flow into the stream.

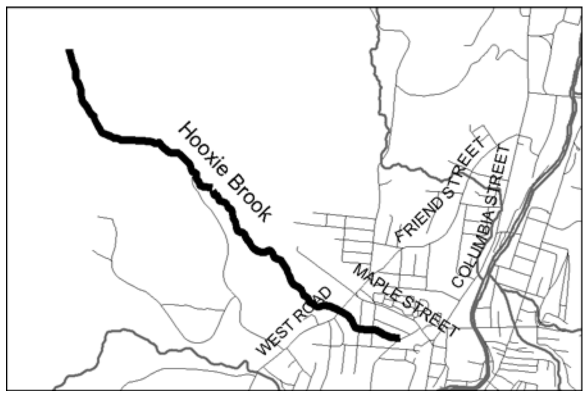
On the north branch, the stream crossed West Road, where a wall on the Linscott property was failing caused by erosion. A dam on the property is filled in with silt adjoining a wetland area, which seemed degraded by silt. Further upstream is Peck's Falls, a well known scenic landmark with trail access. No litter was observed in this area. Where the north branch splits, one tributary drains the Gould farm. There is a possibility that agricultural runoff might have a negative impact on stream quality. The other tributary drains the western area along the Gould trail—this branch seemed to have much less moss and algae than the Gould farm branch.

Assets	**Problems**	**Priority Actions**
Fisk Road Dam could serve as a recreational asset	Undermining at bridge near McDermott Graphics	Establish formal access points to waterfalls and pools
Trout	Lots of iron pipe. At the Dedek Mill, old water lines?	

Assets	Problems	Priority Actions
Shady	Large debris near Fisk Road Dam	Remove debris near Fisk Road Dam
Water-worn bedrock	Siltation behind dam with flow behind wing walls	
Pecks Falls and other waterfalls	Orange pool below dam	
Swimming hole upstream of Linscott dam (12' deep)		
	Erosion near West Road (also affecting dam)	Remediate erosion near West Road
	Tube in bridge closed	
	Cows in stream	

<u>Hoxie Brook</u>

Narrative: Hoxie Brook begins on the forested slopes of Mt Greylock and runs east, parallel to Thiel Road, and crosses Friend Street where it enters a residential section of Adams. Through much of the commercial center of town it is channelized and underground, emerging briefly near the new visitor center before it runs beneath a parking lot and re-emerges near its confluence with the Hoosic River.



The upper section, between Greylock Glen and Forest Park Ave is marked by heavy erosion, particularly in the section below West Road. One culvert was noted in this section, as was the dam at Forest Park, which was severely eroded and caving in. This section is primarily forested, though in sections there is primarily heavy brush lining the river banks. Land use in this section is agricultural and residential as well as undeveloped, and runoff from the orchard and farm may be a concern. Two wetlands exist in this section north of the stream, elsewhere, the river bottom is mixed, but predominantly cobbles. Wildlife abounds, and a woodpecker and kingfisher were spotted, as well as evidence of a black mink. This section was assessed as "very eroded."

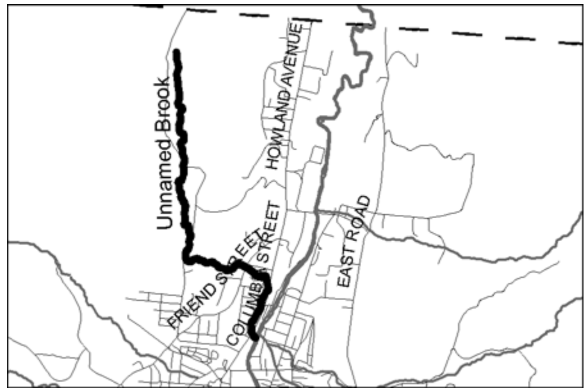
Between Hoosac Street and the Ashuwillticook Trail several locations merit mention. Near Hoosac Street a short stretch of the stream is daylighted, and supports healthy wetland vegetation on the banks of the stream. Nevertheless, this area traps debris and trash. Immediately upstream, near the entrance to the Meehan Mill, the brook is channelized in a culvert for approximately sixty feet. Upstream, behind Interior Alternatives the brook is daylighted for approximately 25 feet. This area needs immediate attention, since there are two sinkholes in the pavement, and the surface is buckling. Although it was dry on the day the survey took place, the surveyors were concerned about runoff from the parking lots and Hoosac Street during storm events. Additionally, many pipes were observed entering the stream. In this section, a small man-made dam has created a small, three foot deep pool. This section was characterized by gravel, cobble and sand substrate. This section was assessed as "fair."

Between Hoosac Street and the convergence of Hoxie Brook and the Hoosic River, the river flows through a broad concrete culvert topped by pavement. Abutting the Hoosic River flood chute, Hoxie Brook emerges in a naturally vegetated stream bank. The daylighted sections appear to have lush, healthy riparian vegetation. This section was assessed as "very good." The river abuts town and Massachusetts Department of Conservation and Recreation land that could be used to provide access for walking trails.

Assets	**Problems**	**Priority Actions**
Shaded	Stream is underground then daylighted then back underground again and again	Investigate educational signage for mini-wetland near Hoosic River confluence
Historic dam at Forest Park Ave.	Meehan Mill – lots of debris, problems with substrate	River clean up in problem sections
Upstream of Forest Park Ave., the valley is deep and narrow and the feeling is "mysterious, green, pristine"	Erosion at the new bike trail, east of the new visitors' center	Address erosion concerns in various locations
Mini-wetland near Hoosic River confluence	Upstream of Forest Park Avenue a dam is entirely silted in.	Evaluate Forest Park dam
	Sinkholes and buckling in pavement behind Interior Alternatives	Repair pavement, investigate daylighting near Visitors Center

Unnamed Brook

Narrative: Unnamed Brook begins as an intermittent stream above the Specialty Mineral International (SMI) property north of Adams. The upper section is primarily pools and riffles, nearly choked with vegetation and boulders. On the SMI land there is informal access. Gradient increases after it crosses under Notch Road through a culvert by a gate. A dam was observed below the culvert, followed by a series of small cascades. The nearby land is more residential here, but the stream is still in the woods. Just west of Friend Street the river runs through a concrete channel beneath a garage. Below this it is channelized in a ditch, and makes a sharp bend north at Pine Street. Along the west side of the baseball field, the river is shaded, until it disappears into a pipe underneath Howland Ave. It then runs in a ditch beside Route 8 North and disappears in a pipe before Lime Street. At this point, it became impossible to locate Unnamed Brook, though it is likely it joins the Hoosic River nearby.



Assets	Problems	Priority Actions
Quiet, pretty brook	Unclear where it enters the Hoosic	Locate confluence with Hoosic River

4.2 Pollutant Loading Analysis

A Quality Assurance Project Plan (QAPP) was developed to sample stormwater discharges in Town to assist in BMP design. The QAPP included a pre-screening land use pollutant loading assessment to identify areas anticipated to have higher pollutant loadings. This assisted with selection of sites for sampling and BMP design. The pollutant loading assessment is summarized below with detailed information included in the September 24, 2003 QAPP in Volume 2 of the Stormwater Management Strategic Plan.

The Town was divided into 26 drainage areas or sub-watersheds, using existing topographic and drainage maps. Land uses were assigned an impervious value, based on published literature and previous work undertaken by Berkshire Regional Planning Commission (BRPC).[1] Pollutant loadings were calculated for each sub-watershed using a Simple Method for estimating urban storm pollutant export (Schueler, Thomas. R., 1987). Forested areas were not included in the calculations to better target urban land use. Phosphorous was used as the pollutant indicator as it is straight forward to calculate and is the limiting nutrient in fresh water systems. The concept is that more developed, impervious areas will contribute higher levels of pollution, which is true for most pollutants.

The top ten drainage sub watersheds were ranked in order of priority based on annual total phosphorous loadings, as shown in **Table 4-1**. Land uses and sub watersheds with numerical ranking are shown in **Figure 4-1**.

Table 4-1. Phosphorous Loadings for Top Ten Sub watersheds

Rank	Sub watershed	Total Annual Phosphorous (pounds)
1	B	368.4
2	L*	285.7
3	C*	224.1
4	R	211.3
5	G	189.5
6	M	171.2
7	W*	170.2
8	H*	154.8
9	Z	154.8
10	O	151.6

*Sub watershed contains one or more QAPP stormwater sampling sites.

This assessment, combined with field assessments and historical data, supported sampling in more specific drainage sub watersheds (see Section 4.3), specifically, C, H, L and W. Sampling data is discussed in Section 4.4.

4.3 Hot Spot Analysis

CEI conducted field inspections of priority drainage sub watersheds and areas of concern previously identified by Town staff and BRPC as “warm spots” for water quality concerns. Drainage sub-watersheds, stormwater outfalls, receiving waters, and associated land uses were inspected to identify the best stormwater sampling sites that would be representative

[1] Berkshire Regional Planning Commission. 2000. *Stormwater Assessment in the Hoosic and Housatonic Watersheds.*

of the top pollution areas within Town. The database of field notes and potential stormwater sample locations are discussed more thoroughly in the stormwater QAPP and the Adams Illicit Discharge Detection and Elimination (IDDE) Plan (see Section 4.5 and Volume 2 Technical Materials of the Stormwater Management Strategic Plan).

Based on this information and analysis, ten water quality hot spots were identified and are summarized in **Table 4-2** below.

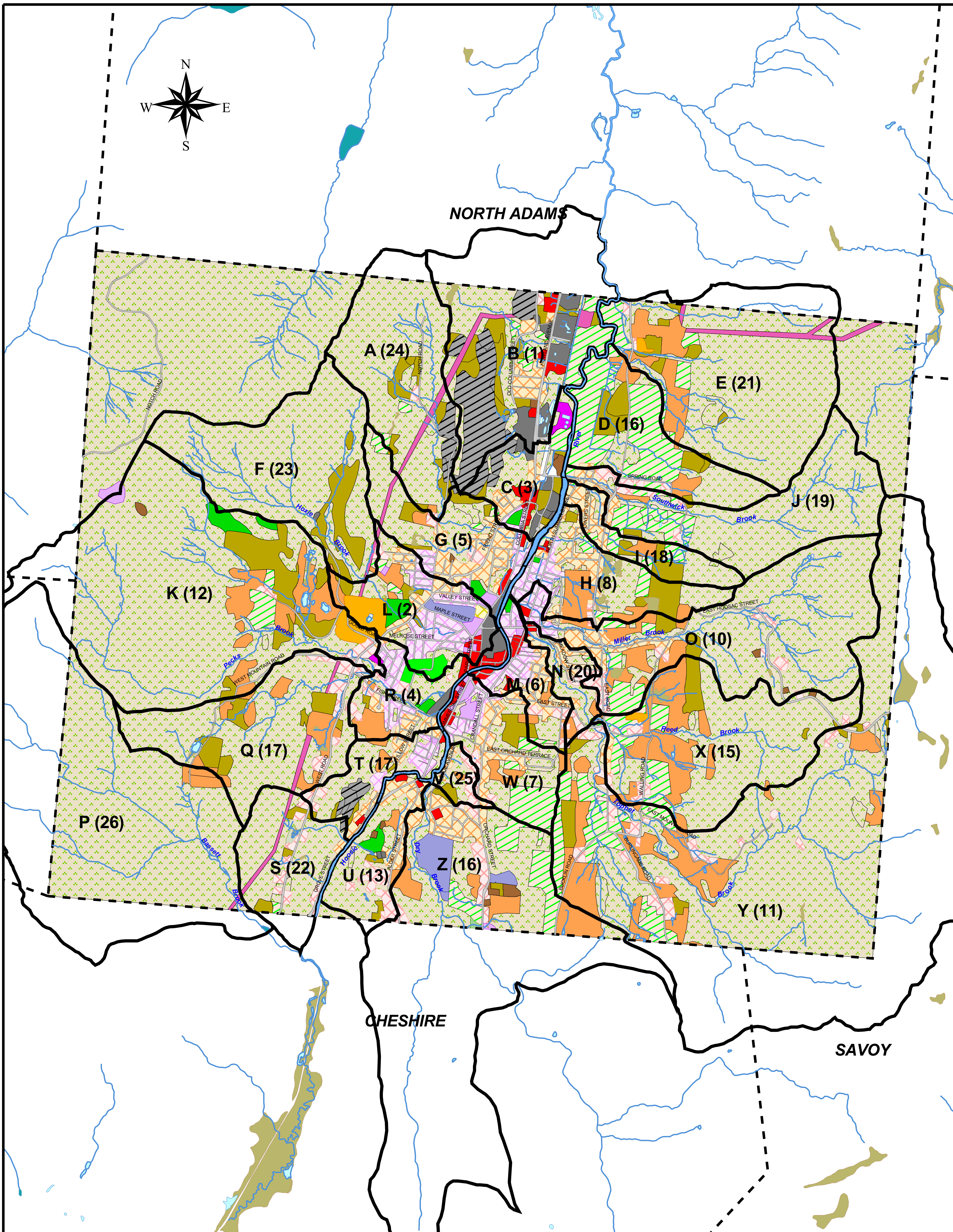
Table 4-2. Water Quality Hot Spots in Adams

Site #[1]	Site Locus[2]	Reason for Concern
1	Peck's Brook/Hoosic River at MacDermid Mill	Large impervious surface area. Unidentified pipes into river, sewer outfall to Hoosic River confirmed during IDDE activities.
3	**Hoosic River along Commercial Street near U.S. Post Office**	Largest contiguous impervious surface area in Town.
5	Hoxie Brook at Melrose/ Gilead Streets	Abandoned dump along stream bank. Possible contaminants leaching from rusted barrels. Significant bank erosion and culvert damage.
6	**Hoxie Brook/Hoosic River at Visitor Center and Depot St./Hoosac St.**	Large impervious surface area in downtown Adams. Hoxie Brook travels underground for ~4,500 feet. Old floor drain connections from former autobody shop to Hoxie Brook confirmed during IDDE activities. Undermining of culvert beneath former autobody shop. Bank erosion and stream degradation from Visitor Center to Hoosic River.
8	Upper Miller Brook at Hoosac Street	Roadside erosion, heavy sediment deposits, runoff directly into stream.
11	Hoosic River at "Aladco" Plant	Possible illicit discharge at laundry facility. Outdoor vehicle washing observed.
14	Reed Brook at Walling and East Street	Road runoff and erosion along East Street to Reed Brook.
15	**Pine Street Brook at Renfrew Street**	Apparent water quality degradation during storm events – often turbid and milky at times.
16	**DPW Facility at North Summer Street**	Drainage swale erosion and sediment deposits in close proximity to the Hoosic River.
17	**Glen Street west of Crandall Street**	Erosion of steep swale along road.

Notes:

1. Most site #s corresponds with warm spots (not necessarily priority) identified during previous field assessments, as discussed in the Adams Stormwater QAPP and IDDE Plan. Bold sites are associated with stormwater sampling sites.
2. See **Figure 4-2** for site locations.

The locations with the greatest potential for BMP implementation were selected for stormwater sampling, since a project goal is to develop future stormwater remediation projects designed to significantly improve water quality with follow-up stormwater remediation projects. In selecting sites, sample locations were eliminated if there were no opportunities for



LEGEND

Land Use

- Cropland
- Pasture
- Forest
- Wetland
- Mining
- Open Land
- Partial Recreation
- Water Based Recreation
- Residential (Multi-family)
- Residential (Less than 1/4 acre lots)
- Residential (1/4 to 1/2 acre lots)
- Residential (Larger than 1/2 acre lots)
- Commercial
- Industrial
- Urban Open
- Transportation
- Waste Disposal
- Water
- Powerlines
- Golf
- Marina
- Urban Public
- Cemetery
- Orchard
- Nursery

Hydrography

- Reservoir
- Wetland
- River
- Lake, Pond
- Stream, Brook

- Drainage Subwatersheds
- Town Boundary
- (1) Represents Subwatershed Priority Rank

2000 0 2000 4000 6000 Feet

SCALE: 1:40000

Data Sources: MassGIS, Berkshire Regional Planning Commission (BRPC), CEI

Figure 4-1

Land Use and Subwatershed Ranking

Adams, Massachusetts

Comprehensive Environmental Inc.

cost-effective BMPs, due to land constraints or ownership. A database of Town-owned lands, open space, and recreation lands was prepared from the Town's GIS (digital mapping system) to assist in screening potential sites for BMPs.

4.4 Stormwater Sampling Program

A stormwater sampling program was developed to characterize urban stormwater in Adams and identify priority sites for future stormwater remediation projects to reduce pollutant loadings associated with nonpoint sources of pollution. This section discusses the results of the stormwater sampling program.

Stormwater Sampling Results Summary

The results of the stormwater sampling program are summarized below, followed by a discussion of the QAPP, data by analytical parameter and stormwater sampling event characteristics as they affect the data.

- Stormwater sampling was conducted from March 31, 2004 to November 24, 2004 with the results presented in **Table 4-3**.
- Laboratory data sheets are provided in **Appendix 4B** and field inspection logs are provided with the full QAPP in Volume 2 Technical Materials of the Stormwater Management Strategic Plan.
- The bacteria results for all sample locations are very high at times, indicative of sewage.
- Total suspended solids results are not unusual for stormwater and total phosphorous results are typical for urban areas.

QAPP Summary

The methodology and details of the sampling program are available in the September 24, 2003 QAPP (See Volume 2 Technical Materials, Stormwater Management Strategic Plan). A brief overview of the 2004 sampling program is provided in **Table 4-4**. Current information for the Hoosic River indicates that water quality is impaired due to bacteria (pathogens, MA DEP 303d List) and nonpoint source pollution associated with urban runoff. The goal of the sampling program was to monitor stormwater discharges to the Hoosic River during "first flush" conditions at priority sites to obtain a better understanding of pollution impacts in Adams and the improvements that should be undertaken to address these impacts.

Stormwater sampling was completed by volunteers from the Adams Community Development Department and the Department of Public Works, as well as staff from the Berkshire Regional Planning Commission. Sampling teams were trained for stormwater sampling protocols in accordance with the QAPP. As the sampling program progressed, data and field sheets were reviewed by the QAPP Project Manager and QA/QC Officer for validation, verification, and reconciliation with data quality objectives. This included correspondence with the field team leader, laboratory, and DEP to ensure that samples were collected and analyzed in accordance with the QAPP. Any discrepancies were noted and discussed/resolved prior to the next sampling round. Examples include mislabeling sample lids from the chain of custody to the laboratory report and missing information for field data sheets that were later resolved.

<table>
<tr><th colspan="4">Table 4-4. Stormwater Sampling Program Overview</th></tr>
<tr><th>Sample ID & Site Location[1]</th><th>Sub watershed Location & Sample Drainage Area</th><th>Site Description</th><th>Laboratory Sampling Parameters & Frequency</th></tr>
<tr><td>SW-1
Renfrew & Columbia Streets</td><td>C (891 acres)</td><td>In-stream sample location downstream of the culvert that passes beneath Renfrew and Columbia Streets.</td><td rowspan="5">Parameters
Fecal coliform, E. coli, Total Phosphorous, Total suspended solids

Frequency
Four storm events with no rain 72 hrs prior to sampling.

Samples were collected during first flush conditions.

Sample times were calculated for each location based on storm flow travel times in each watershed.</td></tr>
<tr><td>SW-2
Adams DPW Facility</td><td>H (193 acres)</td><td>In-stream/stormwater discharge at the Adams DPW Facility downstream of the confluence of the two pipe discharges.</td></tr>
<tr><td>SW-3
Hoxie Brook</td><td>L (1,014 acres)</td><td>In-stream sample location on Hoxie Brook downstream of the rail trail crossing just upstream of the adjacent industrial parking lot.</td></tr>
<tr><td>SW-4
Adams Post Office</td><td>W (96 acres)</td><td>Sample location is a stormwater discharge pipe to the Hoosic River at the U.S. Post Office parking lot.</td></tr>
<tr><td>SW-5
Glen Street</td><td>W (64 acres)</td><td>Sample location is a concrete swale discharge before it goes underground in Glen Street.</td></tr>
</table>

Notes: 1) Stormwater sampling locations are shown on **Figure 4-3**.

Two modifications to the QAPP were made during the sampling program: 1) changes in the sample collection methods (e.g., elimination of buckets); and 2) collection of samples during extended hours beyond the normal work day and at night to allow more opportunities for stormwater sampling events. Documentation for these QAPP modifications is provided in Volume 2 Technical Materials of the Stormwater Management Strategic Plan with the September 24, 2003 QAPP. Overall, most of the QA/QC criteria were fulfilled for stormwater sampling events and laboratory analysis criteria. However, some variations occurred during some sampling events, as follows:

- First flush timing was delayed for field duplicates (Event # 1);

Table 4-3. Adams Stormwater Sampling Results Summary

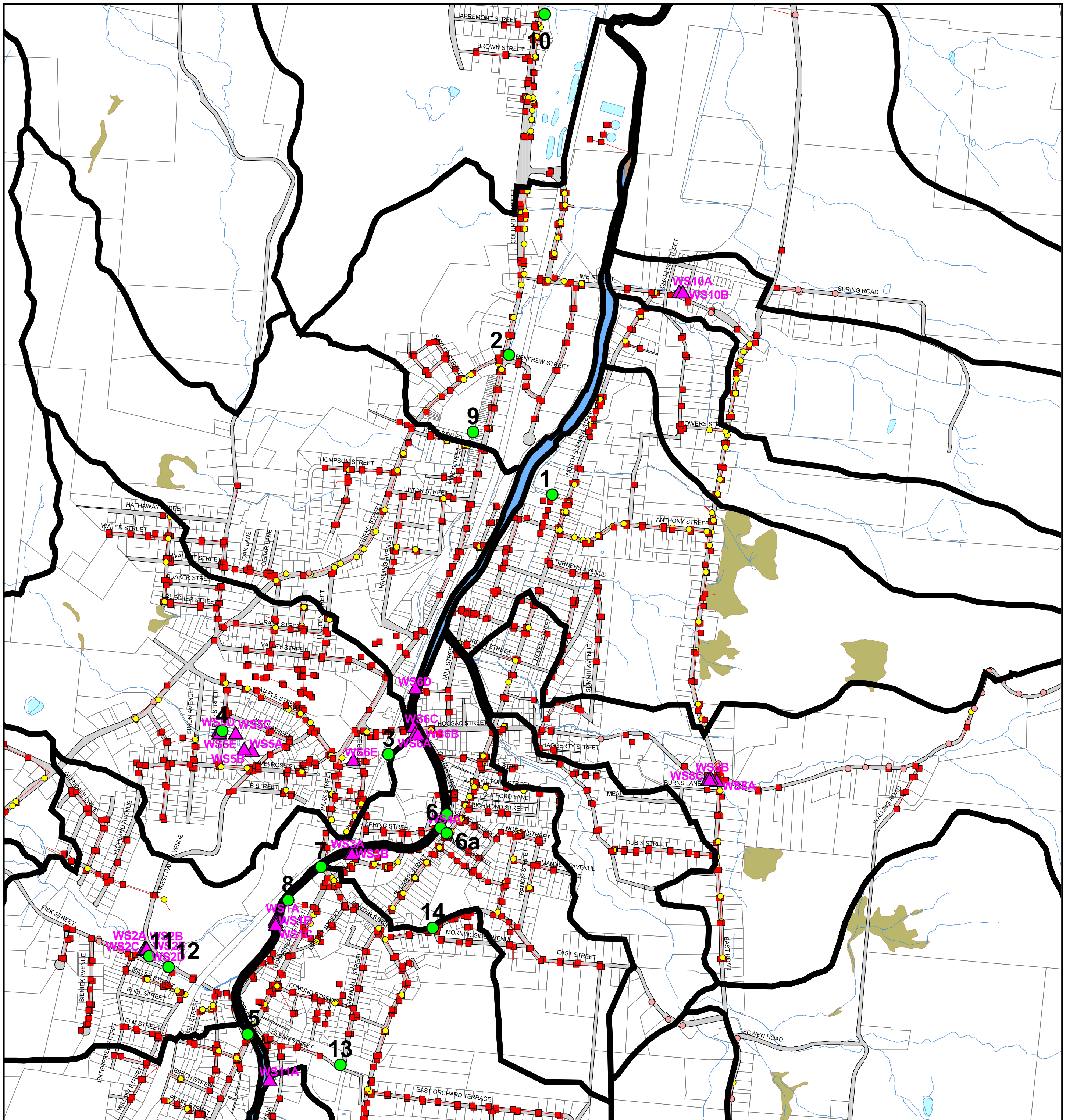
Sample ID & Location	Sampling Event 1 - March 31, 2004						
	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	SW-5
	Renfrew & Columbia Streets	Adams DPW Facility	Hoxie Brook	Adams Post Office	Glen Street	Glen Street Duplicate	Lab Duplicate for Glenn Street
Analytical Parameters							
Fecal Coliform (colonies/100 mL)	160	5,300	110	390	200	180	190
e. Coli (colonies/100 mL)	60	4,100	90	350	180	170	170
Total Suspended Solids (mg/L)	118	410	45	66	50	50	51
Total Phosphorous (mg/L)	0.228	1.014	0.117	0.276	0.124	0.122	0.125
Sampling Event Notes							
Designated Collection Time After Flow is Observed	24 Min.	18 Min.	20 Min.	12 Min.	16 Min.	-	-
Time Flow was Observed	9:46 AM	9:45 AM	9:54 AM	9:28 AM	9:30 AM	-	-
Sample Collection Time	10:15 AM	10:27 AM	10:15 AM	9:40 AM	9:46 AM	10:00 AM	-
Time Between Start of Flow and Sample Collection	29 Min.	42 Min.	21 Min.	12 & 19 Min.*	16 Min.	-	-
Temp (^oC)	5	4.5	4	3.5	4	-	-
Water Level/Flow	Normal	High	High	High	-	-	-
Turbidity Observations	Cloudy	Very Cloudy	Cloudy	Very Cloudy	Cloudy	-	-
Odor	None	None	None	None	None	-	-
Other Relevant Observations	None	None	Litter	None	Some Trash	-	-

Sample ID & Location	Sampling Event 2 - August 12, 2004							
	SW-1	SW-2	SW-3	SW-4	SW-5	SW-5	SW-6	SW-6
	Renfrew & Columbia Streets	Adams DPW Facility	Hoxie Brook	Adams Post Office	Glen Street	Lab Duplicate for Glenn Street	Field Duplicate	Lab Duplicate for Field Duplicate
Analytical Parameters								
Fecal Coliform (colonies/100 mL)	>300,000	72,000	56,000	-	61,000	58,840	80,000	-
e. Coli (colonies/100 mL)	>250,000	54,750	38,730		43,520	52,000	72,700	-
Total Suspended Solids (mg/L)	270	110	196		44	-	66	65
Total Phosphorous (mg/L)	0.772	0.417	0.556		0.560	0.561	0.403	-
Sampling Event Notes								
Designated Collection Time After Flow is Observed	24 Min.	18 Min.	20 Min.	Sample not collected, sampling device lost in river.	16 Min.	-	-	-
Time Flow was Observed	9:50 AM	-	10:00 AM		9:44 AM	-	-	-
Sample Collection Time	10:15 AM	10:05 AM	10:20 AM		10:00 AM	-	-	-
Time Between Start of Flow and Sample Collection	25 Min.	-	20 Min.		16 Min.	-	-	-
Temp (^oC)	19	22.5	-		19	-	-	-
Water Level/Flow	High	High	Normal		-	-	-	-
Turbidity Observations	Very Cloudy	Very Cloudy	Cloudy		Clear	-	-	-
Odor	None	None	None		None	-	-	-
Other Relevant Observations	Trash	Grass Clippings	None		None	-	-	-

Sample ID & Location	Sampling Event 3 - September 17, 2004					
	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6
	Renfrew & Columbia Streets	Adams DPW Facility	Hoxie Brook	Adams Post Office	Glen Street	Glen Street Duplicate
Analytical Parameters						
Fecal Coliform (colonies/100 mL)	86,000	75,000	160,000	53,000	91,000	80,000
e. Coli (colonies/100 mL)	77,000	68,700	120,300	46,100	77,000	72,700
Total Suspended Solids (mg/L)	8	6	2	1	1	1
Total Phosphorous (mg/L)	0.203	0.227	0.211	0.218	0.201	0.187
Sampling Event Notes						
Designated Collection Time After Flow is Observed	24 Min.	18 Min.	20 Min.	12 Min.	16 Min.	-
Time Flow was Observed	-	-	2:00 PM	2:00 PM	2:10 PM	2:10 PM
Sample Collection Time	2:25 PM	2:15 PM	2:20 PM	2:12 PM	2:25 PM	2:28 PM
Time Between Start of Flow and Sample Collection	-	-	20	12	15	-
Temp (^oC)	19	21	18	22	20	20
Water Level/Flow	High	High	Normal	Normal	Low	Low
Turbidity Observations	Cloudy	Cloudy	Cloudy	Cloudy	Cloudy	Cloudy
Odor	None	None	None	None	Musty	Musty
Other Relevant Observations	Litter	None	Trash	None	Leaves, Some Trash	Leaves, Some Trash

Sample ID & Location	Sampling Event 4 - November 24, 2004					
	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6
	Renfrew & Columbia Streets	Adams DPW Facility	Hoxie Brook	Adams Post Office	Glen Street	Duplicate
Analytical Parameters						
Fecal Coliform (colonies/100 mL)	600	700	3,100	1,900	-	-
e. Coli (colonies/100 mL)	400	500	2,600	1,200	-	-
Total Suspended Solids (mg/L)	59	75	15	68	-	-
Total Phosphorous (mg/L)	0.21	0.34	0.07	0.26	-	-
Sampling Event Notes						
Designated Collection Time After Flow is Observed	24 Min.	18 Min.	20 Min.	12 Min.	Sample not collected, late afternoon sampling event.	Sample not collected, late afternoon sampling event.
Time Flow was Observed	3:45 PM	-	4:00 PM	4:00 PM		
Sample Collection Time	4:04 PM	3:56 PM	4:15 PM	4:10 PM		
Time Between Start of Flow and Sample Collection	19	-	15	10		
Temp (^oC)	8	9.5	6.5	8		
Water Level/Flow	High	High	Normal	Normal		
Turbidity Observations	Very Cloudy	Cloudy	Cloudy	Clear		
Odor	None	None	None	None		
Other Relevant Observations	None	None	Trash	None		

Notes:
*TSS/TP was collected at 9:40 AM and bacteria was collected at 9:47 AM.



LEGEND

- Potential Sample Locations
- BRPC Warmspots (See September, 24 2003 QAPP)

Drainage Structures
- Catch Basin
- DI
- Drain Manhole
- Other
- Storm Drain Pipes

Hydrography
- Land, Island
- Reservoir
- Wetland
- River
- Lake, Pond
- Parcels
- Sub-watersheds

N
W E
S

1000 0 1000 2000 Feet

Source: BRPC & MA GIS

Figure 4-2

Field Map BRPC Warm Spots & Potential Sample Locations

- Sample could not be collected due to sampling device lost in river (Event # 2);
- Laboratory duplicate analysis was not performed for all sampling events (Event # 3 & # 4); and
- Field duplicates were not collected and a sample location was missed (Event # 4) due to storm event timing and staff constraints.

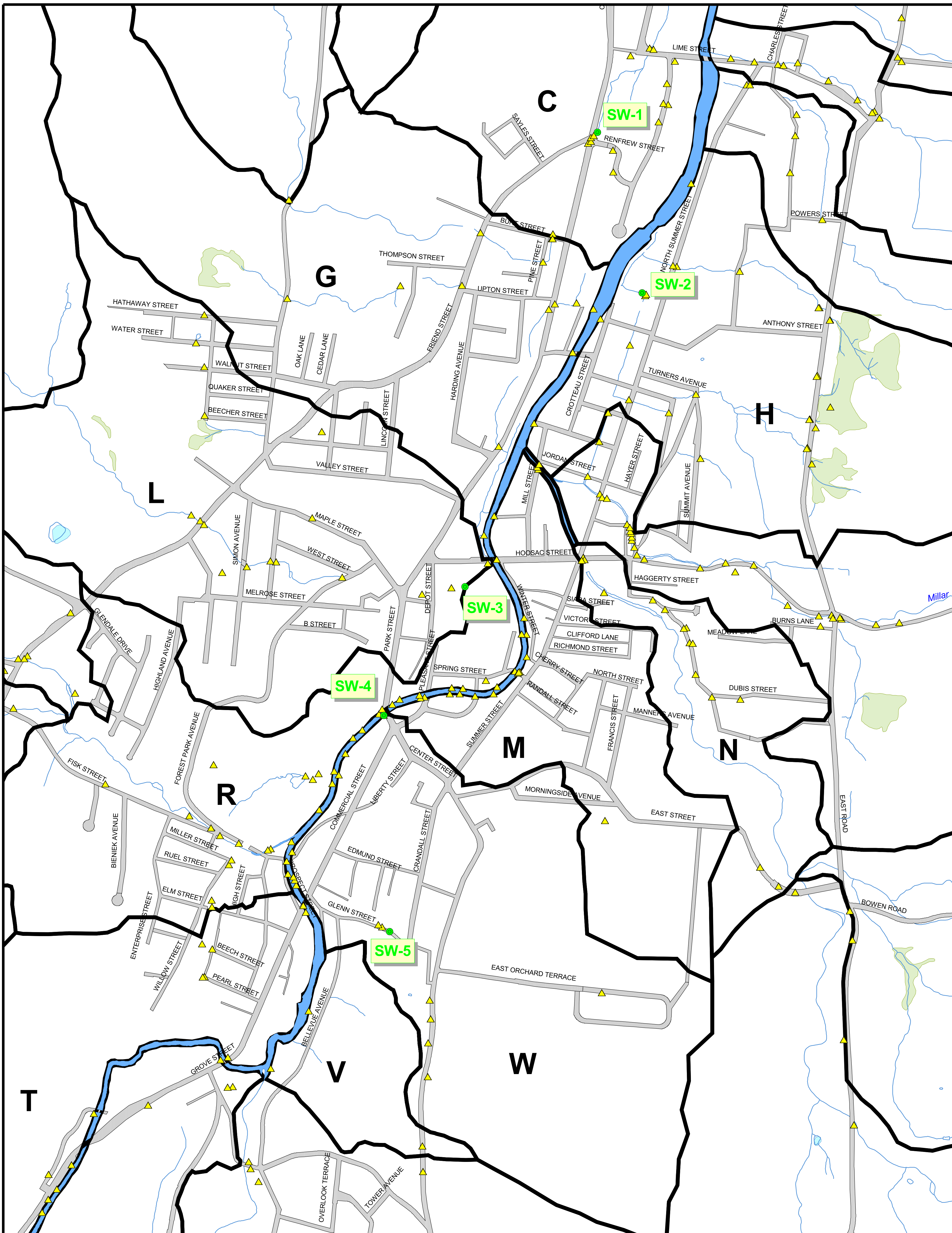
Despite these inconsistencies with the QAPP, the monitoring data trends are comparable from one storm event to another. Future stormwater sampling programs should emphasize equipment needs, training, and a thorough review of the QAPP requirements for all sampling program staff.

Bacteria Results

Sampling data for fecal coliform and E. coli bacteria are very high. These results are representative of sanitary wastewater or a major fecal waste source, particularly the values for sampling events # 2 and # 3. There is no specific standard or threshold for bacteria levels in stormwater discharges, rather existing standards are geared towards receiving waters. The Massachusetts water quality standard for E. coli bacteria in Class B waters is 200 colonies/100 ml. The 1997 Hudson River Basin Water Quality Assessment Report (MA DEP 2000) outlines a dry weather recreation threshold of 400 colonies/100 ml and a wet weather threshold of 2,000 colonies/100 ml. These thresholds are provided as guidance only and apply to in-stream concentrations, which are not comparable to individual stormwater outfalls.

However, some of the stormwater sample locations represent in-stream samples such as Hoxie Brook (SW-3), Pine Street Brook (SW-1) and the unnamed tributary at the DPW Facility (SW-2). Locations SW-1 and SW-2 are minor tributaries to the Hoosic River, but nonetheless are considered surface waters that had in-stream bacteria concentrations greater than the 2,000 colonies/100ml threshold during stormwater sampling events. Nearly all of these three locations exceeded the wet weather threshold during 3 out of 4 sampling events. Perhaps the most significant example of an in-stream bacteria concentration for a major tributary to the Hoosic River is the September 17, 2004 sample on Hoxie Brook that showed an E. coli count of 120,300 colonies/100ml. Even greater is the Pine Street Brook sample at Renfrew and Columbia Streets (SW-1) with an E. coli count greater than 250,000 colonies/100ml.

Irrespective of threshold comparisons for outfalls and tributaries, the stormwater sampling results demonstrate that bacteria loading from stormwater discharges is a significant contributor to the impairment of the Hoosic River.



LEGEND

- Stormwater Sampling Location
- Outfalls
- Drainage Subwatersheds

Hydrography

- Reservoir
- Wetland
- River
- Lake, Pond
- Stream, Brook

N
W E
S

1000 0 1000 2000 Feet

SCALE: 1:12000

Data Sources: MassGIS, Berkshire Regional Planning Commission (BRPC), CEI

Figure 4-3

Overview of Stormwater Sampling Locations

Adams, Massachusetts

Comprehensive Environmental Inc.

Typical bacteria sources that could potentially explain such high bacteria loading are provided below:

1. Significant deposits of animal fecal waste on land or in drainage systems due to the following potential scenarios:
   - Improper disposal of pet waste (observed during a field visit)
   - Rats, mice, pigeons, raccoons, etc. inhabiting drainage systems
   - Runoff from agricultural practices (manure piles, lagoons)

2. Cross-connections between the drainage and sewer systems and mixing of sanitary wastewater and stormwater, possibly due to:
   - Improper sewer connections
   - Back-up of sewer siphons
   - Sewer system surcharge and leakage through damaged pipes to subsurface soils and subsequent inflow to the drainage system
   - Backflow due to inadequate capacity of sewer systems caused by stormwater inflow associated with roof leaders, area drains, sump pumps, etc.

Untreated sanitary wastewater flows generally have bacteria concentrations that are too numerous to count or number in the hundreds of thousands of colonies. A sanitary wastewater flow that is diluted in stormwater, as a result of cross-connections between the sanitary sewer and drainage systems, provides a probable explanation for the very high bacteria results detected in stormwater samples; although, improper disposal of pet waste and animals inhabiting the drainage system are likely contributors since it was observed in the field. However, these sources generally do not produce a bacteria spike such as that observed at the Renfrew Street sample location SW-1 on August 12, 2004 (E. coli >250,000 colonies/100 ml).

Runoff from agricultural practices was not specifically targeted as part of the stormwater sampling program but was evaluated as a potential source based on land use. Based on Town and state MA GIS land use information and discussions with knowledgeable Town employees, agricultural land use (specifically cattle or dairy farms) is very limited in the sub watersheds and drainage areas where sampling occurred. Only two dairy farms are located in Adams, but neither of these operations are within any of the sample site sub watersheds.

Total Suspended Solids Results

Urban stormwater values for total suspended solids (TSS) can vary greatly and the range for the Adams data set is 1 to 410 mg/L. The Adams TSS data is a bit on the high side for some stormwater sampling sites and events, such as SW-2 (DPW Facility) for Event #1 and the data set for Event #2, when compared to the overall data set. This may be affected by numerous activities in the sub watershed around the time of sampling such as the storage of road materials (e.g., DPW Facility), land disturbances, recent street sweeping, and flashiness of the storm event. Lower TSS data may indicate that a recent "flush" occurred (just beyond the required minimum 3 days prior to sampling) so that there were fewer solids picked up with stormwater at the sampling date. For example, TSS data for Event # 3 is more consistent with historical stream data in Adams (refer to Section 2.3). In general, TSS data indicates the amount of solids that is in stormwater, which serve as the transport mechanism for many pollutants (i.e., pollutants stick to sediments) and result in toxicity and sedimentation of water bodies.

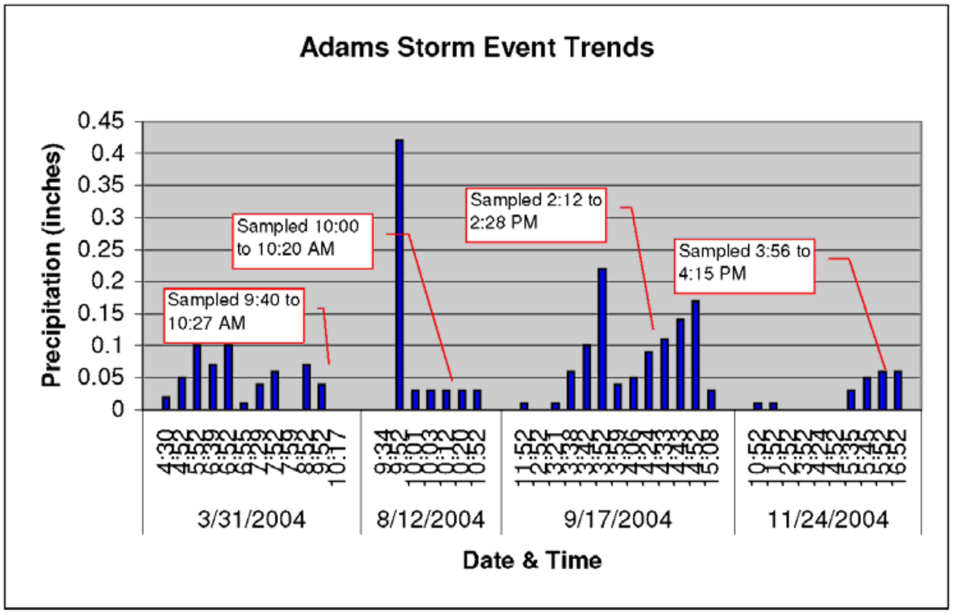
Total Phosphorous Results

The average concentration for total phosphorous in Adams stormwater is 0.32 mg/L (average for all results, including duplicates). As a reference point, published data for total phosphorous in urban runoff shows an average concentration of 0.46 mg/L (Urban Lake Management publication Vol. 3, No.4 - December 2001, by the Center for Watershed Protection). In-stream historical data for the Hoosic River and its tributaries in Adams shows a total phosphorous range between 0.01 mg/L and 0.04 mg/L.

Total phosphorous concentrations provide an estimate of pollutant loadings from stormwater and a gauge of water quality. In general, phosphorous can be used as an indicator of water quality impairment from urban areas. By itself, phosphorous is a nutrient that can cause eutrophication and impair water quality in high concentrations. Generally, lakes and ponds are affected most due to extended detention times.

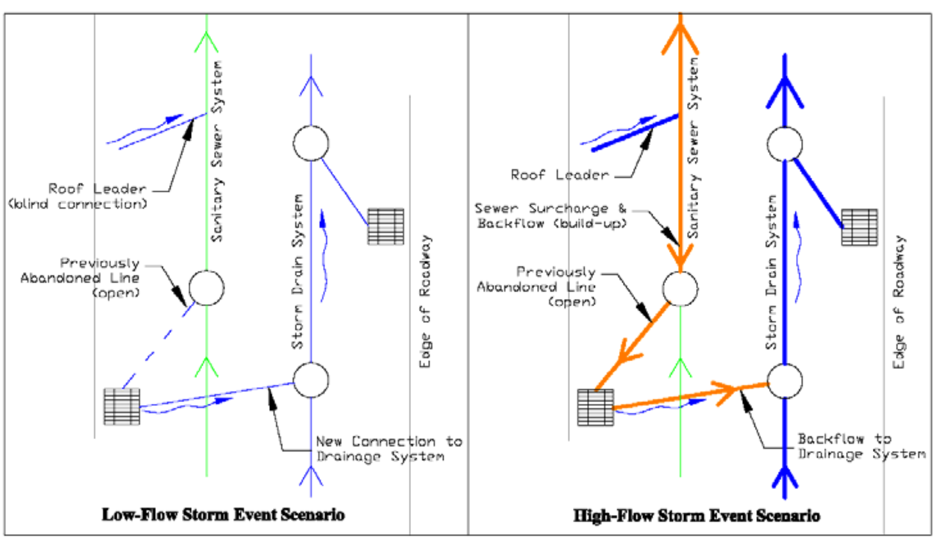
Storm Event Characteristics

A closer look into the rain storm characteristics of each stormwater sampling event reveals an interesting relationship that supports the possibility of backflow/cross-connections between the sanitary sewer and drainage systems, as discussed above. Precipitation data from the North Adams weather station is provided (data sheets are available in Volume 2 Technical Materials of the Stormwater Management Strategic Plan) for each storm event, as illustrated below.



Source: weatherunderground.com, daily history, North Adams weather station.

As shown, the August and September events were quick, flashy storm events and the March and November events were more gradual, smaller precipitation events. All stormwater samples were collected during first flush conditions, once flows discharged from the drainage system. However, the August and September events caused greater flows due to more water in a shorter period of time, which may have caused sanitary sewers to back up into the drainage system. In this case, the sewer system would not be able to handle the excess storm flow (due to connected area drains, roof leaders, etc.) and would back up into the drainage system through blind cross-connections or inadequately plugged abandoned lines. An example of this type of scenario is illustrated below.



Notes: This is a possible cross-connection scenario that would result in the high bacteria levels detected during storm events. Many variations for cross-connections are possible.

The 1987 I/I Study points out several sewer system issues and problem areas for the Town of Adams, including those described above and those outlined below, many of which fall within the stormwater sample site sub watersheds. The following observations were made based on review of the 1987 I/I Study and sampling results:

- Deterioration, blind connections and abandoned lines in the system indicate that changes have occurred over time and it is possible that some infrastructure modifications (sewer and drainage) unintentionally resulted in cross-connections between the sanitary sewer and drainage systems.
- In a recent example (2004), a residential sewer connection was made to an abandoned line on East Street near Morningside Avenue. The line was immediately disconnected once the contractor realized the error and connected to the active sanitary sewer line. This scenario, however, is equally likely for similar connections to and from the drainage system.
- The 1987 I/I Study recommended removing inflow sources such as area drains and catch basins and connecting to the drainage system. It is possible that some of the original discharge lines were not fully plugged and remain connected to the sanitary sewer system, acting as an inlet to the drainage system when the sewer system surcharges.
- The stormwater sampling results are indicative of sanitary waste mixing and the most probable causes for elevated bacteria in stormwater are improper connections (either direct or indirect).
- **Conclusion –** the apparent mixing of sanitary waste with stormwater is perhaps the most significant impact to the Hoosic River and requires the most immediate attention.

Based on these observations, a more detailed review of the 1987 I/I Study is needed to identify and address known sewer problems. Summary tables of sewer system problems from the 1987 I/I Study are provided in **Appendix 4C**. Sanitary waste discharges are discussed further in Section 4.5.

4.5 Illicit Discharge Detection & Elimination Program

An Illicit Discharge Detection and Elimination (IDDE) Plan was prepared as part of this project and is included in Volume 2 of the Stormwater Management Strategic Plan. This section summarizes the IDDE Plan and the results of recent implementation efforts to address non-stormwater discharges.

IDDE Program Summary

Every IDDE Program begins with an IDDE Plan, which serves as the basis for conducting investigations of the drainage system for non-stormwater flows and eliminating discharges that represent a pollution source (referred to as an "illicit discharge"). The IDDE Plan represents a strategy in the form of a work plan and contains the following:

- Prioritization of Illicit Discharge Detection and Elimination Activities: IDDE activities involve mapping stormwater outfalls, field inspection of stormwater outfalls and investigation and elimination of flow sources. These activities can be time consuming and costly, therefore, it is best to prioritize the areas of Town that have the greatest likelihood for illicit discharges and begin investigations there. The Adams prioritization scheme included an evaluation of historical water quality data and investigations, sewer system and drainage system infrastructure, and land uses. This resulted in the following prioritization of sub-watersheds:

    - High Priority – L & R
    - Moderate-High Priority – B, C, G, H, K, M, O, T, U, W, Z
    - Moderate Priority – A, D, E, F, I, J, N, P, Q, S, V, X, Y

- Identification of Illicit Discharges: this portion of the IDDE Plan outlines the process and procedures for conducting illicit discharge investigations, as well as parameters for sampling and data evaluation guidelines. EPA recommends the following sampling parameters under the Phase II stormwater guidelines:

    - *E. coli*, pH, specific conductivity, ammonia, temperature and surfactants

- Elimination of Illicit Discharges: methods for preventing and eliminating illicit discharges are discussed in the IDDE Plan. Enforcement to remove illicit discharges is discussed in greater detail in Volume 2 and relevant public education information has been incorporated into Section 7.0. This is important for future Phase II compliance since communities are required to incorporate information on illicit discharges into their public education and involvement programs, as well as develop a regulatory method/mechanism to prohibit and enforce the removal of illicit discharges.

  As the IDDE Program is implemented, the Town of Adams will be working to eliminate illicit discharges that are discovered and will continue to fulfill the requirements of the Phase II stormwater program, as well as improve water quality in Town.

IDDE Investigation Results

Recent field investigations for illicit discharges were conducted as outlined below:

- May 17 & 18, 2004 – as a result of stormwater sampling Event #1, location SW-2 was further evaluated as a potential illicit discharge due to an E. coli count of 4,100 colonies/100 ml and an elevated phosphorous level of 1.014 mg/L. The Adams DPW investigated the discharge by tracing the flow source during dry weather conditions and sampling for fecal coliform (analyzed by the Adams WWTP, colonies/100 ml) at the following upstream locations (see Figure 4-4):

    - SW-2A (flow from North Summer Street) = 47
    - SW-2B (flow from south of DPW Facility) = 417
    - SW-2C (north side of West Kittler Ave.) = 1,575
    - SW-2D (Kittler Ave. at Richmond Lane) = 105

  Location SW-2C is on the high side and indicates that an illicit discharge source may be present; however, there was no apparent flow at this location. It is possible that leachate from nearby sewers is contributing to this location and flow is not pronounced or easily discernable. The 1987 I/I Study indicates that a portion of the sewer at Kittler Ave. and North Summer Street has broken and damaged pipes, off-set joints and roots. Based on this information, this location requires further investigation to validate the bacteria source and evaluate the need for sewer system repairs.

- November 18, 2004 – Town personnel from DPW and Community Development conducted outfall inspections and illicit discharge investigations with CEI as part of an IDDE training effort and to implement the IDDE Plan. Field inspection data sheets, outfall maps and photos are provided in **Appendix 4D** and the results of the outfall inspections are summarized in **Table 4-5**. Field investigation highlights from Appendix 4D are provided below with sample photos:

    - Over 40 outfalls were inspected in sub-watersheds L, R, M and W. Fourteen of these outfalls were sampled for fecal coliform and portions of the drainage system were investigated to identify potential flow sources and screen for cross-connections. Outfall samples were not analyzed for additional parameters (e.g., E. coli, ammonia, surfactants) due to budget constraints for the project and laboratory capabilities at the Adams WWTP.

Table 4-5. Significant IDDE Field Screening Results for Stormwater Outfalls in Adams

Samples at Flowing Locations	**18-Nov-04**													
	M-1	**M-2**	**R-8**	**HO-P4**	**HO-P5**	**HO-P7**	**HO-P6**	**R-9**	**W-2**	**HO-P16**	**SW-3**	**Hoxie Mid**	**Upstream Hoxie**	**H-P4**
Sample ID & Location Aid (description)	Myrtle Street	Spring Street	Rail Trail/ Commercial Street	Commercial Street	Rail Trail/ Russell Field	Rail Trail/ Russell Field	Commercial Street	Harmony Street	Route 8	Route 8	Downstream Hoxie, Interior Alt., Hoosac Street	Middle of Hoxie, beneath downtown	Hoxie Brook @ West Street	Simon Ave., south of stream
Analytical & Field Parameters														
Fecal Coliform (colonies/100 mL)	0	470	10	0	10	0	0	0	30	0	80	170	150	Not Sampled*
Total Dissolved Solids (ppm)	470	716	229	405	216	245	321	173	239	469	134	119	126	554
Temp (oC)	10.7	8.3	10.5	13.0	8.4	11	9.2	9.4	9.1	10.8	7.8	7.5	8.3	10.8
pH	8.48	8.75	7.89	7.74	8.35	8.03	8.1	8.54	8.38	8.19	8.52	8.41	8.36	8.0
Conductivity (uS)	943	1434	464	811	429	500	633	361	477	938	276	239	252	1127
Sampling Notes														
Flow appearance/ color	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Cloudy/ milky	Clear	Clear	Clear	Clear	Clear	Clear
Odor	None	None	None	None	None	None	None	None	Sewage	None	None	None	None	Sewage
Other Relevant Observations		pigeon droppings	weep hole	sudden short flow	from stream	moss, orange	orange stains	leaves	pigeon droppings		leaves		leaves	pipe 1/2 submerged
Interpretation/ Recommendation														
Refer to #s Below	2	1	5	2	5	5	2	5	3	2	5	5	5	3, 4

*This outfall was observed after the cut-off time for analyzing samples at the Adams WWTP.

1. Trace flow to identify bacteria source & collect additional samples.
2. Trace flow, identify flow source. Elevated field parameters (conductivity or temperature) indicate an illicit discharge may be present, but not a likely bacteria source at this time.
3. Re-sample at outfall for bacteria, trace flow.
4. Investigate flow source, possibly nearby sewer for leaks.
5. Low priority. Conduct additional sampling in future to develop a data trend for comparison to Town-wide data, trace sources that significantly exceed threshholds outlined in the Adams Illicit Discharge Detection and Elimination Plan. Screen outfalls that discharge nearby to identify potential bacteria sources (Hoxie Brook locations).

- Previously unmapped stormwater outfalls were screened for illicit discharges to update the Town base map (see Appendix 4D). Outfalls were assigned ids that correspond with the contributing drainage subwatershed (e.g., M-1, M-2), unless they were previously inspected (e.g., BRPC field inspections in 2003).

- No apparent illicit discharge sources were detected at flowing outfalls based on bacteria sampling, but some areas require additional investigations to evaluate elevated field parameters (e.g., conductivity and temperature).

- At outfall HO-P4, a sudden short flow was observed. Although bacteria was not detected, field observations require additional investigation to confirm that the flow is not a pollutant source (e.g., wash water).

- A non-flowing suspect sewer outfall (HO-P12) was observed at the Hoosic River flood control chutes near MacDermid Mill.

- Direct floor drain connections from a former autobody shop and two suspect discharge pipes were observed in the underground portion of Hoxie Brook in downtown Adams. None of the pipes appeared to be plugged. Unidentified pipes could be an active or inactive roof leader or sanitary sewer discharge.

- Unknown pipes (i.e., roof leaders or sanitary sewer discharges) were observed in Hoxie Brook about mid-way through the underground portion of Hoxie Brook. The origin of these pipes could not be verified since there are no mapping reference points for this portion of the brook (i.e., field teams could not determine their location beneath downtown Adams).

- Portions of the underground culvert for Hoxie Brook are deteriorated and may not be structurally sound. Specific sites include the steel and concrete culvert near Depot Street, below the former autobody shop, and the stone arch culvert beneath the downtown (upstream of Park Street).

- Suspected outfall and unidentified pipes were observed at the Aladco Plant, but could not be confirmed (pipe appears to be below the Hoosic River water line).

4.6 Recommendations

The stormwater assessment activities under this project have resulted in a great deal of information on stormwater quality and its potential impacts to the Hoosic River and its tributaries. Based on this information, several recommendations referred to as Best Management Practices (BMPs)[2] have been developed to address water quality impacts. BMPs are broken down into two categories:

1) Non-Structural – generally includes activities such as field assessment and inspections, water quality sampling and river or stream cleanups.

2) Structural – consists of a physical structure, device or control to address stormwater issues. Examples include deep sump catch basins, water quality swales, infiltration islands, detention basins, sediment forebays, etc.

The stormwater assessment recommendations focus on the following key issues:

1. Stream degradation, erosion and habitat quality.
2. Reduction of pollutant loadings from urban areas.
3. Existing areas of concern and ongoing stormwater impacts.
4. Drainage and sanitary sewer system infrastructure.
5. Follow-up field investigations/assessments.
6. Opportunities for water quality improvements.

These BMP recommendations are discussed in more detail below.

4.6.1 Non-Structural BMPs

Stream Assessment Recommendations

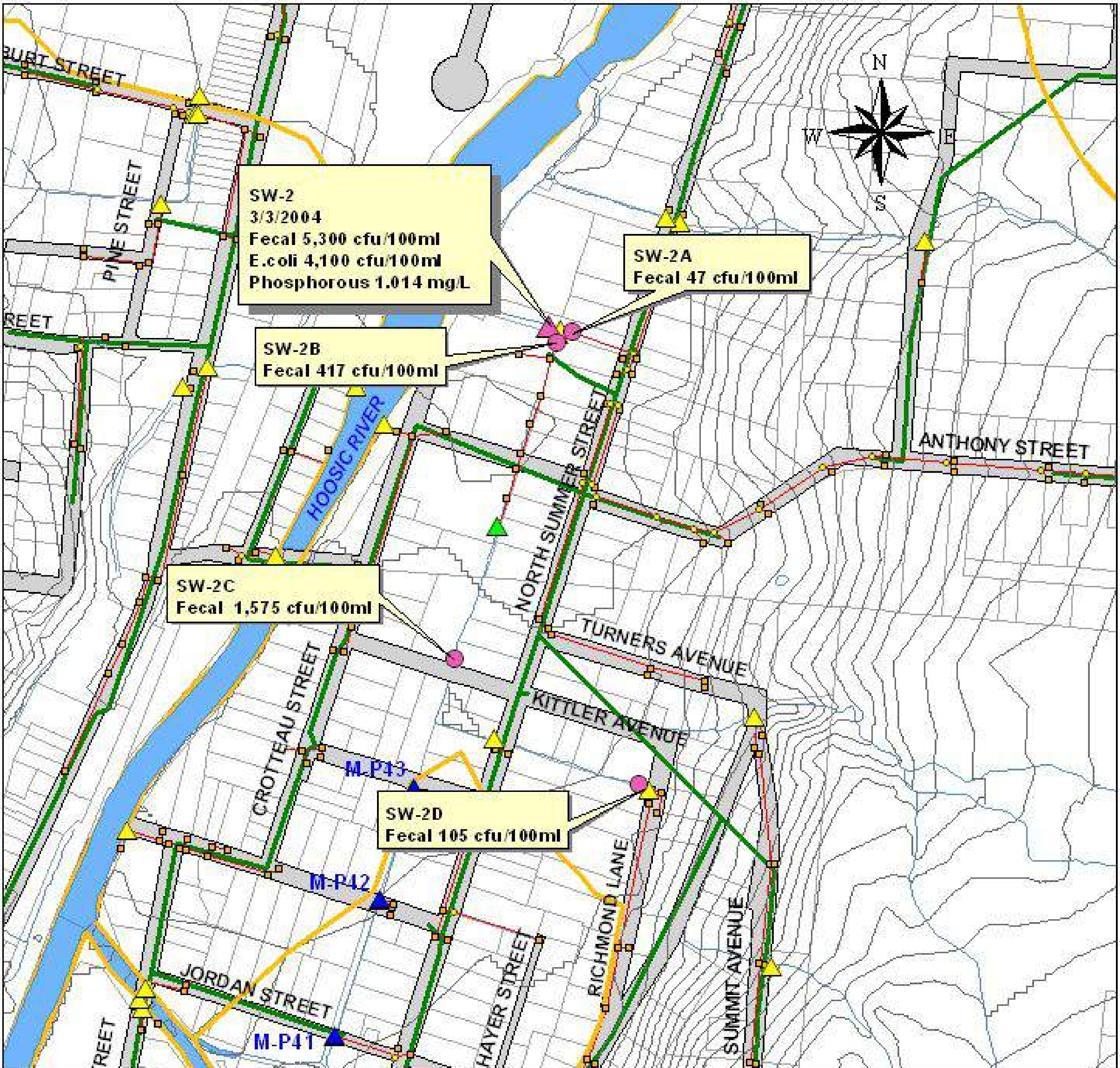
1. Conduct river clean-ups for the following river segments: Hoosic River, Section 1, Leonard Street/Route 8 to Cheshire/Adams town line; Hoosic River, Section 2, Aladco to Leonard Street (Route 8); Tophet Brook (north bank near East Road;) Miller Brook; Southwick Brook; Hoxie Brook.
2. Evaluate erosion in the following river segments: Hoosic River, Section 2, Aladco to Leonard Street (Route 8) (in the vicinity of Bellevue Avenue;) Southwick Brook (lower section).
3. Investigate water quality in the following river segments: Hoosic River, Section 3, Post Office to Aladco (in the vicinity of Aladco;) Hoosic River, Section 4, Hodges Cross Road to Center Street (in the vicinity of the water treatment plant and in the vicinity of Lime Street.)

[2] A Best Management Practice can be defined as any structure or activity that is employed as the most effective non-polluting practice

4. Remove debris in the following river segments: Hoosic River, Section 4, Hodges Cross Road to Center Street (at the cable supporting the high tension tower;) Pecks Brook (in the vicinity of Fisk Road Dam.)
5. Mitigate sedimentation/erosion in the following river segments: Tophet Brook (in the vicinity of the Tophet Brook Farm;) Pecks Brook (in the vicinity of West Road;) Hoxie Brook.
6. Investigate potential for access in the following river segments: Hoosic River, Section 4, Hodges Cross Road to Center Street; Tophet Brook (in the vicinity of the area known as the Cascade and in the vicinity of the Bowens Corners;) Southwick Brook; Pecks Brook (in the vicinity of Peck's Falls.)
7. Investigate pollution prevention opportunities in the following river segments: Tophet Brook (elimination of cows from riparian zone;) Miller Brook (prevention of stormwater runoff from driveways.)
8. Investigate flood prevention opportunities in the following river segment: Southwick Brook (lower section.)
9. Investigate educational opportunities in the following river segment: Hoxie Brook (in the vicinity of the Hoosic River confluence.)

Illicit Discharge Detection & Elimination/Water Quality Analysis

1. Conduct follow-up assessments and corrective actions to the May 17 & 18, 2004 and November 18, 2004 IDDE investigations to confirm and/or remove known illicit discharges from drainage systems and waterways. Significant problem areas are discussed in Section 4.5 above and recommendations for flowing outfalls are outlined in Table 4-5.
2. Address structural support issues for the culvert that carries Hoxie Brook beneath the former autobody shop and stacked stone arch portions upstream of Park Street.
3. Confirm and map all stormwater outfalls in Town, starting with the Hoosic River. Field verification from within the flood control chutes is advantageous for accurately identifying previously unmapped outfalls.
4. Continue screening outfalls in accordance with the IDDE Plan and sample flowing outfalls for bacteria and other parameters as budget allows. The Town of Adams should target at least 50 outfalls per year for outfall screening and illicit discharge investigations. Utilize the Adams WWTP for bacteria analysis as part of water quality assessment and IDDE activities.



LEGEND

- Bacteria Sample Location
- Stormwater Sample Location

Outfalls
- Inspected Stormdrain Outfalls
- Stormdrain Outfalls
- Stormdrain Inlet

Drainage Structures
- Catch Basin
- Drain Manhole
- Storm Drain Pipes
- Sewer Pipes

Hydrography
- Land, Island
- Reservoir
- Wetland
- River
- Lake, Pond
- Stream
- Elevation Contours
- Drainage Subwatershed

200 0 200 400 600 800 1000 Feet

Data Source: MassGIS, Berkshire Regional Planning Commission, CEI

Figure 4-4

Adams DPW
Illicit Discharge Investigation
May 2004

Comprehensive Environmental Inc.

5. Conduct stormwater sampling upstream of sites SW-1 through SW-5 to evaluate pollutant loadings from drainage areas upstream of the sanitary sewer system. Consider adding ammonia and surfactants to the list of analytical parameters and sampling during and after first flush during high flow storm events (e.g., >0.25" in 1 hour or less).
6. Conduct smoke testing of the drainage system to identify cross-connections from the sanitary sewer system that may be contributing pollutant loadings during storm events. Starting points should be based on the results of Task 5 above. Conduct smoke testing of unidentified pipes in the underground portion of Hoxie Brook.
7. Conduct a detailed review of the 1987 I/I Study for the sanitary sewer system to confirm the remaining problem areas that have not been addressed.
8. Evaluate the Town's existing Five Year Capital Improvement Plan with respect to sewer and drainage repairs to prioritize sewer repairs that will result in the greatest water quality improvement. This evaluation should incorporate the review of the 1987 I/I Study, as discussed above.
9. Continually evaluate new data for streams and the Hoosic River in Adams with existing efforts to mitigate stormwater impacts and pollution sources. This includes ongoing studies such as the MA DEP 2002 Water Quality Monitoring for Peck's Brook, Tophet Brook, Dry Brook, and the Hoosic River.
10. Inform residents about the effects of illicit discharges and illegal dumping through the results of IDDE activities. The results of field activities should be incorporated into the Town's stormwater public education program.

4.6.2 Structural BMPs and Conceptual Designs for Priority Stormwater Sites in Adams

Structural BMPs are used to treat stormwater by removing pollutants associated with sediment or providing natural attenuation of pollutants through infiltration and more "natural" stormwater conveyance systems (e.g., vegetated swales, islands, and detention ponds). The feasibility of these BMPs was evaluated for numerous sites in Adams based on field assessments, historical information related to water quality hot spots and site constraints, as discussed in Section 4.3 and the Adams stormwater QAPP. Based on this work, the following five priority stormwater sites were selected to develop conceptual BMP designs for future stormwater remediation and demonstration projects:

- Renfrew Park – Parking Lot BMPs (project completed)
- U.S. Post Office – Runoff Prevention Methods (RPMs)

- Adams DPW Yard – Wetlands Treatment
- Glen Street – Swale Rehabilitation/Stabilization and Cascading Check Dams
- Hoxie Brook Downtown – Stream Restoration and Urban Runoff BMPs

The focus of these proposed BMPs is to provide sediment removal and stormwater infiltration/treatment that will reduce pollutant loadings such as bacteria to receiving waters in Adams. Conceptual designs for the recommended BMPs are provided at this time. Final designs must be completed for construction and all of the recommended BMPs should be designed to meet the requirements of the Massachusetts Stormwater Management Policy for 80% removal of total suspended solids. However, some sites have large storm flows and multiple BMPs throughout the drainage area will be needed to meet this sediment removal efficiency. The conceptual designs for the five BMP sites are briefly discussed below followed by a comparative analysis. More detailed descriptions, designs and site photos are provided in **Appendix 4E**.

<u>Renfrew Park – Parking Lot BMPs</u>
BMP conceptual designs were submitted to the Town of Adams in advance of upcoming reconstruction activities for Renfrew Park with the intent of incorporating parking lot BMPs into the project. Some of the proposed BMPs, primarily leaching catch basins, were incorporated into the new construction (Renfrew Park Renovation Project, Phase I). Leaching catch basins that were incorporated into the project are shown on the conceptual designs in Appendix 4E, along with the other proposed BMPs.

<u>Adams DPW Yard – Wetlands Treatment</u>
The Adams DPW Yard along North Summer Street provides an opportunity rarely found for stormwater treatment near tributaries and the Hoosic River in Adams: sizable, vacant Town-owned land. This BMP site consists of a shallow marsh wetland treatment system and park.

<u>Hoxie Brook Downtown – Stream Restoration and Urban Runoff BMPs</u>
This site includes conceptual BMPs to address stream degradation, water quality, and stormwater issues at Hoxie Brook adjacent to the Ashuwillticook Rail Trail and the Adams Visitor Center on Hoosac Street in downtown Adams.

<u>Glen Street – Swale Rehabilitation/Stabilization and Cascading Check Dams</u>
This site consists of a steep drainage swale, approximately 320 feet long, adjacent to Glen Street at the intersection of Crandall Street. Stormwater

remediation goals at this site include reducing/buffering stormwater flow velocities, sediment removal by check dams and some attenuation through infiltration (due to ponding) and vegetative plantings.

U.S. Post Office – Runoff Prevention Methods (RPMs)
The U.S. Post Office and commercial building along Commercial Street and Center Street represent one of the many impervious urban areas in downtown Adams along the Hoosic River. Minimal stormwater treatment occurs at these areas as stormwater is piped directly to the river. The goal of BMPs at this site is to prevent runoff and provide stormwater treatment to the best extent possible, while serving as a demonstration project for future redevelopment projects.

Comparative Analysis

A comparative analysis is provided in **Table 4-6** to weigh the potential water quality benefits of the conceptual BMP designs described above with implementation and maintenance costs, as well as other design and project considerations. The comparative analysis represents a subjective comparison of sites due to the varying considerations for BMPs and the potential water quality benefits.

The Renfrew Park parking lot BMPs have been temporarily removed from the following ranking since some conceptual BMPs have already been incorporated into the site and no further construction is expected. The remaining conceptual BMP sites are listed below in order of priority based on the priority ranking scheme outlined in **Table 4-7**.

1. Adams DPW Yard – Wetlands Treatment
2. Hoxie Brook Downtown – Stream Restoration and Urban Runoff BMPs
3. Glen Street – Swale Rehabilitation/Stabilization and Cascading Check Dams
4. U.S. Post Office – Runoff Prevention Methods (RPMs)

4.6.3 BMP Opportunities for Redevelopment

The cost of retro-fitting existing drainage systems and implementing structural BMPs in already developed areas is costly. However, when coordinated with proposed redevelopment activities, implementation becomes easier and more cost effective. The Adams Downtown Revitalization Program provides an ideal opportunity for the Town to encourage and incorporate stormwater BMPs into downtown redevelopment projects. BMP opportunities for redevelopment sites in downtown Adams and throughout Town are outlined below with conceptual design drawings provided in Appendix 4E.

BMPs for Pavement Redevelopment - stormwater runoff and treatment are difficult to mitigate in downtown Adams due to limited space and large impervious surfaces. However, stormwater runoff can be reduced and treatment effectiveness increased by handling small portions of runoff at numerous locations. Paved areas with low traffic can be used for stormwater treatment by infiltrating the first flush of storm events, as described in the BMPs below.

- **Brick Paver Gutter Line –** these BMPs can be incorporated into any parking or roadway redesign project where stormwater collects along the edge of a low traffic area such as on-street parking in downtown Adams. An example site is provided below.

On-street parking area and potential brick paver gutter line BMP in front of the Adams Town Hall.

- **Porous Pavement** – when properly maintained, porous pavement is an effective BMP for removing pollutants during first flush and small stormwater events. This BMP is ideal for redevelopment projects that involve parking areas, particularly temporary or seasonal parking. Porous pavement should also be considered as an alternative for walking paths and similar applications.

Table 4-6. Conceptual BMPs Comparative Analysis[1]						
Site & Conceptual BMPs	**Estimated Cost[2]**	**Maintenance & Comparative Costs**	**Reliability for Pollutant Removal**	**Implementation Constraints**	**Wildlife Habitat Potential**	**Additional Considerations**
Hoxie Brook Downtown – Stream Restoration & Urban Runoff BMPs	$395,000	Sediment removal from detention areas and stormwater structures every 1-2 years. Spring and fall park and greenery maintenance.	Moderate to High	Land ownership at adjacent industrial properties (owners contacted and cooperative)	High	High-profile site in downtown Adams adjacent to the Berkshire Visitor's Bureau. Ideal demonstration project for a variety of stormwater BMPs, waterway restoration & public education.
Glenn Street – Swale Rehabilitation/ Stabilization & Cascading Check Dams	$27,000	Sediment removal from detention basin and check dams every 1-2 years.	Moderate	Potential ownership/ easement issues. Steep slopes and equipment accessibility.	Moderate	The Town of Adams would like to construct this BMP as part of an in-house DPW construction project.
U.S. Post Office – Runoff Prevention Methods (RPMs)	$192,000	Spring and fall bioisland maintenance and sweeping of porous pavers and infiltration strips. Cleaning of roof leader dry wells every 5 years. Deep cleaning and removal of porous pavers, infiltration strips and bioisland inlets every 5 years to remove fine sediments and restore infiltration capacity.	Moderate	Land ownership for two properties, site constraints include soil type and groundwater elevations/ hydraulic loading along flood control chutes	Low	High-profile site in downtown Adams along the Hoosic River. High exposure site for demonstration project.
Adams DPW Yard – Wetlands Treatment	$106,000	Sediment forebay cleaning every 2 years. Spring and fall park and greenery maintenance. Wetland longevity ~20 years	High	Widely applicable if land is available. Potential ownership/ easement issues with Army Corps of Engineers	High	One of the few locations in Adams where ample Town-owned land is available.

Notes:

1. The conceptual BMPs comparative analysis is based on the "Comparative Assessment of the Effectiveness of Urban Best Management Practices" (Table 1) of the Design of Stormwater Wetland Systems, Thomas R. Schueler, Anacostia Restoration Team (October 1992).
2. Estimated costs for BMP implementation include engineering design and construction costs (without construction services or permitting) but do not include potential costs associated with land ownership, easements, etc. A more detailed cost estimate was provided for the Hoxie Brook BMP site (including permitting) in anticipation of an upcoming grant project at this location. These costs should be updated, as needed, in the next two years.

Table 4-7. Conceptual BMPs Priority Ranking Scheme				
Ranking Criteria	Hoxie Brook Downtown – Stream Restoration & Urban Runoff BMPs	Adams DPW Yard – Wetlands Treatment	Glenn Street – Swale Rehabilitation/ Stabilization & Cascading Check Dams	U.S. Post Office – Runoff Prevention Methods (RPMs)
Estimated Cost <$50,000 = 3 points $50,000 - $150,000 = 2 points >$150,000 = 1 point	1 point ► >$150,000	2 points ► <$150,000	3 points ► <$50,000	1 point ► >$150,000
Maintenance & Comparative Costs 1-2 year maintenance frequency = 2 points Seasonal maintenance frequency = 1 point	1 point ► seasonal maintenance	1 point ► seasonal maintenance	2 points ► 1-2 year maintenance	1 point ► seasonal maintenance
Reliability for Pollutant Removal[1] High = 3 points Moderate to High = 2 points Moderate = 1 point	2 points ► Moderate to high	3 points ► High	1 point ► Moderate	1 point ► Moderate
Implementation Constraints[2] Moderate to low difficulty = 2 points Moderate difficulty = 1 point	2 points ► Moderate to low difficulty	1 point ► Moderate difficulty	1 point ► Moderate to low difficulty	1 point ► Moderate difficulty
Wildlife Habitat Potential High = 3 points Moderate = 2 points Low = 1 point	3 points ► High	3 points ► High	2 points ► Moderate	1 point ► Low
Additional Considerations[3] High exposure BMP site = 3 points Moderate exposure BMP site = 1 point	3 points ► High exposure	1 point ► Moderate exposure	1 point ► Moderate exposure	3 points ► High exposure
Total Ranking Score	**12 points**	**11 points**	**10 points**	**8 points**

Notes:

1. Pollutant removal reliability is based on similar BMPs discussed in Table 1 of the Design of Stormwater Wetland Systems (Schueler, 1992) for typical stormwater pollutants (TSS, bacteria, phosphorous, various organic compounds).
2. Implementation constraints are based primarily on land ownership issues and whether or not site access is readily available or likely to be approved.
3. Additional considerations are based on exposure as a stormwater demonstration project (mainly in downtown Adams where people frequently visit).

Sample of porous asphalt pavement with 20% void space. Source: University of New Hampshire

BMPs for traffic areas, such as porous pavement must be evaluated and designed for cold weather conditions and sediment loadings from winter sanding to avoid ice problems and clogging. It should be noted that existing applications for these BMPs in New England are limited and most projects are being implemented on an experimental basis to determine their effectiveness. Based on this information, these BMPs should be implemented on a small scale before advocating their widespread use.

- **Swirl Concentrator** – this BMP is a high-velocity stormwater treatment unit designed to handle a portion of stormwater flow from large storm drain systems in urban settings with moderate open space. The swirl concentrator is most effective for removing sediment and attached pollutants, but offers very limited treatment for bacteria. These units could be used in some urban areas of Adams adjacent to the flood control chutes to treat stormwater before it discharges to the Hoosic River.

Example of a swirl concentrator during final construction.

- **Bioislands** – these BMPs have been incorporated into the BMP conceptual design for the U.S. Post Office and have great pollutant removal potential due to organic mass and plantings, while utilizing existing site features and minimizing loss of space. Bioislands are an attractive alternative to common curbed and mulched islands that offer little stormwater benefit.

- **Leaching Catch Basins** – this BMP is easily incorporated into roadway and parking lot drainage reconstruction projects and becomes especially cost-effective if the project requires the replacement of existing deteriorated catch basins or drainage manholes. Leaching catch basins or manholes can be added to drainage systems in-line or stormwater can be diverted from existing "solid" sump catch basins to leaching manholes. These BMPs are an ideal application for the future roadway and drainage reconstruction planned for Friend Street, which will be led by the State of Massachusetts in about 6 years.

- **Infiltration Dividers** – a portion of parking areas is not used for direct travel, such as the overhang of vehicles beyond the wheels, and infiltration dividers can be used at these locations. These BMPs provide stormwater infiltration and natural attenuation from plantings and can be used in any compact urban setting. Infiltration dividers are ideal for large parking lots to handle a portion of the total runoff. Example sites in downtown Adams include the U.S. Post Office and Big Y parking lot, as shown below.

View of downtown Adams and the parking lot at the Big Y Super Market.

APPENDIX 4-A

Perennial Stream Assessment

Shoreline Survey Report:

Perennial Streams
in the
Town of Adams

Surveyed: August-December, 2002
Submitted: May 2003

coordinated by:
the Hoosic River Watershed Association
P.O. Box 667
Williamstown, MA 01267
413-458-2742
hoorwa@berkshire.net

report compiled by:
Duncan Eccleston

Table of Contents:

Participants:

Vicki-Sue DeMarsico, Donna Cesan, Penny Fehr, Leigh Ann Adams, Tom Ennis, Jason Ennis, Russ Cohen, Robin Avery, Heather Linscott, Paula Oparowski, Holly Mann, Adam Garrison, Rachel Contenta, S. Zimmerman and others who assisted these primary investigators.

HooRWA Staff:

Lauren Stevens, Executive Director
Duncan Eccleston, Executive Director
Shelly Stiles, Assistant Director
Richard Schlesinger, Monitoring Coordinator

Organizational Partners:

Hoosic River Watershed Association
Town of Adams Community Development Office
Berkshire Regional Planning Commission

Methodology:

This stream-team survey was undertaken to assess the perennial stream network in the Town of Adams as a component of a 604 (b) stormwater assessment grant. The methodology used was that of the Massachusetts Riverways Program's training for Stream Teams, also known as an Adopt a Stream Shoreline Survey. Data gathered using Stream Team methodology can be used to identify sites for: water quality monitoring, river clean-ups, and river access. The Town had particular interest in bank erosion, riparian health, riparian buffer conditions, in-stream obstructions, and potential illicit discharges, spills or leaks. The Hoosic River Watershed Association (HooRWA) was contracted by the Town of Adams to coordinate the survey, and worked with the Town and the Berkshire Regional Planning Commission (BRPC) to assess the streams and map the stormwater system using GIS technology for this report.

The first step in Stream Team methodology was forming a focus group. This focus group, responsible for planning the survey, was composed of representatives from the HooRWA and the Town of Adams. A key role of the steering committee was to solicit volunteers for the survey—this was done through newspaper articles in the North Adams Transcript and the Advocate, as well as inviting likely Adams residents and HooRWA volunteers, staff and board members to participate.

HooRWA monitoring coordinator Richard Schlesinger, with the help of Lauren Stevens and Shelly Stiles (then HooRWA assistant director) used USGS topographic maps to divide the perennial stream network within the Town of Adams into sections to be inventoried by volunteers. These sections were selected to be a manageable length, and were anticipated to require an afternoon on the water by volunteers. The BRPC supplied enlarged section maps and orthophotos to be used by volunteers.

A training session for volunteers was planned by then-executive director of HooRWA Lauren Stevens, which took place in the Adams Town Hall on the evening of July 15. This training educated volunteers about erosion, riparian conditions, discoloration, substrate, inflow from pipes, river obstructions, channelizations, land use and riparian buffers, and other topics. Volunteers also learned more about important characteristics the Hoosic River and its tributaries, such as the "flashy" nature of the drainage, threats to the historically cold water ecosystem, and he importance of shading and vegetative buffers.

Using an interactive slide show, volunteers became familiar with important data, and learned to record their findings using photos, Adopt a Stream data sheets, a narrative description, and maps. The meeting concluded after volunteers selected streams of particular interest to them, or were assigned segments, and a follow-up priority-setting meeting was scheduled for the following week. Volunteers left the training equipped with section maps, orthophotos, data sheets, instructions, a safety briefing, and a letter of introduction from Adams Town Manager James Leitch to land-owners, explaining the purpose of the shoreline survey.

In the following week, many volunteers were able to survey part or all of their assigned sections, and participants re-convened to share their findings on the evening of July 22. The goal of this meeting was to determine the most significant assets and problems they encountered on their surveys, and suggest priority municipal actions. At this time, many sections were complete, but others had been surveyed but the paperwork was incomplete (Southwick Brook, Lower Hoosic River), and others had not been surveyed at all (Dry Brook, Unnamed Brook). Each volunteer who had walked their assigned section was asked to list the most striking assets and problems they encountered, as well as priority actions to remediate the problem. The information gathered at this meeting was incorporated into the data sheets submitted by volunteers, and appears in the form of a chart below each segment's narrative description in this final report. Completed reports were collected, and volunteers who had not completed their reports were asked to finish the segments, record their data, and return the results to HooRWA.

Collecting all of the important information for this report became an ongoing challenge. There was a leadership transition at HooRWA, with a new executive director, Duncan Eccleston, joining the organization at the end of August. During the transition, the project lost momentum, and as the weather got colder, certain volunteers became reluctant to complete their sections. With the assistance of Donna Cesan and Leigh Ann Adams, several missing segments were surveyed, data collected, photos taken, and results returned to HooRWA. In another case, a volunteer, who had done a careful job of surveying two segments, did not have the time to write up her data on the sheets provided, so Duncan Eccleston and Leigh Ann Adams worked with her to record her data directly into the database. For these two segments, original data sheets do not exist, though annotated maps and an extensive file of photos do.

Compiling the data into maps and a final report was another challenge. Some volunteers were more conscientious about following the Stream Team data sheet format than others, and not every form was filled out completely. Nearly every annotated map was returned with water damage, and often the writing was difficult to read, due to the challenge of record-keeping in the field. Although many volunteers took photos, they did not in every case.

The information gathered by the stream teams was keyed to GIS maps by the BRPC and added to Adams storm drainage system maps and Mass-GIS data to provide a complete snapshot of stormwater and the perennial streams in the Town of Adams. Each point was given a unique identifier, linked to a photo when possible, and categorized as a pipe, debris, miscellaneous point of interest, or channelization. These points correspond with an Excel database that lists the pertinent information for each point.

More general information about stream segments is included in this report in the narrative descriptions. The narratives completed by volunteers form the core of these descriptions, though in many circumstances, important information gleaned from data sheets, maps and photos was included to create a more useful and vivid description of the segment. Some volunteers walked upstream, others downstream. The narratives follow the path of the observers. Each volunteer was asked to evaluate their sections as "excellent", "good", "fair", "poor", or "degraded". These subjective evaluations are included for each section, but the reader should be forewarned that each segment was evaluated by a different volunteer, therefore they might be internally inconsistent. That is, a section rated as "good" by one volunteer, might have more erosion, debris, pipes, and areas for concern than one rated "fair" by a different volunteer. Without a single person surveying every segment this inconsistency is unavoidable, so little weight should be placed on these subjective evaluations.

Assessment of Conditions of the Town of Adams Perennial Stream Network:

The municipal center of the Town of Adams lies in the narrow flood plain of the Hoosic River, between the Greylock Massif to the west, and the Hoosic Range to the east. Tributaries to the Hoosic River in Adams generally tumble down the steep forested slopes, pass through lightly settled agricultural land, and into more populated residential, commercial, and industrial land before they join the Hoosic River or larger tributaries.

The steep drainage basins of these tributaries and the Hoosic River mean that flooding and erosion are ongoing problems for residents, and many steps have been taken, by the Army Corps of Engineers, the Town, and private citizens to protect their property from the river. The Hoosic River is channelized in flood control chutes for over two miles through the center of town, and many of the tributaries are also channelized in these concrete structures as they approach the Hoosic. In many other cases, individuals have attempted to stabilize the banks of tributaries and the Hoosic using rip-rap, old tires, and retaining walls. Volunteers located innumerable examples of these attempts to protect property, and in many cases these structures are slowly eroding and becoming undermined by the river and streams.

This channelization is problematic in many ways. Although retaining walls might keep an individual piece of property from flooding or becoming damaged, it also increases the rate of runoff, which adds to the flooding and erosion problems downstream, and causes the streams to transport more sediment. The flood control structures, which include concrete bottoms, also severely inhibit the cleansing functions of a river. Because they are inhospitable to aquatic life and water flows smoothly, with little turbulence or aeration, contaminants are not broken down as swiftly as they might in a natural river. Also of concern is the lack of shading and vegetative buffer in these areas. Without shading, the river is prone to excessive heating and cooling, and minimal buffers don't help mitigate many of the problems caused storm runoff.

Debris is clearly a major problem in Adams' streams and rivers, and the most troubling examples are essentially dumping grounds. Many of these are historic—ancient pipes, hunks of metal, even old cars and motorcycles—and undoubtedly degrade the water quality of the Hoosic River. There is also evidence of more recent dumping, which suggests this is an ongoing problem. Volunteers located several dumps in or near streams that need immediate attention, and some of these are beyond the scope of a simple volunteer river clean-up—heavy equipment and lots of man-power is needed. A clean-up undertaken by HooRWA between Leonard St/ Rt. 8 and the top of the flood control chutes (at a site identified by volunteers) removed an immense amount of trash and debris, but barely made a dent in the total. Much still remains.

Many pipes were found that may discharge into the Hoosic River and tributaries. Because a Stream Team Survey requires just one visit, it is difficult to know which of these are discharging harmful effluent, which are storm drains, and which are inactive or disconnected. Nevertheless, certain pipes had notable scum or discoloration that bears further investigation in the next phase of this assessment. The most likely have been identified as potential "warm spots" and monitoring these sites is recommended.

Despite these maters of concern, the river and stream network of Adams is a real asset to the town. In the survey, many beautiful sections were explored that could host walking trails, swimming holes, and fishing spots. Access to many is limited, though the Ashuwillticook Rail Trail is a wonderful example of riverside recreational development. Many of the more remote sections are lightly used, and the upper sections of many streams are in near-pristine condition. More than one volunteer was surprised by the beauty of their segments—in many streams the most accessible spots are the most abused, but the hidden valleys and headwaters are spectacular. Tophet Brook, which is channelized by flood control chutes in its lower reaches, has many fine pools, a stunning cascade in the Little Egypt area of town, and a vibrant and intact riparian ecosystem.

While many stretches of river in Adams have been altered, channelized, dumped in, and abused, many of these same streams are inherently pretty, seemingly untouched in sections, and appear blessed with clean water. The following segment assessments will help identify most degraded and pristine areas, so that restoration, mitigation, and protection can take place as appropriate.

Hoosic River, Section 1, Leonard St/ Rt. 8 to Cheshire/Adams town line

Surveyors: Leigh Ann Adams, S. Zimmerman

Subjective Evaluation: “good”

Narrative:
After it crosses under route 8, the river passes along some old industrial/commercial sites on the south side where a great deal of trash was observed. The north side is a good distance away from a residential area, really shaded back here, condition of the river was really healthy: good flow, 1-2 feet deep in most parts, lot of pools. When the river crosses under the rail trail, the same conditions exist, although it’s not as wooded since the Ashuwillticook trail follows the stream from here upstream. Route 8 runs on the West side of the river, with residential land use and evidence of trash and home-made rip-rap (tires in sections) stabilizing the bank. On the east side, however, is the trail and beyond that another heavily wooded area. No farms up this way, though and no rip rap, and the river takes a nice shape and has some relatively short steep banks, approximately 5-7 feet high along the rail trail. Vegetation and wildlife were not evident when the section was surveyed, but in the summer this section becomes a popular fishing destination.

Assets	Problems	Priority Actions
Pretty, with excellent access provided by the rail trail	Trash and debris near Rt. 8	River clean-up
Fishing		

Hoosic River, Section 2, Aladco to Leonard St. (Rt. 8)

Surveyors: Leigh Ann Adams, S. Zimmerman

Subjective Evaluation: “fair”

Narrative:
This segment begins as the river regains its natural characteristics behind Aladco Laundry on Rt. 8. The east bank of the river is extremely steep as the river runs behind residences on Bellevue Ave. This area is characterized by heavy trash that may come from the houses above: mattresses, garbage, toys, metal, concrete blocks. This steep bank is quite eroded in sections. The river bends sharply to the west, providing very little access due to high, rocky bank conditions. Lots of vegetation was present—including in the middle of the river, which seemed to create pools but not constrict the water flow. Dry Brook enters from the east near a substantial pool created by an abandoned dam, and on the west bank is the US Geologic Survey gauging station. There is access to this via a town right of way behind Grove St. The area along an abandoned property by Leonard Street is also marred by lots of trash and debris. Apart from the trash, this is a pretty, secluded section of river, characterized by boulders, sand and cobbles, and heavy vegetation on the banks. The river runs clear, at a depth of greater than one foot, with only sparse pockets of foam.

Assets	**Problems**	**Priority Actions**
Pretty and secluded	Erosion on steep bank	Evaluate bank
	Lots of trash and debris	River clean up

Hoosic River, Section 3, Post Office to Aladco

Surveyors: Leigh Ann Adams, Rachel Contenta

Subjective Evaluation: “good”

Narrative:
The segment begins behind the Adams Post Office, and was followed upstream to Aladco. The river here is channelized in concrete flood control chutes. Overall, the water runs swiftly, and the volume was somewhat high for this time of year due to recent rains. In several spots, leafy debris and grass could be seen growing in the cracks in the concrete. There was also a sparse coating of algae. The Ashuwillticook trail runs parallel to the river on the west side, approximately twenty yards back, providing visual access to the river. Behind the rail trail the land is forested, or covered with vegetation. On the east side of the river is residential and commercial property until it passes beneath Rt. 8 near Aladco. Trash is minimal along this segment, and overall condition is good. As it passes along the Graphic Arts Plant (GAP), the river is inaccessible on the west side. Just north of the graphics plant, a small, unnamed tributary joins the main flow from the west. This stream is marked by heavy iron rust/oxide along the bottom of the stream. Upstream on this tributary is a small wetland that is heavily vegetated, and largely clean of trash and debris. Nearby, Pecks Brook joins the Hoosic from the west.

The river is inaccessible on the west side as it passes Aladco, and behind the Aladco parking lot a small roll dam was observed in the chutes. Across from Aladco, the walls of the chutes become taller as the river makes a sharp bend. On the west side of the river, a small wetland has become established along the bank. Just upstream, the flood chutes end, the wall disappear, and the substrate becomes cobble.

In this section, very little of the river is shaded by vegetation. Many pipes enter the river in this section, and during storm events some of them likely add runoff to the river. Since much of the land in this area is covered by impervious surfaces, the quality of the runoff may be suspect.

Assets	**Problems**	**Priority Action**
Visual access from rail trail	Debris and algae	
Small wetland	Storm drains from impervious surfaces	Investigate water quality during storm events

Hoosic River, Section 4, Hodges Cross Road to Center Street

Surveyor: Vicki-Sue DeMarsico

Subjective Evaluation: “Good/Fair”

Narrative:
This section begins near McCann Technical School at the Hodges Cross Road Bridge, and runs parallel to Rt. 8 and the railroad tracks through a wide flood plain used for agriculture into the town of Adams. From the beginning of the section to the start of the flood control chutes, the river meanders a great deal, completing a 270 degree bend in one section. Although the surrounding land is agricultural, the river is shaded through much of this section, and there is heavy vegetation on the banks—both willows and brush.

Near roads and access points, trash and debris is a problem. A ladder, cement blocks, a mattress, iron beams appliances were all found near the beginning of the section. Also, a cable used to support a high tension electricity tower has caught a large amount of debris that has formed a dam that impedes flow near the Zylonite substation. Erosion was also well-documented: in several areas the silty clay banks were falling into the river. In other spots, there was evidence of attempts to stabilize the banks: rip-rap and concrete blocks had been piled to prevent further erosion. As the river approaches downtown Adams, it becomes channelized in concrete flood control chutes which prevent access to the river.

Several pipes enter in this section, the most notable being the Adams Wastewater Treatment Plant, which had a noticeable odor. Downstream, a milky discharge entered from a canal on the west side of the river—this is likely calcium carbonate from the SMI plant, which, though unsightly, is not a threat to water quality.

Overall, this is a pleasant section of river, with potential for canoeing, though access points are quite limited. Fish and other aquatic life were spotted, and there were signs of large mammals using the river in this area. Much of the substrate is cobbles, with occasional boulders and smaller sediment in the pools. Though the segment is primarily quick-water, there are occasional small rapids that could be negotiated in a canoe.

Assets	Problems	Priority Actions
Lots of shade, some areas good for picnicking	Water treatment plant stinky, with dead fish	Evaluate water treatment plant discharge
Stream bed variable	Milky discharge within 200’ of treatment plant steps	Evaluate Lime Street pipe discharge
Signs of animal life	Some foam near debris jam/island	Clear debris-trapping cable and debris jams to facilitate boating
Boatable and good for tubing in most locations	Low water upstream of plant (and crayfish a different color there)	Secure access points for boating
	Cow manure on Barnett’s farm	
	At Lime Street bridge, dirty runoff from pipe	
	Past the high tension power lines– a cable in the stream in a tangle of woody debris	

Dry Brook, Hoosic River to town line

Surveyor: Leigh Ann Adams, Rachel Contenta

Subjective Evaluation: “excellent/good”

Dry Brook is a beautiful stream, surprisingly debris-free in the way of natural construction and trash even as it passes through residences off of Leonard St up to the cemetery. Near the cemetery it's fairly secluded on both sides. There is a steep ravine coming down from the cemetery, with some erosion, but the other side has a nice flat bank that reaches 20-30 yards out at some points with intermittent streams that feed in from the north. A nice swimming hole exists about half way up through the cemetery that is between seven and eight feet deep. The stream is pretty wide in some spots, mostly a foot deeper or more. The stream is rocky, with boulders, cobbles and gravel. Because it was surveyed in the winter, vegetation/wildlife was limited to some turkeys and deer. Water was clear and high quality, without odors. Frequent pools make this a particularly attractive section

Asset	**Problem**	**Priority Action**
High water quality, pools	Some trash	Clean up is a low priority

Tophet Brook

Surveyors: Lauren Stevens, Shelly Stiles

Subjective Evaluation: “excellent”

Narrative:
Upstream of East Hoosac Street, Tophet Brook begins as a series of wetlands in the Savoy Mountain State Forest. Beaver Activity was noted in several locations, though no beaver were observed. The river winds slowly through wetlands, agricultural land, and woods here, and foam was observed in several locations at the edges of pools, and some siltation was also noted. The stream passes under a driveway through a culvert here, but downstream, the brook is remote and seems far from human activity. Below the driveway, the stream enters the deciduous woods in a steep valley, and has primarily cobble bottom, with occasional bedrock portions. As the stream becomes steeper, it trickles through boulders, creating sizeable cascades. Just above High Bridge, some erosion was observed on the steep banks, and a debris jam had formed in the river.

The most spectacular site on Tophet Brook is the High Bridge Cascade. The cascade lies where a tributary enters from the west, in the area known as Little Egypt. Access to the stream here is difficult, however, since the bridge has been inoperable for many years. Nevertheless, this would be a prime parcel of land for protection and public access. The road that has replaced High Bridge is gated, making the pasture-land on the south side of the stream inaccessible to the public. Below High Bridge, the foundation of a millrace was noted, and nearby, a small tributary entered that was highly turbid—it seemed to be carrying a great deal of sediment from the gravel road on the north side of the stream. Much of the land on the north side of the river is in use as pasture. Upstream of the Patton Brook confluence, Tophet Brook tumbles over a series of large limestone ledges, and briefly passes through pasture land (a barbed wire fence is strung across the stream).

Immediately below where Patton Brook enters, the stream is spanned by a wooden bridge. It remains primarily cobbles and boulders with periodic bedrock ledges until it become channelized in the flood control chutes, approximately .75 miles above its confluence with the Hoosic. Until it reaches Walling Road, the south bank is primarily wooded (hemlocks), and the north bank is pasture and residential land. Near a human-made swimming hole, an island has formed and erosion was noted. Many blow-downs were present downstream, along with human debris, and even a car in the stream. There is little buffer in this section, and in several spots livestock have access to the river. The East Road bridge has an opening that is to small for Tophet Brook at high flows, and it has backed up the stream, resulting in gravel deposition above the bridge.

Below Bowens Corners, the river enters a section with steep banks, where it is well-shaded by willows and other trees. Although there is siltation in sections, in others, the river has scoured bedrock, and created an outstanding swimming hole and a small waterfall. Many other cascades and deep pools exist, separated by sections of cobbles and gravel. From Bowens Corners to the start of the flood chutes would be an excellent candidate for trail access—as of now, no formal access exists.

Above Summer Street, Tophet Brook becomes channelized within low concrete walls, and soon a concrete bottom is added. Although the area is densely populated, the right bank is fifty percent shaded. The stream runs under Summer Street and a parking lot before it re-emerges near the Miller Brook confluence. In this section, Tophet brook seems to carry much less water than it did upstream—perhaps it is losing water in the chutes. Near its confluence with the Hoosic River, cobbles, vegetation and debris were noted in the flood control chutes. Just south of the confluence is a church-owned park that might find more use as a municipal park.

Assets	**Problems**	**Priorities**
Gorgeous cascades and pools, include a downtown swimming hole and High Bridge falls and pools	Road runoff upstream of Tophet Brook Farm	Mitigate sedimentiation caused by road runoff near Tophet Brook Farm
High Bridge stonework	Near Walling Road, cows in stream; on Tophet Brook Farm, cows in riparian zone	Investigate fencing cattle out of stream
Church-owned park at confluence with Hoosic	One “green discharge” pipe	Investigate public access to Cascade
Trout	Bridge too small and askew of Brook at East Road	River clean-up on north bank near East Rd.
	Flood chutes inhospitable to aquatic life	Investigate trail access below Bowens Corners
	Trash and debris in river	

Patton Brook

Surveyor: Tom Ennis

Subjective Evaluation: “excellent”

Narrative:
Patton Brook originates high in the hills, and is largely in pristine condition. The vast majority of its length is shaded by deciduous forest, with several patches of hemlock (perhaps 98% is shaded). The streambed is primarily cobbles, with gravel in the pools separated by miscellaneous boulders. In one spot, flow was blocked by a natural log jam. Although largely undisturbed, an old logging road parallels the stream on the east side for some time, and there looked like active grazing near the tributary stream. Several small tributaries run through pasture land, and might carry sediment during storm events.

Assets	**Problems**	**Priority Actions**
Very pretty	Evidence of cows	
Trout		
Some cascades/pools		
Heavily forested		

Miller Brook

Surveyors: Tom Ennis, Jason Ennis

Subjective Evaluation: mostly “excellent” at flood chute “degraded”

Description:
Although it had rained the night before the stream was surveyed, Miller Brook was no higher than normal. The stream begins at a wooded spring in a swampy are at approximately 550 feet of elevation. Flow is minimal in the small channel as it flows through a thickly forested area, and becomes steep—this section is characterized by large boulders. After a small tributary joins from the northeast (which on this day carried more water than Miller Brook), flow becomes steadier, and gravel bottoms in the many pools are visible through the clear water. After the brook passes under East Hoosac Street, the land is no longer primarily forested, the river bed became wider and bank erosion was visible in several locations. There was also trash and debris in this section of river.

At the East Street Bridge, the river is somewhat channelized, and the bank has been stabilized by rip-rap and rocks on the west side of the river downstream of the bridge. Several pipes were noted at this location. Below the bridge the stream morphology returns to a more natural step-pool state, and once again becomes forested with deciduous trees. At approximately 270 feet elevation, banks become quite steep, and houses are built close to the stream. Just above Richmond Street, the stream becomes channelized by flood control chutes, shaded in places, open to the sun in others. Below Richmond Street some vegetation can be observed within the chutes, and many roof drains empty into the river. Despite the previous night’s rainfall, there was no flow through this section. Flow is re-established downstream, and below Summer Street, there are natural cobbles in the chutes and vegetation in spots. Miller Brook soon flows into Tophet Brook.

Assets	**Problems**	**Priority Actions**
Step/pool morphology – pretty. Cean, clear water	Steep driveways yield sediments in runoff	Prevention of street/stormwater runoff pollution
Little erosion despite steep banks	Flood control chutes inhospitable to aquatic creatures	flood chute remediation
Reports of trout	Some garbage	River clean-up

Southwick Brook

Surveyor: Vicki-Sue DeMarsico

Subjective Evaluation: “Good/ Fair”

Narrative:
Southwick Brook begins as a small stream, flowing out of the Savoy State Forest, and the survey began where Spring Rd crosses the brook, east of Adams. Through the first part of this section, the stream runs through the woods in a deep, scenic gully, trickling over and through large boulders. Some erosion was noted in this section due to steep banks, and one large concrete well was noted near the stream bank. Downstream, a barbed wire fence paralleled the brook. A gravel road, useable by a four wheel drive vehicle crossed the river, and nearby was a cache of trash—bags full of debris that had been abandoned. Where Southwick Brook crosses under East Rd, it is channelized beneath a stone bridge, with a culvert entering from one side.

Downstream, the brook changes in character, and is channelized in many places with concrete, stone rip-rap and even old tires. In one section, trees have fallen into the river, which might impede flow at higher water. Along Lime Street, many small bridges cross the stream, primarily to permit driveway access to houses on the north side of the brook. Stream stability is clearly an important issue in the lower section of Southwick Brook—there is a great deal of erosion, and property owners have attempted to stabilize their banks by any means possible. There are many reports of property damage and flooding during high water. Stormwater seems to be more a problem of quantity than quality, however, since there are no suspect pipes, and land use is primarily forested and residential, rather than impervious. The bottom section was nearly dry on the day this was surveyed.

Assets	**Problems**	**Priority Actions**
Upper section very pretty cascading stream	Extensive erosion and rip-rap in lower section	Investigate strategies to stabilize banks and prevent erosion
High water quality	Bridges, and channelizations may impede flow	Investigate strategies to prevent extensive flooding
	Some large debris – cars, metal, fallen trees from Springhill Farm downstream	Clean-up
	No public access	Investigate public access points
	Dry from Charles St. to Hoosic	
	Near Charles St., a collapsing retaining wall and lots of industrial trash	
	Algae near Arbor St.	

Pecks Brook

Surveyors: Heather Linscott, Robin Avery, Leigh Ann Adams

Subjective Evaluation: “good”

Narrative:
Pecks brook was followed from the Hoosic River upstream. Dead fish were noted, as well as some litter and stone walls falling into the river. Erosion was observed under the bridge, along with Tyvek material and old, non-functioning pipes. In this segment of river the streambed began as flood control chutes but became primarily boulders and cobbles, and green algaes and mosses seemed more prevalent here than upstream. Near Fisk St an old dam is present, with orange deposits that could be caused by rust from iron at the dam. Unfortunately there is litter here, and the area would benefit from a clean-up. One asset nearby was a convoluted series of potholes near the golf course, although an old metal fence also exists nearby, with trees falling into the river and bank erosion present. On one visit, an odor was observed between Fisk St and West Rd. Just upstream the river splits.

On the South branch, the team found evidence of deer, but there was also evidence of humans. Several pipes were present, and a cement spillway and orange scum was also observed. On the west side of West Road there was a sizeable log jam, but upstream the brook was in a more natural state. Bedrock ledges created habitat for fish, although “pool scum” was also noted. Above this area, a pipe crossed the river, but it did not flow into the stream.

On the north branch, the stream crossed West Road, where a wall was falling in on the Linscott property caused by erosion. A dam on the property is filled in with silt adjoining a wetland area, which seemed degraded by silt. Further upstream is Peck’s Falls, a well known scenic landmark with trail access—the surveyors were pleased to report no litter. Where the north branch splits, one tributary drains the Gould farm. There is a possibility that agricultural runoff might have a negative impact on stream quality. The other tributary drains the western area along the Gould trail—this branch seemed to have much less moss and algae than the Gould farm branch.

Assets	**Problems**	**Priority Actions**
Fisk Road Dam could be a really neat place	Undermining at bridge near McDermott Graphics	Establish formal access points to waterfalls and pools
Trout	Lots of iron pipe. At the Dedek Mill, old water lines?	
Shady	Large debris near Fisk Road Dam	Remove debris near Fisk Road Dam
Water-worn bedrock	Siltation behind dam with flow behind wing walls	
Pecks Falls and other waterfalls	Orange pool below dam	
Swimming hole upstream of Linscott dam (12' deep)		
	Erosion near West Road (also affecting dam)	Remediate erosion near West Road
	Tube in bridge closed	
	Cows in stream	

Hoxie Brook

Surveyors: Donna Cesan, Penny Fehr

Subjective Evaluation: Upper: “very eroded” Middle: “fair” Lower: “good”

Narrative:
Hoxie Brook begins on the forested slopes of Mt Greylock and runs east, parallel to Thiel Rd, and crosses Friend St, where it enters a residential section of Adams. Through much of the commercial center of town it is channelized and underground, emerging briefly near the new visitor center before it runs beneath a parking lot and re-emerges near its confluence with the Hoosic River.

The upper section, between Greylock Glen and Forest Park Ave is marked by heavy erosion, particularly in the section below West Rd. One culvert was particularly notable in this section, as was the dam at Forest Park, which was severely eroded and caving in. This section is primarily forested, though in sections there is primarily heavy brush lining the river banks. Land use in this section is agricultural and residential as well as undeveloped, and runoff from the orchard and farm may be a concern. Two wetlands exist in this section north of the stream, elsewhere, the river bottom is mixed, but predominantly cobbles. Wildlife abounds, and a woodpecker and kingfisher were spotted, as well as evidence of a black mink. This section was assessed as “very eroded”.

Between Hoosac Street and the Ashuwillticook Trail several locations merit mention. Near Hoosac Street a short stretch of the stream is daylighted, and supports healthy wetland vegetation on the banks of the stream. Nevertheless, this area traps debris and trash. Immediately upstream, near the entrance to the Meehan Mill, the brook is channelized in a culvert for approximately sixty feet. Upstream, behind Interior Alternatives the brook is daylighted for approximately 25 feet. This area needs immediate attention, since there are two sinkholes in the pavement, and the surface is buckling. Although it was dry on the day the survey took place, the surveyors were concerned about runoff from the parking lots and Hoosac St during storm events. Additionally, many pipes were observed entering the stream. In this section, a small man-made dam has created a small, three foot deep pool. This section was characterized by gravel, cobble and sand substrate. This section was assessed as “fair”.

Between Hoosac St and the convergence of Hoxie Brook and the Hoosic River, the river flows through a broad concrete culvert topped by pavement. Abutting the Hoosic River flood chutes, Hoxie Brook emerges in a naturally vegetated stream bank. The daylighted sections appear to have lush healthy riparian vegetation. This section was assessed as “very good”, and the river abits town and DEM land that could be used to provide access for walking trails.

Assets	Problems	Priority Actions
Shaded	Stream is underground then daylighted then back underground again and again	Investigate educational signage for mini-wetland near Hoosic River confluence
Historic dam at Forest Park Ave.	Meehan Mill – lots of debris, problems with substrate	River clean up in problem sections
Upstream of Forest Park Ave., the valley is deep and narrow and the feeling is “mysterious, green, pristine”	Erosion at the new bike trail, east of the new visitors’ center	Address erosion concerns in various location
Mini-wetland near Hoosic River confluence	Upstream of Forest Park Avenue a dam is entirely silted in.	Evaluate Forest Park dam
	Sinkholes and buckling in pavement behind Interior Alternatives	Repair pavement, investigate daylighting near Visitors Center

Unnamed Brook

Surveyors: Lauren Stevens, Holly Mann

Subjective Evaluation: above Friend St, “excellent”

Narrative:
Unnamed Brook begins as an intermittent stream in the above the SMI property north of Adams. The upper section is primarily pools and riffles, nearly choked with vegetation and boulders. On the SMI land there is informal access. Gradient increases after it crosses under Notch Rd through a culvert by a gate. A dam was observed below the culvert, followed by a series of small cascades. The nearby land is more residential here, but the stream is still in the woods. Just west of Friend St the river runs through a concrete channel beneath a garage. Below this it is channelized in a ditch, and makes a sharp bend north at Pine St. Along the west side of the baseball field, the river is shaded, until it disappears into a pipe underneath Howland Ave. It then runs in a ditch beside Rt. 8 North and disappears in a pipe before Lime St. At this point, it became impossible to locate Unnamed Brook, though it is likely it joins the Hoosic River nearby.

Assets	**Problems**	**Priority Actions**
Quiet, pretty brook	Unclear where it enters the Hoosic	Locate confluence with Hoosic River

Appendix:

Tips for Shoreline Surveyors

Safety and Legalities

- Always walk with someone.
- Watch out for irate dogs. Walk cautiously and practice good dog etiquette.
- Do not drink the river water.
- Lifejackets are required by law for each person in the canoe.
- From September 15 to May 15 all canoe or kayak occupants must wear a U.S. Coast Guard Approved Personal Flotation Device.
- Wear long-sleeved shirts and pants to protect against, ticks, mosquitoes, poison ivy and nettles.
- Wear insect repellent if necessary.
- Consider landowner rights. Ask permission to cross private land, posted or not.
- Do not enter posted areas without permission. Take advantage of any public access points.

Environment:

- Don't walk on unstable banks; your footsteps could speed erosion.
- Be aware of wildlife and animal homes, for both of your sakes.

NEVER PUT YOURSELF INTO DANGER TO GATHER SURVEY INFORMATION.

If at anytime you feel uncomfortable about the stream conditions or surroundings, please STOP your Shoreline Survey. You and your safety are much more valuable than any of the objectives of the Shoreline Survey.

Checklist: What to take on your Survey

__ A buddy
___ Data sheets and map
___ Clipboard or other surface for writing
___ Two pencils color is good to mark on maps
___ Long-sleeved, snag-free clothing /pants (for bugs and thorns)
___ Sunblock
___ Sunglasses (polarized to see into the water better)
___ Lifejackets & paddles if canoeing
___ Camera and film
___ Gloves
___ Copy of letter sent out to landowners

Optional:

___ Rubber boots or waders
___ Yardstick or measuring tape (useful for pipes)
___ Compass
___ Field guides (in ziplock bags)
___ Food, for energy!

What you need to do:

Tonight: Coordinate with your segment team. Arrange canoes, meeting place, etc.

This weekend: Conduct the survey! Fill out the data sheets while you're on the river.
With your team, fill out the *Summary Sheets*—the segment description and the priority Sheet--after you are finished surveying your segment.
Return all *Data* and *Summary Sheets* (one set per team) to:
___ ___ ___ ___ ___
___ ___ ___ ___ ___ Return by: ___

This month: Attend action planning meeting, which will be held: ___

Massachusetts Riverways Programs/DFWELE

Figure 7.

SHORELINE SURVEY FIELD DATA SHEET

Segment begins:______________
Segment ends:______________

Observers:________________________________Date:_______
Today's weather:________________________________
Weather over past 24 hours:________________________________

I. Instream Conditions:

A. Stream bottom:

1. What is stream bed made of?
Mark from 1 (most typical) to 6 (least typical)
_____Organic debris (leaves, twigs) _____Gravel (1/4 - 2")
_____Silt (mud) _____Cobbles (2 - 10")
_____Sand (1/16 to 1/4") _____Boulders (> 10")

2. What color is the stream bottom? *(Circle One)*
Black Brown Orange/Red Yellow Sandy Gray Other__________

B. Water

1. What Color is the water? *(Circle One)*
Clear Cloudy Tea Milky Muddy Other__________

2. Are there indications of... *(Circle)* Oily sheen Foam Scum Other________
*Describe cause if obvious*________________________________

3. What is the water odor? *(Circle One)*
No odor Rotten eggs Musky Fishy Oily Ammonia Other________

4. How deep is the water? *(Circle)* < = less than; > = greater than
< 1' > 1' > 2' > 3'

5. In your opinion, is the water level *(circle)* **higher** or **lower** than usual for this time of year?
If problem is severe state why. ________________________________

6. Is the water flowing..... *(Circle One)*
Quickly Slightly Almost still

7. Number of pools ______ Number of riffles ______ Don't know ______

8. Is the stream flow blocked by *(circle)* **trees**, **trash**, or **man-made objects**? **If yes locate on map.*

C. Stream vegetation

1. Are there areas of extremely dense or clogging aquatic vegetation in any section?
(Circle one) Yes or No **If yes locate on map*
*Describe cause if obvious.*________________________________

2. Are there areas on the stream bed or around pipes that are algae covered? ______
**If algae seems abnormally heavy locate on map.*

3. Are there wetlands in your section? If so, are they degraded by
(circle) phragmites purple loosestrife fill blockage of water ditches
disturbed stream banks pipes sediment trash other don't know

**If you have taken photographs, you could note locations by marking on map #1, #2,...#3, etc. Make sure you mark photos on back with date and location and direction of view. Be as specific as possible so that people can go back and compare later photographs. Mention nearby bridge, road, house, etc.*

II Stream Corridor Conditions...*Answer questions and *locate problem areas on map.*

A. Stream Bank

1. Do trees and shrubs overhang the stream and provide shade?________

   If yes *estimate what % of bank is shaded.*______%

2. *Circle most widespread stream bank condition.*

   Eroding Cleared/cut Developed(buildings or pavement) Wetlands/marsh
   Riprap/channelized Lawns Forest Vegetated (shrubs, plants) Beaches

B. Pipes

*Describe pipes on pipe sheet and *locate on map as P1, P2,...P3 etc.*

C. Litter and Trash

*Describe below any potential cleanup areas. *Locate on map*

D. Fill, brush and clear cutting

**Locate on map as fill (F1, F2,. .F3) or clear cutting (CC1, CC2,...)* and *describe below.*

E. Runoff

Did you see runoff from any of the following? *(circle)*

Manure Farm animals Bridges/roadways Construction sites Sewage
Parking lots Lawn fertilizer Plowed fields Other sources____________

F. Corridor

1. What are the land uses in your segment? *Check which ones*, and *circle the **dominant** land use type.*

____ Industrial	____ Landfill(s)	____ Wastewater treatment plant (s)
____ Commercial	____ Undeveloped/unprotected land	____ Junkyard(s)
____ Agricultural	____ Road(s)	____ Illegal dump(s)
____ Residential	____ Railroad(s)	____ Protected Conservation Land
____ Golf Course(s)	____ Parking lot(s)	____ Other (describe)

2. Is there public access to the stream? If so, is access appropriate for... *(circle)* and **locate on map.*

   canoeing fishing swimming walking(trails) other__________

   *If there are areas which are **potential** access points, describe below and *locate on map.*

III. Wildlife...*Estimate number encountered and species in the following categories.*

A. Aquatic

1. Fish or evidence of fish? ______________________________

   If possible, *describe species & size below.*

2. Other forms of aquatic life? *Circle type and if you can identify species, do so below:*

   Aquatic insects Turtles Snails Salamanders Mussels Clams Other_______

B. Aquatic/land Species

1. Animals or evidence of animals? *(Circle)*

   Beaver Muskrat Otter Other ____________________

2. Water fowl? _____ *Identify species if you can.* ______________

3. Do you know if there are rare & endangered species of plants or animals in your segment?

   *If so, identify.*__________________________

IV. *Figure 7*: Shoreline Survey Summary Sheets

The summary sheets are designed to give a "big picture" of your segment. They provide the basis of the narrative description of segments in the Shoreline Survey Report. (See *Figure 13*.)

Shoreline Survey Summary Sheet

NARRATIVE DESCRIPTION
Describe your segment in a paragraph. (See samples below)

Samples:

Segment 1 extends from the headwaters near Sunshine Drive downstream approximately 0.5 miles and is a seriously damaged portion of the river. Most of the brush has been removed during construction of single family residences thereby reducing bank stability and subjecting the soil to erosion by water. Over 40% of the streambank has been affected to the point that it is now contributing excessive quantities of sediment. Trash, tires and yard debris are commonly seen through out this segment.

Segment 2 flows slowly through this 0.5 mile segment and is virtually undisturbed. The land is owned by the State Department of Fisheries and Wildlife. Vegetation within the upper bank ranges from thick stands of marsh grass to open woods of cedar trees.

Segment 6 flows south between the railroad and Interstate Highway 5 through dense blackberry, willow, marsh and other trees. Surface runoff from light industry at the southern section as well as railroad practices may be contributing sediments, toxins, oils and greases or nutrients.

Samples are taken from EPA's manual Streamwalk.

NARRATIVE DESCRIPTION FOR SEGMENT # __ OF THE __________(River, Brook). The segment begins at ______________ and ends at ______________________.

Figure 7.

SHORELINE SURVEY SUMMARY SHEET

Segment Begins____________________

Segment Ends____________________

Observer:______________________________________ **Date:** ____________________

Today's weather:____

Weather over past 24 hours:____

Please answer the following:

River quality: Looking back at your Field Data sheet and including observations,

1. Are there places which need to be monitored further? *(Circle)* **Yes No.** Identify.

2. Are there problem areas which require immediate action? *(Circle)* Yes No. Identify.

3. Are there places which require a clean up? (Circle) Yes No. Identify.

Habitat: How would you describe habitat in your section?

1. Adequate water flow for the season?
   (Circle) Yes No Don't know

2. Did you see evidence of siltation from roads, bridges, pipes, construction? Yes No If yes, *circle if widespread or localized.*

3. Majority of river bank vegetated, developed or clear cut?

4. Shade along stream?

5. Diverse number of species seen?

6. Did your section contain wetlands? *(circle)* Yes No
   - If yes, were they in your opinion *(circle)* healthy degraded
   - If degraded, were wetlands degraded by
     (circle) phragmites purple loosestrife fill blockage of water ditches disturbed stream banks pipes sediment trash other *(describe)*.
   - Should action be taken to restore wetlands in your section?
     (circle) Yes No Don't know

Overall, the section of the river is *(circle)*:
Excellent good fair poor degraded.

Land Protection: Did you find any large tracts of open land which need to be protected? Describe.

Did you find areas which could be explored for trail development or fishing or canoe access? Describe.

Are there informal access points? Describe.

Please hand these sheets to the Shoreline Survey Chair or to your Segment Captain. Thank you very much!

Figure 8. Pipe Survey

Segment# ____________________ Names of observers: ____________________

Pipe#	Date	Time	Weather today	Weather in last 48 hours	Pipe material	Pipe size/amount of flow	Color of flow	Odor	Comments
Sample #1	5/8/93	8:40AM	sunny + clear air temp 75° water T° 60°	Clear, no rain.	concrete good shape	constant moderate flow 36" diameter	reddish brown	fetid odor	Storm drain. needs to be rechecked.
1									

Massachusetts Adopt a Stream

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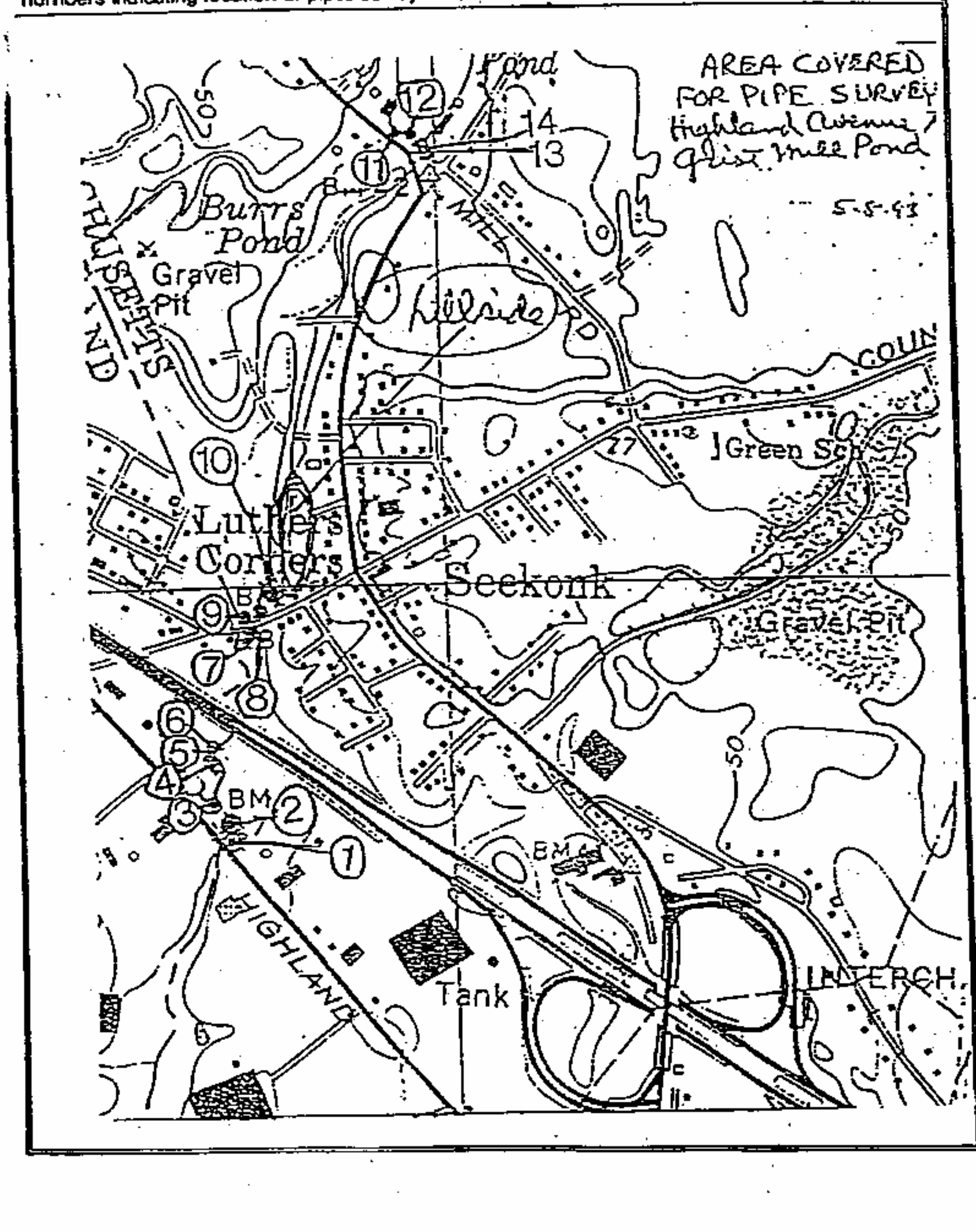
Figure 9. Sample Pipe Survey Map. This is an enlarged U.S.G.S. topographic map with pipe numbers indicating location of pipes surveyed.



SAMPLE Brook
Priority Sheet for Fictitious Brook, 1996
Shoreline Survey September, 1996
South River Watershed

SEGMENT # 2
TEAM MEMBERS Joe Smith and Mary Jones
SEGMENT BEGINS at the Washington Street Bridge
AND ENDS at Maple Street

Problems found by segment:	Assets found by segment:	Priorities by segment
1) constantly flowing pipe: oily sheen seen in water (on the south side of the Washington Street Bridge)	*1) possible access for canoes at Ash Streei Street*	*1) Pipe discharging during dry weather (Washington Street Bridge)*
2) dumping and evidence of backhoe work and a great deal of sediment in river downstream (at industrial area off Commerce Street	*2) large undeveloped piece of land adjacen Park jacent to Jones*	*2) Look into undeveloped land near Jones Park: could this be purchased by state, town or land trust? Are there other means of protection?*
3) trash including car parts (across the river from industrial area)	*3) Wildlife: wood ducks, great blue heron, ron, muskrat holes, deer tracks in undeveloped piece of ce of land dlife*	*3) Trash: clean up?*
4) small amount of erosion of banks (near Ash Street at the new subdivision)	*4) good wetlands area with lots of wildlife*	*4) Backhoe work: is the Conservation Commission aware of this?*

SEE REVERSE SIDE for your stream's PI 's PRIORITY SHEET

Adopt a Stream

Priority Sheet for the _______ Brook/River
Shoreline Survey (Date)____________
Watershed: ______________

SEGMENT # __
TEAM MEMBERS______________________________
SEGMENT BEGINS ____________________
AND ENDS ____________________

Problems found by segment:	Assets found by segment:	Priorities by segment
1)	1)	1)

(SEE REVERSE SIDE FOR SAMPLE PRIORITY SHEET)

Adopt a Stream

Commonwealth of Massachusetts
Department of Fisheries, Wildlife & Environmental Law Enforcement

Adopt-A-Stream

Shoreline Survey Focus Group

This approach is used when the Watershed Association, EOEA Watershed Team or Conservation Commission wants to get data for a particular purpose. Examples:

- Identifying sites for water quality monitoring
- Identifying sites that need cleanups
- Identifying sites for canoe access
- Building a constituency

The Watershed Association, EOEA Watershed Team or Conservation Commission often uses the data to create projects with opportunities for volunteers.

Forming a Focus Group
Watershed association, EOEA Watershed Team, Conservation Commission, folks call the Adopt-A-Stream Program (AAS). AAS supports the formation including the creation of a local steering committee (interested people, town officials (i.e. Concom & Board of Health), abutters, businesses, anglers, etc.)

↓

Planning:
Steering committee plans survey, does pr, invites volunteers, sets up training workshop

↓

Shoreline Survey:
Training: AAS conducts the training workshop. Combining data sheets and interactive slide show: a generic shoreline survey. Training is a night meeting 2-4 days before survey
Survey: done either as a one-day event or within a window of a couple of weeks. Data sheets, cameras, maps are primary tools. Sections are divided so that Survey takes approximately 2 hours.

↓

Priority Setting:
After filling out data sheets, Stream Team members determine which are the significant problems, assets, and priorities for work.

↓

Shoreline Survey Report:
Stream Teams with watershed association support prepares a report that can be formally presented to the town, EOEA Watershed Team, AAS Program, others. This is the official record.

OPTIONAL:
Some Focus Groups want to get volunteer's ideas and have an action-planning meeting. This is optional.

Action Planning:
At an action planning meeting, AAS staff facilitates meeting that looks at the priorities for work and determines (1) which problems should be reported; (2) short term projects; (3) long term projects.

The **Adopt-A-Stream Program** works to support and encourage local stream teams and communities in efforts to protect and restore the ecological integrity of the Commonwealth's watersheds: rivers, streams and adjacent lands.
If you know someone else who would be interested in our newsletter, please contact:
Rachel Calabro, Coordinator • Adopt-A-Stream Program • 251 Causeway Street, Suite 400 • Boston, MA 02114
(617) 626-1549 • email: Rachel.Calabro@state.ma.us • Also check out our web-site: Http://www.massriverways.org
Riverways Programs, Joan Kimball, Director
Department of Fisheries, Wildlife and Environmental Law Enforcement, David M. Peters, Commissioner
Executive Office of Environmental Affairs, Bob Durand, Secretary

APPENDIX 4-B

Laboratory Data & Field Inspection Sheets for Stormwater Sampling Events

BERKSHIRE ENVIRO-LABS, INC.

WATER WASTEWATER AND ENVIRONMENTAL ANALYSIS
PHYSICAL CHEMICAL AND BACTERIOLOGICAL TESTING
LABORATORY AND FIELD MEASUREMENTS

CORNER OF MAIN & CENTER STREETS
266 MAIN STREET, LEE, MASS. 01238 (413) 243-1416

Berkshire Regional Planning Commission

L- 562

RE: Adams Storm

SAMPLE NUMBER	135883						
DATE COLLECTED	3/31/04						
TIME COLLECTED	10:15am						
COLLECTED BY	D.P.W.						
SAMPLE LOCATION	SW-1 - Renfrew/Columbia			DETECTION	METHOD		DATE
ANALYSIS		UNITS	RESULTS	LIMIT	NUMBER	ANALYST	ANALYZED
Fecal Coliform		/100ml	160	10	SM 9222 D	W.E.-B.W.	3/31/04
E. Coli		/100ml	60	10	Modified m TEC	W.E.-B.W.	3/31/04
Total Suspended Solids		mg/l	118	1	SM 2540 D	B.W.	3/31/04
Total Phosphorus (as P)		mg/l	0.228	0.01	SM 4500-P-B,E	B.W.	4/1/04

SAMPLE NUMBER	135884						
DATE COLLECTED	3/31/04						
TIME COLLECTED	9:45am						
COLLECTED BY	D.P.W.						
SAMPLE LOCATION	SW-2 - DPW Facility			DETECTION	METHOD		DATE
ANALYSIS		UNITS	RESULTS	LIMIT	NUMBER	ANALYST	ANALYZED
Fecal Coliform		/100ml	5300	10	SM 9222 D	W.E.-B.W.	3/31/04
E. Coli		/100ml	4100	10	Modified m TEC	W.E.-B.W.	3/31/04
Total Suspended Solids		mg/l	410	1	SM 2540 D	B.W.	3/31/04
Total Phosphorus (as P)		mg/l	1.014	0.01	SM 4500-P-B,E	B.W.	4/1/04

SAMPLE NUMBER	135885						
DATE COLLECTED	3/31/04						
TIME COLLECTED	10:15am						
COLLECTED BY	S.V./P.F.						
SAMPLE LOCATION	SW-3 - Hoxie			DETECTION	METHOD		DATE
ANALYSIS		UNITS	RESULTS	LIMIT	NUMBER	ANALYST	ANALYZED
Fecal Coliform		/100ml	110	10	SM 9222 D	W.E.-B.W.	3/31/04
E. Coli		/100ml	90	10	Modified m TEC	W.E.-B.W.	3/31/04
Total Suspended Solids		mg/l	45	1	SM 2540 D	B.W.	3/31/04
Total Phosphorus (as P)		mg/l	0.117	0.01	SM 4500-P-B,E	B.W.	4/1/04

< = Less Than > = Greater Than ND = Not Detected

William S. Enser, Jr.
Director

BERKSHIRE ENVIRO-LABS, INC.

CORNER OF MAIN & CENTER STREETS
266 MAIN STREET, LEE, MASS. 01238 (413) 243-1416

Berkshire Regional Planning Commission

L- 562

RE: Adams Storm

SAMPLE NUMBER	135886
DATE COLLECTED	3/31/04
TIME COLLECTED	9:42am
COLLECTED BY	S.V./P.F.
SAMPLE LOCATION	SW-4 - Hoosic/Post Office

ANALYSIS	UNITS	RESULTS	DETECTION LIMIT	METHOD NUMBER	ANALYST	DATE ANALYZED
Fecal Coliform	/100ml	390	10	SM 9222 D	W.E.-B.W.	3/31/04
E. Coli	/100ml	350	10	Modified m TEC	W.E.-B.W.	3/31/04
Total Suspended Solids	mg/l	66	1	SM 2540 D	B.W.	3/31/04
Total Phosphorus (as P)	mg/l	0.276	0.01	SM 4500-P-B,E	B.W.	4/1/04

SAMPLE NUMBER	135887
DATE COLLECTED	3/31/04
TIME COLLECTED	9:50am
COLLECTED BY	L.A.
SAMPLE LOCATION	SW-5 - Glenn Street

ANALYSIS	UNITS	RESULTS	DETECTION LIMIT	METHOD NUMBER	ANALYST	DATE ANALYZED
Fecal Coliform	/100ml	200	10	SM 9222 D	W.E.-B.W.	3/31/04
E. Coli	/100ml	180	10	Modified m TEC	W.E.-B.W.	3/31/04
Total Suspended Solids	mg/l	50	1	SM 2540 D	B.W.	3/31/04
Total Phosphorus (as P)	mg/l	0.124	0.01	SM 4500-P-B,E	B.W.	4/1/04

SAMPLE NUMBER	135888
DATE COLLECTED	3/31/04
TIME COLLECTED	10:00am
COLLECTED BY	L.A.
SAMPLE LOCATION	SW-6

ANALYSIS	UNITS	RESULTS	DETECTION LIMIT	METHOD NUMBER	ANALYST	DATE ANALYZED
Fecal Coliform	/100ml	180	10	SM 9222 D	W.E.-B.W.	3/31/04
E. Coli	/100ml	170	10	Modified m TEC	W.E.-B.W.	3/31/04
Total Suspended Solids	mg/l	50	1	SM 2540 D	B.W.	3/31/04
Total Phosphorus (as P)	mg/l	0.122	0.01	SM 4500-P-B,E	B.W.	4/1/04

< = Less Than > = Greater Than ND = Not Detected

William S. Enser, Jr.
Director

BERKSHIRE ENVIRO-LABS, INC.

WATER WASTEWATER AND ENVIRONMENTAL ANALYSIS
PHYSICAL CHEMICAL AND BACTERIOLOGICAL TESTING
LABORATORY AND FIELD MEASUREMENTS

CORNER OF MAIN & CENTER STREETS
266 MAIN STREET, LEE, MASS. 01238 (413) 243-1416

Berkshire Regional Planning Commission

L- 562

RE: Adams Storm - QC Report

SAMPLE NUMBER	135887
DATE COLLECTED	3/31/04
TIME COLLECTED	9:50am
COLLECTED BY	L.A.
SAMPLE LOCATION	SW-5 - Glenn Street

ANALYSIS	UNITS	RESULTS	DUPLICATE RESULTS			
Fecal Coliform	/100ml	200	190			
E. Coli	/100ml	180	170			

SAMPLE NUMBER	135887
DATE COLLECTED	3/31/04
TIME COLLECTED	9:50am
COLLECTED BY	L.A.
SAMPLE LOCATION	SW-5 - Glenn Street

ANALYSIS	UNITS	RESULTS	DUPLICATE RESULTS	SPIKE % RECOVERED		
Total Phosphorus (as P)	mg/l	0.122	0.125	103%		
Nitrate (as N)	mg/l					
Alkalinity	mg/l					

SAMPLE NUMBER	135887
DATE COLLECTED	3/31/04
TIME COLLECTED	9:50am
COLLECTED BY	L.A.
SAMPLE LOCATION	SW-5 - Glenn Street

ANALYSIS	UNITS	RESULTS	DUPLICATE RESULTS			
pH	SU					
Total Suspended Solids	mg/l	50	51			

< = Less Than > = Greater Than ND = Not Detected

William S. Enser, Jr.
Director

Hoosic River Watershed Association

Monitors' Field Report Form

ate 03-31-04 Time 10:15am Site SLU-1 R.W FROLL'S COLUMBIA

ampler(s) Name(s) M. SHERMAN, C. GELINAS, J. TAYLOR

ecent Weather Conditions: Characterize the last 24 hours by checking those that apply.

ky conditions: __ clear __ partly cloudy ✓ cloudy

ainfall: ✓ light rain __ moderate rain __ heavy rain

emperatures __ hot __ seasonable ✓ cool

oday's Weather Conditions:

_ clear __ cloudy ✓ rainy __ heavy rain ______ air temperature

-Stream Conditions: Characterize the condition of the river water by checking those that apply.

'ater level and flow: ____ low ✓ normal ____ high

urbidity: ____ clear ✓ cloudy ____ very cloudy

dor: ____ fishy ____ sewage ✓ other (explain) NO SMELL

'ater temperature: 5°C

pe of sample collected:

bacteria ✓ total phosphorous (TP) ✓ total suspended solids (TSS)

am Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., debris (trash, tires, barrels, dirt or asphalt, etc.), signs of erosion or other disturbance.

TRASH (furniture downstream of sample site)

OW VIS: 9:46am TIME TAKEN: 10:15am

thing Else of Note?

Hoosic River Watershed Association

Monitors' Field Report Form

ate 03-31-04 Time 09:45am Site SW-2 ADAMS DPW FACILITY

ampler(s) Name(s) MIKE SHERMAN, CHRIS GELINAS, JIM TAYLOR

ecent Weather Conditions: Characterize the last 24 hours by checking those that apply.

ky conditions: __ clear __ partly cloudy ✓ cloudy

ainfall: ✓ light rain __ moderate rain __ heavy rain

emperatures __ hot __ seasonable ✓ cool

oday's Weather Conditions:

_ clear __ cloudy ✓ rainy __ heavy rain ______ air temperature

-Stream Conditions: Characterize the condition of the river water by checking those that apply.

ater level and flow: ____ low ____ normal ✓ high

urbidity: ____ clear ____ cloudy ✓ very cloudy

dor: ____ fishy ____ sewage ✓ other (explain) __ NO SMELL

ater temperature: 4.5 °C

pe of sample collected:

_ bacteria ✓ total phosphorous (TP) ✓ total suspended solids (TSS)

an Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., debris (trash, tires, barrels, dirt or asphalt, etc.), signs of erosion or other disturbance.

NO

FLOW VIS: 10:27 am — recording error — Flow visible 10:27

TIME TAKEN: 9:45am — Sample taken 9:45

thing Else of Note?

Hoosic River Watershed Association

Monitors' Field Report Form

Date 3/31/04 Time flow visible 9:54 AM Time sample collected 1) 10:15 AM

Site SW-3 Hoxie Brook

Sampler(s) Name(s) Sarah Voisin, Penny Teller

Recent Weather Conditions: Characterize the last 24 hours by checking those that apply.

Sky conditions:	__ clear	__ partly cloudy	X cloudy
Rainfall:	X light rain	__ moderate rain	__ heavy rain
Temperatures	__ hot	X seasonable	__ cool

Today's Weather Conditions:

__ clear X cloudy X rainy __ heavy rain 12°C air temperature

In-Stream Conditions: Characterize the condition of the river water by checking those that apply.

Water level and flow:	__ low	__ normal	X high
Turbidity:	__ clear	X cloudy	__ very cloudy
Odor:	__ fishy	__ sewage	X other (explain) None

Water temperature: 4°C

Type of sample collected:

✓ bacteria ✓ total phosphorous (TP) ✓ total suspended solids (TSS)

Stream Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., any debris (trash, tires, barrels, dirt or asphalt etc.), signs of erosion or other disturbance.

Litter

Anything Else of Note?

Plastic sheet in water upstream

Hoosic River Watershed Association

Monitors' Field Report Form

Date 3/31/04 Time flow visible 9:28 AM Time sample collected 9:40 AM 1st Plastic bottle

Site SW-4 Adams Post Office Blank not used

Sampler(s) Name(s) Sarah Vossim & Penny Feller

Recent Weather Conditions: Characterize the last 24 hours by checking those that apply.

Sky conditions:	X clear	__ partly cloudy	X cloudy
Rainfall:	__ light rain	X moderate rain	X heavy rain
Temperatures	__ hot	X seasonable	__ cool

Today's Weather Conditions:

__ clear __ cloudy X rainy __ heavy rain 21 °C air temperature

In-Stream Conditions: Characterize the condition of the river water by checking those that apply.

Water level and flow:	____ low	____ normal	X high
Turbidity:	____ clear	____ cloudy	X very cloudy
Odor:	____ fishy	____ sewage	X other (explain) None

Water temperature: 3.5° C

Type of sample collected:

√ bacteria √ total phosphorous (TP) √ total suspended solids (TSS) (*) 9:47 — Brown bottle Blank not used

Stream Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., any debris (trash, tires, barrels, dirt or asphalt, etc.), signs of erosion or other disturbance.

No

Anything Else of Note?

(*) Samples taken 7 mins. apart due to difficulty of sampling site.

Hoosic River Watershed Association

Monitors' Field Report Form

Date 3/31 Time flow visible 9:30A Time sample collected 9:46A

Site SW5 · GLENN ST.

Sampler(s) Name(s) LEIGH ANNE ADAMS

Recent Weather Conditions: Characterize the last 24 hours by checking those that apply.

Sky conditions:	__ clear	__ partly cloudy	✓ cloudy
Rainfall:	__ light rain	✓ moderate rain	__ heavy rain
Temperatures	__ hot	__ seasonable	__ cool

Today's Weather Conditions:

__ clear __ cloudy ✓ rainy __ heavy rain ______ air temperature

In-Stream Conditions: Characterize the condition of the river water by checking those that apply.

Water level and flow: ____ low ____ normal ____ high
Turbidity: ____ clear ✓ cloudy ____ very cloudy
Odor: ____ fishy ____ sewage ____ other (explain) NONE
Water temperature: 4°C

Type of sample collected:

✓ bacteria ✓ total phosphorous (TP) ✓ total suspended solids (TSS)

Stream Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., any debris (trash, tires, barrels, dirt or asphalt etc.), signs of erosion or other disturbance. SOME TRASH

Anything Else of Note?

Project Information

Project Name: ADAMS STORM
Project No.:
Project Location: ADAMS, MA
Project Manager: REBECCA BALKE
Sampler(s): L. ADAMS, S. VOISIN, P. FEHR M. SHERMAN, J. TAYLOR, C. GELINAS
PO #: Lab Quote #:
Turn-Around: ( ) Standard 10 business days * ( ) Other (specify):
Note: TAT's less than 10 days must be pre-approved!

Client Information

Send Reports to: TOM MATUSZKO
Company: BRPC
Address: 1 FENN ST. SUITE 201
PITTSFIELD, MA 01201
Phone: 413-442-1521
Fax: 413-442-1523
Account # (Lab Use Only)
Reporting Requirements: ( ) Mail ( ) Priority
Preliminary: ( ) FAX ( ) Verbal by / /
Final: ( ) FAX ( ) Verbal by / /

Form No. | Page 1 of 1

FILTRATION AND PRESERVATION

Please indicate filtration (0.45 um for dissolved metals) and preservation information below:

Filtration	Preservation
( ) Done	( ) Done
( ) Not Needed	( ) Not Needed
( ) Lab To Do *	( ) Lab To Do *

* Please specify which samples need to be filtered and/or preserved by the lab.

ANALYSES (write test methods above & "X's") # of bottles below for each sample to be tested)

LAB ID (Lab Use Only)	Client/Field Sample ID	Collection Date	Collection Time	Sample Source/Matrix	TP	TSS	FECAL COLIFORM	E COLI					Sample Remarks (below)
	SW1 A	3.31.04	10:15A										
	B	3.31.04	10:03A										
	SW2 A	3.31.04	9:45A										
	B	3.31.04	9:45A										
	SW3 A	3.31.04	10:15A										
	B	3.31.04	10:21A										
	SW4 A	3.31.04	9:42A										
	R	3.31.04	9:50A										
	SW5 A	3.31.04	9:50A										
	B	3.31.04	9:46A										
	SW6 A	3.31.04	10:00A										
	SW6 B	3.31.04	10:02A	# OF BOTTLES									

* Sub-Contracted Analyses are not subject to our Standard 10 business day TAT's.

BERKSHIRE ENVIRO-LABS, INC.
Corner of Main & Center Streets
P.O. Box 113 Lee, MA 01238
Phone/Fax: (413) 243-1416

Notes: A = PLASTIC SAMPLE – TSS/TP
B = GLASS SAMPLE – Bacteria

CHAIN-OF-CUSTODY RECORD

Relinquished by:	Date/Time	Received by:	Date/Time

Condition of Samples Upon Arrival: ( ) Acceptable ( ) Problem(s)

Post-it® Fax Note 7671	Date 4-2	# of pages ▶ 1
To Rich Niles	From Laurie	
Co./Dept.	Co. BRPC	
Phone #	Phone # 413-442-1521	
Fax # 800-331-0892	Fax #	

BERKSHIRE ENVIRO-LABS, INC.

WATER WASTEWATER AND ENVIRONMENTAL ANALYSIS
PHYSICAL CHEMICAL AND BACTERIOLOGICAL TESTING
LABORATORY AND FIELD MEASUREMENTS

CORNER OF MAIN & CENTER STREETS
266 MAIN STREET, LEE, MASS. 01238 (413) 243-1416

Berkshire Regional Planning Commission

L- 562

RE: Adams Storm

** REVISED 10/22/04 **

SAMPLE NUMBER	140478
DATE COLLECTED	8/12/04
TIME COLLECTED	10:15am
COLLECTED BY	J.T./M.S./C.G./D.C./R.S./T.M.
SAMPLE LOCATION	SW1

ANALYSIS	UNITS	RESULTS	DETECTION LIMIT	METHOD NUMBER	ANALYST	DATE ANALYZED
Fecal Coliform	/100ml	>300000	10	SM 9222 D	W.E.-B.W.	8/12/04
E. Coli	/100ml	>250000	0	Colilert	W.E.-B.W.	8/12/04
Total Suspended Solids	mg/l	270	1	SM 2540 D	B.W.	8/15/04
Total Phosphorus (as P)	mg/l	0.772	0.01	SM 4500-P-B,E	B.W.	8/13/04

SAMPLE NUMBER	140479
DATE COLLECTED	8/12/04
TIME COLLECTED	10:05am
COLLECTED BY	J.T./M.S./C.G./D.C./R.S./T.M.
SAMPLE LOCATION	SW2

ANALYSIS	UNITS	RESULTS	DETECTION LIMIT	METHOD NUMBER	ANALYST	DATE ANALYZED
Fecal Coliform	/100ml	72000	10	SM 9222 D	W.E.-B.W.	8/12/04
E. Coli	/100ml	54750	0	Colilert	W.E.-B.W.	8/12/04
Total Suspended Solids	mg/l	110	1	SM 2540 D	B.W.	8/15/04
Total Phosphorus (as P)	mg/l	0.417	0.01	SM 4500-P-B,E	B.W.	8/13/04

SAMPLE NUMBER	140480
DATE COLLECTED	8/12/04
TIME COLLECTED	10:20am
COLLECTED BY	J.T./M.S./C.G./D.C./R.S./T.M.
SAMPLE LOCATION	SW3

ANALYSIS	UNITS	RESULTS	DETECTION LIMIT	METHOD NUMBER	ANALYST	DATE ANALYZED
Fecal Coliform	/100ml	56000	10	SM 9222 D	W.E.-B.W.	8/12/04
E. Coli	/100ml	38730	0	Colilert	W.E.-B.W.	8/12/04
Total Suspended Solids	mg/l	196	1	SM 2540 D	B.W.	8/15/04
Total Phosphorus (as P)	mg/l	0.556	0.01	SM 4500-P-B,E	B.W.	8/13/04

< = Less Than > = Greater Than ND = Not Detected

William S. Enser, Jr.
Director

WATER WASTEWATER AND ENVIRONMENTAL ANALYSIS
PHYSICAL CHEMICAL AND BACTERIOLOGICAL TESTING
LABORATORY AND FIELD MEASUREMENTS

BERKSHIRE ENVIRO-LABS, INC.

CORNER OF MAIN & CENTER STREETS
266 MAIN STREET, LEE, MASS. 01238 (413) 243-1416

Berkshire Regional Planning Commission

L- 562

RE: Adams Storm
** REVISED 10/22/04 **

SAMPLE NUMBER	140481					
DATE COLLECTED	8/12/04					
TIME COLLECTED	10:00am					
COLLECTED BY	J.T./M.S./C.G./D.C./R.S./T.M.					
SAMPLE LOCATION	SW5		DETECTION	METHOD		DATE
ANALYSIS	UNITS	RESULTS	LIMIT	NUMBER	ANALYST	ANALYZED
Fecal Coliform	/100ml	61000	10	SM 9222 D	W.E.-B.W.	8/12/04
E. Coli	/100ml	43520	0	Colilert	W.E.-B.W.	8/12/04
Total Suspended Solids	mg/l	44	1	SM 2540 D	B.W.	8/15/04
Total Phosphorus (as P)	mg/l	0.560	0.01	SM 4500-P-B,E	B.W.	8/13/04

SAMPLE NUMBER	140482					
DATE COLLECTED	8/12/04					
TIME COLLECTED	10:05am					
COLLECTED BY	J.T./M.S./C.G./D.C./R.S./T.M.					
SAMPLE LOCATION	SW6		DETECTION	METHOD		DATE
ANALYSIS	UNITS	RESULTS	LIMIT	NUMBER	ANALYST	ANALYZED
Fecal Coliform	/100ml	80000	10	SM 9222 D	W.E.-B.W.	8/12/04
E. Coli	/100ml	72700	0	Colilert	W.E.-B.W.	8/12/04
Total Suspended Solids	mg/l	66	1	SM 2540 D	B.W.	8/15/04
Total Phosphorus (as P)	mg/l	0.403	0.01	SM 4500-P-B,E	B.W.	8/13/04

SAMPLE NUMBER						
DATE COLLECTED						
TIME COLLECTED						
COLLECTED BY						
SAMPLE LOCATION			DETECTION	METHOD		DATE
ANALYSIS	UNITS	RESULTS	LIMIT	NUMBER	ANALYST	ANALYZED
Fecal Coliform	/100ml		10	SM 9222 D		
E. Coli	/100ml		0	Colilert		
Total Suspended Solids	mg/l		1	SM 2540 D		
Total Phosphorus (as P)	mg/l		0.01	SM 4500-P-B,E		

< = Less Than   > = Greater Than   ND = Not Detected

William S. Enser, Jr.
Director

BERKSHIRE ENVIRO-LABS, INC.

CORNER OF MAIN & CENTER STREETS

266 MAIN STREET, LEE, MASS. 01238 (413) 243-1416

Berkshire Regional Planning Commission L- 562

RE: Adams Storm - QC Report

** REVISED 10/22/04 **

SAMPLE NUMBER	140481					
DATE COLLECTED	8/12/04					
TIME COLLECTED	10:00am					
COLLECTED BY	J.T./M.S./C.G./D.C./R.S./T.M.					
SAMPLE LOCATION	SW5		DUPLICATE			
ANALYSIS	UNITS	RESULTS	RESULTS			
Fecal Coliform	/100ml	61000	58840			
E. Coli	/100ml	43520	52000			

SAMPLE NUMBER	140481					
DATE COLLECTED	8/12/04					
TIME COLLECTED	10:00am					
COLLECTED BY	J.T./M.S./C.G./D.C./R.S./T.M.					
SAMPLE LOCATION	SW5		DUPLICATE	SPIKE %		
ANALYSIS	UNITS	RESULTS	RESULTS	RECOVERED		
Total Phosphorus (as P)	mg/l	0.558	0.561	103%		
Nitrate (as N)	mg/l					
Alkalinity	mg/l					

SAMPLE NUMBER	140482					
DATE COLLECTED	8/12/04					
TIME COLLECTED	10:05am					
COLLECTED BY	J.T./M.S./C.G./D.C./R.S./T.M.					
SAMPLE LOCATION	SW6		DUPLICATE			
ANALYSIS	UNITS	RESULTS	RESULTS			
pH	SU					
Total Suspended Solids	mg/l	66	65			

< = Less Than > = Greater Than ND = Not Detected

William S. Enser, Jr.
Director

Hoosic River Watershed Association

Monitors' Field Report Form

Date 08-~~14~~ 12-04 Time flow visible 9:50am Time sample collected 10:15am

Site SW-1 (RENFREW)

Sampler(s) Name(s) JIM TAYLOR, MIKE SHERMAN, CHRIS GELINAS

Recent Weather Conditions: Characterize the last 24 hours by checking those that apply.

Sky conditions:	__ clear	__ partly cloudy	✓ cloudy
Rainfall:	__ light rain	✓ moderate rain	__ heavy rain
Temperatures	✓ hot	__ seasonable	__ cool

Today's Weather Conditions:

__ clear ✓ cloudy ✓ rainy __ heavy rain 72° air temperature

In-Stream Conditions: Characterize the condition of the river water by checking those that apply.

Water level and flow:	____ low	____ normal	✓ high
Turbidity:	____ clear	____ cloudy	✓ very cloudy
Odor:	____ fishy	____ sewage	✓ other (explain) N/A

Water temperature: 19°C

Type of sample collected:

___ bacteria ✓ total phosphorous (TP) ✓ total suspended solids (TSS)

Stream Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., any debris (trash, tires, barrels, dirt or asphalt, etc.), signs of erosion or other disturbance. TRASH

Anything Else of Note?

(GLHS)

Hoosic River Watershed Association

Monitors' Field Report Form

Date 08-12-04 Time 10:20am Site SW-1 (RENFREW)

Sampler(s) Name(s) JIM TAYLOR, MIKE SHERMAN, CHRIS GELINAS

Recent Weather Conditions: Characterize the last 24 hours by checking those that apply.

Sky conditions: __ clear __ partly cloudy ✓ cloudy

Rainfall: __ light rain ✓ moderate rain __ heavy rain

Temperatures ✓ hot __ seasonable __ cool

Today's Weather Conditions:

__ clear ✓ cloudy ✓ rainy __ heavy rain 72° air temperature

In-Stream Conditions: Characterize the condition of the river water by checking those that apply.

Water level and flow: ____ low ____ normal ✓ high

Turbidity: ____ clear ____ cloudy ✓ very cloudy

Odor: ____ fishy ____ sewage ✓ other (explain) N/A

Water temperature: 19°C

Type of sample collected:

✓ bacteria ___ total phosphorous (TP) ___ total suspended solids (TSS)

Stream Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., any debris (trash. tires, barrels, dirt or asphat. etc.), signs of erosion or other disturbance.

TRASH

Anything Else of Note? ~~G6~~ G696

(PLASTIC)

Hoosic River Watershed Association

Monitors' Field Report Form

Date 08-12-04 Time 10:05 AM Site SW-2 (DPW - ADAMS)

Sampler(s) Name(s) JIM TAYLOR, MIKE SHERMAN, CHRIS GELINAS

Recent Weather Conditions: Characterize the last 24 hours by checking those that apply.

Sky conditions: __ clear __ partly cloudy ✓ cloudy

Rainfall: __ light rain ✓ moderate rain __ heavy rain

Temperatures ✓ hot __ seasonable __ cool

Today's Weather Conditions:

__ clear ✓ cloudy ✓ rainy __ heavy rain 72° air temperature

In-Stream Conditions: Characterize the condition of the river water by checking those that apply.

Water level and flow: ____ low ____ normal ✓ high

Turbidity: ____ clear ____ cloudy ✓ very cloudy

Odor: ____ fishy ____ sewage ✓ other (explain) N/A

Water temperature: 22.5° C

Type of sample collected:

__ bacteria ✓ total phosphorous (TP) ✓ total suspended solids (TSS)

Stream Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., any debris (trash, tires, barrels, dirt or asphat. etc.), signs of erosion or other disturbance.

GRASS (JUST MOWED)

Anything Else of Note?

(COLAS)

Hoosic River Watershed Association

Monitors' Field Report Form

Date 08-12-04 Time 10:07 am Site SW-2 (DPW - ADAMS)

Sampler(s) Name(s) JIM TAYLOR, MIKE SHERMAN, CHRIS GELINAS

Recent Weather Conditions: Characterize the last 24 hours by checking those that apply.

Sky conditions: __ clear __ partly cloudy ✓ cloudy

Rainfall: __ light rain ✓ moderate rain __ heavy rain

Temperatures ✓ hot __ seasonable __ cool

Today's Weather Conditions:

__ clear ✓ cloudy ✓ rainy __ heavy rain 72° air temperature

In-Stream Conditions: Characterize the condition of the river water by checking those that apply.

Water level and flow: ____ low ____ normal ✓ high

Turbidity: ____ clear ____ cloudy ✓ very cloudy

Odor: ____ fishy ____ sewage ✓ other (explain) ____________

Water temperature: 22.5° C

Type of sample collected:

✓ bacteria ___ total phosphorous (TP) ___ total suspended solids (TSS)

Stream Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., any debris (trash, tires, barrels, dirt or asphat. etc.), signs of erosion or other disturbance.

GRASS (JUST MOWED)

Anything Else of Note?

Hoosic River Watershed Association

Monitors' Field Report Form

Date 8/12/04 Time flow visible 10:00 Time sample collected 10:20

Site SW-3 HOXIE BROOK

Sampler(s) Name(s) Renée Speyer / Donna Cesan

Recent Weather Conditions: Characterize the last 24 hours by checking those that apply.

Sky conditions:	__ clear	__ partly cloudy	X cloudy
Rainfall:	X light rain	__ moderate rain	__ heavy rain
Temperatures	__ hot	X seasonable	__ cool

Today's Weather Conditions:

__ clear X cloudy X rainy __ heavy rain 74° air temperature

In-Stream Conditions: Characterize the condition of the river water by checking those that apply.

Water level and flow: ____ low X normal ____ high
Turbidity: ____ clear X cloudy ____ very cloudy
Odor: ____ fishy ____ sewage ____ other (explain) none
Water temperature: NA

Type of sample collected:

X bacteria X total phosphorous (TP) X total suspended solids (TSS)

Stream Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., any debris (trash, tires, barrels, dirt or asphalt, etc.), signs of erosion or other disturbance.

none

Anything Else of Note? no

6461

Hoosic River Watershed Association

Monitors' Field Report Form

Date 8/13/09 Time flow visible__________ Time sample collected__________

Site SW-4 - Post office

Sampler(s) Name(s) R. Speyer / D Cesan

Recent Weather Conditions: Characterize the last 24 hours by checking those that apply.

Failed sample: lost collection device in River

Sky conditions:	__ clear	__ partly cloudy	__ cloudy
Rainfall:	__ light rain	__ moderate rain	__ heavy rain
Temperatures	__ hot	__ seasonable	__ cool

Today's Weather Conditions:

__ clear __ cloudy __ rainy __ heavy rain ________ air temperature

In-Stream Conditions: Characterize the condition of the river water by checking those that apply.

Water level and flow:	____ low	____ normal	____ high
Turbidity:	____ clear	____ cloudy	____ very cloudy
Odor:	____ fishy	____ sewage	____ other (explain) ________________

Water temperature: __________

Type of sample collected:

___ bacteria ___ total phosphorous (TP) ___ total suspended solids (TSS)

Stream Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., any debris (trash, tires, barrels, dirt or asphalt, etc.), signs of erosion or other disturbance.

____

____

____

Anything Else of Note? ____

____

____

____

Hoosic River Watershed Association

Monitors' Field Report Form

Date 8/12/04 Time flow visible 9:44 Time sample collected 10:00

Site SW-5

Sampler(s) Name(s) Tom Matuszko

Recent Weather Conditions: Characterize the last 24 hours by checking those that apply.

Sky conditions:	__ clear	__ partly cloudy	✓ cloudy
Rainfall:	✓ light rain	__ moderate rain	__ heavy rain
Temperatures	__ hot	✓ seasonable	__ cool

Today's Weather Conditions:

__ clear __ cloudy ✓ rainy __ heavy rain 72F air temperature

In-Stream Conditions: Characterize the condition of the river water by checking those that apply.

Water level and flow:	___ low	___ normal	___ high
Turbidity:	✓ clear	___ cloudy	___ very cloudy
Odor:	___ fishy	___ sewage	___ other (explain) None

Water temperature: 19c

Type of sample collected:

✓ bacteria ✓ total phosphorous (TP) ✓ total suspended solids (TSS)

Stream Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., any debris (trash, tires, barrels, dirt or asphalt, etc.), signs of erosion or other disturbance.

No

Anything Else of Note? No

Hoosic River Watershed Association

Monitors' Field Report Form

Date 8/12/04 Time flow visible 9:44 Time sample collected 10:05

Site SW-6

Sampler(s) Name(s) T. Matuszko

Recent Weather Conditions: Characterize the last 24 hours by checking those that apply.

Sky conditions:	__ clear	__ partly cloudy	✓ cloudy
Rainfall:	✓ light rain	__ moderate rain	__ heavy rain
Temperatures	__ hot	✓ seasonable	__ cool

Today's Weather Conditions:

__ clear __ cloudy ✓ rainy __ heavy rain 72 F air temperature

In-Stream Conditions: Characterize the condition of the river water by checking those that apply.

Water level and flow:	____ low	____ normal	____ high
Turbidity:	✓ clear	____ cloudy	____ very cloudy
Odor:	____ fishy	____ sewage	____ other (explain) None

Water temperature: 19c

Type of sample collected:

✓ bacteria ✓ total phosphorous (TP) ✓ total suspended solids (TSS)

Stream Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., any debris (trash, tires, barrels, dirt or asphalt, etc.), signs of erosion or other disturbance.

No

Anything Else of Note? No

Form No. | Page 1 of 3

Project Information

Project Name: Adams Storm
Project No.:
Project Location: Adams, MA
Project Manager: Rebecca Balke
Sampler(s): ~~L. Adams~~ J. Taylor, M. Sherman, C. Golinas, ~~R. Adams~~ D. Cesan, R. Speyer, T. Matuszko
PO #: Lab Quote#:
Turn-Around: ( ) Standard 10 business days * ( ) Other (specify):
Note: TAT's less than 10 days must be pre-approved!

Client Information

Send Reports to: Tom Matuszko
Company: BRPC
Address: 1 Fenn St, Suite 201, Pittsfield, MA 01201
Phone: 413-442-1521
Fax: 413-442-1523
Account # (Lab Use Only)
Reporting Requirements: ( ) Mail ( ) Priority
Preliminary: ( ) FAX ( ) Verbal by / /
Final: ( ) FAX ( ) Verbal by / /

FILTRATION AND PRESERVATION

Please indicate filtration (0.45 um for dissolved metals) and preservation information below:

Filtration	Preservation
( ) Done	( ) Done
( ) Not Needed	( ) Not Needed
( ) Lab To Do *	( ) Lab To Do *

* Please specify which samples need to be filtered and/or preserved by the lab.

ANALYSES (write test methods above & "X's"/# of bottles below for each sample to be tested)

Lab ID (Lab Use Only)	Client/Field Sample ID	Collection Date	Collection Time	Sample Source/Matrix	TP	TSS	Fecal Coliform	E. coli	Sample Remarks (below)	# OF BOTTLES
	SW1 A	8/12/04	10:15 am		X	X				
	B	"	10:20				X	X		
	SW2 A	"	10:05		X	X				
	B	"	10:07				X	X		
	SW3 A	"	10:20		X	X				
	B	"	10:20				X	X		
	SW5 A	"	10:00		X	X				
	B	"	10:00				X	X		
	SW6 A	"	10:05		X	X				
	B	"	10:05				X	X		

OF BOTTLES

* Sub-Contracted Analyses are not subject to our Standard 10 business day TAT's.

Notes: A = Plastic Sample
B = Glass Sample

BERKSHIRE ENVIRO-LABS, INC.
Corner of Main & Center Streets
P.O. Box 113 Lee, MA. 01238
Phone/Fax: (413) 243-1416

Relinquished by:	Date/Time	Received by:	Date/Time
[signature]	8/12/04 2:25	[signature]	8/12/04 2:25

Condition of Samples Upon Arrival: ( ) Acceptable ( ) Problem(s)

CHAIN-OF-CUSTODY RECORD

BERKSHIRE ENVIRO-LABS, INC.

CORNER OF MAIN & CENTER STREETS
266 MAIN STREET, LEE, MASS. 01238 (413) 243-1416

Berkshire Regional Planning Commission

L- 562

RE: Adams Storm

SAMPLE NUMBER	141860
DATE COLLECTED	9/17/04
TIME COLLECTED	2:25pm
COLLECTED BY	C. Gelinas/S. Voisin/T. Matuszko
SAMPLE LOCATION	SW1

ANALYSIS	UNITS	RESULTS	DETECTION LIMIT	METHOD NUMBER	ANALYST	DATE ANALYZED
Fecal Coliform	/100ml	86000	1000	SM 9222 D	W.E.-B.W.	9/17/04
E. Coli	/100ml	77000	100	Colilert	W.E.-B.W.	9/17/04
Total Suspended Solids	mg/l	8	1	SM 2540 D	B.W.	9/20/04
Total Phosphorus (as P)	mg/l	0.203	0.01	SM 4500-P-B,E	B.W.	9/21/04

SAMPLE NUMBER	141861
DATE COLLECTED	9/17/04
TIME COLLECTED	2:15pm
COLLECTED BY	C. Gelinas/S. Voisin/T. Matuszko
SAMPLE LOCATION	SW2

ANALYSIS	UNITS	RESULTS	DETECTION LIMIT	METHOD NUMBER	ANALYST	DATE ANALYZED
Fecal Coliform	/100ml	75000	1000	SM 9222 D	W.E.-B.W.	9/17/04
E. Coli	/100ml	68700	100	Colilert	W.E.-B.W.	9/17/04
Total Suspended Solids	mg/l	6	1	SM 2540 D	B.W.	9/20/04
Total Phosphorus (as P)	mg/l	0.227	0.01	SM 4500-P-B,E	B.W.	9/21/04

SAMPLE NUMBER	141862
DATE COLLECTED	9/17/04
TIME COLLECTED	2:20am
COLLECTED BY	C. Gelinas/S. Voisin/T. Matuszko
SAMPLE LOCATION	SW3

ANALYSIS	UNITS	RESULTS	DETECTION LIMIT	METHOD NUMBER	ANALYST	DATE ANALYZED
Fecal Coliform	/100ml	160000	1000	SM 9222 D	W.E.-B.W.	9/17/04
E. Coli	/100ml	120300	100	Colilert	W.E.-B.W.	9/17/04
Total Suspended Solids	mg/l	2	1	SM 2540 D	B.W.	9/20/04
Total Phosphorus (as P)	mg/l	0.211	0.01	SM 4500-P-B,E	B.W.	9/21/04

< = Less Than > = Greater Than ND = Not Detected

William S. Enser, Jr.
Director

BERKSHIRE ENVIRO-LABS, INC.

CORNER OF MAIN & CENTER STREETS
266 MAIN STREET, LEE, MASS. 01238 (413) 243-1416

Berkshire Regional Planning Commission

L- 562

RE: Adams Storm

SAMPLE NUMBER	141863					
DATE COLLECTED	9/17/04					
TIME COLLECTED	2:12pm					
COLLECTED BY	C. Gelinas/S. Voisin/T. Matuszko					
SAMPLE LOCATION	SW4		DETECTION	METHOD		DATE
ANALYSIS	UNITS	RESULTS	LIMIT	NUMBER	ANALYST	ANALYZED
Fecal Coliform	/100ml	53000	1000	SM 9222 D	W.E.-B.W.	9/17/04
E. Coli	/100ml	46100	100	Colilert	W.E.-B.W.	9/17/04
Total Suspended Solids	mg/l	1	1	SM 2540 D	B.W.	9/20/04
Total Phosphorus (as P)	mg/l	0.218	0.01	SM 4500-P-B,E	B.W.	9/21/04

SAMPLE NUMBER	141864					
DATE COLLECTED	9/17/04					
TIME COLLECTED	2:25pm					
COLLECTED BY	C. Gelinas/S. Voisin/T. Matuszko					
SAMPLE LOCATION	SW5		DETECTION	METHOD		DATE
ANALYSIS	UNITS	RESULTS	LIMIT	NUMBER	ANALYST	ANALYZED
Fecal Coliform	/100ml	91000	1000	SM 9222 D	W.E.-B.W.	9/17/04
E. Coli	/100ml	77000	100	Colilert	W.E.-B.W.	9/17/04
Total Suspended Solids	mg/l	1	1	SM 2540 D	B.W.	9/20/04
Total Phosphorus (as P)	mg/l	0.201	0.01	SM 4500-P-B,E	B.W.	9/21/04

SAMPLE NUMBER	141865					
DATE COLLECTED	9/17/04					
TIME COLLECTED	2:28pm					
COLLECTED BY	C. Gelinas/S. Voisin/T. Matuszko					
SAMPLE LOCATION	SW6		DETECTION	METHOD		DATE
ANALYSIS	UNITS	RESULTS	LIMIT	NUMBER	ANALYST	ANALYZED
Fecal Coliform	/100ml	80000	1000	SM 9222 D	W.E.-B.W.	9/17/04
E. Coli	/100ml	72700	100	Colilert	W.E.-B.W.	9/17/04
Total Suspended Solids	mg/l	1	1	SM 2540 D	B.W.	9/20/04
Total Phosphorus (as P)	mg/l	0.187	0.01	SM 4500-P-B,E	B.W.	9/21/04

< = Less Than > = Greater Than ND = Not Detected

William S. Enser, Jr.
Director

Project Information	Client Information
Project Name: ADAMS STORM	Send Reports to: Tom Matuszko
Project No.:	Company: B.R.P.C
Project Location: ADAMS, MA	Address: 1 Fenn St, Suite 201
Project Manager: Rebecca Balke	Pittsfield, MA 01201
Sampler(s): C. Gelinas S. Voisin	Phone: 413-442-1521
T. Matuszko	Fax: 413-442-1523
PO #: Lab Quote#:	Account # (Lab Use Only)
Turn-Around: ( ) Standard 10 business days *	Reporting Requirements: ( ) Mail ( ) Priority
( ) Other (specify):	Preliminary: ( ) FAX ( ) Verbal by / /
Note: TAT's less than 10 days must be pre-approved!	Final: ( ) FAX ( ) Verbal by / /

Form No. | Page of

FILTRATION AND PRESERVATION

Please indicate filtration (0.45 um for dissolved metals) and preservation information below:

Filtration	Preservation
( ) Done	( ) Done
( ) Not Needed	( ) Not Needed
( ) Lab To Do *	( ) Lab To Do *

* Please specify which samples need to be filtered and/or preserved by the lab.

ANALYSES (write test methods above & "X's"/ # of bottles below for each sample to be tested)

Lab ID (Lab Use Only)	Client/Field Sample ID	Collection Date	Collection Time	Sample Source/Matrix	TP	TSS	Fecal Coliform	E Coli	Sample Remarks (below)	# OF BOTTLES
	SW1 A	9/17/04	2:25		X	X				
	B	"	2:25				X	X		
	SW2 A	"	2:15		X	X				
	B	"	2:15				X	X		
	SW3 A	"	2:20		X	X				
	B	"	2:20				X	X		
	SW4 A	"	2:12		X	X				
	B	"	2:12				X	X		
	SW5 A	"	2:25		X	X				
	B	"	2:25				X	X		
	SW6 A	"	2:28		X	X				
	B	"	2:28				X	X		

OF BOTTLES

* Sub-Contracted Analyses are not subject to our Standard 10 business day TAT's.

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Corner of Main & Center Streets
P.O. Box 113 Lee, MA. 01238
Phone/Fax: (413) 243-1416

Notes: A = Plastic Sample
B = Glass Sample

CHAIN-OF-CUSTODY RECORD

Relinquished by:	Date/Time	Received by:	Date/Time	Condition of Samples Upon Arrival
[signature]	9/17/04 3:55	[signature]	9/17/04 3:55	( ) Acceptable ( ) Problem(s)

Hoosic River Watershed Association

Monitors' Field Report Form

Date ____ Time ____ Site ____

Sampler(s) Name(s) ____

Recent Weather Conditions: Characterize the last 24 hours by checking those that apply.

Sky conditions: __ clear __ partly cloudy __cloudy

Rainfall: __ light rain __ moderate rain __heavy rain

Temperatures __ hot __seasonable __cool

Today's Weather Conditions:

__ clear __cloudy __rainy __heavy rain ____air temperature

In-Stream Conditions: Characterize the condition of the river water by checking those that apply.

Water level and flow: ____low ____normal ____high

Turbidity: ____clear ____cloudy ____very cloudy

Odor: ____fishy ____sewage ____other (explain) ____

Water temperature: ____

Type of sample collected:

__bacteria ✓ total phosphorous (TP) ✓ total suspended solids (TSS)

ream Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., y debris (trash, tires, barrels, dirt or asphat, etc.), signs of erosion or other disturbance.

____

nything Else of Note? ____

Hoosic River Watershed Association

Monitors' Field Report Form

Date ________ Time ________ Site ____________________________

Sampler(s) Name(s) ____

Recent Weather Conditions: Characterize the last 24 hours by checking those that apply.

Sky conditions: __ clear __ partly cloudy __cloudy

Rainfall: __ light rain __ moderate rain __heavy rain

Temperatures __ hot __seasonable __cool

Today's Weather Conditions:

__ clear __cloudy __rainy __heavy rain ________air temperature

In-Stream Conditions: Characterize the condition of the river water by checking those that apply.

Water level and flow: ____low ____normal ____high

Turbidity: ____clear ____cloudy ____very cloudy

Odor: ____fishy ____sewage ____other (explain) ________________

Water temperature: ________

Type of sample collected:

__bacteria X total phosphorous (TP) X total suspended solids (TSS)

ream Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., y debris (trash, tires, barrels, dirt or asphat, etc.), signs of erosion or other disturbance.

nything Else of Note?

Hoosic River Watershed Association

Monitors' Field Report Form

Date 9/17/04 Time flow visible 2:00 Time sample collected 2:20

Site SW 3 Hoxie Brook

Sampler(s) Name(s) Sarah Voisin

Recent Weather Conditions: Characterize the last 24 hours by checking those that apply.

Sky conditions:	✓ clear	✓ partly cloudy	✓ cloudy
Rainfall:	__ light rain	✓ moderate rain	__ heavy rain
Temperatures	__ hot	✓ seasonable	__ cool

Today's Weather Conditions:

__ clear ✓ cloudy ✓ rainy __ heavy rain 68° F air temperature

In-Stream Conditions: Characterize the condition of the river water by checking those that apply.

Water level and flow:	____ low	✓ normal	____ high
Turbidity:	____ clear	✓ cloudy	____ very cloudy
Odor:	____ fishy	____ sewage	✓ other (explain) no odor

Water temperature: 18 °C

Type of sample collected:

✓ bacteria ✓ total phosphorous (TP) ✓ total suspended solids (TSS)

Stream Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., any debris (trash, tires, barrels, dirt or asphalt, etc.), signs of erosion or other disturbance.

There was trash along the banks, probably from the rail trail

Anything Else of Note?

Hoosic River Watershed Association

Monitors' Field Report Form

Date 9/17/04 Time flow visible 2:10 Time sample collected 2:25 pm

Site SW5 - Glen St

Sampler(s) Name(s) Tom Matuszko

Recent Weather Conditions: Characterize the last 24 hours by checking those that apply.

Sky conditions:	__ clear	__ partly cloudy	✓ cloudy
Rainfall:	✓ light rain	__ moderate rain	__ heavy rain
Temperatures	__ hot	✓ seasonable	__ cool

Today's Weather Conditions:

__ clear __ cloudy ✓ rainy __ heavy rain 68 air temperature

In-Stream Conditions: Characterize the condition of the river water by checking those that apply.

Water level and flow: ✓ low ____ normal ____ high
Turbidity: ____ clear ✓ cloudy ____ very cloudy
Odor: ____ fishy ____ sewage ____ other (explain) Musty smell
Water temperature: 20°C

Type of sample collected:

✓ bacteria ✓ total phosphorous (TP) ✓ total suspended solids (TSS)

Stream Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., any debris (trash, tires, barrels, dirt or asphalt, etc.), signs of erosion or other disturbance.

- Leaves in drainage swale
- Small amount of trash

Anything Else of Note?

Hoosic River Watershed Association

Monitors' Field Report Form

Date 9/17/04 Time flow visible 2:10 Time sample collected 2:20

Site SW6

Sampler(s) Name(s) Tom Matuszko

Recent Weather Conditions: Characterize the last 24 hours by checking those that apply.

Sky conditions:	__ clear	__ partly cloudy	✓ cloudy
Rainfall:	✓ light rain	__ moderate rain	__ heavy rain
Temperatures	__ hot	✓ seasonable	__ cool

Today's Weather Conditions:

__ clear __cloudy ✓ rainy __heavy rain ________air temperature

In-Stream Conditions: Characterize the condition of the river water by checking those that apply.

Water level and flow: ✓ low ____normal ____high
Turbidity: ____clear ✓ cloudy ____very cloudy
Odor: ____fishy ____sewage ____other (explain) Musty Smell
Water temperature: 20°C

Type of sample collected:

✓ bacteria ✓ total phosphorous (TP) ✓ total suspended solids (TSS)

Stream Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., any debris (trash, tires, barrels, dirt or asphalt, etc.), signs of erosion or other disturbance.

Leaves in drain swale
Small amount of trash

Anything Else of Note?

WATER WASTEWATER AND ENVIRONMENTAL ANALYSIS
PHYSICAL CHEMICAL AND BACTERIOLOGICAL TESTING
LABORATORY AND FIELD MEASUREMENTS

BERKSHIRE ENVIRO-LABS, INC.

CORNER OF MAIN & CENTER STREETS
266 MAIN STREET, LEE, MASS. 01238 (413) 243-1416

Berkshire Regional Planning Commission

L- 562

RE: Adams Storm

SAMPLE NUMBER	143733
DATE COLLECTED	11/24/04
TIME COLLECTED	3:45pm
COLLECTED BY	J.T./M.S.
SAMPLE LOCATION	SW1

ANALYSIS	UNITS	RESULTS	DETECTION LIMIT	METHOD NUMBER	ANALYST	DATE ANALYZED
Fecal Coliform	/100ml	600	100	SM 9222 D	W.E.-B.W.	11/24/04
E. Coli	/100ml	400	100	Colilert	W.E.-B.W.	11/24/04
Total Suspended Solids	mg/l	59	1	SM 2540 D	B.W.	11/27/04
Total Phosphorus (as P)	mg/l	0.21	0.01	SM 4500-P-B,E	B.W.	12/8/04

SAMPLE NUMBER	143734
DATE COLLECTED	11/24/04
TIME COLLECTED	3:56pm
COLLECTED BY	J.T./M.S.
SAMPLE LOCATION	SW2

ANALYSIS	UNITS	RESULTS	DETECTION LIMIT	METHOD NUMBER	ANALYST	DATE ANALYZED
Fecal Coliform	/100ml	700	100	SM 9222 D	W.E.-B.W.	11/24/04
E. Coli	/100ml	500	100	Colilert	W.E.-B.W.	11/24/04
Total Suspended Solids	mg/l	75	1	SM 2540 D	B.W.	11/27/04
Total Phosphorus (as P)	mg/l	0.34	0.01	SM 4500-P-B,E	B.W.	12/8/04

SAMPLE NUMBER	143735
DATE COLLECTED	11/24/04
TIME COLLECTED	4:15pm
COLLECTED BY	D.C.
SAMPLE LOCATION	SW3

ANALYSIS	UNITS	RESULTS	DETECTION LIMIT	METHOD NUMBER	ANALYST	DATE ANALYZED
Fecal Coliform	/100ml	3100	100	SM 9222 D	W.E.-B.W.	11/24/04
E. Coli	/100ml	2600	100	Colilert	W.E.-B.W.	11/24/04
Total Suspended Solids	mg/l	15	1	SM 2540 D	B.W.	11/27/04
Total Phosphorus (as P)	mg/l	0.07	0.01	SM 4500-P-B,E	B.W.	12/8/04

< = Less Than > = Greater Than ND = Not Detected

William S. Enser, Jr.
Director

BERKSHIRE ENVIRO-LABS, INC.
CORNER OF MAIN & CENTER STREETS
266 MAIN STREET, LEE, MASS. 01238 (413) 243-1416

Berkshire Regional Planning Commission

L- 562

RE: Adams Storm

SAMPLE NUMBER	143736						
DATE COLLECTED	11/24/04						
TIME COLLECTED	4:10pm						
COLLECTED BY	D.C.						
SAMPLE LOCATION	SW4			DETECTION	METHOD		DATE
ANALYSIS		UNITS	RESULTS	LIMIT	NUMBER	ANALYST	ANALYZED
Fecal Coliform		/100ml	1900	100	SM 9222 D	W.E.-B.W.	11/24/04
E. Coli		/100ml	1200	100	Colilert	W.E.-B.W.	11/24/04
Total Suspended Solids		mg/l	68	1	SM 2540 D	B.W.	11/27/04
Total Phosphorus (as P)		mg/l	0.26	0.01	SM 4500-P-B,E	B.W.	12/8/04

SAMPLE NUMBER							
DATE COLLECTED							
TIME COLLECTED							
COLLECTED BY							
SAMPLE LOCATION				DETECTION	METHOD		DATE
ANALYSIS		UNITS	RESULTS	LIMIT	NUMBER	ANALYST	ANALYZED
Fecal Coliform		/100ml		100	SM 9222 D		
E. Coli		/100ml		100	Colilert		
Total Suspended Solids		mg/l		1	SM 2540 D		
Total Phosphorus (as P)		mg/l		0.01	SM 4500-P-B,E		

SAMPLE NUMBER							
DATE COLLECTED							
TIME COLLECTED							
COLLECTED BY							
SAMPLE LOCATION				DETECTION	METHOD		DATE
ANALYSIS		UNITS	RESULTS	LIMIT	NUMBER	ANALYST	ANALYZED
Fecal Coliform		/100ml		100	SM 9222 D		
E. Coli		/100ml		100	Colilert		
Total Suspended Solids		mg/l		1	SM 2540 D		
Total Phosphorus (as P)		mg/l		0.01	SM 4500-P-B,E		

< = Less Than > = Greater Than ND = Not Detected

William S. Enser, Jr.
Director

CHAIN-OF-CUSTODY RECORD

Project Information

Project Name: Adams Storm
Project No.:
Project Location: Adams MA
Project Manager: Rebecca Balke
Sampler(s):

PO #: Lab Quote#:
Turn-Around: ( ) Standard 10 business days * ( ) Other (specify):
Note: TAT's less than 10 days must be pre-approved!

Client Information

Send Reports to: Tom Matuszko
Company: B.R.P.C
Address: 1 Fenn St, Suite 201
Pittsfield, MA 01201
Phone: 413-442-1521
Fax: 413-442-1523
Account # (Lab Use Only)
Reporting Requirements: ( ) Mail ( ) Priority
Preliminary: ( ) FAX ( ) Verbal by / /
Final: ( ) FAX ( ) Verbal by / /

Form No. Page of

FILTRATION AND PRESERVATION
Please indicate filtration (0.45 um for dissolved metals) and preservation information below:

Filtration	Preservation
( ) Done	( ) Done
( ) Not Needed	( ) Not Needed
( ) Lab To Do *	( ) Lab To Do *

* Please specify which samples need to be filtered and/or preserved by the lab.

ANALYSES (write test methods above & "X's"/ # of bottles below for each sample to be tested)

Lab ID (Lab Use Only)	Client/Field Sample ID	Collection Date	Collection Time	Sample Source/Matrix	TP	TSS	Fecal Coliform	E Coli	Sample Remarks (below)	# OF BOTTLES
	SW1 A	11/24/04	3:45		X	X				
	B	"	3:45				X	X		
	SW2 A	11/24	3:55		X	X				
	B	"	3:56				X	X		
	SW3 A	"	4:15		X	X				
	B	"	4:15				X	X		
	SW4 A	"	4:10		X	X				
	B	"	4:10				X	X		
	SW5 A	"			X	X				
	B	"					X	X		
	SW6 A	"			X	X				
	B	"					X	X		

OF BOTTLES

* Sub-Contracted Analyses are not subject to our Standard 10 business day TAT's.

BERKSHIRE ENVIRO-LABS, INC.
Corner of Main & Center Streets
P.O. Box 113 Lee, MA. 01238
Phone/Fax: (413) 243-1416

Notes: A = Plastic Sample
B = Glass Sample

Relinquished by:	Date/Time	Received by:	Date/Time	Condition of Samples Upon Arrival
[signature]	11/24/05	[signature]	11/24/04 5:15	( ) Acceptable ( ) Problem(s)

Hoosic River Watershed Association

Monitors' Field Report Form

Date 11-24-04 Time flow visible 3:45 PM Time sample collected 4:04 pm

Site SW-1 Renfrew & Columbia

Sampler(s) Name(s) Jim Taylor, Mike Sherman

Recent Weather Conditions: Characterize the last 24 hours by checking those that apply.

Sky conditions:	__ clear	__ partly cloudy	✓ cloudy
Rainfall:	__ light rain	✓ moderate rain	__ heavy rain
Temperatures	__ hot	__ seasonable	✓ cool

Today's Weather Conditions:

__ clear ✓ cloudy __ rainy __ heavy rain 50° air temperature

In-Stream Conditions: Characterize the condition of the river water by checking those that apply.

Water level and flow: ____ low ____ normal ✓ high
Turbidity: ____ clear ____ cloudy ✓ very cloudy
Odor: ____ fishy ____ sewage ✓ other (explain) Cloudy
Water temperature: 8° C

Type of sample collected:

✓ bacteria ✓ total phosphorous (TP) ✓ total suspended solids (TSS)

6662 6662

Stream Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., any debris (trash, tires, barrels, dirt or asphalt, etc.), signs of erosion or other disturbance.

Anything Else of Note?

Hoosic River Watershed Association

Monitors' Field Report Form

Date 11-24-04 Time 3:50 PM Site SW-2 DPW

Sampler(s) Name(s) JIM TAYLOR, MIKE SHERMAN

Recent Weather Conditions: Characterize the last 24 hours by checking those that apply.

Sky conditions: __ clear __ partly cloudy ✓ cloudy

Rainfall: __ light rain ✓ moderate rain __ heavy rain

Temperatures __ hot __ seasonable ✓ cool

Today's Weather Conditions:

__ clear ✓ cloudy __ rainy __ heavy rain 50° air temperature

In-Stream Conditions: Characterize the condition of the river water by checking those that apply.

Water level and flow: ____ low ____ normal ✓ high

Turbidity: ____ clear ✓ cloudy ____ very cloudy

Odor: ____ fishy ____ sewage ✓ other (explain) Muddy

Water temperature: 9.50 C

Type of sample collected:

✓ bacteria ✓ total phosphorous (TP) ✓ total suspended solids (TSS)

G724 G724

Stream Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., any debris (trash, tires, barrels, dirt or asphat, etc.), signs of erosion or other disturbance.

Anything Else of Note?

Hoosic River Watershed Association

Monitors' Field Report Form

Date 11/24/04 Time flow visible 4:00 Time sample collected 4:15 pm

Site SW#3

Sampler(s) Name(s) MARK MALLOY, Donna Cesan

Recent Weather Conditions: Characterize the last 24 hours by checking those that apply.

Sky conditions:	__ clear	__ partly cloudy	✓ cloudy
Rainfall:	__ light rain	✓ moderate rain	__ heavy rain
Temperatures	__ hot	__ seasonable	✓ cool

Today's Weather Conditions:

__ clear ✓ cloudy __ rainy __ heavy rain 50° air temperature

In-Stream Conditions: Characterize the condition of the river water by checking those that apply.

Water level and flow:	__ low	X normal	__ high
Turbidity:	__ clear	X cloudy	__ very cloudy
Odor:	__ fishy	__ sewage	__ other (explain) ______

Water temperature: 6.5°C

Type of sample collected:

✓ bacteria ✓ total phosphorous (TP) ✓ total suspended solids (TSS) 9585

Stream Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., any debris (trash, tires, barrels, dirt or asphalt, etc.), signs of erosion or other disturbance.

____

____

____

Anything Else of Note? ______________________________

____

____

____

Hoosic River Watershed Association

Monitors' Field Report Form

Date 9/17/04 Time flow visible 2:00 Time sample collected 2:12

Site SW-4 Adams Post Office

Sampler(s) Name(s) Sarah Voisin

Recent Weather Conditions: Characterize the last 24 hours by checking those that apply.

Sky conditions:	✓ clear	✓ partly cloudy	✓ cloudy
Rainfall:	__ light rain	✓ moderate rain	__ heavy rain
Temperatures	__ hot	✓ seasonable	__ cool

Today's Weather Conditions:

__ clear __ cloudy ✓ rainy __ heavy rain 68°F air temperature

In-Stream Conditions: Characterize the condition of the river water by checking those that apply.

Water level and flow:	____ low	✓ normal	____ high
Turbidity:	____ clear	✓ cloudy	____ very cloudy
Odor:	____ fishy	____ sewage	x other (explain) no odor

Water temperature: 72°F

Type of sample collected:

✓ bacteria ✓ total phosphorous (TP) ✓ total suspended solids (TSS)

Stream Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., any debris (trash, tires, barrels, dirt or asphalt, etc.), signs of erosion or other disturbance.

Nothing unusual around the banks

Anything Else of Note? ______

Hoosic River Watershed Association

Post Office

Monitors' Field Report Form

Date 11/24/04 Time flow visible 4:00 pm Time sample collected 4:10 pm

Site SW4 DEC

Sampler(s) Name(s) MARK MALLOY, DONNA CESAN

Recent Weather Conditions: Characterize the last 24 hours by checking those that apply.

Sky conditions:	__ clear	__ partly cloudy	✓ cloudy
Rainfall:	__ light rain	✓ moderate rain	__ heavy rain
Temperatures	__ hot	__ seasonable	✓ cool

Today's Weather Conditions:

__ clear ✓ cloudy __ rainy __ heavy rain 50° air temperature

In-Stream Conditions: Characterize the condition of the river water by checking those that apply.

Water level and flow: ____ low X normal ____ high
Turbidity: X clear ____ cloudy ____ very cloudy
Odor: ____ fishy ____ sewage ____ other (explain) ____________
Water temperature: 8°C

Type of sample collected:

✓ bacteria ✓ total phosphorous (TP) ✓ total suspended solids (TSS) G299

Stream Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., any debris (trash, tires, barrels, dirt or asphalt, etc.), signs of erosion or other disturbance. G299

Anything Else of Note? ____________

Hoosic River Watershed Association

Monitors' Field Report Form

Date 11/24/08 Time flow visible________ Time sample collected________

Site SWS - GLEN STREET

Sampler(s) Name(s) Tom Matuszko

Recent Weather Conditions: Characterize the last 24 hours by checking those that apply.

Sky conditions:	__ clear	__ partly cloudy	__ cloudy
Rainfall:	__ light rain	__ moderate rain	__ heavy rain
Temperatures	__ hot	__ seasonable	__ cool

Today's Weather Conditions:

__ clear __ cloudy __ rainy __ heavy rain ________ air temperature

In-Stream Conditions: Characterize the condition of the river water by checking those that apply.

Water level and flow:	____ low	____ normal	____ high
Turbidity:	____ clear	____ cloudy	____ very cloudy
Odor:	____ fishy	____ sewage	____ other (explain) ________

Water temperature: ________

Type of sample collected:

___ bacteria ___ total phosphorous (TP) ___ total suspended solids (TSS)

Stream Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., any debris (trash, tires, barrels, dirt or asphalt, etc.), signs of erosion or other disturbance.

Anything Else of Note? Sample not collected

Hoosic River Watershed Association

Monitors' Field Report Form

Date 11/24/04 Time flow visible__________ Time sample collected__________

Site SW6

Sampler(s) Name(s) Tom Matuszko

Recent Weather Conditions: Characterize the last 24 hours by checking those that apply.

Sky conditions: __ clear __ partly cloudy __ cloudy
Rainfall: __ light rain __ moderate rain __ heavy rain
Temperatures __ hot __ seasonable __ cool

Today's Weather Conditions:

__ clear __ cloudy __ rainy __ heavy rain ________ air temperature

In-Stream Conditions: Characterize the condition of the river water by checking those that apply.

Water level and flow: ____ low ____ normal ____ high
Turbidity: ____ clear ____ cloudy ____ very cloudy
Odor: ____ fishy ____ sewage ____ other (explain) __________
Water temperature: __________

Type of sample collected:

___ bacteria ___ total phosphorous (TP) ___ total suspended solids (TSS)

Stream Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., any debris (trash, tires, barrels, dirt or asphalt, etc.), signs of erosion or other disturbance.

Anything Else of Note? Sample not collected

APPENDIX 4-C

1987 I/I Study
Sewer System Problem Areas/Recommendations

TABLE IV-2

REHABILITATION RECOMMENDATIONS BASED ON

TELEVISION AND MANHOLE INSPECTIONS

AREA	REACH NAME	FROM	TO	SIZE (IN)	TYPE	TOTAL LENGTH (FT)	OBSV'D DEFECTS	REHABILITATION RECOMMENDATIONS & COMMENTS
1	Howland-Zylonite	S2-1	S1-2	6,10	VC	1,800	BP,CP,DP,R	MH rehab, Spot repair, C&TV, Root control, JT&S, Replace tap
5	Miller-Fisk	S2-94	S2-95	8	VC,CI	184	BJ,DP,L,OSJ,R	MH rehab, C&TV, Root control, JT&S,
6	Across the river	S2-99	S2-114	24,8,15	RCP,CI	2,602	BP,CP,DP,MD	MH rehab, Replace 450' of 15"pipe, Clean, JT&S, Replace taps
7	East/Orchard	S2-82C1	S2-83,82G	8	VC	953	CP,R,T,DP	MH rehab, Spot repair, C&TV, Root control, JT&S, Replace taps
7	Summer	S2-82	S2-84	8,12	AC,VC	1181	BP,CP,R,T	Spot repair, C&TV, Root control, JT&S, Replace taps
7	Commercial/Myrtle	S2-87	S2-89	15,18	VC	700	DP,L,T	MH rehab, Heavy cleaning, C&TV, JT&S, Replace tap
7	XC-Spring/Depot	S2-64	S2-69	21	RCP	809	R,T	Root control, C&TV, JT&S, Replace taps
8	East Hoosac	S2-120	S2-124	8	VC,CI	2,635	BP,CP,DP,L,MD,OSJ,R,T	MH rehab, Spot repair, Inspect services, Root control, C&TV, JT&S, Replace taps
8	N. Summer/Kittler	S2-39	S2-41	8	VC	650	BP,DP,L,OSJ,R,T	MH rehab, Spot repair, Root control, C&TV, JT&S, Replace taps
8	Winter	S2-49	S2-49A	8	VC	40	CP,OSJ	C&TV, JT&S
8	XC/Crotteau	S2-31	S2-34	18	AC	785	Blockage,CP,L,MD	MH rehab, Spot repair, C&TV, JT&S
9	Burt/Pine	S2-15J	S2-18,17D	8	VC	1,165	BP,CP,DP,L,MD,OSJ,T	Spot repair, Inspect services, C&TV, JT&S, Replace taps
9	Columbia	S2-15	S2-19,16	10,8	VC	3,389	BJ,BP,CP,DP,L,OSJ,R,T	Reloc watermains, MH rehab, Spot repair, Inspect services, Root control, C&TV, JT&S, Replace taps
9	Friend	S2-21	S2-52	8	VC	646	BP,CP,DP,T	Spot repair, C&TV, JT&S, Replace taps
9	Hoosic River	S2-25	S2-34	27	RCP	939	R,T	Inspect services, Root control, C&TV, JT&S
					TOTALS	18,478		

LEGEND

BJ = Bad Joint
BP = Broken Pipe
CP = Cracked Pipe

MD = Mineral Deposit
OSJ = Off-set Joint
R = Roots present

C&TV = Clean and TV inspect
JT&S = Joint testing and sealing

TABLE VIII-1

SEWER REACHES RECOMMENDED FOR REHABILITATION TO REDUCE INFILTRATION

Area	Reach Name	Location From	Location To	Appendix G Page No.
7	XC-Spring/Depot	S2-64	S2-69	G-7
8	Winter	S2-49	S2-49A	G-10
9	Hoosic River	S2-25	S2-34	G-15
8	XC/Crotteau	S2-31	S2-34	G-11
6	Across the river	S2-99	S2-114	G-3
9	Burt/Pine	S2-15J	S2-18,17D	G-12
9	Columbia	S2-15	S2-19,16	G-13
7	Commercial/Myrtle	S2-87	S2-89	G-6
9	Friend	S2-21	S2-52	G-14
8	N. Summer/Kittler	S2-39	S2-41	G-9

TABLE VIII-2

SEWER REACHES RECOMMENDED FOR ROOT CONTROL

Area	Reach Name	Location From	Location To
8	East Hoosac	S2-120	S2-124
7	East/Orchard	S2-82-C-1	S2-83, 83G
7	Summer	S2-82	S2-84
5	Miller-Fisk	S2-94	S2-95
1	Howland-Zylonite	S2-1	S1-2

Table A-1:

Adams, Massachusetts TV Inpsection Data:

Gage Area	Street Name	Location (from/to)	Size (in)	Type	Length (ft)	BJ	BP	CP	DP	L	MD	OSJ	R	T	Estim Infilt (gpm)	Comment
K-1	XC-Howland/Zylonite	S1-43/S2-3-C	6	VC	142		2	4	1				1			
K-1	XC-Howland/Zylonite	S2-3-C/S2-3	6													STA 1+42 unable to proceed
K-1	XC-Howland/Zylonite	S2-3/S1-2	10	VC	313				3							Unable to inspect
K-5	Willard/Fisk	S2-95/S2-94	8	VC&CI	184	1			1	1		1	10			Dips 2-3 inches
K-6	Across the river	S2-114/S2-113														Pipe changes from VC to CI
K-6	Across the river	S2-111/S2-112	24	AC	190						2					Line makes a 90 deg. prior entering MH#S2-113
K-6	Across the river	S2-112/S2-113	24	AC	112											
k																Appears to be a concrete bloc
K-6	Across the river	S2-111/S2-110	24	AC	156											
K-6	Across the river	S2-110/S2-109	24	AC	130											Leak at downstream connection
K-6	Across the river	S2-109/S2-107														None observed
K-6	Across the river	S2-107/S2-106	8	CI	75				1							Unable to inspect
K-6	Across the river	S2-106/S2-105														Camera lens submerged
e																Unable to fit camera into lin
K-6	Across the river	S2-103/S2-102	8	VC	209											
K-6	Across the river	S2-103/S2-105	8	CI	17											None observed
K-6	Across the river	S2-102/S2-101	15	VC	235		2	5						2		Unable to proceed
K-6	Across the river	S2-100/S2-99-B														
K-6	Across the river	S2-99-B/S2-99-A														No connection to MH#S2-99-B
K-6	Across the river	S2-99-A/S2-99	15	VC	176				3							Unable to inspect
K-7	Orchard	S2-82-G/S2-82-F	8	VC	0											Camera submerged
K-7	Orchard	S2-82-F/S2-82-E	8	VC	114			2								Unable to string line
K-7	Orchard	S2-82-E/S2-82-D	8	VC	58									1		
K-7	Orchard	S2-82-D/S2-82-D1	8	VC	143									4		
K-7	East	S2-83/S2-82-D	8	VC	137			2					3			Pipe curves to the left
K-7	Summer	S2-82-D/S2-82-C1	8	VC	162	1		1				2				
K-7	Summer	S2-84/S2-82-C1	8	VC	294				1	1			10	3		
K-7	Summer	S2-82-C1/S2-82	12	AC	887											
K-7	Commercial	S2-89/S2-87-D	15	VC	74				2							None observed
K-7	Commercial	S2-87-D/S2-89	15	VC	8											Camera lens submerged
K-7	Commercial/Myrtle	S2-87-C/S2-87-D	12	VC	13		1									Concrete blockage
K-7	Myrtle	S2-87-D/S2-87-C	12	VC	27				1							
K-7	Myrtle	S2-87-B/S2-87-C	18	VC	78											
K-7	Myrtle	S2-87-A/S2-87-B	18	VC	192											None observed
K-7	Myrtle	S2-87/S2-87-A	18	VC	112					1						
K-7	XC-Spring/Depot	S2-69/S2-68	21	RCP	194											Camera lens submerged
K-7	Depot	S2-68/S2-64-A	21	RCP	102								1			
K-7	Depot	S2-64-A/S2-64-B	21	RCP	114											Camera lens submerged
K-7	Depot	S2-64-B/S2-64-C	21	RCP	273									1		Camera lens submerged
K-7	Depot	S2-64-C/S2-64	21	RCP	126									2		Camera lens submerged
K-8	East Hoosac	S2-124/S2-122-D														Camera lens submerged
K-8	East Hoosac	S2-122-D/S2-122-C	8	VC	217					2		1			1.00	Unable to inspect
K-8	East Hoosac	S2-122-C/S2-122-B	8	VC	58					3		1		2	3.50	
K-8	East Hoosac	S2-122-B/S2-122-C	8	VC	194						2		2	1		
K-8	East Hoosac	S2-122-A/S2-122-B	8	CI	8											
K-8	East Hoosac	S2-122-A/S2-122	8	VC	102				1		1	2				Blockage at invert
K-8	East Hoosac	S2-122/S2-121-F	8	VC	156			1				3	3			
K-8	East Hoosac	S2-121-F/S2-121-E	8	VC	247			1				1				
K-8	East Hoosac	S2-121-E/S2-121-D	8	VC	229			1				1				
K-8	Crotteau	S2-32-A/S2-32	18	AC	189			2		3	1				0.06	

Table A-1 (continued):

K-8	East Hoosac	S2-121-D/S2-121-C	8	VC	227		1	20								
K-8	East Hoosac	S2-121-A/S2-121	8	VC	62								1	1		
K-8	East Hoosac	S2-121/S2-120-A	8	VC	198		1	2		1		1			5.00	
K-8	East Hoosac	S2-120-A/S2-120	8	VC	143							1		1		
K-8	East Hoosac	S2-120/S2-120-A	8	VC	55			1						4		
K-8	Kittler	S2-41/S2-40	8	VC	122					1				1	0.50	
K-8	Kittler	S2-40/S2-41	8	VC	252			1		1		2	4	1	0.50	
K-8	Crotteau	S2-34/S2-32-A						1	4			1	3	1		Concrete in joint @ 250
K-8	Burt	S2-49-A/S2-49	8	VC	40											Unable to inspect
K-8	Burt	S2-40/S2-39						1				1				
K-8	Burt	S2-32/S2-31	18	AC	266			2		3						Unable to inspect
K-9	St. Martha	S2-18/S2-17-B	8	VC	53			2			3					
K-9	Pine	S2-17-B/S2-18	8	VC	241									1	0.06	
K-9	Pine	S2-17-B/S2-17-A	8	VC	237							1		1		
K-9	Pine/Burt	S2-17-SE/S2-17-D						10	5	1					0.25	
K-9	Pine/Burt	S2-17-D/S2-17-C	8	VC	54			1	1			2		2		No access to S2-17-SE
K-9	Pine/Burt	S2-17-C/S2-17-D	8	VC	67			1			1			1		
K-9	Burt/Park	S2-17-C/S2-17-A	8	VC&CI	203		1		2		1			1		
K-9	Columbia	S2-17-A/S2-17-C	8	VC	88				1					1		
K-9	Columbia	S2-17-NE/S2-17-D														
K-9	Columbia	S2-17-A/S2-17-J	8	VC&CI	220		1	5	2	2	1	2				No access to MH#S2-17-SE
vs.)															1.50	Pipe changes from (VC to CI &
K-9	Columbia	S2-19/S2-15-K	8	VC	14											
K-9	Columbia	S2-15-K/S2-15-J	8	VC	315	1		7	1	1						Camera lens submerged
K-9	Columbia	S2-15-J/S2-15-I	10	VC	204			4	4						0.50	
K-9	Columbia	S2-15-I/S2-15-H	10	VC	55			3								Unable to proceed
K-9	Columbia	S2-15-H/S2-15-I	10	VC	232			1								
K-9	Columbia	S2-15-H/S2-15-G	10	VC	204			1	2							Camera lens submerged
K-9	Columbia	S2-15-G/S2-15-F	10	VC	199		2	3	2	1						
K-9	Columbia	S2-15-E/S2-15-D	10	VC	37				1						0.25	
K-9	Columbia	S2-15-D/S2-15-C	10	VC	70			3	1							Unable to dewater line
K-9	Columbia	S2-15-C/S2-15-B	10	VC	298		1	12	4				7		1.00	
K-9	Friend	S2-15-B/S2-15-A	10	VC	399		1	16	3	1		1	10		2.00	
K-9	Friend	S2-15-A/S2-15	10	CI&VC	212			1	3				4			
K-9	Friend	S2-15/S2-15-A	10	VC	22				1				2			
K-9	Friend	S2-52/S2-21-B	8	VC	52		1	1	1							
K-9	Friend	S2-21-B/S2-52	8	VC	160				3							
K-9	North Across River	S2-21-B/S2-21-A	8	VC	221			2						1		
K-9	North Across River	S2-21-A/S2-21	8	VC	79									2		
K-9	North Across River	S2-21/S2-21-A	8	VC	46			1						1		
K-9	Friend	S2-26/S2-25-D	27	RCP	170									1		
K-9	Friend	S2-25-D/S2-25-B	27	RCP	500											None observed
K-9	Friend/Columbia	S2-25-B/S2-25-A	27	RCP	69											
K-9	Friend/Columbia	S2-16/S1-9-A	8	VC	106	1			4			1	5			
K-9	Friend/Columbia	S1-9-A/S1-9	10	VC	344		2	8	4	1						
K-9	Friend/Columbia	S1-9/S2-15-E	10	VC	24		1	1		2				2	0.07	
															14.00	

BJ-bad joint, BP-broken pipe, CP-cracked pipe, DP-dip in line, MD-mineral deposit, OSJ-offset joint, R-roots, T-tap problem

Table C-1:

Adams, Massachusetts Manhole Inspection Data: Photo Logs - Roll No. 1

Gage Area	Location	Manhole No	Photo No.	Inv. Shelf Debris	Surch.	General Condition	Leak rate (gpm)	Comment
K-8	E. Hoosac St	122-C	I-1	none	no	Good	–	Square MH, rough conc. base
K-8	E. Hoosac St	122-B	I-2	none	no	–	–	Square conc. MH, drop conn. difficult reach to T.V.
K-8	E. Hoosac St	122-A	I-3	none	no	Poor	–	Misaligned MH, tough to clean and T.V., solids built up on invert
K-6	E. Hoosac St	S2-122	I-4	none	no	Good	–	Square MH, rough base
K-6	X-country @ river (immed. bef. X-ing)	S2-105	I-5	none	yes	Good	–	Exterior recently plastered with mortar, pole to left of base is surcharge cause
K-6	X-country @ river (immed. bef. X-ing)	S2-105	I-13	none	no	Good	–	Interior good shape, no app. leaks turb. flow, not easily estimated
K-6	X-ing river bet. MH's S2-105 & S2-103	–	I-6	none	no	Fair	–	Reeves st. is directly behind wall S2-103 is on right of pic, higher than top of wall
K-6	on S2-103 side of S2-105, near river	–	I-7	none	no	Fair	*	Spring water running out of ground near loc. of pipe. Approx. 3-4 GPM (river is to bott. of pict)
K-6	X-country @ river	S2-106	I-8	none	no	Fair	–	External recently plastered with mortar
K-6	X-country @ river	S2-106	I-14	none	no	Poor	2-3	Internal poor cond, seepage at base, inv. at bott. of pic. (flow to right - low flow, plugged
K-6	X-country @ river	S2-107	I-9	none	no	Fair	–	Correct MH is MH not marked, some damage to external
K-6	X-country @ river	S2-107	I-11	none	no	Fair	–	Poor picture of int. (see #12)
K-6	X-country @ river	S2-107	I-12	none	no	Fair	–	Flow from 8" line into 24", very turb., base is rough & wet
K-8	E. Hoosac St @ Burns St	S2-122	I-10	none	no	Good	–	Internal dry, rough base, odd 3 way invert, small opening at base, low flow,
K-7	Spring St	G.W.G. #3	I-15,16	much	no	Fair	–	Dry, low clear flow moisture ring below GWM.
K-8	N. Hoosac @ Allen St	G.W.G. #2	I-17	some	no	Good	–	Debris on shelf, solids cought in invert, moist ring below GWM
K-8	N. Hoosac @ Allen St	G.W.G. #2	I-18	some	no	Good	–	walls in good shape,
K-7	Commercial (@ Park)	S2-89	I-19	none	no	Fair	–	Shallow, rough shelf, high flow (flow towards paper)
K-7	Commercial (@ Park)	87-A	I-20	none	no	Good	–	High flow, steel inv.
K-7	Int. Myrtle & Park	87-C	I-21	none	no	Good	–	Shallow, flow too high to estimate, no leaks, flow dir towards wall shown
K-7	Comm. St(@ Mc Donalds)	87-B	I-22	none	no	Good	–	Deep, dry base, high flow level, flow dir.towards top of photo, ladder on right
K-7	Myrtle St. @ Pleasant	S2-87	I-23	none	no	–	–	Crew set up over MH
K-7	Myrtle St. @ Pleasant	S2-87	I-24	none	no	Good	–	Moist base, flow too high to estimate

* High probability of infiltration in area MH's due to high groundwater table

Table C-1 (continued):

Adams, Massachusetts Manhole Inspection Data: Photo Logs – Roll No. 2 & 3

Gage Area	Location	Manhole No	Photo No.	Inv. Shelf Debris	Surch.	General Condition	Leak rate (gpm)	Comment
K-6	Reeves St	101-A	II-0	much	no	Good	–	Dry, slow deep flow
K-6	Reeves St. @ Glenn	S2-101	II-1	–	–	–	–	Equip. set up over MH
K-6	Reeves St. @ Glenn	S2-101	II-2	some	no	Fair	–	Moist,(rough shelf), slow flow
K-8	E. Hoosac St.	121-B	II-3	none	no	Good	–	Shallow, dry, flow towards side of MH shown
K-8	E. Hoosac St.	121-D	II-5	some	no	Fair	1/2-1	Shallow, moist
K-1	Howland (Zylonite)	S1-43	II-6	some	no	Fair	–	High flow rate, moist base
K-1	X-country (Zylonite)	3-C	II-9,10	some	no	Poor	3-4	Shallow, Square MH, evidence of infil-tration through & around smaller supposedly out of service
K-1	X-country (Zylonite)	3-B	II-11	–	no	–	–	Top shown partially buried behind stone pile beneath tree limbs
K-8	E. Hoosac St.	121-A	II-12	some	no	Fair	–	Shallow, and invert dry
K-8	E. Hoosac St.	121-C	II-13	some	no	Good	–	Shallow, dry
K-8	X-country (DPW Garage)	32-A	II-14-16	–	–	–	–	Deep, moist (near river), high flow rate
K-8	Crotteau @ Sparrow	S2-34	II-17	some	no	Good	–	Deep, dry, high flow rate
K-9	Friend St.	15-M	III-16	much	no	–	–	Heavy cleaning
K-9	Upton & Columbia	S2-19	III-17,18	much	yes	Poor	–	Before cleaning MH by vac truck
K-9	Upton & Columbia	S2-19	III-19-21	much	yes	–	–	Town crew manning vac truck
K-9	Upton & Columbia	S2-19	III-22	some	yes	–	–	MH – After cleaning

Table C-1 (continued):

Adams, Massachusetts Manhole Inspection Data: Photo Logs - Roll No. 4

Gage Area	Location	Manhole No	Photo No.	Inv. Shelf Debris	Surch.	General Condition	Leak rate (gpm)	Comment
K-9	Friend St.	15-M	IV-0	-	no	-	-	Debris/grit taken from single run from 15-M - S2-16
K-9	Friend & Colombia	15-L	IV-1	-	no	-	-	Town and S&S crews cleaning to 15-M
K-9	Friend & Colombia	15-L	IV-2	-	no	-	-	Town and S&S crews cleaning to 15-M
K-1	Station St. near P.Sta	S2-3	IV-3	some	no	Good	-	Dry, 10" pipe, 1/2" sediment in invert
K-1	Station St. near P.Sta	S1-2	IV-4	some	no	Good	-	Dry, 10" pipe
K-9	Burt & Pine St.	S2-17	IV-5	-	yes	-	-	Surcharge
K-9	Pine st.	17-C	IV-6	-	-	-	-	Dry
K-9	Upton & Pine	S2-20	IV-7	-	yes	-	-	Somewhat surcharged
K-9	Burt St.(near Friend)	S2-18	IV-8	-	no	Good	-	Dry
K-9	Upton & Friend	S2-21	IV-9	-	no	-	-	High flow from Friend uphill
K-3	Friend St.	S2-52	IV-10	none	no	Good	-	Dry, High velocity
K-7	Orchard St.	82-P	IV-11	none	no	Fair	-	Moist, shallow, low flow
K-7	Summer & Orchard	82C-1	IV-12	much	yes	Poor	-	Surcharged due to sediment in invert
K-7	Summer near Orchard	82-C	IV-13	none	no	Good	-	High velocity, 10'pipe
K-7	Summer St.	S2-82	IV-14	none	no	Good	-	High velocity, 10'pipe
K-7	Off of Depot St.	S2-69	IV-15	some	no	Good	-	Too deep to measure
K-7	Depot & Maple	-	IV-16	-	-	-	-	Wrong MH, MH 64-A not found
K-7	Depot & Hoosac	S2-64	IV-17	-	yes	-	-	Too deep to measure
K-8	E. Hoosac (near Summer)	S2-120	IV-18	none	no	Fair	-	
K-8	E. Hoosac St.	121-F	IV-19	none	-	Fair	1/2-1	Wet inside
K-8	E. Hoosac St.	122-D	IV-20	none	no	Fair	-	Dry inside

Table D-1 (continued):

Adams, Massachusetts Rainfall Simulation Data:

Area Sketch	Street Name	Location	Photo No.	Observation	Storm Drn in Street	Dye Flood/trace: Flood Sketch	Dye Sketch	Test Pos/neg	Rate (gpm) to sewer	Area Drained (sq.ft.)
K-8-8	E. Hoosac St	@ East Rd	38	Indirect CB	yes	K-8-6		pos	10	1500
K-8-13	E. Jordan St	Hse #35,39	–	Suspect roof leader	none					unk
K-8-13	E. Jordan St	Hse #37	43	Direct roof leader	none					1000
K-8-13	E. Jordan St	Hse #41	–	Suspect roof leader	none		K-8-4	pos	–	1500
K-8-20	E. Jordan St	Hse #46	–	Suspect roof leader	none					unk
K-8-30	East Rd	Hse #146	–	Suspect roof leader	yes					unk
K-8-26	East Rd	Hse #35	–	Suspect roof leader	yes					unk
K-8-26	East Rd	Hse #89	–	Suspect roof leader	yes					unk
K-8-27	East Rd	Hse #55	–	Suspect roof leader	yes					unk
K-8-19	Kittler Av	@ Richmond St	54	Smoking culvert wall	yes					–
K-8-19	Kittler Av	Hse #2	–	Suspect roof leader	none					unk
K-8-6	Meadow St	Hse #6	34	Suspect roof leader	none					unk
K-8-5	Meadow St	Hse #41	–	Flr Drn in Barn	none					–
K-8-5	Meadow St	S of Dubis St	33	Smk from hole in Gnd	none	K-8-2		neg	–	500
K-8-5	Meadow St	Hse #41	32	Susp. broken service	none					unk
K-8-6	Meadow St	Hse #38	31	Direct roof leader	none					1000
K-8-6	Meadow St	Hse #34	30	Susp. broken service	none	K-8-4		pos	–	100
K-8-6	Meadow St	Hse #10	–	Suspect roof leader	none					unk
K-8-5	Meadow St	Hse #42	29	Susp. broken service	none	K-8-3		neg	–	–
K-8-2	Mill St	Hse #14	26	Direct roof leader	yes					1000
K-8-2	Mill St	Hse #17	27	Direct roof leader	yes					1500
K-8-1	Murray St	Hse #23	23	Direct roof leader	yes					500
K-8-1	Murray St	Hse #10,18,21	25	Suspect roof leader	yes					unk
K-8-1	Murray St	Hse #23-1/2	24	Direct roof leader	yes					500
K-8-10	Potter St	Hse #3	40	Susp. broken service	none					25
K-8-20	Richmond La	Hse #25	–	Suspect area drain	yes					unk
K-8-20	Richmond La	Hse 20,25,26,27,32,49,53	–	Suspect roof leader	yes					unk
K-8-20	Richmond La	Hse #28,36	–	Suspect roof leader	yes		K-8-5	pos	–	2000
K-8-16	Summer St	@ Church School	47	Direct CB	yes					2500
K-8-13	Summer St	Hse #53	–	Suspect roof leader	yes					unk
K-8-13	Summer St	Hse #30	–	Suspect roof leader	yes		K-8-4	pos	–	1500
K-8-16	Summer St	Church	48	Direct roof leader	yes					5000
K-8-9	Summer St	Hse #107	39	Direct roof leader	yes					500
K-8-12	Summer St	Hse #69	–	Suspect roof leader	yes					unk
K-8-16	Summer St	Church School	46	Direct roof leader	yes					2500
K-8-9	Summer St	Hse #115,116	–	Suspect roof leader	yes					unk
K-8-16	Summer St	Old School Apts	49	Direct roof leader	yes					2000
K-8-12	Turner's Av	Hse #4,14,22	–	Suspect roof leader	yes					unk
K-8-12	Turner's Av	Hse #5	42	Direct roof leader	yes					1000
K-8-12	Turner's Av	mid Hse #14,22	41	Indirect CB	yes	K-8-7		pos	1	500
K-8-3	Weber St	Hse #1,9	–	Suspect roof leader	yes					unk
K-8-3	Winter St	Hse #30	–	Suspect roof leader	yes		K-8-2	pos		1000 *

Table D-1:

Adams, Massachusetts Rainfall Simulation Data:

Area Sketch	Street Name	Location	Photo No.	Observation	Storm Drn in Street	Dye Flood/trace				Area Drained (sq.ft.)
						Flood Sketch	Dye Sketch	Test Pos/neg	Rate (gpm) to sewer	
K-2(8-17)	Lime St	Hse #215	51	Direct roof leader	yes					500
K-2(8-17)	Lime St	@ Summer St	50	Smoke from sidewalk	yes	K-8-8		pos	–	25
K-3-4	Beecher St	Hse #13,19	–	Suspect roof leader	yes		K-3-1	neg	–	–
K-3-4	Beecher St	Hse #5	–	Suspect roof leader	yes					unk
K-3-2	Cedar Ln	Hse #3,5,6	–	Suspect roof leader	yes					unk
K-3-1	Friend St	Hse #120,141	–	Suspect roof leader	yes					unk
K-3-5	Greylock Av	Opp. Quaker St	3	Indirect CB	yes	K-3-2		pos	25	1500
K-3-7	Hathaway St	Hse #2	–	Suspect roof leader	none					unk
K-3-6	Hathaway St	Near Greylock Av	4	Indirect CB	yes	K-3-3		neg	–	–
K-3-6	Hathaway St	Hse #9	–	SP conn. to sewer	none					sump
K-3-6	Hathaway St	Hse #23	5	Direct roof leader	none					500
K-3-3	Notch Rd	Hse #14	–	SP conn. to sewer	yes					sump
K-3-7	Notch Rd	Hse #53	–	Suspect roof leader	none		K-3-3	neg	–	–
K-3-5	Quaker St	Hse #14,15	–	Suspect roof leader	none		K-3-2	neg	–	–
K-3-4	Quaker St	Hse #7	–	Suspect roof leader	none					unk
K-3-5	Waters St	@ Greylock Av	2	Indirect CB	yes	K-3-1		neg	–	–
K-3-8	Waters St	White	–	Susp. driveway drain	yes		K-3-4	neg	–	–
K-3-5	Waters St	Hse #20	–	Suspect roof leader	yes		K-3-2	neg	–	–
K-3-3	West Rd	@ Valley St	1	Indirect CB	yes					1500
K-4-23	A St	Hse #12	20	Direct roof leader	yes					500
K-4-23	A St	Hse #12	21	Indirect CB	yes	K-4-5		neg	–	–
K-4-5	Albert St	near Cook St	6	2 Direct CB's, south	yes					5000]
K-4-5	Albert St	near Cook St	7	2 Direct CB's, north	yes					5000]
K-4-23	B St	Hse #5	–	Suspect roof leader	none		K-4-8	neg	–	–
K-4-23	B St	Hse #9,11	–	Suspect roof leader	none					unk
K-4-23	B St	Hse #7	–	Suspect roof leader	none		K-4-8	pos	–	1000 *
K-4-12	Burnett St	200' N of Grant St	–	Indirect CB	yes				–	unk
K-4-6	Columbia St	2 Churches & Rectory	–	Suspect roof leader	yes					unk
K-4-6	Columbia St	Hse #70	–	Suspect roof leader	yes					unk
K-4-6	Columbia St	400' N of Valley Rd	8	Indirect CB	yes					1500
K-4-6	Columbia Terr	@ Columbia St	–	Storm drain conn.?	yes					unk *
K-4-17	Country Club Av	White Hse	–	Suspect roof leader	yes					unk
K-4-12	Cross St	@ Grant St	–	Indirect CB	yes	K-4-2		pos	5	1000 *
K-4-13	Dean Dr	Hse #1	–	Suspect roof leader	none		K-4-3	neg	–	–
K-4-8	Depot St	@ School St	9	2 Indirect CB's	yes	K-4-1		pos	13	2500
K-4-16	Edward Av	Hse #13	–	Susp. driveway drain	yes		K-4-5	neg	–	unk
K-4-16	Edward Av	Hse #64	–	Suspect roof leader	yes		K-4-5	pos	–	1500
K-4-18	Forest Park St	Hse #31,33	–	Suspect roof leader	yes		K-4-6	pos	–	2000 *
K-4-18	Forest Park St	Hse #29	–	Suspect roof leader	yes		K-4-6	neg	–	–
K-4-18	Forest Park St	Hse #12,17,21	–	Suspect roof leader	yes					unk
K-4-21	Forest Park St	Hse #24	19	Direct roof leader	yes					2500
K-4-20	Gilead St	@ X-country	18	Smoke from ground	yes	K-4-4		neg	–	–
K-4-14	Grandview Terr	Hse #10	–	Suspect roof leader	yes		K-4-4	neg	–	
K-4-12	Grant St	mid Cross & Burnett	17	Indirect CB	yes				–	unk
K-4-12	Grant St	mid Cross & Burnett	16	Smoke from lawn	yes	K-4-3		neg	–	–
K-4-16	Highland Av	Hse #19	–	Suspect roof leader	yes		K-4-5	neg	–	–
K-4-11	Lincoln St	Near Valley St	14	Indirect CB	yes					1500
K-4-23	Maple St	Hse #16	–	Suspect roof leader	yes					unk
K-4-10	Maple St	Armory	–	Susp. RL, area drain	none		K-4-2	neg	–	–
K-4-3	Marshall Av	Hse #14	–	Suspect roof leader	none		K-4-1	neg	–	–

Flow Isolation Reach	Cont. Gage Area	Number of In-miles	Approx. Sewer Age	Flow (gpd) Infiltrat.[1]	Infil/In-mi. (gpd/in-mi)	Comments
S1-26	K-6	11.14	5-55	600,382	53,894	MHI obs. gravel, rock & clear water in line.
S1-37	K-8	8.84	30-60	282,715	31,981	MHI obs. near brook w/ infilt.
S1-49	K-4	7.56	30	219,786	29,072	Check for cross connections.
S1-12	K-9	2.87	60	79,807	27,807	"
S1-39a	K-8	1.44	50-60	33,442	23,224	Check XC from Richmond to N.Summer
S1-7b	K-9	0.68	70	14,400	21,176	Questionable flow pattern; surch.
S1-44	K-3	11.38	35-70	191,424	16,821	Invest. Notch, West & Friend
S1-17	K-4	1.80	65	27,967	15,537	MHI-12 obs. questionable flow pattern
S1-29a	K-6	11.82	10-60	160,855	13,609	Surch. at siphon, invest. downstream of siphon
S1-39c	K-8	6.02	75	73,732	12,248	MHI-10 obs. brook may flow into sewer.
S1-30	K-7	2.40	50-60	27,750	11,563	"
S1-8,10,11	K-9	9.40	30-70	102,861	10,943	Surch.;possible overflow at inst. gage 11.
S1-16	K-4	3.58	30	36,545	10,208	Check for cross connections.
S1-35	K-7	6.51	50-60	64,800	9,954	MHI obs. evidence of infilt.
S1-4	K-2	9.20	35-55	87,593	9,521	MHI obs. broken pipe & gravel in MH
S1-38	K-8	18.43	60	161,068	8,739	Old interceptor near river.
S1-9	K-9	4.38	50-70	36,000	8,219	Concentrate on Friend.
S1-2	K-1	6.25	20	46,480	7,437	Needs cleaning/lime deposits
S1-45	K-8	3.18	55	23,244	7,309	"
S1-1	K-1	11.74	50	61,860	5,269	Used cont. gage for estimates
S1-42c	K-8	3.33	40	15,840	4,757	To be verified.
S1-5	K-2	3.59	35	16,921	4,713	"
S1-31b	K-7	0.76	30	2,880	3,789	"
S1-3	K-1	3.71	65	13,168	3,549	Needs cleaning/MHI observed clear water
S1-42b	K-8	1.52	10-30	5,040	3,316	"
S1-20	K-4	3.10	70	8,640	2,787	"
S1-40	K-8	5.83	55	14,963	2,567	"
S1-28	K-6	12.88	10-55	30,240	2,348	"
S1-6	K-3	5.20	30,50,80	11,520	2,215	Needs cleaning
S1-33	K-7	7.20	10,70	15,840	2,200	"
S1-42a	K-8	9.62	10-30	20,160	2,096	"
S1-23	K-6	2.80	60	5,760	2,057	"
S1-31a	K-7	5.83	30,70	11,520	1,976	"
S1-21b	K-4	0.76	50	1,440	1,895	"
S1-29b	K-6	0.90	60	1,440	1,600	"
S1-34a	K-7	9.19	30,60	14,400	1,567	MHI obs. evidence of inflow & surch.
S1-27	K-6	7.50	20-55	11,520	1,536	"
S1-21a	K-4	10.15	10-30,60	13,915	1,371	"
S1-32	K-7	2.37	55	2,880	1,215	"
S1-25	K-6	6.44	50-60	7,200	1,118	Indust. flow 40,000 gpd.
S1-22	K-4	7.89	30	8,640	1,095	"
S1-46	K-8	1.38	70	1,440	1,043	"
S1-47	K-4	7.94	55	7,685	968	"
S1-41	K-8	6.64	45-60	4,320	651	"
S1-0	K-5	13.56	55-65	7,800	575	Poor gage reliab., surch., requires FI on Fisk
S1-43	K-1	6.36	20	1,440	226	Serves Mall,and Deacon Plastics in N.Adams
S1-24	K-6	8.48	15	1,440	170	Regional High School line.
S1-18	K-4	17.48	50-70	2,880	165	MHI obs. clear water, evid of infilt.
S1-34b	K-7	0.23	60	0	0	"
S1-21c	K-4	0.45	50	0	0	"
S1-39b	K-8	0.91	50	0	0	"
S1-19	K-4	2.39	30	ND	ND	"
S1-50	K-6	3.84	70	ND	ND	Poor gage reliability.
S1-36,48	K-7	25.47	25,60,70	ND	ND	Suspect readings at Cont. gage 6 off.
S1-7a	K-9	5.47	30-60	ND	ND	Poor data; Upton & Friend are Old.
S1-13,WWTP	K-9	32.28	40	ND	ND	Interceptor surch.

Flow Isolation Reach	Cont. Gage Area	Corresp. Reach Phase-1	Number of In-miles	Approx. Sewer Age (yrs)	Flow (gpd) Infiltrat.	Infil/In-mi. (gpd/in-mi)	Comments
S2-111	K-6	S1-26	0.45	30	56,210	124,911	
S2-64	K-7	S1-48	2.59	30	238,470	92,073	
S2-101b	K-6	S1-26	1.14	55	92,800	81,404	
S2-32	K-8	S1-37	1.53	60	122,600	80,131	
S2-39a	K-8	S1-37	0.46	55	35,560	77,304	
S2-99a	K-6	S1-50	0.57	-	41,430	72,684	
S2-25	K-9	S1-15	4.86	30	339,070	69,767	
S2-109	K-6	S1-26	0.45	30	23,684	52,631	
S2-99b	K-6	S1-50	0.74	55	38,160	51,568	
S2-40a	K-8	S1-39c	0.68	75	30,320	44,588	
S2-110	K-6	S1-26	1.14	30	37,480	32,877	
S2-15a	K-9	S1-9,10	6.27	65	269,940	29,762	
S2-17	K-9	S1-8	2.80	45	ND	29,762	Surcharged
S2-21	K-9	S1-7	0.91	-	26,900	29,560	
S2-106	K-6	S1-26	0.46	55	11,390	24,761	Turbulent flow
S2-102	K-6	S1-26	0.97	55	22,560	23,258	
S2-120	K-8	S1-40	6.29	55	114,070	18,135	Turbulent flow
S2-112	K-6	S1-26	0.68	30	39,130	17,238	
S2-113b	K-6	S1-26	1.59	55	ND	17,238	
S2-87	K-7	S1-36	2.74	75	41,270	15,062	
S2-94B	K-5	S1-0	0.30	-	4,040	13,467	
S2-82	K-7	S1-35	3.55	55	47,520	13,386	
S2-90	K-7	S1-36	1.03	65	11,520	11,184	Pump sta. influences flow
S2-49b	K-8	S1-38	0.53	60	5,760	10,868	
S2-4	K-1	S1-2	1.42	-	36,000	10,619	
S2-3	K-1	S1-2	1.97	-	ND	10,619	Surcharged
S2-54	K-3	S1-44	0.98	-	8,640	8,816	
S2-41	K-8	S1-39c	0.74	75	6,250	8,446	
S2-117	K-6	S1-29a	1.29	30	8,640	6,698	
S2-113a	K-6	S1-26	0.46	-	2,880	6,261	
S2-48	K-8	S1-46	1.39	55,70	8,640	6,216	
S2-29	K-4	S1-16,17	5.00	30,60	30,500	6,100	
S2-5	K-1	S1-1	2.84	55	17,280	6,085	Lamped; line under creek OK
S2-7	K-1	S1-3	1.89	70	11,130	5,889	
S2-118	K-6	S1-29a	0.45	30	46,080	5,855	
S2-37	K-8	S1-37	1.52	15	8,640	5,684	
S2-58b	K-3	S1-44	0.80	45	4,350	5,438	
S2-46	K-8	S1-38	2.48	-	13,200	5,323	
S2-91	K-7	S1-36	2.20	45	11,520	5,236	
S2-30	K-4	S1-49	3.98	30	47,950	4,819	
S2-51	K-4	S1-49	1.79	30	ND	4,819	}Flows don't make sense
S2-61	K-4	S1-49	4.18	30	ND	4,819	}again.
S2-71	K-7	S1-30,31a	5.96	60	28,650	4,807	
S2-124	K-8	S1-42c	1.74	35	7,920	4,552	
S2-44	K-8	S1-45	0.63	65	2,760	4,381	
S2-6	K-1	S1-1	8.90	55	37,830	4,251	
S2-13	K-2	S1-4	3.11	35	10,975	3,529	
S2-18	K-9	S1-8	2.42	30	8,100	3,347	
S2-9	K-2	S1-4	2.19	45	7,315	3,340	
S2-83	K-7	S1-35	2.67	60	8,640	3,236	
S2-70b	K-7	S1-48	1.81	55	5,760	3,182	
S2-56	K-3	S1-6	5.21	55	15,840	3,040	
S2-55	K-3	S1-44	3.11	55	8,610	2,768	
S2-122	K-8	S1-40	1.06	-	2,880	2,717	
S2-94a	K-5	S1-0	0.53	65	1,440	2,717	
S2-97b	K-5	S1-0	2.28	-	5,760	2,526	
S2-1	K-1	S1-43	6.36	-	15,840	2,491	
S2-16a	K-9	S1-9	1.89	50	4,320	2,286	
S2-43	K-8	S1-45	0.45	75	990	2,200	
S2-38	K-8	S1-37	3.33	40	7,200	2,162	
S2-76	K-7	S1-31a	1.36	55	2,880	2,118	
S2-59	K-3	S1-44	1.36	45	2,880	2,118	
S2-34	K-8	S1-38	5.16	60	10,530	2,041	
S2-2	K-1	S1-2	2.86	20	5,760	2,014	Broken pipe
S2-16b	K-9	S1-9	1.46	60	2,880	1,973	
S2-60	K-4	S1-18	9.77	65	23,760	1,943	
S2-63	K-4	S1-18	2.46	45	ND	1,942	
S2-80b	K-7	S1-32	0.38	55	720	1,895	
S2-11	K-2	S1-4	1.06	45	1,985	1,873	
S2-100	K-6	S1-25	6.45	60	11,520	1,786	
S2-79	K-7	S1-33	3.26	60	5,760	1,767	
S2-35a	K-9	S1-15	0.83	55	1,440	1,735	
S2-72	K-4	S1-20,47	5.83	55	10,080	1,729	

1 — Infiltration measured during high groundwater, April/May 1985

TABLE V-4: Summary of Phase-2 Infiltration Data, Prioritized by Infil/in-mi. (Continued)

Flow Isolation Reach	Cont. Gage Area	Corresp. Reach Phase-1	Number of In-miles	Approx. Sewer Age (yrs)	Flow (gpd) Infiltrat.	Infil/In-mi. (gpd/in-mi)	Comments
S2-49a	K-8	S1-46	1.70	-	2,880	1,694	
S2-75	K-7	S1-31a	1.74	35	2,880	1,655	
S2-123	K-8	S1-42a	9.62	20	15,840	1,647	
S2-10	K-2	S1-5	3.59	35	5,760	1,604	
S2-116b	K-6	S1-29b	0.90	70	1,440	1,600	
S2-65	K-4	S1-18	0.45	45	720	1,600	
S2-39b	K-8	S1-39b	0.91	55	1,440	1,582	
S2-35b	K-9	S1-15	0.98	55	1,440	1,469	
S2-125	K-8	S1-42c	1.59	35	2,160	1,358	
S2-80a	K-7	S1-32	0.55	55	720	1,309	
S2-115	K-6	S1-27	7.50	35	8,640	1,152	
S2-93	K-5	S1-0	1.37	55	1,440	1,051	
S2-88	K-7	S1-36	1.43	55	1,440	1,007	
S2-114	K-6	S1-28,24	21.37	15-55	20,160	943	
S2-36	K-2	S1-4	1.40	55	1,275	911	
S2-81	K-7	S1-33	3.26	15	2,880	883	
S2-95b	K-5	S1-0	5.16	60	4,320	837	
S2-8	K-1	S1-3	1.82	65	1,440	791	
S2-97a	K-5	S1-0	0.98	65	720	735	
S2-53	K-3	S1-44	2.12	30	1,440	679	
S2-74c	K-4	S1-47	0.53	55	360	679	
S2-121	K-8	S1-41	6.65	50	4,320	650	
S2-73a	K-4	S1-22a	18.05	30	11,520	638	
S2-74a	K-4	S1-47	1.21	55	720	595	
S2-104	K-6	S1-23	2.80	-	1,440	514	
S2-47	K-8	S1-38	8.54	60	3,720	436	
S2-74b	K-4	S1-47	1.13	35	360	319	
S2-19	K-9	S1-7	0.30	65	1,420	311	
S2-20	K-9	S1-7	4.26	60	ND	311	Unreliable measurement
S2-95a	K-5	S1-0	0.98	-	280	286	
S2-85	K-7	S1-34	6.21	30,50	1,440	232	
S2-40b	K-8	S1-39a	4.16	55	340	82	
S2-119	K-6	S1-29a	7.42	45	0	0	
S2-84a	K-7	S1-34	2.97	65	0	0	
S2-62	K-4	S1-18,20	3.00	70	0	0	
S2-116a	K-6	S1-29a	2.65	10	0	0	
S2-50	K-4	S1-18	1.70	70	0	0	
S2-77	K-7	S1-32	1.74	55	0	0	
S2-103	K-6	S1-26	1.36	55	0	0	
S2-27	K-9	S1-15	2.44	30	0	0	
S2-22	K-4	S1-17	0.38	70	0	0	
S2-96	K-5	S1-0	0.68	55	0	0	
S2-92	K-5	S1-0	1.28	65	0	0	
S2-26a	K-9	S1-15	1.79	30	0	0	
S2-12	K-2	S1-4	1.44	-	0	0	
S2-66	K-4	S1-18	0.91	45	0	0	
S2-45	K-8	S1-45	1.02	15	0	0	
S2-26b	K-9	S1-15	0.45	30	0	0	
S2-33	K-8	S1-37	2.46	55	0	0	
S2-86	K-7	S1-36	1.70	75	0	0	
S2-31	K-9	S1-15	0.99	60	0	0	
S2-24	K-9	S1-15	1.02	30	0	0	
S2-107	K-6	S1-26	0.68	55	0	0	
S2-67	K-4	S1-18	1.52	45	0	0	
S2-108	K-6	S1-26	1.36	30	0	0	
S2-57	K-3	S1-44	0.61	55	0	0	
S2-78	K-7	S1-33	0.68	30	0	0	
S2-73b	K-4	S1-22b	0.76	50	0	0	
S2-101a	K-6	S1-26	0.71	-	0	0	
S2-14	K-9	S1-13	13.34	25,65	0	0	
S2-15b	K-9	S1-9,10	0.61	65	0	0	
S2-89	K-7	S1-36	4.09	75	0	0	
S2-68	K-7	S1-48	1.78	30	0	0	
S2-98	K-6	S1-50	1.83	65	0	0	
S2-58a	K-3	S1-44	0.57	45	0	0	
S2-84b	K-7	S1-34	0.23	-	0	0	
S2-73c	K-4	S1-22c	0.45	-	0	0	
S2-42	K-8	S1-39c	2.50	35	0	0	
S2-52	K-3	S1-44	1.82	-	0	0	
S2-105	K-6	S1-26	0.45	55	ND	0	Surcharging
S2-69	K-7	S1-48	4.33	30	ND	0	Suspect wrong MH measured.
S2-28	K-9	S1-15	0.38	30	ND	0	
S2-23	K-9	S1-15	1.54	30	ND	0	Lime St. surcharged
S2-70a	K-7	S1-48	1.70	75	ND	0	
S2-0	K-9	S1-WWTP	5.54	20	ND	ND	

TABLE V-5
ADAMS, MA - I/I INVESTIGATION
FLOW ISOLATION GAGING RESULTS FOR AREA 1

Street	From/to	Phase 2 Flow Isol. Reach	Drawer/ Plan	Pipe Length (ft)	Equiv. Pipe Dia. (in)	Year Const.	Peak Reach Infilt. (gpd)	Peak Infilt. Rate (gpd/in-mi)
Howland Ave	N.Adams/XC	S2-1	np	4200	8	unk *	15,840	2,489
Old Columbia	Mid/Howland	S2-2	p5,73	1550	8	1964 *		
Howland Ave	Butler/XC	S2-2	np	450	6	unk *	5,760	2,014
XC	Howland/S2-3	S2-3	np	1300	8	unk *	ND	10,619
Zylonite	S2-3/WWTP	S2-4	np	750	10	unk *	36,000	10,619 "
Howland Ave	Lime/WWTP access	S2-8	p4,19	1200	8	1922 *	1,440	792
Howland Ave	WWTP acc/S2-7	S2-7	p1,80	1250	8	1917 *	11,130	5,877
Brown St	End/Howland	S2-6	p4,77	850	8	1931 *		
Apremont St	End/Howland	S2-6	p4,76	900	8	1930 *		
Newark St	End/Howland	S2-6	p4,75	950	8	1930 *		
Orcutt St	End/Howland	S2-6	p4,77	400	8	1930 *		
Howland Ave	Brown/Apremont	S2-6	p4,77.5	600	8	1936,41 *		
Howland Ave	S2-7/Apremont	S2-6	p4,77	550	8	1931 *		
Howland Ave	Apremont/Mid Howl.	S2-6	p4,77	1300	10	1931 *	37,830	4,250
Howland Ave	Mid Howl./Zylonite	S2-5	p4,77	600	10	1931 *		
Zylonite St	Howland/mid	S2-5	p4,77	450	10	1931 *		
Zylonite Sta.	Mid/S2-5	S2-5	np	450	10	unk *	17,280	6,083
TOTAL (GAGE 1):				17,750		*	125,280	4,463

TABLE V-6
ADAMS, MA - I/I INVESTIGATION
FLOW ISOLATION GAGING RESULTS FOR AREA 2

Street	From/to	Phase 2 Flow sol. Reach	Drawer/ Plan	Pipe Length (ft)	Equiv. Pipe Dia. (in)	Year Const.	Peak Reach Infilt. (gpd)	Peak Infilt. Rate (gpd/in-mi)
Wilfred Ave	End/Powers	S2-10	p5,23	650	6	1954 *		
Powers St	East/mid	S2-10	p5,3	700	6	1952 *		
Powers St	Mid/Lime	S2-10	p5,3;2,68	1350	8	1939,51 *	5,760	1,609
Spring Rd	End/East	S2-12	np	200	8	unk *		
East Rd	Spring/lime	S2-12	np	750	8	unk *	0	0
East Rd	Anthony/lime	S2-13	p5,1	2050	8	1951 *	10,975	3,533
Charles St	End/Lime	S2-9	np	300	8	unk *		
Davis St	End/Lime	S2-9	np	300	8	unk *		
Lime St	S2-11/S2-9	S2-9	p4,78;A	850	8	1930,39 *	7,315	3,330
Frederick Ln	End/N.Summer	S2-36	p4,78	250	4	1930 *		
N.Summer St	Frederick/Lime	S2-36	p4,78	800	8	1930 *	1,275	910
Lime St	East/S2-11	S2-11	p4,78;A	700	8	1930,39 *	1,985	1,872
TOTAL (GAGE 2):				8,900		*	27,310	2,136

TABLE V-8
ADAMS, MA - I/I INVESTIGATION
FLOW ISOLATION GAGING RESULTS FOR AREA 4

Street	From/to	Phase 2 Flow Isol. Reach	Drawer/ Plan	Pipe Length (ft)	Equiv. Pipe Dia. (in)	Year Const.	Peak Reach Infilt. (gpd)	Peak Infilt. Rate (gpd/in-mi)
West Rd	Mountain/Glendale	S2-73a	p4,30a	850	7.94	1973 *		
Dean Dr	End/Glendale	S2-73a	p5,57a	200	8	1963 *		
Mt View Dr	End/Glendale	S2-73a	p5,57a	350	6	1963 *		
Glendale Dr	West/Grandview	S2-73a	p5,57a	800	8	1963 *		
Grandview Ter	N End/XC	S2-73a	p5,50	600	6	1958 *		
Grandview Ter	S End/XC	S2-73a	p5,50	400	6	1958 *		
XC	Grandview/Highland	S2-73a	p5,4	300	8	1954 *		
Highland Av	End/XC	S2-73a	p5,4	1100	7.3	1953,55 *		
XC	Higland/Edward	S2-73a	p5,4	450	8	1953 *		
Edward Av	XC/Melrose	S2-73a	p4,29	600	8	1947 *		
Gould Rd	End/West	S2-73a	p4,30d	1650	8	1973 *		
West Rd	Gould/Mid	S2-73a	p4,30d	450	8	1973 *		
West Rd	Mid/Marshall	S2-73a	p5,64	750	8	1961 *		
West Rd	End/Marshall	S2-73a	p5,55	600	8	1959 *		
Marshall Av	West/Melrose	S2-73a	p5,7	750	8	1953 *		
Highland Av	Mid/Melrose	S2-73a	p5,4	550	8	1953 *		
Country Club	Ends/Melrose	S2-73a	p4,29	850	8	1924 *		
Melrose St	Highland/Edward	S2-73a	p5,9	250	8	1953 *		
Melrose St	Edward/Gilead	S2-73a	p4,29	500	8	1924 *		
Melrose St	Gilead/For.Park	S2-73a	pT1,7	350	8	1936 *	11,520	638
Forest Park Av	End/Melrose	S2-73b	pT1,7	500	8	1936 *	0	0
Melrose St	Marmon/FPA	S2-73c	pT1,7	300	8	1936 *	0	0
Maple St	End/Gilead	S2-74a	p4,30	500	8	1924 *		
Gilead	Maple/S2-74	S2-74a	p4,88	300	8	1931 *	720	594
Simon Av	Ends/XC	S2-74b	p3,111	450	8	1951 *		
XC	Simon/Gilead	S2-74b	p3,111	300	8	1951 *	360	317
West St	Mid/Gilead	S2-74c	p1,89	350	8	1931 *	360	679
Gilead	End,S2-74/XC	S2-72	p4,88	600	8	1931 *		
XC	Gilead/FPA	S2-72	pT1,7	800	8	1936 *		
West St	Mid/FPA	S2-72	np	350	8	unk *		
Forest Park Av	Melrose/Maple	S2-72	pT1,7	700	8	1936 *		
XC	West--Maple	S2-72	np	550	8	unk *		
Maple St	End/FPA	S2-72	p1,87	350	8	1931 *		
Maple St	FPA/Columbia	S2-72	np	500	8	unk *	10,080	1,728
B St	End/Marmon	S2-62	p2,6	550	8	1918 *		
Marmon St	B/A	S2-62	p2,6	200	8	1918 *		
A St	Marmon/Melrose	S2-62	np	300	8	unk *		
Melrose St	A/Maple	S2-62	p2,69	500	8	1938 *		
Columbia St	Maple/S2-62	S2-62	p1.60	350	10	1917 *	0	0
Park St	End/Depot(XC)	S2-67	p2,67	500	8	1938 *		
Depot St	Park/School	S2-67	p2,67	500	8	1938 *	0	0
School St	Park/Depot	S2-66	p2,67	600	8	1938 *	0	0
E. Maple St	Park/Depot	S2-65	p2,67	300	8	1938 *	720	1,584
Depot St	School/Columbia	S2-63	p2,67	1300	10	1938 *	ND	1,942
Columbia St	S2-62/Valley	S2-60	p1,60	750	10	1917 *		
Cross St	End/Grant	S2-60	p1,39	500	8	1915 *		
Burnett St	End/Grant	S2-60	p3,84	400	8	1946,75 *		
Grant St	West/Burnett	S2-60	np	800	8	unk *		
XC	Grant/Valley	S2-60	np	300	10	unk *		
Valley St	End/Cross	S2-60	p1,6	400	8	1918 *		
Lincoln St	End/Valley	S2-60	p4,40	600	8	1925 *		
Valley St	Cross/Columbia	S2-60	np	1500	8	unk *		
XC	Valley/Mid Col.	S2-60	p1,60	750	10	1917 *	23,760	1,942
Columbia St	XC/S2-50	S2-50	p1,60	900	10	1917 *	0	0
Columbia St	S2-50/Cook	S2-22	p1,60	200	10	1917 *	0	0

TABLE V-8
ADAMS, MA - I/I INVESTIGATION
FLOW ISOLATION GAGING RESULTS FOR AREA 4
(Continued)

Street	From/to	Phase 2 Flow Isol. Reach	Drawer/ Plan	Pipe Length (ft)	Equiv. Pipe Dia. (in)	Year Const.	Peak Reach Infilt. (gpd)	Peak Infilt. Rate (gpd/in-mi)
Cook St	Columb/Albert	S2-29	p1,79	250	10	1919 *		
Albert St	Cook/INT	S2-29	pT3,10	500	10	1924 *		
INT	S1-49/Gage K4	S2-29	np	900	21	1957 *	30,500	6,100
INT	Depot/S1-19	S2-61	np	600	21	1957 *		
INT	S1-19/S2-61	S2-61	np	450	21	1957 *	ND	4,822
INT	S2-61/S2-51	S2-51	np	450	21	1957 *	ND	4,822
INT	S2-51/S2-30	S2-30	np	1000	21	1957 *	47,950	4,822
TOTAL (GAGE 4):				35,250		*	125,970	1,996

TABLE V-10
ADAMS, MA - I/I INVESTIGATION
FLOW ISOLATION GAGING RESULTS FOR AREA 6

Street	From/to	Phase 2 Flow Isol. Reach	Drawer/ Plan	Pipe Length (ft)	Equiv. Pipe Dia. (in)	Year Const.	Peak Reach Infilt. (gpd)	Peak Infilt. Rate (gpd/in-mi)
XC	Req.H.S./Bellevue	S2-114	np	5600	8	1970 *		
Orchard St	Mid/Leonard	S2-114	p5,2;71	1600	8	1964,74 *		
Tower Ave	End/Woods	S2-114	p5,2	300	8	1953 *		
Woods Dr	End/Overlook	S2-114	p5,2	850	8	1953 *		
Overlook Ter	Mid/Leonard	S2-114	p5,2;47	600	7.36	1953,57 *		
Arnold Ave	End/Bellevue	S2-114	np	950	8	unk *		
Overlook Ter	Mid/Bellevue	S2-114	p5,47	450	8	1957 *		
Bellevue Ave	Arnold/Leonard	S2-114	p1,92	950	8	1931 *		
Leonard St	Orchard/XC	S2-114	p485;58;192	2850	8	30,31,53,56*	20,160	944
Alger St	T.L./Leonard	S2-115	p4,86;5,78	4950	8	1930,67 *	8,640	1,152
Grove St	T.L./Quality	S2-119	p3,90;1,77	4450	8	1939,73 *		
Quality St	Grove/S2-119	S2-119	p3,113	450	8	1951 *	ND	5,849
Quality St	S2-119/S2-118	S2-118	p3,113	300	8	1951 *	46,080	5,849
XC	Quality/S2-117	S2-117	p5,39	850	8	1957 *	8,640	6,709
XC	S2-117/Commercial	S2-116a	p5,39	550	8	1957 *		
Back Row	End/Leonard	S2-116a	np	350	8	unk *		
Grove St	End/Leonard	S2-116a	p1,75	850	8	1922 *	0	0
Commercial St	Marsh/Leonard	S2-116b	p1,57	700	6.815	1908,23 *	1,440	1,594
Bellevue Ave	End/Glen	S2-104	np	1850	8	unk *	1,440	514
Leonard St	Commercial/XC	S2-113b	p4,85	300	8	1930 *		
XC	Leonard/S2-113	S2-113b	p5,40;485	250	24	1957,80 *	ND	17,217
XC	Bellevue/S2-113	S2-113a	np	300	8	unk *	2,880	6,336
XC	S2-113/S2-112	S2-112	p5,40;485	150	24	1957,80 *	39,130	17,217
XC	S2-112/S2-111	S2-111	p5,40;485	100	24	1957,80 *	56,210	123,662
XC	S2-111/S2-110	S2-110	p5,40;485	250	24	1957,80 *	37,480	32,982
XC	S2-110/S2-109	S2-109	p5,40;485	100	24	1957,80 *	23,684	52,105
XC	S2-109/S2-108	S2-108	p5,40;485	300	24	1957,80 *	0	0
XC	S2-108/S2-107	S2-107	p5,40;485	150	24	1957,80 *	0	0
XC	S2-107/S2-106	S2-106	p5,40;485	100	24	1957,80 *	11,390	25,058
XC	S2-106/S2-105	S2-105	p5,40;485	100	24	1957,80 *	ND	0
XC	S2-105/S2-103	S2-103	p5,40;485	300	24	1957,80 *	0	0
XC	S2-103/S2-102	S2-102	p5,40;485	200	24	1957,80 *	22,560	24,816
Reeves St	XC/Glen	S2-101b	p4,84	400	15	1930 *	92,800	81,664
Pearl St	End/Railroad	S2-100	p4,31	600	8	1951 *		
Beech St	End/Railroad	S2-100	p1,91a	300	8	1931 *		
Railroad St	Pearl/Elm	S2-100	p1,91;4,31	700	8	1930,25 *		
Temple St	End/Elm	S2-100	p1,91a	900	8	1930 *		
Elm St	RR/Commer.	S2-100	p1,91a	650	8	1930 *		
Commercial St	Marsh/XC	S2-100	p1,74	1100	8	1922 *	11,520	1,789
XC	Commer/Reeves	S2-99b	p4,84	500	7.8	1930 *	38,160	51,663
Glen St	Bell./Reeves	S2-101a	np	250	15	unk *	0	0
Glen St	Reeves/Commer.	S2-99a	np	200	15	unk *	41,430	72,917
Plunkett Ln	End/Commer.	S2-98	np	300	8	unk *		
Commercial St	Glen/Gage K-6	S2-98	pT1,1	450	16.07	1911 *	0	0
TOTAL (GAGE 6):				38,400		*	463,644	7,045

TABLE V-11
ADAMS, MA - I/I INVESTIGATION
FLOW ISOLATION GAGING RESULTS FOR AREA 7

Street	From/to	Phase 2 Flow Isol. Reach	Drawer/ Plan	Pipe Length (ft)	Equiv. Pipe Dia. (in)	Year Const.	Peak Reach Infilt. (gpd)	Peak Infilt. Rate (gpd/in-mi)
E.Orchard Ter	End/Orchard	S2-85	p5,62	1500	8	1956 *		
Orchard St	End/Jenks	S2-85	p1,77;423	2600	8	22,35,50 *	1,440	232
Jenks St	Orchard/Crandall	S2-84a	p1,77	350	8	1922 *		
Glen St	End/Crandall	S2-84a	P2,61	150	6	1952 *		
Crandall St	Glen/S2-84	S2-84a	p1,85;2,61	1500	8	1924,16 *	0	0
Crandall Ter	End/S2-84	S2-84b	np	150	8	unk *	0	0
Morningside Av	Mid/East	S2-83	np	700	8	unk *		
East St	Mid/Orchard	S2-83	p4,83;1,82	1000	8	1930,23 *	8,640	3,354
Orchard St	Mid/Summer	S2-82	p4,23(b)	1050	8	1921,40 *		
Crandal St	Gage/Summer	S2-82	p2,61	300	8	1933 *		
Summer St	S2-84/S2-82	S2-82	p1,85	1000	8	1924 *	47,520	13,346
Morningside Av	East/XC	S2-81	np	450	8	unk *		
East St	End/Second	S2-81	p4,83b	1700	8	1972 *	2,880	884
Francis Av	End/Manners	S2-79	p4,26	600	4	1924 *		
Manners Av	End/Second	S2-79	p4,26	750	8	1924 *		
Second St	East/Randall	S2-79	p1,38	400	8	1915 *		
Second St	Manners/Randall	S2-79	p4,26	250	8	1924 *		
Randall St	Second/S2-79	S2-79	p5,45	450	8	1957 *	5,760	1,768
Randall St	S2-79/Summer	S2-78	p5,45	450	8	1957 *	0	0
Francis Av	Mid/North	S2-80a	p1,93	150	6	1931 *		
North St	End/S2-80	S2-80a	p1,93	250	8	1931 *	720	1,311
Second St	Mid/North	S2-80b	p1,93	250	8	1931 *	720	1,901
North St	S2-80/First	S2-77	p1,93	200	8	1931 *		
First St	North/Smith	S2-77	p1,93	500	8	1931 *		
Smith St	First/S1-32	S2-77	p1,93	250	8	1931 *		
Smith St	Gage/Summer	S2-77	p1,93	200	8	1931 *	0	0
Victory St	End/Summer	S2-75	p2,102	1150	8	1951 *	2,880	1,653
Richmond St	End/Summer	S2-76	p1,88	900	8	1931 *	2,880	2,112
Summer St	Cherry/Spring	S2-71	p1,85	150	8	1924 *		
Spring St	Summer,Dean/Gavin	S2-71	p4,43	450	8	1926 *		
Siara St	End/Summer	S2-71	np	450	8	unk *		
Summer St	S2-82/S2-78	S2-71	p1,85	250	8	1924 *		
Clifford La	End/Summer	S2-71	np	600	8	unk *		
Cherry St	End/Summer	S2-71	p5,49	500	8	1957 *		
Summer St	Siara/Cherry	S2-71	p77,2	750	8	1915 *		
Gavin Av	Spring/Bedell	S2-71	pT3,10	350	18	1924 *	28,650	4,802
River St	Gage K-5/Commercia	S2-90	p1,61	550	10	1920 *	11,520	11,059
Linden St	End/Edmund	S2-91	np	250	8	unk *		
Daniels Ct	End/Edmund	S2-91	p2,73	450	8	1938 *		
Edmund St	Linden/Commerc.	S2-91	np	750	8	unk *	11,520	5,244
Commercial St	Gage K-6/S2-89	S2-89	pT1,1	1200	18	1911 *	0	0
Liberty St	End/Center	S2-88	p4,90	400	6	1929 *		
Center St	End/Dean	S2-88	p4,38	650	8	1925 *	1,440	1,000
Commercial St	S2-89/Center	S2-87	pT1,1	200	18	1911 *		
Center St	Comm/Dean	S2-87	pT1,1	200	14.25	1911 *		
Myrtle St	Center/S2-87	S2-87	pT1,1	450	18	1911 *	41,270	14,976
Pleasant St	End/Spring	S2-70b	4,73	300	8	1928 *		
Spring St	Pleasant/XC	S2-70b	p4,43	500	8	1926 *		
Pleasant St	End/Spring	S2-70b	np	400	8	1957 *	5,760	3,168

TABLE V-11
ADAMS, MA - I/I INVESTIGATION
FLOW ISOLATION GAGING RESULTS FOR AREA 7
(Continued)

Street	From/to	Phase 2 Flow Isol. Reach	Drawer/ Plan	Pipe Length (ft)	Equiv. Pipe Dia. (in)	Year Const.	Peak Reach Infilt. (gpd)	Peak Infilt. Rate (gpd/in-mi)
XC	Spring/S2-69	S2-69	np	750	21	1957 *		
Bedell Ln	Gavin/XC	S2-69	np	400	18	1957 *	ND	0
Dean St	Center/S2-86	S2-86	pT1,1	500	18	1911 *	0	0
Dean St	S2-86/Spring	S2-70a	pT1,1	500	18	1911 *	ND	0
XC	S2-69/Depot	S2-68	np	450	21	1957 *	0	0
Depot St	XC/Gage K-7	S2-64	np	650	21	1957 *	238,470	92,243
TOTAL (GAGE 7):				32,250			412,070	6,872

TABLE V-12
ADAMS, MA - I/I INVESTIGATION
FLOW ISOLATION GAGING RESULTS FOR AREA 8

Street	From/to	Phase 2 Flow Isol. Reach	Drawer/ Plan	Pipe Length (ft)	Equiv. Pipe Dia. (in)	Year Const.	Peak Reach Infilt. (gpd)	Peak Infilt. Rate (gpd/in-mi)
East Rd	S.End/E.Hoosac	S2-123	p3,11;5,1	6350	8	52-61,73 *	15,840	1,646
East Rd	N.End/E.Hoosac	S2-120	p3,11;5,1	1000	8	52-61,73 *		
E. Hoosac St	East/N.Summer	S2-120	p4,81;3,72;	3150	8	30,34,39 *	114,070	18,141
E.Hoosac St	End/S2-125	S2-125	p2,101	1050	8	1948 *	2,160	1,358
E.Hoosac St	S2-125/East	S2-124	p2,101	1150	8	1948 *	7,920	4,545
Dubis St	End/Meadow	S2-121	p2,65;100	1250	7.27	1939,48 *		
Meadow Ln	End/Meadow	S2-121	np	350	8	unk *		
Haggerty St	End/Meadow	S2-121	p4,17	400	8	1922 *		
Meadow St	End/E.Hoosac	S2-121	p4,81;1,62;	2600	7.67	21,30,32,39*	4,320	651
Burns La	End/E.Hoosac	S2-122	np	700	8	unk *	2,880	2,715
N. Summer St	Murray/Kittler	S2-40b	p4,79	650	8	1930 *		
Baskin La	End/N.Summer	S2-40b	p3,72	600	8	1934 *		
E. Jordan St	End/N.Summer	S2-40b	np	300	8	unk *		
N. Summer St	E.Hoosac/Murray	S2-40b	p4,79	1200	8	1930 *	340	82
Summit Av	End/Richmond	S2-45	p5,74	900	6	1968 *	0	0
Richmond La	Summit/S2-44	S2-44	p4,18	550	6	1922 *	2,760	4,416
Richmond La	S2-44/S2-43	S2-43	np	400	6	unk *	990	2,178
Summit Av	Mid/John	S2-42	p5,74a	1000	8	1960 *		
John St	Summit/Richmond	S2-42	p3,114	650	8	1940 *	0	0
Richmond La	John/Kittler	S2-41	p1,5	650	6	1908 *	6,250	8,462
Kittler Av	Richmond/N.Summer	S2-40a	p1,5	450	8	1908 *	30,320	44,469
N. Summer St	Kittler/Turner	S2-39a	p4,79	175	14	1930 *	35,560	76,635
Turners Av	End/N.Summer	S2-39b	p2,63	600	8	1932 *	1,440	1,584
Weber St	End/Summer	S2-49b	np	350	8	unk *	5,760	10,862
Conrad St	End/Summer	S2-48	np	200	8	unk *		
Summer St	Weber/Hoosac	S2-48	pT1,2	400	8	1915 *		
Hoosac St	Summer/N.Hoosac	S2-48	p4,81	250	10	1930 *	8,640	6,249
Winter St	End/Weber	S2-49a	pT3,10	450	20	1924 *	2,880	1,690
Hoosac St	N.Hoosac/Mill	S2-47	p4,81	250	8	1930 *		
Winter St	Weber/Hoosac	S2-47	pT3,10	400	20	1924 *		
Hoosac St	Winter/Mill	S2-47	pT3,10	250	22	1924 *		
Allen St	End/Mill	S2-47	p3,115	500	8	unk *		
Jordan St	End/Mill	S2-47	np	450	10	unk *		
Mill St	Hoosac/Murray	S2-47	pT3,10	1400	15	1924 *	3,720	364
Murray St	Mill/Crotteau	S2-46	pT3,10	200	20	1924 *		
Murray St	End/Crotteau	S2-46	np	350	8	unk *		
Crotteau St	Murray/Staple	S2-46	pT3,10	350	18	1924 *	13,200	5,320
Staples St	End/Crotteau	S2-34	np	250	8	unk *		
W. Kittler Av	End/Crotteau	S2-34	np	300	8	unk *		
Cook St	Mid/Crotteau	S2-34	p1,79a	200	8	1940 *		
Crotteau St	Staple/S2-34	S2-34	pT3,10	1050	18	1924 *		
Sparrow St	End/Crotteau	S2-34	np	300	8	unk *	10,530	2,037
Potter St	End/Anthony	S2-38	p5,10	300	8	1952 *		
Anthony St	East/N.Summer	S2-38	p4,33	1900	8	24,38,56 *	7,200	2,160
XC	Donald/N.Summer	S2-37	p5,10	1000	8	1971 *	8,640	5,702
N. Summer St	Murray,End/XC	S2-33	p4,79	1125	8	1930 *		
XC	N.Summer/Crotteau	S2-33	np	500	8	unk *	0	0
Crotteau St	S2-34/S2-32	S2-32	p1,76	450	18	1922 *	122,600	79,917

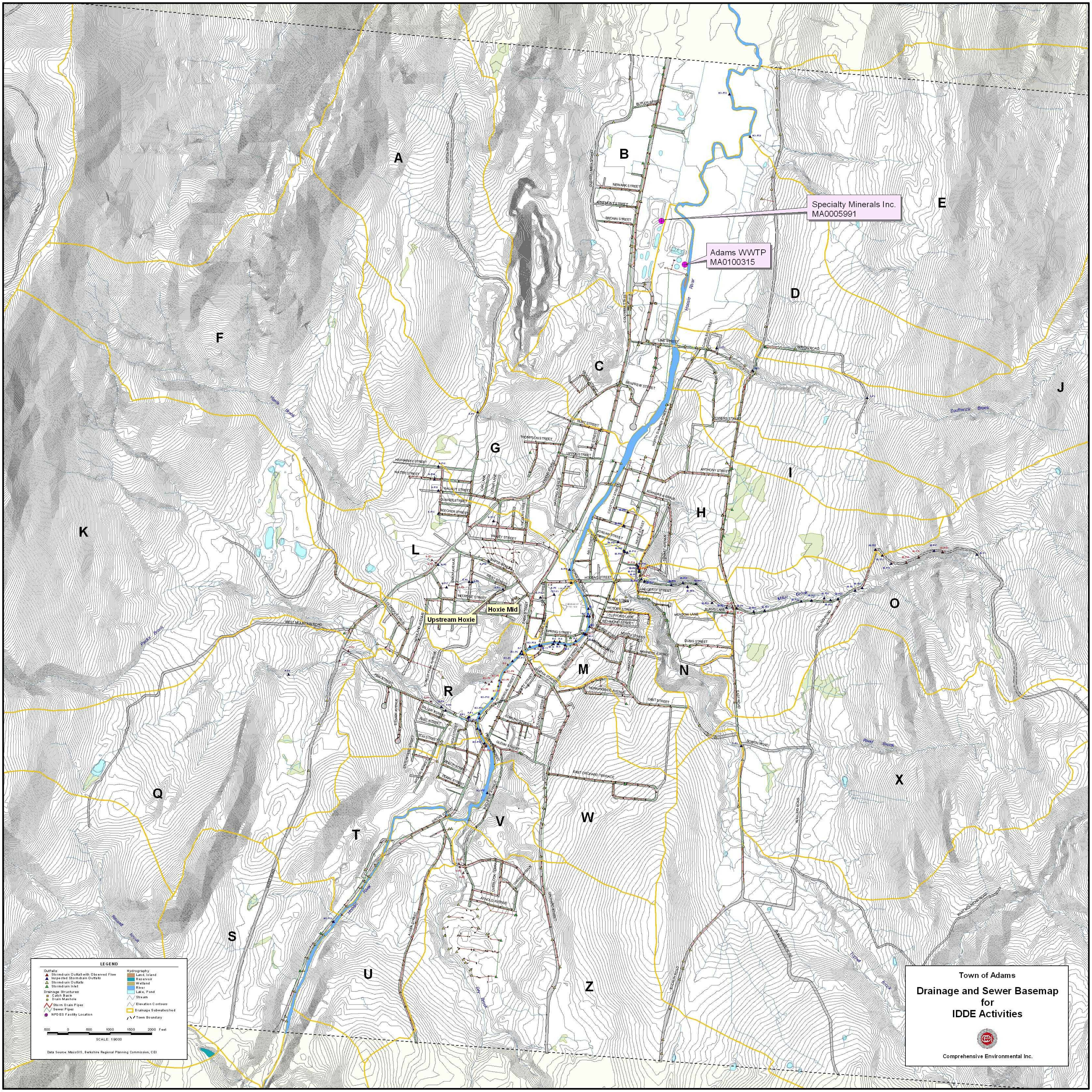
TABLE V-13
ADAMS, MA - I/I INVESTIGATION
FLOW ISOLATION GAGING RESULTS FOR AREA 9

Street	From/to	Phase 2 Flow Isol. Reach	Drawer/ Plan	Pipe Length (ft)	Equiv. Pipe Dia. (in)	Year Const.	Peak Reach Infilt. (gpd)	Peak Infilt. Rate (gpd/in-mi)
Friend St	Gage K-3/Upton	S2-21	p1,96	600	8	unk *	26,900	29,590
Garfield St	End/Harding	S2-20	p5,11	300	8	1938 *		
McKinley St	End/Harding	S2-20	p3,110	300	8	1951 *		
Harding Av	End/Upton	S2-20	p1,78	1100	8	1922 *		
Kerr Av	End/Upton	S2-20	p4,27	550	6	1924 *		
Upton St	Harding/S2-20	S2-20	p1,78	700	8	1922 *	ND	311
Upton St	S2-20/Columbia	S2-19	p1,78	200	8	1922 *	1,420	311
Tracie Av	End/Thompson	S2-18	p5,5	200	8	1953 *		
Thompson St	End/Friend	S2-18	p5,5	900	8	1953 *		
Friend St	Thompson/Burt	S2-18	p5,48	500	8	unk *	8,100	3,341
St Martha St	End/Pine	S2-17	p1,99	350	8	1931 *		
Pine St	End/Burt	S2-17	p2,94	600	8	1940 *		
Burt St	Friend/Columbia	S2-17	p2,77	900	8	1939 *	ND	29,755
Hastings St	End/Hughes	S2-16a	np	250	8	unk *		
Hughes St	Hastings/Sayles	S2-16a	np	250	8	unk *		
Noonan St	End/Sayles	S2-16a	np	200	8	unk *		
Sayles St	NooNan/Friend	S2-16a	p2,45	550	8	1936 *	4,320	2,281
W. Burt St	End/Friend	S2-16b	p4,41	150	6	1955 *		
Friend St	W.Burt/Sayles+	S2-16b	p1,54;58	850	8	1913,26 *	2,880	1,975
Columbia St	Cook/Upton	S2-15a	p1,54	450	8	1914 *		
Columbia St	Upton/XC	S2-15a	p1,54	1550	10	1914 *		
Friend St	Sayles+/Columbia	S2-15a	p4,41	550	10	1914 *		
XC	Columbia/S1-10	S2-15a	p1,65	400	10	1921 *		
XC	S1-10/S1-11	S2-15a	p1,65	250	10	1921 *		
XC	S1-11/Lime	S2-15a	p1,65	200	10	1921 *	269,940	29,755
Columbia St	End/Lime	S2-15b	p1,65	400	8	1921 *	0	0
INT	Gage K-4/Siphon	S2-27	np	200	24	unk *		
INT	Siphon/S2-27	S2-27	np	300	27	1957 *	0	0
INT	S2-27/Siphon	S2-26a	np	350	27	1957 *	0	0
XC	Gage K-8/Siphon	S2-31	p1,76	250	21	1922 *	0	0
XC	Siphon/INT	S2-28	p1,76	100	28	1922 *	ND	0
Summer St	N. End/INT	S2-35a	p4,79	550	8	1930 *	1,440	1,728
Summer St	S. End/INT	S2-35b	p4,79	650	8	1930 *	1,440	1,462
XC	S2-35/S2-26	S2-26b	p4,79	300	8	1930 *	0	0
INT	Siphon/2S-25	S2-25	COE	950	27	1957 *	339,070	69,797
INT	2S-25/2S-24	S2-24	COE	200	27	1957 *	0	0
INT	2S-24/Lime	S2-23	COE	300	27	1957 *	ND	0
Lime St	Gage K-2/INT	S2-14	p4,78	500	8	1930 *		
INT	Lime/1S-15	S2-14	p1,65	200	24	1921 *		
Lime St	Columbia/INT	S2-14	p1,65	950	10.47	1921 *		
INT	1S-15/1S-14	S2-14	p1,65	200	24	1921 *		
INT	1S-14/1S-13	S2-14	p1,65	600	24	1921 *		
XC	A.P.W/Lime	S2-14	CDM	400	21	1962 *		
XC	Lime/1S-13	S2-14	CDM	1000	24	1962 *	0	0
INT	1S-13/WWTP		CDM	800	30	1962 *		
James River	JRC/WWTP		np	250	21	unk *	ND	ND
TOTAL (GAGE 9):				22,300		*	655,510	11,900


NORTH ADAMS
CHESHIRE
ZYLONITE
ZYLONITE STATION
RENFREW
MAPLE GROVE
ARNOLDSVILLE
K-1
K-2
K-3
K-4
K-5
K-6
K-7
K-8
K-9
WWTP
LEGEND
EXISTING FORCE MAIN
EXISTING SEWERS AND MANHOLES
CONTINUOUS GAGING TRIBUTARY BOUNDARY
K-2 GAGING AREA DESIGNATION
GAGING LOCATIONS
K-6 CONTINUOUS GAGING LOCATION
S1-50 PHASE I SPOT GAGING LOCATION
V-5 VISUAL INSPECTION LOCATION
S2-96 PHASE 2 SPOT GAGING LOCATION
SEWER SECTIONS RECOMMENDED FOR TV INSPECTION BUT NOT COMPLETED
SEWER SECTIONS TV INSPECTED
PS. EXISTING PUMPING STATION
GWG GROUNDWATER GAGING LOCATION
NOTE: ALL PIPE SIZES ARE 8-INCH UNLESS OTHERWISE NOTED
SCALE IN FEET
600 0 300 600 1200
TOWN OF ADAMS, MASSACHUSETTS
INFILTRATION / INFLOW STUDY
MAP OF
EXISTING SEWERAGE SYSTEM
SHOWING
GAGING LOCATIONS, TRIBUTARY AREAS
AND TV INSPECTION RECOMMENDATIONS
CAMP DRESSER & McKEE INC
ENVIRONMENTAL ENGINEERS
BOSTON, MASSACHUSETTS
FEBRUARY 1987
FIGURE IV-1

APPENDIX 4-D

Illicit Discharge Investigation Field Maps, Inspection Sheets & Photos


Town of Adams
Drainage and Sewer Basemap
for
IDDE Activities
Comprehensive Environmental Inc.
Specialty Minerals Inc.
MA0005991
Adams WWTP
MA0100315
Upstream Hoxie
Hoxie Mid
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
Q
R
S
T
U
V
W
X
Z
LEGEND
Outfalls
Stormdrain Outfall with Observed Flow
Inspected Stormdrain Outfalls
Stormdrain Outfalls
Stormdrain Inlet
Drainage Structures
Catch Basin
Drain Manhole
Storm Drain Pipes
Sewer Pipes
NPDES Facility Location
Hydrography
Land, Island
Reservoir
Wetland
River
Lake, Pond
Stream
Elevation Contours
Drainage Subwatershed
Town Boundary
500 0 500 1000 1500 2000 Feet
SCALE: 1:9000
Data Source: MassGIS, Berkshire Regional Planning Commission, CEI


Hoxie beneath bank 2.JPG


Hoxie underground undermining.JPG


Hoxie underground suspect pipe.JPG


Hoxie underground stone arch.JPG


Hoxie underground suspect pipe 2.JPG


Hoxie beneath auto shop.JPG


Hoxie unknown pipe from auto shop.JPG


Hoxie damage beneath auto shop.JPG


Hoxie auto shop foundation.JPG


Hoxie auto shop floor drain.JPG


Hoxie instability beneath auto shop.JPG


Hoxie inside auto floor drain.JPG


Leachate at beginning of chutes - off Grove St.JPG


Equipment at beginning of chutes - off Grove St.JPG


Aladco pipes along building.JPG


Aladco suspect discharge location.JPG


Aladco suspect discharge location 2.JPG


Aladco suspect discharge location 3.JPG


H-P5.JPG


H-P5 (2).JPG


H-P6.JPG


H-P7.JPG


H-P4.JPG


View of Flood Chutes at Tophet & Miller Brook to H…


M-1.JPG


M-1 upstream.JPG


M-2.JPG


M-3.JPG


M-4.JPG


R-1.JPG


M-5.JPG


R-2.JPG


M-6.JPG


M-7.JPG


R-3.JPG


M-8.JPG


R-4.JPG


M-9.JPG


View of Flood Chutes.JPG


R-5.JPG


M-10.JPG


HO-P24.JPG


M-11.JPG


M-12.JPG


R-6.JPG


R-7.JPG


HO-P1.JPG


HO-P2.JPG


View of weep holes.JPG


HO-P3.JPG


R-8.JPG


R-8 (2).JPG


HO-P4.JPG


HO-P4, inside pipe.JPG


HO-P5.JPG


Weep hole adjacent to HO-P5.JPG


HO-P7.JPG


HO-P6.JPG

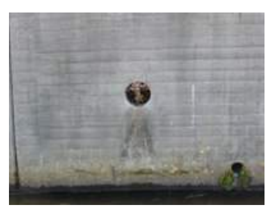

HO-P12.JPG


HO-P12 close-up.JPG


HO-P13 close-up.JPG


HO-P13.JPG


HO-P14.JPG


W-1.JPG

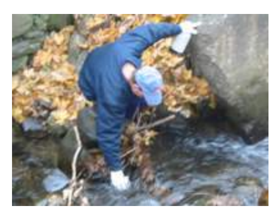

R-9.JPG


W-2 close-up.JPG


W-2.JPG


HO-P16.JPG


Upstream Hoxie.JPG


Upstream Hoxie 2.JPG


Hoxie beneath bank.JPG

Adams Stormwater Outfall Inspection Checklist

Outfall ID# M-1 **Location Aid** Myrtle St.

Date: 11/18/04 Time: 8:35 AM
Surveyor/Observer: Sarah Voisin
Weather Today: cloudy 40°F
Weather over past 72 hours: cloudy, 40's°F

Flow Observed (circle): YES NO

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	**Pipe Flow Depth (inches) Note: measure from pipe invert**	**Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance**	**Flow Appearance / Color**	**Flow Odor**	**~~Turbidity~~ TDS (PPM)**	**Temperature**	**pH**	**Conductivity**	**Comments and Notes**
	1" Depth	Depth	✓ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	✓ None __ Chemical __ Petroleum __ Sewage __ Other *	470	10.7°C	8.48	943	
2. Structure Details (pipe or other conveyance info.)	**Pipe Material**	**Pipe Condition**	**Channel, Ditch or Swale Condition**	**Diameter or Width (specify distance units)**	**Slope (degrees)**	**Outlet Structure**	**GPS Coordinates**	**Discharge directly to surface water?****	**Comments and Notes**
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	✓ Good __ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	5'		__ Headwall __ Riprap __ No Outlet Protection __ Other*	________ Lat. ________ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	
3. Outfall Observations (general conditions at outfall)	**Deposits**	**Surrounding Vegetation**	**Erodibility**	**Land Use at Outfall**	**Land Use Upstream of Outfall**	**Appearance / Color**	**Odor**	**Sediment Depth (inches) (if present)**	**Comments and Notes**
	✓ None __ Grease/Oil __ Paper/Trash __ Foam __ Other *	✓ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture ✓ Residential __ Commercial __ Industrial	__ Forest __ Agriculture ✓ Residential __ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		Algae growth
4. Laboratory Analysis (check if submitted)	**Surfactant**	**Ammonia Concentration**	**E. coli**	**Oil & Grease (if oil or sheen is observed)**	**VOCs (if solvent odor is present)**	**Additional Field Comments and Notes**			
			✓			Photos 1+2			

Notes:

* Provide additional comments to describe the observations made for the category.

** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# M-2 **Location Aid** Spring St.

Date: 11/18/04 Time: 8:45AM Weather Today: cloudy 40°F
Surveyor/Observer: Sarah Voisin Weather over past 72 hours: cloudy 40's

Flow Observed (circle): (YES) NO

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	~~Turbidity~~ TDS (ppm)	Temperature	pH	Conductivity	Comments and Notes
	trickle Depth	Depth	✓ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	✓ None __ Chemical __ Petroleum __ Sewage __ Other *	~~716~~ 716	8.3°C	8.75	1434	pigeon droppings in flow
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	✓ Good __ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	36"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	______ Lat. ______ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	✓ None __ Grease/Oil __ Paper/Trash __ Foam __ Other *	✓ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture ✓ Residential __ Commercial __ Industrial	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		Algae growing down the wall
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			
			✓			Photo #3			

Notes:
* Provide additional comments to describe the observations made for the category.
** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# M-3 **Location Aid** Spring St.

Date: 11/18/04 Time: 8:50AM	Weather Today: cloudy 40°F
Surveyor/Observer: Sarah Voisin	Weather over past 72 hours: cloudy 40's

Flow Observed (circle): YES NO (NO circled)

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	**Pipe Flow Depth (inches) Note: measure from pipe invert**	**Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance**	**Flow Appearance / Color**	**Flow Odor**	**Turbidity**	**Temperature**	**pH**	**Conductivity**	**Comments and Notes**
	Depth ___ no flow	Depth ___	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *					staining
2. Structure Details (pipe or other conveyance info.)	**Pipe Material**	**Pipe Condition**	**Channel, Ditch or Swale Condition**	**Diameter or Width (specify distance units)**	**Slope (degrees)**	**Outlet Structure**	**GPS Coordinates**	**Discharge directly to surface water?****	**Comments and Notes**
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	✓ Good __ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	18"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	________ Lat. ________ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	
3. Outfall Observations (general conditions at outfall)	**Deposits**	**Surrounding Vegetation**	**Erodibility**	**Land Use at Outfall**	**Land Use Upstream of Outfall**	**Appearance / Color**	**Odor**	**Sediment Depth (inches) (if present)**	**Comments and Notes**
	✓ None __ Grease/Oil __ Paper/Trash __ Foam __ Other *	✓ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture ✓ Residential __ Commercial __ Industrial	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		
4. Laboratory Analysis (check if submitted)	**Surfactant**	**Ammonia Concentration**	**E. coli**	**Oil & Grease (if oil or sheen is observed)**	**VOCs (if solvent odor is present)**	**Additional Field Comments and Notes**			
						Photo #4			

Notes:

* Provide additional comments to describe the observations made for the category.

** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# m-4 **Location Aid** Spring St.

Date: 11/18/04 Time: 8:50AM	Weather Today: cloudy, 40°F
Surveyor/Observer: Sarah Voisin	Weather over past 72 hours: cloudy 40's

Flow Observed (circle): YES NO

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	**Pipe Flow Depth (inches) Note: measure from pipe invert**	**Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance**	**Flow Appearance / Color**	**Flow Odor**	**Turbidity**	**Temperature**	**pH**	**Conductivity**	**Comments and Notes**
	Depth ___ no flow	Depth ___	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *					no flow, staining
2. Structure Details (pipe or other conveyance info.)	**Pipe Material**	**Pipe Condition**	**Channel, Ditch or Swale Condition**	**Diameter or Width (specify distance units)**	**Slope (degrees)**	**Outlet Structure**	**GPS Coordinates**	**Discharge directly to surface water?****	**Comments and Notes**
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	✓ Good __ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	18"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	______ Lat. ______ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	
3. Outfall Observations (general conditions at outfall)	**Deposits**	**Surrounding Vegetation**	**Erodibility**	**Land Use at Outfall**	**Land Use Upstream of Outfall**	**Appearance / Color**	**Odor**	**Sediment Depth (inches) (if present)**	**Comments and Notes**
	✓ None __ Grease/Oil __ Paper/Trash __ Foam __ Other *	✓ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Forest __ Agriculture ✓ Residential __ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		
4. Laboratory Analysis (check if submitted)	**Surfactant**	**Ammonia Concentration**	**E. coli**	**Oil & Grease (if oil or sheen is observed)**	**VOCs (if solvent odor is present)**	**Additional Field Comments and Notes**			
						photo #5			

Notes:

* Provide additional comments to describe the observations made for the category.

** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# R-1 **Location Aid** End Spring St.

Date: 11/18/04 Time: 8:52 Weather Today: Cloudy

Surveyor/Observer: Weather over past 72 hours: Dry, no rain

Flow Observed (circle): YES NO

1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	Field Monitoring Data (note: fill in units for each parameter): Turbidity	Temperature	pH	Conductivity	Comments and Notes
	____ Depth	____ Depth	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *					

2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	✓ Good __ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	18"		✓ Headwall __ Riprap __ No Outlet Protection __ Other*	____ Lat. ____ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	Pipe is in Concrete Chute

3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	X None __ Grease/Oil __ Paper/Trash __ Foam __ Other *	__ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture ✓ Residential __ Commercial __ Industrial	__ Forest __ Agriculture __ Residential __ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		

4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes
						Pigeons in pipe Picture # 6

Notes:

* Provide additional comments to describe the observations made for the category.

** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# m-5 **Location Aid** down from Spring St

Date: 11/18/04 Time: 9:00 AM	Weather Today: cloudy 40°F
Surveyor/Observer: Sarah Voisin	Weather over past 72 hours: cloudy 40's

Flow Observed (circle): YES NO

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	Turbidity	Temperature	pH	Conductivity	Comments and Notes
	Depth ____ no flow	Depth ____	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *					Animal trap in pipe
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	✓ Good ✓ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	24"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	______ Lat. ______ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	Pipe cracked & pulling away from cement wall
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	✓ None __ Grease/Oil __ Paper/Trash __ Foam __ Other *	✓ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture ✓ Residential ✓ Commercial __ Industrial	__ Forest __ Agriculture ✓ Residential ✓ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			
						Picture #7			

Notes:

* Provide additional comments to describe the observations made for the category.

** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# R-2 **Location Aid** near Mechanic Co. near Spring St.

Date: 11/18/09 Time: 9:10 AM Surveyor/Observer: Sarah Voisin	Weather Today: cloudy 40°F Weather over past 72 hours: cloudy 40's °F

Flow Observed (circle): YES **NO**

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	**Pipe Flow Depth (inches)** Note: measure from pipe invert	**Channel, Ditch or Swale Flow Depth (inches)** Note: measure from center of conveyance	**Flow Appearance / Color**	**Flow Odor**	**Turbidity**	**Temperature**	**pH**	**Conductivity**	**Comments and Notes**
	Depth ___ no flow	Depth ___	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *					no flow minimal staining
2. Structure Details (pipe or other conveyance info.)	**Pipe Material**	**Pipe Condition**	**Channel, Ditch or Swale Condition**	**Diameter or Width (specify distance units)**	**Slope (degrees)**	**Outlet Structure**	**GPS Coordinates**	**Discharge directly to surface water?****	**Comments and Notes**
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	✓ Good __ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	12"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	________ Lat. ________ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	
3. Outfall Observations (general conditions at outfall)	**Deposits**	**Surrounding Vegetation**	**Erodibility**	**Land Use at Outfall**	**Land Use Upstream of Outfall**	**Appearance / Color**	**Odor**	**Sediment Depth (inches) (if present)**	**Comments and Notes**
	✓ None __ Grease/Oil __ Paper/Trash __ Foam __ Other *	✓ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture ✓ Residential __ Commercial __ Industrial	__ Forest __ Agriculture ✓ Residential __ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		
4. Laboratory Analysis (check if submitted)	**Surfactant**	**Ammonia Concentration**	**E. coli**	**Oil & Grease (if oil or sheen is observed)**	**VOCs (if solvent odor is present)**	**Additional Field Comments and Notes**			
						Picture #8			

Notes:

* Provide additional comments to describe the observations made for the category.

** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# M-6 **Location Aid** Winter Street

Date: 11/19/04 Time: 9:10
Surveyor/Observer: Rich Miles

Weather Today: Cloudy
Weather over past 72 hours: No Rain

Flow Observed (circle): YES NO

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	**Pipe Flow Depth (inches) Note: measure from pipe invert**	**Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance**	**Flow Appearance / Color**	**Flow Odor**	**Turbidity**	**Temperature**	**pH**	**Conductivity**	**Comments and Notes**
	___ Depth	___ Depth	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *					
2. Structure Details (pipe or other conveyance info.)	**Pipe Material**	**Pipe Condition**	**Channel, Ditch or Swale Condition**	**Diameter or Width (specify distance units)**	**Slope (degrees)**	**Outlet Structure**	**GPS Coordinates**	**Discharge directly to surface water?****	**Comments and Notes**
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	✓ Good __ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	12"		✓ Headwall __ Riprap __ No Outlet Protection __ Other*	______ Lat. ______ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	
3. Outfall Observations (general conditions at outfall)	**Deposits**	**Surrounding Vegetation**	**Erodibility**	**Land Use at Outfall**	**Land Use Upstream of Outfall**	**Appearance / Color**	**Odor**	**Sediment Depth (inches) (if present)**	**Comments and Notes**
	✓ None __ Grease/Oil __ Paper/Trash __ Foam __ Other *	__ Little or No Distress __ Moderate Distress __ High Distress	✓ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture __ Residential __ Commercial __ Industrial	__ Forest __ Agriculture __ Residential __ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		appears to be branches, feces, debris in pipe
4. Laboratory Analysis (check if submitted)	**Surfactant**	**Ammonia Concentration**	**E. coli**	**Oil & Grease (if oil or sheen is observed)**	**VOCs (if solvent odor is present)**	**Additional Field Comments and Notes**			
						Flood Chute Discharge Picture #9			

Notes:
* Provide additional comments to describe the observations made for the category.
** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# M-7 **Location Aid** bridge by Mechanicsville/near spring St.

Date: 11/18/04 Time: 9:15AM Weather Today: cloudy 40°F

Surveyor/Observer: Sarah Voisin Weather over past 72 hours: cloudy 40's°F

Flow Observed (circle): YES NO (NO circled)

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	Turbidity	Temperature	pH	Conductivity	Comments and Notes
	Depth ___	Depth ___	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *					no flow
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	✓ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	__ Good ✓ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	12"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	______ Lat. ______ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	pipe is damaged, staining
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	✓ None __ Grease/Oil __ Paper/Trash __ Foam __ Other *	✓ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture ✓ Residential __ Commercial __ Industrial	__ Forest __ Agriculture ✓ Residential __ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			
						Picture #40			

Notes:

* Provide additional comments to describe the observations made for the category.

** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# R-3 **Location Aid** Myr He St.

Date: 11/18/04 Time: 9:30 am Weather Today: cloudy 40°F
Surveyor/Observer: Sarah Vilsn Weather over past 72 hours: cloudy 40's°F

Flow Observed (circle): YES (NO)

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	Turbidity	Temperature	pH	Conductivity	Comments and Notes
	____ Depth	____ Depth	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *					no flow
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	✓ Good __ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	~~15"~~ 12"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	____ Lat. ____ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	staining below pipe
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	✓ None __ Grease/Oil __ Paper/Trash __ Foam __ Other *	✓ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture ✓ Residential ✓ Commercial __ Industrial	__ Forest __ Agriculture ✓ Residential ✓ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			
						Picture #11			

Notes:
* Provide additional comments to describe the observations made for the category.
** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# M-8 **Location Aid** Myrtle St.

Date: 11/15/04 Time: 9:28
Surveyor/Observer: Rich Niles
Weather Today: Cloudy
Weather over past 72 hours: No Rain

Flow Observed (circle): YES **NO** (circled)

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	Turbidity	Temperature	pH	Conductivity	Comments and Notes
	Depth ___	Depth ___	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *					
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	__ Good __ Cracked __ Exposed Steel ✓ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	24"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	______ Lat. ______ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	__ None __ Grease/Oil __ Paper/Trash __ Foam __ Other *	__ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture ✓ Residential __ Commercial __ Industrial	__ Forest __ Agriculture ✓ Residential __ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		Debris Last section of pipe separating water flowing below pipe
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			
						Picture # 12 Pigeons in Pipe			

Notes:
* Provide additional comments to describe the observations made for the category.
** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# R-4 **Location Aid** Mrytle St.

Date: 11/18/04 Time: 9:35 AM

Surveyor/Observer: Sarah Voisin

Weather Today: cloudy

Weather over past 72 hours: no rain

Flow Observed (circle): YES NO (NO circled)

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	**Pipe Flow Depth (inches) Note: measure from pipe invert**	**Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance**	**Flow Appearance / Color**	**Flow Odor**	**Turbidity**	**Temperature**	**pH**	**Conductivity**	**Comments and Notes**
	Depth ___	Depth ___	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *					no flow
2. Structure Details (pipe or other conveyance info.)	**Pipe Material**	**Pipe Condition**	**Channel, Ditch or Swale Condition**	**Diameter or Width (specify distance units)**	**Slope (degrees)**	**Outlet Structure**	**GPS Coordinates**	**Discharge directly to surface water?****	**Comments and Notes**
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	✓ Good __ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	12"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	______ Lat. ______ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	
3. Outfall Observations (general conditions at outfall)	**Deposits**	**Surrounding Vegetation**	**Erodibility**	**Land Use at Outfall**	**Land Use Upstream of Outfall**	**Appearance / Color**	**Odor**	**Sediment Depth (inches) (if present)**	**Comments and Notes**
	✓ None __ Grease/Oil __ Paper/Trash __ Foam __ Other *	__ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		
4. Laboratory Analysis (check if submitted)	**Surfactant**	**Ammonia Concentration**	**E. coli**	**Oil & Grease (if oil or sheen is observed)**	**VOCs (if solvent odor is present)**	**Additional Field Comments and Notes**			
						Picture #13 Catch Basins			

Notes:

* Provide additional comments to describe the observations made for the category.

** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# M-9 **Location Aid** Myrtle St

Date: 11/15/10 Time: 9:40 AM
Surveyor/Observer: Sarah V[illegible]

Weather Today: cloudy
Weather over past 72 hours: no rain

Flow Observed (circle): YES NO (NO circled)

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	**Pipe Flow Depth (inches)** Note: measure from pipe invert	**Channel, Ditch or Swale Flow Depth (inches)** Note: measure from center of conveyance	**Flow Appearance / Color**	**Flow Odor**	**Turbidity**	**Temperature**	**pH**	**Conductivity**	**Comments and Notes**
	Depth	Depth	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *					
2. Structure Details (pipe or other conveyance info.)	**Pipe Material**	**Pipe Condition**	**Channel, Ditch or Swale Condition**	**Diameter or Width (specify distance units)**	**Slope (degrees)**	**Outlet Structure**	**GPS Coordinates**	**Discharge directly to surface water?****	**Comments and Notes**
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	✓ Good __ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	15"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	______ Lat. ______ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	
3. Outfall Observations (general conditions at outfall)	**Deposits**	**Surrounding Vegetation**	**Erodibility**	**Land Use at Outfall**	**Land Use Upstream of Outfall**	**Appearance / Color**	**Odor**	**Sediment Depth (inches) (if present)**	**Comments and Notes**
	✓ None __ Grease/Oil __ Paper/Trash __ Foam __ Other *	__ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture ✓ Residential __ Commercial __ Industrial	__ Forest __ Agriculture ✓ Residential __ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		
4. Laboratory Analysis (check if submitted)	**Surfactant**	**Ammonia Concentration**	**E. coli**	**Oil & Grease (if oil or sheen is observed)**	**VOCs (if solvent odor is present)**	**Additional Field Comments and Notes**			
						Picture #14 Catch Basin			

Notes:
* Provide additional comments to describe the observations made for the category.
** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# R-5 **Location Aid** Spring St.

Date: 11/18/04 Time: 9:40AM Weather Today: cloudy
Surveyor/Observer: Sarah Voisin Weather over past 72 hours: no rain

Flow Observed (circle): YES NO (circled)

1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	Field Monitoring Data (note: fill in units for each parameter): Turbidity	Temperature	pH	Conductivity	Comments and Notes
	Depth ___	Depth ___	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *					
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	✓ Good __ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	12"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	______ Lat. ______ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	✓ None __ Grease/Oil __ Paper/Trash __ Foam __ Other *	__ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			
						Picture #16 - other pipes coming into area behind pipe opening			

Notes:
* Provide additional comments to describe the observations made for the category.
** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# A1-10 **Location Aid** Pleasant St.

Date: 11/18/04 Time: 9:40AM	Weather Today: cloudy
Surveyor/Observer: Sarah Voisin	Weather over past 72 hours: no rain

Flow Observed (circle): YES NO (NO circled)

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	**Pipe Flow Depth (inches) Note: measure from pipe invert**	**Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance**	**Flow Appearance / Color**	**Flow Odor**	**Turbidity**	**Temperature**	**pH**	**Conductivity**	**Comments and Notes**
	Depth ____	Depth ____	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *					
2. Structure Details (pipe or other conveyance info.)	**Pipe Material**	**Pipe Condition**	**Channel, Ditch or Swale Condition**	**Diameter or Width (specify distance units)**	**Slope (degrees)**	**Outlet Structure**	**GPS Coordinates**	**Discharge directly to surface water?****	**Comments and Notes**
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	✓ Good __ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	12"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	____ Lat. ____ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	
3. Outfall Observations (general conditions at outfall)	**Deposits**	**Surrounding Vegetation**	**Erodibility**	**Land Use at Outfall**	**Land Use Upstream of Outfall**	**Appearance / Color**	**Odor**	**Sediment Depth (inches) (if present)**	**Comments and Notes**
	✓ None __ Grease/Oil __ Paper/Trash __ Foam __ Other *	__ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture ✓ Residential ✓ Commercial __ Industrial	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		
4. Laboratory Analysis (check if submitted)	**Surfactant**	**Ammonia Concentration**	**E. coli**	**Oil & Grease (if oil or sheen is observed)**	**VOCs (if solvent odor is present)**	**Additional Field Comments and Notes**			
						Picture #17			

Notes:

* Provide additional comments to describe the observations made for the category.

** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Ho - P24

Adams Stormwater Outfall Inspection Checklist

Outfall ID# RE-U6 **Location Aid** Pleasant St

Date: 11/18/04 Time: 9:43 AM

Surveyor/Observer: Sarah Voisin

Weather Today: cloudy

Weather over past 72 hours: no rain

Flow Observed (circle): YES NO

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	Turbidity	Temperature	pH	Conductivity	Comments and Notes
	Depth ____	Depth ____	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *					
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	✓ Good __ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	18"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	____ Lat. ____ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	__ None __ Grease/Oil __ Paper/Trash __ Foam ✓ Other *	✓ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		large amount of pigeon debris
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			
						Picture # 18			

Notes:

* Provide additional comments to describe the observations made for the category.

** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# M-1 **Location Aid** Pleasant st

Date: 11/18/04 Time: 9:45AM Weather Today: cloudy
Surveyor/Observer: Sarah Voisin Weather over past 72 hours: no rain

Flow Observed (circle): YES NO (NO circled)

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	Turbidity	Temperature	pH	Conductivity	Comments and Notes
	Depth ____	Depth ____	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *					no flow
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	__ Good __ Cracked __ Exposed Steel ✓ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	18"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	____ Lat. ____ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	Pipe has been patched, corroding at bottom
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	✓ None __ Grease/Oil __ Paper/Trash __ Foam __ Other *	✓ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			
						Photo #19			

Notes:
* Provide additional comments to describe the observations made for the category.
** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# R-6 **Location Aid** b/t Pleasant & Park St

Date: 11/18/04 Time: 9:48 AM Weather Today: cloudy

Surveyor/Observer: Sarah Voisin Weather over past 72 hours: ____

Flow Observed (circle): YES **NO**

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	Turbidity	Temperature	pH	Conductivity	Comments and Notes
	Depth ____	Depth ____	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *					no flow
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	✓ Good __ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	36"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	____ Lat. ____ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	__ None __ Grease/Oil __ Paper/Trash __ Foam __ Other *	__ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			
						- wood over where grate used to be - photo # 21			

Notes:

* Provide additional comments to describe the observations made for the category.

** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# R-7 **Location Aid** Park St.

Date: 11/18/04 Time: 9:50AM Weather Today: cloudy
Surveyor/Observer: Sarah Voisin Weather over past 72 hours: no rain

Flow Observed (circle): YES NO (NO circled)

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	Turbidity	Temperature	pH	Conductivity	Comments and Notes
	___ Depth	___ Depth	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *					
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	✓ Clay __ Concrete __ Corrugated Steel __ PVC __ Cast Iron	__ Good __ Cracked __ Exposed Steel ✓ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	15"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	______ Lat. ______ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	staining below pipe - corroded below pipe
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	✓ None __ Grease/Oil __ Paper/Trash __ Foam __ Other *	__ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			
						Photo #22			

Notes:
* Provide additional comments to describe the observations made for the category.
** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# M-12 **Location Aid** Pleasant St.

Date: 11/18/04 Time: 9:45AM Weather Today: cloudy
Surveyor/Observer: Sarah Voisu Weather over past 72 hours: no rain

Flow Observed (circle): YES NO

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	Turbidity	Temperature	pH	Conductivity	Comments and Notes
	___ Depth	___ Depth	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *					
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	✓ Good __ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	12"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	___ Lat. ___ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	staining below pipe
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	✓ None __ Grease/Oil __ Paper/Trash __ Foam __ Other *	__ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industriel	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			
						Photo # 20			

Notes:
* Provide additional comments to describe the observations made for the category.
** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# HO - P1 **Location Aid** Park St. / Post office

Date: 11/18/04 Time: 9:55AM	Weather Today: cloudy
Surveyor/Observer: Sarah Voisin	Weather over past 72 hours: no rain

Flow Observed (circle): YES NO

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	Turbidity	Temperature	pH	Conductivity	Comments and Notes
	____ Depth	____ Depth	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *					
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	✓ Good __ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	48"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	________ Lat. ________ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	__ None __ Grease/Oil __ Paper/Trash __ Foam ✓ Other *	__ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		leaves /debris
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			
						photo # 23			

Notes:

* Provide additional comments to describe the observations made for the category.

** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# Ho - P2 **Location Aid** Park St.

Date: 11/18/04 Time: 9:57AM Weather Today: cloudy
Surveyor/Observer: Sarah Voisin Weather over past 72 hours: no rain

Flow Observed (circle): YES (NO)

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	Turbidity	Temperature	pH	Conductivity	Comments and Notes
	Depth ___	Depth ___	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *					
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	✓ Good __ Cracked __ Exposed Steel ✓ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	48"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	____ Lat. ____ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	culvert collasping
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	__ None __ Grease/Oil __ Paper/Trash __ Foam ✓ Other *	__ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion ✓ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		sediment, growth & debris collected at bottom
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			
						Photo # 24			

Notes:
* Provide additional comments to describe the observations made for the category.
** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# Ho - P3 **Location Aid** Commercial St/ Rail Trail

Date: 11/18/04 Time: 10AM Weather Today: cloudy
Surveyor/Observer: Sarah Voisin Weather over past 72 hours: no rain

Flow Observed (circle): YES (NO)

1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	Field Monitoring Data (note: fill in units for each parameter) Turbidity	Temperature	pH	Conductivity	Comments and Notes
	____ Depth	____ Depth	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *					
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	✓ Good __ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	15"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	____ Lat. ____ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	staining
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	__ None __ Grease/Oil __ Paper/Trash __ Foam ✓ Other *	__ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		leaves in pipes
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			
						photo #26			

Notes:
* Provide additional comments to describe the observations made for the category.
** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# R-8 **Location Aid** Rail Trail / Comm. St.

Date: 11/18/04 Time: 10:05 am Weather Today: cloudy
Surveyor/Observer: Sarah Voisin Weather over past 72 hours: no rain

Flow Observed (circle): YES NO

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	~~Turbidity~~ TDS (ppm)	Temperature	pH	Conductivity	Comments and Notes
	Depth ___ trickle	Depth ___	✓ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	✓ None __ Chemical __ Petroleum __ Sewage __ Other *	229	10.5°C	7.89	464	
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	✓ Clay __ Concrete __ Corrugated Steel __ PVC __ Cast Iron	__ Good __ Cracked __ Exposed Steel ✓ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	6"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	___ Lat. ___ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	moss growing
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	__ None __ Grease/Oil __ Paper/Trash __ Foam ✓ Other *	__ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	✓ Forest __ Agriculture __ Residential __ Commercial __ Industrial	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		moss
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			
			✓			photo #27-28 -weep hole			

Notes:
* Provide additional comments to describe the observations made for the category.
** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# Ho-84 **Location Aid** Commercial St.

Date: 11/18/04 Time: 10:10AM	Weather Today: cloudy
Surveyor/Observer: Sarah Voisin	Weather over past 72 hours: no rain

Flow Observed (circle): YES NO

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	~~Turbidity~~ TDS (ppm)	Temperature	pH	Conductivity	Comments and Notes
	trickle Depth	Depth	✓ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	✓ None __ Chemical __ Petroleum __ Sewage __ Other *	405	13°C	7.74	811	possible flow - trickle cannot be reached
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	✓ Good __ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	48"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	______ Lat. ______ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	__ None __ Grease/Oil __ Paper/Trash __ Foam ✓ Other *	__ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Forest __ Agriculture ✓ Residential ✓ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		moss; vegetation growing
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			
			✓			photo # 29-30 -suddenly flow increased - tested water & shortly after flow stopped			

Notes:

* Provide additional comments to describe the observations made for the category.

** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# HO-P5 **Location Aid** Rail Trail / Russel Field

Date: 11/16/04 Time: 10:15AM Weather Today: cloudy

Surveyor/Observer: Sarah Voisin Weather over past 72 hours: no rain

Flow Observed (circle): YES NO

					Field Monitoring Data (note: fill in units for each parameter)				
	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	~~Turbidity~~ TDS (ppm)	Temperature	pH	Conductivity	Comments and Notes
1. Flow Observations (fill out this section only if flow is observed)	2 3/4" Depth	___ Depth	✓ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	✓ None __ Chemical __ Petroleum __ Sewage __ Other *	216	8.43°C	8.35	429	
	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
2. Structure Details (pipe or other conveyance info.)	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	__ Good ✓ Cracked __ Exposed Steel ✓ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	60"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	______ Lat. ______ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	
	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
3. Outfall Observations (general conditions at outfall)	__ None __ Grease/Oil __ Paper/Trash __ Foam ✓ Other *	__ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	✓ Forest __ Agriculture __ Residential __ Commercial ✓ Industrial	✓ Forest __ Agriculture __ Residential __ Commercial ✓ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		moss
	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			
4. Laboratory Analysis (check if submitted)			✓			Photo #31 - flow from stream near Russell Field			

Notes:

* Provide additional comments to describe the observations made for the category.

** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# Ho-P7 **Location Aid** RailTrail / Russel Field

Date: 11/18/04 Time: 10:25AM Weather Today: cloudy
Surveyor/Observer: Sarah Voisin Weather over past 72 hours: no rain

Flow Observed (circle): YES NO

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	~~Turbidity~~ TDS (ppm)	Temperature	pH	Conductivity	Comments and Notes
	1 3/4" Depth	___ Depth	✓ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	✓ None __ Chemical __ Petroleum __ Sewage __ Other *	245	11°C	8.03	500	
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	__ Good __ Cracked __ Exposed Steel ✓ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	36"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	______ Lat. ______ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	__ None __ Grease/Oil __ Paper/Trash __ Foam ✓ Other *	__ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	✓ Forest __ Agriculture __ Residential __ Commercial ✓ Industrial	✓ Forest __ Agriculture __ Residential __ Commercial ✓ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		moss? orange material
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			
			✓			photo # 33			

Notes:
* Provide additional comments to describe the observations made for the category.
** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# Ho-P6 **Location Aid** commercial St.

Date: 11/18/04 Time: 10:25 AM Weather Today: cloudy
Surveyor/Observer: Sarah Voivin Weather over past 72 hours: no rain

Flow Observed (circle): (YES) NO

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	~~Turbidity~~ TDS (PPM)	Temperature	pH	Conductivity	Comments and Notes
	Depth ___ trickle	Depth ___	_ Clear _ Cloudy/Milky _ Dark (Tea) _ Sheen ✓ Other *	✓ None _ Chemical _ Petroleum _ Sewage _ Other *	321	9.2°C	8.1	633	~~could not sample~~ - orange material
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	_ Clay ✓ Concrete _ Corrugated Steel _ PVC _ Cast Iron	✓ Good _ Cracked _ Exposed Steel ✓ Corroded _ Other*	_ Good _ Clogged _ Debris _ Scoured or Eroded _ Other*	48"		_ Headwall _ Riprap _ No Outlet Protection _ Other*	___ Lat. ___ Lon.	_ Yes _ No If Yes, Provide Receiving Water Name	
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	_ None _ Grease/Oil _ Paper/Trash _ Foam ✓ Other *	_ Little or No Distress _ Moderate Distress _ High Distress	_ Little or No Erosion _ Small Areas of Erosion _ Many Eroded Areas	_ Forest _ Agriculture ✓ Residential ✓ Commercial _ Industrial	_ Forest _ Agriculture ✓ Residential ✓ Commercial _ Industrial	_ Clear _ Cloudy/Milky _ Dark (Tea) _ Sheen _ Other *	_ None _ Chemical _ Petroleum _ Sewage _ Other *		orange material coming out of pipe
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			
			✓			photo # 34 - took sample - small flow			

Notes:
* Provide additional comments to describe the observations made for the category.
** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# HO - P12 **Location Aid** McDermit Mill

Date: 11/18/04 Time: 10:35AM Weather Today: cloudy

Surveyor/Observer: Sarah Voisin Weather over past 72 hours: no rain

Flow Observed (circle): YES NO

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	Turbidity	Temperature	pH	Conductivity	Comments and Notes
	Depth ____	Depth ____	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum ✓ Sewage __ Other *					
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	✓ Clay __ Concrete __ Corrugated Steel __ PVC __ Cast Iron	__ Good __ Cracked __ Exposed Steel ✓ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	12"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	________ Lat. ________ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	__ None __ Grease/Oil __ Paper/Trash __ Foam ✓ Other *	__ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture __ Residential ✓ Commercial ✓ Industrial	__ Forest __ Agriculture __ Residential ✓ Commercial ✓ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		paper / debris
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			
						Photo # 35-36 - sanitary sewer waste, smells like sewer			

Notes:

* Provide additional comments to describe the observations made for the category.

** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# Ho-P13 **Location Aid** Prospect /Harmony

Date: 11/18/04 Time: 10:40AM Weather Today: Cloudy

Surveyor/Observer: Sarah Voisin Weather over past 72 hours: no rain

Flow Observed (circle): YES (NO)

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	**Pipe Flow Depth (inches) Note: measure from pipe invert**	**Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance**	**Flow Appearance / Color**	**Flow Odor**	**Turbidity**	**Temperature**	**pH**	**Conductivity**	**Comments and Notes**
	Depth ____	Depth ____	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *					
2. Structure Details (pipe or other conveyance info.)	**Pipe Material**	**Pipe Condition**	**Channel, Ditch or Swale Condition**	**Diameter or Width (specify distance units)**	**Slope (degrees)**	**Outlet Structure**	**GPS Coordinates**	**Discharge directly to surface water?****	**Comments and Notes**
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	__ Good ✓ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	12"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	____ Lat. ____ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	Wall is cracking
3. Outfall Observations (general conditions at outfall)	**Deposits**	**Surrounding Vegetation**	**Erodibility**	**Land Use at Outfall**	**Land Use Upstream of Outfall**	**Appearance / Color**	**Odor**	**Sediment Depth (inches) (if present)**	**Comments and Notes**
	__ None __ Grease/Oil __ Paper/Trash __ Foam __ Other *	__ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture __ Residential __ Commercial ✓ Industrial	__ Forest __ Agriculture __ Residential __ Commercial ✓ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		
4. Laboratory Analysis (check if submitted)	**Surfactant**	**Ammonia Concentration**	**E. coli**	**Oil & Grease (if oil or sheen is observed)**	**VOCs (if solvent odor is present)**	**Additional Field Comments and Notes**			
						Photo # 37-38			

Notes:

* Provide additional comments to describe the observations made for the category.

** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# HD - 014 **Location Aid** Prospect / Harmony St

Date: 11/18/04 Time: 10:45AM	Weather Today: cloudy
Surveyor/Observer: Sarah Varin	Weather over past 72 hours: no rain

Flow Observed (circle): YES NO

1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	Field Monitoring Data (note: fill in units for each parameter): Turbidity	Temperature	pH	Conductivity	Comments and Notes
	Depth ___	Depth ___	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *					
2. Structure Details (pipe or other conveyance info.)	**Pipe Material**	**Pipe Condition**	**Channel, Ditch or Swale Condition**	**Diameter or Width (specify distance units)**	**Slope (degrees)**	**Outlet Structure**	**GPS Coordinates**	**Discharge directly to surface water?****	**Comments and Notes**
	__ Clay __ Concrete __ Corrugated Steel __ PVC ✓ Cast Iron	__ Good __ Cracked __ Exposed Steel ✓ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	12"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	______ Lat. ______ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	
3. Outfall Observations (general conditions at outfall)	**Deposits**	**Surrounding Vegetation**	**Erodibility**	**Land Use at Outfall**	**Land Use Upstream of Outfall**	**Appearance / Color**	**Odor**	**Sediment Depth (inches) (if present)**	**Comments and Notes**
	__ None __ Grease/Oil __ Paper/Trash __ Foam __ Other *	__ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture __ Residential __ Commercial ✓ Industrial	__ Forest __ Agriculture __ Residential __ Commercial ✓ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		
4. Laboratory Analysis (check if submitted)	**Surfactant**	**Ammonia Concentration**	**E. coli**	**Oil & Grease (if oil or sheen is observed)**	**VOCs (if solvent odor is present)**	**Additional Field Comments and Notes**			
						Pipe has been sealed w/ concrete photo # 39			

Notes:

* Provide additional comments to describe the observations made for the category.

** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# ~~MW03~~ W-1 **Location Aid** Prospect / Harmony & T.

Date: 11/18/04 Time: 10:45AM Weather Today: cloudy
Surveyor/Observer: Sarah Voisin Weather over past 72 hours: no rain

Flow Observed (circle): YES NO (NO circled)

1. Flow Observations (fill out this section only if flow is observed)	**Pipe Flow Depth (inches) Note: measure from pipe invert**	**Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance**	**Flow Appearance / Color**	**Flow Odor**	**Field Monitoring Data (note: fill in units for each parameter)** Turbidity	Temperature	pH	Conductivity	**Comments and Notes**
	Depth ___	Depth ___	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *					
2. Structure Details (pipe or other conveyance info.)	**Pipe Material**	**Pipe Condition**	**Channel, Ditch or Swale Condition**	**Diameter or Width (specify distance units)**	**Slope (degrees)**	**Outlet Structure**	**GPS Coordinates**	**Discharge directly to surface water?****	**Comments and Notes**
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	✓ Good __ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	12"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	______ Lat. ______ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	
3. Outfall Observations (general conditions at outfall)	**Deposits**	**Surrounding Vegetation**	**Erodibility**	**Land Use at Outfall**	**Land Use Upstream of Outfall**	**Appearance / Color**	**Odor**	**Sediment Depth (inches) (if present)**	**Comments and Notes**
	__ None __ Grease/Oil __ Paper/Trash __ Foam ✓ Other *	__ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture ✓ Residential __ Commercial __ Industrial	__ Forest __ Agriculture ✓ Residential __ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		plant growth coming out of pipe
4. Laboratory Analysis (check if submitted)	**Surfactant**	**Ammonia Concentration**	**E. coli**	**Oil & Grease (if oil or sheen is observed)**	**VOCs (if solvent odor is present)**	**Additional Field Comments and Notes**			
						Photo # 40			

Notes:
* Provide additional comments to describe the observations made for the category.
** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# R-9 **Location Aid** Harmony St.

Date: 11/18/04 Time: 10:50AM Weather Today: cloudy
Surveyor/Observer: Sarah Voisin Weather over past 72 hours: no rain

Flow Observed (circle): YES NO

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	~~Turbidity~~ TDS (PPM)	Temperature	pH	Conductivity	Comments and Notes
	Depth __ trickle	Depth __	__ Clear ✓ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	✓ None __ Chemical __ Petroleum __ Sewage __ Other *	173	9.4°C	8.54	361	
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	✓ Good __ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	30"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	______ Lat. ______ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	__ None __ Grease/Oil __ Paper/Trash __ Foam ✓ Other *	__ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture __ Residential __ Commercial ✓ Industrial	__ Forest __ Agriculture __ Residential __ Commercial ✓ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		leaves
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			
			✓			Photo #41			

Notes:

* Provide additional comments to describe the observations made for the category.

** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# W-2 **Location Aid** Rt 8

Date: 11/18/04 Time: 10:55AM Weather Today: cloudy

Surveyor/Observer: Sarah Voisin Weather over past 72 hours: no rain

Flow Observed (circle): (YES) NO

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	~~Turbidity~~ TDS (ppm)	Temperature	pH	Conductivity	Comments and Notes
	3" Depth	Depth ___	_ Clear _ Cloudy/Milky _ Dark (Tea) _ Sheen _ Other *	_ None _ Chemical _ Petroleum ✓ Sewage _ Other *	239	9.1°C	8.38	477	
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	_ Clay ✓ Concrete _ Corrugated Steel _ PVC _ Cast Iron	_ Good ✓ Cracked _ Exposed Steel _ Corroded _ Other*	_ Good _ Clogged _ Debris _ Scoured or Eroded _ Other*	60"		_ Headwall _ Riprap _ No Outlet Protection _ Other*	______ Lat. ______ Lon.	_ Yes _ No If Yes, Provide Receiving Water Name	Pipe is cracked
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	_ None _ Grease/Oil _ Paper/Trash _ Foam ✓ Other *	_ Little or No Distress _ Moderate Distress _ High Distress	_ Little or No Erosion _ Small Areas of Erosion _ Many Eroded Areas	_ Forest _ Agriculture ✓ Residential ✓ Commercial _ Industrial	_ Forest _ Agriculture ✓ Residential ✓ Commercial _ Industrial	_ Clear _ Cloudy/Milky _ Dark (Tea) _ Sheen _ Other *	_ None _ Chemical _ Petroleum _ Sewage _ Other *	-	Moss & pigeon feathers & droppings
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			
			✓			Photo # 42-43			

Notes:

* Provide additional comments to describe the observations made for the category.

** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# Ho-PL6 **Location Aid** R+8

Date: 11/18/04 Time: 10:58AM Weather Today: cloudy

Surveyor/Observer: Sarah Voisin Weather over past 72 hours: no rain

Flow Observed (circle): YES NO

1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	Field Monitoring Data (note: fill in units for each parameter): ~~Turbidity~~ TDS (ppm)	Temperature	pH	Conductivity	Comments and Notes
	1/2" Depth	Depth	Clear Cloudy/Milky Dark (Tea) Sheen Other *	✓ None Chemical Petroleum Sewage Other *	469	10.8°C	8.19	938	

2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	Clay ✓ Concrete Corrugated Steel PVC Cast Iron	✓ Good Cracked Exposed Steel Corroded Other*	Good Clogged Debris Scoured or Eroded Other*	24"		Headwall Riprap No Outlet Protection Other*	____ Lat. ____ Lon.	Yes No If Yes, Provide Receiving Water Name	

3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	✓ None Grease/Oil Paper/Trash Foam Other *	Little or No Distress Moderate Distress High Distress	Little or No Erosion Small Areas of Erosion Many Eroded Areas	Forest Agriculture Residential Commercial ✓ Industrial	Forest Agriculture Residential Commercial ✓ Industrial	Clear Cloudy/Milky Dark (Tea) Sheen Other *	None Chemical Petroleum Sewage Other *		

4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes
			✓			photo # 44

Notes:

* Provide additional comments to describe the observations made for the category.

** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# SW-3 **Location Aid** Interior Alt. / Hoosac St.

Date: 11/18/04 Time: 11:20 AM
Surveyor/Observer: Sarah Voisin
Weather Today: cloudy
Weather over past 72 hours: no rain

Flow Observed (circle): YES NO

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	~~Turbidity~~ TDS (ppm)	Temperature	pH	Conductivity	Comments and Notes
	___ Depth	11" Depth	✓ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	✓ None __ Chemical __ Petroleum __ Sewage __ Other *	134	7.8°C	8.52	276	
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	__ Clay __ Concrete __ Corrugated Steel __ PVC __ Cast Iron	__ Good __ Cracked __ Exposed Steel __ Corroded __ Other*	✓ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*			__ Headwall __ Riprap __ No Outlet Protection __ Other*	______ Lat. ______ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	__ None __ Grease/Oil __ Paper/Trash __ Foam ✓ Other *	✓ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion ✓ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		leaves
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			
						photo # Downstream Hoxie Brook			

Notes:
* Provide additional comments to describe the observations made for the category.
** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# upstream Hoxie **Location Aid** Hoxie Brook/West

Date: 11/18/04 Time: 11:35AM Weather Today: cloudy

Surveyor/Observer: Sarah Voisin Weather over past 72 hours: norain

Flow Observed (circle): YES (circled) NO

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	~~Turbidity~~ TDS (ppm)	Temperature	pH	Conductivity	Comments and Notes
	Depth ___	Depth ___	✓ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	✓ None __ Chemical __ Petroleum __ Sewage __ Other *	126	8.3°C	8.36	252	
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	__ Clay __ Concrete __ Corrugated Steel __ PVC __ Cast Iron	__ Good __ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged ✓ Debris __ Scoured or Eroded __ Other*			__ Headwall __ Riprap __ No Outlet Protection __ Other*	______ Lat. ______ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	leaves/twigs
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	__ None __ Grease/Oil __ Paper/Trash __ Foam ✓ Other *	✓ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion ✓ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture ✓ Residential __ Commercial __ Industrial	__ Forest __ Agriculture ✓ Residential __ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		leaves
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			
			✓			Photo # 45 – 48			

Notes:

* Provide additional comments to describe the observations made for the category.

** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# Hoxie MID **Location Aid** Middle of Hoxie beneath Downtown

Date: 11/18/04 Time: 12:00
Surveyor/Observer: Rich Niles

Weather Today: ____________
Weather over past 72 hours: ____________

Flow Observed (circle): YES NO

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	~~Turbidity~~ TDS	Temperature	pH	Conductivity	Comments and Notes
	Depth ___	6" Depth	✓ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	✓ None __ Chemical __ Petroleum __ Sewage __ Other *	119 ppm	7.5	8.41	239	
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	__ Clay __ Concrete __ Corrugated Steel __ PVC __ Cast Iron	__ Good __ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged __ Debris ✓ Scoured or Eroded __ Other*			__ Headwall __ Riprap __ No Outlet Protection __ Other*	________ Lat. ________ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	Undermined Stone Arch
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	__ None __ Grease/Oil __ Paper/Trash __ Foam ✓ Other * Some sticks + leaves	__ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture __ Residential __ Commercial __ Industrial	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		Beneath Downtown
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			
			✓			Some undermining at stone arch culvert.			

Notes:
* Provide additional comments to describe the observations made for the category.
** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# H-P5 **Location Aid** West Rd - Marshal Ave (East Side)

Date: ______ Time: 1500 Weather Today: ______
Surveyor/Observer: M Sherman Weather over past 72 hours: ______

Flow Observed (circle): YES NO

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	Turbidity	Temperature	pH	Conductivity	Comments and Notes
	– Depth	– Depth	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen ✓ Other *	__ None __ Chemical __ Petroleum __ Sewage ✓ Other *	–	–	–	–	NO Flow
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	✓ Good __ Cracked __ Exposed Steel __ Corroded __ Other*	✓ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	12"		✓ Headwall __ Riprap __ No Outlet Protection __ Other*	______ Lat. ______ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	✓ None __ Grease/Oil __ Paper/Trash __ Foam __ Other *	✓ Little or No Distress __ Moderate Distress __ High Distress	✓ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture ✓ Residential __ Commercial __ Industrial	✓ Forest ✓ Agriculture __ Residential __ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen ✓ Other *	__ None __ Chemical __ Petroleum __ Sewage ✓ Other *		
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			

Notes:
* Provide additional comments to describe the observations made for the category.
** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# 14-P6 **Location Aid** Ward Rd. Marshall AVE (west side)

Date:________	Time: 1508	Weather Today:________
Surveyor/Observer: M Sherman		Weather over past 72 hours:________

Flow Observed (circle): YES NO

1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	Field Monitoring Data (note: fill in units for each parameter) Turbidity	Temperature	pH	Conductivity	Comments and Notes
	Depth____	Depth____	_ Clear _ Cloudy/Milky _ Dark (Tea) _ Sheen _ Other *	_ None _ Chemical _ Petroleum _ Sewage _ Other *					

2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	_ Clay ✓ Concrete _ Corrugated Steel _ PVC _ Cast Iron	✓ Good _ Cracked _ Exposed Steel _ Corroded _ Other*	_ Good _ Clogged _ Debris _ Scoured or Eroded _ Other*	12"		✓ Headwall _ Riprap _ No Outlet Protection _ Other*	____ Lat. ____ Lon.	_ Yes _ No If Yes, Provide Receiving Water Name	

3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	✓ None _ Grease/Oil _ Paper/Trash _ Foam _ Other *	✓ Little or No Distress _ Moderate Distress _ High Distress	_ Little or No Erosion _ Small Areas of Erosion _ Many Eroded Areas	_ Forest _ Agriculture ✓ Residential _ Commercial _ Industrial	_ Forest ✓ Agriculture _ Residential _ Commercial _ Industrial	_ Clear _ Cloudy/Milky _ Dark (Tea) _ Sheen ✓ Other *	_ None _ Chemical _ Petroleum ✓ Sewage ✓ Other *		

4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes

Notes:

* Provide additional comments to describe the observations made for the category.

** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# 12-P-7 **Location Aid** West Rd - Mendall Ave (west side)

Date: 11/12/04 Time: 1512	Weather Today:
Surveyor/Observer: M Sheridan	Weather over past 72 hours:

Flow Observed (circle): YES NO

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	Turbidity	Temperature	pH	Conductivity	Comments and Notes
	Depth	Depth	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *					
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	✓ Clay __ Concrete __ Corrugated Steel __ PVC __ Cast Iron	__ Good ✓ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	12"		__ Headwall __ Riprap ✓ No Outlet Protection __ Other*	______ Lat. ______ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	__ None __ Grease/Oil __ Paper/Trash __ Foam __ Other *	✓ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion ✓ Many Eroded Areas	__ Forest ✓ Agriculture __ Residential __ Commercial __ Industrial	__ Forest ✓ Agriculture __ Residential __ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen ✓ Other *	__ None __ Chemical __ Petroleum __ Sewage ✓ Other *		
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			

Notes:

* Provide additional comments to describe the observations made for the category.

** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# A-84 **Location Aid** ~~Simo~~ Simon Ave south side out stream

Date: 11/17/08 Time: 1530 Weather Today: Cloudy
Surveyor/Observer: M Sherman Weather over past 72 hours: Sunny

Flow Observed (circle): YES NO

1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	Field Monitoring Data (note: fill in units for each parameter): ~~Turbidity~~ TDS	Temperature	pH	Conductivity	Comments and Notes
	10 Depth	10 Depth	✓ Clear _ Cloudy/Milky _ Dark (Tea) _ Sheen _ Other *	_ None _ Chemical _ Petroleum ✓ Sewage _ Other *	554	10.8 C	8.00	1127	

2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	_ Clay ✓ Concrete _ Corrugated Steel _ PVC _ Cast Iron	_ Good ✓ Cracked _ Exposed Steel _ Corroded _ Other*	_ Good ✓ Clogged ✓ Debris _ Scoured or Eroded _ Other*	18	75°	_ Headwall _ Riprap ✓ No Outlet Protection _ Other*	______ Lat. ______ Lon.	_ Yes _ No If Yes, Provide Receiving Water Name	

3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	_ None _ Grease/Oil _ Paper/Trash _ Foam ✓ Other *	_ Little or No Distress _ Moderate Distress _ High Distress	_ Little or No Erosion _ Small Areas of Erosion _ Many Eroded Areas	_ Forest _ Agriculture ✓ Residential _ Commercial _ Industrial	_ Forest _ Agriculture ✓ Residential _ Commercial _ Industrial	✓ Clear _ Cloudy/Milky _ Dark (Tea) _ Sheen _ Other *	_ None _ Chemical ✓ Petroleum _ Sewage _ Other *		

4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes
						lot of Build up in Swale leaves + debris

Notes:

* Provide additional comments to describe the observations made for the category.

** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

APPENDIX 4-E

Conceptual BMP Designs & Photos for Priority Stormwater Remediation Sites in Adams

Conceptual BMP Designs for Redevelopment Projects

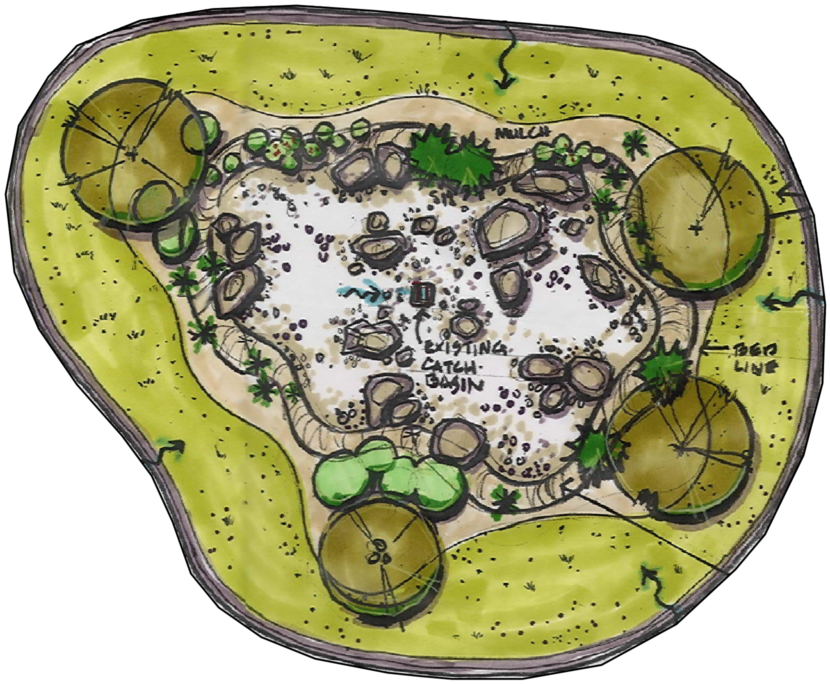
Site: Renfrew Park – Parking Lot BMPs

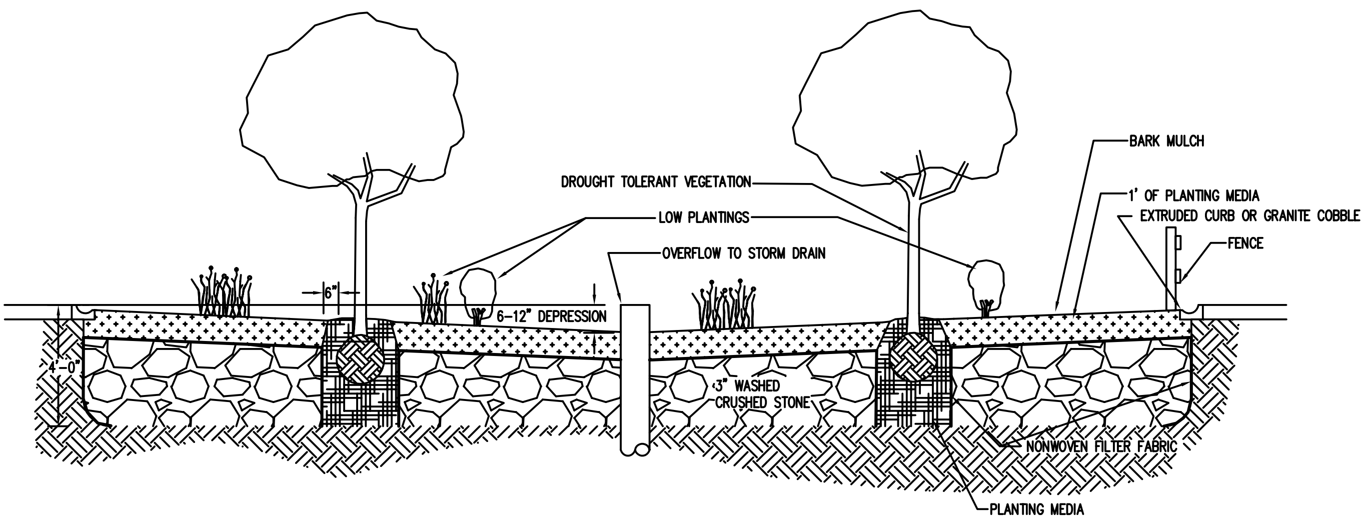
Cost: N/A, some BMPs already constructed

BMP Rank: N/A

Description of Stormwater BMPs:

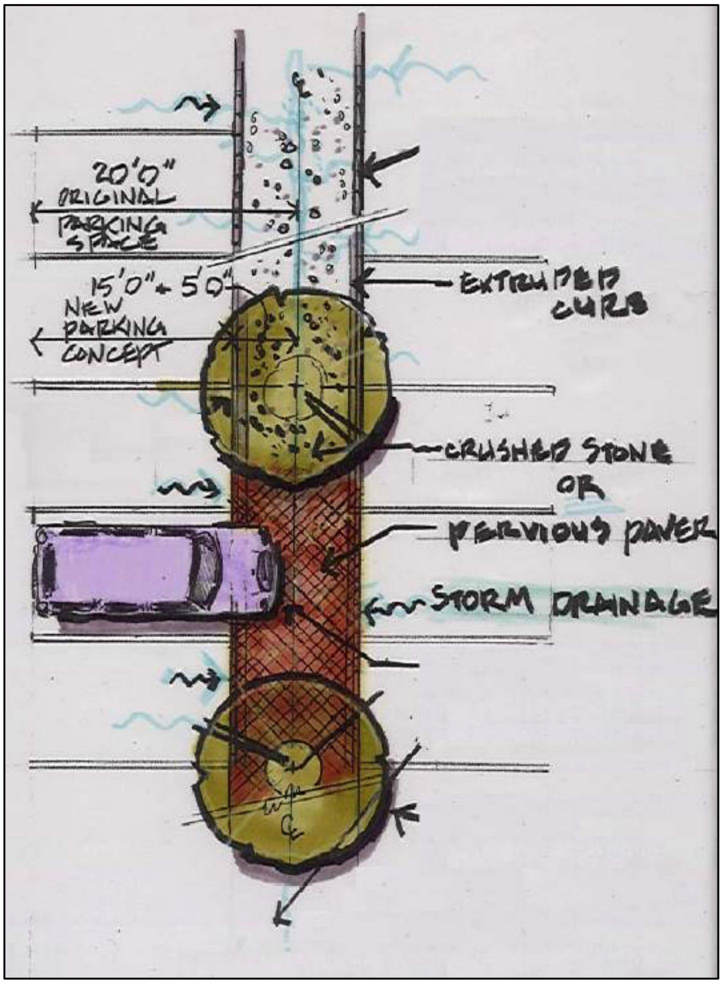
- Stormwater BMPs at this site will be used to treat first flush stormwater events, maximize infiltration and reduce peak stormwater flows to Pine Street Brook.
- A portion of runoff is diverted from Friend Street to an infiltration divider that will also handle approximately half of the parking lot runoff through infiltration. This will treat stormwater from Friend Street, as well as the adjacent parking lot, reducing runoff volumes and providing first flush stormwater treatment.
- The infiltration divider will overflow into a series of leaching manholes to maximize infiltration before discharging to Pine Street Brook.
- Additional leaching catch basins and overflow infiltration galleries handle additional parking lot runoff along the park side of the lot.
- Porous pavement and underlying infiltration galleries can be used in combination with the aforementioned leaching catch basins to handle parking lot runoff, primarily first flush.
- An infiltration bioisland can be incorporated into the landscape near Friend Street and Columbia Street to treat a portion of the parking lot at this location.

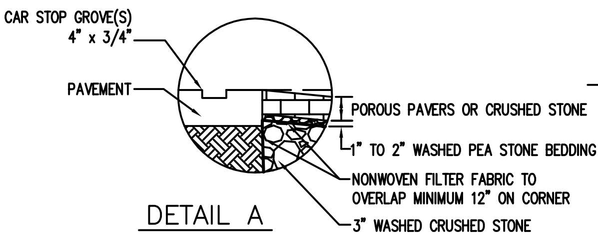


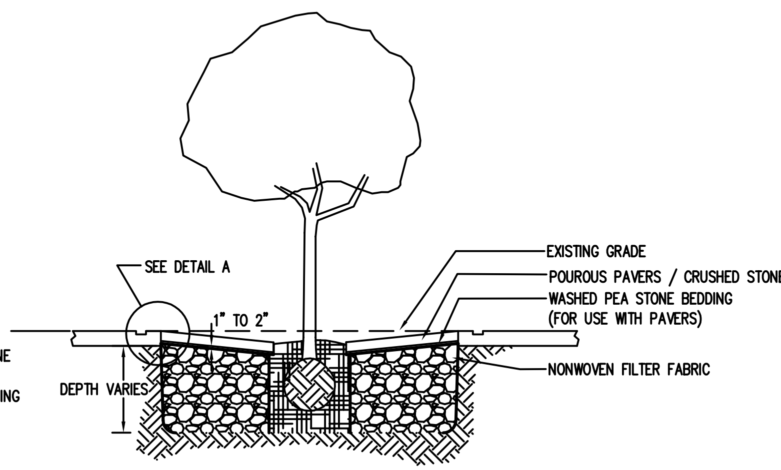


BIO ISLAND

COMPREHENSIVE
ENVIRONMENTAL
INCORPORATED

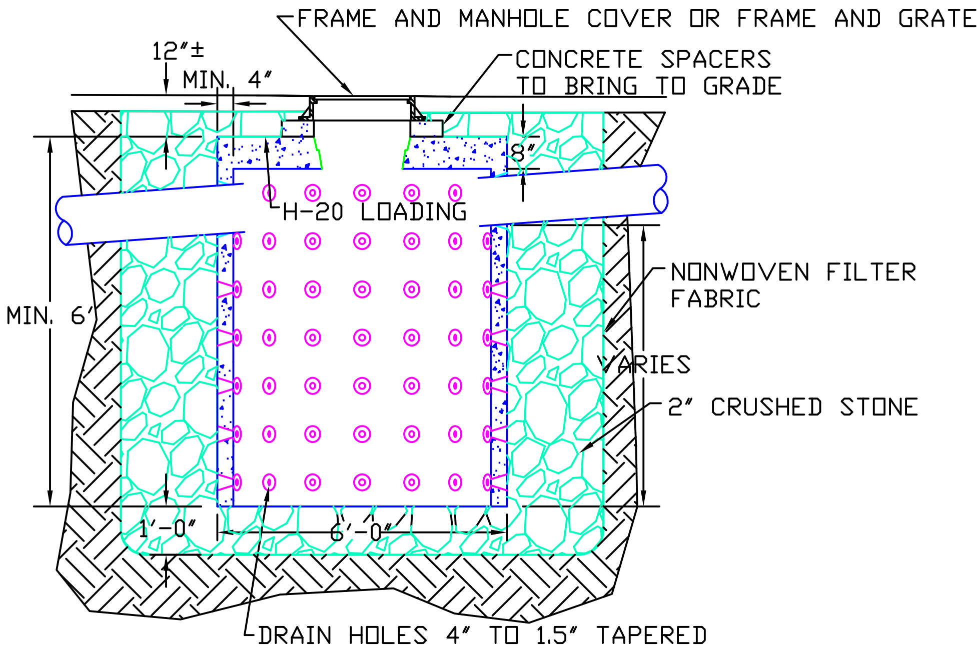






INFILTRATION DIVIDER

COMPREHENSIVE
ENVIRONMENTAL
INCORPORATED



LEACHING CATCH BASIN

COMPREHENSIVE
ENVIRONMENTAL
INCORPORATED

VIEW OF RENFREW PARK BALLFIELD WITH FRIEND STREET IN BACKGROUND

PINE STREET BROOK (UPSTREAM OF FRIEND STREET PARKING LOT)

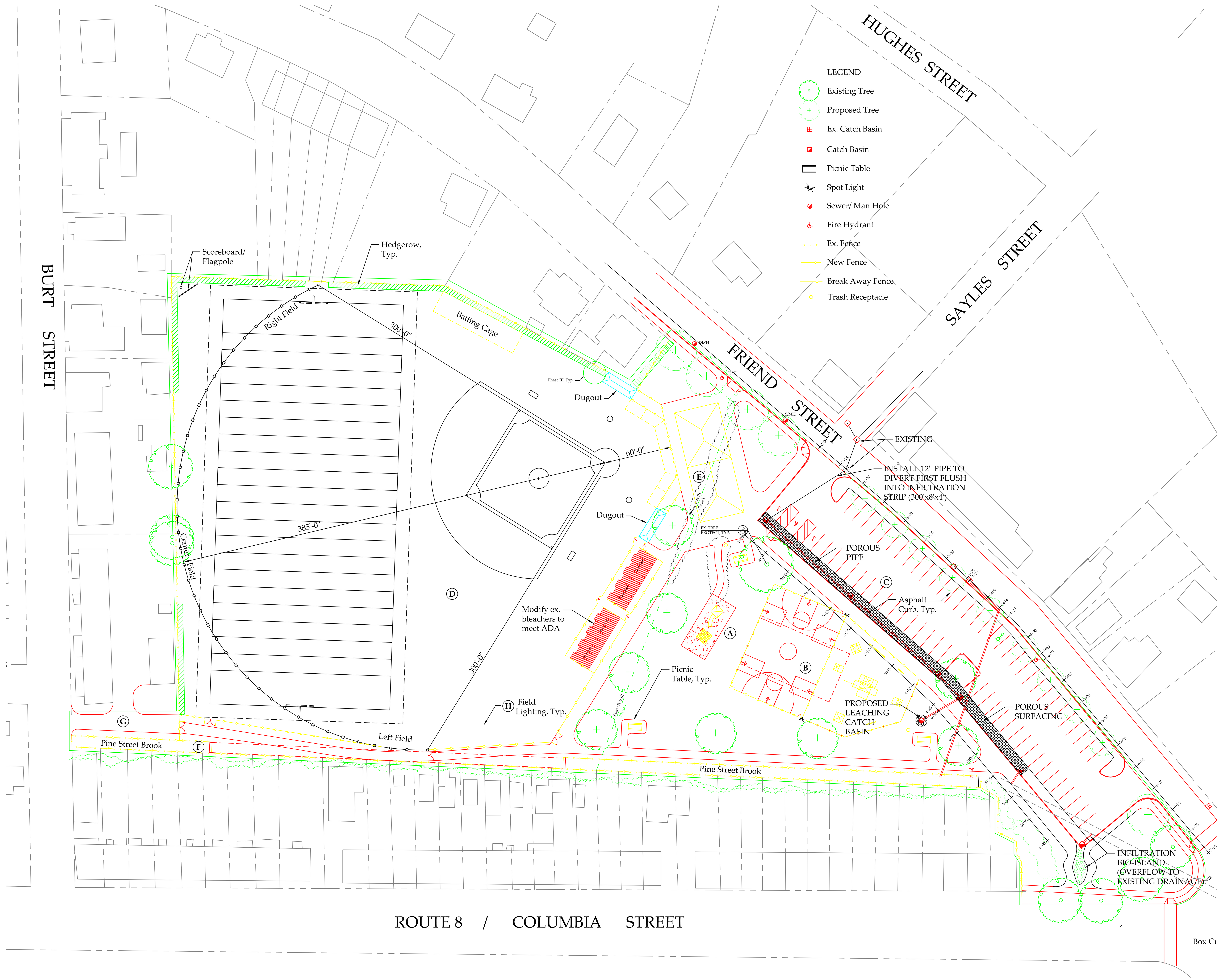
UNDEVELOPED SITE AT THE FRIEND STREET PARKING LOT

FRIEND STREET PARKING LOT UNDER CONSTRUCTION

RENFREW PARK BMP
SITE PICTURES

COMPREHENSIVE ENVIRONMENTAL INCORPORATED

64 DILLA STREET
MILFORD, MA 01757



These documents are not valid and cannot be constructed without an authorized signature.

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CEI-CHANGES:

1. SEVERAL OPTIONS ARE SHOWN ON THE DRAWING AND CAN BE USED IN ANY COMBINATION.

2. BIOISLAND AT LOWER CORNER OF PARKING LOT TO BE SIZED TO HOLD 1" OF RUNOFF FROM PARKING LOT DRAINING TO IT.

3. INFILTRATION DIVIDER SIZED TO HOLD 1" OF RUNOFF FROM PARKING LOT. ADDITIONAL SIZE TO BE ADDED TO TREAT DIVERTED STORMWATER FROM FRIEND STREET. SURFACING TO BE POROUS PAVERS OR LANDSCAPING TO ALLOW SURFACE INFILTRATION. DEEP SUMP CATCH BASINS ONLY NECESSARY AT INFILTRATION DIVIDER BEGINNING AND END.

4. LEACHING CATCH BASINS TO HOLD 1" OF RUNOFF DRAINING TO EACH CATCH BASIN.

5. VEGETATED BUFFER STRIP ALONG FRIEND STREET SHRUNKEN TO ALLOW INFILTRATION DIVIDER TO FIT ON LOWER SIDE TO COLLECT ALL OF PARKING LOT RUNOFF.

6. SEE PDF OF COMBINED BMPS FOR EXAMPLES.

Renfrew Field

Adams, MA

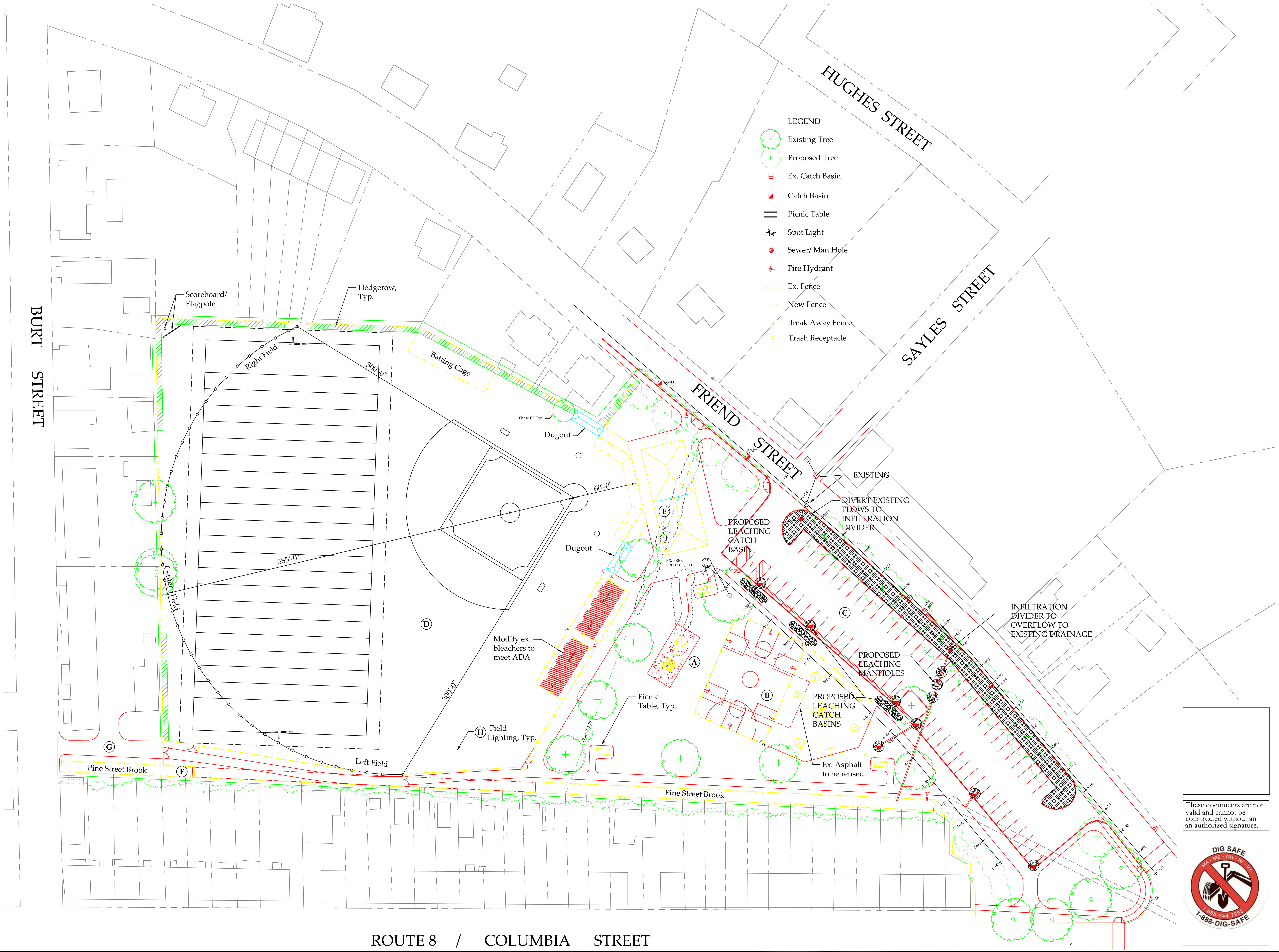
Master Plan

Okerstrom·Lang Ltd.
Landscape Architects

17 Bridge Street
Great Barrington, MA 01230
413-528-6523
www.okerstromlang.com

September 10, 2003
Scale: 1"=40'-0"
Sheet No.
L-1

NORTH



CEI-CHANGES:

1. SEVERAL OPTIONS ARE SHOWN ON THE DRAWING AND CAN BE USED IN ANY COMBINATION.

2. CONVERT CATCH BASINS TO DEEP SUMP LEACHING CATCH BASINS. INSTALL LEAKOFF WITH CRUSHED STONE TO PROMOTE INFILTRATION.

3. INFILTRATION DIVIDER INSTALLED BETWEEN FRIEND STREET AND PARKING LOT. DIVIDER TO OVERFLOW THROUGH CATCH BASIN INTO EXISTING DRAINAGE. SURFACING TO BE POROUS PAVERS OR LANDSCAPED TO ALLOW SURFACE INFILTRATION.

4. INSTALL LEACHING MANHOLES INLINE INTO EXISTING DRAINAGE PIPE.

5. SEE PDF OF COMBINED BMPS FOR EXAMPLES.

Renfrew Field

Adams, MA

Master Plan

Okerstrom·Lang Ltd.
Landscape Architects

17 Bridge Street
Great Barrington, MA 01230
413-528-6523
www.okerstromlang.com

September 10, 2003
Scale: 1"=40'-0"
Sheet No.
L-1

Site: Hoxie Brook Downtown – Stream Restoration & Urban Runoff BMPs

Cost: $395,000*

BMP Rank: 2

Description of Stormwater BMPs:

- This site includes the following BMPs: restoration of natural stream buffers; stream bank stabilization; creating detention areas for sediment removal; parking lot runoff treatment; and an educational component with walkways and an information kiosk.
- Previous construction has destroyed the natural buffer strip along the stream banks. Native trees and shrubs will be planted along the upper stream segment to shade the stream and recreate that environment. A 25' streamscape buffer will be constructed which will serve to filter/treat runoff from the adjacent visitor's center parking lot.
- An educational kiosk will be installed along the main walkway and the proposed loop walkway for passers-by to read about the BMP project, stormwater management and waterway protection.
- The portion of the stream between the rail trail crossing and industrial parking lot will be renovated to improve surface water quality. This will include construction of weir walls to create a second waterfall and detention area. Existing sediment will be excavated from the two pools to increase detention. The second wall will also aid in protecting the water main running through the stream.
- Stream banks between the rail trail crossing and industrial parking lot are eroding due to high stream flows associated with stormwater runoff. The eroding stream banks will be stabilized and planted with native trees and shrubs to protect the stream.
- Sediment from stormwater events and stream bank erosion has partially clogged the culvert that passes beneath the industrial parking lot. The sediment will be removed from the culvert under the parking lot to prevent flooding.
- The 92,000 square foot gravel parking area will have its gravel surface removed and will be loamed and seeded to create a pervious surface, which will reduce runoff and the migration of fines from the parking area. An infiltration divider will be constructed to collect and infiltrate overland flow from the parking area. During icing periods, water may enter the infiltration divider through the catch basin at the end of the structure.
- Large stormwater flows over the gravel and paved parking area have caused a section of the stream retaining wall and parking lot to collapse. A double grated deep sump catch basin will be installed to collect the stormwater and divert it to a baffle tank to remove sediment. Following this pretreatment, the water will flow into two leaching manholes to infiltrate into the ground. An overflow pipe will be installed for stormwater which will be discharged into the stream after being treated in the baffle tank.

*This BMP conceptual design cost has been prepared for engineering design, permitting and construction of the project and does not include construction service costs.

- A 10” water main passes through the stream in this open stream segment. It will be stabilized with crushed stone and rip rap protection on top. A chain link fence will be installed around the open stream to prevent trash and debris from entering the stream.
- The final stretch of open stream before it enters the twin culverts beneath Hoosac Street has eroded stream banks and sediment has accumulated in the culverts due to stormwater events and stream bank erosion. The eroded stream bank will be stabilized with gabions and erosion control fabric and sediment will be removed from the twin culverts. The banks will be seeded with a wetland plant mix.
- Gabion weir walls will be installed at the twin pipe outlet to create a detention area to treat stormwater. The area adjacent to the open channel will be dredged and seeded with a wetland plant mix to improve the detention and treatment of stormwater flows to this area. This will treat stormwater flows from the adjacent parking lot, as well as the larger watershed that feeds the stream.

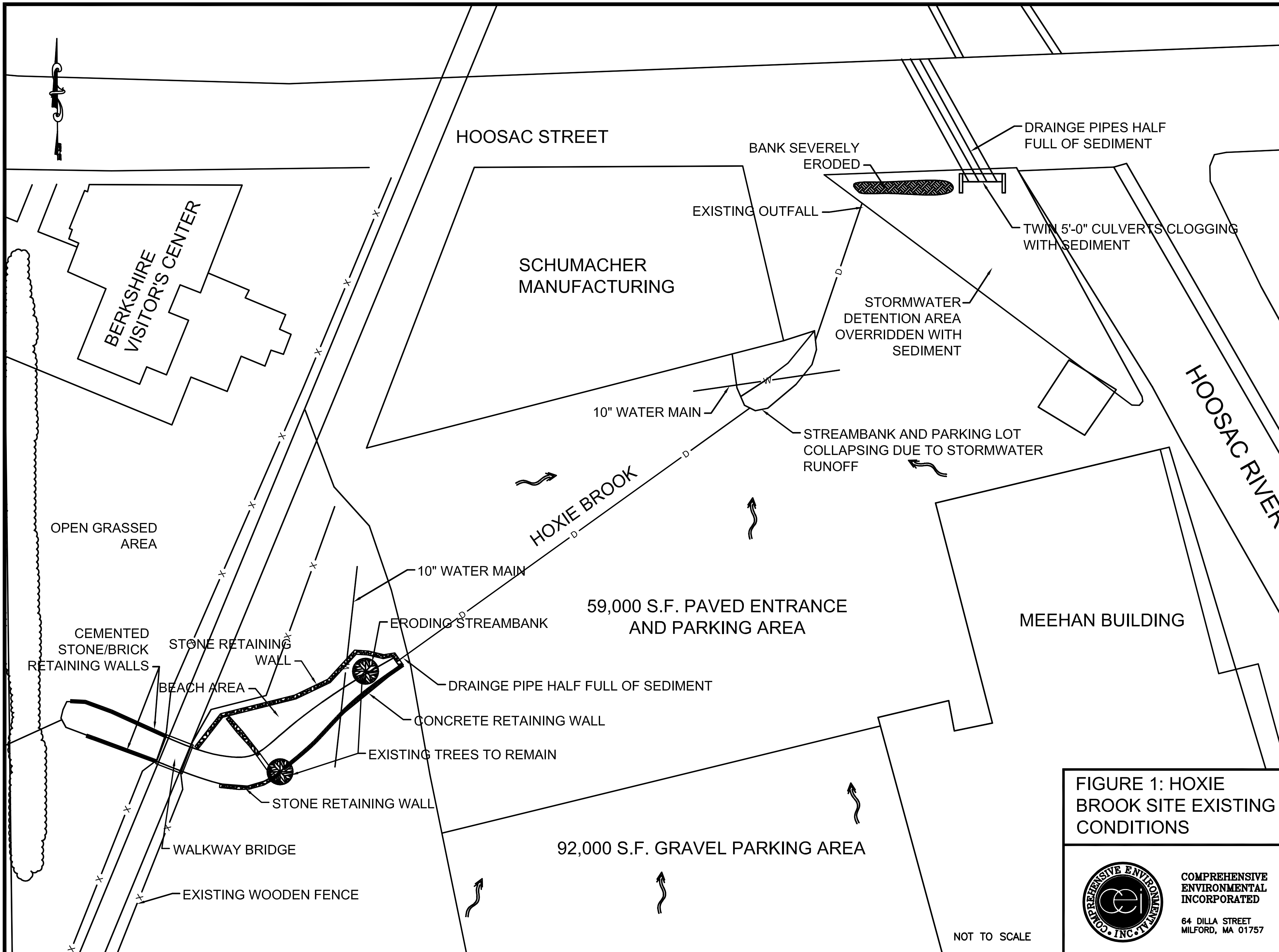


FIGURE 1: HOXIE BROOK SITE EXISTING CONDITIONS

COMPREHENSIVE ENVIRONMENTAL INCORPORATED
64 DILLA STREET
MILFORD, MA 01757

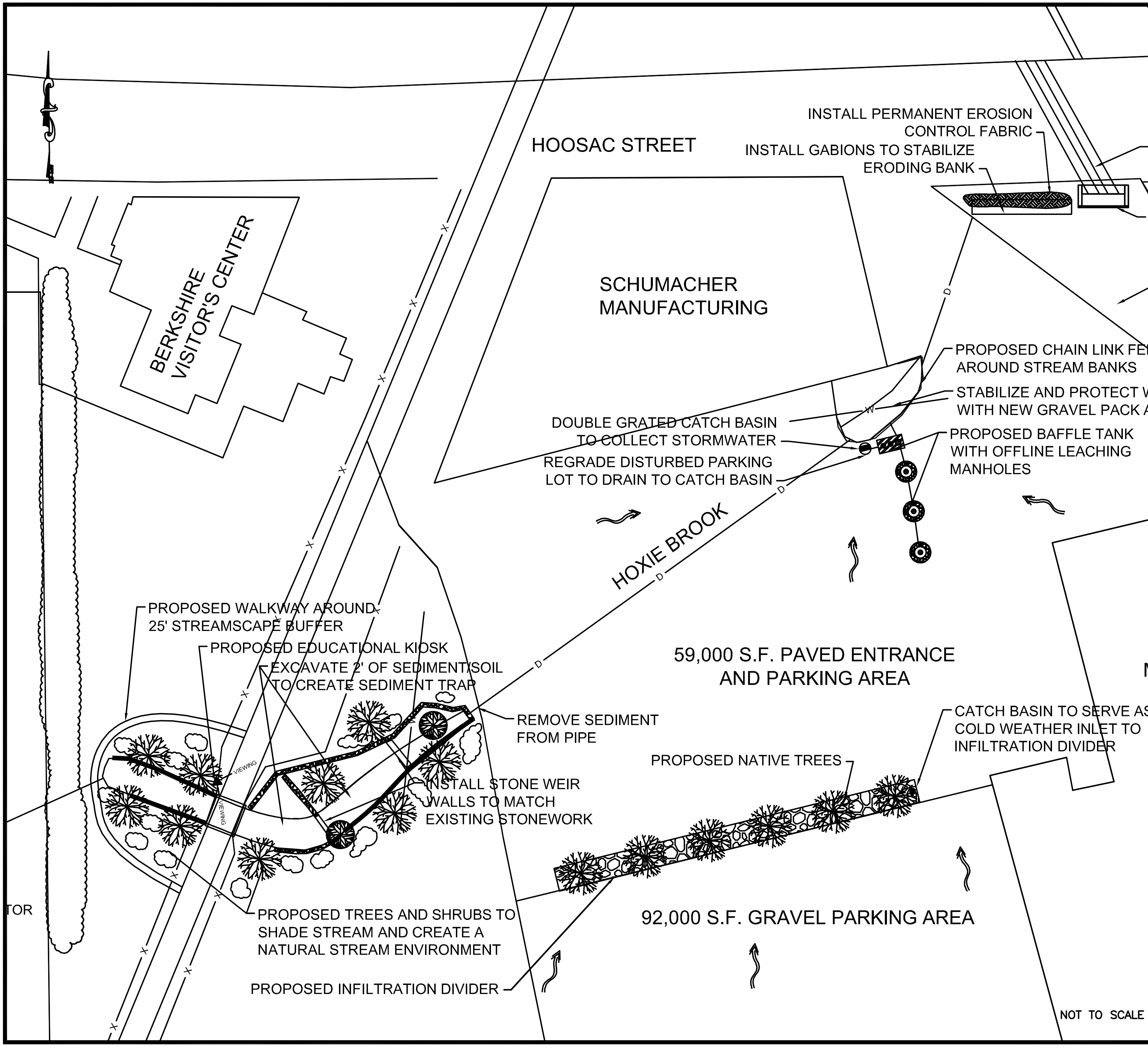


FIGURE 2: HOXIE BROOK SITE PROPOSED CONDITIONS - 1 OF 2

COMPREHENSIVE ENVIRONMENTAL INCORPORATED
64 DILLA STREET
MILFORD, MA 01757

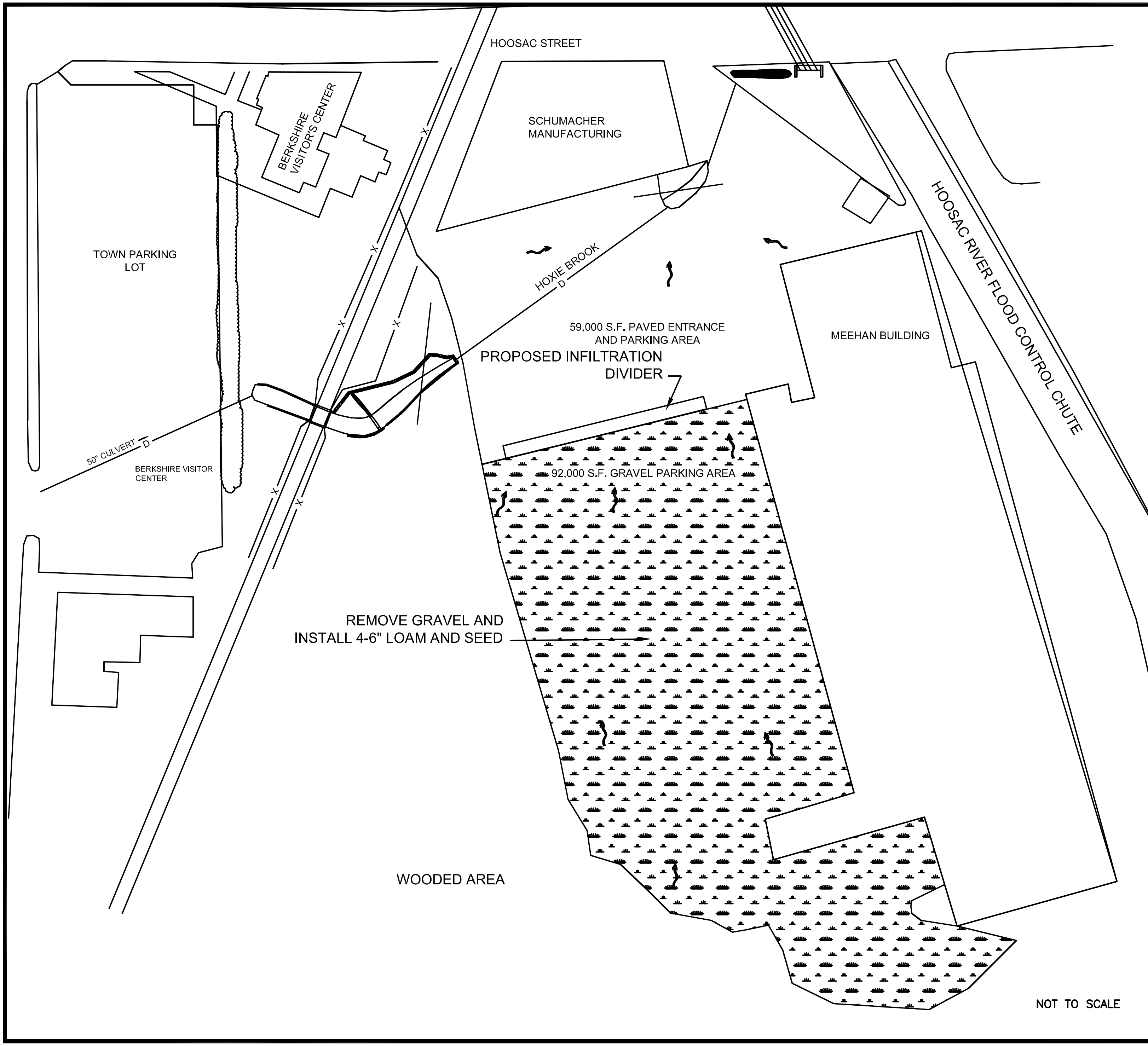


FIGURE 3: HOXIE BROOK SITE PROPOSED CONDITIONS - 2 OF 2

COMPREHENSIVE ENVIRONMENTAL INCORPORATED
64 DILLA STREET
MILFORD, MA 01757

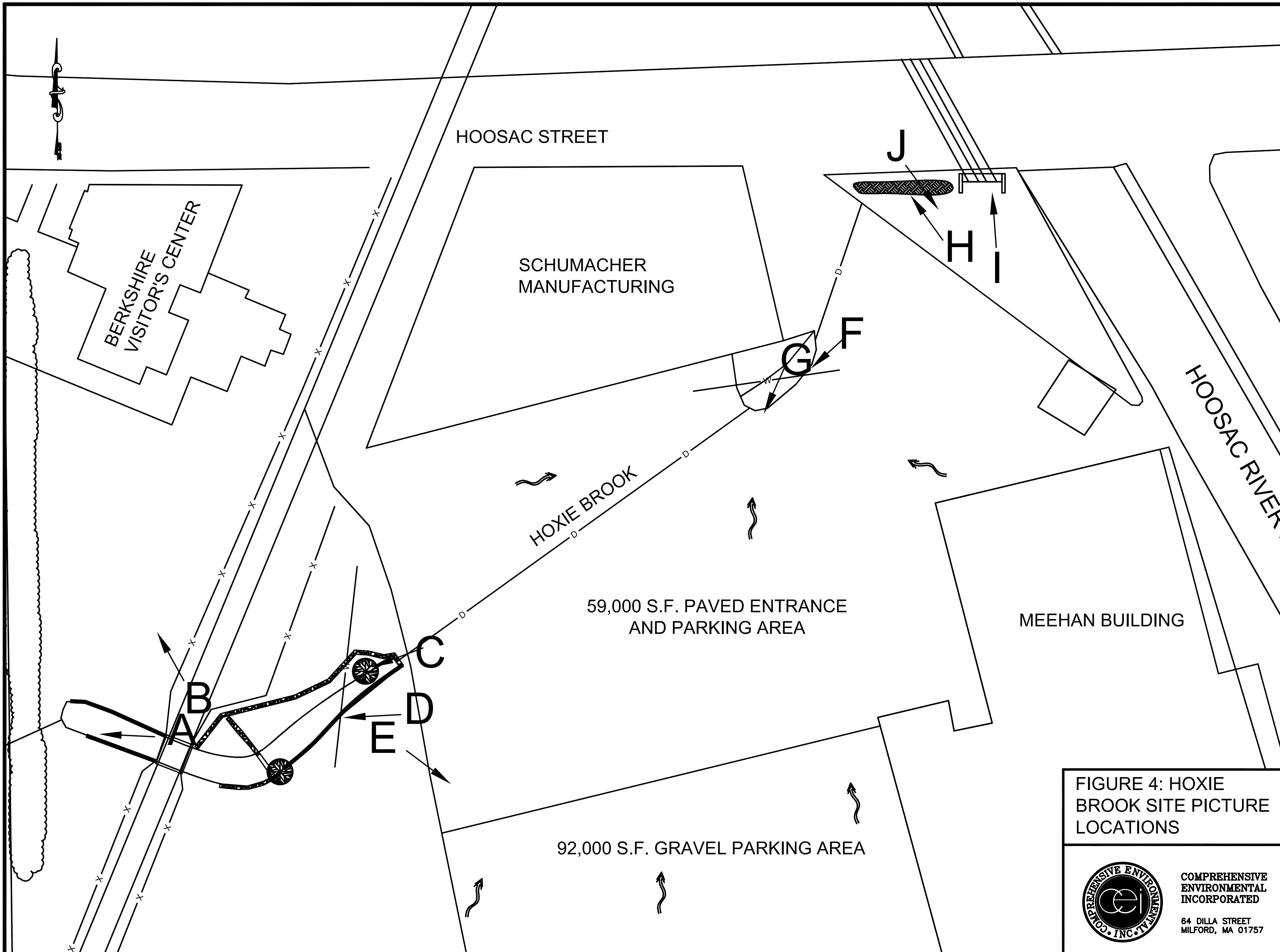


FIGURE 4: HOXIE BROOK SITE PICTURE LOCATIONS

COMPREHENSIVE ENVIRONMENTAL INCORPORATED
64 DILLA STREET
MILFORD, MA 01757

A – RETAINING WALL COLLAPSING NEAR CULVERT

B – UNFORESTED AREA ALONG STREAMBANK

C – STREAMBANK EROSION BETWEEN TREE AND CULVERT

D – COLLAPSING STONE AROUND WATERFALL

E – GRAVEL PARKING AREA TO BE LOAMED AND SEEDED

F – COLLAPSING RETAINING WALL IN OPEN STREAM SEGMENT

FIGURE 5: HOXIE BROOK SITE PICTURES I

COMPREHENSIVE ENVIRONMENTAL INCORPORATED
64 DILLA STREET
MILFORD, MA 01757

G – RETAINING WALL COLLAPSING INTO STREAM

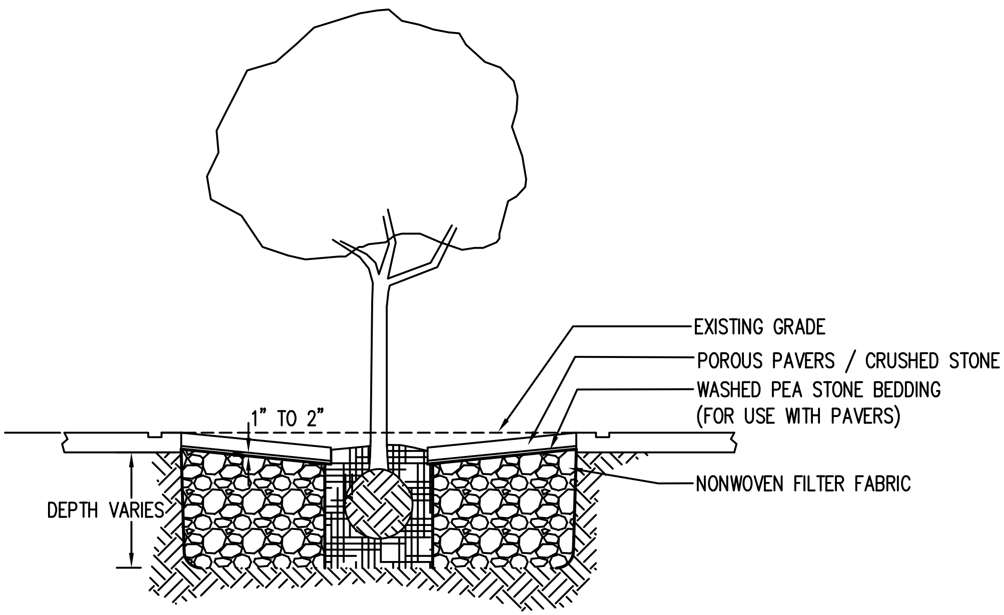
H – BANK BEING ERODED BY STORMWATER FROM OUTFALL

I – DETENTION AREA AND CULVERTS FILLED IN WITH SEDIMENT.

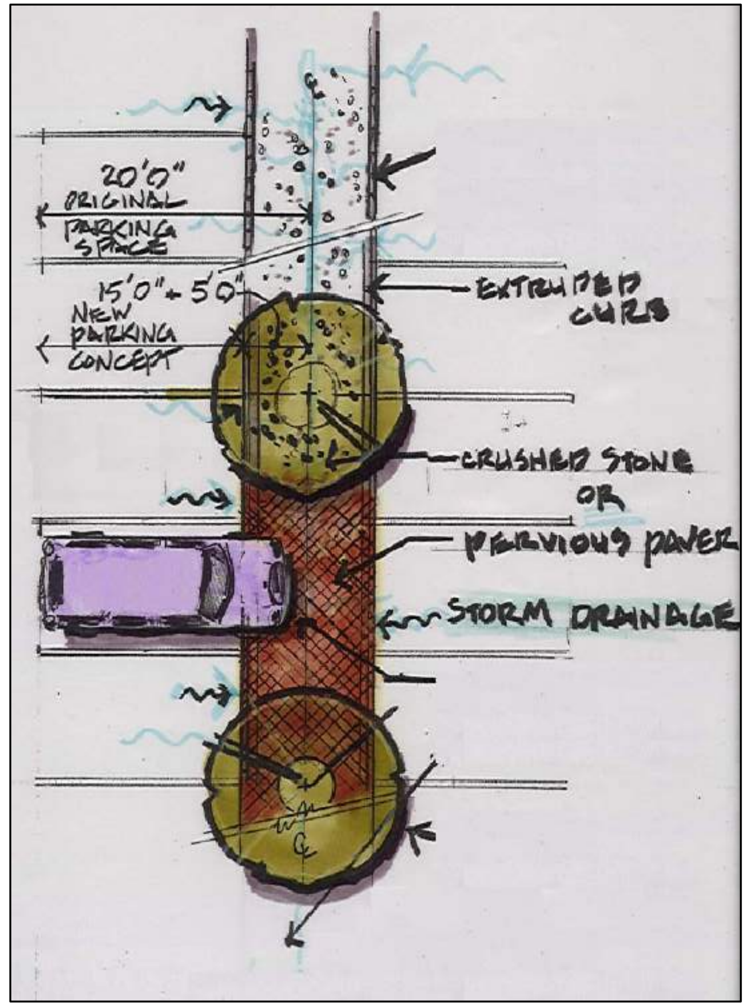
J – DETENTION AREA OVERVIEW

FIGURE 6: HOXIE BROOK SITE PICTURES II

COMPREHENSIVE ENVIRONMENTAL INCORPORATED
64 DILLA STREET
MILFORD, MA 01757



SECTION VIEW



PLAN VIEW

FIGURE 7: TYPICAL
INFILTRATION DIVIDER

COMPREHENSIVE
ENVIRONMENTAL
INCORPORATED

64 DILLA STREET
MILFORD, MA 01757

Site: Adams DPW Yard – Wetlands Treatment

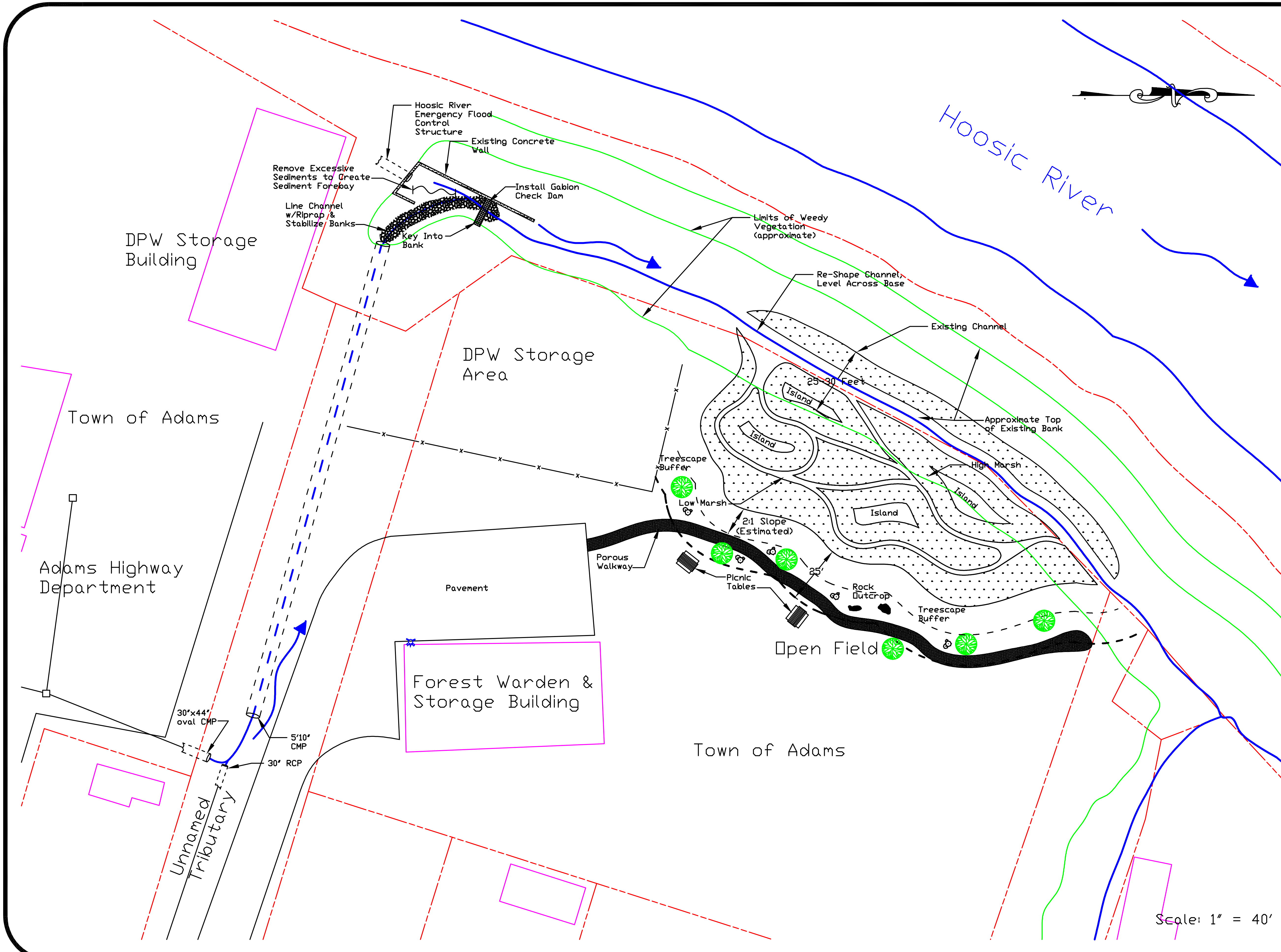
Cost: $106,000*

BMP Rank: 1

Description of Stormwater BMPs:

- Stormwater BMPs at this site utilize existing drainage features and Town-owned land to remove sediment and provide wetlands treatment/attenuation of nutrients (phosphorous) and bacteria before discharging to the Hoosic River.
- An unnamed tributary and stormwater systems at the DPW Yard flow through existing drainage channels along the Hoosic River. This steady base flow will be used to support a wetland treatment system downstream.
- The beginning of the channel, near the Hoosic River flood control structure, will be reshaped to create a forebay for sediment removal. The forebay includes a rip rap channel lining and bank stabilization with a gabion check dam to increase ponding and settling of sediments prior to wetland treatment.
- The drainage channel that flows parallel to the Hoosic River will be reshaped with a level base to increase contact with grassy vegetation and maximize stormwater treatment. The drainage channel will expand into a shallow marsh wetland for natural attenuation of stormwater pollutants before discharging to the Hoosic River. The partial off-line wetland treatment system will allow high flows to pass through the existing drainage channel without damaging the wetland treatment system.
- The wetland detention basin cannot handle all stormwater events due to the size of the drainage area (~193 acres) and land availability, but is intended to provide treatment for low to moderate stormwater flows and at least handle first flush stormwater flows.
- This stormwater treatment conceptual design is based on a shallow marsh wetland system (Design of Stormwater Wetland Systems, Thomas R. Schueler, October 1992) with meandering flow paths of high and low marsh conditions to support a variety of wetland plants. Islands, vegetated banks and tree plantings have been incorporated into the BMP conceptual design to add aesthetic value and support wildlife habitat.
- A walkway and park will be incorporated into the design for beautification and to establish a buffer to protect the shallow marsh wetland. This park will serve as a picnic area and promote public education of stormwater treatment systems with information signs along the walkway.

*This BMP conceptual design cost has been prepared for engineering design and construction of the project and does not include permitting or construction service costs.



General Notes

1. This site plan was developed from the Town of Adams Assessor's map. Some buildings were added with the assistance of aerial photographs provided by MassGIS. This site plan is intended to show approximate site features for the purpose of developing conceptual BMPs for stormwater remediation, as outlined in the 2005 Adams Stormwater Management Strategic Plan.

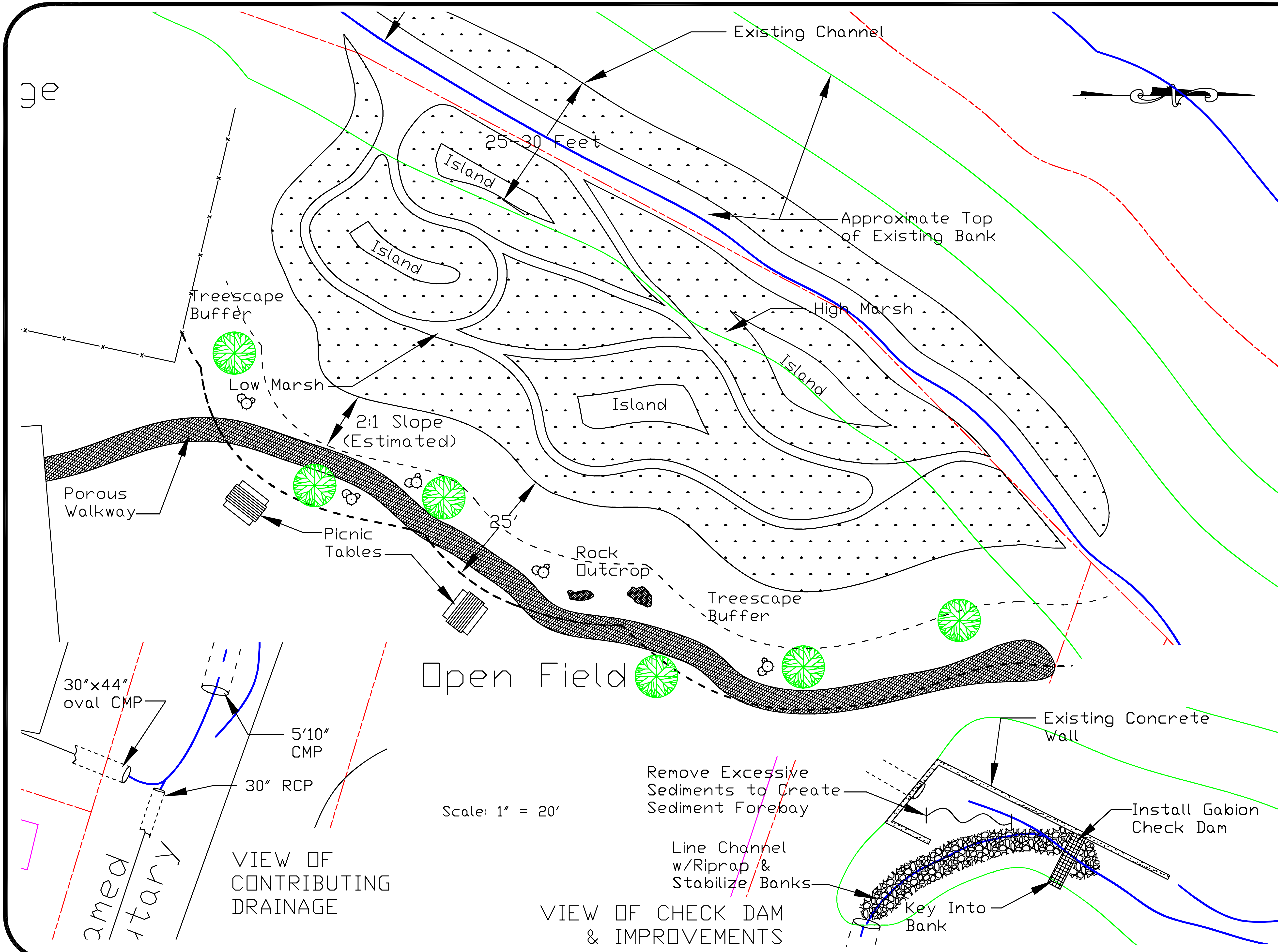
No.	Revision/Issue	Date

COMPREHENSIVE ENVIRONMENTAL INCORPORATED
64 DILLA STREET
MILFORD, MA 01757

Adams DPW Yard - Town of Adams Conceptual BMPs for Stormwater Remediation

Adams Stormwater Management Assessment Project: DEP 604(b) Project 2002-02

Project: 184-1
Date: 1/19/04
DESIGNED BY: RN
CHECKED BY: RB
Scale: AS NOTED
Sheet 1 of 2



General Notes

1. This site plan was developed from the Town of Adams Assessor's map. Some buildings were added with the assistance of aerial photographs provided by MassGIS. This site plan is intended to show approximate site features for the purpose of developing conceptual BMPs for stormwater remediation, as outlined in the 2004 Adams Stormwater Management Strategic Plan.

No.	Revision/Issue	Date

COMPREHENSIVE ENVIRONMENTAL INCORPORATED
64 DILLA STREET
MILFORD, MA 01757

Adams DPW Yard - Town of Adams Conceptual BMPs for Stormwater Remediation

Adams Stormwater Management Assessment Project: DEP 604(b) Project 2002-02

Project: 184-1
Sheet: 2 of 2
Date: 1/19/04
DESIGNED BY: RN
CHECKED BY: RB
Scale: AS NOTED

CULVERT SECTION OF UNNAMED TRIBUTARY

BEGINNING OF SWALE ALONG THE HOOSIC RIVER, PROPOSED CHECK DAM IMPROVEMENT AREA

PROPOSED WETLAND TREATMENT SITE

EXISTING UNNAMED TRIBUTARY ALONG THE HOOSIC RIVER

DPW YARD BMP SITE PICTURES

COMPREHENSIVE ENVIRONMENTAL INCORPORATED
64 DILLA STREET
MILFORD, MA 01757

Site: Glenn Street – Swale Rehabilitation/Stabilization & Cascading Check Dams

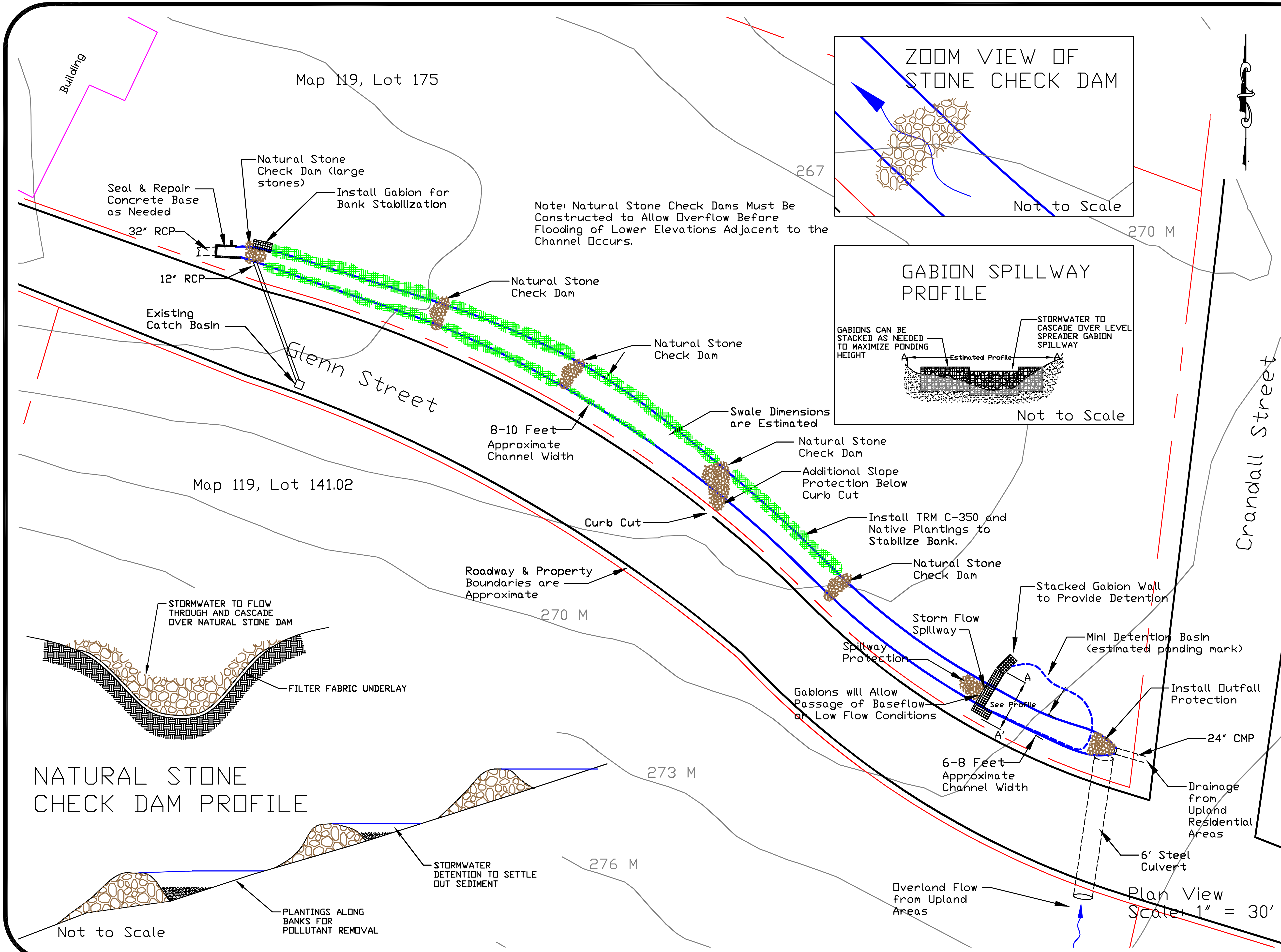
Cost: $27,000*

BMP Rank: 3

Description of Stormwater BMPs:

- The existing drainage swale at this site will be used to maximize stormwater detention, infiltration and treatment by using a mini detention basin and cascading gabion check dams.
- The mini detention basin will be constructed at the beginning of the rocky swale within the existing site contours using a gabion wall spillway. The detention basin will act as a plunge pool for sediment removal and to buffer initial stormwater flows at this steep site to prevent scouring.
- A series of check dams will be installed at various points along the swale to continually buffer stormwater flows and pond stormwater for sediment removal, as well as infiltration. Check dams will be constructed of natural stones to match the landscape and will create a cascading waterfall effect down the swale during storm events, making the site an appealing and effective BMP.
- Turf reinforcing material (TRM C-350) will be installed to stabilize the eroding banks of the swale and provide a vegetative support material. Plantings will be installed along the banks to increase pollutant removal through natural attenuation.
- Additional natural stones will be placed at the curb cut along Glenn Street to provide outfall protection and prevent erosion at this location.
- A gabion will be installed at the storm drain outfall at the end of the swale to prevent erosion and the concrete inlet to the 32" pipe beneath Glenn Street will be repaired.

*This BMP conceptual design cost has been prepared for engineering design and construction of the project and does not include permitting or construction service costs.



General Notes

1. This site plan was developed from GIS data provided by BRPC, MassGIS and the Town of Adams Assessor's map. This site plan is intended to show approximate site features for the purpose of developing conceptual BMPs for stormwater remediation, as outlined in the 2005 Adams Stormwater Management Strategic Plan.

No.	Revision/Issue	Date

COMPREHENSIVE ENVIRONMENTAL INCORPORATED

64 DILLA STREET
MILFORD, MA 01757

Glenn Street Site - Town of Adams Conceptual BMPs for Stormwater Remediation

Adams Stormwater Management Assessment Project: DEP 604(b) Project 2002-02

Project: 184-1
Date: 3/15/04
DESIGNED BY: RN
CHECKED BY: RB
Scale: AS NOTED
Sheet: 1 of 1

EXISTING SWALE AT THE INTERSECTION OF GLENN ST. AND CRANDALL ST.

DEPRESSED AREA AND CHANNELIZED SWALE

DRAINAGE DISCHARGES TO THE EXISTING SWALE

END OF SWALE WHERE IT ENTERS THE CLOSED DRAINAGE SYSTEM IN GLENN STREET

ERODED SWALE ALONG GLENN STREET

GLENN STREET BMP
SITE PICTURES

COMPREHENSIVE ENVIRONMENTAL INCORPORATED
64 DILLA STREET
MILFORD, MA 01757

Site: U.S. Post Office – Runoff Prevention Methods (RPMs)

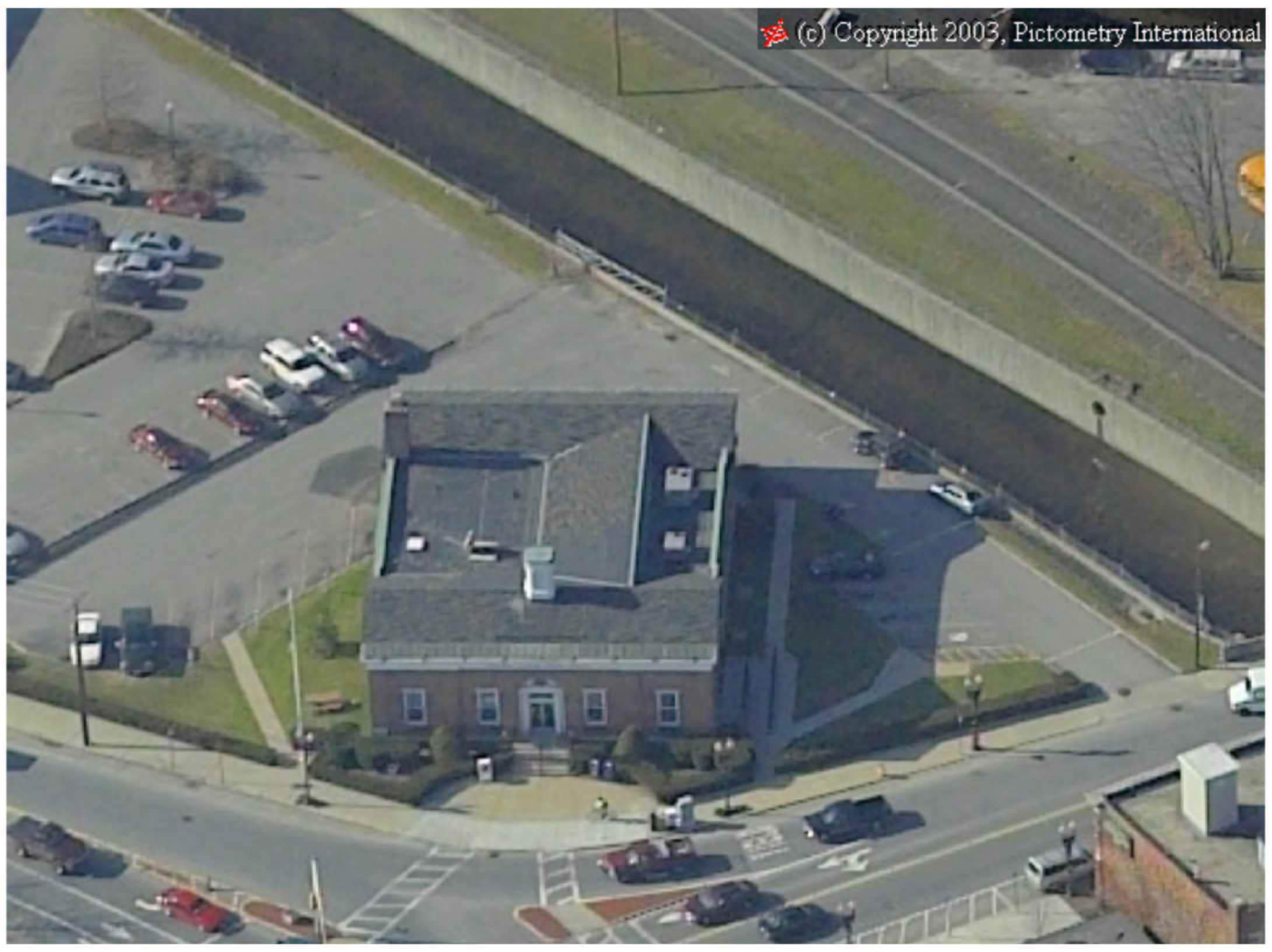
Cost: $192,000*

BMP Rank: 4

Description of Stormwater BMPs:

- Stormwater BMPs at this site will prevent runoff to the best extent possible and maximize infiltration and treatment before discharging to the Hoosic River.
- Stormwater will be handled by a combination of runoff prevention methods (RPMs) to prevent/reduce runoff and provide stormwater treatment at least during first flush conditions for small storm events. These methods at the site include: roof leader dry wells, bioislands, infiltration dividers and strips, diversion berms, vegetated swales and porous pavers.
- Storm flows from roof leaders create excess stormwater discharges from the site and result in more stormwater volume to treat, as well as increased flashiness of the Hoosic River. Roof leader dry wells will be used for on-site recharge and to remove/decrease this flow from the stormwater treatment equation.
- Vegetated swales will be used to treat stormwater along the Hoosic River prior to entering existing storm drain structures. Site conditions require only rehabilitation of existing swale areas.
- Infiltration dividers and strips (porous pavers) will be used to handle portions of the stormwater flow. These BMPs do not compromise parking space and bioislands have been incorporated into existing landscaped islands or excess paved areas at the site (e.g., large paved area west of 1 Commercial Place).

*This BMP conceptual design cost has been prepared for engineering design and construction of the project and does not include permitting or construction service costs.



AERIAL VIEW OF THE U.S. POST OFFICE IN DOWNTOWN ADAMS

HOOSIC RIVER FLOOD CONTROL CHUTE ALONG THE U.S. POST OFFICE SITE

PROPOSED INFILTRATION STRIP (POROUS PAVERS) AND GRASSY SWALE REPLACEMENT SITES

EXISTING GRASSY SWALE ALONG 1 COMMERCIAL STREET PROPERTY (CONTOUR TO COLLECT PARKING LOT RUNOFF)

PROPOSED GRASSY SWALE SITE

PROPOSED INFILTRATION DIVIDER SITE AT 1 COMMERCIAL PLACE

U.S. POST OFFICE
BMP SITE PICTURES
1 OF 2

COMPREHENSIVE ENVIRONMENTAL INCORPORATED
64 DILLA STREET
MILFORD, MA 01757

PROPOSED BIOISLAND SITE USING EXISTING LANDSCAPE BEDS AT 1 COMMERCIAL PLACE

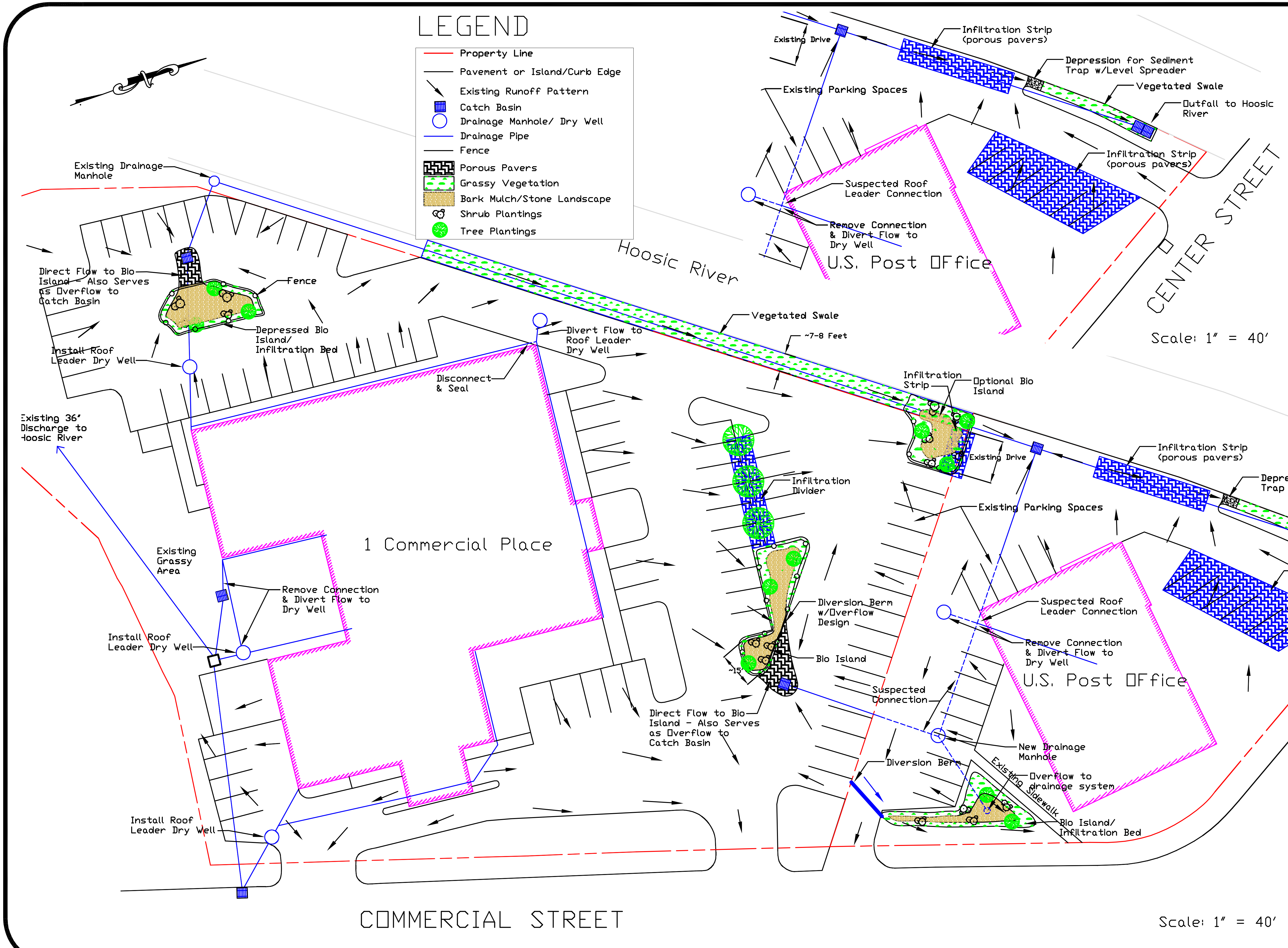
PROPOSED BIOISLAND SITE IN OPEN GRASSY AREA AT THE U.S. POST OFFICE

PROPOSED BIOISLAND SITE AT 1 COMMERCIAL STREET NEXT TO THE HOOSIC RIVER (RIGHT)

U.S. POST OFFICE
BMP SITE PICTURES
2 OF 2

COMPREHENSIVE ENVIRONMENTAL INCORPORATED

64 DILLA STREET
MILFORD, MA 01757



General Notes

1. This site plan was developed from scanned images of the following drawings: "Site Plan" by Cambridge Seven Associates, Inc., 2/4/87; "1 Commercial Place Landscape Plan" by Dr. Lahey's Garden, 2/4/88; and "Soil Excavation Location" by EMCON, 8/23/95. Site plans were manually overlayed based on property boundaries and are intended to show approximate site features for the purpose of developing conceptual BMPs for stormwater remediation.

2. Overland drainage patterns and subsurface drainage structures are based on field inspections by CEI and locations are approximate.

3. See Sheet 2 for Infiltration Strip and Roof Leader Dry Well/ Leaching Catch Basin details.

4. See Sheet 3 for Bio Island and Infiltration Divider details.

No.	Revision/Issue	Date

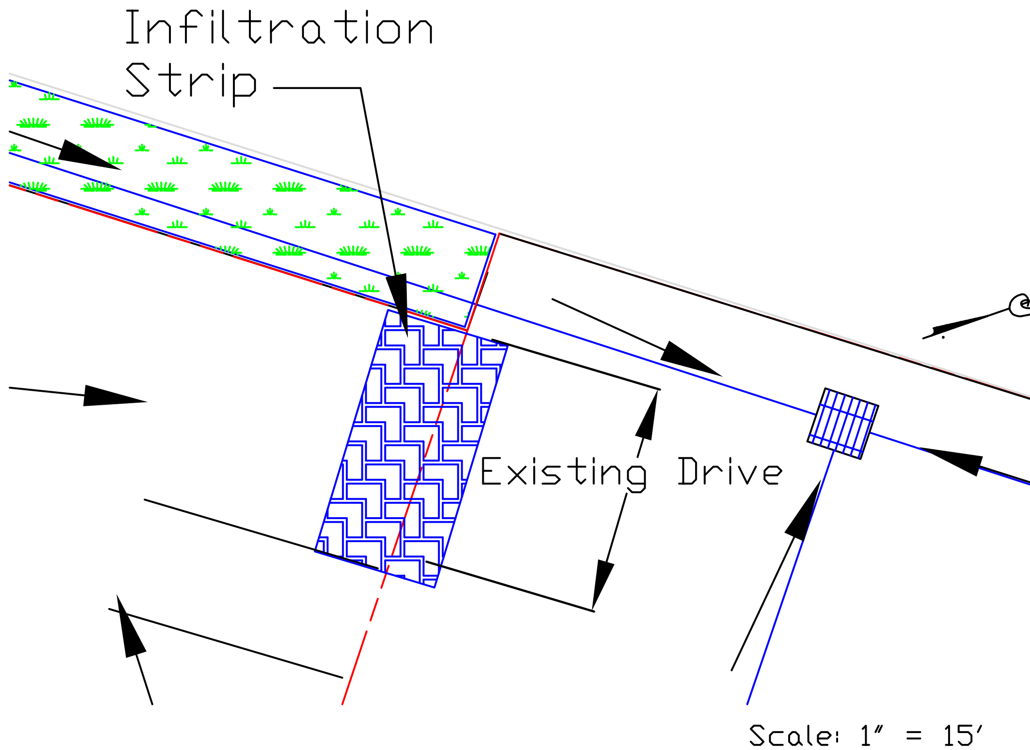
COMPREHENSIVE ENVIRONMENTAL INCORPORATED
64 DILLA STREET
MILFORD, MA 01757

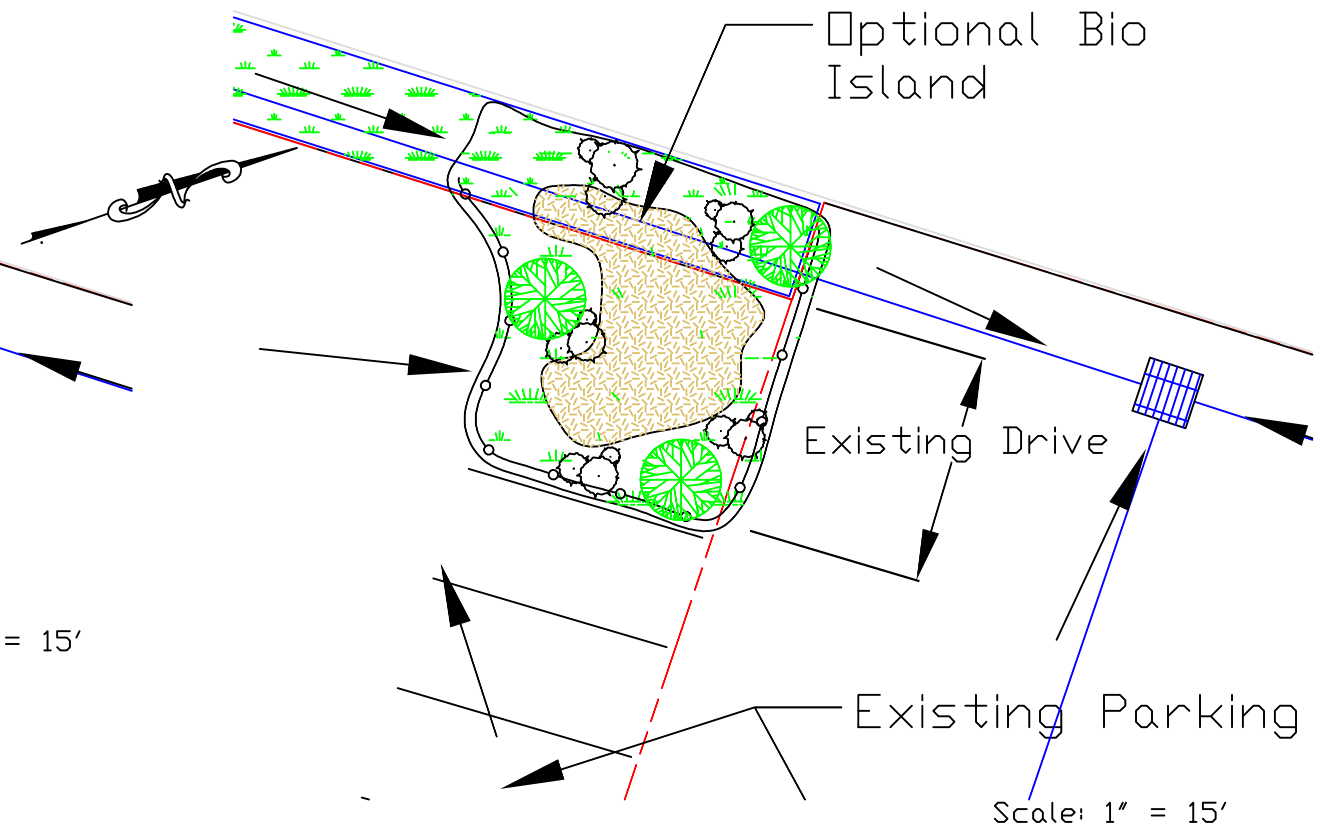
U.S. Post Office & 1 Commercial Place - Town of Adams
Conceptual BMPs for Stormwater Remediation

Adams Stormwater Management Assessment Project: DEP 604(b) Project 2002-02

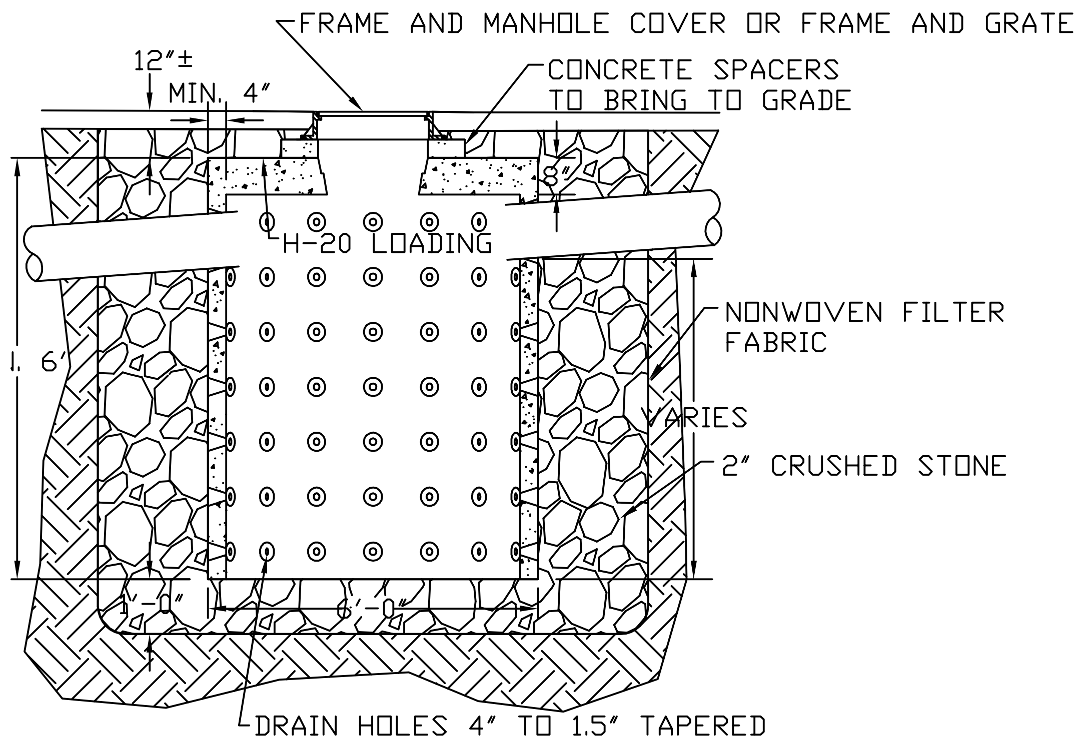
Project: 184-1	Sheet 1 of 3
Date: 5/10/04 DESIGNED BY: RN CHECKED BY: RB	
Scale: AS NOTED	

Alternative BMPs



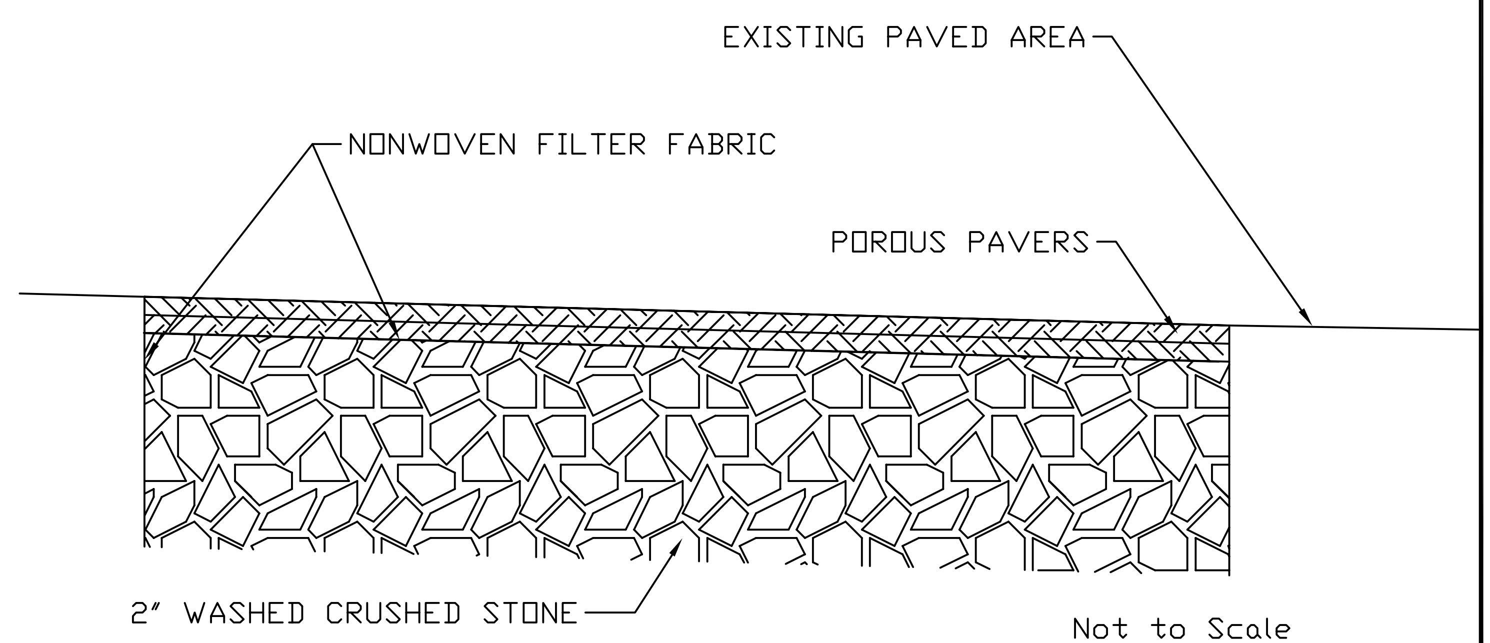


Roof Leader Dry Well/ Leaching Catch Basin



Not to Scale

Infiltration Strip



Not to Scale

General Notes

1. Infiltration strips, leaching catch basins and roof leader dry wells to be sized to hold 1" of runoff from respective contributing drainage areas.

No.	Revision/Issue	Date

COMPREHENSIVE ENVIRONMENTAL INCORPORATED
64 DILLA STREET
MILFORD, MA 01757

U.S. Post Office & 1 Commercial Place - Town of Adams
Conceptual BMPs for Stormwater Remediation

Adams Stormwater Management Assessment Project: DEP 604(b) Project 2002-02

Project: 184-1
Sheet: 2 of 3
Date: 5/10/04
DESIGNED BY: RN
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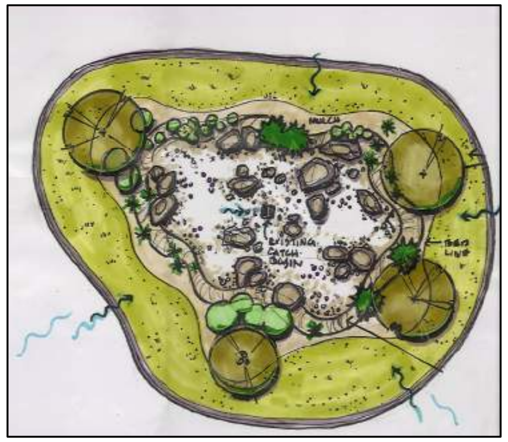
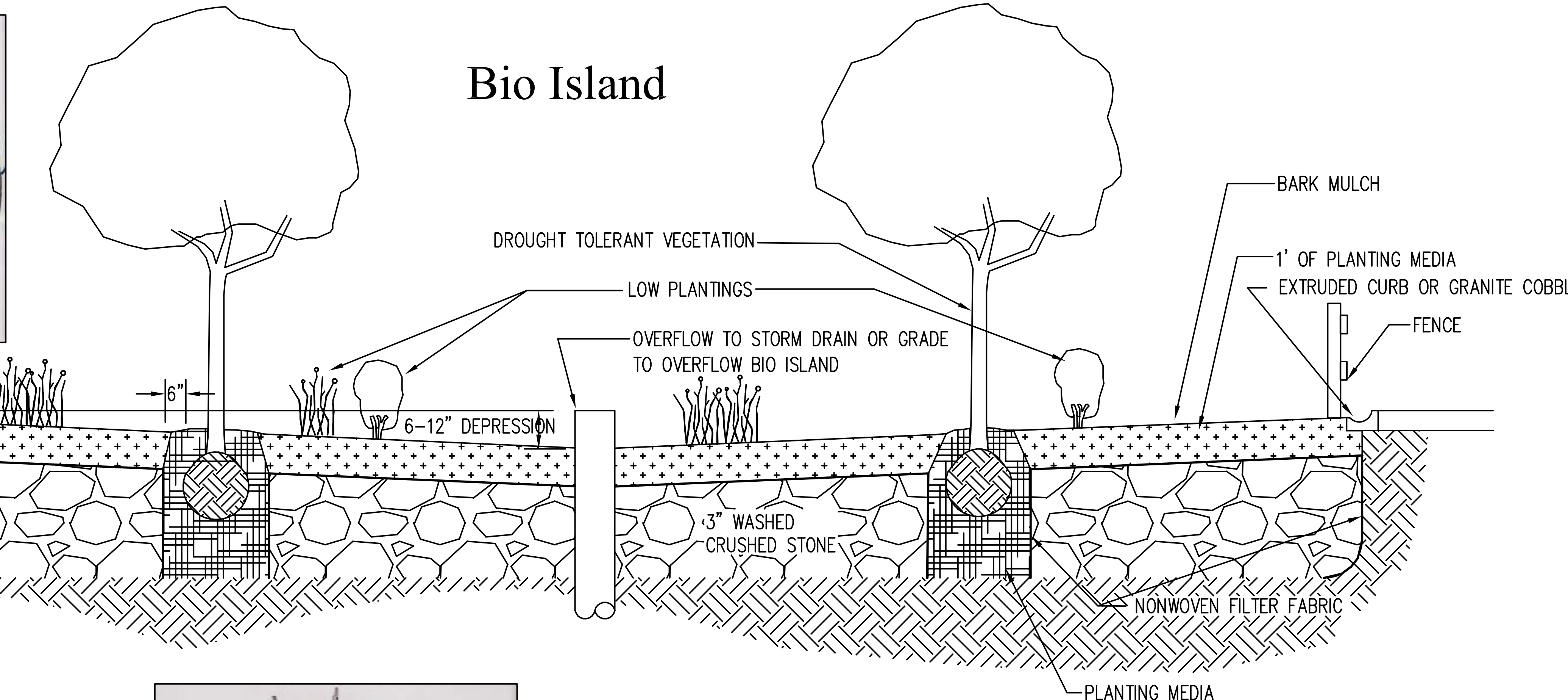
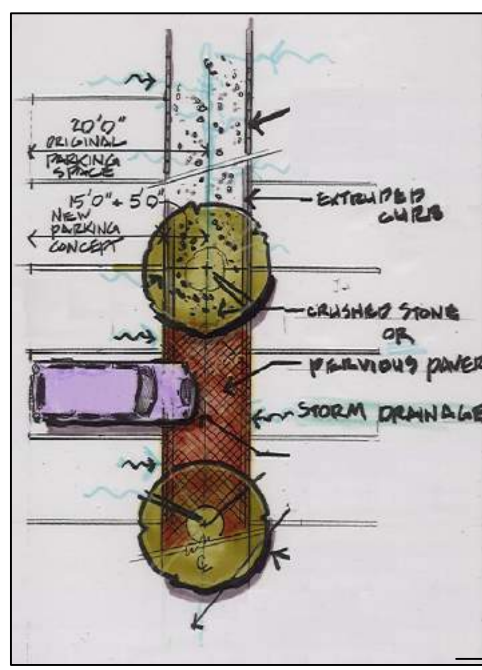
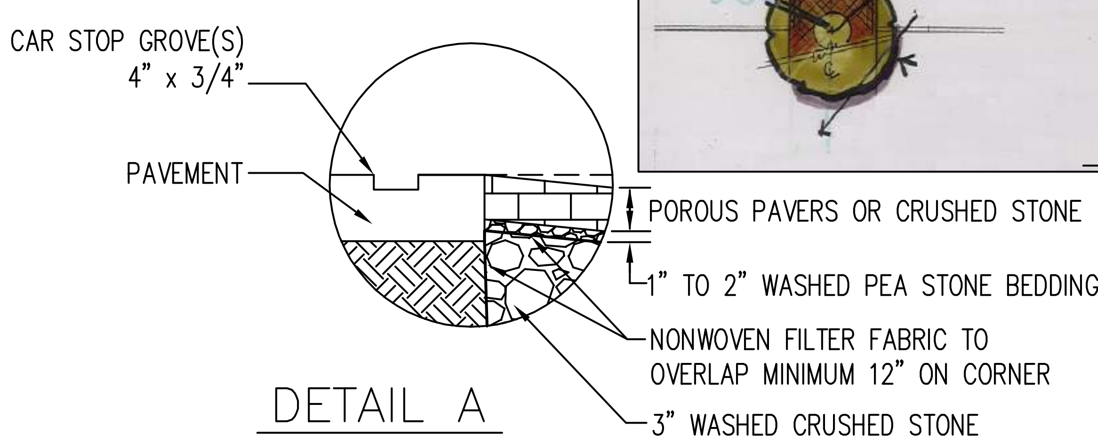
Bio Island

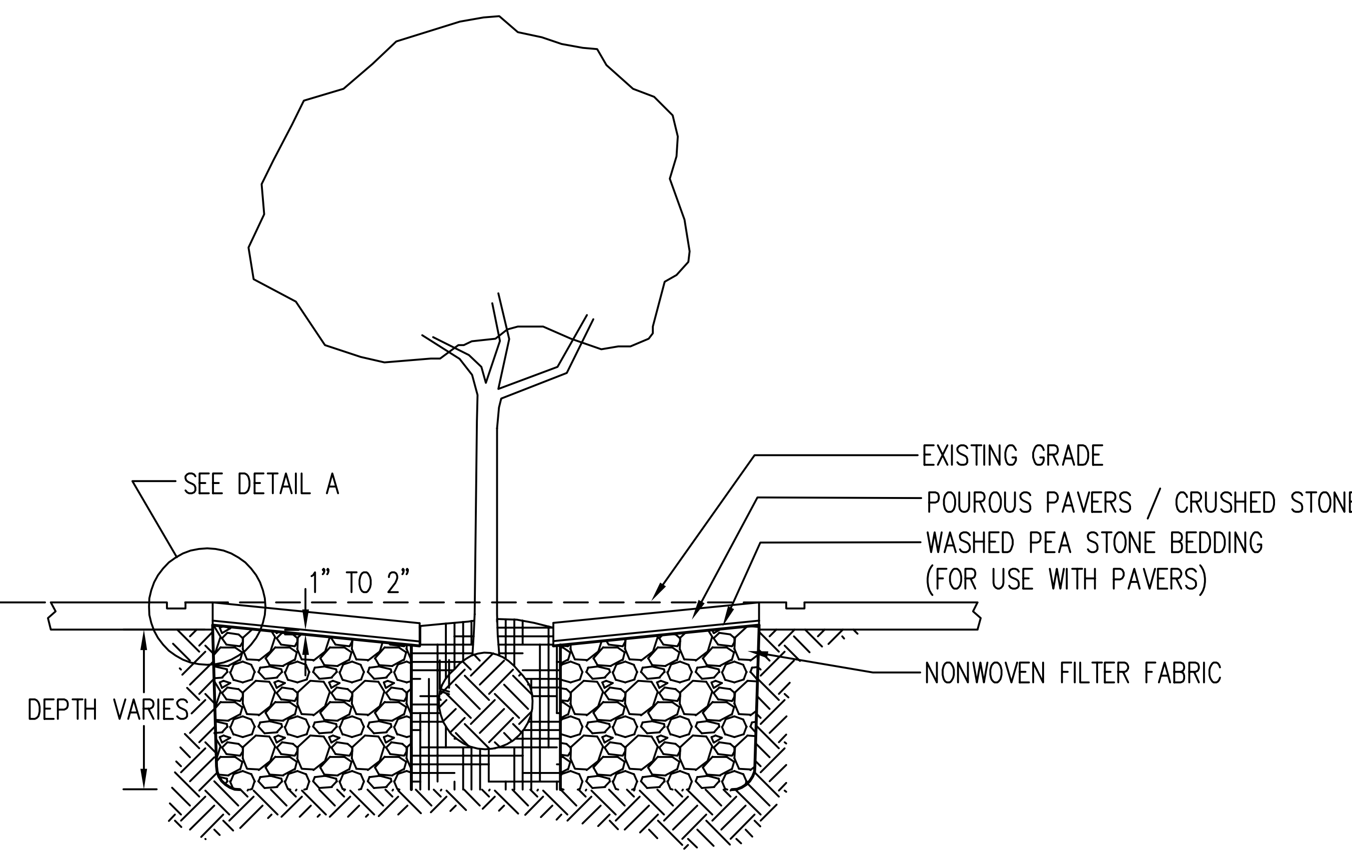




Infiltration Divider







Not to Scale

General Notes

1. Bio Islands and infiltration dividers to be sized to hold 1" of runoff from respective contributing drainage areas.

No.	Revision/Issue	Date

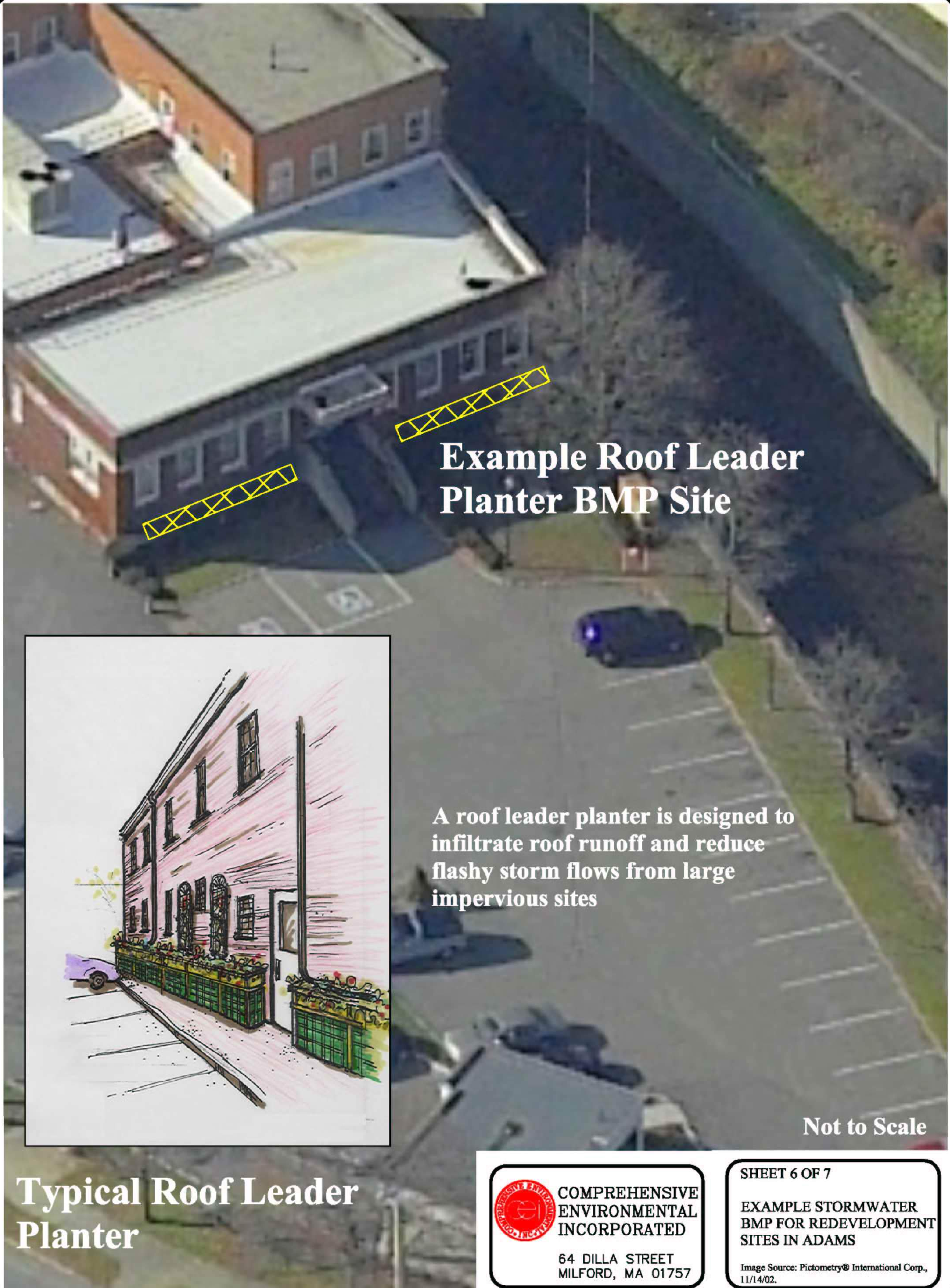
COMPREHENSIVE ENVIRONMENTAL INCORPORATED
64 DILLA STREET
MILFORD, MA 01757

U.S. Post Office & 1 Commercial Place - Town of Adams
Conceptual BMPs for Stormwater Remediation

Adams Stormwater Management Assessment Project: DEP 604(b) Project 2002-02

Project: 184-1
Date: 5/10/04
DESIGNED BY: RN
CHECKED BY: RB
Scale: AS NOTED
Sheet 3 of 3

Conceptual BMP Designs for Redevelopment Projects



COMPREHENSIVE
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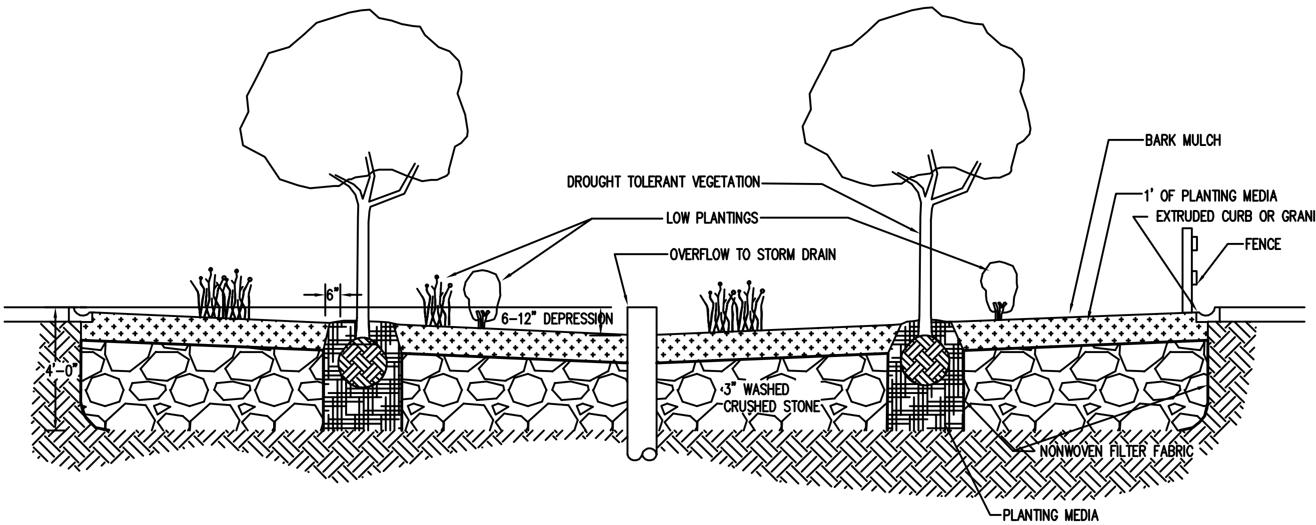
INCORPORATED

64 DILLA STREET
MILFORD, MA 01757

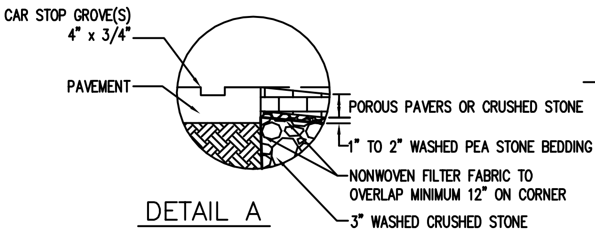
SHEET 6 OF 7

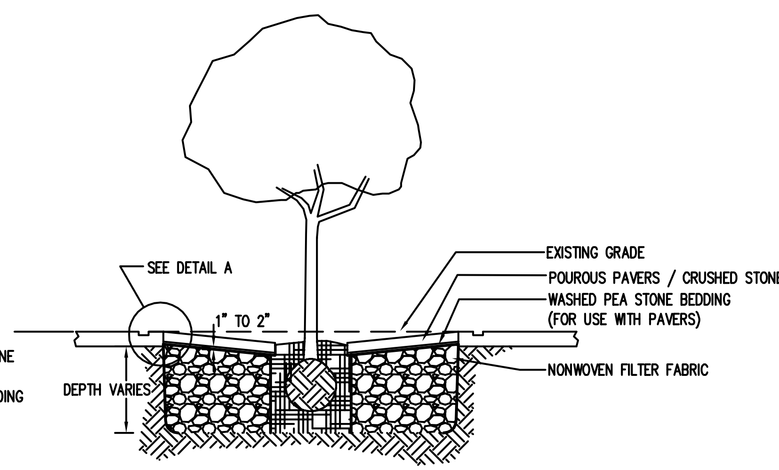
EXAMPLE STORMWATER
BMP FOR REDEVELOPMENT
SITES IN ADAMS

Image Source: Pictometry® International Corp., 11/14/02.



Typical Bioisland Profile





Typical Infiltration Divider Profile

Not to Scale

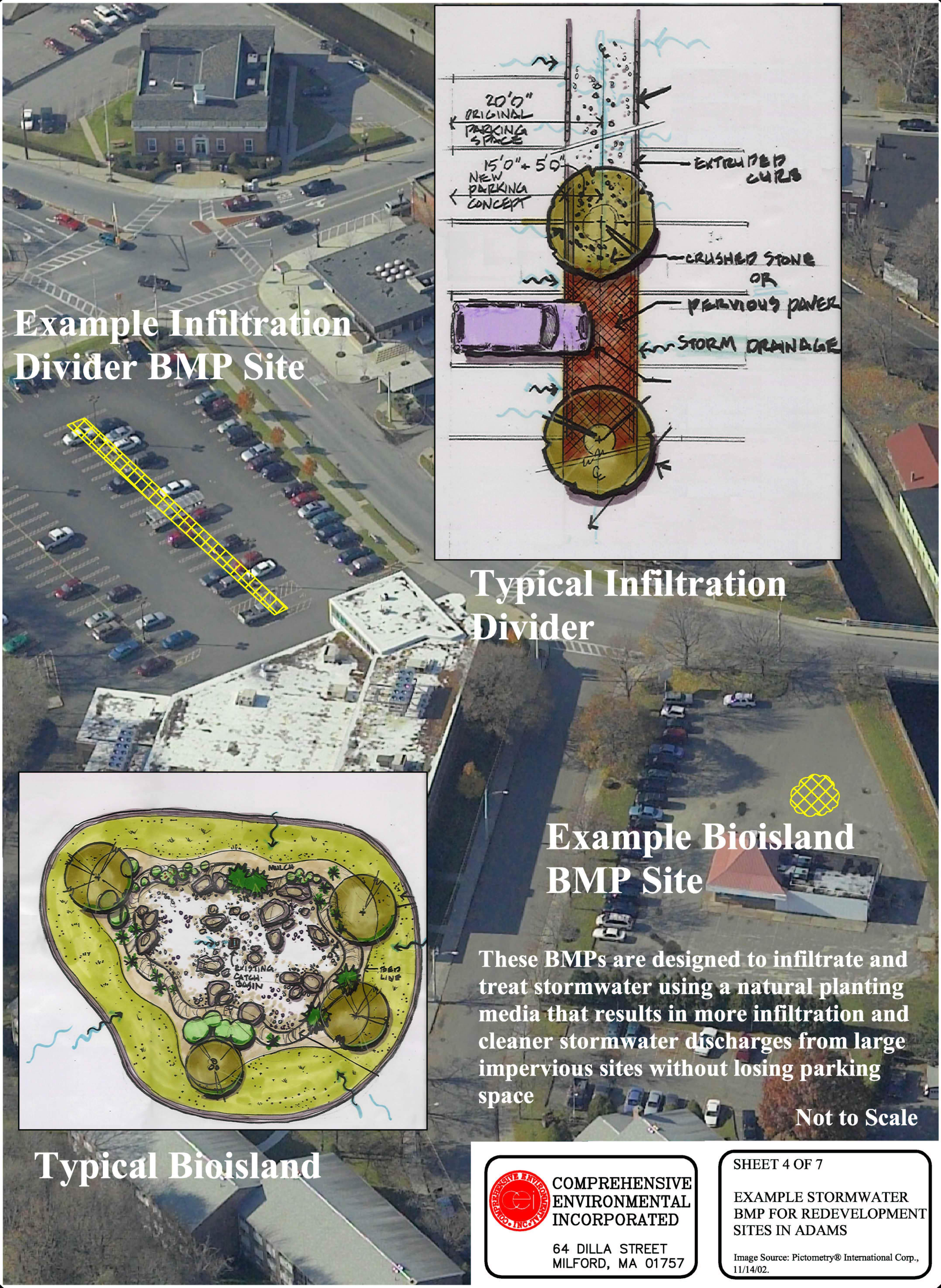
COMPREHENSIVE
ENVIRONMENTAL
INCORPORATED

64 DILLA STREET
MILFORD, MA 01757

SHEET 5 OF 7

EXAMPLE STORMWATER
BMP FOR REDEVELOPMENT
SITES IN ADAMS

Image Source: Pictometry® International Corp., 11/14/02.



These BMPs are designed to infiltrate and treat stormwater using a natural planting media that results in more infiltration and cleaner stormwater discharges from large impervious sites without losing parking space

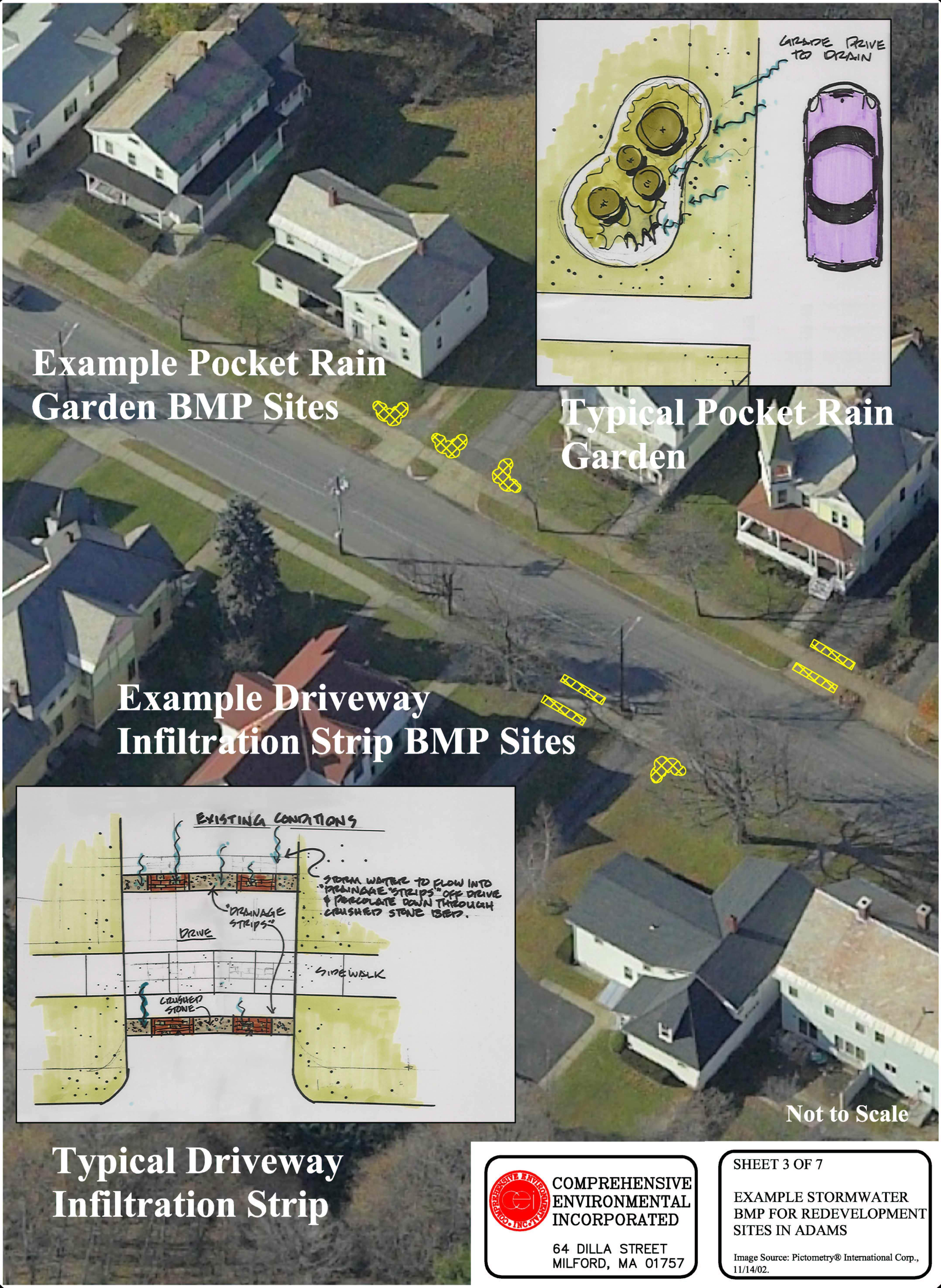
Not to Scale

COMPREHENSIVE ENVIRONMENTAL INCORPORATED
64 DILLA STREET
MILFORD, MA 01757

SHEET 4 OF 7

EXAMPLE STORMWATER BMP FOR REDEVELOPMENT SITES IN ADAMS

Image Source: Pictometry® International Corp., 11/14/02.

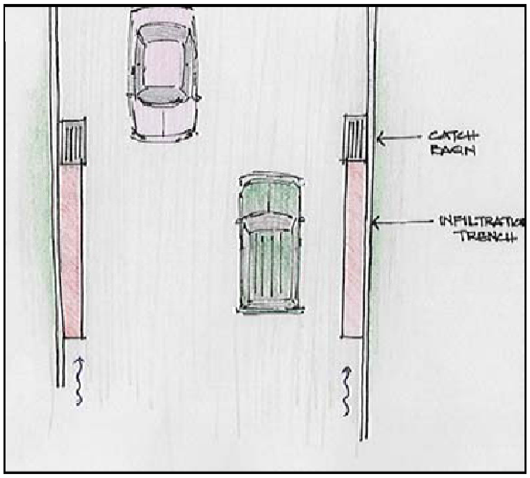


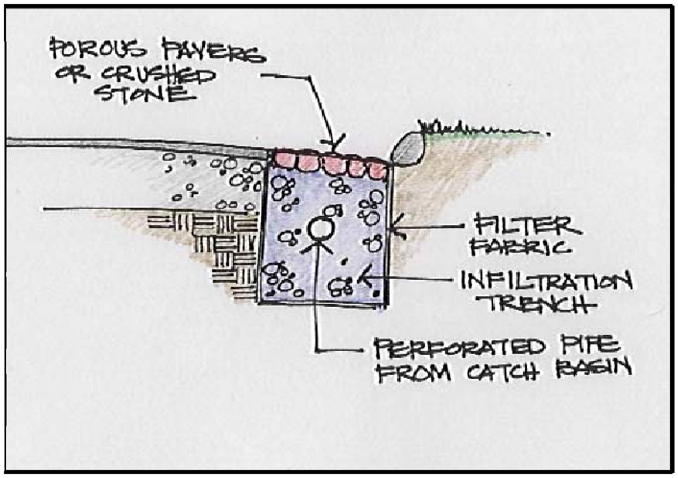
COMPREHENSIVE ENVIRONMENTAL INCORPORATED
64 DILLA STREET
MILFORD, MA 01757

SHEET 3 OF 7

EXAMPLE STORMWATER BMP FOR REDEVELOPMENT SITES IN ADAMS

Image Source: Pictometry® International Corp., 11/14/02.





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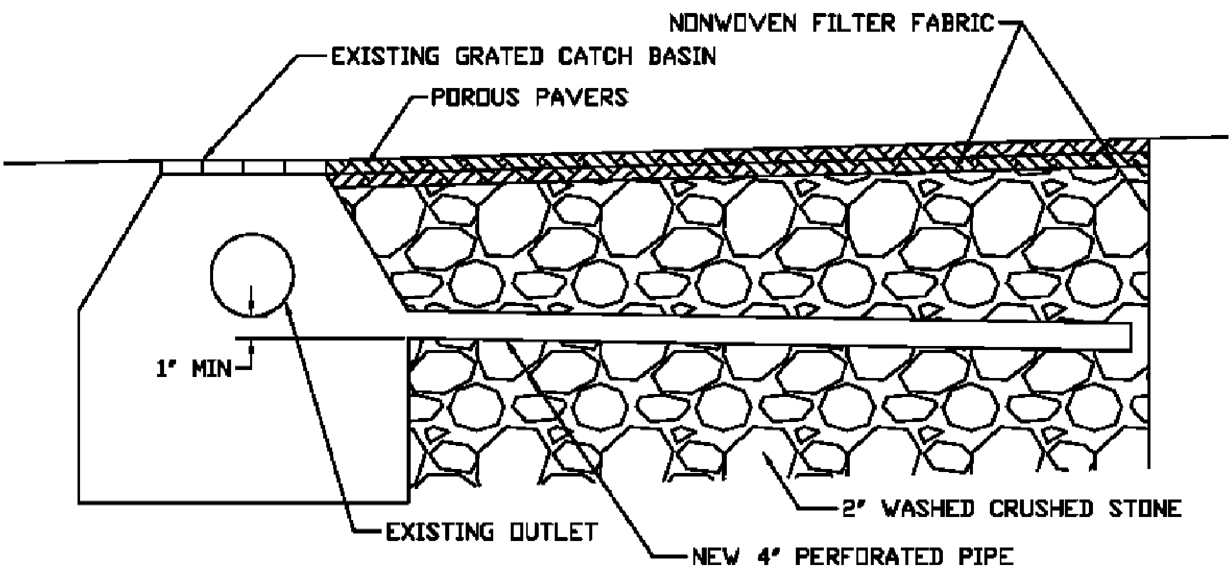
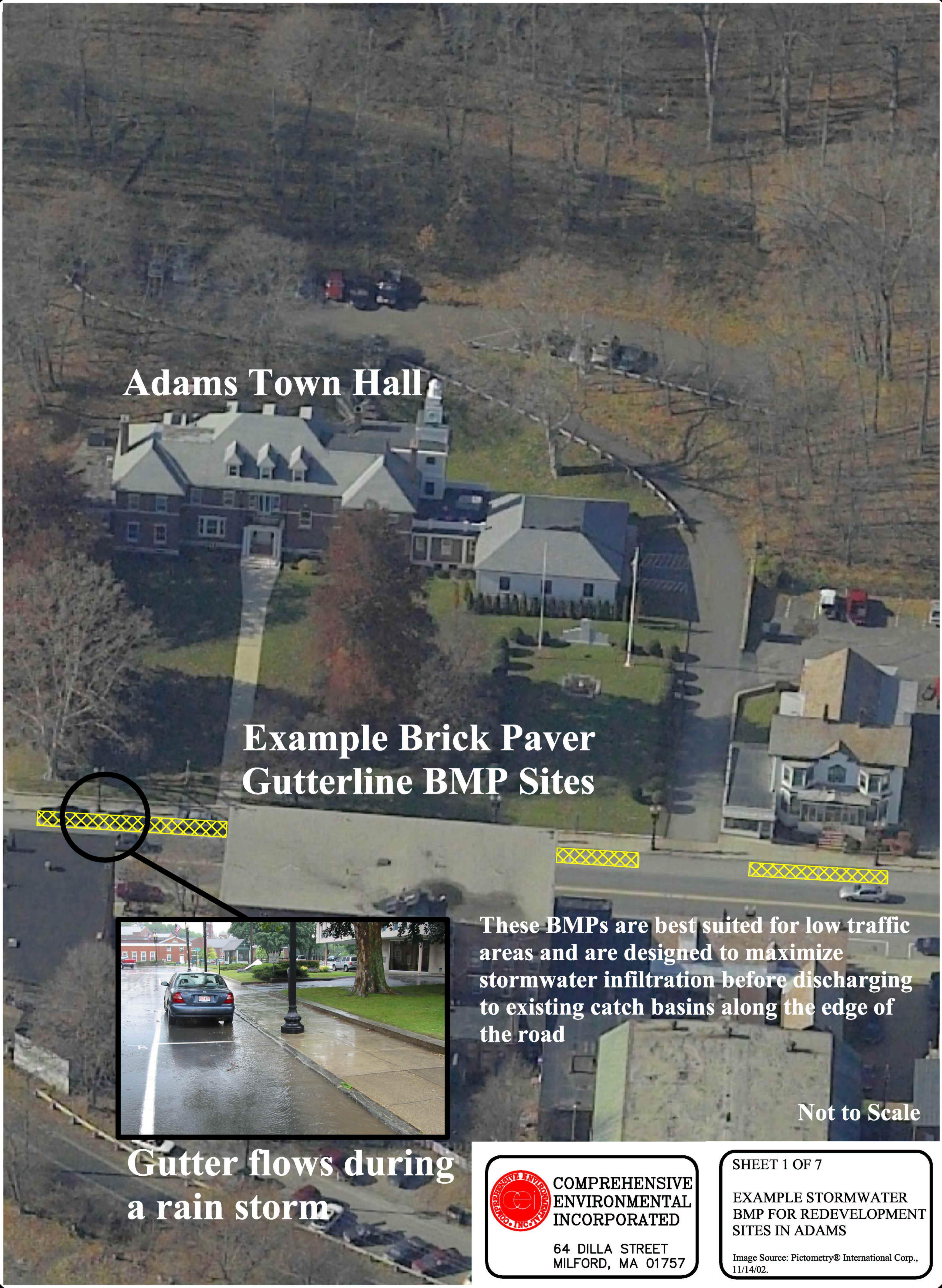


Typical Brick Paver Gutterline BMP

COMPREHENSIVE ENVIRONMENTAL INCORPORATED
64 DILLA STREET
MILFORD, MA 01757

EXAMPLE STORMWATER BMP FOR REDEVELOPMENT SITES IN ADAMS

Image Source: Pictometry® International Corp., 11/14/02.



COMPREHENSIVE
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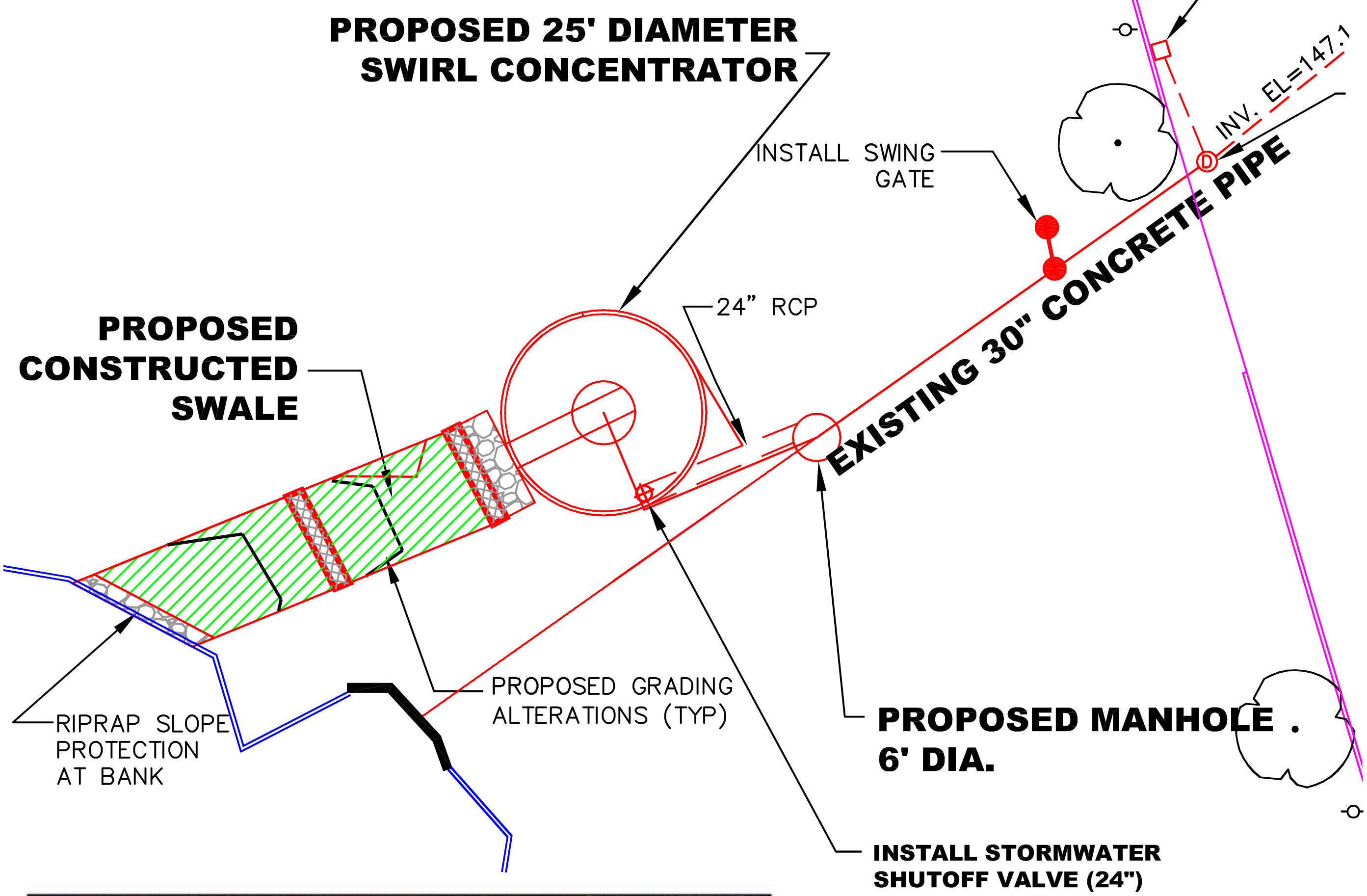
MILFORD, MA 01757

SHEET 1 OF 7

EXAMPLE STORMWATER
BMP FOR REDEVELOPMENT
SITES IN ADAMS

Image Source: Pictometry® International Corp., 11/14/02.

A Swirl Concentrator Provides Off-line Treatment of High Volume Stormwater Flows



Swirl Concentrator During Final Construction

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SHEET 7 OF 7

EXAMPLE STORMWATER BMP FOR REDEVELOPMENT SITES IN ADAMS

Image Source: Pictometry® International Corp., 11/14/02.

APPENDIX 4-A

Perennial Stream Assessment

APPENDIX 4-B

Laboratory Data & Field Inspection Sheets for Stormwater Sampling Events

APPENDIX 4-C

1987 I/I Study
Sewer System Problem Areas/Recommendations

Conceptual BMP Designs for Redevelopment Projects

5.0 Assessment of Local Water Quality Protection Measures

EPA Phase II Final Rule requires regulated communities to develop, implement, and enforce a plan to reduce pollutants in stormwater runoff from construction activities on land disturbances of one or more acres. Polluted stormwater runoff is commonly discharged from construction sites into local rivers and streams. Sediment is usually the main pollutant of concern and sediment runoff rates from construction sites are typically 10 to 20 times greater than those of agricultural lands, and 1,000 to 2,000 times greater than those of forested lands. Within a short period of time, construction sites can contribute more sediment to streams than can be deposited naturally during several decades. The resulting siltation and the addition of other pollutants from construction sites can cause physical, chemical, and biological harm to the nation's waters.

5.1 Construction Site Runoff Control Measures

To comply with Phase II, the Town must put in place expanded development controls to ensure that all construction sites that disturb one acre of land or more do not increase pollution entering the municipal storm drainage system. Specifically, to satisfy the Minimum Control Measures for Construction Site Runoff Control, the Town of Adams must address the following areas:

- Enact or revise bylaws or other regulatory mechanisms requiring the preparation and implementation of proper erosion and sediment controls, and controls for other wastes, on construction sites of greater than or equal to one acre, or as the Town may deem necessary;
- Develop a procedure for the review of construction site plans for potential water quality impacts;
- Develop procedures for site inspections and enforcement of control measures;
- Develop penalties or sanctions to ensure compliance with appropriate bylaws or other regulatory mechanisms;
- Establish procedures for the receipt and consideration of information submitted by the public; and
- Determine the appropriate best management practices (BMPs) and measurable goals for this minimum control measure.

5.2 Existing Construction Site Measures in Place

Adams, like many smaller municipalities, has a relatively simple system in place with which to control the use and development of land. To determine to what extent the Town already meets the standards required under the Phase II ruling and to make appropriate recommendations for additional needed measures, the following components of the Town's land use management system were reviewed:

Adams General Bylaws
Adams Zoning Bylaw
Adams Rules and Regulations for the Subdivision of Land
Adams Board of Health regulations
Town policies and procedures
Wetlands Protection Act regulations (CMR 10.00)

Substantial flexibility is provided under Phase II to allow communities to address the required control measures and related provisions using methods uniquely tailored to the specific characteristics of the community. Stormwater control measures that currently exist within the Town's bylaws, regulations, or other regulatory mechanisms were first identified and then evaluated for their effectiveness and the degree to which they address Phase II requirements. A discussion of this evaluation follows.

Zoning Bylaw

Under the Town's Zoning Bylaw, a Special Permit is required to permit many, if not most, uses. The Town's "Special Permit Granting Authority (SPGA)" is typically the Zoning Board of Appeals. However, in cases involving planned developments and other specific uses like wireless communications facilities; the Planning Board is the designated SPGA. Many uses permitted "by right" and by Special Permit are reviewed under the Bylaw's site plan review process.

Development standards within the Adams Zoning Bylaw are limited and general in nature. The lack of any specificity with regards to clearing and grading, site coverage and the extent of impervious surfaces, preserving natural vegetation, supplemental landscaping, and other standards of development is problematic. Decisions are made and development requirements are imposed on a case-by-case basis, making it more challenging for the respective review board to maintain consistency and fairness in their deliberations. Without standards and requirements to set a framework for review and implementation, the Town's process is too loose and often uneven.

Site Plan Review

Section 125-19 of the Adams Zoning Bylaw establishes provisions for the review and approval of site plans. Subsection 125-19(E) identifies the uses that require site plan review by the Planning Board. Generally, any exterior modification of an existing non-residential building, other than signage and trash containers, also requires an approved site plan.

Among several proposed bylaw revisions, Town staff has discussed the particular need to amend current provisions for site plan review. The existing site plan requirements are ambiguous and provide little to no guidance to the regulated public. New provisions should be developed that establish detailed requirements for plan content, submittal procedures, administration, and enforcement. Additionally, provisions should clearly establish the review criteria the Planning Board will employ in evaluating submitted plans. The Town's site plan requirements are not geared to water quality or the quality of stormwater runoff. Specific standards and/or criteria relative to protecting sensitive environmental resources, minimizing land disturbance, preserving existing vegetation (documenting existing on-site plant material and incorporating tree protection measures into development proposals), and minimizing impervious surfaces are currently absent from the Town's site plan review process.

Erosion and Sediment Control

In response to the serious potential for pollution from construction sites, most communities have adopted erosion and sediment control regulations as either a separate bylaw, within an existing set of regulations (like those for subdivisions), or as a required component of an application review process (special permit or site plan). Currently in Adams, larger development projects must address stormwater management and erosion and sediment control as part of subdivision review or site plan review. Erosion control is listed under §125-19(B) regarding the contents of a site plan, but there are no established standards for erosion and sediment control measures in the Zoning Bylaw.

The Town currently controls erosion and sedimentation through three primary means:

- The Planning Board reviews residential subdivision plans for erosion and sediment control. Like many rural communities, however, most new residential development in Adams is a result of lots created under the "Approval Not Required" provisions of state law. There has been very limited subdivision activity within the Town, with only two small subdivisions reviewed and approved in the past five years (both of these projects were within the past year: one had 9 lots and the other had a total of 12 lots).

- Some uses require site plans under the Town's Zoning Bylaw. The Planning Board reviews these, including the provisions for erosion and sediment control during construction. Currently, site plan review is triggered by use, not directly by intensity or extent of development.

- Under the requirements of the MA Wetlands Protection Law, the Adams Conservation Commission reviews proposed development projects that impact or are in close proximity to wetlands and riverfront protection areas. If erosion and sedimentation from a construction site impacts wetlands, the Conservation Commission has enforcement powers. This enforcement is "after the fact" and does not provide an adequate mechanism to <u>prevent</u> wetlands impacts proactively.

The Town's existing regulatory structure does not provide an adequate regulatory framework to address stormwater pollution prevention from construction activities. Although the words "drainage" and "erosion" appear frequently in the Town's bylaws and regulations, specific standards or requirements for erosion and sediment control or stormwater management are absent. Areas where existing erosion and sediment control requirements are lacking are as follows:

- Town bylaws and regulations do not establish a land disturbance threshold;
- Development standards for stormwater quality are absent;
- No established requirements or standards for acceptable erosion control measures;
- No criteria or guidance on the preparation of erosion control plans and the contents of said plans;
- No established process for plan review and approval; and
- No enforcement and penalty provisions.

Some level of erosion and sediment control measures are routinely implemented for development projects within Adams. Smaller projects typically install hay bales and/or silt fencing. However, without specific, enforceable standards it has been difficult for Town staff to exact additional control measures as part of the development review process or during construction. Much development, even when disturbing a large amount of land, is not adequately regulated. Since there are no land disturbance limitations, significant clearing and grading can occur and significant damage to natural resources or to the public infrastructure can result before the Town has the ability to act. Correcting a problem after-the-fact is less effective and more costly, both financially and environmentally; and, too often, even after the problem is corrected, results in some uncorrectable damage. The current regulatory structure also appears to be inequitable. Although most commercial and industrial uses are regulated under the site plan provisions, other land development activities that could potentially be more extensive are not.

Given the smaller scale of development and the Town's concern for the cumulative impact of many small development projects, it is recommended that Adams should adopt an erosion and sediment control bylaw which requires plans and permits for all land disturbance activities of more than 10,000 square feet in area.

Subdivision Rules and Regulations

Under the Town's Subdivision Rules and Regulations, subdivision plan review and approval is required for the subdivision of parcels of land within the Town. The Planning Board is responsible for the review and approval of preliminary and final subdivision plans. The Subdivision regulations provide the Planning Board the ability to require a developer to pay the cost of an independent consulting engineer hired by the Town to review subdivision plans on its behalf. The consulting engineer can also be hired to monitor construction activities while a project is under development ensuring work is done in accordance with the approved plans and in compliance with the Town's construction standards, again at the developer's cost. Proposed subdivisions impacting areas regulated by the Massachusetts Wetlands Protection Act must first seek necessary approvals from the Conservation Commission.

The Town's Subdivision regulations are several decades old and are limited and general in nature. Drainage information is required as part of subdivision review, but the regulations contain limited standards. An environmental analysis is required for projects of 30 or more lots. This analysis includes a site assessment and narrative description of existing conditions and potential impacts. Some information and analysis includes vegetative cover, groundwater levels, impacts to surface and groundwater, and an analysis of the soils and erosion control measures to allow development "without danger of erosion, silting, or other instability." Residential development in Adams, however, is traditionally very small scale involving far fewer than 30 lots. Although the Planning Board has the authority to require information and analysis in accordance with this section for smaller projects, the analysis is not routinely demanded of developers.

The design standards in the regulations include a section on stormwater management. However, this section is written primarily from the perspective of roadway design and the prevention of flooding. It does require that stormwater be recharged rather than piped to surface water, to the maximum extent feasible. The section requires that post-development peak rates be no more than 10% greater than pre-development rates. The stormwater system must be designed for the 20-year storm and culverts for the 50-year storm. Section 472 requires that "due regard" be given to the preservation and minimization of impacts to mature trees, wetlands, watercourses, land within 200 feet of a watercourse or waterbody, steep slopes (greater than 15%), high points, other scenic points, or historic resources.

A limitation to the Town's ability to regulate and review subdivisions is the State's "Approval Not Required" (ANR) provisions for subdivision proposed along existing roads. The only requirement allowed by state law is that the lots must meet minimum frontage requirements and have access to a public way. Much more development occurs through the ANR provisions than through subdivisions regulated by the Town's Subdivision Rules and Regulations. While the impact of individual lots created under the ANR provisions may be relatively small, the cumulative impact is greater.

The Town has very limited staff capacity to review subdivision plans and to monitor construction activities during construction. There is no Professional Engineer on the Town staff. Town Public Works staff are at capacity in maintaining existing infrastructure and public facilities and do not have surplus capacity to carefully monitor the installation of infrastructure or to ensure that erosion and sediment control measures are maintained during the course of a subdivision construction process.

Similarly, the Town has very limited staff capacity to ensure that homeowner's associations in the case of privately maintained water quality/quantity systems are maintaining stormwater management devices according to operations and maintenance plans which are often required as part of the development review process. Thus, there is limited ability to ensure that these systems are maintained as proscribed in order to achieve the intended water quality protection.

5.3 Recommended Additional Measures Needed

There are a variety of improvements in both process and standards that are recommended for the site plan review provisions established in the Town's Zoning Bylaw. These are:

- New provisions should be developed that establish detailed requirements for plan content, submittal procedures, administration, and enforcement. Provisions should clearly establish the review criteria the Planning Board will employ in evaluating submitted plans.

- Specific standards and/or criteria relative to protecting sensitive environmental resources, minimizing land disturbance, preserving existing vegetation (documenting existing on-site plant material and incorporating tree protection measures into development proposals), and minimizing impervious surfaces should be developed and incorporated in the Zoning Bylaw.

- Development of standards for stormwater quality and quantity resulting from new developments covered by site plan review are needed. These should be included in the Town's site plan review standards. The threshold for stormwater runoff from new developments should be "no net increase."

- Develop a "trigger" for preparation of an environmental review for developments undergoing site plan review or consideration of a special permit. The acreage or the amount of land disturbance involved should be considered as possible thresholds. The language should reference, at a minimum, an external set of standards or guidelines for proper design of erosion and sediment controls and stormwater management systems.

- The Town should retain a consulting engineer with strong working knowledge of stormwater management systems to assist in reviewing site plans. Such engineering assistance would be funded by prospective developers under the provisions of MGL Chapter 44, §53G.

- The Town should employ a clerk of the works to oversee that construction covered by site plan approval is done according to approved plans and meets the Town's construction specifications. Such site plan construction oversight would be funded by developers under the provisions of MGL Chapter 44, §53G.

In addition to the Site Plan provisions and requirements, the Zoning Bylaw should also be reviewed to consider the following improvements:

- Review the bylaw for excessive standards, such as parking requirements or excessive setbacks, which lead to excessive impervious surfaces or land disturbance.

- Review the existing provision for open space residential subdivisions to encourage its use.

- Consider a Resource Protection overlay zone for sensitive environmental areas, such as River Protection Areas, wetlands, or drinking water protection areas, or a zoning setback requirement from such areas.

- Consider incorporating other standards in the Zoning Bylaw, such as impervious coverage limits and landscaping standards which may serve to protect water quality.

There are a variety of improvements in both process and standards that are recommended for the Town's Subdivision regulations. These are:

- The development of improved standards for stormwater quality, as well as quantity, resulting from new subdivisions is needed. The new standards should be adopted by the Adams Planning Board as an amendment to the Town's Subdivision Rules & Regulations.

- The threshold for stormwater runoff from new developments should be decreased to "no net increase" from the current allowance of up to a ten percent (10%) increase from pre-development conditions.

- The 30 lot "trigger" for developing an Environmental Analysis should be modified to base the threshold on the amount of proposed disturbance, not the number of lots. The language should reference, at a minimum, an external set of standards or guidelines for proper design of erosion and sediment controls and stormwater management systems.

- The Town should retain a consulting engineer with strong working knowledge of stormwater management systems to assist in reviewing subdivision development plans. Such engineering assistance would be funded by prospective developers under the provisions of MGL Chapter 44, §53G.

- The Town should employ a clerk of the works to oversee that subdivision construction is done according to approved plans and meets the Town's construction specifications. Such subdivision construction oversight would be funded by developers under the provisions of MGL Chapter 44, §53G.

- Upon acceptance of streets and drainage infrastructure by the Town, a maintenance and capital improvements program should be established to manage the infrastructure on an ongoing basis.

A stand-alone Erosion and Sediment Control Bylaw should be considered. Such a bylaw would provide more detailed requirements and standards, covering subdivision developments, ANR developments, and developments on individual parcels and lots.

5.4 Post-Construction Runoff Control Measures

Although most Best Management Practices (BMPs) are intended to guide the design of new development and redevelopment, practices to address the Post-Construction Runoff Control Measure under Phase II generally precede construction activity. EPA's Phase II recommended actions include such local measures as comprehensive planning to focus growth and development away from environmentally sensitive areas, zoning tools (e.g., cluster development, conservation subdivisions, low-impact development, improved site design, urban growth boundaries, etc.) and other regulatory controls to reduce stormwater runoff and improve water quality.

To specifically satisfy the minimum control measures for Post-Construction Runoff Controls, the Town of Adams must develop and implement strategies which include a combination of structural and/or non-structural BMPs, develop a bylaw or other regulatory mechanism requiring the implementation of Post-Construction Runoff Controls, ensure the adequate long-term operation and maintenance of said controls, and determine appropriate best management practices and measurable goals for these minimum control measures.

5.5 Existing Post-Construction Measures in Place

In meeting the Phase II goal of reducing pollutants to the maximum extent practical, EPA recommends a number of structural and nonstructural BMPs. Structural BMPs may include storage practices like retention basins, infiltration practices like dry wells and porous pavement, and vegetative practices like grass swales, filter strips, and rain gardens. These best management practices are all designed to capture stormwater from a site and remove pollutants before discharging off site. Non-structural BMPs include sound community planning and improved development review procedures, standards to minimize land disturbance and impervious cover, improved site design, and the identification and protection of unique environmental resources. Several of the potential non-structural practices that will be important to the Town of Adams in working toward Phase II compliance are evaluated and discussed below.

Comprehensive Plan

A comprehensive plan provides a framework to guide local leaders in decisions affecting community growth and development. Given this, the process of updating and revising comprehensive plans affords local governments an important opportunity to evaluate existing development patterns and their impact on stormwater management and water quality protection. This process also provides the opportunity to proactively guide future development so as to assure the long-term viability of sensitive environmental resources. A comprehensive plan that does a good job of meeting the intent of Phase II will integrate water quality protection and stormwater management issues with other community interests. Such a plan will work to:

- Reduce energy consumption;
- Provide efficiencies in the provision of services;
- Protect environmental resources;
- Improve accessibility to a wider range of public services; and facilities to a broader range of the population.

The Town's last updated its comprehensive plan in the late 1970s.

Despite the lack of a current comprehensive plan for Adams, the Town has engaged in a number of recent planning initiatives, which include policies and recommended actions intended to improve stormwater quality and protect surface water resources. Chief among these is the ***Sustainable Adams Action Plan*** (February 2002). With funding from an EPA "Sustainable Communities" grant, the Plan establishes goals and policies for sustainable behaviors that integrate environmental, social, and economic concerns and promote existing cultural and recreational assets. The Plan identifies short and long-term actions, measurable indicators, and procedures to track progress toward meeting the plan's goals. Although never formally adopted by the Adams Planning Board, the *Sustainable Adams Action Plan* has served as an important base for other community planning efforts that followed and, as such, is reflected in the priorities and actions of these other planning documents.

In July 2003, the Planning Board adopted the ***Adams Downtown Development Plan***. This Plan is intended to direct public and private investment in the revitalization of Downtown Adams, and establishes specific recommendations relative to business development, physical design and open space, and housing. As one initiative to revitalize the downtown area, the Plan suggests opportunities to enhance public access to the Hoosic River as part of the proposed reconfiguration of the concrete flood control chutes built in the 1950s by the U.S. Army Corps of Engineers after several disastrous floods. The flood control chutes create a water quality problem which is best dealt with through a redesign that allows a more natural environment, reducing water temperatures and increasing oxidization, and allowing improved public access to the river, as well as improving the river's aesthetics throughout the downtown.

A new comprehensive plan will allow Adams to broadly address its needs, including those for the protection of the environment. Logical policies to be considered include:

1) Focusing development in areas already served by or close to existing infrastructure, while limiting development in outlying areas that tend to be more environmentally constrained. The Community Development Department is working with the Adams Fire District to establish an urban services boundary as part of the update of the Town's Comprehensive Plan. Such actions would serve to also protect water quality through general land use patterns;

2) Establishing a network of greenways along water courses within Adams by preserving and protecting existing undisturbed riparian areas to maintain wildlife corridors and permit compatible passive recreational use. All tributary streams in the Town should be considered for such protection and possibly rezoned as conservation;

3) Areas designated for redevelopment – the Downtown, the Route 8 Corridor north and south of downtown, and older residential neighborhoods – may provide significant opportunities to improve water quality;

4) Consideration of legal protection, through the Berkshire Scenic Mountains Act or other enabling laws, of the higher terrain on the east and west sides of Adams would provide water quality benefit through more stringent regulation of possible development in these areas.

Zoning Controls

As already noted, the Town's zoning does not contain specific standards for the protection of water quality. It does require a site plan for certain uses and requires that development within the floodplain meet the requirements of the National Flood Insurance Program, which limits the bulk of fill and building that may occur within the Town's floodplains. Also, the Town's zoning does not set standards on the extent of impervious cover nor are there standards for setbacks from environmentally sensitive areas. The Massachusetts Wetlands Protection Act establishes Riverfront Areas but these are not referenced in the Zoning Bylaw. The Conservation Commission considers Riverfront Areas in its permitting decisions.

Town Community Development staff is currently embarking upon a revision process to the Town's Zoning Bylaw. The revision process is proposed to be phased over the next few years, but is expected to result in a major overhaul of the existing zoning standards and Town procedures.

It will be important to further evaluate proposed development standards for their impact on water quality and the management of stormwater as part of the bylaw revision process.

5.6 Additional Measures Needed

The Town should consider implementing the following regulatory measures to meet the minimum requirements of EPA's Phase II Final Rule and the Minimum Control Measure for Post-Construction Stormwater Runoff Control.

Stormwater Management and Erosion Control Bylaw

The Commonwealth of Massachusetts Department of Environmental Protection, the Massachusetts Office of the Attorney General, and several regional agencies have developed model bylaws for stormwater management and erosion and sediment control. The Town of Adams should develop a combined Stormwater Management and Erosion Control Bylaw to be adopted as a separate general Town bylaw so that standards and requirements contained or referenced in the bylaw will apply throughout Adams. The separate bylaw should be prepared to satisfy the requirements of both Minimum Control Measures addressing development – Construction Site Runoff Control and Post-Construction Stormwater Runoff Control. The Town should consider regulating all land disturbances in excess of 10,000 square feet under the proposed Stormwater Management and Erosion Control Bylaw.

Low Impact Development (LID)

Low Impact Development is a cost-effective and visually appealing approach to site design that involves innovative land planning practices and technologies for managing stormwater and wastewater. LID works to protect a community's natural, pre-development water flow in order to minimize the ecological impacts of urbanization. LID focuses on: i) site design techniques that reduce runoff and maintain existing hydrological features; and ii) site-level or "at-source" stormwater controls. The fundamentals of LID site planning and development concepts include:

- Using hydrology as a basis for designing new development;
- Thinking "micromanagement" for stormwater control;
- Controlling stormwater at the source;
- Using simplistic, nonstructural stormwater control methods when feasible; and
- Creating multi-functional landscapes and infrastructure.

Hydrology should be carefully integrated into the site planning process by first identifying and protecting areas important to the natural hydrology of the site: streams and riparian buffer areas; floodplains; wetlands; steep slopes; high-permeability soils; and woodland conservation zones. Future development is then located in remaining areas that are less sensitive to disturbance or have lower value in terms of hydrologic function. Development in these areas is then designed to minimize clearing and grading, minimize and disconnect impervious surfaces, minimize the quantity of velocity of surface runoff, and provide for on-site/on-lot management of runoff. Additionally, the existing topography and drainage pattern is maintained to disperse runoff flow paths.

Whenever possible, LID designs use open, vegetated drainage systems in lieu of conventional storm drains. LID flow and conveyance systems are designed to maximize overland sheet flow, involve wider, rougher, and longer flow paths, and include pockets of vegetation (trees and shrubs) in the flow path. In addition, flows from large paved surfaces are dispersed in multiple directions, using sheet flow when feasible.

In addition to such design considerations, LID involves micro-management of stormwater using small-scale integrated best management practices or BMPs distributed throughout the site or individual lot. Examples of such practices include bioretention facilities, dry wells, filter/buffer strips, grassed swales, bioretention swales, wet swales, rain barrels, cisterns, and infiltration trenches. These techniques are used to control runoff at its source. As with other BMPs, these practices also require monitoring and periodic upkeep, including trash removal and maintenance of vegetation. With education on the purpose and proper care of BMPs, private property owners can often assume responsibility for maintaining water quality BMPs located on their property.

For Adams to benefit from the LID approach, the Town should integrate LID techniques into its development standards established in the Zoning Bylaw and the Adams Subdivision Control Regulations. The Town may need to develop an oversight program and adopt flexible zoning options to better facilitate the use of LID techniques by developers.

Operation and Maintenance (O&M) Plan

As previously discussed, the Town should consider adopting a “stand alone” bylaw addressing stormwater management and erosion and sediment control. The proposed bylaw should also require an Operation and Maintenance Plan for structural BMPs. The O&M Plan will require the applicant to provide adequate documentation detailing the proper operation and maintenance of the structural BMPs incorporated into any proposed development project. The O&M Plan should specify, at a minimum, the following:

- Preventive maintenance activities proposed for the structural BMPs;
- The anticipated frequency of maintenance and inspection;
- Mechanism for funding activities called for in the O&M Plan;
- An easily identifiable way for the layperson to know when non-routine maintenance is needed;
- A statement by the owner that they are aware and assume full responsibility for compliance with the O&M Plan; and
- A legal instrument, such as the covenant currently used by the Town, that will be recorded at the Northern Berkshire Registry of Deeds to ensure that the O&M Plan is adhered to and to allow the Town's designee to enter the property for inspection of the stormwater management practices and/or structures. The Town has developed a BMP Maintenance Agreement (see Appendix) that includes language allowing the Town to perform maintenance in the event that the owner does not, and stating the Town's right to seek reimbursement for such expenses by the property owner or owners.

In addition to requiring the preparation of the O&M Plan, the Town should implement a process to monitor and enforce the required maintenance detailed in the O&M Plan. Property owners should be required to submit annual reports demonstrating compliance with the O&M Plan approved for the development project.

6.0 Pollution Prevention & Good Housekeeping for Municipal Operations

This section evaluates existing municipal operations and presents pollution prevention and good housekeeping practices that the Town of Adams can use to address water quality protection, as well as fulfill Control Measure 6 of the Phase II stormwater requirements.

Control Measure 6 of the Phase II Stormwater rule requires regulated operators of MS4s to examine their municipal operations and to alter them as needed to reduce pollutants to stormwater discharges. The alteration of municipal operations should focus on reducing pollution from streets, parking lots, open spaces and storage and vehicle maintenance areas. Improvements to land development and flood management practices and the maintenance of storm drain systems should also be considered to reduce pollutant impacts.

The Department of Public Works (DPW) conducts municipal operations in Adams and consists of the following four divisions: 1) Equipment and Maintenance; 2) Highways; 3) Parks and Grounds, including the cemeteries; and 4) Wastewater Treatment. The Adams DPW is responsible for the following operations: maintenance of town streets, drainage systems, sewers, and town vehicles; planting/maintenance of trees on town property; maintenance of the town's playing fields, parks, and playgrounds; and maintenance of town cemeteries, cemetery/burial records for research and sale of burial lots. Existing and recommended BMPs for municipal operations are discussed below.

6.1 Existing & Recommended BMPs for Municipal Operations

Existing municipal operations were discussed with DPW personnel. No site inspections were conducted with the exception of the Adams Parks Department sites. Based on these operations, recommendations were developed to be more protective of water resources. Municipal operations are broken down into those conducted throughout town and at specific municipal facilities.

6.1.1 Town-wide Municipal Operations

BMPs for town-wide municipal operations include those associated with:

- Parks, Cemeteries, Open Space and Recreation Maintenance
- Road Maintenance
- Winter Roadway Treatments
- Town Waste Disposal
- Snow Disposal

Parks, Cemeteries, Open Space & Recreation Maintenance

A Management Plan was developed in June 2004 for the Adams Parks Division to minimize potential environmental impacts from the maintenance of town-owned lands. The Management Plan was funded by the Massachusetts Department of Environmental Protection under the Municipal Environmental Stewardship Program with project development and coordination efforts by the Berkshire Regional Planning Commission and the Town of Adams. It included a review of existing sites maintained by the Parks Division and recommendations to make operations more protective of water resources. A summary of key recommendations is provided in **Appendix 6A** and a copy of the Management Plan is provided in Volume 2 of this plan.

Road Maintenance

The Department of Public Works uses pavement management practices and conducts some roadway repairs and re-surfacing. Erosion and sediment controls are used on some projects; however, additional BMPs can be incorporated into road maintenance operations as outlined below:

- Ensure that all road maintenance and repairs (including utility repairs) are conducted in a manner to prevent erosion of materials into nearby surface waters. For example, filter socks can be used for dewatering activities during utility repairs.
- Utilize BMPs from the Massachusetts Unpaved Roads BMP Manual (BRPC 2001), which outlines numerous BMPs in a "user-friendly" format that should be followed for the maintenance of dirt road surfaces, ditches, culverts, stormwater outlets and steep banks for erosion and sediment control.
- Other road maintenance activities such as paving and painting operations should only be performed during dry weather conditions and care should be taken to not spray or spill materials into the drainage system.
- The Town of Adams should provide spill control materials for roadway crew vehicles to assist in the cleanup of small spills that may occur during road maintenance activities. Some towns have placed small, affordable spill kits behind the seat of highway trucks and have found that the easy accessibility results in more effective cleanup of spills that may otherwise reach a catch basin or sensitive area.

Winter Roadway Treatments

Salt used for winter roadway treatments is toxic to aquatic life and fish. The Adams DPW indicates that there are no salt restricted areas in town and winter roadway treatments generally consist of adequate application of deicing materials to make roadways safe. The Adams DPW uses liquid calcium chloride (CaCl) as a salt catalyst for de-icing activities. Generally, salt catalysts can maximize salt effectiveness and minimize overall material use. Although deicing is a necessary component of DPW operations for public safety, the following activities can be performed to minimize over application[1]:

- Routinely calibrate sand/salt spreaders and use sand/salt spreaders that are capable of adjusting application rates to achieve an optimal application rate according to roadway characteristics (e.g., width and design).
- Train existing and new employees for effective application of deicing materials.
- Use ice-cutting plow blades to reduce the need and/or volume of de-icing materials.
- Consider alternative deicing agents or catalysts (e.g., magnesium chloride) to maximize the effectiveness of salt applications and reduce the overall volume needed for road treatment.
- Utilize weather and roadway monitoring systems to adjust deicing activities to changing conditions; minimize improper roadway pretreatment techniques (e.g., salting prior to a storm that does not occur). These methods for gauging the most appropriate deicing action can vary greatly in price; however, they can be as simple as the local radar tracking system or weather station (e.g., North Adams) that provides updated storm information or become more complex with integrated roadway temperature sensors to indicate and predict freezing road conditions.

Solid and Hazardous Waste Disposal

The Town of Adams landfill closed in 1996 and solid waste disposal is handled through a transfer and recycling facility in town. The Adams Board of Health sponsors annual household hazardous waste collection days. The Town of Adams also conducts leaf composting at the Adams Wastewater Treatment Facility with leaves collected from streets and from residents at the Recycling Center. Loam is the final compost product, which is used for spring repairs (i.e., snow plow damage) and landscape projects throughout town.

As discussed above, some BMPs are already in place to ensure proper disposal of solid and hazardous wastes in town. Additionally, composting activities demonstrate the Town's conservation of natural resources. To more effectively target and emphasize stormwater and

[1] Methods for reducing salt and deicing activities may require some pilot testing and are suggested as alternatives for consideration by the Town of Adams. Some of these alternatives are discussed in more detail in the EPA Fact Sheet "Minimizing Effects from Highway Deicing", EPA 832-F-99-016 available at http://www.epa.gov/OW-OWM.html/mtb/ice.pdf.

water quality protection, the Town of Adams should implement the following BMPs:

- Send out mailers to inform residents on the proper methods for rubbish disposal, recycling, and special disposal of regulated materials or equipment as they relate to stormwater and water quality protection. This information should be incorporated into the public education/outreach and participation/involvements activities discussed in Section 7.0.
- Ensure that composting activities are conducted in accordance with DEP Guidelines. DEP has developed a detailed Leaf and Yard Waste Compost Guideline that can be used for compost site operations and reference. The Environmental Impact Control Measures included in the Guideline outline BMPs to minimize stormwater and resource impacts such as: diverting runoff away from compost materials and providing treatment for compost runoff. The Adams compost site needs to be evaluated with respect to the DEP Leaf and Yard Waste Compost Guideline to determine if any site modifications are needed to address runoff and water quality.

Snow Disposal

Existing snow disposal activities in Adams are conducted near the Adams landfill due to limited disposal options elsewhere. The Town of Adams should ensure that snow disposal practices comply with the Massachusetts Snow Disposal Guidelines Policy No. BRPG01-01 (see **Appendix 6B**). In general, the following activities should be avoided:

- Disposal to waterways
- Disposal at sites with steep slopes that may result in erosion of soils
- Dumping in sanitary landfills, gravel pits and public or private water supply protection areas
- Disposal on top of storm drain catch basins or in stormwater drainage swales or ditches

BMPs for Stormwater Projects

The Phase II stormwater rule recommends procedures to ensure that new flood management projects are assessed for water quality impacts and that existing projects are assessed for incorporation of additional water quality protection devices or practices. For example, BMPs implemented to control floods should also be designed to improve water quality.

Routine stormwater designs and drainage repairs should also consider water quality. For example, the use of a vegetated swale for stormwater conveyance to remedy drainage or erosion problems alongside roadways will provide more water quality protection than direct piping to a nearby drainage system or water body. Another BMP opportunity for water quality improvement associated with drainage repairs includes installing leaching catch basins or deep sump catch basins to replace deteriorated or failed structures during roadway improvement projects. The typical cost difference to install a leaching manhole is roughly 15% greater than the installation of a similar solid manhole (CEI estimate). Refer to Section 4.6 for example structural BMPs and opportunities that can be used in Adams.

Municipal Operations Periodic Evaluation

A Town-Wide Municipal Operations Checklist for the Adams DPW to conduct inspections is provided in Appendix 6A. The Town of Adams should document protocols for municipal operations using this checklist or another format to track activities and ensure that best management practices are continued in the future. Documentation of these practices can also assist in evaluating staff needs, providing budget information, and scheduling work. Municipal operations and facilities should be evaluated annually using the Town-Wide Municipal Operations Checklist and documented in a binder at the Adams DPW. This provides an opportunity for the Town to evaluate past and future practices for municipal operations as they relate to water quality. For example, the frequency of catch basin cleaning and street sweeping should be evaluated in relation to sediment loadings to waterways to determine if some areas of Town require more frequent cleaning.

In most communities subject to the Phase II Stormwater requirements, a designated Town employee or consultant will evaluate municipal operations and existing BMPs to determine if they are effectively working to improve water quality. Part of the Phase II Annual Report requirements includes an evaluation of progress towards the Measurable Goals established in the Town's Stormwater Notice of Intent (NOI). BMPs and measurable goals for municipal operations in Adams are outlined in Section 8.0 - Recommendations and Implementation Plan.

6.1.2 Municipal Maintenance/Storage & Industrial Facilities

General Maintenance/Storage Facilities

Municipal operations at maintenance/storage facilities can have a significant impact on water quality (e.g., vehicle fueling and maintenance, fertilizer storage). Appendix 6A contains BMP recommendations for specific facilities that were developed as part of the Adams Parks Department Management Plan. General best management practices (BMPs) for all facilities are outlined in the Municipal Operations Checklist in Appendix 6A. Municipal facilities such as the DPW Garage, Recycling Center and Bellevue Cemetery Garage should be inspected monthly using the Facility Pollution Prevention Inspection

<u>Checklist</u> provided in Appendix 6A. Major town-owned facilities in Adams that are most likely to impact stormwater are discussed below.

Individual Facilities

<u>Adams DPW Garage</u>

The Adams Department of Public Works Garage on North Summer Street is a high priority site for BMP implementation due to the nature of site activities (e.g., equipment and material storage, vehicle maintenance, and fueling operations) and its proximity to the Hoosic River. The Town of Adams developed a draft Stormwater Pollution Prevention Plan (SWPPP) with assistance from the Berkshire Regional Planning Commission (BRPC) in March 2003. The SWPPP is designed to address stormwater pollution at the site and makes recommendations for measures to protect water quality. Based on information contained in the SWPPP and site information provided by Adams DPW, the following activities are recommended for the DPW Garage:

- Finalize the DPW SWPPP and implement BMP recommendations.
- Develop a Spill Prevention Control and Countermeasure (SPCC) Plan for the DPW Garage due to the storage of oil greater than 1,320 gallons at the site, as required by the Federal Oil Pollution Prevention regulation at 40 CFR 112 - Oil Pollution Prevention and Response; Non-Transportation-Related Onshore and Offshore Facilities.

<u>Adams Recycling Center and Wastewater Treatment Facility</u>

The Town of Adams and BRPC evaluated the Adams Recycling Center and Wastewater Treatment Facility, with assistance from the U.S. Environmental Protection Agency, for compliance with the federal stormwater regulations during the 2002/2003 winter. These types of facilities fall under the industrial categories that require a stormwater permit and SWPPP; however, the compliance evaluation showed that the facilities are eligible for the "No Exposure Certification" since they do not have stormwater discharges associated with industrial activity. As a reminder, the "No Exposure Certification" must be maintained at these facilities and the Town is responsible for operations at these and all town-owned facilities to reduce stormwater pollution. At a minimum, the "No Exposure Certification" must be submitted to EPA every five years. The "No Exposure Certification" form and instructions can be found at http://www.epa.gov/npdes/pubs/noexpoform_app4.pdf.

6.2 Stormwater Inspection and Maintenance Plan

Lack of maintenance to structural stormwater controls, including catch basins and stormwater treatment devices can have adverse effects on stormwater quality and that of receiving water bodies due to re-entry of pollutants into the stormwater as it passes through the structure. An inspection and maintenance schedule can help reduce pollutant loads from the drainage network. Currently, the Adams DPW sweeps streets in town at least twice a year with weekly sweeping in the downtown area during the summer months. The Adams DPW indicates that street sweepings are used as fill at a steep slope adjacent to the old landfill in town, per DEP oral approval.

Street sweeping prevents materials from entering the drainage system; however, there is no removal of stormwater residuals from drainage structures (e.g., catch basin cleaning) due to issues associated with the handling and disposal of these materials (see Section 6.3), as well as inadequate funding on a regular basis. Additionally, there is no inspection schedule for the storm drain system or Town-owned BMPs. Drainage system improvements are addressed as problems arise. Recommendations for water quality improvement are provided below:

- Develop an inspection and maintenance plan for existing town-owned BMPs. This will help the Town work towards compliance with the Phase II regulations, since an inspection and maintenance plan is required. The inspection and maintenance plan should outline components to be inspected, the inspection frequency, what to look for during inspections, and what conditions trigger maintenance. A standardized inspection form will help streamline these activities (see Appendix 6A for an example BMP inspection form). Maintenance activities can then be based on the results of the inspection. As data is collected, the inspection frequencies can be reduced as appropriate. The inspection and maintenance plan should also incorporate a policy for disposing of maintenance-generated wastes (i.e., stormwater residuals, see Section 6.3).

- Sweep all streets in town at least twice a year and sweep areas prone to sediment accumulation on a more frequent basis, such as the downtown area, which is swept weekly. The Adams DPW should develop a sweepings priority plan to maximize sediment removal in areas that are likely to result in the greatest water quality impact. The plan can be a simple map that highlights priority areas, seasonal timing and cleaning frequency. The sweeping plan should be based on how much sediment collects in each area, proximity to surface waters and whether stormwater BMPs are present to collect sediment before it reaches surface waters. The goal of the street sweepings plan is to prevent sediment from entering the drainage system and surface waters since the current sediment removal capacity is limited in some areas. Thorough and effective street sweeping may also decrease the cleaning frequency for catch basins and other drainage structures.

An example of a high priority area is the downtown area along Park Street and Maple Street where catch basins are located directly on top of the culvert that carries Hoxie Brook underground. At these locations, there is no opportunity for sediment removal other than street sweeping. Other high priority areas include road crossings at waterways and major drainage features (e.g., swales, ditches). Additionally, the timing of sweeping activities in the spring should be scheduled to occur as soon as possible after roadway sediments thaw.

- Clean all catch basins and drainage manholes in town at least once each year or as needed to ensure sediments never reach the invert of the drainage outlet pipe. One method for developing a cleaning schedule is to log the volume of sediment removed from various drainage networks/areas in Town and prioritize the networks/areas by these volumes (i.e., greater volumes require more frequent cleaning). Information on the condition of drainage structures should also be documented during cleaning efforts to plan for drainage improvement projects. The Adams DPW submitted a request for the FY2006 budget to purchase a vacuum truck for drainage system cleaning.

- At a minimum, other town-owned BMPs (e.g., swales, ditches) should be inspected on an annual basis and cleaned as needed.

6.3 Handling and Disposing of Stormwater Residuals

Stormwater residuals (i.e., street sweepings and catch basin cleanings) contain elevated levels of pollutants from roadways and must be properly handled and disposed to prevent impact to runoff and groundwater resources. This is a key component of the Phase II requirements and MA DEP regulations and policies. Proper handling consists of containing the materials during transport and storage to prevent migration with wind and rain. Currently, there is minimal removal of stormwater residuals from drainage structures (e.g., catch basin cleaning) in Adams due to the lack of funding for cleaning and disposal. Historically, stormwater residuals were disposed in the Adams landfill but this has closed, limiting cost-effective disposal options.

The following options are available for disposal of catch basin cleanings and street sweepings:

- Catch Basin Cleanings – Catch basin cleanings are regulated under the Solid Waste Regulations, 310 CMR 19.00. There are currently two disposal options available: 1) Catch basin cleanings may be disposed at a landfill without any prior testing, unless there is reason to suspect the materials are contaminated. Contaminated materials must be handled and disposed in accordance with 310 CMR 30.000 Massachusetts Hazardous Waste Regulations. This may require testing and special disposal costs. Nearby facilities that accept these materials are provided in **Table 6-1**, with rough disposal costs provided in **Table 6-2**. 2) A Beneficial Use Determination (BUD) application (310 CMR 19.060) may be filed with DEP for reuse. Potential uses for catch basin cleanings, with a BUD, may include fill for road right-of-ways, mixing with road bed material and mixing with compost if the organic content is high, although the use of this compost will likely be limited.

  As a potential disposal cost alternative, a BUD could be filed for reuse of catch basin cleanings as daily cover at an approved landfill. This would result in a cost savings for reuse as daily cover as opposed to a solid waste disposal premium. A copy of the Draft Interim Guidance Document for Beneficial Use Determination Regulations, 310 CMR 19.060, March 18, 2004 has been provided in Appendix 6B for reference. This document outlines potential reuse scenarios for street sweepings and catch basin cleanings with a risk-based approach to guide applicants for developing a BUD application.

- Street Sweepings – Street sweepings are regulated by the Solid Waste Regulations, 310 CMR 19.00 and through the DEP Policy #BWP-94.092 (provided in Appendix 6B). The policy outlines the following storage and reuse options: 1) Street sweepings collected from residential areas may be used under public road surfaces or as fill in borrowed areas outside residential and other sensitive areas or can be landfilled without DEP approval. 2) Sweepings collected from commercial/retail business districts and industrial/manufacturing areas (Urban Center Roads), can be landfilled without DEP approval and may be used as daily cover. Any other uses require filing a BUD and DEP approval.

Table 6-1. Potential Disposal Facilities for Stormwater Residuals

Facility Name	Location	Distance (approx.)
Stockbridge Sludge Landfill	Stockbridge, MA	30 miles
Northampton Landfill	Northampton, MA	38 miles
Granby-Holyoke Landfill	Granby, MA	55 miles
Chicopee Landfill	Chicopee, MA	67 miles
Hardwick Landfill	Hardwick, MA	68 miles

Agawam Landfill-Bondis Island	Agawam, MA	70 miles
Gardner Landfill	Gardner, MA	80 miles

Table 6-2. Estimated Disposal Costs for Stormwater Residuals

Facility Name	**Street Sweepings***	**Catch Basin Cleanings***
Northampton Landfill	$25-35/ton	$70-80/ton
Chicopee Landfill	$40-50/ton	$95-105/ton

*These costs are estimated based on transportation and tipping/disposal fees to the receiving facility. Cost estimates are provided for informational purposes only and should not be relied upon for budget or planning purposes. Actual prices may vary and quotes must be obtained from the receiving facility and haulers.

6.4 Municipal Training

The Phase II rule requires that Town employees be trained on how to incorporate the pollution prevention/good housekeeping BMPs discussed above. Town training programs for stormwater and groundwater are intended to teach employees about stormwater management, potential sources of contaminants, and BMPs for water quality protection. An awareness of pollution prevention efforts throughout Town can significantly decrease the potential water quality impact of municipal operations and other activities.

Existing municipal training programs can be tied into water quality training efforts. For example, Fire Department employees are typically familiar with oil and hazardous material spill training techniques. Such training efforts focus on protecting human health and the environment and can be used to convey stormwater awareness and pollution prevention efforts as well.

The requirements of Phase II impact several town departments and boards including the DPW, Community Development (including inspection services), Planning Board, Conservation Commission, and Board of Health, depending on how the town sets up compliance and enforcement actions. Each of the officials involved in Phase II regulated issues and water quality protection should be trained specifically in the areas that apply to them. For example, DPW personnel should be trained in appropriate operations to minimize stormwater impacts, while the Building Inspector should be trained to identify stormwater impacts from construction projects as part of a routine inspection.

Town of Adams, with assistance from BRPC or its consultant, should develop a municipal training program for water quality protection in accordance with the Phase II requirements. The program should include the following key elements, which can be tailored specifically to town operations.

- Stormwater Management Strategy & Phase II Program Overview
- Town Department Responsibilities

- Town Drainage System, Water Supply and Water Quality
- Spill Prevention and Response
- Good Housekeeping
- Material Management Practices
- Maintenance of Town-Owned Lands
- Stormwater Inspections
- Illicit Discharge Detection
- Construction Sites and Development

Training should be conducted annually and may be minimized after the first year to include refresher topics.

6.5 Municipal Operations Staffing & Responsibilities

In most communities, as is the case with Adams, municipal operations related to stormwater fall under the responsibility and workload of the Department of Public Works. Based on discussions with the Adams DPW there is not enough staff to implement stormwater activities. The Town of Adams needs to increase available staff and distribute responsibilities to ensure effective BMP implementation for municipal operations, as well as other components of the Adams Stormwater Management Strategic Plan.

Staffing needs can be assisted partly through the coordination and combination of efforts between town departments; however, some capital investment in staffing and equipment may be needed. For example, the Adams Conservation Commission could work with the Department of Public Works to develop a salt reduction strategy. The Town of Adams can also work with other local agencies and watershed groups such as BRPC and the Hoosic River Watershed Association to assist in BMP implementation.

The Town of Adams should consider hiring an employee to handle the following stormwater responsibilities for pollution prevention:

- Implement and monitor BMPs for municipal operations.
- Develop and implement an inspection and maintenance plan for the storm drain system.
- Conduct monthly pollution prevention inspections at municipal facilities and evaluate municipal operations annually.
- Maintain compliance with the DPW Garage SWPPP and No Exposure requirements for the Adams Recycling Center and Wastewater Treatment Plant.
- Maintain compliance with the Adams Parks Department Management Plan and implement BMP recommendations.
- Coordinate and document DPW operations and water quality results related to stormwater improvements and investigations of

the storm drain and sanitary sewer systems (e.g., coordinate illicit discharge investigations).

Appendix 6A

BMP Recommendations – Adams Parks Department Management Plan

Municipal Industrial Operations Stormwater Checklist

Facility Pollution Prevention Inspection Checklist

Sample BMP Inspection Form

Summary of BMP Recommendations
Adams Parks Department Management Plan (June 2004)

Site ID or General Activities	BMP Recommendations
1. Bellevue Cemetery	• Paint indoors or use drop cloths for outdoor painting of park benches and small equipment. • Store hazardous materials in fire rated cabinets with appropriate labels and ensure that only approved portable containers are used for equipment refueling. • Continue to store vehicles and equipment indoors. • Ensure that any future vehicle and equipment maintenance activities are performed indoors. • Cut grass to 3 inches or greater. • Establish a mowing buffer zone (e.g., 50 feet) to the large swale at the entrance to the cemetery and mow grass within this area to 5 inches. • Seed swales with wildflowers and grasses to minimize maintenance needs. • Utilize space adjacent to the garage for the tree replanting program. • Utilize hay bales around catch basins or in swales until vegetation is fully established at disturbed areas. • Sweep roadways, inspect and maintain on-site drainage structures at least annually and report maintenance needs to DPW. • Avoid leaving grass clippings on paved areas draining to the storm drain system.
2. Maple Street Cemetery	• Cut grass to 3 inches or greater. • Replace lost trees as part of the tree replanting program. • Utilize hay bales around catch basins or in swales until vegetation is fully established at disturbed areas. • Sweep roadways, inspect and maintain on-site drainage structures at least annually and report maintenance needs to DPW. • Avoid leaving grass clippings on paved areas draining to the storm drain system.
3. Quality Playground	• Cut grass to 3 inches or greater. • Avoid leaving grass clippings on paved areas draining to the storm drain system.
4. Siara Street Field	• Cut grass to 3 inches or greater. • Avoid leaving grass clippings on paved areas draining to the storm drain system.
5. Russell Field	• Cut grass to 3 inches or greater at park areas and 2.5 to 3 inches at athletic field areas. • Establish a no mow zone and increased height (5 inches) mowing buffer to the stream that flows along the athletic field and park. Maximize the mowing buffer (depending on athletic field constrains) to 50 feet if possible. • Seed buffer zones with wildflowers and grasses as an alternative to mowing. • Use trees from the replanting program to help establish and maintain a buffer to the stream, as part of park beautification.
6. Valley Street Field	• Coordinate turf management activities with the Adams Little League to ensure that fertilizers are applied in accordance with the manufacturer's specifications and pesticides are applied by a licensed applicator. A condition for allowing the Little League to apply chemicals should include a 50 foot “no-application zone” around the perimeter of the field to establish a buffer to nearby drainage systems. • Discuss irrigation practices with the Little League to coordinate irrigation activities with rainfall appropriately. Consider a rain sensor for the irrigation system to water according to soil moisture and rainfall events. • Cut grass to 2.5 to 3 inches. • Avoid leaving grass clippings on paved areas draining to the storm drain system.

Summary of BMP Recommendations Continued	
7. Reid Field	• Cut grass to 2.5 to 3 inches. • Establish a mowing buffer zone (e.g., 50 feet) to the unnamed tributary at the eastern portion of the field. Maximize the mowing buffer based on athletic field constraints.
8. Renfrew Athletic Field	• Cut grass to 3 inches or greater at park areas and 2.5 to 3 inches at athletic field areas. • Establish a mowing buffer zone (e.g., 50 feet) to Pine Street Brook. Maximize the mowing buffer based on athletic field constraints.
9. DPW Garage and Forest Warden Property	• Continue to store vehicles and equipment indoors. • Continue existing vehicle and equipment washing practices and ensure that outdoor vehicle washing is not conducted at other sites in town. • Establish a mowing buffer zone (e.g., 50 feet) to the unnamed tributary that flows through the property and the on-site swales. Maximize the mowing buffer based on athletic field constraints. • Avoid leaving grass clippings on paved areas draining to the storm drain system.
10. Bowe Field	• Cut grass to 3 inches or greater. • Coordinate cleanup activities with the Adams Agricultural fair to ensure that animal waste is thoroughly cleaned up and properly disposed.
11. Hoosic River Control Chutes	• Cut grass to 3 inches or greater. • Establish a mowing buffer zone and/or seed buffer zones with wildflowers and grasses as an alternative to mowing. • Ensure that grass clippings are not dispersed into the Hoosic River or the adjacent storm drain system.
12. Memorial Park	• Cut grass to 3 inches or greater. • Avoid leaving grass clippings on paved areas draining to the storm drain system.
13. Town Common	• Cut grass to 3 inches or greater. • Avoid leaving grass clippings on paved areas draining to the storm drain system.
BMP Recommendations for General Activities	
Chemical Applications & General Use	• For future chemical applications, the following should be implemented: licensing of Parks Department employees for the application of pesticides; incorporate written protocols for chemical applications into this Management Plan that are consistent with the principles of an Integrated Pest Management (IPM) Plan; and establish "no application" zones for sites within 50 feet of waterways or significant drainage features, such as storm drains, ditches, channels or swales. • The Parks Department should continually try to use non-hazardous or alternative cleaners for Parks Department operations, regardless of outdoor usage. These practices will highlight the Parks Department's efforts to "lead by example" for pollution prevention throughout town.
Spill Containment & Control	• Incorporate spill prevention, control and cleanup training into existing training programs or procedures. • Acquire spill kits for all Parks Department vehicles. • Continue existing practices to ensure that care is used to prevent spills. Ensure that on-site refueling activities are conducted as far as possible from waterways or significant drainage features. • As a general rule, establish a 50' no-fueling zone along waterways and significant drainage features.

Municipal Industrial Operations Stormwater Checklist

Use for Annual Evaluation

Municipal Industrial Operations Stormwater Checklist

Date of Inspection: _______________ Inspector: _____________________

Location(s) Inspected: ____

Number of Potential Stormwater Issues Identified: ______

This checklist is intended as a guide for evaluating stormwater impacts that may occur from operations at municipal facilities and throughout town. Major categories of operations are presented below with a list of common activities that can impact stormwater. Municipal employees should check YES or NO for each item or not applicable (N/A) or not reviewed (N/R) for the category. **Items checked NO indicate that corrective action or further evaluation is needed to reduce stormwater impacts.** Generally, the checklist question is the answer for the corrective action.

For Specific Sites, Consider the Following Characteristics that Relate to Stormwater Pollution Prevention

- Stormwater Discharge Point(s) (outfalls)
- Drainage Patterns and Direction of Flow
- Nearby Surface Water Bodies (e.g., stream, river, wetland) Receiving Site Runoff
- Structural Stormwater Control Measures/Devices
- Locations of Industrial Activities and Significant Materials Exposed to Stormwater
- Types of Pollutants Likely to be Discharged from Each Drainage Area

A. Municipal Operations Related to Parks, Golf Courses, Cemeteries, and Trees
☐ **N/A** ☐ **N/R**

1. Was an equal or lesser amount of fertilizers and pesticide used throughout Town compared to last year or previous uses?
   ☐ YES ☐ NO

2. Are fertilizers and pesticides applied only during light rain or dry weather conditions (should not be applied during heavy rain conditions)?
   ☐ YES ☐ NO

3. Were fertilizers and pesticides applied as needed based on inspected conditions (should avoid use on a regular or scheduled basis)?
   ☐ YES ☐ NO

4. Were other methods of pest control employed instead of chemical treatment (e.g., physical weeding, horticultural techniques)?
 YES NO

5. Do licensed town employees or a certified arborist apply the fertilizers and pesticides in town?
 YES NO

6. Do the application rates and methods for fertilizers and pesticides always follow the manufacturers specifications?
 YES NO

7. Was care used to prevent applying fertilizers or pesticides near stormwater drainage locations?
 YES NO

8. Were fertilizers and pesticides applied at least 75 feet from wetlands and waterways?
 YES NO

B. Roadway/Bridge Maintenance and Repair Activities N/A N/R

1. Are storm water BMPs (i.e., oil water separators, detention basins, retention/infiltration devices, vegetative swales), throughout Town and at municipal facilities, maintained/cleaned out to ensure proper operation?
 YES NO

2. Is there an inspection schedule for stormwater structural BMPs?
 YES NO

3. Are erosion and sediment controls used during roadway and bridge maintenance or repair activities?
 YES NO

4. Are roadways and Town-owned facilities swept at least once a year or more in the downtown areas?
 YES NO

5. Are any other routine cleanups performed (e.g., roadside trash pick-up, municipal facility spring cleaning)?
 YES NO

6. Are catch basins cleaned at least annually or as needed to prevent materials from accumulating at or above the invert of the outlet pipe?
 YES NO

7. Are stormwater residuals (i.e., catch basin cleanings, muck from sediment forebays) handled and disposed in accordance with DEP Policies?
☐ YES ☐ NO

8. Are stormwater quality and BMPs considered during roadway or bridge reconstruction projects? An example could be installing a vegetative swale along a roadway instead of an additional catch basin with a direct discharge to a receiving water body.
☐ YES ☐ NO

9. Are filter socks or other BMPs used for dewatering activities during construction or repairs?
☐ YES ☐ NO

10. Are roadway maintenance activities, particularly paving and sealing activities, performed during dry weather only to prevent contamination of runoff?
☐ YES ☐ NO

11. Are paving tools (e.g., rakes, shovels) and equipment cleaned with a solvent fluid at a designated maintenance facility (i.e., Highway Garage)?
☐ YES ☐ NO

12. Are pollution prevention materials such as drip pans and absorbent materials used to limit or contain leaks and spills from paving equipment or materials?
☐ YES ☐ NO

13. Are salt and sand spreaders routinely calibrated to prevent over-application of deicing and sand materials?
☐ YES ☐ NO

14. Are salt and sand spreaders capable of adjusting application rates to achieve an optimal application rate according to roadway characteristics such as road width and design, traffic concentration, and proximity to surface waters?
☐ YES ☐ NO

15. Are employees trained in the proper application of deicing materials, the timing of applications, and types of deicing materials in consideration of water quality and aquatic habitat (i.e., environmental awareness)?
☐ YES ☐ NO

16. Do routine road salting activities throughout town conform to salt use restricted areas, if any, for water quality protection?
☐ YES ☐ NO

17. Are alternative materials (e.g., liquid salt catalysts that maximize salt effectiveness and minimize overall material use) used for deicing operations? This can result in a decrease in pollutant loading to runoff and environmental impact.
☐ YES ☐ NO

18. Are any monitoring systems in place to evaluate roadway conditions in an effort to adjust deicing activities as temperature and weather conditions change? A Road Weather Information System (RWIS) often includes meteorological sensors, pavement sensors, site-specific forecasts, temperature profiles of roadways, a weather advisor, communications, and planning.
☐ YES ☐ NO

19. Does the town generally use roadway pretreatment techniques (e.g., salting and applying de-icers prior to storms)? This can sometimes result in applying excess salt materials.
☐ YES ☐ NO

20. Are ice-cutting plow blades used to reduce the need for deicing materials?
☐ YES ☐ NO

21. Is snow disposal being conducted in accordance with DEP's Snow Disposal Guidelines? There should be no disposal to waterways, sites with steep slopes, sanitary landfills, gravel pits, public or private water supply protection areas or on top of storm drain catch basins or in stormwater drainage swales of ditches.
☐ YES ☐ NO

C. Vehicle Fueling Operations **☐ N/A** **☐ N/R**

1. Are spill and overfill prevention devices present on fuel dispensing equipment (i.e. automatic shut-offs, pump control switches, and emergency pump shut-off switches)?
☐ YES ☐ NO

2. Is the fueling area covered to prevent rain contact?
☐ YES ☐ NO

3. Is storm water prevented from flowing across the fueling area?
☐ YES ☐ NO

4. Are oil/water separators used in storm drains in the fueling area?
☐ YES ☐ NO

5. Is the fueling area cleaned using only dry methods (no hosing or washing)?
☐ YES ☐ NO

6. Are there spill control materials nearby the fueling area?
 YES NO

7. Are employees trained on the proper use and management of fueling station (i.e., no topping off fuel tanks, not leaving vehicle unattended during fueling, or washing down fueling area)?
 YES NO

D. Vehicle/Equipment Maintenance and Waste Handling **N/A** **N/R**

1. Are maintenance areas, outdoors and around solvent parts cleaners free of any signs of spills or leaks?
 YES NO

2. Do maintenance areas appear to be well maintained and organized?
 YES NO

3. Is liquid cleaning of parts at a centralized station (e.g., parts washer)?
 YES NO

4. Are solvents non-chlorinated?
 YES NO

5. Are any non-hazardous or alternative cleaners used at the site?
 YES NO

6. Is all maintenance conducted indoors; or at least fluid changes?
 YES NO

7. Are waste fluids handled and disposed of properly (i.e., manifested offsite, recycled – they should not be dumped down floor or sink drains)?
 YES NO

8. Have employees received any training for hazardous waste handling and disposal operations (e.g., 40-hour HAZWOP training or other)?
 YES NO

9. Is there any written protocol for site operations (i.e., parts cleaning, spill response, and disposal)?
 YES NO

10. Are floor drains connected to a tight tank or the sanitary sewer or closed (they should not be connected to the storm sewer system)? Are all other plumbing connections known?
 YES NO

11. Are work areas cleaned using only dry methods (unless drains are connected to a tight tank or the sewer, areas should not be washed or hosed down with water)?
 YES NO

12. Are spills cleaned and disposed of properly using appropriate absorbents (e.g., rags and speedi-dry)?
 YES NO

13. Are oil filters completely drained before recycling or disposal?
 YES NO

14. Are incoming vehicles and equipment checked for leaking oil and fluids?
 YES NO

15. Is the site free of wrecked or salvage vehicles?
 YES NO

16. If wrecked or salvage vehicles are generally stored onsite, are measures taken to prevent or contain leaks from such vehicles (i.e., drip pans, draining of fluids, storing under cover)?
 YES NO

17. Are used batteries stored under cover and leaking batteries stored in leak proof secondary containers?
 YES NO

18. Are vehicles or equipment washed indoors?
 YES NO

E. Painting Operations **N/A** **N/R**

1. Are paint wastes collected (i.e., with tarps, drip pans, etc.) and disposed of properly?
 YES NO

2. Are wastes from sanding contained (i.e., they should not be allowed to be carried away by the wind)?
 YES NO

3. Is paint equipment that minimizes overspray used (i.e., electrostatic spray equipment, air-atomized spray guns, high-volume/low-pressure spray guns, gravity-feed guns)?
 YES NO

4. Are employees trained to use spray equipment correctly?
 YES NO

5. Are combustible paint supplies stored in a fire-resistant cabinet and labeled appropriately?
 YES NO

F. Loading and Unloading of Bulk Materials (including salt) N/A N/R

1. Are tank trucks and material delivery vehicles located where spills or leaks can be contained?
 YES NO

2. Are petroleum storage containers (underground and aboveground) and dispensing equipment (tank truck dispensing hoses) equipped with spill and overfill prevention devices (i.e., high level alarms, automatic shut-offs, sight-level gauges)?
 YES NO

3. Are loading/unloading areas covered to prevent exposure to rainfall?
 YES NO

4. Is storm water prevented from flowing across the loading/unloading area?
 YES NO

5. Are employees trained in proper loading/unloading procedures to prevent spillage of materials?
 YES NO

6. For outdoor salt loading operations; is the loading operation performed on an impervious surface that is thoroughly cleaned after loading operations?
 YES NO

G. Above-Ground Storage Tanks N/A N/R

1. Are overflow protection and leak detection devices installed?
 YES NO

2. Are bollards or other physical barriers located around tanks to prevent vehicle damage?
 YES NO

3. Are the tanks visually inspected on a periodic basis (e.g., weekly) to identify problem areas before a release?
 YES NO

4. Is routine preventative maintenance performed for tanks?
 YES NO

5. Is access to all parts of the tanks provided for adequate inspection?
 YES NO

6. Is the tank integrity tested periodically?
 YES NO

7. Are tanks double-walled, bermed, or surrounded by a secondary containment system?
 YES NO

8. Do municipal facilities with petroleum stored on-site have a storage capacity less than 1,320 gallons, either in a single container or aggregate (sum of containers greater than 55-gallons capacity)?
 YES NO

9. Are spill control materials (e.g., pads, booms, catch basin covers) available to contain a release?
 YES NO

10. Are employees familiar with how to respond to a spill (e.g. procedures for notifying appropriate authorities and procedures for containing, diverting, isolating, and cleaning up spills)?
 YES NO

H. Materials Storage and Handling ** N/A N/R**

1. Are salt piles and sand/salt mixture piles completely protected from rain and are coverings free of holes?
 YES NO

2. Are dumpsters sealed to prevent waste leachate from escaping?
 YES NO

3. Are sand piles and other roadway process materials located/contained such that they will not contribute sediment to storm water runoff from the site?
 YES NO

4. Are sand piles and other roadway process materials located at least 100 feet from surface waters and/or wetlands?
 YES NO

5. Is the site free of organic refuse and/or compost operations?
 YES NO

6. Are composting operations contained and are stormwater diversion structures in place to prevent migration with stormwater?
 YES NO

7. Are composting operations conducted at least 100 feet from surface waters, wetlands or direct stormwater conduits (e.g., swales, catch basins)?
 YES NO

8. Are all other processed materials completely protected from rain (i.e., virgin oil, waste oil, batteries)?
 YES NO

9. Are flow diversion devices (such as gutters, drains, sewers, dikes, berms, swales, and graded pavement) used to convey stormwater away from material storage areas?
 YES NO

10. Are periodic material inventories conducted to identify if MSDSs are available for all materials used throughout municipal facilities?
 YES NO

11. Is the material inventory and associated storage locations reviewed for sources of potential stormwater contamination?
 YES NO

12. Are the hazardous materials labeled appropriately and stored in designated storage containers, areas, or on pallets with appropriate labels or signs?
 YES NO

13. Are hazardous materials stored in a manner (e.g., sufficient aisle space) that provides access for inspections and ease of material transport to prevent spillage?
 YES NO

14. Are hazardous materials stored away from high-traffic areas to reduce the likelihood of accidental damage and spills?
 YES NO

15. Is any preventative maintenance performed for storage areas to prevent a release due to equipment failure?
 YES NO

16. Are employees familiar with the proper storage and handling practices for hazardous materials?
 YES NO

I. Other Pollution Prevention BMPs **☐ N/A** **☐ N/R**

1. Does any Town department (i.e., Public Works, Building Inspector, Board of Health or Conservation Commission) conduct any inspections for stormwater BMPs or stormwater issues such as erosion and contamination?
   ☐ YES ☐ NO

2. Are there any employee training efforts throughout the year (e.g., employee awareness efforts for BMP monitoring, spill reporting procedures, spill drills, operating manuals and standard procedures aimed at pollution prevention, and training about good housekeeping practices)?
   ☐ YES ☐ NO

3. Is there any system or procedure for internal reporting of stormwater management issues (e.g., a Storm Water Pollution Prevention Team for specific municipal facilities) to prevent and contain potential stormwater contamination?
   ☐ YES ☐ NO

4. Are records maintained for inspections, stormwater system maintenance, repairs and modification of storage tanks and storage areas, spills, leaks, or other discharges throughout Town or at specific municipal facilities?
   ☐ YES ☐ NO

5. List any other stormwater pollution prevention BMPs or additional comments from the above categories.

Facility Pollution Prevention Inspection Checklist

<u>Use for Monthly Inspections</u>

CHECKLIST A – FACILITY POLLUTION PREVENTION INSPECTION				Completed by: Date:
Item	**Pollution Prevention Target Area or Activity**	**YES**	**NO**	**Comments or Needed Improvement**
1	Is the fueling station free of spills or leaks (inspect pumps and surrounding area, note stained concrete or asphalt and sheen, if any)?			
2	Does all fuel dispensing equipment appear to be intact and functioning properly?			
3	Is the sand/salt mix pile adequately contained to prevent migration with stormwater?			
4	Is the sand/salt loading area free of significant loose materials?			
5	Is there any evidence of leaks or deterioration of the CaCl AST and associated piping, fittings, etc.?			
6	Are all hazardous or raw materials (e.g., drums, paint buckets, paving materials) contained, covered or stored indoors to adequately protect against contact with stormwater?			
7	Is there any excessive (beyond 5 cubic yards volume) outdoor storage of scrap metal and equipment?			
8	Are all outdoor rubbish containers equipped with a lid and free of holes and leaks?			
9	Are there any significant vehicle and equipment leaks or drips throughout the facility?			
10	Are there any significant leaks or drips from outdoor snow plow equipment?			
11	Are all road/earth material storage locations adequately contained and are adequate erosion/sediment controls in place to prevent migration of materials with stormwater?			
12	Is there sufficient space between (>6 inches) catch basin sediment and pipe inverts at all catch basin locations at the site?			
13	Is there any evidence of erosion or significant sediment accumulation at stormwater discharges from the site?			
14	Is there any evidence of outdoor vehicle washing at the site?			

Note: Attach additional sheets for comments, if necessary. Record items checked "NO" in the Record of Correction of Deficiencies Discovered During Facility Inspection. Use Checklist B to track the correction of deficiencies discovered during the facility inspection.

CHECKLIST B – RECORD OF CORRECTION OF DEFICIENCIES DISCOVERED DURING FACILITY INSPECTION		Completed by: Date:
Deficient Item	**Corrective Action or Improvement**	**Date of Correction**

Note: Refer to items on Checklist A (e.g., 1, 4, 7). Deficiencies noted during the inspection must be corrected as soon as practicable, but no later than 14 days from the inspection.

Sample BMP Inspection Form

Use to Inspect BMPs as Part of the
Stormwater Inspection & Maintenance Plan

BMP Inspection

BMP ID #	Type of BMP	Does BMP appear to be working properly?	Is maintenance required?	Maintenance Access	Sediment Accumulation	Sediment Depth	Deposits	Structural Condition	Erodibility	Vegetation	Comments
	__ Leaching Catch Basin __ Proprietary Unit __ Swale __ Detention Pond __ Forebay __ Other*	__ Yes __ No*	__ Yes __ No	__ Easy __ Moderate __Difficult	__ None __ Slight build up __ Heavy build up	_____ inches	__ None __ Grease/Oil __ Grass Clippings/Compost __ Trash/Debris __ Other*	__ N/A __ Good __ Corroded __ Cracked __ Exposed Steel __ Other*	__ N/A __ None __ Channeling/Depressions __ Bank Erosion __ Displaced Riprap __ Other*	__ N/A __ No Distress __ Distressed __ Sparse __ Undesirable Woody __ Invasive Plants	
	__ Leaching Catch Basin __ Proprietary Unit __ Swale __ Detention Pond __ Forebay __ Other*	__ Yes __ No*	__ Yes __ No	__ Easy __ Moderate __Difficult	__ None __ Slight build up __ Heavy build up	_____ inches	__ None __ Grease/Oil __ Grass Clippings/Compost __ Trash __ Other*	__ N/A __ Good __ Corroded __ Cracked __ Exposed Steel __ Other*	__ N/A __ None __ Channeling/Depressions __ Bank Erosion __ Displaced Riprap __ Other*	__ N/A __ No Distress __ Distressed __ Sparse __ Undesirable Woody __ Invasive Plants	
	__ Leaching Catch Basin __ Proprietary Unit __ Swale __ Detention Pond __ Forebay __ Other*	__ Yes __ No*	__ Yes __ No	__ Easy __ Moderate __Difficult	__ None __ Slight build up __ Heavy build up	_____ inches	__ None __ Grease/Oil __ Grass Clippings/Compost __ Trash __ Other*	__ N/A __ Good __ Corroded __ Cracked __ Exposed Steel __ Other*	__ N/A __ None __ Channeling/Depressions __ Bank Erosion __ Displaced Riprap __ Other*	__ N/A __ No Distress __ Distressed __ Sparse __ Undesirable Woody __ Invasive Plants	
	__ Leaching Catch Basin __ Proprietary Unit __ Swale __ Detention Pond __ Forebay __ Other*	__ Yes __ No*	__ Yes __ No	__ Easy __ Moderate __Difficult	__ None __ Slight build up __ Heavy build up	_____ inches	__ None __ Grease/Oil __ Grass Clippings/Compost __ Trash __ Other*	__ N/A __ Good __ Corroded __ Cracked __ Exposed Steel __ Other*	__ N/A __ None __ Channeling/Depressions __ Bank Erosion __ Displaced Riprap __ Other*	__ N/A __ No Distress __ Distressed __ Sparse __ Undesirable Woody __ Invasive Plants	
	__ Leaching Catch Basin __ Proprietary Unit __ Swale __ Detention Pond __ Forebay __ Other*	__ Yes __ No*	__ Yes __ No	__ Easy __ Moderate __Difficult	__ None __ Slight build up __ Heavy build up	_____ inches	__ None __ Grease/Oil __ Grass Clippings/Compost __ Trash __ Other*	__ N/A __ Good __ Corroded __ Cracked __ Exposed Steel __ Other*	__ N/A __ None __ Channeling/Depressions __ Bank Erosion __ Displaced Riprap __ Other*	__ N/A __ No Distress __ Distressed __ Sparse __ Undesirable Woody __ Invasive Plants	
	__ Leaching Catch Basin __ Proprietary Unit __ Swale __ Detention Pond __ Forebay __ Other*	__ Yes __ No*	__ Yes __ No	__ Easy __ Moderate __Difficult	__ None __ Slight build up __ Heavy build up	_____ inches	__ None __ Grease/Oil __ Grass Clippings/Compost __ Trash __ Other*	__ N/A __ Good __ Corroded __ Cracked __ Exposed Steel __ Other*	__ N/A __ None __ Channeling/Depressions __ Bank Erosion __ Displaced Riprap __ Other*	__ N/A __ No Distress __ Distressed __ Sparse __ Undesirable Woody __ Invasive Plants	
	__ Leaching Catch Basin __ Proprietary Unit __ Swale __ Detention Pond __ Forebay __ Other*	__ Yes __ No*	__ Yes __ No	__ Easy __ Moderate __Difficult	__ None __ Slight build up __ Heavy build up	_____ inches	__ None __ Grease/Oil __ Grass Clippings/Compost __ Trash __ Other*	__ N/A __ Good __ Corroded __ Cracked __ Exposed Steel __ Other*	__ N/A __ None __ Channeling/Depressions __ Bank Erosion __ Displaced Riprap __ Other*	__ N/A __ No Distress __ Distressed __ Sparse __ Undesirable Woody __ Invasive Plants	
	__ Leaching Catch Basin __ Proprietary Unit __ Swale __ Detention Pond __ Forebay __ Other*	__ Yes __ No*	__ Yes __ No	__ Easy __ Moderate __Difficult	__ None __ Slight build up __ Heavy build up	_____ inches	__ None __ Grease/Oil __ Grass Clippings/Compost __ Trash __ Other*	__ N/A __ Good __ Corroded __ Cracked __ Exposed Steel __ Other*	__ N/A __ None __ Channeling/Depressions __ Bank Erosion __ Displaced Riprap __ Other*	__ N/A __ No Distress __ Distressed __ Sparse __ Undesirable Woody __ Invasive Plants	

* Provide additional comments to describe the observations made for the category.

Appendix 6B

DEP Snow Disposal Guidelines - BRPG01-01

Reuse & Disposal of Street Sweepings - BWP 94.092

Draft Interim Guidance Document for Beneficial Use Determination Regulations, 310 CMR 19.060, March 18, 2004

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
ONE WINTER STREET, BOSTON, MA 02108 617-292-5500

ARGEO PAUL CELLUCCI
Governor

JANE SWIFT
Lieutenant Governor

BOB DURAND
Secretary

LAUREN A. LISS
Commissioner

BUREAU OF RESOURCE PROTECTION
SNOW DISPOSAL GUIDELINES

Effective Date: March 8, 2001 Guideline No. BRPG01-01

Applicability: Applies to all federal, state, regional and local agencies, as well as to private businesses.

Supersedes: BRP Snow Disposal Guideline BRPG97-1 issued 12/19/97, and all previous snow disposal guidance

Approved by: ______________________________
Glenn Haas, Assistant Commissioner
for Resource Protection

PURPOSE: To provide guidelines to all government agencies and private businesses regarding snow disposal site selection, site preparation and maintenance, and emergency snow disposal options that are acceptable to the Department of Environmental Protection, Bureau of Resource Protection.

APPLICABILITY: These Guidelines are issued by the Bureau of Resource Protection on behalf of all Bureau Programs (including Drinking Water Supply, Wetlands and Waterways, Wastewater Management, and Watershed Planning and Permitting). They apply to public agencies and private businesses disposing of snow in the Commonwealth of Massachusetts.

INTRODUCTION

Finding a place to dispose of collected snow poses a challenge to municipalities and businesses as they clear roads, parking lots, bridges, and sidewalks. While we are all aware of the threats to public safety caused by snow, collected snow that is contaminated with road salt, sand, litter, and automotive pollutants such as oil also threatens public health and the environment.

As snow melts, road salt, sand, litter, and other pollutants are transported into surface water or through the soil where they may eventually reach the groundwater. Road salt and other pollutants can contaminate water supplies and are toxic to aquatic life at certain levels. Sand washed into waterbodies can create sand bars or fill in wetlands and ponds, impacting aquatic life, causing flooding, and affecting our use of these resources.

There are several steps that communities can take to minimize the impacts of snow disposal on public health and the environment. These steps will help communities avoid the costs of a contaminated water supply, degraded waterbodies, and flooding. Everything we do on the land has the potential to impact our water resources. Given the authority of local government over the use of the land, municipal officials and staff have a critically important role to play in protecting our water resources.

The purpose of these guidelines is to help municipalities and businesses select, prepare, and maintain appropriate snow disposal sites before the snow begins to accumulate through the winter.

RECOMMENDED GUIDELINES

These snow disposal guidelines address: (1) site selection; (2) site preparation and maintenance; and (3) emergency snow disposal.

1. SITE SELECTION

The **key** to selecting effective snow disposal sites is to locate them **adjacent to or on pervious surfaces in upland areas** away from water resources and wells. At these locations, the snow meltwater can filter in to the soil, leaving behind sand and debris which can be removed in the springtime. The following areas should be avoided:

- ^ Avoid dumping of snow into any waterbody, including rivers, the ocean, reservoirs, ponds, or wetlands. In addition to water quality impacts and flooding, snow disposed of in open water can cause navigational hazards when it freezes into ice blocks.

- ^ Do not dump snow within a Zone II or Interim Wellhead Protection Area (IWPA) of a public water supply well or within 75 feet of a private well, where road salt may contaminate water supplies.

- ^ Avoid dumping snow on DEP-designated high and medium-yield aquifers where it may contaminate groundwater (see the next page for information on ordering maps from MassGIS showing the locations of aquifers, Zone IIs, and IWPAs in your community).

- ^ Avoid dumping snow in sanitary landfills and gravel pits. Snow meltwater will create more contaminated leachate in landfills posing a greater risk to groundwater, and in gravel pits, there is little opportunity for pollutants to be filtered out of the meltwater because groundwater is close to the land surface.

^ Avoid disposing of snow on top of storm drain catch basins or in stormwater drainage swales or ditches. Snow combined with sand and debris may block a storm drainage system, causing localized flooding. A high volume of sand, sediment, and litter released from melting snow also may be quickly transported through the system into surface water.

Site Selection Procedures

It is important that the municipal Department of Public Works or Highway Department, Conservation Commission, and Board of Health work together to select appropriate snow disposal sites. The following steps should be taken:

a) Estimate how much snow disposal capacity is needed for the season so that an adequate number of disposal sites can be selected and prepared.

b) Identify sites that could potentially be used for snow disposal such as municipal open space (e.g., parking lots or parks).

c) Sites located in upland locations that are not likely to impact sensitive environmental resources should be selected first.

d) If more storage space is still needed, prioritize the sites with the least environmental impact (using the site selection criteria, and local or MassGIS maps as a guide).

MASSGIS Maps of Open Space and Water Resources

If local maps do not show the information you need to select appropriate snow disposal sites, you may order maps from MassGIS (Massachusetts Geographic Information System) which show publicly owned open spaces and approximate locations of sensitive environmental resources (locations should be field-verified where possible). Different coverages or map themes depicting sensitive environmental resources are available from MassGIS on the map you order. At a minimum, you should order the Priority Resources Map. The Priority Resources Map includes aquifers, public water supplies, DEP-approved Zone II's, Interim Wellhead Protection Areas, Wetlands, Open Space, Areas of Critical Environmental Concern, NHESP Wetlands Habitats, DEP Permitted Solid Waste facilities, Surface Water Protection areas (Zone A's) and base map features. The cost of this map is $25.00. Other coverages or map themes you may consider, depending on the location of your city or town, include Outstanding Resource Waters and DEP Eelgrass Resources. These are available at $25.00 each, with each map theme being depicted on a separate map. Maps should be ordered from MassGIS via the Internet at http://www.state.ma.us/mgis. Maps may also be ordered by fax at (617) 626-1249 (order form available from the MassGIS web site) or mail. For further information, contact MassGIS at (617) 626-1189.

2. SITE PREPARATION AND MAINTENANCE

In addition to carefully selecting disposal sites before the winter begins, it is important to prepare and maintain these sites to maximize their effectiveness. The following maintenance measures should be undertaken for all snow disposal sites:

- A silt fence or equivalent barrier should be placed securely on the downgradient side of the snow disposal site.
- To filter pollutants out of the meltwater, a 50-foot vegetative buffer strip should be maintained during the growth season between the disposal site and adjacent waterbodies.
- Debris should be cleared from the site prior to using the site for snow disposal.
- Debris should be cleared from the site and properly disposed of at the end of the snow season and no later than May 15.

3. EMERGENCY SNOW DISPOSAL

As mentioned earlier, it is important to estimate the amount of snow disposal capacity you will need so that an adequate number of upland disposal sites can be selected and prepared.

If despite your planning, upland disposal sites have been exhausted, snow may be disposed of near waterbodies. A vegetated buffer of at least 50 feet should still be maintained between the site and the waterbody in these situations. Furthermore, it is essential that the other guidelines for preparing and maintaining snow disposal sites be followed to minimize the threat to adjacent waterbodies.

Under extraordinary conditions, when all land-based snow disposal options are exhausted, disposal of snow that is **not obviously contaminated** with road salt, sand, and other pollutants may be allowed in certain waterbodies under certain conditions. **In these dire situations, notify your Conservation Commission and the appropriate DEP Regional Service Center <u>before</u> disposing of snow in a waterbody.**

Use the following guidelines in these emergency situations:

- Dispose of snow in open water with adequate flow and mixing to prevent ice dams from forming.
- Do not dispose of snow in saltmarshes, vegetated wetlands, certified vernal pools, shellfish beds, mudflats, drinking water reservoirs and their tributaries, Zone IIs or IWPAs of public water supply wells, Outstanding Resource Waters, or Areas of Critical Environmental Concern.
- Do not dispose of snow where trucks may cause shoreline damage or erosion.

^ Consult with the municipal Conservation Commission to ensure that snow disposal in open water complies with local ordinances and bylaws.

FOR MORE INFORMATION

If you need more information, contact one of DEP's Regional Service Centers:

Northeast Regional Office, Wilmington, (978) 661-7677
Southeast Regional Office, Lakeville, (508) 946-2714
Central Regional Office, Worcester, (508) 792-7683
Western Regional Office, Springfield, (413) 755-2214

or

Call Thomas Maguire of DEP's Bureau of Resource Protection in Boston, at (617) 292-5602.

Snow guidance 3-8-01b

REUSE AND DISPOSAL OF STREET SWEEPINGS

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BUREAU OF WASTE PREVENTION

FINAL POLICY # BWP-94.092

This Policy provides guidance on the Department of Environmental Protection's requirements, standards, and approvals for handling, reuse and disposal of street sweepings.

____
Date

By Signature on Original
Carl F. Dierker,
Assistant Commissioner,
Bureau of Waste Prevention

POLICY # BWP-94.092
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1 POLICY STATEMENT AND SCOPE

This Policy explains the Department of Environmental Protection's requirements for managing street sweepings. Street sweepings are solid waste subject to the Massachusetts solid waste regulations. The options for managing street sweepings are as follows.

1. Use the street sweepings in accordance with the pre-approved uses described in Section 4 of this policy.

2. Use the street sweepings for a beneficial use after obtaining prior approval from the Department under the provisions of the solid waste regulations, 310 CMR 19.060, Beneficial Use of Solid Wastes.

3. Dispose of street sweepings at a permitted solid waste landfill.

The provisions and requirements for managing street sweepings under these options are the subject of this policy.

2 APPLICABILITY

This policy applies to the reuse or disposal of street sweepings that are generated in the ordinary and customary maintenance of roadways. The policy does not apply to catch basin cleanings or street sweepings mixed with catch basin cleanings or other wastes. The policy does not apply to the material generated as the result of the clean up of an oil or hazardous material spill.

Street sweepings are not exempt from the Hazardous Waste Regulations, 310 CMR 30.000, and must be handled as hazardous waste when they exhibit any of the characteristics of a hazardous waste. If there is no evidence of unusual contamination, the Department does not require street sweepings to be routinely tested, but, as is the case with any waste, the generator has the ultimate responsibility for determining whether the waste is a hazardous waste.

3 DEFINITIONS

<u>Department</u> or <u>DEP</u> means the Massachusetts Department of Environmental Protection.

<u>Public Way</u> means the strip of land over and under a publicly owned, paved road or highway and includes the publicly owned land adjacent to the road or highway.

<u>Street Sweepings</u> means materials consisting primarily of sand and soil generated during the routine cleaning of roadways but may also contain some leaves and other miscellaneous solid wastes collected

during street sweeping. Street sweepings does not mean the material generated during the clean up of a spill or material from other structures associated with a roadway such as catch basins.

Urban center roads means local roads in central commercial and retail business districts and industrial and manufacturing areas.

4 PRE-APPROVED USES, RESTRICTIONS AND CONDITIONS

This policy allows street sweepings to be used in several applications. No approval from the Department is required when the restrictions and conditions identified in this policy are adhered to. However, sweepings shall not be used unless prior approval is obtained from the owner of the location where the sweepings are to be used.

4.1 Use at Landfills

Street sweepings may be used for daily cover at lined or unlined permitted solid waste landfills and need no prior DEP approval if the sweepings satisfy the requirements for daily cover material specified at 310 CMR 19.130(15).

4.2 Use as Fill in Public Ways

Street sweepings shall be used for fill in public ways without prior approval from the Department only when the following restrictions and conditions are observed:

The sweepings have not been collected from Urban Center Roads (see definition);

The sweepings are used under the road surface or as fill along the side of the road within the public way;

The sweepings are not used in residential areas;

The sweepings are kept above the level of the groundwater;

The sweepings are not used in designated "No Salt Areas";

The sweepings are not used within the 100 foot buffer zone of a wetland or within wetland resource areas including bordering vegetative wetlands and riverfront areas;

The sweepings are not used within 500 feet of a ground or surface drinking water supply.

4.3 Use As an Additive to Restricted Use Compost

Street sweepings shall be used as an additive to compost without prior approval from the Department only when the following restrictions and conditions are observed:

> The sweepings have not been collected from Urban Center Roads (see definition);
>
> The compost is used only in public ways;
>
> The compost is not used in residential areas;
>
> The compost is kept above the level of the groundwater;
>
> The compost is not used in designated "No Salt Areas";
>
> The compost is not used within the 100 foot buffer zone of a wetland or within wetland resource areas including bordering vegetative wetlands and riverfront areas;
>
> The compost is not used within 500 feet of a ground or surface drinking water supply.

5 OTHER USES

Any use not pre-approved in the preceding section requires prior Department approval under the Beneficial Use provisions of the <u>Solid Waste Management Facility Regulations</u> at 310 CMR 19.060. A "Beneficial Use Determination" or BUD can be made only after the submission of an application characterizing the waste and describing the proposed beneficial use.

6 DISPOSAL

While the beneficial use of street sweepings is strongly encouraged, the Department does not prohibit the disposal of street sweepings. Street sweepings may be disposed in either lined or unlined permitted solid waste landfills without prior approval from the Department.

7 HANDLING

7.1 Collection of Street Sweepings

Although DEP does not regulate the collection of street sweepings, collection practices should be compatible with intended uses. For example, sweepings from Urban Center Roads are not approved for the uses allowed for sweepings from other areas. Keeping sweepings from

Urban Center Roads separate from sweepings from other areas will make the full benefits of this policy available.

This policy does not cover sweepings known to be contaminated by spills, and such sweepings should be collected separately and kept segregated. Depending on the contamination and circumstances, the handling of contaminated sweepings may be governed by the Massachusetts Contingency Plan, 310 CMR 40, the Massachusetts Hazardous Waste Regulations, 310 CMR 30, the Massachusetts Site Assignment Regulations for Solid Waste Facilities, 310 CMR 16 or the Massachusetts Solid Waste Management Facility Regulations, 310 CMR 19.

7.2 Storage

Street sweepings shall be temporarily stored prior to use, only when the following conditions are satisfied:

Storage must be at the site where the sweepings are generated (in the public way) or at a location, such as a DPW yard, that is under the control of the governmental entity which is doing the sweeping or has contracted for the sweeping;

The sweepings shall be protected from wind and rain to the extent necessary to prevent dust, erosion and off-site migration;

The sweepings shall not be stored within the 100 foot buffer zone of a wetland or within wetland resource areas including bordering vegetative wetlands and riverfront areas;

The sweepings shall not be stored within 500 feet of a ground or surface drinking water supply;

Storage shall incorporate good management practice and result in no public nuisance;

Storage must be temporary. Street sweepings shall be used within one year of collection unless the DEP Regional Office in the region where the sweepings are stored grants a written extension. An extension may be granted when it is demonstrated that all storage conditions will continue to be satisfied and the stored sweepings will be put to a specific identified use prior to the expiration of the extension period.

7.3 Preparation Prior to Use

Solid waste, such as paper, auto parts and other trash, shall be removed from the sweepings prior to use. Leaves, twigs and other organic matter should also be removed when good engineering practice indicates this is necessary to produce a material that is suitable for the intended use.

8 BACKGROUND

The Department has consistently classified street sweepings as solid waste subject to Massachusetts General Law Chapter 111, Section 150A and the Massachusetts Solid Waste Regulations (Site Assignment Regulations for Solid Waste Facilities, 310 CMR 16.00 and Solid Waste Management Facility Regulations, 310 CMR 19.000). There has been confusion among some in the regulated community about this classification.

Prior to the development of this policy, the options for handling street sweepings were limited to:

1. Disposal at a permitted solid waste landfill,

2. Use as cover at a permitted solid waste landfill or

3. Use in accordance with a Beneficial Use Determination (BUD). BUD decisions are made on a case-by-case basis and require the submittal of a formal application to the Department containing data showing the chemical composition of the street sweepings.

The simplest of these options was either to use the sweepings for landfill cover or to dispose of the sweepings at the local landfill. As many local landfills close, these options become less available to many communities. However, transporting sweepings to a distant landfill involves increased transportation costs and possibly payment of tipping fees.

To clarify the requirements and to provide simpler and less expensive alternatives for handling street sweepings, the Department undertook the development of this policy. Because useful studies of the chemical composition of street sweepings could not be found in the literature, the Department solicited the help of municipalities and state agencies in conducting a study of the composition of street sweepings from various types of areas. The results showed that sweepings from all areas, except Urban Center Roads, were similar with the main constituents of concern being total petroleum hydrocarbons (TPH) and polynuclear aromatic hydrocarbons (PAHs). Very limited data from Urban Center Roads indicated that sweepings from these areas may be more contaminated than sweepings from other areas.

The test results indicate that sweepings may contain levels of contamination that are unsuitable for unrestricted use. However, except for sweepings from Urban Center Roads, the levels of contamination were consistent and low enough to allow the use of sweepings in restricted applications without requiring testing or pre-approval as long as certain conditions were met. Sweepings from urban areas were excluded from some pre-approved uses. This situation could change when more data are available from Urban Center Roads.

This policy makes it possible for municipalities, state agencies and other governmental entities to handle street sweepings in an environmentally sound manner with a minimum of paperwork and expense.

9 ADDITIONAL INFORMATION

For additional copies of this policy, permit application forms or other DEP documents (except regulations) call any DEP Regional Office and ask for the Service Center or call the DEP Infoline in Boston. The permit application number for a Beneficial Use Determination is BWP SW-13 (Major) and BWP SW-30 (Minor).

Many DEP documents, including this policy, are available via modem from the DEP electronic bulletin board system, (617)292-5546. Information about the DEP and some documents are also available from the DEP's internet site at http://www.magnet.state.ma.us/dep.

Copies of all Massachusetts regulations, including the solid waste regulations, may be purchased from the State House Bookstore, (617)727-2834. The solid waste regulations are:

310 CMR 16.000, Site Assignment Regulations for Solid Waste Facilities

310 CMR 19.000, Solid Waste Management Facility Regulations

Questions about the Provisions of the Policy

If you have technical questions about the policy, please call any DEP office and ask to speak with a staff member about the provisions of the policy.

DEP InfoLine: from area code 617 and outside MA: (617)338-2255
from area codes 413 and 508: (800)462-0444
e-mail: infoline@state.ma.us

DEP Western Regional Office
436 Dwight Street
Springfield, MA 01103
Main Number: (413)784-1100
Service Center: extension 214

DEP Central Regional Office
627 Main Street
Worcester, MA 01605
Main Number: (508)792-7650
Service Center: (508)792-7683

DEP Northeast Regional Office
10 Commerce Way
Woburn, MA 01801
Main Number: (617(932-7600
Service Center: (617)932-7677

DEP Southeast Regional Office
20 Riverside Drive
Lakeville, MA 02347
Main Number: (508)946-2700
Service Center: (508)946-2714

DEP Boston Office
Division of Solid Waste
One Winter Street
Boston, MA 02108
(617)292-5960

Draft Interim Guidance Document for Beneficial Use Determination Regulations 310 CMR 19.060

March 18,2004

Massachusetts Department of Environmental Protection

Bureau of Waste Prevention

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Appendicies

Executive Summary

This Beneficial Use Determination Guidance Document provides information to assist the applicant in preparing an application for beneficial use in accordance with the Beneficial Use Regulations, 310 CMR 19.060. The Guidance also includes a table of numerical values for secondary material constituents calculated using predefined exposure assumptions.

The information contained in this document is intended solely as guidance. This Policy does not create any substantive or procedural rights, and is not enforceable by any party in any administrative proceeding with the Commonwealth. This Policy provides recommendations and guidance on approaches the Department considers acceptable for meeting the performance standards set forth in the Solid Waste Management Facility Regulations, 310 CMR 19.000 and discussed in this document.

DEP will use the information submitted by the applicant to determine if a proposed use of a secondary material can be accomplished without creating a significant risk, causing an adverse impact, or resulting in nuisance conditions. It is incumbent upon the applicant to demonstrate and otherwise provide DEP with sufficient information to determine if issuing a Beneficial Use Determination (BUD) is warranted.

There are four categories of uses for secondary materials. Each category is held to the same general standard of protection of public health, safety and the environment. However, within each category are options for demonstrating that this standard has been met. The scope of work required for each option should be consistent with the nature and extent of contamination and the type of use proposed. Therefore, uses of materials with lesser contamination and greater material control have a simpler demonstration to make. The categories include:

- Beneficial Use of Secondary Materials in Commercial Products
- Beneficial Use of Secondary Materials in Regulated Systems
- Beneficial Use of Secondary Materials in Restricted Applications
- Beneficial Use of Secondary Materials in Unrestricted Applications.

The Department has developed a quantitative risk assessment approach for use in restricted and unrestricted applications for use when evaluating risk. This approach is similar to the approach used by the Bureau of Waste Site Cleanup as documented in the Massachusetts Contingency Plan (MCP, M.G.L. Chapter 21E), but contoured to the goals of the Bureau of Waste Prevention. The assessment incorporates three methods for establishing criteria for comparison with secondary material constituent concentrations. Method 1 incorporates a list of hazardous material values that have been calculated based upon a predetermined set of exposure scenarios. Secondary materials that contain constituents of concern that do not exceed these values have demonstrated no significant risk to the public health, safety and the Environment. Method 2 may be used to derive risk criteria when unavailable in the Method 1 assessment. Method 3 involves an assessment of total risk based on site-specific information.

Where an Applicant is interested in obtaining a BUD in more than one state, there is an opportunity to pursue multi-state review of BUD applications. To do so the applicant must notify DEP at the beginning of the application process. For more information about multi-state review, see *"APPLICANT GUIDANCE DOCUMENT FOR MULTI-STATE BENEFICIAL USE DETERMINATIONS FOR NON-HAZARDOUS MATERIALS,"* which is available upon request.

This document does not provide solid waste facility siting guidance pursuant to 310 CMR 16.00 nor does it affect traditional recycling activities for which exemptions from site assignment exist pursuant to 310 CMR 16.05.

For further information

On the Web

Risk Assessment: Office of Research & Standards,
*http://www.state.ma.us/dep/ors/orspubs.ht*m

Solid Waste Regulations & Best Management Practices:

Bureau of Waste Prevention, Solid Waste
http://www.state.ma.us/dep/ors/orspubs.htm
or contact (sean.griffin@state.ma.us) (617) 292-5967 or
James Doucett, Bureau of Waste Prevention.
(James.Doucett@state.ma.us) (617) 292-5868

1 Application Process

The BUD application process is divided into two phases: 1) pre-application, and 2) application (see figure1). During the pre-application phase, the applicant provides the Department with a clear picture of the proposed beneficial use, and then, working with the Department, outlines the steps necessary to demonstrate that the proposed use meets the requirements of the beneficial use regulations.

1.1 Determination of Applicability

In some instances, an applicant may want an interpretation from the Department to determine if an activity is exempt from solid waste regulations pursuant to 310 CMR 16.05. The proponent may request a Determination of Applicability. A Determination of Applicability is a prescreening tool used by the Department to evaluate general information about a secondary material and use. The required information for the Determination of Applicability is found at 310 CMR 19.060(2), Determination of Applicability, and includes:

- A facility or operation description
- A list of products currently and historically manufactured by the facility
- A description of the secondary material
- Specifications for use of the secondary material
- A list of licenses, permits or other prior approvals issued for the use of the secondary material

The distinction between a solid waste and a product or commodity in commerce is not a bright line. The request for a Determination of Applicability should make the case for the activity as a commercial operation based upon the information submitted.. The request does not have to be comprehensive, as is necessary for a beneficial use application, nor is sampling a prerequisite. General information that is readily available should usually suffice.

1.2 Pre-Application

The pre-application process provides an opportunity for the applicant to receive specific guidance on submitting a comprehensive application. The applicant initiates the pre-application process by submitting pre-application information to the Department and requesting guidance. Upon receipt of the request the Department may: schedule a pre-application meeting; advise the applicant to submit a formal application (BWP SW 13 or 30); or determine that a BUD is not warranted. The information may be in a format of the applicants choosing, such as a draft of the application, but it should contain the information found at 310 CMR 19.060 (6), General Application Requirements, which includes:

- A physical and chemical characterization of the secondary material
- A general description of the secondary material (i.e. visual appearance, matrix, etc.)
- Identification of proposed amounts to be used
- A description of how the secondary material will be used
- Identification of the material it is replacing, if applicable, and specifications for use
- A description of the facility or operation that will use the material
- Identification of risk management techniques and best management practices (BMPs) to be employed in the use of the secondary material

- Identification of the proposed location of use, if applicable, or types of locations where the secondary material will be used (e.g. highway rights-of-way, industrial zoned properties, etc.)

This information will allow the Department to conduct a cursory review and to anticipate issues that may need to be discussed with the Applicant. Although the applicant may have conducted testing prior to the pre-application process, the Department recommends that comprehensive, statistically valid sampling, if necessary, be performed after consultation with the Department. The Department will provide specific application requirements, including the appropriate category of review, upon request.

1.3 Filing the Application

The application phase begins the official permit timeline and is initiated by the submittal of the completed application, transmittal form, and application fee if applicable, pursuant to 310 CMR 4.00. In most cases the review component of the process is 60-90 days. Sixty days is the standard timeline for reviews of technically complete applications. However, an incomplete or deficient application will trigger an additional 30-day technical review period. If the scope of the proposal warrants an individual rule, pursuant to 310 CMR 4.05, the applicant and Department will work together to develop a more appropriate schedule and fee with milestones and deadlines.

1.3.1 Where to File

Applicants should submit applications for sites in a specific town(s) or DEP region(s) to the appropriate regional office, c/o Solid Waste Section Chief, Bureau of Waste Prevention. The Department regional office mailing address information is found on the Web at www.mass.gov/dep/. BUDs issued by a region are valid only in the issuing regions.

If applicants want to use the material in more than one region, applicants should submit applications for statewide beneficial use to:

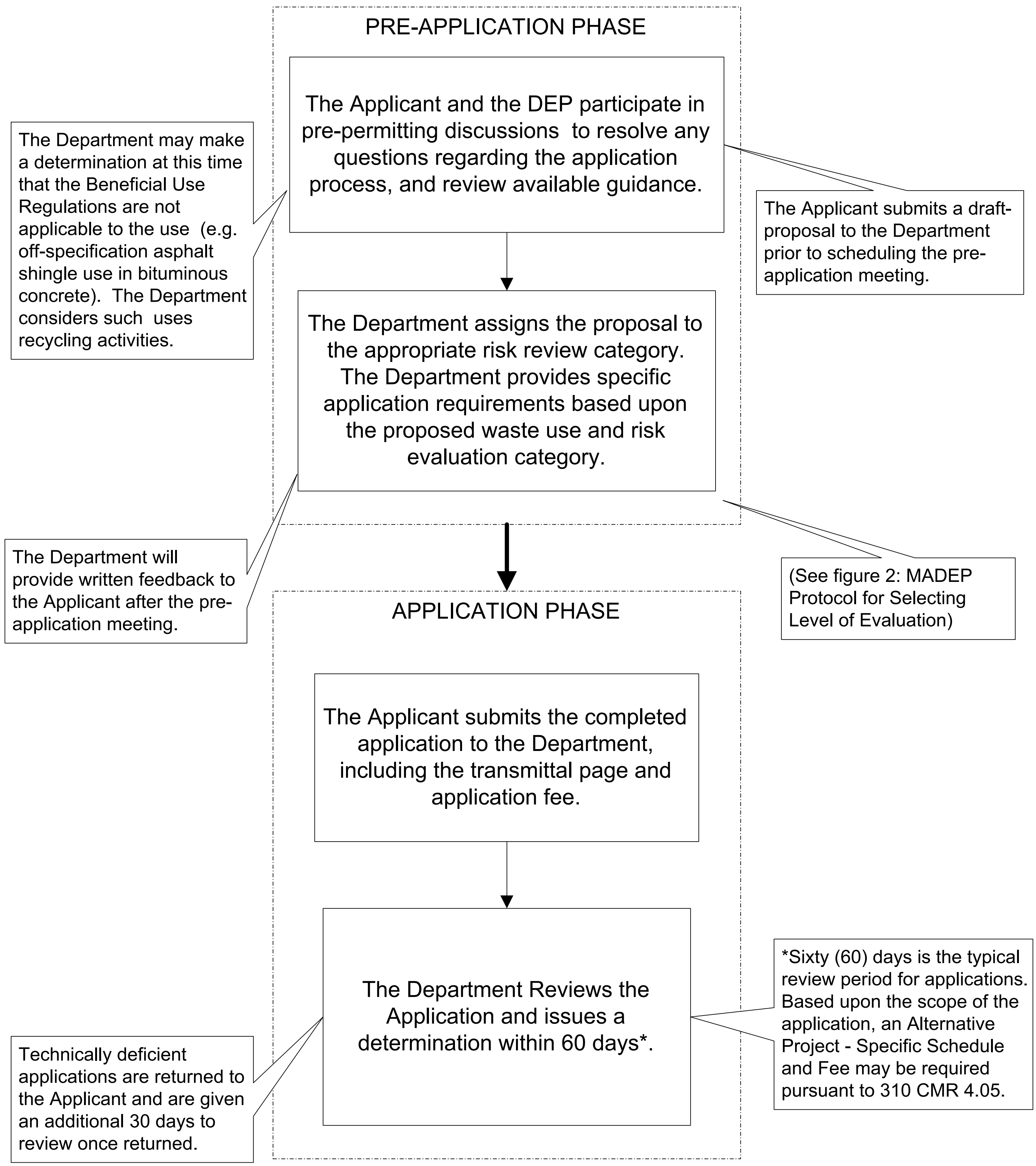
The Department of Environmental Protection
c/o Waste Branch Chief
Bureau of Waste Prevention, 9th floor
One Winter Street
Boston, MA 02108

A statewide BUD authorizes the applicant to use the secondary material throughout the Commonwealth.

1.3.2 Generic BUDs

Occasionally, the Department will issue Generic Beneficial Use Determinations as policies. These policies are specific to certain waste-use combinations and are authorized for any party provided that the user conforms to all the conditions contained in the policy. The Department's policy on contaminated soil use as daily cover at landfills (Comm. 97-001) is an example of the type of policy that is

Figure 1: Application Process Overview



considered a generic BUD. Consult the Department's home page on the web at www.state.ma.us/dep for a list of statewide generic BUDs.

1.3.3 Processing of Secondary Materials

When a solid waste is processed, a facility site assignment is required pursuant to Chapter 111: Section 150A, Solid Waste Disposal Facilities; Maintenance and Operation; Applications For Site Assignment. Limited processing of secondary materials intended for beneficial use may be allowed without a site assignment if this processing is typical of processing of similar industrial products or feedstock materials.

However, the Department will inform the applicant if a site assignment, Determination of Need (DON) or other appropriate mechanism is necessary pursuant to 310 CMR 16.00, Site Assignment Regulations.

1.4 Demonstration Projects

The Department may grant temporary approval for a pilot project or demonstration project pursuant to 310 CMR 19.062, Demonstration Projects or Facilities. Demonstration project approvals are granted, solely at the Department's discretion, when the information gathered during the demonstration project will determine if the secondary material is an effective substitute for the material it is replacing or assist the Department in making a long-term determination regarding the potential for significant risk or adverse impact to public health, safety and the environment. The application requirements will be determined on a case-by-case basis.

2 Secondary Material Testing

2.1 Sampling, Analytical and Data Quality

Any person applying to beneficially use secondary materials needs to ensure that analytical and other data used in support of any application are scientifically valid and defensible, and of a level of precision and accuracy commensurate with its stated or intended use. Applications that do not conform to these criteria will be rejected. The following provides guidance to assist applicants in complying with these requirements.

2.2 Mixtures

Sampling performed to evaluate potential risk or identify adverse impacts shall be conducted on the material as used based upon industry specifications or specifications as developed to meet a specific need. The basis for determining the content of products produced using secondary materials should be determined prior to chemical characterization. It may be necessary to perform sampling on the secondary material as well and this should be detailed in the Quality Assurance Plan as discussed in section 2.5. Final mix ratios should not be based upon a dilution factor in order to conform to an established Department standard, value or criteria.

2.3 Secondary Material Characterization.

The application should address all potential constituents of concern (COC) that may reasonably be expected to be contained in the secondary material. These include secondary material precursor constituents, products of formation resulting from the mixing of materials, cross contamination resulting from the contact with other materials in the waste stream or during their primary use, or the presence of proprietary ingredients that may contain COCs. If a secondary material is not adequately characterized the beneficial use may be denied.

Depending on the secondary material and its proposed beneficial use, sampling and chemical analyses may be required to determine or confirm the nature of the constituents present and determine their concentration. In these cases, a well thought out sampling plan should be developed and implemented (see Section 2.4) to ensure that the data generated is representative of the secondary material.

2.4 Sampling And Analytical Test Methods.

Sampling methods should consider in situ conditions and other factors, such as mix ratios, that contribute to releases of COCs.
It is the applicant's responsibility to insure that the analytical and sampling methods used and the data generated are appropriate and meet performance requirements (e.g. equipment sensitivity; reproducibility; etc.). Because of the diversity of secondary material constituents, it is impossible to identify specific sampling and analytical protocols to cover all situations. A variety of test methods exist that may be appropriate for chemical analyses of secondary materials (for example, see EPA SW846 at http://www.epa.gov/epaoswer/hazwaste/test/main.htm). The applicant must ensure that the methods selected are appropriate and meet necessary data quality objectives. It should be noted that if secondary material-specific COCs are identified that are not included on a method-specific target analyte list, then these additional analytes must also be incorporated into the sampling and analytical plan with appropriate calibration and QA/QC verification.

In every case, the reporting limit, based on the concentration of the lowest calibration value for each COC, must be less than or equal to the applicable BUD standard or other criteria, as appropriate (i.e., Method 1 Standards, risk management criteria; background concentration; etc.) In some cases, this may require analytical modifications, such as increased sampling weight or volume, to increase sensitivity. All such modifications should be reported.

2.5 Quality Assurance Plans.

In order to ensure that appropriate performance criteria are established and met, the applicant should, for every application, prepare a BUD Quality Assurance Plan (QAP).. The QAP is a comprehensive document that details the QA/QC protocols and goals for a specific data collection activity.

In preparing QAPs, the following sources of information should be consulted. These sites provide detailed information on the content and preparation methods for developing an acceptable QAP.

- http://www.state.ma.us/dep/bwsc/files/data/QAQCDocs.htm
- http://www.epa.gov/epaoswer/hazwaste/test/main.htm
- SW846 (chapter 1 and chapter 9)
- http://www.state.ma.us/dep/bwsc/files/data/samevrep.pdf
- MA DEP's Quality Assurance and Quality Control Guidelines for Sampling, Data Evaluation and Reporting Activities.

- http://www.epa.gov/r10earth/offices/oea/r0qadrg.htm
- US EPA's Data Review Guidelines

Common QA/QC requirements that should be included in any BUD sample collection and analysis effort are listed below. QAPs that do not include these components may be viewed as unacceptable unless a valid, detailed scientific explanation is provided.

QAPs should specify:

1. trip blanks with each batch of samples submitted to the lab for analysis of VOCs and VPH;
2. an equipment blank for analysis of all parameters. If more than 20 samples are to be taken, one blank per 20 samples should be submitted;
3. triplicate samples for a matrix spike (ms) and matrix spike duplicate (msd) analysis, with one triplicate set for every 20 samples;
4. blind duplicate samples and blind proficiency standards;
5. certification by responsible parties (laboratory director; consultant in charge; applicant) that sampling records and analytical data were reviewed and that all elements of the QAP were complied with or, if not, that all deviations were identified and adequately explained.

In addition, applicants must ensure that all staff involved with any component of the sampling and analysis plan, including those collecting samples as well as the selected laboratory:

1) Review the Project's QAP and identify any exceptions or qualifications.
2) Verify, document and maintain sample integrity (containers, preservatives, holding times, etc.)
3) Perform the requested analyses in strict conformance with the specified method and any applicable DEP method requirements.
4) Maintain complete records of all sample submittals and analytical process data.

2.6 Representative Sampling

The Department experience with BUD applications shows that statistical representation is not often considered when sampling secondary materials. This section is meant to provide a brief summary of some key statistical concepts and terms; provide references for consultation; and to emphasize the importance that statistically based testing plays in demonstrating protection to the public health, safety and the environment. Proper analysis will allow the applicant to gain the necessary information with the minimum of expense and effort. However, the physical and chemical diversity of materials, as well as the dissimilarity of storage facilities (lagoons, open piles, tanks, drums, etc.) and sampling equipment associated with them, preclude a detailed consideration in this guidance document of any specific sampling plan. Consequently, the burden of responsibility for developing a technically sound sampling plan rests with the applicant.

In most cases, the objective of a beneficial use application sampling plan is to adequately characterize the secondary material. Frequently, it is impossible, or at least impractical, to take measurements of all the entire waste material (the population). Statistical analysis is a tool for drawing conclusions about a population by evaluating a sample size that is smaller than the entire population in order to make judgments about the entire population. Statistically valid sampling plans will have samples that are representative of the population. The purpose of the sampling plan is to derive a mean concentration (the mean concentration is the average of sample readings) that may not be the true mean (the average of the entire population) but some measure of central tendency and dispersion about the true mean. The measure of the dispersion around the mean is called the standard deviation (or standard error) and is calculated based upon the assumption that the distribution of the concentration of any contamination within a solid waste resembles a bell curve. It is important to note at this time that although a variety of distribution curves exist for varying populations, the curve for contamination within a solid waste is considered to be a normal distribution. There are methods for testing the correctness of this assumption; however, this usually requires a great number of samples beyond what is typical for solid waste analysis.

Since one cannot be 100% sure that the mean concentration is equal to the true concentration, the closer the mean concentration is to the regulatory threshold the more important it is for added precision. For purposes of evaluating solid wastes, the probability level (confidence interval) of 80 % has been selected. That is to say that for each chemical COC, a confidence interval (CI) is described around the true mean for which 80 out of 100 samples are expected to fall. The 80% CI is then compared with the appropriate regulatory threshold. Because the normal bell shaped curve is presumed for the distribution of samples around the true mean there is actually only a 10% chance (not 20%) that the threshold is equaled or exceeded. Consequently, the CI employed to evaluate solid wastes is, for all practical purposes, a 90% interval. For example, if a regulatory threshold is 5 mg/Kg and the calculated mean concentration within a waste is 4 mg/Kg then the upper range of the CI (the range for which 80 out of 100 samples are expected to fall based upon the bell curve) must also be below the regulatory threshold of 5 mg/Kg.

It is prudent to collect a greater number of samples than indicated by the preliminary estimates of the mean and standard deviation in the event that poor estimates were chosen. The information described in this section was derived from the EPA Guidance Document, *Test Methods for Evaluating Solid Waste,* SW-846.

2.7 Reporting.

Analytical results must be reported in conformance with DEP’s requirements for the submittal as a whole and for the specified analyses.

Reports should include:

- Sample information (matrix, preservative, temperature on receipt, etc.)
- Request for analysis
- Method citation(s)
- Custody records
- Case narrative detailing anomalies, comments and qualifications to data.

- Analytical results (to include individual reporting limits for individual analytes, dilutions, extraction/pretreatment, etc.)
- QA/QC results (surrogate recovery, method blanks, standard deviation, etc., as applicable)
- Laboratory analytical certification (method followed, acceptance criteria met, and documentation of method modifications or anomalies)

3 CATEGORIES OF BENEFICIAL USE

Assessment options for evaluating COCs are specific to categories of use. The Department developed these categories to tailor the application requirements to similar types of uses. The categories differ in their potential for releases of, and exposures to, COC.

The categories include the following:

Category 1: <u>Beneficial Use of Secondary Materials in Commercial Products</u>

Products manufactured from secondary materials or secondary materials that are directly used as products are considered commercial products under the following conditions:

- When the product is used in a manner that is consistent with industry accepted product specifications or performance standards;
- When the product is controlled and managed throughout its lifecycle in a manner that effectively limits potential for illegal or inadvertent disposal or releases of hazardous material to the environment and exposure to people;
- When any adverse impacts or significant risks to public health, safety and the environment, including, but not limited to, nuisance conditions and public welfare impacts, can be evaluated by demonstrating conformance with the conditions stipulated in section 4.3;
- Products applied to the land cannot be considered commercial products.

Category 2: Beneficial Use of Secondary Materials in Regulated Systems

This category is applicable to beneficial uses that the Department already regulates through an existing permit, order or approval (e.g. landfill cover use is addressed through DEP Policy Comm. 97-001).

Category 3: Beneficial Use of Secondary Materials in Restricted Applications

Secondary materials that are beneficially used in applications that utilize risk management techniques in order to prevent adverse impact or significant risks to public health, safety and the environment, including, but not limited to, nuisance conditions and public welfare impacts, shall be reviewed in accordance with this section.

Category 4: Beneficial Use of Secondary Materials in Unrestricted Applications.

Secondary materials that are beneficially used in applications that do not limit exposure to potential human or environmental receptors from secondary material constituents are reviewed in accordance with this section when constituents have the potential to adversely impact or create a risk to public health, safety, or the environment, including, but not limited to, nuisance conditions or public welfare impacts when improperly stored, treated, transported, disposed of, used, or otherwise managed. Unrestricted beneficial use proposals are subject to the most comprehensive risk evaluations.

4 OPTIONS FOR EVALUATING CONSTITUENTS OF CONCERN (COCs) IN SECONDARY MATERIALS

4.1 Performance Standards

All beneficial use applications must demonstrate that the proposed beneficial use will not create significant risk or cause adverse impacts to the public health, safety, and the environment or result in nuisance conditions. The Applicant may demonstrate this by conforming to specific performance criteria included in the regulation and discussed in sections 4.2 and 4.3. These vary by category and may include consistency with background COC concentrations; consistency with COC concentrations in a traditional manufactured product (subject to specific limitations as discussed below); and consistency with DEP risk management criteria.

4.2 Critical Contaminants of Environmental Concern (CCCs)

CCCs are a subset of the universe of Contaminants of Concern (see Appendix – 2 for a full listing). This list includes compounds that pose an elevated threat to public health and the environment for the reasons identified below, and therefore are of particular concern. The list includes compounds that exhibit several of the following properties: 1) persistence in the environment; 2) ability to bioaccumulate; 3) potent toxicity; and/or 4) widespread presence in the environment at levels of concern. Under the BUD program, concentrations of CCCs in secondary materials must be demonstrated to be consistent with background levels and meet other applicable requirements for beneficial use in categories 3 and 4.

4.3 CATEGORY 1- Beneficial Use of Secondary Materials in Commercial Products

Category 1 beneficial uses may be approved provided that:

A. Concentrations of COC are demonstrated to be consistent with or below those in the traditional material it is replacing. This determination can be made through a statistical comparison of the concentrations of COC in samples of the secondary material with concentrations of COCs in samples of the traditional material. Applicants may be able to make this demonstration based on existing data or general information regarding the composition of the original and secondary materials.

Note that Category 1 approvals are not applicable to "products" intended for, or that will likely result in, unrecoverable dissemination in the environment (e.g. soil additives/amendments).

OR

B. Concentrations of all COC are demonstrated to be below MA background soil levels;

4.4 CATEGORY 2- Beneficial Use of Secondary Material in Regulated Systems

If the use of a secondary material is subject to an existing facility permit, order, policy, regulation or other approval, the use is considered adequately regulated for purposes of the Solid Waste Facility Regulations, 310 CMR 19.000. However, if there are any aspects of the beneficial use not covered that have the potential to create significant risk or cause adverse impacts to the public health, safety, and the environment or result in nuisance conditions then these concerns will be regulated under a BUD. When all solid waste concerns are overseen by an existing faciliy permit, order, policy, regulation or other approval, a BUD is not required. In all cases, the storage, transfer, processing, treatment, use and disposal of the secondary material shall be achieved using best management practices that prevent adverse impacts and significant risks to public health, safety and the environment, including, but not limited to, nuisance conditions and public welfare impacts.

4.5 CATEGORY 3: Beneficial Use of Secondary Materials in Restricted Applications

Category 3 beneficial use applications may be approved provided:

A. Concentrations of all COC are below Upper Contamination Limits (See Section - 5*.2.1.5, Upper Contamination Limits (UCLs)*).

AND

B. The proposed beneficial use, considering all COC, can be demonstrated to be in compliance with all applicable risk criteria using BUD Risk Assessment (RA) Methods 1 and/or 2, or Method 3 (note Methods 1 and 2 may be used together; Methods 1 and 2 cannot be combined with Method 3). If using a Method 1 BUD RA then concentrations must fall below the appropriate BUD Method 1 category (e.g. S-1/GW-2 or S-2/GW1 etc). If using a Method 3 BUD RA then assessments must use exposure pathways appropriate to the beneficial use.

OR

C. Concentrations of all COC are demonstrated, through sampling, to be below DEP approved MA background soil levels;

OR

D. The applicant can adequately demonstrate that environmental release and exposure pathways are substantively eliminated over the product's lifecycle under conditions of the beneficial use and DEP concurs. This option is not applicable to Unrestricted Beneficial Use (Category 4) proposals.

For Critical Contaminants of Concern (CCC)

If Critical Contaminants of Concern (CCC) are present then the applicant must demonstrate compliance with acceptable risk limits as in (B) above

AND

Demonstrate consistency with background (as in C above). (D) is not an option for CCC.

4.6 CATEGORY 4- Beneficial Use of Secondary Material in Unrestricted Applications

Category 4 beneficial use applications may be granted if:

A. Concentrations of all COC are below UCLs.

AND

B. The proposed beneficial use, considering all COC, can be demonstrated to be in compliance with all applicable risk criteria using BUD RA Methods 1 and/or 2, or Method 3 (note Methods 1 and 2 may be used together; Methods 1 and 2 cannot be combined with Method 3). Because use in this category is unrestricted, COC concentrations must fall below the most stringent BUD Method 1 standard or Method 2 values must be derived using the guidance discussed below or Method 3 assessments must be completed using conservative (residential-type) exposure pathways.

OR

C. Concentrations of all COC are demonstrated to be below DEP approved MA background soil levels.

For Critical Contaminants of Concern (CCC).

If Critical Contaminants of Concern (CCC) are present then the applicant must demonstrate compliance with acceptable risk limits as in (B) above;

AND

Demonstrate consistency with background (as in C above).

5 BUD RISK ASSESSMENT METHODS

The BUD risk assessment approach is based on, but not identical to, that used under the MCP (M.G.L. Chapter 21E Subpart I: Risk Characterization) to address hazardous waste sites in MA. Although the methodologies are similar, significant differences exist. In order to understand these differences and avoid potential delays in processing and reviewing BUD applications, it is important that the following guidance be reviewed carefully. Project proponents are advised to retain consultants with expertise in MA and USEPA risk assessment methods to complete BUD risk assessment work.

For a BUD to be approved the applicant must make an adequate demonstration that public health, safety and welfare and the environment will not be endangered because of the beneficial use. Criteria that may be used to make this determination for each of the beneficial use categories are discussed in Section 4, Options For Evaluating Constituents Of Concern In Secondary Materials. In all cases, the burden of proof rests with the applicant who must make this demonstration using appropriate data and methods. The level of complexity of the assessment required depends on the nature of the secondary material and the proposed beneficial use. Unrestricted beneficial use applications require very thorough and comprehensive assessments.

The following section provides guidance on risk assessment methods that applicants may use to evaluate beneficial use risks. In order to enhance consistency and to minimize potential creation of liability under the MCP associated with secondary material use and to streamline the process, BUD risk assessment methodologies have been based on those used in the MA MCP program. These methods are summarized below. Sections of the MCP risk assessment guidance and related documents, where more detailed information may be obtained, are identified. Differences between the MCP approach and that used to evaluate BUD risks are highlighted.

5.1 BACKGROUND: MCP RISK ASSESSMENT APPROACH

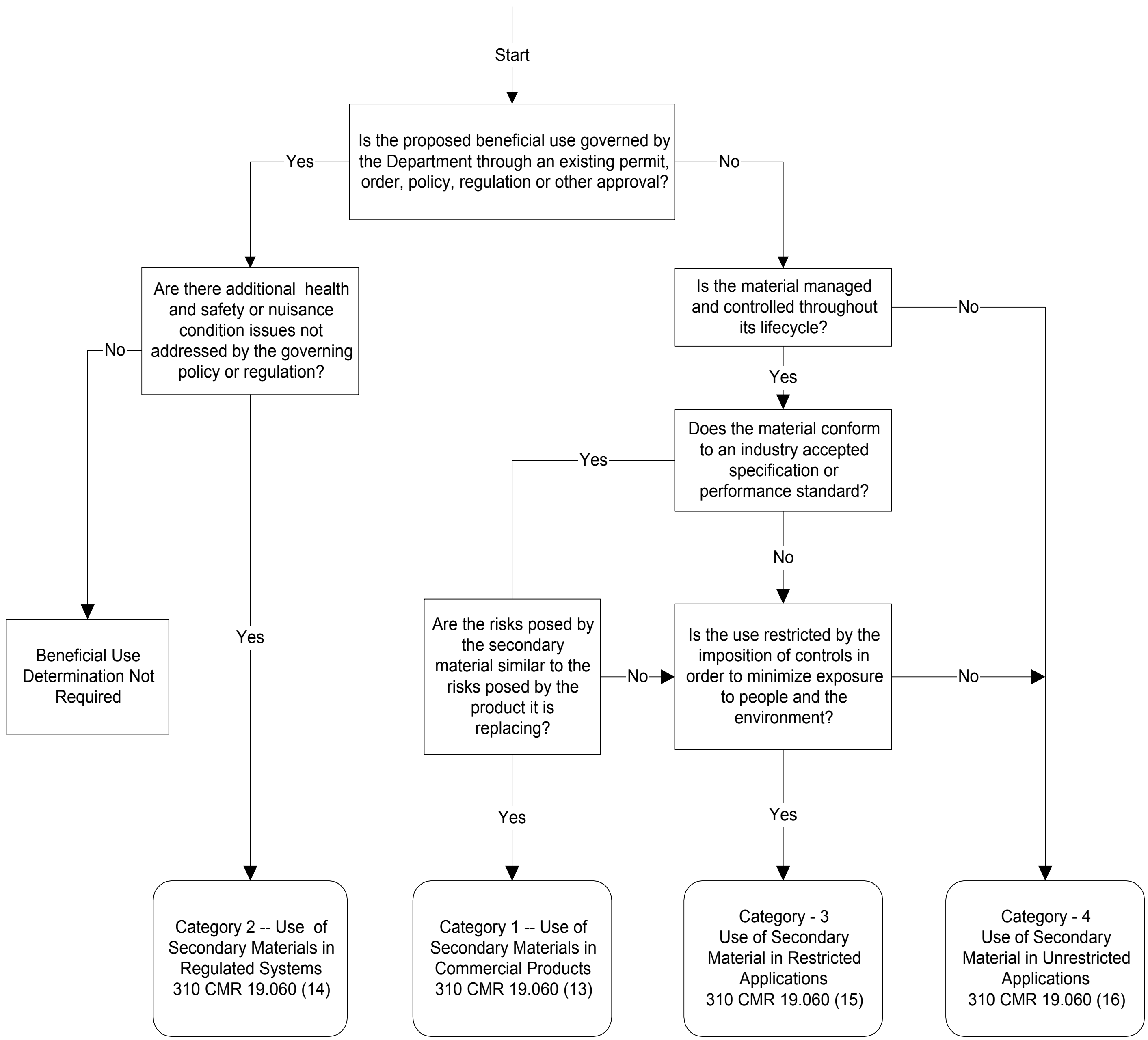
In Massachusetts, hazardous waste sites are assessed and cleaned-up under the regulations known as the Massachusetts Contingency Plan ("MCP"). The MCP specifies conditions under which contamination must be reported to the Department and conditions under which site contamination would pose "No Significant Risk" of harm to health, safety, public welfare and the environment. In the case of BUDs, if constituents in secondary materials are not adequately characterized and risks appropriately assessed, use of secondary materials has the potential of creating liability under the MCP.

The MCP provides three approaches for characterizing risks and the need for remediation at sites. These are: 1) use of standards established by DEP (Method 1); 2) use of standards developed by the applicant using appropriate methods as delineated by DEP (Method 2); and, 3) comprehensive site-specific risk evaluation (Method 3).

Method 1 standards include three categories for groundwater and three categories for soil. Method 2 provides for the derivation of a standard if one is not available under Method 1, using methods and risk management criteria specified by DEP. Method 3 involves an assessment of total risk based on site-specific information.

Under the MCP, sites must be cleaned up until constituent concentration risks meet the applicable risk management criteria or until concentrations are consistent with background. If feasible, background concentrations must be achieved.

Figure 2: Flowchart for Defining the Appropriate Waste Use Category



5.2 BUD RISK ASSESSMENT APPROACH

The BUD risk assessment approach parallels that used under the MCP. Key differences are summarized below, followed by guidelines for the appropriate use of the Method 1-3 options to assess BUD risks.

5.2.1 Key Differences: BUD vs. MCP Methods.

5.2.1.1 Risk Management Criteria.

The risk management criteria used in the BUD program differ from those established under the MCP. More stringent health protective criteria have been used in the BUD process to prevent the introduction of new constituents into the environment to prevent the creation of new environmental contamination. The MCP, on the other hand, is for the cleanup of existing contamination. The risk management criteria established under the MCP and the BUD program are compared in Table 1.

Table 1: Risk Management Criteria

Risk Type	**Risk Management Criteria (acceptable risk level)**	
	BUD Program	**MCP**
Individual Chemical Risk		
Cancer	0.5 X E-06	1 X E-06
Non-cancer	HI = 0.1	HI = 0.2
Total Risk		
Cancer	0.5 X E-05	1 X E-05
Non-cancer	HI = 0.5	HI = 1

5.2.1.2 Basis for Determining Background

BUD background values rely on the 50th percentile of appropriate sample distributions. In contrast, under the MCP, upper-range values were generally used. For example, under the MCP, the 90th percentile of an applicable distribution of contaminant concentrations in "clean" soils was used to establish generic background values for metals *(http://www.state.ma.us/dep/ors/files/backtu.pdf)*. These values are used in the

MCP to evaluate consistency of site contamination with background. Under the BUD process, consistency with background requires a demonstration that secondary material constituent concentrations are at or below the 50th percentile of an appropriate background soil concentration data set. To derive generic background values such data must be derived from samples of clean soils (e.g. rural, uncontaminated soils). Site specific background balues may also be derived and used in the case of Categories 1-3. These must be appropriate to the proposed use and/or site of use and must again be based on the 50th percentile. (note that hte MCP background values for PAHs were based on fill materials that are expected to have somewhat elevated levels compared to undisturbed soils. Thus, these were not used in the derivation of the BUD Method 1 values.)

5.2.1.3 Reportable Concentrations ("RCs")

Under the MCP, contamination in groundwater or soil must be reported to DEP if any concentration exceeds the applicable Reportable Concentration in either groundwater or soil. For use of secondary materials containing chemical COCs, reportable concentrations ***are not applicable.*** All secondary materials containing COCs, whether or not their concentrations are above or below RCs, must be evaluated through the BUD process using appropriate methodologies.

5.2.1.4 Basis of Values

In contrast to the derivation of the MCP Method 1 standards, drinking water standards and guidelines are not always adopted, when available, as the basis for the BUD Method 1 Values. The drinking water standards and guidelines are not all risk based. These values may take into account additional considerations, such as feasibility and cost issues, in their derivation. Because the BUD program addresses the potential introduction of new contamination into the environment, DEP concluded that it was inappropriate to establish BUD Method 1 Values using values that may be based on the feasibility and costs of treatment and cleanup of existing contamination. Instead, BUD Method 1 Values are based on risk, background concentrations, detection limits and nuisance conditions (odor potential).

For some chemicals the drinking water standard or guideline may be lower than the value derived using these alternatives (e.g. due to the inclusion of an additional uncertainty factor for possible carcinogens for which slope factors are not available). In these cases the drinking water value has been used in the derivation of the BUD standard.

5.2.1.5 Upper Contamination Limits (UCLs)

Under the MCP, DEP established Upper Concentration Limits for chemicals to limit the extent to which a site-specific risk assessment can be used to justify high residual concentrations of contaminants. In the MCP, if site concentrations exceed the UCLs established for groundwater or soil, the site cannot be considered "permanently cleaned up", except in the case of soil contaminants encapsulated beneath an engineered barrier.

For BUD evaluations, if constituent concentrations exceed the MCP UCLs, the material cannot be considered acceptable for beneficial use under Categories 3-4. It is important to note that compliance with UCLs does not mean that the material is acceptable for beneficial use. Compliance with all the other appropriate beneficial use decision criteria must also be demonstrated.

5.2.1.6 Critical Contaminants of Environmental Concern (CCCs)

As previously discussed special provisions are included in the BUD regulations for CCCs, which are not included in the MCP. Under the BUD program, concentrations of CCCs in secondary materials must be demonstrated to be consistent with background levels *and* meet other applicable requirements for beneficial use in categories 3 and 4.

6 RISK ASSESSMENT OPTIONS FOR BUDS

6.1 BUD Method 1

Method 1 may be used to assess beneficial use risks for any beneficial use category when Method 1 standards are available for all COCs in the secondary material. Each constituent must meets its applicable Method 1 standard. In addition the aggregate or summed risk of all constituents present must meet the BUD risk management criteria (Table 1).

The Beneficial Use Method 1 Values are presented in Appendix 5. These values differ from the MCP Method 1 values. As noted previously, the BUD Method 1 values are based on different risk management criteria which establish a higher bar for demonstrating that a secondary material beneficial use does not endanger public health and the environment.

6.1.1 Applicability and Interpretation

6.1.1.1 Beneficial Use of Secondary Materials in Unrestricted Applications

For all unrestricted beneficial use applications the concentrations of all COCs must be below the most conservative (lowest) Method 1 value from Table 1. If COCs are present for which Method 1 values do not exist, the applicant must either develop a Method 2 value using approved DEP methods (see Section

6.2) or must complete a Method 3 assessment. If toxicity data do not exist that allow for completion of a Method 2 or 3 assessment, the material may not be used in Category 4 (Unrestricted Beneficial Use) applications unless consistency with background is demonstrated.

6.1.1.2 Beneficial Use of Secondary Materials in Restricted Applications

For Restricted Beneficial Use Applications (BUD Category 3), COC concentrations must be compared to the Method 1 value most appropriate to the release and exposure pathways of concern for the beneficial use in question, as discussed below.

If the use substantively eliminates release and exposure pathways, DEP may determine that a quantitative risk assessment is not needed. Such a determination is contingent upon the applicant providing detailed information and data demonstrating that release and exposure pathways are, in fact, adequately controlled under current and future conditions of the beneficial use.

6.1.2 BUD Method I Values

1) Groundwater –1 (GW-1) values apply to any beneficial uses that may result in releases within Current and Potential Drinking Water Source Areas. These values are calculated assuming the potable use of the water.

2) Groundwater – 2 (GW-2) values apply to beneficial uses within 30 feet of an occupied building where the depth to groundwater is 15 feet or less. These values are calculated assuming the infiltration of vapors from a dissolved groundwater source of contamination.

3) Groundwater –3 (GW-3) values apply to beneficial uses that may directly impact any groundwater, and are calculated assuming that the groundwater will discharge to a nearby water body. The GW-3 values are based on the aquatic toxicity of chemicals.

4) Soil - The BUD Soil Values are based on a range of exposure scenarios. The most stringent values (S-1) assume long-term exposure to children and adults, while the least stringent values (S-3) are based on short-term, infrequent, adult-only exposures. The appropriate Soil Categories for comparison depend upon the accessibility of the beneficially used material (e.g., depth); nature of the material vis-à-vis potential exposure pathways; the nature of the potential receptors exposed (e.g., child or adult); the frequency of exposure; and, the intensity of the exposure that could result from the beneficial use.

6.2 BUD Method 2.

For COCs lacking established Method 1 values, the applicant may assess potential risks using Method 2. Detailed guidance on appropriate methods is available at http://www.state.ma.us/dep/ors/orspubs.htm. Applicants must keep in mind the differences between the BUD and MCP approaches as discussed in Section 4.2.1. This approach must be used if the applicant wishes to use Method 1 values to evaluate other secondary material constituents. Alternatively, the total waste risk may be assessed using Method 3 (Section 5.3). Method 2 may also be used to derive modified values that account for exposure and release variables specific to a proposed restricted beneficial use. In Method 2 the applicant derives a value for the chemical in question using appropriate data, methods and risk management criteria as specified by DEP. Method 2 values are thus functionally equivalent to Method 1 values but are derived by the applicant.

6.3 BUD Method 3.

The third method for characterizing risk relies on a use-specific risk assessment approach analogous to the site-specific approach under the MCP. Detailed guidance on appropriate methods is available at http://www.state.ma.us/dep/ors/orspubs.htm. Applicants must keep in mind the differences between the BUD and MCP approaches as discussed in Section 5.2.1. A Method 3 assessment describes and quantifies the current and future exposures that would occur attributable to the proposed beneficial use and compare the estimated risks to the Total Waste Cancer and Noncancer Risk Limits specified in the BUD regulations. If the risk assessment includes limitations on site use, such as a prohibition of residential development, such limitations must be included in a deed notification. Such notification shall be recorded in the registry of deeds or in the registry section of the land court for the district wherein the property lies. Such notification shall describe the limitations on the use of the property and reference to the Department file number or other Department means for identifying the file

A use-specific risk assessment could be used to demonstrate that constituent concentrations higher than the published Method 1 Values pose “No Significant Risk” due to limited exposure potential with a given beneficial use. A Method 3 assessment is also required if exposure pathways, which were not considered in the derivation of Method 1 and Method 2 values, exist.

As stipulated in the Regulations, dilution may not be used to meet risk criteria. Thus, when using Method 3 to assess compliance with the acceptable risk criteria, exposure point concentrations must be based on the COC concentrations in the secondary material product as used. Additives may only be used if they are required to impart a critical function or attribute to the final material to be beneficially used.

APPENDICES

Appendix 1. Definitions

310 CMR 16.00 refers to the siting regulations that address solid waste management facilities. These include siting requirements for landfills, municipal waste combustors, and transfer and processing facilities.

Adverse Impact means an injurious impact that is significant in relation to the public health, safety, or environmental interest being protected. Adverse Impact refers to qualitative impacts resulting from beneficial uses that may affect people and the environment. The Massachusetts Department of Environmental Protection is responsible for protecting human health and the environment by ensuring clean air and water, through the safe management and disposal of solid and hazardous wastes. DEP's role under Article 97 of the Massachusetts Constitution is the guarantor of the people's right to "clean air and water", as well as "the natural scenic, historic and aesthetic qualities of the environment.

Beneficial Use means the use of a material as an effective substitute for a commercial product or commodity.

Beneficial Use Determination (BUD) means the permitting by a State environmental agency of the use of a non-hazardous RCRA solid waste in a product, or used as a product itself, when certain environmental and public health standards are met. In general, for such a waste to be beneficially used it must have chemical and physical properties similar to the raw material that it is replacing or, when incorporated into another product, its use must contribute to the effectiveness of the final product.

Commercial means of, relating to, or being goods, often unrefined, produced and distributed in large quantities for use by industry.

Constituents of Concern ("constituent") means any component of a secondary material that may present a risk of injury to health or the environment.

Critical Contaminants of Environmental Concern (CCCs) are a subset of the universe of Contaminants of Concern (see Appendix – 2 for a full listing). This list includes compounds that pose a elevated threat to public health and the environment because they exhibit: 1) persistence in the environment; 2) ability to bioaccumulate; 3) potent toxicity; and/or 4) widespread presence in the environment at levels of concern.

Destructive Practices means any process that results in breakage of products manufactured using secondary materials increasing surface area and potentially releasing COCs to the environment.

Exposure Pathway means the mechanism by which human or environmental receptors inhale, consume, absorb, or otherwise take in oil and/or hazardous material at an Exposure Point.

Performance Data means any parameter or piece of information collected or produced from measurements, analyses or models of environmental processes, conditions and effects of COCs on human health and the environment including results from laboratory analyses, demonstration or pilot project and the work performed to obtain, use, or report information pertaining to process, method, procedure, equipment, system or facility.

Quality Assurance (QA) means an integrated system of management activities involving planning, implementation, assessment, reporting, and quality improvement to ensure that a process, item, or service is of the type and quality needed and expected.

Quality Control (QC) means the overall system of technical activities that measures the attributes and performance of a process, item, or service against defined standards to verify that they meet the stated requirements established by the customer; operational techniques and activities that are used to fulfill requirements for quality.

RCRA means the Resource Conservation and Recovery Act.

Recyclable or Recyclable Material means a material that has the potential to be recycled and which is pre-sorted and not contaminated by significant amounts of toxic substances.

Recycle means to recover materials or by-products that are:

a) Reused; or
b) Used as an ingredient or a feedstock in an industrial or manufacturing process to make a marketable product; or
c) Used in a particular function or application as an effective substitute for a commercial product or commodity.

"Recycle" does not mean to recover energy from the combustion of a material.

Regulated Systems means any storage, transfer, processing, treatment, use, or disposal activity governed, approved, or otherwise ordered by the Department.

Restricted Applications means uses of secondary materials that utilize risk management techniques in order to prevent adverse impacts to the public health, safety and the environment.

Secondary Material means a discarded material that has the potential to be recycled and is not classified as a "recyclable material" – i.e. not pre-sorted, contains COCs, or is used at facilities and operations to which 310 CMR 16.00 applies.

Solid Waste or Waste means useless, unwanted or discarded solid, liquid or contained gaseous material resulting from industrial, commercial, mining, agricultural, municipal or household activities that is abandoned by being disposed or incinerated or is stored, treated or transferred pending such disposal, incineration or other treatment, but does not include:

(a) Hazardous wastes as defined and regulated pursuant to 310 CMR 30.000;

(b) Sludge or septage which is land applied in compliance with 310 CMR 32.00;

(c) Waste-water treatment facility residuals and sludge ash from either publicly or privately owned waste-water treatment facilities that treat only sewage, which is treated and/or disposed at a site regulated pursuant to M.G.L. c. 83, §§ 6 & 7 and/or M.G.L. c. 21, §§ 26 through 53 and the regulations promulgated thereunder, unless the waste-water treatment residuals and/or sludge ash are co-disposed with solid waste;

(d) Septage and sewage as defined and regulated pursuant to 314 CMR 5.00, as may be amended, and regulated pursuant to either M.G.L. c. 21, §§ 26 through 53 or 310 CMR 15.00, as may be amended, provided that 310 CMR 16.00 does apply to solid waste management facilities which co-dispose septage and sewage with solid waste;

(e) Ash produced from the combustion of coal when reused as prescribed pursuant to M.G.L. c. 111, § 150A;

(f) Solid or dissolved materials in irrigation return flows;

(g) Source, special nuclear or by-product material as defined by the Atomic Energy Act of 1954, as amended;

(h) Those materials and by-products generated from and reused within an original manufacturing process; and

(i) Compostable or recyclable materials when composted or recycled in an operation not required to be assigned pursuant to 310 CMR 16.05(2) through (5).

Unrestricted Applications means uses of secondary materials that result in unlimited routes of exposure to human and environmental receptors from secondary material constituents.

Appendix 2: CRITICAL CONTAMINANTS OF CONCERN LIST

MADEP has identified the following compounds as critical contaminants of concern for assessment under the revised BUD regulations. These compounds include the Level 1 and Level 2 priority Persistent Bioaccumulative Toxic Chemicals PBTs identified under the Binational Toxics Strategy (http://www.epa.gov/glnpo/bns/chemicals.html) as well as select compounds from the RCRA Waste Minimization PBT Chemical List (http://www.epa.gov/fedrgstr/EPA-WASTE/1998/November/Day-09/f29952.htm). MADEP has also included the brominated diphenyl ether compounds as a group on this list because of their persistence, bioaccumulative nature and toxicity, as well as data that demonstrates that environmental levels and exposures to these chemicals are close to those associated with overt toxicity and are increasing. Lead has been included because of its toxicity to children.

Modifications to this list may be made as new information becomes available.

Binational Toxics Strategy Level 1 Substances:

aldrin/dieldrin
benzo(a)pyrene
chlordane
DDT, DDD, DDE
hexachlorobenzene
alkyl-lead
mercury and its compounds
mirex
octachlorostyrene
PCBs
dioxins and furans
toxaphene

Binational Toxics Strategy Level 2 Substances:

cadmium and cadmium compounds
1,4-dichlorobenzene
3,3'-dichlorobenzidine
dinitropyrene
endrin
heptachlor (and heptachlor epoxide)
hexachlorobutadiene and hexachloro-1,3-butadiene
hexachlorocyclohexane
4,4'-methylenebis(2-chloroaniline)
pentachlorobenzene
pentachlorophenol
tetrachlorobenzene (1,2,3,4- and 1,2,4,5-)
tributyl tin
PAHs as a group, including anthracene, benzo(a)anthracene, benzo(ghi)perylene,perylene, and phenanthrene[2]

Other Compounds of Concern To DEP

Brominated diphenyl ethers
Lead

Select Compounds from the Draft RCRA Waste Minimization PBT Chemical List

Chlorinated Solvents:
- Chloroform
- 1,1-Dichloroethane
- 1,1,1-Trichloroethane

Chlorobenzenes:
- 1,2-Dichlorobenzene
- 1,3-Dichlorobenzene
- 1,2,4-Trichlorobenzene

Other Halogenated Organics:
- 4-Bromophenyl phenyl ethers

Pesticides
- alpha-Endosulfan
- beta-Endosulfan
- Methoxychlor
- Pentachloronitrobenzene

2,4,5-Trichlorophenol
Organonitrogens:
  Nitrobenzene
Nonhalogenated Phenolics:
  Phenol
  2,4,6-tris-(1,1-Dimethylethyl)phenol
Phthalate esters:
  Bis-(2-ethylhexyl) phthalate
  Butylbenzyl phthalate
  Dibutyl phthalate
Polycyclic aromatic hydrocarbons:
  Acenaphthene
  Acenapthylene
  Anthracene
  Fluoranthene
  Fluorene
  2-Methylnaphthalene
  Naphthalene
  Pyrene

Metals
  Antimony
  Arsenic
  Beryllium
  Chromium
  Copper
  Nickel
  Selenium
  Zinc
  Cyanide

Appendix 3. Permit Schedule

Application Phase Process Steps	Purpose	Applicant Actions	Department Actions	Timetable	Fee
Pre-Application / Determination of Applicability Phase					
Preliminary Application / Determination of Applicability Meeting	To obtain sufficient information to classify the use. Provide guidance to the applicant.	Submit pre-application information	Meet with the applicant. Explain the beneficial use process. Identify approval standards. Provide final application requirements.	Applicant submits preliminary information at least 10 business days prior to meeting.	NA
Beneficial Use Category Determination	To establish review criteria based upon material use and potential hazards.	NA	Decide which review category is applicable to the beneficial use.	Prior to the pre-application meeting, if possible.	NA
Scope of Evaluation Determination	Determine final application requirements.	NA	Specify specific application requirements. Identify standards for approval. Establish timeline and fee, if applicable.	Within 10 business days after the pre-application meeting.	NA
At the end of the pre-application phase the Department will have assigned the application to a tier review category, provided the applicant with characterization requirements and standards for review, and established the timeline and fee for individual rule permit applications.					
Application Phase					
Administrative Review	Ensure application contains necessary information.	Applicant submits full application.	Department reviews the application to assess administrative completeness.	Tier I: 30 days Tier II: 30 days Tier III: 30 days Tier IV: 30 days	Tier I: $ Tier II: $ Tier III: individual rule Tier IV: individual rule
First Technical Review	Review application to ensure use is safe.	The applicant has 180 days from receiving a technical deficiency to respond to the technical deficiency.	Department reviews the application for technical completeness and issues BUD or deficiency.	Tier I: 30 days Tier II: 30 days Tier III, Tier IV: individual rule	
Second Technical Review	Review application to ensure use is safe (if necessary).	Submits deficient information. If deficient again the BUD is denied.	In the case that technical information is inadequate the applicant shall submit requested information.	Tier I: 30 days Tier II: 30 days Tier III, Tier IV: individual rule	

Appendix 4: References

Massachusetts Department of Environmental Protection (DEP). July, 1988. Ash Sampling and Analysis Guidance. SWM-9-7/88 (as further clarified in 7/97 DEP communications to facility operators).

Massachusetts Department of Environmental Protection. (DEP). July, 1995. Guidance for Disposal Site Risk Characterization – in Support of the Massachusetts Contingency Plan. Bureau of Waste Site Cleanup and Office of Research and Standards.

United States Environmental Protection Agency (US EPA). December, 1989. Risk Assessment Guidance for Superfund (Volume 1) – Human Health Evaluation Manual (Part A) – Interim Final. Office of Emergency and Remedial Response.

United States Environmental Protection Agency (US EPA). 1997a. Compilation of Air Pollutant Emission Factors, AP-42. 5th ed. Supplement C. Office of Air Quality Planning and Standards. Research Triangle Park, NC.

United States Environmental Protection Agency (US EPA). 1997b. Exposure Factors Handbook. National Center for Environmental Assessment

United States Environmental Protection Agency (US EPA). 1997c. Health Effects Assessment Summary Tables (HEAST). Solid Waste and Emergency Response. FY 1997 Update.

United States Environmental Protection Agency (US EPA). 1997d. Emission Factor Documentation for AP-42 Section 2.4 – Municipal Solid Waste Landfills –Revised.

United States Environmental Protection Agency (US EPA). February, 1998. User's Manual – Landfill Gas Emissions Model. Air Pollution Prevention and Control Division; Control Technology Center; and Office of Research and Development.

United States Environmental Protection Agency (US EPA). 2001. Integrated Risk Information System (IRIS) database. http://www.epa.gov/ngispgm3/iris/subst/index.html.

7.0 Public Participation / Outreach and Participation / Involvement

The Stormwater Phase II Rule requires the development and implementation of a municipal public education and outreach program. Phase II requirements are to: *"implement a public education program to distribute educational materials to the community, or conduct equivalent outreach activities about the impacts of stormwater discharges on local waterbodies and the steps that can be taken to reduce stormwater pollution: and determine the appropriate best management practices (BMPs) and measurable goals for this minimal control measure."*

Public education is crucial to the success of a stormwater management program because it creates greater support for the program. Support increases compliance with management practices contained in the program. Broad public support improves the likelihood of approval of future local funding requests to implement BMPs contained in the program.

In addition, municipalities are required to involve the public in the stormwater management program. Towns are encouraged to involve the public in the development, implementation and review of their stormwater management programs and practices. The goal is to involve a diverse cross-section of people who could offer a variety of concerns, ideas, and connections during program development and implementation.

This plan outlines the Town of Adams's approach to a public education program that meets the requirements of Phase II. The plan includes a diverse array of educational outreach and participation programs in an attempt to reach as wide an audience as possible.

Table 7-1 (a,b,c) shows the summarized educational plan. The Education Plan is directed at three target audiences, the general public, businesses and institutions and municipal officials. This is due to the different impacts each audience has on stormwater runoff and the different strategies needed to inform and involve them.

The Education Plan **(Table 7-1 (a,b,c)**, is broken down into three sections for each target audience: 1) proposed education topics; 2) proposed outreach activities; and 3) proposed participation and involvement activities. The education topic column describes various problems and aspects related to pollutant transport in Adams. The educational program will cover these topics. The outreach column lists the specific activities recommended through this program to deliver the educational message to the target audience. The participation and involvement column lists ways for Adams to involve the target audience in an activity designed to improve stormwater management. Specific educational material and outreach activities can be further tailored to different population groups, to different types of businesses such as garden centers and vehicle repair shops. The various parts of the Education Plan are described in greater detail in the narrative following **Table 7-1(a,b,c).** Section 8, the Best Management Practices Plan, identifies specific recommendations.

The education program may begin small due to time, personnel and financial constraints. This program can grow as greater interest is generated and more people and groups become involved, taking on some of the responsibilities of education and outreach. Volunteers, students, retirees, and interested organizations can help and/or direct education programs reducing the workload to the town.

Table 7-1a. Adams Stormwater Education and Participation Summary

***Target Audience* = General Public**		
Proposed topics to be covered in the Education Program*	**Proposed education & outreach activities to relay educational material to the target audience ***	**Proposed participation activities to involve participants in stormwater management ***
• Pet Waste • Lawns & Gardens - Yard Debris Disposal - Erosion Control Practices - Fertilizer Use and Application - Herbicide Use and Application • Motor Vehicles - Proper Maintenance - Leak Prevention - Washing and Cleaning - Proper Storage • Septic Systems • Illicit and Indirect Discharges/ Connections • Household Waste	• Pet Waste Signage and Other Outreach • Mailings (with tax bills) • Press releases • Web Site (post Stormwater Management Strategic Plan) • Stormwater Material Displays • Displays at Town Hall • Displays at local events • Information Workshops, Public Meetings, and Presentations to Civic Groups and Organizations	• Pet Waste Bags in the Downtown Area • Storm Drain Marking/ Stenciling • River Clean-Ups • Classroom Education and School Field Trips • Stream Team Assessments • River Walks • Volunteer Water Quality Monitoring • Increased Participation in Watershed Association (Hoosic River Watershed Association) activities. - State of the River Conference, Riverfest

Table 7-1a. Adams Stormwater Education and Participation Summary		
***Target Audience* = General Public**		
Proposed topics to be covered in the Education Program*	**Proposed education & outreach activities to relay educational material to the target audience ***	**Proposed participation activities to involve participants in stormwater management ***
Reduction and Recycling • Illegal Dumping • Household Hazardous Materials: Storage, Use, Disposal • Better Site Design for New Development	• Local Cable Broadcasts (of Selectmen Meetings)	• Bike Tours along the Ashuwillticook Rail Trail • Riparian Tree/Shrub Planting

Table 7-1b. Adams Stormwater Education and Participation Summary		
***Target Audience* = Businesses and Institutions**		
Proposed topics to be covered in the Education Program*	**Proposed education & outreach activities to relay educational material to the target audience ***	**Proposed participation activities to involve participants in stormwater management ***
• Housekeeping Practices • Catch Basins • Motor Vehicles - Proper Maintenance - Leak Prevention - Washing and Cleaning - Proper Storage • Hazardous Materials: Storage, Use, Disposal • Stormwater BMPs • Illicit Discharges • Better Site Design for	• Mailings • Fact Sheets • Information Workshops, Public Meetings, and Presentations to Civic Groups and Organizations • Web Site • Promotional Items	• Storm Drain Marking/ Stenciling • "Clean Stream" Participation Incentives • Adopt-A-Stream • Employee Training • Implement Stormwater BMPs

Table 7-1b. Adams Stormwater Education and Participation Summary		
Target Audience = Businesses and Institutions		
Proposed topics to be covered in the Education Program*	**Proposed education & outreach activities to relay educational material to the target audience ***	**Proposed participation activities to involve participants in stormwater management ***
New Development and Re-development		

Table 7-1c. Adams Stormwater Education and Participation Summary		
Target Audience = Municipal Officials		
Proposed topics to be covered in the Education Program*	**Proposed education & outreach activities to relay educational material to the target audience ***	**Proposed participation activities to involve participants in stormwater management ***
• Erosion and Sedimentation Control • Site Design Review Practices - Impervious Surfaces (parking lots) - Development on Steep Slopes • Best Management Practices for Stormwater Treatment • Low Impact Design BMPs for Stormwater Management • Evaluation of Stormwater Drainage Calculations	• Short Frequent Seminar Trainings • Brief Trainings as part of Regular Meetings. • Succinct Written Material/Handouts • "Hands-on" Trainings as Components of Site Visits	• Participation at Hoosic Watershed Team Meetings • Participation in Frequent Trainings • Participation in Formalized Training Programs • Regular Presentations to the Board of Selectmen • Preparation of and Participation in Stormwater Management Grant Programs

* (Note: Table 7-1(a,b,c) does not necessarily show one-to-one correspondence between the topic and outreach and participation activities. A bullet point in one column does not necessarily directly relate to the one directly aside it. For instance, information for

the General Public about motor vehicles may be distributed through mailings, displays and workshops.)

7.1 General Public

The general public is the largest target audience and has the most to gain from reducing the impacts of stormwater runoff. Cleaner water allows greater potential for use of water resources for recreational activities such as fishing, swimming, and nature observation. Actions taken by residents can also decrease community costs associated with the use and maintenance of expensive stormwater treatment facilities and treating degraded water quality and stream banks. This section describes the proposed education topics for the general public, recommended activities to educate the general public and proposed ways to actively involve the public in stormwater management.

Proposed Education Topics for the General Public

The following is a list of topics that will be included in the public education program for the Town of Adams. Education materials will generally inform residents of the impacts these topic areas can have, and describe actions that residents can take to reduce those impacts. Educational material is readily available from a wide variety of sources, including many over the World Wide Web. Adams will use these sources and adapt them for the town's use.

- Pet Waste - Pet waste contains harmful pathogens that can be washed into nearby water bodies degrading water quality. Pet waste is especially problematic in the downtown area that gets extensive use from "dog walkers." In addition to a water quality problem, pet waste, especially dog feces, is a nuisance and contributes to the overall sense of degradation of an area. Adams is making strong efforts to re-vitalize the downtown. Pet waste takes away from those efforts. Section 14-5 of the General Code for the Town of Adams requires animal handlers to remove animal feces on public property, punishable by a fine of $50 for each offense. The educational material will address proper handling of pet waste.

- Lawns and Gardens – Residents in the Town of Adams generally take pride in the appearance of their yards and properties, which are generally neat, tidy and well kept. However, many aspects of lawn and garden maintenance can degrade water quality including disposal of yard debris, erosion control measures, and fertilizer, pesticide and herbicide use and application. The educational material will cover proper yard maintenance.

  Yard Debris*:* Improper disposal of yard waste can clog storm drains, causing local flooding. In addition, decaying yard waste can allow bacteria, oxygen-consuming materials, phosphorus and nitrogen to be released into local streams and rivers. A river or stream bank is a convenient location to dispose of yard waste. "Just dump it over the bank," is a common attitude. The stream team assessment identified numerous locations where yard waste was improperly disposed.

Erosion control measures: Sediment from erosion can cloud the water in a river or stream and "smother" habitat areas for aquatic plants and wildlife. Erosion can fill-in flood storage areas, increasing the likelihood of downstream flooding. Erosion can clog culverts, leading to high maintenance costs. Inappropriate erosion controls, as well as abandoned vehicles, tires, and appliances are problems. The stream team assessment identified numerous erosion sites and inappropriate erosion control measures.

Fertilizers: Fertilizers contain large amounts of phosphorus and nitrogen that can promote excessive aquatic vegetation and algal blooms that can deplete the oxygen in the water for fish and other wildlife.

Pesticide and herbicides: Stormwater runoff can pick-up and convey pesticides to streams and rivers. These pesticides can be harmful to wildlife. In strong enough concentrations pesticides can be harmful to humans as well, especially children who are generally more susceptible to lower concentrations than adults are. Stormwater runoff can pick-up and convey fertilizers and pesticides to nearby water bodies.

<u>Motor Vehicles</u> – Many aspects of motor vehicles can create water quality impacts, including improper maintenance practices, an improperly maintained vehicle, leaky vehicles, improper washing and cleaning and improper storage. The educational material will cover proper motor vehicle maintenance and storage to minimize water quality impacts.

Properly maintained vehicles: Proper vehicle maintenance includes good maintenance practices while working on vehicles so that spills from such items as cleaning solvents do not end up in stormwater. Properly maintained vehicles also have cleaner emissions. Emission residuals, even in tiny amounts, can enter stormwater.

Leak Prevention: Vehicle fluids such as engine oil, gasoline, hydraulic fluid, transmission fluid, brake fluid and engine coolant can leak on to road surfaces and wash into storm drains leading into nearby surface waters during storm events. These fluids can directly kill plant and wildlife, deplete oxygen levels, and block sunlight.

Washing and Cleaning: Soap, scum, and oily grit from vehicle washing enters storm drains and then rivers and streams. Soap

contains phosphates, which can cause excess algae to grow using up oxygen in the water.
Proper Vehicle Storage: Vehicles stored outdoors for long periods can leak and corrode, with these materials washed into storm drains and ending up in nearby streams.

- Septic Systems – A municipal sanitary sewer system serves much of the Town of Adams. Some locations in town, however, are not in the sanitary system service area. These locations rely on individual on-site septic systems. These areas are in the outskirts of town and generally in areas where headwater stream tributaries are located. Improperly maintained septic systems can seep untreated septic wastes, including pathogens (bacteria and viruses) and nutrients into nearby streams. Proper use and maintenance of septic systems will be conveyed in education materials.

- Illicit Discharges/Connections - An illicit discharge is a non-stormwater discharge due to illegal connections to the storm drain system. These occur when a drainpipe is improperly connected to the storm drain system producing a discharge of some type of inappropriate flow into the storm drainpipe. Because of these illicit connections, waste enters into storm drains or directly into local waters. Illicit discharges from residences can be the result of a failing septic system or illegal dumping practices. An illicitly connected floor or garage shop drain connected to the storm drain system is an example as well. In addition to illicit connections as defined by EPA's Phase II regulations, a number of other indirect discharges may contribute to water quality problems such as cellar sump pumps. These may be problematic because typically cellars store hazardous materials that may mix with stormwater. Other indirect discharges that might create water pollution are dumping, irrigation overflows, swimming pool discharges, and car washing. Illicit discharges, as well as indirect discharges will be included in the educational material.

- Household Waste Reduction and Recycling – Appropriate solid waste management practices and recycling are important ways to prevent pollution from occurring. The "four R's" of solid waste management form the basis of an effective solid waste management program: 1. **R**educe the amount of trash discarded; 2. **R**euse containers and products; 3. **R**ecycle used materials, and compost; and 4. **R**espond to the solid waste dilemma by reconsidering other options. For the past 9 years, Adams has averaged about a 12% recycling rate (according to DEP statistics; Massachusetts Municipal Recycling Rates FY 1995-2001 and FY 2002-2003.) This is substantially lower than other Berkshire County municipalities (Dalton: ~34%; Great Barrington:

~30%; North Adams: ~ 30%; Pittsfield: ~ 20%.) Solid waste management practices and recycling will be included in educational material.

- Illegal Dumping – Debris from illegal dumping, in addition to creating an eyesore that all residents must endure, can contain toxic waste that can leak into rivers and streams. Debris items, such as six-pack rings and plastic bags can choke, suffocate or disable aquatic life such as fish and ducks. The stream team assessment identified numerous illegal dumping sites.

- Household Hazardous Material – Many commonly used household products such as cleaning products, car maintenance items, and home improvement items, such as paint, strippers, and brush cleaners contain toxic material that if not properly stored, used and disposed of can end up in rivers and streams, either by being transported over the land surface or direct dumping into storm drains. Proper handling, use and disposal practices, including appropriate disposal methods and locations, will be addressed in education materials.

- Better Site Design for New Development – Numerous practices are available to minimize water quality impacts from new development. Design practices can limit the amount of impervious surface (i.e. using wooden decks, brick paths, rock gardens,) employ vegetated strips (using native vegetation which generally requires less fertilizer, less pesticide, and less irrigation) as components of landscape design, minimize cutting and clearing of natural vegetation, and keeping development away from ecologically sensitive areas. Educational material will be prepared for perspective homebuilders to use to make their new home more "water friendly."

Proposed Education and Outreach Activities for the General Public

Once the public education materials have been collected and adapted to the Town of Adams, it will be distributed or presented to residents. The following outreach methods will be used in the Town of Adams to educate residents about the potential impacts of stormwater runoff.

- Pet Waste Signage and Other Outreach - Adams installed pet waste bags in the downtown area in September 2002. Adams took this approach because the volume of dog waste on downtown sidewalks was increasing. It was the town's hope that residents would use the pet waste bags, rather than receive a fine. Pet waste signs and poles were also installed. Pet waste signage will continue and will be used in conjunction with other educational material about pet waste management.

- Mailings - Mailings in the form of fact sheets, brochures, fliers, and newsletters will be periodically distributed to the public relevant to the topic areas previously identified. This educational material will be included in regular mailings to town residents, such as in tax bills. Mailings reach a wide audience of residents, especially when they are a part of a regular, periodic mailing.

- Press Releases - Local newspapers will be used as a medium for press releases to educate residents and inform them of upcoming events. Newspapers can reach a wide audience. The copy of the article from the North Adams Transcript (See the Appendix) is an example of such material. Future releases will be coordinated with other educational efforts, such as mailings, meetings or events.

- Web Site - Adams has a well-developed website. A section will be devoted to stormwater management. This section will include the Executive Summary of the Adams Stormwater Management Strategic Plan, copies of educational material and fact sheets, and information about upcoming events, such as river clean-ups, and river walks. The web site provides easy accessibility for residents to obtain education material and information about upcoming events. Residents will be made aware of the web page section through mailings.

- Stormwater Material Displays – A display that includes posters, brochures, fact sheets, Executive Summaries of the Stormwater Management Strategic Plan, event announcements, and other material for residents to view or take will be prepared. This display will be periodically set up in areas where residents frequently pass, such as main entranceways and voting areas. It will be periodically updated to include information about progress towards specific items and to recognize achievements of groups or individuals such as stream team assessments, clean ups, and "Clean Stream" and Adopt-A-Stream business and institution participants. Space will be made available at public places such as the library and schools to exhibit the display. In schools, it will be displayed in conjunction with stormwater educational programs whenever possible. "Clean Stream" and Adopt-A-Stream participants will be given the opportunity to exhibit this display at their business or institution.

- Displays at Town Hall – The main entryway in the Town Hall receives a relatively large volume of resident foot traffic. Various displays are regularly exhibited at that location. The stormwater display should be exhibited in this location at least once a year to show basic information about stormwater management (to coincide with mailed material) and activities, accomplished and planned, related to stormwater management.

- Displays at Local Events – The Susan B. Anthony Celebration is a popular summer event in Adams. The stormwater display should be exhibited at this event. In addition, someone who can explain the Stormwater Management Strategic Plan and good stormwater management practices and solicit volunteers should staff it.

- Informational Workshops, Public Meetings and Presentations to Civic Groups – Adams has numerous Civic Organizations and Clubs such as the Lions Club, Elks Lodge, Maple Grove Civic Club, Adams Garden Club, and Polish American Club that have regular meetings and are frequently looking for speakers and presentations. This is a good venue to get the word out about stormwater management because it offers the opportunity for a question and answer format. This same format should be used for at least one public meeting per year about stormwater management as well. An introductory workshop will be prepared and initially delivered at these venues. Update workshops (one per year) will be prepared and delivered to announce the prior year's accomplishments and events and activities upcoming in the next year.

- Local Cable Broadcasts – Meetings of the Adams Board of Selectmen are regularly covered by the local cable channel and viewed by a relatively large number of Adams' residents. This is a good vehicle to get the word out about stormwater management activities. Presentations about stormwater management will be made at Board of Selectmen meetings on a regular basis. An initial presentation will be made about the Stormwater Management Strategic Plan. Subsequent, more succinct, presentations will be given on an as-needed basis to announce significant accomplishments and announce upcoming events and activities.

Proposed Participation and Involvement Activities for the General Public

Broad based engagement of the public is the best way to obtain a long lasting, effective stormwater management program. The following measures will be used to increase community involvement in stormwater management.

- Pet Waste Bags in the Downtown Area – Pet waste bags are available in two locations in the downtown area: 1. Park Street next to the Ashuwillticook Trail; and 2. On Hoosac Street next to the *Discover the Berkshires* Adams Visitor Center. The DPW provides funds for this program. The DPW periodically inspects the dispensers and refills them as necessary. To make this program more effective it should be coordinated with other outreach efforts such as mailings. Once adequate public outreach has been provided, strict enforcement of the town's current law requiring the cleanup of animal feces by the handler should occur.

- Storm Drain Marking/Stenciling - Storm drain stencils or marking programs create public awareness about the connection of water quality and storm drains. Storm drain marking projects also create opportunities for various groups of volunteers to participate in preventing degradation of water quality in town. Installing semi-permanent buttons or stenciling storm drains with words and symbols is an effective way of reducing the dumping of pollutants into drains. HooRWA has an interest in developing a storm drain stenciling program with the Town of Adams. A potential way to combine this activity with a school program is to have some type of "design contest" in the schools, whereby students could design the "stencil." If it is not feasible to mark all storm drains in town because of time and money constraints, stenciling should begin in the highest priority sub-basins and proceed to lower priority sub-basins.

- River Clean-Up - A river clean-up program is a great way for people to literally get their hands dirty and get fast results from their efforts. Trash in a river can degrade water quality, harm wildlife and people, and is an eyesore in a community. Participants volunteer to walk or paddle an identified length of a river or stream collecting and removing trash and recording the types of garbage that has been removed. Working within a river can give people a greater appreciation of this complex ecosystem. The Steam Team Assessment identified numerous locations where trash was located. These sites should be prioritized, with the worst ones cleaned first. Photographs taken before and after cleanup activities can be used to document the results of these efforts. This program may involve the use of boats and other equipment depending on the scope of involvement and available resources. The town can be involved by allowing the use of town equipment to remove large or heavy items and by hauling and disposing of collected trash. Enhancements to a basic clean-up program may include an onsite expert to teach people about river ecology.

- Classroom Education and School Field Trips - A classroom education program can consist of a relatively simple one-day presentation or can be fully integrated into a school curriculum. A program can focus on one grade level or many depending on the resources available and the schools willingness to participate. Organizations such as *Project Wet* ("an international, interdisciplinary, water science and education program for formal and non-formal educators of kindergarten to grade 13 students") and *Green Teacher* ("a magazine by and for educators to enhance environmental and global education across the curriculum at all grade levels") can aid in preparing an education program. HooRWA has a strong interest in developing and delivering an educational program. In the summer of 2005, HooRWA is enhancing its web site as a teacher resource. In the 2005 – 2006 school year, HooRWA is planning teacher workshops about how to use existing river education resources, and school field trips to visit river sites.

- <u>Stream Team Assessments</u> – A stream team assessment is a useful way to assess and evaluate the condition of rivers and streams in a town. Water quality related problems such as bank erosion areas, discharges, and illegal dumping areas can be identified. Water related opportunities, such as enhanced recreational access, can be identified as well. Data gathered during a stream team assessment can help identify sites for such activities as water quality monitoring, river clean-ups, installation of Best Management Practices, and river access. Another important aspect of a stream team assessment is the use of volunteers. Engaging volunteers is a way to increase public awareness about and management involvement in a town's stream network. Stream team assessments are not meant to be static events. They are meant to provide an ongoing presence, as "watchers" or "keepers" of river segments. Stream teams can be leaders to implement items identified in the assessments, such as correcting problems or developing enhancements. Stream team assessments have been conducted for the Hoosic River (at least twice) and its tributaries. These assessments, however, have not led to an ongoing presence by active Adams residents. To be more effective, such an active presence should be developed. HooRWA was the primary sponsor of the previous assessments and would be a strong candidate to coordinate and conduct an ongoing stream team assessment program.

- <u>River Walks</u> – River walks provide a low investment – high return opportunity to raise overall awareness of water related issues. Walks can include a variety of subject areas, such as plant identification, habitat discovery, or land use "investigation." Such walks can be tailored to a wide variety of constituent groups that might have differing capabilities. The Hoosic River is the pre-eminent river in northern Berkshire County. However, the flood control project has contributed to a lessoning of awareness by town residents of its important ecological significance. River walks are ways to have residents re-connect with the river. HooRWA would be a strong candidate to coordinate or conduct these walks.

- Volunteer Water Quality Monitoring – Volunteer monitoring programs encourage residents to learn about water resources. Taking samples of perennial streams is a great way to monitor water quality and identify potential problems areas that may have otherwise gone unnoticed. High levels of bacteria, phosphorus, road salt, and sediment can all be attributed to stormwater runoff and can have adverse impacts on stream ecology. HooRWA has conducted a successful water quality monitoring program for several years. HooRWA has conducted this program according to a DEP/EPA approved Quality Assurance Project Plan. HooRWA's program has not made extensive use of Adams volunteers. Greater involvement by Adams' residents would allow expansion of the program. Another important component of a volunteer monitoring program is to document improvements to water quality. Improvement to water quality is an important way to generate continued enthusiasm and support for the stormwater management program.

- Participation at Hoosic River Watershed Association Events - The Hoosic River Watershed Association (HooRWA) has several events and activities that bring attention to and awareness of the Hoosic River, related tributaries and surrounding watershed. HooRWA hosts regularly scheduled activities like canoe rides and nature walks. In addition, Riverfest (traditionally Memorial Day Weekend) and the State of the River Conference (generally in late winter/early spring) are two regularly scheduled events, that provide a celebration and an in-depth review of the current condition of the river. In prior years, outreach to Adams residents and participation by Adams residents regarding these events has been limited. Increased participation by Adams residents at these events would provide a two-way opportunity. It would allow Adams residents the opportunity to learn about other activities occurring in the larger watershed. In addition, it would provide non-Adams residents an opportunity to learn about Adams' proactive stormwater program. This exchange of information would build mutual support between the two interests.

- Riparian Tree/Shrub Planting Program – Re-establishing forested or shaded buffers along the banks of a watercourse is an important way to restore a river's natural ecosystem and reduce the impacts from stormwater. Vegetation along stream banks can stabilize the bank, thereby preventing sedimentation, and can trap and filter pollutants. Plants intercept rainfall, absorbing and transpiring moisture, and thereby reduce runoff and flood potential. Plants also provide shade, which reduces runoff temperatures. Shade along stream banks can provide safe havens for fish from the hot summer sun. This is especially important along the flood control chutes. Water quality data has shown that the main chute through the downtown area dramatically increases water temperature (by as much as 7 degrees from one end to the other in the summer.) This elevated water temperature puts an extreme stress on fish (especially trout, which is a cold-water fish) and other species. In addition, trees and shrubs can enhance neighborhood aesthetics.

The town is currently working with the United States Army Corps of Engineers to examine the potential to restore the flood control project to a more natural setting. One option being considered is re-establishing vegetation along the banks of the project to provide shade. This option is being considered for both the concrete channel and the rip-rap areas downstream of the concrete channel. Recent and ongoing efforts at downtown re-vitalization have identified the Hoosic River as a cornerstone for the success of those efforts. Previous public "Design Charettes" have identified the desire for a more natural setting adjacent to the river. Bank re-vegetation efforts are important components to those efforts. This program can be coordinated either by the town or by volunteers and/or interested organizations such as a garden club.

- Bike Tours along the Ashuwillticook Rail Trail – The Ashuwillticook Rail Trail is a popular recreational asset used by many town residents. The Rail Trail loosely parallels the course of the Hoosic River. Fun bike tours with educational stops could raise overall awareness of the river and riverine ecosystem. Part of HooRWA's mission is to advance environmental awareness. HooRWA would be a strong candidate to coordinate or conduct these tours. These could initially be conducted in conjunction with other events or activities such as the Susan B. Anthony Days celebration or the Adams Agricultural Fair.

7.2 Businesses and Institutions

Many business and institution activities can contribute to stormwater pollution. For instance, poor housekeeping practices and large impervious parking lots can affect water quality in a community. Large expensive stormwater treatment facilities, such as detention ponds, frequently are built to handle runoff from business and institution sites. These systems can be eyesores in a community. If they are not properly maintained, which is often the case, they do not treat stormwater as they were designed. Encouraging good stormwater management practices and providing incentives can be an effective way for towns to approach businesses and institutions. Participation in municipal stormwater management programs can provide good publicity to a business or institution. Treating stormwater on site can also help minimize or decrease municipal costs associated with the use and maintenance of expensive stormwater treatment facilities. In turn this can help a municipality keep taxes low. This section describes the proposed education topics for businesses and institutions, recommended activities to educate businesses and institutions and proposed ways to involve businesses and institutions in stormwater management.

Proposed Education Topics for Businesses and Institutions

The following is a list of topics that will be included in the public education outreach and participation efforts to businesses and institutions of the Town of Adams. Educational material will inform businesses and institutions of the impacts related to these topic areas, and describe ways to reduce them. These elements can be stand-alone items. However, this educational program would be more effective if it were integrated into other items such as an employee training program, "Clean Stream" initiative, or Adopt-A-Stream program.

- <u>Housekeeping Practices</u> – Good housekeeping practices for businesses and institutions are important because of their overall size and scale. Typically, these are large properties, have large impervious surface areas, use relatively large amounts of hazardous materials, have numerous employees, and result in a large amount of solid waste. Keeping a property clean from trash and debris, properly storing materials, and properly conducting site maintenance (landscaping, snow removal, impervious surface sweeping) are all ways to reduce the impacts of stormwater runoff. These practices help keep debris, litter and unwanted contaminants from being picked up by stormwater and entering nearby surface waters. Educational material will focus on a range of good housekeeping practices for businesses and institutions.

- <u>Catch Basins</u> - Businesses and institutions may be unaware of catch basins located on their property and of their responsibility to clean them. Unmaintained catch basins can fill up with sediment and debris. When they do, they no longer function as intended and contribute to stormwater pollution. Educational material will be distributed to businesses and institutions about identifying and locating catch basins on their property, water quality functions of catch basins, the importance of pollution prevention (i.e. dumping,) and maintenance practices and schedules.

- <u>Motor Vehicles</u> – Water quality issues related to motor vehicles are generally the same for businesses and institutions as they are for homeowners: proper maintenance; leak prevention; washing and cleaning; and proper storage. The difference with businesses and institutions is a matter of scale. Whereas a homeowner may maintain one or two vehicles, a business or institution may have a fleet, thereby magnifying the potential threat. In addition, these vehicles may be large sized vehicles, with greater storage capacity for vehicular fluids and are highly used, warranting more frequent maintenance and cleaning. Educational material will be prepared and distributed to businesses and institutions about maintaining their fleet

- Hazardous Materials: Storage, Use, Disposal – Businesses and institutions frequently deal with large volumes of hazardous material, such as cleaners and solvents, car maintenance items, and petroleum products. If not properly stored, used and disposed of these can end up in rivers and streams, either by being transported over the land surface or direct dumping into storm drains. Protocols need to be clearly developed and available to a potentially large number of employees who may be exposed to these items. Proper handling, use and disposal practices including appropriate disposal methods and locations will be addressed in educational materials.

- Stormwater BMPs – Stormwater BMP effectiveness is directly related to their long-term maintenance and management. Businesses and institutions may have inherited a stormwater BMP from a previous owner and are unaware of its operation, water quality treatment function and its maintenance schedule. Educational material will be provided to businesses and institutions about the typical stormwater BMPs that may be on their property, how that BMP functions as a water treatment device and proper maintenance practices.

- Illicit Discharges - An illicit discharge is a non-stormwater discharge due to illegal connections to the storm drain system. Because of these illicit connections, contaminated wastewater enters into storm drains or directly into local waters. Illicit connections may be intentional (i.e., illegal dumping activities) or may be unknown to the business owner or institution manager and often are due to the connection of floor drains to the storm sewer system. Educational material will be prepared and distributed to businesses and institutions about conducting a field survey to identify outfalls on their property, preparing a map, conducting a dry-weather survey, conducting water quality sampling, tracing the source of the discharge and removing the source of that discharge.

- Better Site Design for New Development and Re-development – Businesses and institutions can benefit from low impact development (LID) practices that emphasize on-site stormwater collection and treatment. Businesses and institutions can use numerous LID measures, such as increased green space, vegetated infiltration islands, Bioretention Cells, Bioretention Swales, Permeable Pavement Blocks, Infiltration Trenches, Level Spreaders, Grass Filter Strips, and Storm Water Wetlands. LID still allows land to be developed, but in a cost-effective manner that helps mitigate potential environmental impacts. Incorporating low impact development into development or re-development practices helps to systematically balance environmental and cost issues. These measures can reduce long-term management and maintenance costs to property owners as well. Information will be provided about LID measures that businesses and institutions can use in their next development or re-development project.

Proposed Education and Outreach Activities for Businesses and Institutions

Once the public education materials have been collected/developed, they will be distributed and conveyed to businesses and institutions. The following outreach methods will be used in the Town of Adams to educate businesses and institutions.

- Mailings - Mailings of fact sheets, brochures, fliers, and newsletters will be distributed to businesses and institutions. This will be done by inclusion of the educational material with regular tax bills.

- Fact Sheets – Topic-specific fact sheets will be developed and distributed in conjunction with the "Clean Stream" and Adopt-A-Stream programs and will cover the topics identified previously.

- Informational Workshops, Public Meetings, Presentations to Civic Groups and Organizations - An introductory workshop will be prepared about the Stormwater Management Strategic Plan and stormwater management practices. This will initially be presented at a meeting of the Downtown Development Committee. A list of the informational topics described previously will be distributed. Businesses and institutions will be solicited to determine their interest in workshops about other topics. Topic specific workshops for businesses and institutions will be prepared and delivered as interest warrants.

- Web Site - A subsection of the Town's stormwater education link will be tailored to the impacts of stormwater from businesses and institutions with links to fact sheets relevant to the topic areas. Businesses and institutions will be made aware of the web page section by mailings. "Clean Stream" and Adopt-A-Stream participants will be posted on the web site.

- Promotional Items – Stormwater management promotional items, such as door hangers, bookmarks, refrigerator magnets, key chains are effective ways to raise constant awareness of stormwater issues while at the same time giving a business the opportunity for increased advertising. A program for promotional items will be developed and made available to interested businesses.

Proposed Participation and Involvement Activities for Businesses and Institutions

- Storm Drain Marking/Stenciling – Businesses and institutions can actively participate in a storm drain marking programs in numerous ways, including identifying and marking storm drains on their property, allowing and encouraging employees to participate in storm drain marking programs on company time, and providing funding for program coordination or supplies. Businesses and institutions could also initiate onsite employee trainings about storm drains. Business and institution participation in storm drain marking could be part of the "Clean Stream" program described below.

- "Clean Stream" Participation Incentives - A "Clean Stream" Program is a way to recognize businesses and institutions for good stormwater practices. Through this program specific stormwater Best Management Practices would be identified. These would include such items as employee training, landscaping practices, treatment of hazardous materials, vehicle maintenance and operation, and impervious surfaces management. Parameters could be established relating to stormwater runoff reduction, as well as implementing low impact development practices. Site evaluations would be conducted. Those businesses and institutions meeting specified standards on the established parameters would be recognized as "Clean Stream" participants. These participants would be formally recognized through award presentations at public meetings, such as a Town Meeting or Selectmen's meeting and meetings of civic organizations. Participants would also be posted on the website and listed in local newspapers on a regular basis. This Program could be used in conjunction with an Adopt-A-Stream Program.

- Employee Training - A training program can be encouraged at businesses and institutions to educate employees about practices that can reduce the impacts of stormwater runoff. Topics would include those identified previously, such as good housekeeping, catch basins, motor vehicles, hazardous materials, illicit discharges, better site design and a general primer about stormwater BMPs. The program would be coordinated with distribution of the fact sheets. It would also be coordinated with the informational workshops presented to the general public except that in this instance the trainer would go to specific businesses and institutions instead of civic groups. In some instances, a professional trainer may be warranted to explain a highly technical topic. An employee training program could be a component of a larger "Clean Stream" effort.

- Adopt-A-Stream – An Adopt-A-Stream program is an effort where participants become the primary caretakers of an identified stretch of a river or stream. Businesses and institutions could have their employees "adopt" a section of a stream or sponsor and provide funding for another organization, such as a youth organization or school group, to do so. Responsibilities for "adopting" a river or stream section could include stream clean-ups, stream bank assessments, monitoring water quality and assisting with enhancement projects, such as plantings and erosion control. Signs could be posted indicating which business or institution adopted a stream section. This program, in addition to providing environmental benefits, provides good advertising for a business or institution.

- Implement Stormwater BMPs at Business and Institution Sites – Business and institution sites typically have not been developed to be "stormwater friendly." Frequently large areas of impervious surfaces, vehicles storage and maintenance, hazardous material use and storage are associated with these sites. Businesses and institutions could be encouraged and solicited to implement stormwater low impact development BMPs, using practices such as infiltration islands, perimeter vegetated swales, or a small wetland retention system. Incentives could include complete or partial funding of the project through state and local resources, publicity, and tax relief. The Massachusetts Department of Environmental Protections 319 Nonpoint Source Pollution Grant is one such program that might provide funding.

7.3 Municipal Officials

Municipal officials, including Planning Board members, Conservation Commission members and the Building Inspector review and approve new developments and re-development projects. These individuals are on the "front-lines" of stormwater management. In addition to the necessary local regulatory framework, as described in Section 5, thorough knowledge and understanding of stormwater management practices is needed by Board members to fully implement an effective stormwater management program. A survey and interviews of Planning Board members and Conservation Commission members about stormwater related issues was conducted. Survey results are contained as an Appendix to this section.

Overall, the Adams Planning Board and Conservation Commission members had a generally good understanding of what stormwater was and its relationship to impervious surfaces. The importance of and methods for stormwater treatment were less understood. Stormwater flow, re-directing the water away from specific areas, was generally deemed more important than pollutant attenuation. Control of erosion was also identified as an important concern.

The overwhelming consensus of the Planning Board was that there has been very little official training about site design review techniques and sediment and erosion control techniques. There had been no training related to evaluating drainage calculations and reviewing BMP designs. Training about the relationship between impervious surface and water quality and quantity was desired as well by the Planning Board. Planning Board members believed that more training would be beneficial.

Conservation Commission members, primarily because of the training opportunities provided by the Massachusetts Association of Conservation Commissions have had more training. The Conservation Commission unanimously agreed that more training is desirable, especially on alternative site design techniques.

Short informational sessions as part of monthly meetings and individual seminars directed to the specific Board or Commission were the preferred training methods. Succinct handouts would accompany both of these trainings.

Planning Board and Conservation Commission members were in strong agreement that the public does not understand the effect of nonpoint source pollution on the water resources of Adams.

The Phase II rule requires that town employees be trained on how to incorporate the pollution prevention/good housekeeping BMPs discussed in Section 6. Town training programs for stormwater and groundwater are required to teach employees about stormwater management, potential sources of contaminants, and BMPs for water quality protection.

The Town of Adams, with assistance from BRPC or its consultant, should develop a municipal training program for water quality protection in accordance with the Phase II requirements. The program should include the following key elements, which can be tailored specifically to town operations.

- Stormwater Management Strategy & Phase II Program Overview
- Town Department Responsibilities
- Town Drainage System, Water Supply and Water Quality
- Spill Prevention and Response
- Good Housekeeping
- Material Management Practices
- Maintenance of Town-Owned Lands

- Stormwater Inspections
- Illicit Discharge Detection
- Construction Sites and Development

Training should be conducted annually and may be minimized after the first year to include refresher topics. Greater detail is provided in Section 6.4.

Proposed Education Topics for Municipal Officials

This section describes the proposed education topics for municipal officials, recommended activities for municipal officials, and proposed ways to actively involve municipal officials in stormwater management. These items are primarily aimed at officials involved in the design and permitting of development projects.

Based on discussions with Planning Board and Conservation Commission members educational material for the following topics will be prepared.

- Erosion and Sedimentation Control – Erosion and sediment control training is extremely important in Adams, especially given the "flashy" nature of the rivers and streams in town. Numerous areas of erosion were identified in the Stream Team Assessment.

- Site Design Review Practices – Good site design can minimize stormwater impacts. Items such as how to design on steep slopes, (designing with the contours of the land), designing to minimize clearing, and designing to work with rather than against natural flow conditions can help prevent the need for impervious surfaces and can minimize erosion and flooding. Another added benefit of good stormwater design practices is that developments built to these standards generally enhance and "fit in" to the overall community character and pre-existing development. Volunteers serving on Planning Board and Conservation Commissions routinely review site plans to determine compliance of the proposed development with land use regulations. A major consideration of site plan review, however, should be the proposed development's impact on water resources, particularly from polluted stormwater runoff, or "nonpoint source pollution." Traditionally, stormwater management has emphasized water quantity, with little concern for water quality. To address both of these factors in a comprehensive manner, each site plan should contain a stormwater management plan that details the impact of proposed land use on water quantity and quality, both on-site and within the watershed. Volunteer Board and Commission members can review plans for compliance with general planning guidelines related to stormwater management with a minimum of training.

- Best Management Practices for Stormwater Treatment – When reviewing development proposals Planning Board and Conservation Commissions can be presented with a wide range of stormwater BMPs, including detention basins, retention ponds, constructed wetlands, infiltration trenches and basins, dry wells, sand filters, water quality inlets, deep sump catch basins, sediment traps and drainage channels. A basic understanding of how these BMPs function is necessary to determine if they are appropriate for the site, if the calculations have been appropriately performed to be able to handle and treat the expected volume of runoff, and to determine if proposed maintenance practices are adequate.

- Low Impact Design BMPs for Stormwater Management - Low Impact Development (LID) is a relatively innovative stormwater management approach with a basic principle that is modeled after nature: manage rainfall at the source using uniformly distributed decentralized micro-scale controls. LID's goal is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to its source. Techniques are based on the premise that stormwater management should not be seen as stormwater disposal. Instead of conveying and managing/treating stormwater in large, costly end-of-pipe facilities located at the bottom of drainage areas, LID addresses stormwater through small, cost-effective landscape features located at the lot level. These landscape features, known as Integrated Management Practices (IMPs), are the building blocks of LID. Almost all components of the urban environment have the potential to serve as an IMP. This includes not only open space, but also rooftops, streetscapes, parking lots, sidewalks, and medians. LID is a versatile approach that can be applied equally well to new development, urban retrofits, and redevelopment/revitalization projects. An important source of information about LID is the Low Impact Development Center, Inc. The Low Impact Development Center is a non-profit 501 (c) (3) organization dedicated to research, development, and training for water resource and natural resource protection issues. The Center (http://www.lowimpactdevelopment.org) focuses on furthering the advancement of Low Impact Development technology.

- Evaluation of Stormwater Drainage Calculations – The Massachusetts Stormwater Policy establishes consistent performance standards to address stormwater impacts. These performance standards are increasingly complex and generally require a trained specialist to prepare them. It is not necessarily the responsibility of volunteer Board or Commission members to be able to prepare engineered calculations but they should have a general familiarity with them.

Proposed Education and Outreach Activities for Municipal Officials

Members of the Planning Board and Conservation Commission are volunteers who fit their municipal responsibilities into their day-to-day activities. As volunteers, they generally have little available time to attend specialized training. Frequently, municipal budgets are limited and provide limited, if any, funding to attend specialized training. The training program most likely to be used by Planning Board and Conservation Commission members is one with the following characteristics:

- Short frequent seminar trainings
- Brief trainings as part of regular meetings
- Training accompanied by succinct written material/handouts
- "Hands-on" trainings as components of site visit

These trainings would occur at a public meeting. They would be open to the public and other municipal officials. Training topics would be posted on the web site.

Adams could use two programs to assist them in providing this training. One program is the NEMO program. NEMO stands for Nonpoint Education for Municipal Officials. The Connecticut Cooperative Extension Program developed this program. Because Cooperative Extension is an educational organization, NEMO is an educational approach to address the issues of nonpoint source pollution and watershed management. NEMO deals with the land use impacts to water quality and targets its education efforts at local land use decision-makers. NEMO (http://nemo.uconn.edu/index2.htm has prepared a wide range of readily available material that could be used in a municipal training program. The Berkshire Regional Planning Commission has adapted components of the NEMO program for use in Berkshire County and could work with the town on this program.

The second program Adams could use to provide training to municipal officials is the Berkshire Conservation Agent Program. This is a program that Adams already participates in where the services of a professional Conservation Agent are available to the town on a project-by-project basis. Specific Conservation Commission trainings could be prepared by the Conservation Agent and delivered to the Conservation Commission and other municipal officials.

Proposed Participation and Involvement Activities for Municipal Officials

- Participation on Hoosic Watershed Team Meetings – For several years the Massachusetts Executive Office of Environmental Affairs sponsored the Watershed Initiative. The overall goal of this state program was to better coordinate the activities of state agencies, on a watershed basis, especially related to issuing state permits. Another goal was to form closer partnerships and collaboration between state agencies, non-profit organizations and municipalities. The state was divided into 27 major watersheds. A Watershed Team Leader was assigned to each of the major watersheds. Regular (monthly) team meetings were held amongst the various parties. These meetings provided a good opportunity to exchange information and form working partnerships between the various interest groups. The state sponsored Watershed Initiative has been discontinued. However, participants on the Hoosic Watershed Team have continued to meet. Adams has maintained an active presence on the Hoosic Watershed Team with participation by the Department of Community Development, Department of Public Works, Waste Water Treatment Plant Operator, and private citizens. Adams will continue to participate on the Hoosic Watershed Team as a way to advance their stormwater management program.

- Participation in Frequent Trainings – The effectiveness of frequent trainings at regular Board or Commission meetings will depend on them being regularly utilized. This will require that Chairs regularly include them as part of the meeting agenda and members regularly participate.

- Participation in Formalized Training Programs – Specialized training will continue to be an important supplement to trainings as part of monthly meetings. Specialized training will keep members current about the latest changes to laws and regulations as well as provide information about the latest technological practices. Efforts should continue to make trainings, such as those sponsored by state agencies, available to town boards, commissions, and staff.

- Regular Presentations to the Board of Selectmen – The Board of Selectmen is in a unique role in a town because it often serves as a clearinghouse about the activities of various other Boards and town employees. Boards of Selectmen also have the opportunity to consider the comprehensive needs of the town. The Board of Selectman should be periodically updated about stormwater management activities.

- Preparation of and Participation in Stormwater Management Grant Programs – The town can seek several grants or funding sources to improve its stormwater management practices. These include the Massachusetts Department of Environmental Protections 319 Nonpoint Source Pollution Grant Program (nonpoint source pollution remediation,) the Massachusetts Environmental Trust (water quality monitoring and environmental education,) and the United States Army Corps of Engineers Section 1135 Aquatic Ecosystem Restoration Program (for restoration of the flood control project.) A demonstration of broad based local interest, involvement, and support increases the success rate for obtaining these funds. In addition, the successful implementation of the grant activities is greatly enhanced by active participation of municipal boards, officials and employees. Adams will continue to pursue available stormwater management funding opportunities and involve a wide local constituency in those efforts.

Greater detail about specific recommendations, the tasks needed to accomplish the recommendations, the party most likely responsible to take the lead with implementation, measure goals and a timetable are shown in Section 8 on the Best Management Practices Plan.

Appendix 7

Town of Adams Stormwater Management Questionnaire

North Adams Transcript Article

<u>Town of Adams Stormwater Management Questionnaire</u>

Your name... 7 members of the Conservation Commission responded – the following are their answers:

<u>The following questions relate to how stormwater affects your responsibilities as outlined by the Wetland Protection Act.</u>

When considering stormwater which of the following is your greatest concern?
(Check Box)
Quantity: Redirecting the flow away from or to a particular area or □ *4*
Quality: Controlling pollutants/nutrients and temperature change □ *3*

What do you see as contributing the most problems pertaining to stormwater issues? (Number in sequence of importance #1 being most important)

Rooftop runoff *1,2,6,7,8,10* (5.6)	Open space/Parks *1*,1,4,8,9,9,10 (7)*
Parking lots *3,3,4,4,4,7,7 (4.5)*	Agriculture *2,3,4,4,5,10 (4.6)*
Driveways *2,5,5,5,6,7 (5)*	Forests *2,4,5,11,11,11 (7.3)*
Sidewalks *4,6,7,8,10,11 (7.6)*	Commercial sites *1,3,5,7,9,11 (6)*
Roads *1,1,1,2,3,3,6 (2.4)*	Industrial sites *2,2,6,6,8,9 (5.5)*
Lawns *3,8,8,9,10,10 (8)*	Other/Name *1)mountain side (Adams is located in a valley)*

** If located on a mountainside.*

Which side effects of increased runoff are of most concern: (number in sequence of importance #1 being most important?)

Increased "flashiness" (sudden flooding) of watershed *1,1,1,2,3,5,6, (2.7)*	Pathogens (disease causing bacteria) in the waterways *4,6,6,7,9,10 (7)*
Erosion *1,1,2,2,3,3,4 (2.3)*	Increased elevation of floodplain *5,5,6,10,10,11 (7.8)*
Sediment buildup in waterways *2,2,3,3,7,8 (4.1)*	Nutrients in waterways *4,6,7,7,8,8, (6.6)*
Debris in water bodies *2,3,4,4,4,5,9 (4.4)*	Change of stream form 1,1,2,5,6,8 (3.8)
Increased toxic contaminants in Waterways *3,4,7,8,9,9,10 (6.2)*	Change in water temperature 5,7,9,9,10,10 (8.3)

Which of the following Best Management Practices related to stormwater management are you familiar with?: (check the ones you are familiar with)

Detention basins *7*	Water quality/Deep sump catch basins *6*
Drainage channels *5*	Infiltration basins *4*
Water quality swales *7*	Infiltration trenches *3*
Sediment traps *5*	Other (name)

Approximately how much formal training have you gained in site design/development techniques specifically in relation to stormwater?
□ None or Self-trained*4*　□ Attended some workshops*2*　□ Formal classroom training*1*

Please identify the workshops or other training from which you've benefited:

1) *Mass. Conservation Commission workshop*
2) *Courses in Environmental Science at Berkshire Community College*

Would training be helpful to broaden your knowledge of good and alternative site design techniques?　□ Yes *7*　□ No

In addition to site design, are there other areas of education/training that would help you in meeting your responsibilities as a member of the Conservation Commission?

1) *We are requesting timely information on the changes to the wetlands protection law. We require a detailed interpretation of the law change and the effect of that change on a local Conservation Commission*
2) *Storm water management practices*

What type of training works best for you? (i.e. circle the following individual seminars 2, short informational sessions as part of your monthly meetings *2*, handouts *3*, or other – please describe below)

Are you most often involved in projects before or after contamination or degradation of a resource area has occurred?

□ Before *6*　□ After *2 (we've had very few)*

Knowing the limits of the Conservation Commission's jurisdiction, do you believe water quality is adequately protected from stormwater impacts in Adams?

□ Yes *3*　□ No *1*　□ Somewhat *4*

Given the relationship of increased impervious surfaces to water quality and quantity do you feel it is appropriate for the Conservation Commission to

recommend alternative site designs to an applicant that will reduce overall imperviousness?

□ Yes *7*   □ No

In your review of projects how much/what type of consideration is given to the effect of a new development on the area beyond the site itself?

□ None   □ Some *2*   □ A lot   □ Depends on site *6*

Is the type and amount of information you typically receive regarding stormwater management issues adequate for you to conduct a thorough review?

□ Yes *6*   □ Somewhat lacking *1*   □ Usually lacking   □ No

Do you think the public adequately understands impacts on our water resources from nonpoint source pollution ?   □ Yes   □ No *7*

The Massachusetts Wetlands Protection Act establishes the purview of and resource areas to be protected by the local Conservation Commission.

Do you think your efficacy related to these regulations and stormwater issues could be improved by establishing new town by-laws that support your responsibilities?

□ Yes   □ No *7*

If yes, how?

In what areas do you feel the Town needs to have supplemental requirements or review authority?

Control of erosion and sedimentation *4*
Stormwater management for smaller sites *2*
Long-term maintenance of stormwater BMP's *2*
Steep slope development *3*
Potential stormwater damage to private property *2*

Thank you for your time.
Please return this questionnaire via fax or mail by Feb. ? to:

Attn: Sari Calame
Berkshire Regional Planning Commission
1 Fenn Street, Suite 201

Summary

The CC is equally split between which is more important – the directing of storm water flow and controlling the pollutants etc. in storm water runoff.

Based on Averaging the scores the largest contributors to storm water issues (in order from the greatest to the least) are:

1) Roads
2) Parking Lots
3) Agriculture
4) Driveways
5) Industrial Sites
6) Rooftop runoff
7) Commercial Sites and Lawns
8) Open Space / Parks
9) Forests and Industrial sites
10) Sidewalks

NB: Rooftop Runoff, Forests, Open Space and Commercial Sites (6,7,8 & 9) had the greatest discrepancy in individual placement of importance – (before averaging the answers out).

Based on Averaging the scores the results of runoff of greatest concern (in order from the greatest to the least) are:

1) Erosion
2) Increased flashiness of watershed
3) Change of stream form
4) Sediment buildup in waterways
5) Debris in water bodies
6) Increased toxic contaminants
7) Nutrients in water
8) Pathogens in waterways
9) Increased elevation of floodplain
10) Change in water temperature

NB Debris in the water, pathogens in the waterways and change in stream form (5,8 & 10) had the greatest discrepancy in individual placement of importance – (before averaging the answers out).

Knowledge of BMP's related to storm water management seems quite well developed.

Training:
All felt they had some form of training in site design/development techniques relating to storm water ranging from self trained (57%), workshops (29%) and formal classroom training (14%)

Training has been given by Mass. Conservation Commission and courses in Environmental Science from BCC.
They unanimously agreed that more training in good and alternative site design techniques would be very helpful.
The preferred type of training would be:

1) handouts
2) short informational sessions as part of their monthly meetings
3) individual seminars

They request more timely updates in the Wetlands Protection Law and the effect on the job they do and more information on storm water management practices.

They most often get involved in problems concerning contamination or degradation of a resource area before the problem occurs.
They are split between believing that their water is and is not adequately protected from storm water impacts.

All agree that it is appropriate for the Con.Com. to recommend reduction of impervious surfaces in site designs.

When looking at new projects the effect of runoff onto other sites mostly depends on the site itself but the level of concern appears less than that of the Planning Board.

As a group they mostly are comfortable with the level of information regarding storm water management.

They unanimously agree that the public does NOT understand the effect of nonpoint source pollution on the water resources of Adams.

They unanimously agree that the introduction of new by-laws would NOT improve their efficacy related to their responsibilities under the Mass. Wetlands Protection Act over resource areas related to storm water issues.
However – they do believe the town should have more requirements/authority over:

1) Erosion and sedimentation control
2) Development on steep slopes
3) Storm water management on smaller sites
4) Long term maintenance of storm water BMP's
5) Potential storm water damage to private properties.

Town of Adams Stormwater Management Questionnaire

Your name…3 members of the Planning Board Responded – the following are their answers:

When you hear the term "stormwater" what do you think of?

1) *Temporary flow of water caused by heavy storm, or runoff from winter snow, ice melt at a fast rate,*
2) *Rain water runoff*
3) *Water runoff impervious surfaces*

When considering stormwater which of the following is your greatest concern? (Check Box)

Quantity: Redirecting the flow away from or to a particular area or □ *2*

Quality: Controlling pollutants/nutrients and temperature change □ 0

What do you see as contributing the most problems pertaining to stormwater issues? (Number in sequence of importance #1 being most important)

Rooftop runoff *4,7,10 (7)*	Lawns 9,10,11 (10)	Agriculture 11,12,12 (11.6)
Parking lots 1,5,7 (4.3)	Open space/Parks 6,7,10 (7.6)	Steep slopes 1,3,5 (3)
Driveways 2,6,8 (5.3)	Forests 4,11,12 (9)	Other (Name): Basins (6)
Sidewalks 8,9,13 (10)	Commercial Sites 1,2,8 (3.6)	
Roads 3,4,5 (4)	Industrial sites 2,3,9 (4.6)	

Why? (Describe for your top two choices)

1) *Impact on other areas*
2) *A.Water flows down from mountain areas – mountains also form many wet area forming streams.B. Sites consume previous grassy /tree site with buildings and blacktop.*
3) *Hard surface. Large area*

Which side effects of increased runoff are of most concern? (number in sequence of importance, #1 being most important)

Increased "flashiness" (sudden flooding) of watershed *2,2,4 (2.7)*	Pathogens (disease causing bacteria) in the waterways *2,4,9 (5)*
Erosion *1,1,5 (2.3)*	Increased elevation of floodplain *5,5,8 (6)*
Sediment buildup in waterways *3,6,6 (5)*	Nutrients in waterways *7,7,8 (7.3)*
Debris in water bodies *3,6,7 (5.3)*	Change of stream form *4,9,10 (4.3)*
Increased toxic contaminants in Waterways *1,3,10 (4.7)*	Change in water temperature *8,9,10 (9)*

Give a brief description of what Best Management Practices (BMPs) are related to stormwater management

1) *Control of runoff and protection of other areas.*
2) *Working with a certain party or business for a sensible solution. Laws must be modified to fit with a project. Flexibility is the key.*
3) *-*

Which of the following Best Management Practices related to stormwater management are you familiar with? (check the ones you are familiar with) NB: only one person responded.

Detention basins *1*	Water quality/Deep sump catch basins
Drainage channels *1*	Infiltration basins
Water quality swales *1*	Infiltration trenches
Sediment traps *1*	Other (name)

Which measures, if any, are imposed to specifically address erosion control and sediment conditions <u>before</u> *and* <u>after</u> construction? (Check each that applies) NB: 2 out of 3 responded

Surface stabilization (mulching/seeding etc) *1*
Runoff control (temporary/permanent diversion) *2*
Sediment control (sediment trap etc.) *2*
Runoff conveyance (swale, rip-rap etc) *2*
Stream crossings (temporary and permanent) *1*
Streambank protection/stabilization *2*
Site preparation (construction road stabilization etc) *2*
Preserving natural vegetation *2*

Have you been trained in how to assess any of the following related how they affect stormwater?

A) Review site design techniques	□ Yes *1 somewhat*	□ No *2*
B) Review sediment and erosion control techniques	□ Yes *1 somewhat*	□ No *2*
C) Evaluate drainage calculations	□ Yes	□ No *3*
D) Review BMP designs	□ Yes	□ No *3*

Would training in any of the above be helpful to broaden your knowledge?

A	□ Yes *3*	□ No
B	□ Yes *3*	□ No
C	□ Yes *3*	□ No
D	□ Yes 3	□ No

What type of training works best for you? (i.e. circle the following: individual seminars *(1)*, short informational sessions as part of your monthly meetings *(2)*, handouts, or other – please describe below) 2 out of 3 answered.

Do you know that there is a relationship between the overall percentage of impervious surfaces in your Town to water quality and quantity? □ Yes *1* □ No *2*

In your review of projects, how much/what type of consideration is given to the effect of a new development on the area beyond the site itself?

□ None □ Some □ A lot *2* □ Depends on site *1*

When reviewing drainage regulations do you concentrate on road coverage only or look at the whole "built-out area" (roof tops, driveways etc) when sizing stormwater BMPs/pipes etc? □ Road coverage □ Whole area *3*

Do you know what nonpoint source pollution is? □ Yes *1 (sort of)* □ No *2*

What are your concerns with nonpoint source pollution? 1 answer
1) only if pollution is/would be permanently detrimental to area.

Local bylaws are established to benefit the community's general welfare. Protecting natural features can enhance the Town's ability to better control nonpoint source pollution and improve the community's overall health.

Do you think the Town of Adams Zoning By-law adequately protects?

Natural resource areas (rivers, streams and wetlands, aquifers)	□ Yes *2*	□ No *1*
Native vegetation	□ Yes *2*	□ No *1*
Mature trees	□ Yes *1*	□ No *2*
Open space	□ Yes *3*	□ No
Soils/gravels	□ Yes *2*	□ No *1*
Slopes	□ Yes *2*	□ No *1*
Community character	□ Yes *2*	□ No *1*

Thank you for you time.
Please return this questionnaire to the Kelly at the Community Development Department by **Friday, February 6, 2004. (If you need more time, just let Kelly know)**

If you have any questions about the survey, please contact Donna at the Department at 743-8317 or 743-8315.

You can also contact Sari Calame at Berkshire Regional Planning Commission

Tel: (413)442-1521
Fax: (413)442-1523
scalame@berkshireplanning.org

Summary

There is general understanding that "storm water" refers to snow/ice melt and rainfall and is related to the amount of impervious surfaces.

Redirecting the water away from specific areas is more important than the pollutants etc.in the runoff.

Based on Averaging the scores the largest contributors to storm water issues (in order from the greatest to the least) are:

1) Steep slopes
2) Commercial Sites
3) Roads
4) Parking Lots
5) Industrial Sites
6) Driveways
7) Rooftop Runoff
8) Open Space / Parks
9) Forests
10) Lawns and Sidewalks
11) Agriculture

NB: Forests, Commercial Sites and Industrial Sites (9,2 & 5) had the greatest discrepancy in individual placement of importance – (before averaging the answers out).

The top three reasons given for why the above answers were reached were

1) the impact on surrounding areas
2) Steep slopes increase runoff problems
3) Increased impervious surfaces, and reduced grassy/natural areas result in heavier runoff flow.

A later question revealed that only 1 out of the 3 understands the relationship between increased impervious surface and water quality and quantity.

Based on Averaging the scores the results of runoff of greatest concern (in order from the greatest to the least) are:

1) Erosion
2) Increased flashiness of watershed
3) Change of stream form
4) Increased toxic contaminants
5) Pathogens in the waterways
6) Sediment buildup in waterways
7) Debris in waterbodies
8) Increased elevation of floodplain
9) Increased nutrients in the waterway
10) Change in water temperature

NB Increased toxic contaminants and pathogens in the waterways (4 & 5) had the greatest discrepancy in individual placement of importance – (before averaging the answers out).

Q: What are BMP's?
A: Again – more concerned with redirecting runoff away from other areas.
Laws need to be modified to achieve a "sensible solution"

There is knowledge of some BMP practices related to storm water management, but there is room for a deeper level of understanding of available options.

There is a better understanding of how to control erosion and sediment buildup.

Training:
The overwhelming consensus is that there has been very little official training about site design review techniques and sediment/erosion control techniques and **NO training** related to evaluation drainage calculations and reviewing BMP designs

Training in the relationship of impervious surface to water quality and quantity is needed.
Also in why it is important to protect the water quality (not just where the water flows)
Nobody was sure what nonpoint pollution is

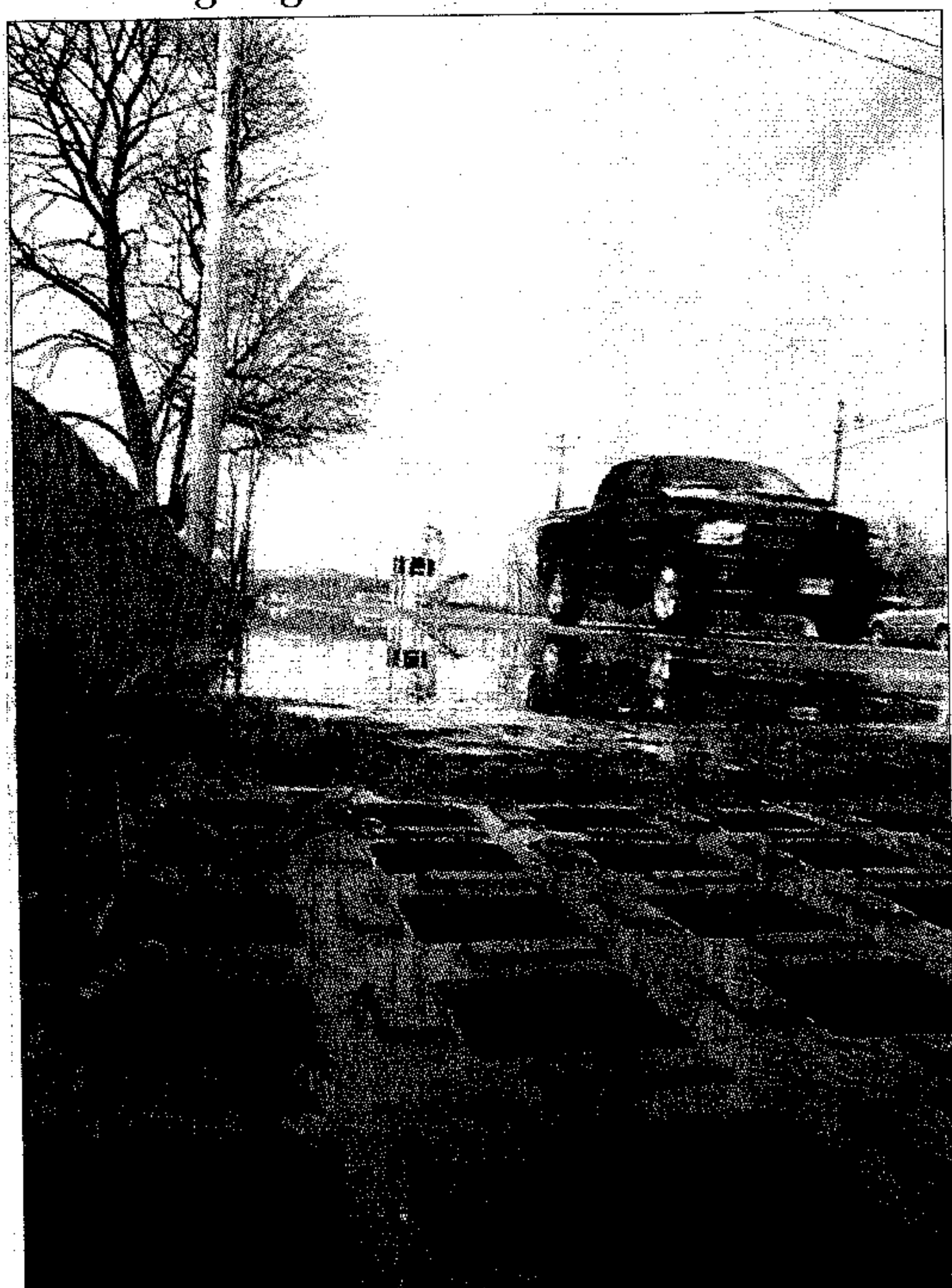
There was unanimous agreement that training would be beneficial.
The preferred type of training would be:
1) short informational sessions as part of their monthly meetings
2) individual seminars

Q: Do current by-laws protect natural feature sufficiently?
A: In general the answer was yes – the only disagreement was that mature trees are NOT protected enough.

North Adams Transcript

pt.com Friday, March 25, 2005 • North Adams, Massachusetts Fifty cents

No going down the drain for Adams



A sewer along Route 8 in Adams.

Adams gets proactive about water runoff

By Hinda Mandell
NORTH ADAMS TRANSCRIPT

ADAMS — The town of Adams is taking proactive measures to protect the area's waterways and comply with environmental regulations not yet in effect for the town, according to Director of Community Development Donna Cesan.

The Environmental Protection Agency is working with local governments across the country to address polluted runoff of rainwater into storm drains. The purpose of this program — Storm Water Phase II — is to improve the quality of the nation's water sources.

According to Cesan, when rain hits the sidewalks it flushes chemicals, grease, dust, pet waste and other types of refuse on its surface down the storm drain. Eventually, this waste makes its way into the Hoosic River, untreated and unclean, through storm drainage systems.

When rain hits the sidewalks it flushes chemicals, grease, dust, pet waste and other types of refuse on its surface down the storm drain.

According to information from an EPA publication provided by Cesan, phase I of the project addressed storm water runoff in sewer systems servings populations of 100,000 or more, as well as construction affecting five acres of land or more.

Adams is working on a draft of a "storm water management strategic plan," said Cesan. This information "will guide the town on how to meet the Storm Water Phase II requirements."

Cesan expects that the town will need to comply with the program regulations within three to five years. Adams received government funding in 2002 — a water quality management planning grant from the state — to work ahead on this strategic plan. The town has until June to turn in a completed strategic plan to the state. This funding allowed Adams to hire a civil engineer from Comprehensive Environmental Inc., an engineering firm with expertise in municipal storm water drainage. Over the next several years the town will implement this plan.

While small towns do not need to immediately comply with the program, Adams is hoping "to get a leg up," said Cesan.

"We hope to be a model for other smaller communities," she said.

According to the spokesman

Please see ADAMS, Page A8

Adams: Won't be waiting to be told

Continued from Page A1

for the state's Department of Environmental Protection, Edmund Coletta, the EPA expects to see progress before that deadline five years down the road.

"The Environmental Protection Agency usually wants to see communities make progress. They don't want to see communities wait until the last year," he said.

Taking a proactive stance in complying with these future regulations gives the town more time to be in compliance, while also acting in a cost-effective manner, Cesan said.

While implementing the strategic plan, the town will address such issues as the timeliness of street cleaning. For example, the Adams Department of Public Works cleans the streets each spring — disposing of salt, sand and other debris — which prevents waste from entering the drainage system and polluting the Hoosic River.

However, the timeliness of the street cleaning is important, said Cesan. If it happens later in the spring months, then more pollutants can enter the storm water pipes, and subsequently, the river.

Cesan also said that educating the public plays a critical role in getting the word out about activities that might have a detrimental effect on natural water-bodies. Awareness programs in schools might contribute to a decrease in the amount of pollutants in storm water runoff. After all, said Cesan, recycling became successful when students brought awareness into their homes from schools.

The strategic plan also hopes to address "illicit discharges," said Cesan, which she described as "inappropriate connections between storm drainage and sewer pipes."

Before drainage systems were in place, some grungy contents of sewer pipes flowed into the river. As part of the strategic plan, the town will map out and identify these illicit discharges, which also include cracked or leaking sewer pipes and overflow from septic tanks.

"Mistakes happen over time," said Cesan. "Nobody knows about it because it's all happening underground."

8.0 Recommendations & Implementation Plan

The Best Management Practices (BMP) Implementation Plan (Table 8-1) portrays a comprehensive approach for the Town of Adams to improve water quality and work towards compliance with the six Minimum Control Measures of the Phase II Stormwater Regulations. This BMP Plan is a summary of the recommended implementation measures provided in previous sections (3.0 through 7.0) and outlines existing and required measures to meet Phase II. For consistency with the six minimum measures, the BMPs are organized into six categories in Table 8-1: 1) Public Education and Outreach; 2) Public Participation/ Involvement; 3) Illicit Discharge Detection and Elimination; 4) Construction Site Runoff Control; 5) Post-Construction Runoff Control; and 6) Pollution Prevention and Good Housekeeping.

The BMP Plan also outlines the responsible party(ies) for implementing each BMP, the measurable goals for each BMP, and a five-year implementation schedule. This schedule is consistent with the time period under a normal Phase II permit, except the current Phase II permit term started in May 2003. Table 8-2 also portrays cost estimates for some BMPs based on Town input and the potential need for contractor assistance.

Notice of Intent and NPDES Stormwater Permit

When the Town of Adams is formally in EPA's Phase II Program, it will be required to file the required Notice of Intent (NOI) form: BRP WM 08A – NPDES Stormwater General Permit Notice of Intent for Discharges from Small Municipal Separate Storm Sewer Systems (MS4s). The NOI would contain a summary of the information discussed in the Town's Stormwater Management Strategic Plan, specifically Table 8-1, as well as the names of receiving waters and the number of stormwater discharges to those waters. Attached to the NOI would be a detailed five-year schedule of the BMPs consistent with Table 8-1.

Section B of the NOI form asks the applicant to determine if the eligibility criteria for protection of listed endangered species, critical habitat and historic places have been met. Although the Town of Adams is not required to file a NOI at this time, BMPs are included in Table 8-1 for the evaluation of these places to fulfill the permit eligibility in accordance with the permit guidance in Addendum B.

The NOI would outline the Town's intentions for meeting the Phase II regulations and complying with the NPDES General Permit for MS4s. Implementation of this plan would fulfill the requirements outlined in the

NPDES General Permit for MS4s. In addition to the implementation activities outlined in this plan, the Town would also have to perform the following activities throughout the duration of the permit (see Appendix 8A for a copy of the NPDES General Permit).

- **Program Evaluation –** Conduct annual evaluations of the Stormwater Management Program for compliance with permit conditions. This evaluation would include a determination of the appropriateness of the selected BMPs in efforts towards achieving the measurable goals outlined in Table 8-1. The Town would be required to notify EPA and DEP of additions or modifications to the Stormwater Management Program, some of which may require EPA or DEP approval. EPA or DEP may require that changes be made to the Stormwater Management Program over the permit term.

- **Record Keeping –** Maintain records that pertain to the Stormwater Management Program for a period of at least five years. Records need to be made available to the public. The Town may charge a reasonable fee for copying. Records would not need to be submitted to EPA or DEP unless specifically requested.

- **Reporting –** Submit an annual report to EPA and DEP at one year from the effective date of the permit and annually thereafter.

Adams is not yet formally included in the Phase II Program and therefore is not required to submit the NOI or maintain permit conditions. However, the Town would benefit from conducting an annual evaluation of the Stormwater Management Program as well as maintaining stormwater records consistent with the Phase II Program. In addition to placing the town in an advantageous position should it become included in the Phase II Program, these practices would: ensure the long-term effectiveness of the Program; provide additional support/leverage and position the town to obtain future grants; and justify future spending requests for environmental and water quality improvement efforts.

Table 8-1. Stormwater Best Management Practices Plan for Phase II Compliance

BMP ID	BMP Description[1.]	Implementation: Tasks for each BMP	Responsible Dept./Person	Measurable Goal	Year: 2005	2006	2007	2008	2009
1. Education and Outreach for the General Public, Businesses and Institutions and Municipal Officials									
1A	**Develop and Distribute Stormwater Fact Sheet to Residents (7.1)**	1. Develop a stormwater fact sheet based on the Adams Stormwater Assessment Project.	Community Development	Copies of materials. Distribution to at least 75% of residents	**Completed June 2005**	*	*	*	*
		2. Mail to all residents in Town annually as the beginning of a series of fact sheets on different stormwater topics each year.			*	*	*	*	*
		3. Direct audiences to the stormwater section of the Town's website.			*	*	*	*	*
1B	**Distribute Brochures and Fact Sheets to Residents and Businesses (7.1, 7.2)**	1. Obtain and adapt topic specific education materials. Specific topics for identified target audiences are identified in Section 7 of the Stormwater Management Plan.	Community Development	Copies of materials. Distribution to at least 75% of residents and 90% of businesses	*	*	*	*	*
		2. Mail to residents and businesses with tax bills (twice/yr) and direct audience to stormwater section of website.			*	*	*	*	*
		4. Prepare and distribute Fact Sheet series to businesses.			*	*	*	*	*
		3. Direct audiences to the stormwater section of the Town's website.			*	*	*	*	*
1C	**Send out Stormwater Press Releases (7.1)**	1. Send press releases to all local papers twice/year regarding the stormwater management program, the educational mailings, and the importance of stormwater management at each home.	Community Development	Copies of articles	**Partially complete - March 2005**	*	*	*	*
1D	**Develop Stormwater Section of Town Web Site (7.1, 7.2)**	1. Identify vendor or town staff to create new stormwater section of web site.	Community Development and Town Website Manager	Measure number of hits annually	*	*			
		2. Review other stormwater sites from across the country.			*	*			
		3. Prepare site. Include Executive Summary of Stormwater Management Strategic Plan. List "Clean Stream" business participants.			*	*			
		4. Regularly update site as warranted.				*	*	*	*
		5. Measure hits annually.				*	*	*	*
1E	**Create and Exhibit a Stormwater Educational Display (7.1)**	1. Prepare materials for display.	Community Development with Town Administrator, Event Coordinators, Businesses	Track quantity of educational materials taken quarterly by display users / visitors	*	*			
		2. Identify locations (e.g., Town Hall, schools, businesses) and events (e.g. Susan B. Anthony Days, Agricultural Fair, State of the River Conference, Riverfest) and person(s) to maintain site.			*	*	*	*	*
		3. Place and re-stock "take home" materials (e.g., brochures, fact sheets) at the site.				*	*	*	*
		4. Update display site with new information and additional materials, as needed.				*	*	*	*
1F	**Develop and Present Informational Workshops and Public Meetings (7.1, 7.2)**	1. Identify vendor or town staff to create and present stormwater informational workshops.	Community Development	Track number of workshop participants through attendance sheets	*	*			
		2. Prepare materials for workshops. Tailor material to likely audiences, such as business owners (including by business type,) residential property owners, gardeners.				*			
		3. Identify and secure venues to give workshops.				*			
		4. Update workshop content as necessary (at least yearly) and give updates at previously identified venues.					*	*	*

Table 8-1. Stormwater Best Management Practices Plan for Phase II Compliance

BMP ID	BMP Description[1.]	Implementation							
		Tasks for each BMP	Responsible Dept./Person	Measurable Goal	Year				
					2005	2006	2007	2008	2009
1. Education and Outreach for the General Public, Businesses and Institutions and Municipal Officials									
1G	**Promotional Items for Businesses (7.2)**	1. Identify vendor or town staff to create and present a program for stormwater promotional items to businesses. Where possible, integrate it with a "Clean Stream" participant.	Community Development	Track number of businesses using this program	*	*			
		2. Conduct the stormwater promotional item program.				*	*	*	*
1H	**Local Cable Broadcasts of Board of Selectmen's Meetings (7.1, 7.3)**	1. Develop initial presentation about the Stormwater Management Strategic Plan.	Community Development, Department of Public Works, Board of Selectmen, Town Administrator	Copies of cable TV tapes of presentations	*				
		2. Inform residents of presentation to the Board of Selection through the web site.			*				
		3. Show initial presentation at a Board of Selectmen meeting. Make sure that meeting is covered by local cable access.			*				
		4. Give update presentation to the Board of Selectmen, at meeting covered by cable television, at least annually thereafter.				*	*	*	*
1I	**Greater Participation at HooRWA Events (7.1)**	1. Provide increased outreach to Adams resident about events.	HooRWA, Community Development	Track participation by Adams residents and interests at events		*			
		2. Set State of the River Conference Agenda to include presentation about Adams Stormwater Management activities.				*	*	*	*
		3. Exhibit Adams stormwater management display at Riverfest and State of the River Conference.				*	*	*	*

Notes:
1. BMP descriptions are based on recommendations discussed in the Stormwater Management Strategic Plan. The section number where these recommendations appear in the Plan is noted in parentheses.

Table 8-1. Stormwater Best Management Practices Plan for Phase II Compliance

BMP ID	BMP Description[1.]	Implementation: Tasks for each BMP	Responsible Dept./Person	Measurable Goal	Year 2005	2006	2007	2008	2009
2. Participation and Involvement by the General Public, Businesses and Institutions, and Municipal Officials									
2A	**Establish / Continue Pet Waste Bags in the Downtown Area (7.1)**	1. Install pet waste bag dispensers and signage in the downtown area.	Department of Public Works, Community Development	Record number of bags placed in dispensers	**Completed prior**				
		2. Periodically (at least weekly in spring, summer, fall) monitor and inspect dispensers. Re-stock bags as necessary.				*	*	*	*
		3. Develop and conduct educational outreach about pet waste, consistent with other components of the Education Plan Program (i.e. mailings, press releases, website, displays, presentations.)				*	*	*	*
		4. Aggressively enforce bylaw requiring clean up of animal feces.						*	*
2B	**Stormwater Management Grant / Funding Programs (7.3)**	1. Identify staff person to lead this grant effort.	Community Development, Department of Public Works, Town Administrator	Amount of funding secured for stormwater programs	*				
		2. Identify potential grant or funding sources. Explore wide range of options, including state, federal, and non-profit grants and private funding sources such as banks, business sponsorship.			*	*	*	*	*
		3. Conduct activities to foster broad-based partnerships to enhance the likelihood of success in obtaining grant funds and ensure successful project implementation.			*	*	*	*	*
		4. Prepare applications / funding requests.			*	*	*	*	*
2C	**Mark Storm Drains (7.1, 7.2)**	1. Identify vendor or staff person and interested volunteers or watershed group(s) to develop, coordinate and participate in this program. Coordinate with businesses and institutions, such as securing participation, sponsorship or employee training. Coordinate with other programs such as "Clean Stream" and "Adopt-A-Stream."	Community Development in partnership with HooRWA	50% of storm drains marked by year 5		*			
		2. Identify / secure funding to conduct marking program.				*	*		
		3. Identify catch basins to be marked in highest priority sub-basins.				*			
		4. Select and purchase storm drain markers, (stencils). Conduct school design "contest" of stencil.				*			
		5. Mark catch basins starting in highest priority sub-basins.				*	*		
		6. Mark catch basins in moderate-high priority sub-basins.					*	*	
		7. Identify marked storm drains on storm drain base map.				*	*	*	
2D	**Stormwater Management Training Program for Municipal Officials (6.4, 7.3)**	1. Identify vendor or staff person to coordinate training program for municipal officials.	Community Development, Planning Board, Conservation Commission, in partnership with Berkshire Regional Planning Commission	Attendance lists of participants	*	*			
		2. Identify / secure funding to conduct the training program.			*	*			
		3. Obtain / develop training material. Revise and update as necessary.				*	*	*	*
		4. Establish training program schedule. Coordinate with "Good Housekeeping" Training (6T.)				*	*	*	*
		5. Conduct training program.				*	*	*	*
		6. Regularly inform Board and Commission members about formalized trainings offered by public, private and non-profit entities.			*	*	*	*	*

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BMP ID	BMP Description[1.]	Implementation							
		Tasks for each BMP	Responsible Dept./Person	Measurable Goal	Year				
					2005	2006	2007	2008	2009
2. Participation and Involvement by the General Public, Businesses and Institutions, and Municipal Officials									
2E	**Establish "Clean Stream" Program**	2. Identify / secure funding to conduct the "Clean Stream" program.	Community Development with cooperation from businesses and institutions	Number of "Clean Stream" participants		*	*		
		3. Prepare list of Clean Stream parameters ("how to" packets describing the program and various activities) for distribution to interested businesses and institutions.					*	*	
		4. Identify and secure interested businesses or institutions to participate in the program.					*	*	
		5. Conduct site evaluations against established parameters.						*	*
		6. Recognize participants via the web site, press releases, the display, and at presentations.					*	*	*
2F	**Establish an Adopt-A-Stream Program (7.2)**	1. Identify vendor or staff person to develop and coordinate this program.	Community Development in partnership with HooRWA and with strong support from area businesses and institutions	Miles of stream segments "adopted"		*	*		
		2. Identify / secure funding to conduct the Adopt-A-Stream program.				*	*		
		3. Prepare "how to" packets describing the program and various activities for distribution to interested businesses and institutions.				*			
		4. Identify and secure interested businesses to participate in the program.				*			
		5. Conduct on-going Adopt-A-Stream activities.				*	*	*	*
		6. Recognize participants via the web site, press releases, the display, and at presentations.				*	*	*	*
		7. Continue to evaluate streams through stream team assessments and integrate ongoing stream team assessment results into future clean-up sites.				*	*	*	*
2G	**Conduct River Clean-ups (7.1, 7.2)**	1. Identify vendor or staff person and interested volunteers or watershed group(s) to conduct and participate in the program.	Community Development, Department of Public Works in partnership with HooRWA and other local groups	Highest priority sites completely cleaned within 5 years		*	*		
		2. Identify / secure funding to conduct clean-ups.							
		3. Using Stream Team Assessment results identify highest priority clean-up sites. Coordinate clean-ups with segments identified in the Adopt-A-Stream (2F) and "Clean Stream" Programs (2E.)				*	*		
		4. Arrange clean-up logistics. Coordinate with the DPW.				*	*		
		5. Conduct clean-up of highest priority sites.				*	*		
		6. Conduct ongoing clean-ups using updated results of stream team assessments.					*	*	*
2H	**Conduct Employee Trainings at Participating Businesses or Institutions (7.2)**	1. Identify vendor or staff person to solicit and identify potential businesses and institutions to participate in this program.	Community Development in partnership with businesses and institutions	An employee training series presented to at least one business or institution per year	*	*			
		2. Identify / secure funding to conduct trainings.							
		3. Prepare or coordinate training program - secure and adapt material, arrange times and locations, and secure presenters as necessary.				*	*		
		4. Conduct trainings.							
		5. Recognize participants via the web site, press releases, the display, and at presentations.				*	*	*	*

Table 8-1. Stormwater Best Management Practices Plan for Phase II Compliance

BMP ID	BMP Description[1.]	Implementation							
		Tasks for each BMP	Responsible Dept./Person	Measurable Goal	Year				
					2005	2006	2007	2008	2009
2. Participation and Involvement by the General Public, Businesses and Institutions, and Municipal Officials									
2I	**Implement Stormwater BMPs at Business or Institution Sites (7.2)**	1. Identify vendor or staff person to solicit and identify potential business sites as candidates for this item.	Community Development, Department of Public Works	At least one BMP installation at the end of 5 years		*	*	*	*
		2. Research and identify suitable incentives.				*	*		
		3. Work with property owners to identify and design acceptable BMPs.				*	*	*	
		4. Prepare and secure incentive package such as grant application. Secure commitment from property owner to go forth with the incentive effort.				*	*	*	*
		5. If incentive package request is successful, install BMP.					*	*	*
2J	**Stream Team Assessments (7.1)**	1. Identify vendor or staff person and interested volunteers or watershed group(s) to conduct and participate in the program.	Community Development with HooRWA and Youth Center, Inc.	Stream Team Assessments conducted for major stream segments every 2 years	*	*			
		2. Identify and secure funding for vendor services or reimbursement of costs.			*	*			
		3. Conduct organizational activities including identification and prioritizations of stream segments, volunteer solicitation, volunteer training, preparation of volunteer field work materials, and volunteer oversight.				*	*		
		4. Conduct assessments and related follow-up, including write-up of findings, photograph and map documentation, and prioritization of needed site specific activities (i.e. clean-up, erosion control, monitoring, etc.)				*	*	*	*
		5. Provide ongoing presence related to implementing needed activities.				*	*	*	*
		6. Recognize efforts of participants via the web site, press releases, the display, and at				*	*	*	*
2K	**Classroom Education and Field Trip Program (7.1)**	1. Coordinate with HooRWA to insure that Adams stormwater items get integrated into existing teacher training effort and school field trips.	Community Development with HooRWA	Number of school children exposed to educational training related to Adams stormwater items	*				
		2. Work with HooRWA to explore possible expansion of the classroom education program. Seek and obtain a sustainable source of funds for regular operation of this program.			*	*			
		3. Work with schools to expand curriculum to included Adams stormwater items.				*	*		
		4. Explore opportunities with the Massachusetts College of Liberal Arts to develop / integrate K - 12 stormwater education program into MCLA curriculum.					*	*	
		5. Explore opportunities to integrate K - 12 stormwater education program into future development of Greylock Glen site.					*	*	*
2L	**Conduct Volunteer Water Quality Monitoring (7.1)**	1. Coordinate with HooRWA's monitoring program to monitor for stormwater impacts.	Community Development with HooRWA	Number of sites where samples have been taken		*			
		2. Identify and secure funding for reimbursement of monitoring costs.				*			
		3. Expand volunteer monitors to include Adams residents.				*	*		
		4. Train personnel/volunteers to conduct sampling according to appropriate protocols.				*	*	*	*
		5. Implement stormwater monitoring program. Conduct sampling.					*	*	*
		6. Interpret and widely disseminate results (as part of other activities such as mailings, presentations, Board of Selectmen updates.)					*	*	*
		7. Use results to correct identified problems and improve water quality.					*	*	*

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2. Participation and Involvement by the General Public, Businesses and Institutions, and Municipal Officials									
2M	**Conduct River Walks (7.1)**	1. Identify interested volunteers or watershed group(s) to conduct and participate in the program.	Community Development with HooRWA	Number of participants			*		
		2. Develop and promote walk itineraries.					*		
		3. Conduct walks. Take pictures and interview participants to use with other outreach efforts, such as the display board.					*	*	*
2N	**Participation at Hoosic Watershed Team Meetings (7.3)**	1. Include broad range of Adams officials on the Hoosic Team e-mail list serve. Update as necessary.	Community Development, Department of Public Works, Town Administrator, Selectmen, HooRWA	Number of Adams representatives attending meetings	Ongoing	*	*	*	*
		2. Coordinate between Adams officials as to the most appropriate attendee(s) to the upcoming meeting.			Ongoing	*	*	*	*
		3. Participate at meetings.			Ongoing	*	*	*	*
		4. Conduct follow-up activities / networking between meetings.			Ongoing	*	*	*	*
2O	**Participation in Watershed Association Events (7.1, 7.3)**	1. Provide targeted outreach to Adams residents about Watershed Association events.	HooRWA	Number of Adams residents attending events	*	*	*	*	*
		2. Integrate an Adams component to Riverfest (i.e. stormwater display) and State of the River Conference.			*	*	*	*	*
		3. Participate at events.				*	*	*	*
2P	**Conduct Bike Tours along the Ashuwillticook Rail Trail (7.1)**	1. Identify vendor, staff person, interested volunteers or watershed group(s) to coordinate and run this effort. This is a good summer intern activity and could be combined with other water related intern activities.	Community Development in partnership with HooRWA with involvement from area schools and colleges	Number of participants	*	*			
		2. Identify / secure funding is a vendor is used or to reimburse for volunteer expenses.			*	*			
		3. Prepare interpretive program.				*			
		4. Advertise and solicit participants.				*	*	*	*
		5. Conduct Tours.				*	*	*	*
2Q	**Riparian Tree / Shrub Planting Program (7.1)**	1. In conjunction with activities specific in 6D, monitor efforts of flood control chute restoration project.	Department of Public Works, Community Development, Selectmen, Conservation Commission, Hoosic Watershed Team Members and Volunteers	Record the number, location, and kind of tree or shrub planted and monitor the overall mortality / survival rate					
		2. Evaluate the potential for tree and shrub planting along the banks of the flood control structure. If favorable conditions exist complete steps 3-7.							
		3. Adjust Operations and Maintenance Plan as necessary.							
		4. Recruit volunteers and organizations for plantings.				*			
		5. Prioritize areas to plant shrubs and trees and determine planting species (use native species) to be used at each location.				*			
		6. Obtain funding and plants.					*		
		7. Plant trees and shrubs.					*	*	*

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Table 8. Stormwater Best Management Practices Plan for Phase II Compliance

BMP ID	BMP Description[1]	Implementation							
		Tasks for each BMP	Responsible Dept./Person	Measurable Goal	Year				
					2005	2006	2007	2008	2009
3. Illicit Discharge Detection and Elimination									
3A	**Develop Illicit Discharge Prohibition Bylaw**	1. Determine whether amendments to existing bylaws, rules, and regulations or a separate general bylaw will be used to prohibit illicit discharges.	Community Development	Adopted Illicit Discharge Prohibition Bylaw approved by the Attorney General's Office	*				
		2. Prepare amendments or new bylaw and present draft to public.				*			
		3. Submit bylaw amendments or new bylaw for Town Meeting.				*	*		
3B	**Develop a Storm Drain System Base Map (3.0)**	1. Develop a drainage base map showing town features (roads, hydrography, resource waters and topography). 2. Map storm drain system using historical mapping projects, existing plans, and knowledge of town employees. 3. Field verify drainage system connections. 4. Create a GIS base map and database for the storm drain system.	Department of Public Works and Community Development	95 % of system mapped on GIS	**Completed in 2003**				
3C	**Field Verify all Stormwater Outfalls and Update Base Map (4.5)**	1. Field verify 42 storm system outfalls in sub-basins L & R.	Department of Public Works and Community Development	All outfalls field verified by 2008	**Completed November 2004**				
		2. Field verify remaining storm system outfalls to the Hoosic River and the highest priority sul basins L & R.				*	*		
		3. Locate and field verify storm system outfalls in the moderate-high priority sub-basins B, C, G, H, K, M, O, T, U, W and Z.				*	*		
		4. Locate and field verify storm system outfalls in the moderate priority sub-basins A, D, E, F, I, J, N, P, Q, S, V, X and Y.					*	*	
		5. Add outfall information to the existing GIS base map and compile inspection sheets to document maintenance needs.			**42 updated**	*	*	*	
3D	**Screen all Stormwater Outfalls for Illicit Discharges in Accordance with the Adams IDDE Plan (3.0 & 4.5)**	1. Inspect outfalls for dry weather flows as part of the inspections under BMP 3B and screen dry weather flows for illicit discharges as outlined in the Adams IDDE Plan. Sample for bacteria and other parameters as budget allows.	Department of Public Works and Community Development	50 outfalls screened each year and all outfalls screened by 2009	**42 screened in 2004**	*	*	*	*
		2. Seek sources of illicit discharges one by one and provide enforcement using newly adopted illicit discharge ordinance authority.				*	*	*	*
3E	**Conduct Follow-up Assessments and Corrective Actions to the May 17 & 18, 2004 and November 18, 2004**	1. Conduct additional water quality sampling (if needed) and trace flow sources (see Table 4-5 in the Stormwater Management Strategic Plan).	Department of Public Works and Community Development	All corrective actions completed by 2007		*			
		2. Identify illicit discharge source, contact owner(s) and physically disconnect the source.				*	*		
3F	**Conduct a Detailed Review of the 1987 I/I Study for the Sanitary Sewer System (4.5)**	1. Confirm the remaining problem areas for the sanitary sewer system that have not been addressed since the 1987 I/I Study. Cross-reference DPW projects, repairs and other sewer projects with the I/I Study findings and recommendations for further investigatior	Department of Public Works and Community Development	Documented findings, maps and fixed areas. Five (5) problem areas to be fixed each year	*	*			
		2. Compile a list of remaining problem areas and areas that were not previously evaluated as part of the 1987 I/I Study.				*			
		3. Prioritize repairs based on the greatest potential for water quality improvement and need for immediate repairs (e.g., likelihood of sewer failures).					*		
		4. Procure funding and begin sewer repairs.					*	*	*

Table 8. Stormwater Best Management Practices Plan for Phase II Compliance

BMP ID	BMP Description[1]	Implementation: Tasks for each BMP	Responsible Dept./Person	Measurable Goal	Year: 2005	2006	2007	2008	2009
3. Illicit Discharge Detection and Elimination									
3G	**Evaluate the Town's existing Five-year Capital Improvement Plan for Sewer and Drainage Repairs (4.6.1)**	Evaluate the Town's sewer and drainage projects in the CIP and prioritize sewer repairs that will result in the greatest water quality improvement. Incorporate the review of the 1987 I/I Study (BMP 3E).	Department of Public Works and Community Development	Prioritized list of improvement areas over five years			*		
3H	**Conduct Stormwater Sampling Upstream of Stormwater Sample Sites SW-1 through SW-5 (4.6.1)**	1. Identify stormwater sample locations upstream of urban areas associated with sample sites SW-1 through SW-5. Calculate sample times based on watershed characteristics	Department of Public Works and Community Development	3 stormwater events sampled, water quality report	*				
		2. Conduct stormwater sampling in accordance with the 2003 Adams QAPP and consider adding ammonia and surfactant parameters. Consider sampling during and after furst flush during high flow storm events (e.g., >0.25" in 1 hour or less).				*	*		
		3. Evaluate water quality data, storm event characteristics and historical water quality data and prepare a report of findings.					*		
3I	**Conduct Smoke Testing of the Drainage System to Identify Cross Connections with the Sanitary Sewer System (4.5)**	1. Begin smoke testing of the drainage system based on the results of BMPs 3E & 3G and/or the contributing drainage network upstream of stormwater sample sites SW-1 through SW-5. Refer to the Adams IDDE Plan for guidance.	Department of Public Works and Community Development	Identified illicit connections are removed within one year of discovery		*	*	*	*
		2. Conduct smoke testing of the unidentified pipes that enter the underground portion of Hoxie Brook.				*			
		3. Document findings, maps and next steps to remove identified illicit connections. Contact owner(s) and physically disconnect the source.				*	*	*	*
3J	**Evaluate Stormwater Discharges to Endangered Species Habitat and Historic Places**	1. Designate a responsible individual and/or retain a consultant to conduct the evaluation.	Community Development, Conservation Commission, and Contractor	Final list of endangered species and historic places	*				
		2. Develop project needs for the evaluation (species and historic places lists) based on the EPA guidance document and Town characteristics identified in Sections 2.5 and 2.6 of the Stormwater Management Strategic Plan.			*				
		3. Conduct evaluations in accordance with EPA's guidance document.		Results of evaluation		*			
3K	**Continually Evaluate New Water Quality Data for Waterways in Adams (4.6.1)**	1. Evaluate new water quality data with historical water quality data to identify potential areas of concern, refine water quality improvement/mitigation efforts or document water quality improvements over time.	Department of Public Works and Community Development	Documented water quality findings, key points for further investigation	*	*	*	*	*
		2. Evaluate illicit discharge investigation data, stormwater and stream data as it becomes available. This includes ongoing studies such as the MA DEP 2002 water quality monitoring for Peck's Brook, Tophet Brook, Dry Brook and the Hoosic River.			*	*	*	*	*
3L	**Incorporate Information on Illicit Discharges into Public Education and Outreach Topics (4.6.1)**	1. Incorporate public education materials on hazards associated with illegal discharges and improper disposal of waste with the public education program.	Department of Public Works, Community Development, and Board of Health	Copies of materials	*	*	*	*	*
		2. Incorporate the results of IDDE field efforts and water quality findings into the public education program.				*	*	*	*
3M	**Consider Establishing a**	1. Identify department to receive calls.	Department of Public Works, Board of Health, and	Log of complaints and		*			
		2. Advertise (with public education materials) who to call to report dumping or other inappropriate inputs to the MS4.				*			

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		Tasks for each BMP	Responsible Dept./Person	Measurable Goal	Year				
					2005	2006	2007	2008	2009
3. Illicit Discharge Detection and Elimination									
	Hotline for Illicit Discharges	3. Develop protocol for addressing complaints.	Adams Fire District	actions taken		*			
		4. Keep records of complaints and actions taken.				*	*	*	*

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BMP ID	BMP Description[1]	Implementation: Tasks for each BMP	Responsible Dept./Person	Measurable Goal	Year: 2005	2006	2007	2008	2009
4. Construction Site Runoff Control									
4A	Establish Adequate Erosion and Sediment Control and Stormwater Measures	1. Prepare erosion and sediment control and stormwater management measures for incorporation into the proposed Stormwater Management and Sediment Control Bylaw that address: standards for acceptable control measures; requirements for stormwater/erosion control plans; procedures for Town plan review and approval; and adeqate enforcement and penalty measures.	Community Development	Endorsed Criteria for Stormwater Management and Erosion and Sediment Control		*			
		2. Conduct workshops with Planning Board, Conservation Commission, Selectmen, etc. to present the draft criteria/measures.				*			
		3. Conduct public meetings on the proposed criteria for stormwater management and erosion and sediment control, as needed.				*			
4B	Adopt a "Standalone" Stormwater Management and Erosion Control Bylaw (5.3)	1. Complete the final draft of a Town of Adams Stormwater Management and Erosion Control Bylaw based on the review of state and CEI model bylaws.	Community Development	Adopted Erosion and Sediment Control Bylaw Provisions		*			
		2. Conduct workshops with Planning Board, Conservation Commission, Selectmen, etc. to present the draft erosion and sediment control measures.				*			
		3. Conduct Public Hearing on the proposed erosion and sediment control measures and prepare revised language, as needed.				*			
		4. Prepare Town Meeting Warrant; seek Town Meeting approval.				*	*		
4C	Amend the Zoning Bylaw to incorporate new development standards consistent with water quality goals (5.3)	1. Prepare final draft amendments to the Zoning Bylaw that incorporate new development standards.	Community Development	Adopted Zoning Bylaw Amendments approved by the Attorney General's Office	*	*			
		2. Conduct workshops with Planning Board, Zoning Board of Appeals, Downtown Committee, Selectmen, etc. to present the draft Bylaw amendments.				*	*		
		3. Conduct Public Hearing(s) on the Bylaw amendments and prepare revised language, as needed.				*	*		
		4. Prepare Town Meeting Warrant; seek Town Meeting approval.					*		
4D	Amend the Subdivision Rules and Regulations consistent with water quality goals	1. Prepare final draft amendments to the Subdivision Regulations that incorporate new development standards consistent with water quality goals and objectives.	Community Development	Adopted Amendments to the Town's Subdivision Regulations		*			
		2. Conduct workshops with Planning Board on the proposed amendments to the Subdivision Regulations.				*			
		3. Conduct Planning Board Public Hearing(s) on the Amended Subdivision Regulations; Prepare revised language, as needed.				*	*		

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BMP ID	BMP Description[1]	Implementation							
		Tasks for each BMP	Responsible Dept./Person	Measurable Goal	Year				
					2005	2006	2007	2008	2009
4. Construction Site Runoff Control									
4E	**Establish New Site Plan Review Requirements (5.3)**	1. Prepare final draft amendments to the Zoning Bylaw that incorporate improved site plan review requirements.	Community Development	Adopted Provisions for Enhanced Site Plan Review		*			
		2. Conduct workshops with Planning Board, Zoning Board of Appeals, Selectmen, etc. to present the draft site plan amendments to the Zoning Bylaw.				*			
		3. Conduct Public Hearing(s) on the site plan Bylaw amendments and prepare revised language, as needed.				*	*		
		4. Prepare Town Meeting Warrant; seek Town Meeting approval.					*		

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		Tasks for each BMP	Responsible Dept./Person	Measurable Goal	2005	2006	2007	2008	2009
5. Post Construction Runoff Control									
5A	**Integrate Stormwater Management and Water Quality Protection Goals in the Revision of the Town's Comprehensive Plan (5.6)**	1. Evaluate the Town's general land use pattern and determine future land use areas in the Plan that should be modified to protect water quality.	Community Development	Adopted Comprehensive Plan Revision	*	*			
		2. Consider establishing a comprehensive greenway system within Adams based on the protection of undisturbed riparian areas along the Town's tributary stream network.				*			
		3. Evaluate existing developed areas for redevelopment with opportunites to integrate water quality BMPs over time.				*	*		
		4. Work with the Adams Fire District to establish a growth area boundary to define areas appropriate for utility extensions.				*	*		
5B	**Incorporate Low Impact Development (LID) provisions into the Zoning Bylaw and Subdivision Regulations (5.6)**	1. Prepare draft amendments to the Zoning Bylaw that incorporate LID provisions.	Community Development	Adopted Zoning Bylaw and Subdivision Regulations Amendments		*			
		2. Prepare draft amendments to the Town's Subdivision Regulations that incorporate LID provisions.				*			
		3. Conduct workshops with Planning Board, Selectmen, and General Public to present the draft LID provisions.				*			
		4. Conduct Public Hearing(s) on the Bylaw amendments and prepare revised language, as needed.				*			
		5. Prepare Town Meeting Warrant for the proposed amendments to the Zoning Bylaw; seek Town Meeting approval.				*	*		
5C	**Develop Relevant Best Management Practices for Redevelopment**	1. Develop appropriate BMPs for redevelopment to improve water quality over time as previously developed areas redevelop.	Community Development	Implement Redevelopment Best Management Practices		*			
		2. Prepare draft amendments to Town bylaws/regulations as appropriate to incorporate standards for redevelopment BMPs.				*			
		3. Conduct Public Hearing(s) on the Bylaw amendments and prepare revised language, as needed.				*			

Table 8. Stormwater Best Management Practices Plan for Phase II Compliance

BMP ID	BMP Description[1]	Implementation							
		Tasks for each BMP	Responsible Dept./Person	Measurable Goal	Year				
					2005	2006	2007	2008	2009
5. Post Construction Runoff Control									
5D	**Develop Tree Protection and Replacement Requirements**	1. Develop criteria for tree protection/replacement for integration in the Town's Zoning Bylaw, erosion control requirements, and site plan review process.	Community Development	Adopted Requirements for Tree Protection and Replacement		*	*		
		2. Prepare draft amendments to Town bylaws/regulations as appropriate to incorporate tree protection provisions.				*	*		
		3. Conduct Public Hearing(s) on the Bylaw amendments and prepare revised language, as needed.					*		
5E	**Establish an Improved Environmental Assessment Process focused on Water Quality and Stormwater Impacts (5.6)**	1. Evaluate the Town's existing site plan review and subdivision review requirements and develop specific langauge to incorporate environmental assessment criteria.	Community Development	Adopted provisions for an improved environmental assessment process		*	*		
		2. Prepare draft amendments to Town bylaws/regulations as appropriate to incorporate improved standards for environmental assessment of development impacts on stormwater and water quality.				*	*		
		3. Conduct Public Hearing(s) on the Bylaw amendments and prepare revised language, as needed.					*		
		4. Prepare Town Meeting Warrant for the proposed amendments to the Zoning Bylaw; seek Town Meeting approval.					*		

Table 8. Stormwater Best Management Practices Plan for Phase II Compliance

BMP ID	BMP Description[1]	Implementation: Tasks for each BMP	Responsible Dept./Person	Measurable Goal	Year 2005	2006	2007	2008	2009
6. Pollution Prevention and Good Housekeeping									
6A	**Develop an Inspection and Maintenance Plan (protocol) for the Storm Drain System and Begin Inspections (6.2)**	1. Develop a written inspection/maintenance plan (protocol) for structural BMPs and the drainage system throughout Town. The plan will include the information discussed in BMPs 6B, 6C and 6D should outline components to be inspected, the inspection frequency, what to look for during inspections, and what conditions trigger maintenance.	Department of Public Works	Written protocols and schedule		*			
		2. Perform inspection and maintenance, modifying frequency as necessary.		Records of inspections and maintenance		*	*	*	*
		3. Develop an in-house policy for handling maintenance generated wastes (i.e., catch basin cleanings, street sweepings, sediments from detention ponds).				*	*		
6B	**Clean Catch Basins & Stormwater Structures (6.2)**	1. Procure funding for drainage system cleaning equipment.	Department of Public Works	Clean all catch basins annually	**Purchase of a vacuum truck was requested for the**				
		2. Clean all catch basins and drainage manholes in Town at least once each year or as needed to ensure sediments never reach the invert of the drainage outlet pipe.				*	*	*	*
		3. Record the volume of sediment removed from various drainage networks/areas in Town and prioritize the networks/areas by these volumes (i.e., greater volumes require more frequent cleaning).				*	*	*	*
		4. Modify cleaning frequency based on inspection results and the maintenance plan (BMP 6A).					*	*	*
6C	**Sweep Streets in Town to Reduce Sediment Loadings to Waterways (6.2)**	1. Continue to sweep all streets in Town at least twice a year and sweep areas prone to sediment accumulation on a more frequent basis, such as the downtown area, which is currently swept weekly.	Department of Public Works	Sweep all streets 2x/yr., downtown weekly	**Ongoing**				
		2. Develop a sweepings priority plan to maximize sediment removal in areas that are likely to result in the greatest water quality impact. Utilize a map that highlights priority areas, seasonal timing and cleaning frequency based on how much sediment collects in each area, proximity to surface waters and whether stormwater BMPs are present to collect sediment before it reaches surface waters. The timing of sweeping activities in the spring should be scheduled to occur as soon as possible after roadway sediments thaw.		Priority plan of sweeping based on water quality impact		*			
6D	**Develop an In-house Policy for Management of Stormwater Residuals (6.3)**	1. Evaluate potential reuse sites for stormwater residuals (e.g., street sweepings) in Town in accordance with the existing DEP Street Sweeping Policy #BWP-94.092 (Appendix 6B).	Department of Public Works	In-house, written protocol for reuse of street sweepings	*	*			
		2. Evaluate potential reuse sites in Town for stormwater residuals (street sweepings and catch basin cleanings) under a Beneficial Use Determination (BUD). File a BUD once viable reuse options have been determined. This option can be completed with or without Task 1 above.		BUD filed for reuse of catch basin cleanings and/or street sweepings	*	*			
		3. As a final option, procure funding for disposal of stormwater residuals and dispose of materials in accordance with local landfill requirements and MA DEP regulations (refer to Tables 6-1 and 6-2 for potential disposal facilities and estimated costs).		Volume of material removed from the drainage system		*	*	*	*

Table 8. Stormwater Best Management Practices Plan for Phase II Compliance

BMP ID	BMP Description[1]	Implementation: Tasks for each BMP	Responsible Dept./Person	Measurable Goal	Year: 2005	2006	2007	2008	2009
6. Pollution Prevention and Good Housekeeping									
6E	**Evaluate the Feasibility for Maintenance Dredging of Flood Control Chute Structures (3.3)**	1. Designate a responsible individual or Department to evaluate the existing drop structures, stilling basins and storage basins along the Hoosic River. Coordinate the evaluation with the U.S. Army Corps of Engineers.	Department of Public Works and Community Development	Evaluation with recommendations completed by end of 2006	*				
		2. Review construction drawings and conduct field reviews along the Hoosic River flood control chutes to evaluate sites for sediment removal and future stormwater treatment based on needed maintenance areas.				*			
		3. Evaluate the drop structure and stilling basin west of the Miller Street Bridge on Tophet Brook, just before its confluence with the Hoosic River, where a large sand/gravel bar has formed.				*			
		4. Evaluate the pumping station and storage basin adjacent to Hoosac Street and to the west of the Hoosic River that is laden with sediment.				*			
		5. Evaluate other structures: weir upstream of Commercial Street; stilling basin on Hoosic River upstream of Tophet Brook; and stilling basin on Hoosic River west of North Summer Street, downstream of Crotteau Street and Adams DPW Yard.				*			
		6. Prepare a summary report of findings and recommendations.				*			
6F	**Update the 1959 Operation and Maintenance (O&M) Manual for the Hoosic River Flood Control Chutes (3.3)**	1. Evaluate the 1959 O&M Manual in relation to water quality and current maintenance practices/requirements to determine if any modifications are warranted or possible. Coordinate the evaluation with the U.S. Army Corps of Engineers.	Department of Public Works and Community Development	Updated O&M Manual by end of 2006		*			
		2. Propose modifications based on maintenance needs and water quality benefits.				*			
		3. Adopt the updated O&M Manual.				*			
6G	**Address Structural Support Issues for the Culvert that Carries Hoxie Brook Downtown (4.5)**	1. Conduct a detailed inspection of the structural integrity of the culvert beneath the former autobody shop along Depot Street and the stacked stone arch portions upstream of Park Street.	Department of Public Works and Community Development	No further deterioration of the culvert. All major repairs completed by end of 2007		*			
		2. Develop a list of construction/repair needs and recommendations for problem areas.				*			
		3. Procure funding and begin repairs.				*	*		
6H	**Incorporate BMPs into the Repair and Upgrade of Drainage Systems (3.3, 4.6.3 & 6.1.1)**	1. Utilize deep sump catch basins or leaching structures when drainage manholes are repaired or replaced.	Department of Public Works and Community Development	75% of drainage structure replacements utilize deep sumps		*	*	*	*
		2. Construct vegetated swales or rip rap swales instead of concrete swales or pipes to convey runoff, where feasible.		Number of new or improved swales		*	*	*	*
		3. Incorporate BMPs into downtown reconstruction projects and roadway redevelopment projects (refer to Appendix 4E for conceptual BMPs at redevelopment sites).		1 demonstration project constructed by 2007			*	*	*
6I	**Implement BMPs at Priority Stormwater Remediation Sites in Town (4.6.2)**	1. Select a project site for construction of structural BMPs based on the Conceptual BMP sites evaluated in Section 4.6.2.	Department of Public Works and Community Development	1 demonstration project constructed by 2007	*				
		2. Pursue/procure funding (e.g., s319 grant) for design and construction of BMPs.			*	*			
		3. Construct BMPs and document water quality results.					*		
		4. Pursue additional BMP sites as grant or Town projects.					*	*	*

Table 8. Stormwater Best Management Practices Plan for Phase II Compliance

BMP ID	BMP Description[1]	Implementation: Tasks for each BMP	Responsible Dept./Person	Measurable Goal	Year 2005	2006	2007	2008	2009
6. Pollution Prevention and Good Housekeeping									
6J	**Implement the SWPPP & BMP Recommendations at the Adams DPW Garage (6.1.2)**	1. Finalize the DPW Garage Stormwater Pollution Prevention Plan (SWPPP) that was developed by BRPC in March 2003.	Department of Public Works	Final SWPPP, implemented by 2006	*				
		2. Begin the recommendations outlined in the SWPPP and ensure ongoing compliance.				*	*	*	*
6K	**Develop a SPCC Plan for the Adams DPW Garage (6.1.2)**	1. Retain a qualified contractor to develop or assist in the development of a Spill Prevention Control and Countermeasure (SPCC) Plan, as required by the Federal Oil Pollution Prevention regulation at 40 CFR 112 - Oil Pollution Prevention and Response; Non-Transportation-Related Onshore and Offshore Facilities.	Department of Public Works	Final SPCC Plan, implemented by 2006	*				
		2. Finalize the SPCC Plan and ensure ongoing compliance at the DPW Garage.				*	*	*	*
6L	**Maintain "No Exposure Certification" at the Adams Recycling Center and Wastewater Treatment Facility (6.1.2)**	1. Currently, the Adams Recycling Center and Wastewater Treatment Facility qualify for the "No Exposure Certification" under the industrial stormwater permit requirements. The Town must maintain this certification and reduce stormwater pollution at these facilities.	Department of Public Works	No industrial materials/ activities exposed to stormwater at the sites. Certification forms filed with EPA	*	*	*	*	*
		2. Submit the "No Exposure Certification" form to EPA every five years for each facility.					*		
6M	**Evaluate the Adams Compost Site to Address Runoff and Water Quality (6.1.1)**	1. Review the Adams compost site, map drainage and evaluate runoff treatment methods in accordance with the Environmental Impact Control Measures in the DEP Leaf and Yard Waste Compost Guideline.	Department of Public Works and Conservation Commission	Photos and sketches to document conditions/ changes at the site	*				
		2. Develop and construct BMPs or site modifications to comply with the DEP Guideline and minimize water quality impact.				*			
6N	**Implement the Adams Parks Management Plan for the Maintenance of Town-Owned Lands (6.1.1)**	1. Complete the recommendations developed in the June 2004 Management Plan for the Adams Parks Division to minimize potential environmental impacts from the maintenance of Town-owned lands and make operations more protective of water resources. See the summary of recommendations provided in Appendix 6A and the full Management Plan in Volume 2 of the Adams Stormwater Management Strategic Plan.	Department of Public Works and Parks Division	Recommendations completed by end of 2006 and ongoing thereafter	*	*			
		2. Ensure ongoing BMPs are regularly completed and the Management Plan is reviewed on an annual basis.		Updated plan as needed		*	*	*	*
6O	**Minimize Over Application of Winter Roadway Treatments (deicing) (6.1.1)**	1. Routinely calibrate sand/salt spreaders and use sand/salt spreaders that are capable of adjusting application rates to achieve an optimal application rate according to roadway characteristics (e.g., width and design).	Department of Public Works	All spreaders calibrated	*	*	*	*	*
		2. Train existing and new employees for effective application of deicing materials.		Annual training session	*	*	*	*	*
		3. Consider additional deicing management techniques: using ice-cutting plow blades to reduce the need and/or volume of de-icing materials; alternative deicing agents or catalysts (e.g., magnesium chloride) to maximize the effectiveness of salt applications and reduce the overall volume needed for road treatment; and weather and roadway monitoring systems to adjust deicing activities to changing conditions to indicate and predict freezing road conditions.		Effective and safe winter roadway treatments. with minimal use of deicing materials	*	*	*	*	*

Table 8. Stormwater Best Management Practices Plan for Phase II Compliance

BMP ID	BMP Description[1]	Implementation: Tasks for each BMP	Responsible Dept./Person	Measurable Goal	Year 2005	2006	2007	2008	2009
6. Pollution Prevention and Good Housekeeping									
6P	**Incorporate Stormwater Pollution Prevention BMPs into Roadway Maintenance Operations (6.1.1)**	1. Ensure that all road maintenance and repairs (including utility repairs) are conducted in a manner to prevent erosion of materials into nearby surface waters. Use filter socks for dewatering activities during utility repairs and silt fence/hay bales to contain earth stockpiles.	Department of Public Works	Erosion controls used on all DPW projects	*	*	*	*	*
		2. Utilize BMPs from the Massachusetts Unpaved Roads BMP Manual (BRPC 2001), which outlines numerous BMPs for the maintenance of dirt road surfaces, ditches, culverts, stormwater outlets and steep banks for erosion and sediment control.		Copy of manual at DPW office	*	*	*	*	*
		3. Perform activities such as paving and painting operations only during dry weather conditions and take care to not spray or spill materials into the drainage system.		No spills or water quality impacts	*	*	*	*	*
		4. Provide spill control materials for roadway crew vehicles to assist in the cleanup of small spills that may occur during road maintenance activities.		Spill materials readily available for roadway crews	*	*	*	*	*
6Q	**Ensure Compliance for Snow Disposal in Town (6.1.1)**	1. Review the current snow disposal sites in Adams to ensure compliance with the Massachusetts Snow Disposal Guidelines Policy No. BRPG01-01 (see Appendix 6B).	Department of Public Works and Conservation Commission	Photos and sketches to document conditions/ changes at the site	*				
		2. Modify snow disposal activities or locations, if needed, to comply with the Guidelines.				*			
		3. Ensure compliance for all other snow disposal activities in Town by avoiding the following: disposal to waterways; disposal at sites with steep slopes that may result in erosion of soils; dumping in sanitary landfills, gravel pits and public or private water supply protection areas; and disposal on top of storm drain catch basins or in stormwater drainage swales or ditches.			*	*	*	*	*
6R	**Conduct Periodic Evaluations of Municipal Operations (6.1.1)**	1. Evaluate municipal operations and facilities annually using the Town-wide Municipal Operations Checklist and document the results in a binder at the Adams DPW. The evaluation should address past and future practices for municipal operations as they relate to water quality and outline changes for water quality improvements. For example, the frequency of catch basin cleaning and street sweeping should be evaluated in relation to sediment loadings to waterways to determine if some areas of Town require more frequent cleaning.	Department of Public Works, Community Development, and Conservation Commission	Record of evaluation, completed checklist		*	*	*	*
		2. Modify municipal operations based on the results of the evaluation to improve water quality.							
6S	**Conduct Monthly Pollution Prevention Inspections for Municipal Maintenance/ Industrial Facilities (6.1.2)**	1. Inspect the DPW Garage, Recycling Center and Bellevue Cemetery Garage using the Facility Pollution Prevention Inspection Checklist provided in Appendix 6A. All facilities can be inspected at once and the results can be compiled onto one checklist.	Department of Public Works	Completed checklists and corrective actions	*	*	*	*	*
		2. Modify municipal operations at facilities as needed to follow the pollution prevention practices outlined on the checklist.							

Table 8. Stormwater Best Management Practices Plan for Phase II Compliance

BMP ID	BMP Description[1]	Implementation							
		Tasks for each BMP	Responsible Dept./Person	Measurable Goal	Year				
					2005	2006	2007	2008	2009
6. Pollution Prevention and Good Housekeeping									
6T	**Conduct Town Employee Stormwater Training (6.4)**	1. Identify program coordinator.	Department of Public Works, Community Development, Police Department, Fire District, and Consultant	Attendance sheet and copy of program		*			
		2. Evaluate the need for stormwater training for all Town departments (e.g., Police Department, Adams Fire District) based on their current and potential pollution prevention roles.				*			
		3. Prepare or contract curriculum/course materials.				*			
		4. Conduct annual stormwater training session for Town departments. Provide separate stormwater training sessions, if needed, depending on the preference of different Town Departments.				*	*	*	*
6U	**Consider Hiring a Town Employee to Handle Stormwater Pollution Prevention (6.5)**	1. Develop a job description, responsibilities (refer to Section 6.5), qualifications and salary for a new employee to handle stormwater pollution prevention and other DPW tasks.	Department of Public Works, Community Development, Police and Fire Departments, and Consultant	Attendance sheet and copy of program		*			
		2. Present the proposed position at Town meeting.					*		
		3. Procure funding and hire a stormwater pollution prevention officer.					*	*	

Notes:
1. BMP descriptions are based on recommendations discussed in the Stormwater Management Strategic Plan. The section number where these recommendations appear in the Plan is noted in parentheses.

Appendix 8

NPDES General Permit Requirements

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
GENERAL PERMIT FOR STORM WATER DISCHARGES
FROM SMALL MUNICIPAL SEPARATE STORM SEWER SYSTEMS

Authorization to discharge under the National Pollutant Discharge Elimination System

In accordance with the provisions of the Clean Water Act, as amended, (33 U.S.C. §1251 et. seq. (the Act) operators of small municipal separate storm sewer systems, located in the areas specified in Parts I.A.2., 3.,.and 4 are authorized to discharge in accordance with the conditions and requirements set forth herein.

Only operators of storm water discharges from small municipal separate storm sewer systems in the general permit area who submit a Notice of Intent and a storm water management program in accordance with Part I.E. of this permit and obtain written authorization from EPA are authorized under this general permit.

This permit becomes effective on May 1, 2003.

This permit and authorization to discharge expire at midnight five years from the effective date.

Signed this 18 day of April 2003

Linda M. Murphy, Director
Office of Ecosystem Protection
United States Environmental Protection Agency
One Congress Street - Suite 1100
Boston, Massachusetts 02114

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
GENERAL PERMIT FOR STORM WATER DISCHARGES
FROM SMALL MUNICIPAL SEPARATE STORM SEWER SYSTEMS

Authorization to discharge under the National Pollutant Discharge Elimination System

In accordance with the provisions of the Clean Water Act, as amended, (33 U.S.C. §1251 et. seq. (the Act) operators of small municipal separate storm sewer systems, located in the area specified in Part I.A.1, Commonwealth of Massachusetts, are authorized to discharge in accordance with the conditions and requirements set forth herein.

Only operators of storm water discharges from small municipal separate storm sewer systems in the general permit area who submit a Notice of Intent and a storm water management program in accordance with Part I.E. of this permit and obtain written authorization from EPA are authorized under this general permit.

This permit becomes effective on May 1, 2003.

This permit and authorization to discharge expire at midnight five years from the effective date.

Signed this 18 day of April 2003

Linda M. Murphy, Director
Office of Ecosystem Protection
United States Environmental Protection Agency
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Massachusetts Department of Environmental Protection
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PART I

A. Area of Coverage: Small municipal separate storm sewer systems (MS4s) located within

1. Commonwealth of Massachusetts;
2. State of New Hampshire;
3. Indian Country lands within the States of Connecticut, Massachusetts, and Rhode Island; and
4. Federal Facilities within the State of Vermont.

B. Eligibility criteria:

1. This permit authorizes the discharge of storm water from small MS4s defined at 40 CFR §122.26(b)(16). This includes small MS4s designated under 40 CFR §122.32(a)(1) and 40 CFR §122.32(a)(2). The permittee is authorized to discharge under this permit if:

(a). The permittee is the operator of a small MS4 within the permit areas described in Part I.A;
(b). The permittee is not a large or medium MS4 defined in 40 CFR §§122.26(b)(4) or (7);
(c). The municipality is located fully or partially in an urbanized area as determined by the latest Decennial Census by the Bureau of Census; and
(d). The permittee submits a Notice of Intent in accordance with Part I.E. of this permit and obtains written authorization from EPA.

Small municipal separate storm sewer system means all separate storm sewers that are:

(a) owned or operated by the United States, a State, city town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity and Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States.
(b) not defined as large or medium municipal separate storm sewer systems pursuant to 40 CFR §122.26(b)(4) and (b)(7) or designated under 40 CFR §122.26(a)(1)(v).
(c) This term includes systems similar to separate storm sewer systems in municipalities, such as systems at military bases, large hospitals or prison complexes, and highways and other thoroughfares. The term does not include separate storm sewers in very discrete areas, such as individual buildings.

2. The following storm water discharges are not authorized by this permit:
(a) Discharges that are mixed with sources of non-storm water unless such non-storm water discharges are:
i. In compliance with a separate NPDES permit, or
ii. Determined by EPA not to be a substantial contributor of pollutants to waters of the U.S.
(b) Storm water discharges associated with industrial activity as defined in 40 CFR§122.26(b)(14)(i)-(ix) and (xi).
(c) Storm water discharges associated with construction activity as defined in 40 CFR§122.26(b)(14)(x) or 40 CFR §122.26(b)(15).
(d) Storm water discharges currently covered under another permit, including discharges covered under other regionally issued general permits.
(e) Discharges or discharge related activities that may adversely affect any species that are listed as endangered or threatened under the Endangered Species Act (ESA) or result in the adverse modification or destruction of habitat that is designated as critical under the ESA.

i. Coverage under this permit is available only if the storm water discharges, allowable non-storm water discharges, and discharge related activities do not adversely affect any species that are listed as endangered or threatened ("listed") under the ESA or result in the adverse modification or destruction of habitat that is designated as critical under the ESA ("critical habitat"). Submission of a signed NOI will be deemed to constitute certification of eligibility.

ii. "Discharge related activities" include: activities which cause, contribute to, or result in storm water point source pollutant discharges; and measures to control storm water discharges, including the siting, construction and operation of best management practices (BMPs) to control, reduce or prevent storm water pollution.

iii. In order to demonstrate eligibility, the permittee must use the guidance in Addendum A and the most recent Endangered and Threatened Species County-Species List available from EPA. Eligibility must be determined prior to submission of the NOI. The most current list is available at: http://www.epa.gov/npdes/. The permittee must meet one or more of the criteria described below for the entire term of the permit. The information used to determine eligibility must be maintained as part of the Storm Water Management Program.

- Criterion A: No endangered or threatened species or critical habitat are in proximity to the MS4 or the points where authorized discharges reach the receiving waters; or
- Criterion B: In the course of a separate federal action involving the MS4, formal or informal consultation with the U.S. Fish and Wildlife Service (FWS) and/or the National Marine Fisheries Service (NMFS) under Section 7 of the ESA has been concluded and that consultation:
-Addressed the effects of the MS4 storm water discharges, allowable non-storm water discharges, and discharge related activities on listed species and critical habitat; and
- The consultation resulted in either a no jeopardy opinion or a written concurrence by FWS and/or NMFS on a finding that the storm water discharges, allowable non-storm water discharges, and discharge related activities are not likely to adversely affect listed species or critical habitat; or
- Criterion C: The activities are authorized under Section 10 of the ESA and that authorization addresses the effects of the storm water discharges, allowable non-storm water discharges, and discharge related activities on listed species and critical habitat; or
- Criterion D: Using the best scientific and commercial data available, the effects of the storm water discharges, allowable non-storm water discharges, and discharge related activities on listed species and critical habitat have been evaluated. Based on those evaluations, a determination is made by the permittee and affirmed after review by EPA that the storm water discharges, allowable non-storm water discharges, and discharge related activities will not affect any federally threatened or endangered species or designated critical habitat.
- Criterion E: The storm water discharges, allowable non-storm water discharges, and discharge related activities were already addressed in another operator's certification of eligibility which includes the MS4 activities. If certification is under this criteria, the permittee agrees to comply with any measures or controls upon which the other operator's certification was based.

iv. The permitting authority may require any permittee or applicant to provide documentation of the determination of eligibility for this permit where the EPA or the FWS and/or NMFS determines that there is a potential impact on listed species or critical habitat.

v. A discharge is not authorized if the discharge or discharge related activities cause a prohibited "take" of endangered or threatened species (as defined under Section 3 of the ESA and 50 CFR 17.3), unless such actions are authorized by FWS or NMFS under sections 7 or 10 of the ESA.

vi. Discharges are not authorized where the discharge or discharge related activity are likely to jeopardize the continued existence of any species that are listed as endangered or threatened under the ESA or result in the adverse modification or destruction of habitat that is designated as critical under the ESA.

vii. Operators who conduct informal consultation to meet the eligibility requirements of Criterion

B are automatically designated as non-Federal representatives under this permit. See 50 CFR §402.08. Operators who choose to conduct informal consultation as a non-Federal representative must notify EPA and the appropriate service office in writing of that decision.

(f) Discharges whose direct or indirect impacts may adversely affect any Essential Fish Habitat.

(g) Discharges, or implementation of a storm water management program, which adversely effects properties listed or eligible to be listed on the National Register of Historic Places. The permittee must determine eligibility prior to submission of the Notice of Intent. The permittee should follow the guidance detailed in Addendum B. Discharges may be eligible for coverage under this permit if the permittee is in compliance with requirements of the National Historic Preservation Act and has coordinated any necessary activities to avoid or minimize impacts. These requirements must be coordinated with the State Historic Preservation Officer. Information used to determine eligibility must be maintained as part of the Storm Water Management Program.

(h) Discharges to territorial seas, the contiguous zone, and the oceans unless such discharges are in compliance with the ocean discharge criteria of 40 CFR 125 subpart M.

(i) Discharges prohibited under 40 CFR 122.4. This includes discharges not in compliance with the state's antidegradation policy.

(j) Discharges mixed with non-storm water except those discharges which are in compliance with another NPDES permit or are an allowable non-storm water discharge as discussed in Part I.F.

(k) Discharges that would cause or contribute to instream exceedance of water quality standards. The storm water management program must include a description of the BMPs that will be used to ensure that this will not occur. EPA, MA DEP , or NH DES may require corrective action or an application for an individual permit or alternative general permit if an MS4 is determined to cause an instream exceedance of water quality standards.

(l) Discharges of any pollutant into any water for which a Total Maximum Daily Load (TMDL) has been established or approved by the EPA unless the discharge is consistent with the TMDL. This eligibility condition applies at the time of submission of the NOI. If conditions change after submission of the NOI, coverage may continue provided the applicable requirements of Part 1.C. are met. In order to remain eligible for this permit, any limitations, conditions and requirements applicable to discharges authorized by this permit, must be incorporated into the storm water management program. This may include monitoring and reporting. Discharges not eligible for this permit, must apply for an individual or alternative NPDES general permit.

C. Discharges to Water Quality Impaired Waters

1. The permittee must determine whether storm water discharges from any part of the MS4 contribute, either directly or indirectly, to a 303(d) listed water body.

2. The storm water management program must include a section describing how the program will control the discharge of the pollutants of concern and ensure that the discharges will not cause an instream exceedance of the water quality standards. This discussion must specifically identify control measures and BMPs that will collectively control the discharge of the pollutant(s) of concern. Pollutant(s) of concern refer to the pollutant identified as causing the impairment.

D. Total Maximum Daily Load Allocations

If a TMDL has been approved for any water body into which the MS4 discharges, the permittee must:

1. Determine whether the approved TMDL is for a pollutant likely to be found in storm water discharges from the MS4.

2. Determine whether the TMDL includes a pollutant waste load allocation (WLA), BMP recommendations or other performance requirements for storm water discharges. This storm water WLA may be expressed in the TMDL as a gross allotment for the impaired water body. Or, provided no specific WLA for the MS4 exists, determine if a Performance Agreement or Memorandum of Understanding has been established between the MS4, EPA , and MA DEP or NH DES which modifies the BMPs or performance standards of the TMDL. Such Memoranda are posted on the TMDL websites. The Massachusetts site is: http://www.state.ma.us/dep/brp/wm/tmdl.htm The New Hampshire site is: http://www.des.state.nh.us/wmb/TMDL

3. If the MS4 is required to implement storm water waste load allocation provisions of the TMDL, the permittee must assess whether the WLA is being met through implementation of existing storm water control measures or if additional control measures are necessary. The permittee's assessment of whether the WLA is being met is expected to focus on the adequacy of the permittee's storm water controls (implementation and maintenance), not on the response of the receiving water.

4. Highlight in the storm water management program and annual reports all control measures currently being implemented or planned to be implemented to control pollutants of concern identified in approved TMDLs. Also include a schedule of implementation for all planned controls. Document the assessment which demonstrates that the WLA will be met including any calculations, maintenance log books, or other appropriate controls.

E. Obtaining Coverage

1. Small MS4s seeking coverage under this permit, must submit a Notice of Intent which contains the following information:

(a). Name of person responsible for overall coordination of the storm water management program, mailing address and phone number
(b). Name of municipality and state. For municipalities seeking coverage under Part V. of this permit, only identify the name of the agency, the city or town, and the state in which it is located.
(c). Identify the legal status of the operator of the MS4 as either, Federal, State, Tribal, county, or other Public Entity. If the municipality is a city or town, indicate if there are other MS4s within its boundaries such as state highways, universities, prisons.
(d). Identify the names of all known waters that receive a discharge from the MS4. If known, indicate the number of outfalls to each water.
(e). Using the guidance in Addendum A, describe how the eligibility criteria for listed species and critical habitat have been met.
(f). Using the guidance in Addendum B describe how the requirements to protect historic properties have been met.
(g). Identify best management practices for each minimum control measure described in Part II B (1-6); Part III B(1-6); Part IV. B(1-6) or Part V.B(1-6)., depending upon the type of MS4.
(h). Identify measurable goals for each best management practice described in paragraph (g) above including implementation time frames and contact person..
(i). The NOI must be signed by an appropriate official (see Part VI. G. of this permit). The NOI must contain the following 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, I certify that 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.

Print the name of the appropriate official, followed by signature, and date.

Municipalities in Massachusetts must use the form designated by the Massachusetts Department of Environmental Protection (MA DEP). The form is available at http://www.state.ma.us/dep/brp/stormwtr/strmfms.htm or by contacting MA DEP at 508/792-7470. The permit code for the form is BRP WM 08 A EPA does not require the use of this form, but will accept information submitted on this form. All signatures must be originals.

Municipalities in New Hampshire should use the form developed by the New Hampshire Department of Environmental Services. The form is available at: http://www.des.state.nh.us/StormWater/. EPA does not require the use of this form, but will accept information submitted on this form. All signatures must be originals.

2. The Notice of Intent must be submitted by March 10, 2003, if designated under 40 CFR 122.32(a)(1)- those MS4s located fully or partially in an urbanized area; or within 180 days of notice, if designated under 40 CFR 122.32(a)(2), unless granted a longer period of time by EPA;

3. Submission of Notice of Intent

(a) All permittees must submit the Notice of Intent to EPA-Region I at the following address:
United States Environmental Protection Agency
Municipal Assistance Unit (CMU)
One Congress Street – Suite 1100
Boston, Massachusetts 02114-2023

(b) MS4s located in Massachusetts, subject to Part II, Part IV, or Part V, except Indian lands, must also submit a copy of the NOI to the MA DEP at the following address:
Massachusetts Department of Environmental Protection
Division of Watershed Management
627 Main Street
Worcester, Massachusetts 01608

The appropriate fee must accompany the submission to MA DEP. The application fee is $60.00. A fee exemption applies to any Massachusetts city, town or state agency. The fee does apply to Massachusetts state authorities.

(c) MS4s located in New Hampshire subject to Part III, Part IV or Part V, must also submit a copy of the NOI to the New Hampshire Department of Environmental Services (NH DES) at the following address:
New Hampshire Department Environmental Services
Water Division
Wastewater Engineering Bureau
P.O. Box 95
Concord, New Hampshire 03302-0095

New Hampshire may also adopt this permit as a state permit pursuant to RSA 485-A:13,I.(a).

4. Effective date of coverage. The authorization to discharge begins on the date of receipt of EPA's written authorization. The initial written receipt will detail the completeness of the submission. The permittee may be contacted by either EPA or MA DEP/NHDES at a later date requesting additional or updated information concerning the storm water management program. The initial response will not provide detailed comments on the submission.

5. A municipality is not prohibited from submitting a Notice of Intent after the dates provided in paragraph E.2. However, if a late NOI is submitted, authorization is only for discharges that occur after permit coverage is granted. The permitting authority reserves the right to take appropriate enforcement actions for any unpermitted discharges.

F. Allowable Non-Storm Water Discharges

The following non-storm water discharges are authorized provided it has been determined by the permittee that they are not significant contributors of pollutants to the MS4. If these discharges are identified as significant contributors to the MS4, they must be addressed in the Illicit Discharge Detection and Elimination minimum control measure described in Parts II, III, IV and V.

1. water line flushing,
2. landscape irrigation,
3. diverted stream flows,
4. rising ground waters,
5. uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20)),
6. uncontaminated pumped ground water,
7. discharge from potable water sources,
8. foundation drains,
9. air conditioning condensation,
10. irrigation water, springs,
11. water from crawl space pumps,
12. footing drains,
13. lawn watering,
14. individual resident car washing,
15. flows from riparian habitats and wetlands,
16. dechlorinated swimming pool discharges,
17. street wash water, and
18. Residential building wash waters, without detergents.

Discharges or flows from fire fighting activities occur during emergency situations. The permittee is not expected to evaluate fire fighting discharges with regard to pollutant contributions. Therefore, these discharges are authorized as allowable non-storm water discharges, unless identified, by EPA, as significant sources of pollutants to Waters of the U.S..

PART II
MASSACHUSETTS SMALL MS4 STORM WATER MANAGEMENT PROGRAM

A. Storm Water Management Program

The permittee must develop, implement and enforce a program to reduce the discharge of pollutants from the MS4 to the maximum extent practicable; protect water quality, and satisfy the water quality requirements of the Clean Water Act and Massachusetts Water Quality Standards.

1. The permittee must develop a storm water management program implementing the minimum measures described in Paragraph II.B.

2. All elements of the storm water management program must be implemented by the expiration date of this permit.

3. Implementation of one or more of the minimum measures may be shared with another entity, or the entity may fully implement the measure(s). When another entity fully implements a minimum control measure for the permittee, the following applies:

(a.) the other entity, in fact, implements the control measure;
(b.) the particular control measure, or component of that measure is at least as stringent as the corresponding permit requirement.
(c.) The other entity agrees to implement the control measure on the permittee's behalf. A legally binding written acceptance of this obligation is expected. This obligation must be maintained as part of the storm water management program. If the other entity agrees to report on the minimum measure, the permittee must supply the other entity with the reporting requirements contained in this permit under Part II.E.
(d) The permittee remains responsible for permit compliance and implementation of the minimum measure if the other entity fails to do it.

4. Permittee may use the following state program to implement some of the requirements of Part II.B.4 and Part II.B.5: The Massachusetts Department of Environmental Protection, Wetland Protection Act (MGL Chapter 131, Section 40) Storm Water Management Policy

(a) Standard 8 of the Policy may be used for the minimum control measure regarding construction site storm water runoff control, Part II.B.4(c). Standards 2, 3, 4, and 7 of the Policy may be used for the minimum control measure regarding post construction storm water management in development and redevelopment, Part II.B.5. The permittee may not apply this criterion outside of the jurisdiction of the Wetlands Protection Act unless the municipality has specifically provided for such in local by-laws.
(b) Additional information available at: http://www.state.ma.us/dep/brp/stormwtr/stormpub.htm

5. For each minimum measure, the permittee must:

(a.) identify the person(s) or department responsible for the measure;
(b.) identify all Best Management Practices (BMPs) for the measure;
(c.) identify measurable goals for each BMP. Identify time lines and milestones for implementation.

6. EPA's BMP menu found at http://www.epa.gov/npdes/menuofbmps/menu.htm and EPA's guidance on measurable goals, found at http://www.epa.gov/npdes/stormwater/measurablegoals/index.htm, may be used in the development of the storm water management program.

B. Minimum Control Measures

1. Public education and outreach. The permittee must implement a public education program to distribute educational material to the community. The public education program must provide information concerning the impact of storm water discharges on water bodies. It must address steps and/or activities that the public can take to reduce the pollutants in storm water runoff.

The following should be included in the education and outreach efforts:

(a.) information regarding both industrial and residential activities including illegal dumping into storm drains.

(b.) coordination with local groups (i.e. watershed associations, or schools)

(c.) materials for outreach/education may include, but are not limited to, pamphlets; fact sheets; brochures; public service announcements; storm drain stenciling and newspaper advertisements.

(d.) topics may include, but are not limited to, litter disposal, pet waste, household hazardous waste disposal, proper use of fertilizer and pesticides, and effects of impervious areas on water bodies. (This list is intended to provide examples, the permittee is encouraged to use a variety of activities for public education.)

2. Public involvement and participation. All public involvement activities must comply with state public notice requirements at MGL Chapter 39 Section 23B and local public notice requirements.

(a.) The permittee must provide opportunity for the public to participate in the implementation and review of the storm water management program.

(b.) Activities may also include volunteer stream monitoring or formation of a storm water management committee. (These are examples of public involvement activities, the permittee is encouraged to use a wide range of activities to maximize public involvement.)

3. Illicit discharge detection and elimination. The permittee must develop, implement and enforce a program to detect and eliminate illicit discharges. An illicit discharge is any discharge to a municipal separate storm sewer that is not composed entirely of storm water. Exceptions are discharges pursuant to a NPDES permit (other that the NPDES permit for discharges from the municipal sewer system), allowable non storm water discharges described at Part I.F. and discharges resulting from fire fighting activities.

(a.) If not already existing, the permittee must develop a storm sewer system map. At a minimum, the map must show the location of all outfalls and the names of all waters that receive discharges from those outfalls. Additional elements may be included on the map, such as, location of catch basins, location of manholes, and location of pipes within the system. Initial mapping should be based on all existing information available to the permittee including city records and drainage maps. Field surveys may be necessary to verify existing records and locate all outfalls.

(b.) To the extent allowable under state or local law, the permittee must effectively prohibit, through an ordinance or other regulatory mechanism, non storm water discharges into the system and implement appropriate enforcement procedures and actions. If a regulatory mechanism does not exist, development and adoption of such a mechanism must be included as part of the storm water management program.

(c.) The permittee must develop and implement a plan to detect and address non -storm water discharges, including illegal dumping, into the system.

The illicit discharge plan must contain the following elements:

i. Procedures to identify priority areas. This includes areas suspected of having illicit discharges, for example: older areas of the city, areas of high public complaints and areas of high recreational value or high environmental value such as beaches and drinking water sources.

ii. Procedures for locating illicit discharges (i.e. visual screening of outfalls for dry weather discharges, dye or smoke testing)

iii. Procedures for locating the source of the discharge and procedures for the removal of the source.

iv. Procedures for documenting actions and evaluating impacts on the storm sewer system subsequent to the removal.

(d.) The permittee must inform public employees, businesses, and the general public of hazards associated with illegal discharges and improper waste disposal.

(e.) The non-storm water discharges listed in Part I.F. must be addressed if they are identified as being significant contributors of pollutants to the small MS4.

4. Construction site storm water runoff control. The permittee must develop, implement, and enforce a program to reduce pollutants in any storm water runoff to the MS4 from construction activities that result in a land disturbance of greater than or equal to one acre. The permittee must include disturbances less than one acre if part of a larger common plan.

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

At a minimum, the program must include:

(a.) To the extent allowable under state or local law, an ordinance or other regulatory mechanism to require sediment and erosion control at construction sites. If such an ordinance does not exist, development and adoption of an ordinance must be part of the program.

(b.) Sanctions to ensure compliance with the program. To the extent allowable under state or local law sanctions may include both monetary or non-monetary penalties.

(c.) Requirements for construction site operators to implement a sediment and erosion control program which includes BMPs that are appropriate for the conditions at the construction site, including efforts to minimize the area of the land disturbance.

(d.) Requirements for the control of wastes, including but not limited to, discarded building materials, concrete truck wash out, chemicals, litter, and sanitary wastes.

(e.) Procedures for site plan review including procedures which incorporate consideration of potential water quality impacts. The site plan review should include procedures for preconstruction review.

(f.) Procedures for receipt and consideration of information submitted by the public.

(g.) Procedures for inspections and enforcement of control measures at construction sites.

5. Post construction storm water management in new development and redevelopment.

The permittee must develop, implement and enforce a program to address storm water runoff from new development and redevelopment projects that disturb greater than one acre and discharge into the municipal system.

The program must include projects less than one acre if the project is part of a larger common plan of development which disturbs greater than one acre.

The post construction program must include:

(a.) To the extent allowable under state or local law, an ordinance or other regulatory mechanism to address post construction runoff from new development and redevelopment. If such an ordinance does not exist, development and adoption of an ordinance must be part of the program.

(b.) Procedures to ensure adequate long term operation and maintenance of best management practices.

(c.) Procedure to ensure that any controls that are put in place will prevent or minimize impacts to water quality.

6. Pollution prevention and good housekeeping in municipal operations.

The permittee must

(a.) Develop and implement a program with a goal of preventing and/or reducing pollutant runoff from municipal operations. The program must include an employee training component.

(b.) Include, at a minimum, maintenance activities for the following : parks and open space (areas such as public golf course and playing fields); fleet maintenance, building maintenance; new construction and land disturbance; and road way drainage system maintenance and storm water system maintenance.

(c.) Develop schedules for municipal maintenance activities described in paragraph (b) above.

(d) Develop inspection procedures and schedules for long term structural controls.

7. Cooperation between interconnected municipal separate storm sewer systems is encouraged. The permittee should identify interconnections within the system. The permittee should attempt to work cooperatively with an interconnected municipality in instances of discharges impacting a system.

8. The permittee must evaluate physical conditions, site design, and best management practices to promote groundwater recharge and infiltration where feasible in the implementation of the control measures described above. During the implementation of the storm water management program, the permittee must address recharge and infiltration for the minimum control measures, as well as any reasons for electing not to implement recharge and infiltration. Loss of annual recharge to ground water should be minimized through the use of infiltration measures to the maximum extent practicable. Permittees in areas identified as "high" or "medium" in the most recent Massachusetts Water Resources Commission's *Stressed Basins in Massachusetts* report in effect at the time the permittee submits a Notice of Intent and accompanying storm water management program, must minimize the loss of annual recharge to ground water from new development and redevelopment, including but not limited to drainage improvements done in conjunction with road improvements, street drain improvement projects and flood mitigation projects, consistent with Standard 3 of the Storm Water Management Policy in areas both within and outside of the jurisdiction of the Massachusetts Wetlands Protection Act.
(See http://www.state.ma.us/dem/programs/intbasin/stressed_basin)

9. MS4s which discharge to coastal waters with public swimming beaches should consider these waters a priority in implementation of the storm water management program. Refer to Part IX , State 401 Certification Requirements, for additional requirements.

C. Public Drinking Water Supply Requirements

1. MS4s which discharge to public drinking water sources and their protection areas (Class A and B surface waters used for drinking water and wellhead protection areas) should consider these waters a priority in implementation of the storm water management program.

2. Discharges to public drinking water supply sources and their protection areas (Zones I, II, Wellhead Protection Areas, Zone A, B, and C as defined in 310 CMR 22.00) should provide pretreatment and spill control capabilities to the extent feasible.

3. Direct discharges to Class A waters and Zone I wellhead protection areas (as defined in 310 CMR 22.02) should be avoided to the extent feasible.

D. Program Evaluation

1. The permittee must annually evaluate the compliance of the storm water management program with the conditions of this permit.

2. The permittee must evaluate the appropriateness of the selected BMPs in efforts towards achieving the defined measurable goals. The storm water management program may be changed in accordance with the following provisions:

(a). Changes adding (but not subtracting or replacing) components, controls or requirements to the SWMP may be made at any time upon written notification to EPA and MA DEP

(b). Changes replacing an ineffective or infeasible BMP specifically identified in the SWMP with an alternative BMP may be requested in writing to EPA and MA DEP at any time. Unless denied, changes proposed in accordance with the criteria below shall be deemed approved and may be implemented 60 days from submittal of the request. If the request is denied, EPA or MA DEP, as applicable, will send you a written explanation of the denial.

(c). Modification requests, must include the following information:
i. an analysis of why the BMP is ineffective or infeasible (including cost prohibitive)
ii. expectations on the effectiveness of the replacement BMP, and
iii. an analysis of why the replacement BMP is expected to achieve the goals of the BMP to be replaced.
iv. Change requests or notifications must be in writing and signed in accordance with the signatory requirements of Part VI.

3. EPA or MA DEP may require changes to the SWMP as needed to:

(a). Address impacts on receiving water quality caused or contributed to by discharges from the MS4;

(b). To include more stringent requirements necessary to comply with new Federal statutory or regulatory requirement; or

(c). To include such other conditions deemed necessary to comply with the goals and requirements of the CWA.

(d). Any changes requested by EPA or MA DEP will be in writing and will set forth the schedule for the permittee to develop the changes and offer the opportunity to propose alternative program changes to meet the objective of the requested modification.

E. Record Keeping

1. All records required by this permit must be kept for a period of at least five years. Records include information used in the development of the storm water management program, any monitoring, copies of reports, and all data used in the development of the notice of intent.

2. Records need to be submitted only when specifically requested by the permitting authority.

3. The permittee must make the records relating to this permit available to the public, including the storm water management program. The public may view the records during normal business hours. The permittee may charge a reasonable fee for copying requests.

F. Reporting

1. The permittee must submit an annual report. The initial report is due one year from the effective date of this permit and annually thereafter. The reports should contain information regarding activities of the previous calendar year. Reports should be submitted to both EPA and MA DEP at the following addresses:

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

and

Massachusetts Department of Environmental Protection
Division of Watershed Management
627 Main Street
Worcester, Massachusetts 01608

2. The following information must be contained in the annual report:

(a) A self assessment review of compliance with the permit conditions.

(b) An assessment of the appropriateness of the selected BMPs.

(c) An assessment of the progress towards achieving the measurable goals.

(d) A summary of results of any information that has been collected and analyzed. This includes any type of data.

(e) A discussion of activities for the next reporting cycle.

(f) A discussion of any changes in identified BMPs or measurable goals.

(g) Reference any reliance on another entity for achieving any measurable goal.

G. State Permit Conditions

This permit is issued jointly by the U.S. Environmental Protection Agency and the Massachusetts Department of Environmental Protection under federal and state law, respectively. As such, all the terms and conditions of this permit are hereby incorporated into and constitute a discharge permit issued by the Commissioner of the MA DEP pursuant to M.G.L. Chap. 21, §43 and under regulations found at 314 CMR 3.00. Regulations found at 314 CMR 3.19 (Standard Permit Conditions) are incorporated into this permit by reference.

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

PART III
NEW HAMPSHIRE SMALL MS4
STORM WATER MANAGEMENT PROGRAM
(This part also applies to Indian Lands in MA, CT, and RI .)

A. Storm Water Management Program

The permittee must develop, implement and enforce a program to reduce the discharge of pollutants from the MS4 to the maximum extent practicable; protect water quality, and satisfy the water quality requirements of the Clean Water Act and state water quality standards

1. The permittee must develop a storm water management program implementing the minimum measures described in Paragraph III.B.

2. All elements of the storm water management program must be implemented by the expiration date of this permit.

3. Implementation of one or more of the minimum measures may be shared with another entity, or the entity may fully implement the measure. When another entity fully implements a minimum control measure for the permittee, the following applies:

(a.) the other entity, in fact, implements the control measure;
(b.) the particular control measure, or component of that measure is at least as stringent as the corresponding permit requirement.
(c.) The other entity agrees to implement the control measure on the permittee behalf. A legally binding written acceptance of this obligation is expected. This obligation must be maintained as part of the storm water management program. If the other entity agrees to report on the minimum measure, the permittee must supply the other entity with the reporting requirements contained in this permit under Part III.E.
(d) The permittee remains responsible for permit compliance and implementation of the minimum measure if the other entity fails to do it.

4. For each minimum measure, the permittee must:

(a.) identify the person(s) or department responsible for the measure;
(b.) identify Best Management Practices (BMPs) for the measure;
(c.) identify measurable goals for each BMP. Identify time lines and milestones for implementation.

5. EPA's BMP menu found at:
http://www.epa.gov/npdes/menuofbmps/menu.htm and EPA's guidance on measurable goals, found at: http://www.epa.gov/npdes/stormwater/measurablegoals/index.htm, may be used in the development of the storm water management program.

B. Minimum Control Measures

1. Public education and outreach. The permittee must implement a public education program to distribute educational material to the community. The public education program must provide information concerning the impact of storm water discharges on water bodies. It must address steps and/or activities that the public can take to reduce the pollutants in storm water runoff.

The following should be included in education and outreach efforts:

(a.) information regarding industrial, commercial, and residential activities including illegal dumping into storm drains.
(b.) coordinate activities with local groups (i.e. watershed associations, or schools)

(c.) materials for outreach/education may include, but are not limited to, pamphlets; fact sheets; brochures; public service announcements; storm drain stenciling and newspaper advertisements.
(d.) topics may include, but are not limited to, litter disposal, pet waste, household hazardous waste disposal, proper use of fertilizer and pesticides. (This list is intended to provide examples of education topics, the permittee is encouraged to use a variety of methods for public education.)

2. Public Involvement and participation. All public involvement activities in the State of New Hampshire must comply with state public notice requirements, RSA-91A. Activities must also comply with local and Tribal requirements, as appropriate.

(a.) The permittee must provide opportunity for the public to participate in the development, implementation and review of the storm water management program.
(b) Activities may also include volunteer stream monitoring or formation of a storm water management committee. (These are examples of public involvement activities, the permittee is encouraged to use a wide range of activities to maximize public involvement.)

3. Illicit discharge detection and elimination. The permittee must develop, implement and enforce a program to detect and eliminate illicit discharges. An illicit discharge is any discharge to a municipal separate storm sewer that is not composed entirely of storm water. Exceptions are discharges pursuant to a NPDES permit (other that the NPDES permit for discharges from the municipal sewer system), allowable non storm water discharges described at Part I.F. and discharges resulting from fire fighting activities.

(a.) If not already existing, the permittee must develop a storm sewer system map. At a minimum, the map must show the location of all outfalls and the names of all waters that receive discharges from those outfalls. Additional elements may be included on the map, such as, location of catch basins, location of manholes, and location of pipes within the system. Initial mapping should be based on all existing information available to the permittee including city records and drainage maps. Field surveys may be necessary to verify existing records and locate all outfalls.

(b.) To the extent allowable under state, Tribal or local law, the permittee must effectively prohibit, through an ordinance or other regulatory mechanism, non-storm water discharges into the system and implement appropriate enforcement procedures and actions. If a regulatory mechanism does not exist, development and adoption of such a mechanism must be included as part of the storm water management program.

(c.) The permittee must develop and implement a plan to detect and address non storm water discharges, including illegal dumping, into the system.

The illicit discharge plan must contain the following elements:
i. Procedures to identify priority areas. This includes areas suspected of having illicit discharges, for example: older areas of the city, areas of high public complaints and areas of high recreational value or high environmental value such as beaches and drinking water sources.
ii. Procedures for locating illicit discharges (i.e. visual screening of outfalls for dry weather discharges, dye or smoke testing)
iii. Procedures for locating the source of the discharge and procedures for the removal of the source.
iv. Procedures for documenting actions and evaluating impact on the storm sewer system subsequent to the removal.

(d.) The permittee must inform public employees, businesses, and the general public of hazards associated with illegal discharges and improper waste disposal.

(e.) The non-storm water discharges listed in Part I.F. must be addressed if they are identified as being significant contributors of pollutants to the MS4.

4. Construction site storm water runoff control. The permittee must develop, implement, and enforce a program to reduce pollutants in any storm water runoff to the MS4 from construction activities that result in a land disturbance of greater than or equal to one acre. The permittee must include disturbances less than one acre if part of a larger common plan.

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

At a minimum, the program must include:

(a.) To the extent allowable under state, Tribal or local law, an ordinance or other regulatory mechanism to require sediment and erosion control at construction sites. If such an ordinance does not exist, development and adoption of an ordinance must be part of the program.

(b.) Sanctions to ensure compliance with the program. To the extent allowable under state, Tribal or local laws, sanctions may include both monetary or non-monetary penalties.

(c.) Requirements for construction site operators to implement a sediment and erosion control program which includes BMPs that are appropriate for the conditions at the construction site.

(d.) Requirements for the control of wastes, including but not limited to, discarded building materials, concrete truck wash out, chemicals, litter, and sanitary wastes.

(e.) Procedures for site plan review including procedures which incorporate consideration of potential water quality impacts. The site plan review should include procedures for preconstruction review.

(f.) Procedures for receipt and consideration of information submitted by the public.

(g.) Procedures for inspections and enforcement of control measures at construction sites.

5. Post construction storm water management in new development and redevelopment.

The permittee must develop, implement and enforce a program to address storm water runoff from new development and redevelopment projects that disturb greater than one acre and discharge into the municipal system.

The program must include projects less than one acre if the project is part of a larger common plan of development.

The post construction program must include:

(a.) To the extent allowable under state, Tribal or local law, an ordinance or other regulatory mechanism to address post construction runoff from new development and redevelopment. If such an ordinance does not exist, development and adoption of an ordinance must be part of the program.

(b.) Procedures to ensure adequate long term operation and maintenance of best management practices.

(c.) Procedure to ensure that any controls that are in place will prevent or minimize impacts to water quality.

6. Pollution prevention and good house keeping in municipal operations.
The permittee must

(a.) Develop and implement a program with a goal of preventing and/or reducing pollutant runoff from municipal operations. The program must include an employee training component.

(b.) Include, at a minimum, maintenance activities for the following : parks and open space (area such as public golf courses and athletic fields); fleet maintenance, building maintenance; new construction and land disturbance; roadway drainage system maintenance and storm water system maintenance.

(c.) Develop schedules for municipal maintenance activities described in paragraph (b) above.

(d) Develop inspection procedures and schedules for long term structural controls.

7. Cooperation between interconnected municipal separate storm sewer systems is encouraged. The permittee should identify interconnections within the system. The permittee should attempt to work cooperatively with an interconnected municipality in instances of discharges impacting a system.

8. MS4s which discharge to coastal waters with public swimming beaches should consider these waters a priority in implementation of the storm water management program.

9. The permittee must evaluate physical conditions, site design, and best management practices to promote groundwater recharge an infiltration where feasible in the implementation of the control measures described above. During the implementation of the storm water management program, the permittee must address recharge and infiltration for the minimum control measures, as well as any reasons for electing not to implement recharge and infiltration. Loss of annual recharge to ground water should be minimized through the use of infiltration measures to the maximum extent practicable.

C. Public Drinking Water Supply Requirements

1. MS4s which discharge to public drinking water sources and their protected areas (Class A and B surface waters used for drinking water and wellhead protection areas) should consider these waters a priority in implementation of the storm water management program.

2. Discharges to public drinking water supply sources and their protection areas (wellhead protection areas, Class A and B waters) should provide pretreatment and spill control capabilities to the extent feasible.

3. Direct discharges to Class A waters and the sanitary radius to supply wells (defined in EnV-Ws 378.06, EnV-Ws 372.13) should be avoided to the extent feasible.

D. Program Evaluation

1. The permittee must annually evaluate the compliance of the storm water management program with the conditions of this permit.

2. The permittee must evaluate the appropriateness of the selected Best Management Practices in efforts towards achieving the defined Measurable Goals. The SWMP may be changed in accordance with the following provisions:

(a). Changes adding (but not subtracting or replacing) components, controls or requirements to the SWMP may be made at any time upon written notification to EPA.

(b.) Changes replacing an ineffective or infeasible BMP specifically identified in the SWMP with an alternative BMP may be requested at any time. Unless denied, changes proposed in accordance with the criteria below shall be deemed approved and may be implemented 60 days from submittal of the request. If the request is denied, EPA will send a written explanation of the denial.

(c.) Modification requests, must include the following information:

i. an analysis of why the BMP is ineffective or infeasible (including cost prohibitive)

ii. expectations on the effectiveness of the replacement BMP, and

iii. an analysis of why the replacement BMP is expected to achieve the goals of the BMP to be replaced.

iv. Change requests or notifications must be in writing and signed in accordance with the signatory requirements of Part VI.

3. EPA or NHDES may require changes to the SWMP as needed to:

(a.) Address impacts on receiving water quality caused or contributed to by discharges from the MS4;

(b.) To include more stringent requirements necessary to comply with new Federal statutory or regulatory requirement; or

(c.) To include such other conditions deemed necessary to comply with the goals and requirements of the CWA.

(d.) Any changes requested by EPA or NHDESwill be in writing and will set forth the schedule for the permittee to develop the changes and offer the opportunity to propose alternative program changes to meet the objective of the requested modification.

E. Record Keeping

1. All records required by this permit must be kept for a period of at least five years. Records include information used in the development of the storm water management program, any monitoring, copies of reports, and all data used in the development of the notice of intent.

2. Records need to be submitted only when specifically requested by the permitting authority.

3. The permittee must make the records relating to this permit available to the public, including the storm water management program. The public may view the records during normal business hours. The permittee may charge a reasonable fee for copying requests.

F. Reporting

1. The permittee must submit an annual report. The initial report is due one year from the effective date of this permit and annually thereafter. The reports should contain information regarding activities of the previous calendar year. Reports must be submitted to EPA at the following address:

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

Municipalities located in the State of New Hampshire, must also submit reports to the New Hampshire Department of Environmental Services at the following address:

New Hampshire Department of Environmental Services
Water Division
Wastewater Engineering Bureau
P.O. Box 95
Concord, New Hampshire 03302-0095

2. The following information must be contained in the annual report:

(a) A self assessment review of compliance with the permit conditions.

(b) An assessment of the appropriateness of the selected BMPs.

(c) An assessment of the progress towards achieving the measurable goals.

(d) A summary of results of any information that has been collected and analyzed. This includes any type of data.

(e) A discussion of activities for the next reporting cycle.

(f) A discussion of any changes in identified BMPs or measurable goals.

(g) Reference any reliance on another entity for achieving any measurable goal.

PART IV
NON-TRADITIONAL SMALL MS4 -STORM WATER MANAGEMENT PROGRAM
(This covers federal, county, or state owned small MS4s located in any of the areas described in Part I.A. of this permit)

A. Storm Water Management Program

The permittee must develop, implement and enforce a program to reduce the discharge of pollutants from the MS4 to the maximum extent practicable; protect water quality, and satisfy the water quality requirements of the Clean Water Act and state water quality standards.

1. The permittee must develop a storm water management program implementing the minimum measures described in Paragraph IV.B.

2. All elements of the storm water management program must be implemented by the expiration date of this permit.

3. Implementation of one or more of the minimum measures may be shared with another entity, or the entity may fully implement the measure. When another entity fully implements a minimum measure for the permittee, the following applies:

(a.) the other entity, in fact, implements the control measure,
(b.) the particular control measure, or component of that measure is at least as stringent as the corresponding permit requirement.
(c.) The other entity agrees to implement the control measure on the permittee behalf. A legally binding written acceptance of this obligation is expected. This obligation must be maintained as part of the storm water management program. If the other entity agrees to report on the minimum measure, the permittee must supply the other entity with the reporting requirements contained in this permit under Part IV.E.
(d) The permittee remains responsible for permit compliance and implementation of the minimum measure if the other entity fails to do it.

4. For each minimum measure, the permittee must:

(a.) identify the person(s) or department responsible for the measure;
(b.) identify Best Management Practices (BMPs) for the measure;
(c.) identify measurable goals for the BMP. The permittee may also identify an overall goal for the measure. Time lines and milestones for implementation of BMPs should be identified.

5. The following EPA websites may be used in the development of BMPs and measurable goals. EPA's BMP menu: http://www.epa.gov/npdes/menuofbmps/menu.htm EPA's guidance on measurable goals: http://www.epa.gov/npdes/stormwater/measurablegoals/index.htm

B. Minimum Control Measures

1.. Public education and outreach. The permittee must implement a public education program to distribute educational material to the community. For the purposes of this permit, a community consists of the people who use the facility. For example, at a university it would be the faculty, other staff, students, and visitors. The public education program must provide information concerning the impact of storm water discharges on water bodies. It must address steps and/or activities that the community can take to reduce the pollutants in storm water runoff.

The following should be included in education and outreach efforts:

(a.) information regarding activities that occur at the facility, including illegal dumping into storm drains.
(b.) activities may be coordinated with local groups (i.e. watershed associations, or schools).

(c.) materials for outreach/education may include, but are not limited to, pamphlets; fact sheets; brochures; public service announcements; storm drain stenciling and newspaper advertisements.
(d.) encourage cooperative efforts with neighboring municipalities, watershed associations and others.

2. Public Involvement and participation. All public involvement activities must comply with state public notice requirement. In Massachusetts the public notice requirements are at MGL Chapter 39, Section 23B. In New Hampshire, the public notice requirements are at RSA 91A.

(a.) The permittee must provide opportunity for the public to participate in the implementation and review of the storm water management program.

3. Illicit discharge detection and elimination. The permittee must develop, implement and enforce a program to detect and eliminate illicit discharges. An illicit discharge is any discharge to a municipal separate storm sewer that is not composed entirely of storm water. Exceptions are discharges pursuant to a NPDES permit (other than the NPDES permit for discharges from the municipal sewer system), allowable non-storm water discharges described at Part I.F. and discharges resulting from fire fighting activities.

(a.) If not already existing, the permittee must develop a storm sewer system map. At a minimum, the map must show the location of all outfalls and the names of all waters that receive discharges from those outfalls. Additional elements may be included on the map, such as, location of catch basins, location of manholes, and location of pipes within the system. Initial mapping should be based on all existing information available to the permittee including facility records, city records, and drainage maps. Field surveys may be necessary to verify existing records and locate all outfalls.

(b.) To the extent allowable under state law, the permittee must effectively prohibit, through regulatory mechanisms available to the permittee, non storm water discharges into the system and implement appropriate enforcement procedures and actions. If a regulatory mechanism does not exist, development and adoption of such a mechanism must be included as part of the storm water management program. The permittee should evaluate existing procedures, policies, and authorities pertaining to connections to its separate storm sewer system. These may be used to assist in the development of the required regulatory mechanism.

If an illicit discharger fails to comply with procedures or policies established at the facility, the permittee may seek assistance from EPA or the state agency in enforcing this provision of the permit.

(c.) The permittee must develop and implement a plan to detect and address non -storm water discharges, including illegal dumping, into the system.

The illicit discharge plan must contain the following elements:
i. Procedures to identify priority areas. This includes areas suspected of having illicit discharges, for example: older areas of the city, areas of high public complaints and areas of high recreational value or high environmental value such as beaches and drinking water sources.
ii. Procedures for locating illicit discharges (i.e. visual screening of outfalls for dry weather discharges, dye or smoke testing).
iii. Procedures for locating the source of the discharge and procedures for the removal of the source.
iv. Procedures for documenting actions and evaluating the impact on the storm sewer system subsequent to the removal.

(d.) The permittee must inform users of system and the general public of hazards associated with illegal discharges and improper waste disposal.

(e.) The non-storm water discharges listed in Part I.F. must be addressed if they are identified as being significant contributors of pollutants to the MS4.

4. Construction site storm water runoff control. The permittee must develop, implement, and enforce a program to reduce pollutants in any storm water runoff to the MS4 from construction activities that result in a land disturbance of greater than or equal to one acre. The permittee must include disturbances less than one acre if part of a larger common plan.

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

At a minimum, the program must include:

(a.) To the extent allowable under state law, a regulatory mechanism to require sediment and erosion control at construction sites. If such a mechanism does not exist, development and adoption of a mechanism must be part of the program. The permittee should evaluate existing procedures, policies, and authorities pertaining to activities occurring on its property, these may be used to assist in the development of the required regulatory mechanism. If attempts to enforce this part of their program are ineffective, the permittee may seek assistance from EPA or the state agency for enforcement of this provision .

(b.) Sanctions to ensure compliance with the program. To the extent allowable under state law sanctions may include both monetary or non-monetary penalties.

(c.) Requirements for construction site operators to implement a sediment and erosion control program which includes best management practices that are appropriate for the conditions at the construction site. The overall goal of a sediment and erosion control plan is to retain sediment on site, to the extent practicable. A sediment and erosion control plan should, at a minimum, include provisions to address maintenance and inspection of BMPs, and long and short term stabilization practices.

(d.) Require control of wastes, including but not limited to, discarded building materials, concrete truck wash out, chemicals, litter, and sanitary wastes.

(e.) Procedures for site plan review including procedures which incorporate consideration of potential water quality impacts. The site plan review should include procedures for preconstruction review.

(f.) Procedures for receipt and consideration of information submitted by the public.

(g.) Procedures for inspections and enforcement of control measures at construction sites.

5. Post construction storm water management in new development and redevelopment.

The permittee must develop, implement and enforce a program to address storm water runoff from new development and redevelopment projects that disturb greater than one acre and discharge into the MS4.

The program must include projects less than one acre if the project is part of a larger common plan of development.

The post construction program must include:

(a.) To the extent allowable under state law, a regulatory mechanism to address post construction runoff from new development and redevelopment. If such a mechanism does not exist, development and adoption of a mechanism must be part of the program. The permittee should evaluate existing procedures and policies concerning activities occurring on its property. These may be used to assist in development of the required regulatory mechanism. If attempts to enforce this provision of the program are ineffective, the permittee may seek assistance from EPA or the state agency in enforcing this provision.

(b.) Procedures to ensure adequate long term operation and maintenance of best management practices.

(c.) Procedure to ensure that any controls that are put in place will prevent or minimize impacts to water quality.

6. <u>Pollution prevention and good housekeeping in community/facility operations</u>.

The permittee must

(a.) Develop and implement a program with a goal of preventing and/or reducing pollutant runoff from community/facility operations. The program must include an employee training component.

(b.) Include, at a minimum, maintenance activities for the following : parks and open space; fleet maintenance, building maintenance; new construction and land disturbance; road way drainage system maintenance, and storm water system maintenance.

(c.) Develop schedules for maintenance activities described in paragraph (b) above.

(d) Develop inspection procedures and schedules for long term structural controls.

7. Cooperation with interconnected municipal separate storm sewer systems is encouraged. The permittee should identify interconnections within the system. These interconnections include both those leaving the system and those entering the system. The permittee should attempt to work cooperatively with an interconnected municipality in instances of discharges impacting either system.

8. MS4s which discharge to coastal waters with public swimming beaches should consider these waters a priority in implementation of the storm water management program.

9. The permittee should consider opportunities for ground water recharge and infiltration in implementation of the control measures described above.
The permittee must evaluate physical conditions, site design, and best management practices to promote groundwater recharge and infiltration where feasible in the implementation of the control measures described above. During the implementation of the storm water management program, the permittee must address recharge and infiltration for the minimum control measures as well as any reasons for electing not to implement recharge and infiltration. Loss of annual recharge to ground water should be minimized through the use of infiltration measures to the maximum extent practicable.
Massachusetts Only: Permittee in areas identified as "high" or "medium" in the most recent Massachusetts Water Resources Commission's *Stressed Basins in Massachusetts* report in effect at the time the permittee submits a Notice of Intent and accompanying storm water management program, must minimize the loss of annual recharge to ground water from new development and redevelopment, including but not limited to drainage improvements done in conjunction with road improvements, street drain improvement projects and flood mitigation projects, consistent with Standard 3 of the Storm Water Management Policy in areas both within and outside of the jurisdiction of the Massachusetts Wetlands Protection Act.

(See http://www.state.ma.us/dem/programs/intbasin/stressed_basin)

C. Public Drinking Water Supply Requirements

1. MS4s which discharge to public drinking water sources and their protection areas (Class A and B surface waters used for drinking water and wellhead protection areas) should consider these waters a priority in implementation of the storm water management program.

2. Discharges to public drinking water supply sources and their protection areas (wellhead protection areas, Class A and Class B waters) should provide pretreatment and spill control capabilities to the extent feasible.

3. Direct discharges to Class A waters and the sanitary radius to public supply wells should be avoided the extent feasible.

D. Program Evaluation

1.The permittee must annually evaluate the compliance of the storm water management program with the conditions of this permit.

2.The permittee must evaluate the appropriateness of the selected Best Management Practices in efforts towards achieving the defined Measurable Goals. The SWMP may be changed in accordance with the following provisions:

(a.) Changes adding (but not subtracting or replacing) components, controls or requirements to the SWMP may be made at any time upon written notification to EPA and MA DEP.

(b.) Changes replacing an ineffective or infeasible BMP specifically identified in the SWMP with an alternative BMP may be requested in writing to EPA and MA DEP at any time. Unless denied, changes proposed in accordance with the criteria below shall be deemed approved and may be implemented 60 days from submittal of the request. If the request is denied, EPA or MA DEP, as applicable, will send you a written explanation of the denial.

(c.) Modification requests, must include the following information:

i. an analysis of why the BMP is ineffective or infeasible (including cost prohibitive)

ii. expectations on the effectiveness of the replacement BMP, and

iii. an analysis of why the replacement BMP is expected to achieve the goals of the BMP to be replaced.

iv. Change requests or notifications must be in writing and signed in accordance with the signatory requirements of Part VI.

3. EPA or the state agency may require changes to the SWMP as needed to:

(a.) Address impacts on receiving water quality caused or contributed to by discharges from the MS4,

(b.) To include more stringent requirements necessary to comply with a new Federal statutory or regulatory requirement; or

(c.) To include such other conditions deemed necessary to comply with the goals and requirements of the CWA.

(d.) Any changes requested by EPA or MA DEP/ NH DES will be in writing and will set forth the time schedule for the permittee to develop the changes and offer the opportunity to propose alternative program changes to meet the objective of the requested modification.

E. Record Keeping

1. All records required by this permit must be kept for a period of five years. Records include information used in the development of the storm water management program, any monitoring, copies of reports, and all data used in the development of the notice of intent.

2.Records need to be submitted only when specifically requested by the permitting authority.

3. The permittee must make the records relating to this permit available to the public, including the storm water management program. The public may view the records during normal business hours. The permittee may charge a reasonable fee for copying requests.

F. Reporting

1.The permittee must submit an annual report. The initial report is due one year from the effective date of this permit and annually thereafter. The reports should contain information regarding activities of the previous calendar year. Reports should be submitted to EPA. At the following address:

United States Environmental Protection Agency
Water Technical Unit
P.O. Box 8127
Boston, Massachusetts, 02114

Massachusetts MS4s must also submit reports to:

Massachusetts Department of Environmental Protection
Division of Watershed Management
627 Main Street
Worcester, Massachusetts 01608

New Hampshire MS4s must submit reports to:

New Hampshire Department of Environmental Services
Water Division
Wastewater Engineering Bureau
P.O. Box 95
Concord, New Hampshire 03302-0095

2. The following information must be contained in the annual report:

(a) A self assessment review of compliance with the permit conditions

(b) An assessment of the appropriateness of the selected BMPs.

(c) An assessment of the progress towards achieving the measurable goals

(d) A summary of results of any information that has been collected and analyzed. This includes any type of data.

(e) A discussion of activities for the next reporting cycle.

(f) A discussion of any changes in identified BMPs or measurable goals.

(g) Reference any reliance on another entity for achieving any measurable goal.

G. Massachusetts State Permit Conditions

This permit is issued jointly by the U.S. Environmental Protection Agency and the Massachusetts Department of Environmental Protection under federal and state law, respectively. As such, all the terms and conditions of this permit are hereby incorporated into and constitute a discharge permit issued by the Commissioner of the MA DEP pursuant to M.G.L. Chap. 21, §43 and under regulations found at 314 CMR 3.00. Regulations found at 314 CMR 3.19 (Standard Permit Conditions) are incorporated into this permit by reference.

To the extent allowable by their respective laws and regulations, each agency shall have the independent right to enforce the terms and conditions of this permit. Any modification, suspension or revocation of this permit shall be effective only with respect to the agency taking such action, and shall not affect the validity or status of this permit as issued by the other agency, unless and until each agency has concurred in writing with such modification, suspension or revocation. In the event any portion of this permit is declared invalid, illegal or otherwise issued in violation of the state law such permit shall remain in force and effect under federal law as a NPDES permit issued by the U.S. Environmental Protection Agency. In the event this permit is declared invalid, illegal or otherwise issued in violation of federal law, this permit shall remain in full force and effect under state law as a permit issued by the Commonwealth of Massachusetts. Refer to Part IX for 401 Certification Requirements.

PART V
TRANSPORTATION MS4 - STORM WATER MANAGEMENT PROGRAM
(This part applies to state and county agencies who maintain roadways, highways and other thoroughfares in the state including but not limited to Massachusetts Highway Department and New Hampshire Department of Transportation)

A. Storm Water Management Program

The permittee must develop, implement and enforce a program to reduce the discharge of pollutants from the MS4 to the maximum extent practicable; protect water quality, and satisfythe water quality requirements of the Clean Water Act and state water quality standards

1. The permittee must develop a storm water management program implementing the minimum measures described in Paragraph V.B.

2. All elements of the storm water management program must be implemented by the expiration date of this permit.

3. Implementation of one or more of the minimum measures may be shared with another entity, or the entity may fully implement the measure. When another entity fully implements a minimum measure for the permittee, the following applies
   (a.) the other entity, in fact, implements the control measure;
   (b.) the particular control measure, or component of that measure is at least as stringent as the corresponding permit requirement.
   (c.) The other entity agrees to implement the control measure on the permittee behalf. A legally binding written acceptance of this obligation is expected. This obligation must be maintained as part of the storm water management program. If the other entity agrees to report on the minimum measure, the permittee must supply the other entity with the reporting requirements contained in this permit under Paragraph V.E.
   (d) The permittee remains responsible for permit compliance and implementation of the minimum measure if the other entity fails to do it.

4. For each minimum measure, the permittee must:
   (a.) identify the person(s) or department responsible for the measure;
   (b.) identify Best Management Practices (BMPs) for the measure;
   (c.) identify measurable goals for each best management practice. The permittee may also identify an overall goal for each measure. Time lines and milestones for implementation of BMPs should be identified.

5. The following EPA websites may be used in the development of BMPs and measurable goals. EPA's BMP menu: http://www.epa.gov/npdes/menuofbmps/menu.htm EPA's guidance on Measurable goals: http://www.epa.gov/npdes/stormwater/measurablegoals/index.htm

Minimum Control Measures

1. <u>Public education and outreach</u>. The permittee must implement a public education program to distribute educational material to the community. For the purposes of this permit, a community consists of the people who use the facility. For a transportation agency, this would include employees, contractors, and general public. The public education program must provide information concerning the impact of storm water discharges on water bodies. It must address steps and/or activities that the community can take to reduce the pollutants in storm water runoff.

The following should be included in education and outreach efforts:

(a.) information regarding activities that occur within the facility, including illegal dumping into storm drains.
(b.) coordinate activities with local groups (i.e. watershed associations, or schools)
(c.) materials for outreach/education may include, but are not limited to, pamphlets; fact sheets; brochures; public service announcements; storm drain stenciling and newspaper advertisements.
(d.) encourage cooperative efforts with neighboring municipalities, watershed associations and others.

2. Public involvement and participation. All public involvement activities must comply with state public notice requirement.

(a.) The permittee must provide opportunity for the public to participate in the development, implementation and review of the storm water management program. In Massachusetts, the public notice requirements are at Chapter 39, Section 23B. In New Hampshire, the public notice requirements are at RSA-91A.

3. Illicit discharge detection and elimination. The permittee must develop, implement and enforce a program to detect and eliminate illicit discharges. An illicit discharge is any discharge to a municipal separate storm sewer that is not composed entirely of storm water. Exceptions are discharges pursuant to a NPDES permit (other that the NPDES permit for discharges from the municipal sewer system), allowable non-storm water discharges described at Part I.F. and discharges resulting from fire fighting activities.

(a.) If not already existing, the permittee must develop a storm sewer system map. At a minimum, the map must show the location of all outfalls and the names of all waters that receive discharges from those outfalls. Due to the magnitude of a transportation agency's drainage system, identification of outfalls may be done on a district basis, and as part of construction and redevelopment projects.

Additional elements may be included on the map, such as, location of catch basins, location of manholes, and location of pipes within the system. Initial mapping should be based on all existing information available to the permittee including project plans, agency records, city records and drainage maps. Field surveys may be necessary to verify existing records and locate all outfalls.

(b.) To the extent allowable under state law, the permittee must effectively prohibit, through a regulatory mechanism, non storm water discharges into the system and implement appropriate enforcement procedures and actions. If a regulatory mechanism does not exist, development and adoption of such a mechanism must be included as part of the storm water management program. The permittee should evaluate existing procedures, policies and authorities pertaining to connections to its separate storm sewer system.

If an illicit discharger fails to comply with procedures or policies established by the agency, the permittee seek assistance from EPA or the state environmental agency in enforcing this provision of the permit.

(c.) The permittee must develop and implement a plan to detect and address non-storm water discharges, including illegal dumping, into the system.

The illicit discharge plan must contain the following elements:
i. Procedures to identify priority areas. This includes areas suspected of having illicit discharges, for example: older areas of a city, areas of high public complaints, and areas of high recreational value or high environmental value such as beaches and drinking water sources.
ii. Procedures for locating illicit discharges (i.e. visual screening of outfalls for dry weather discharges, dye or smoke testing).

iii. Procedures for locating the source of the discharge and procedures for the removal of the source.
iv. Procedures for documenting actions and evaluating the impact on the storm sewer system subsequent to the removal.

(d.) The permittee must inform users of the system and the general public of hazards associated with illegal discharges and improper waste disposal. The permittee must train field inspectors to recognize illicit discharges.

(e.) The non storm water discharges listed in Part I.F. must be addressed if they are identified as being significant contributors of pollutants.

4. Construction site storm water runoff control. The permittee must develop, implement, and enforce a program to reduce pollutants in any storm water runoff to the MS4 from construction activities that result in a land disturbance of greater than or equal to one acre. The permittee must include disturbances less than one acre if part of a larger common plan.

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

At a minimum, the program must include:

(a.) To the extent allowable under state law,a regulatory mechanism to require sediment and erosion control at construction sites. If such a mechanism does not exist, development and adoption of a mechanism must be part of the program. If attempts to enforce this part of their program are ineffective, the permittee may seek assistance from EPA or the state agency for enforcement of this provision.

(b.) Sanctions to ensure compliance with the program. To the extent allowable under state law, sanctions may include both monetary or non-monetary penalties. The transportation agency can consider with-holding payment to contractors who fail to implement appropriate sediment and erosion control plans.

(c.) Requirements for construction site operators to implement a sediment and erosion control program which includes best management practices that are appropriate for the conditions at the construction site. The Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas may be used as a tool to implement this provision. The New Hampshire Department of Transportation may use the Storm Water Management Sediment and Erosion Control Handbook as a tool to implement this provision.

(d.) Require control of wastes, including but not limited to, discarded building materials, concrete truck wash out, chemicals, litter, and sanitary wastes.

(e.) Procedures for site plan review including procedures which incorporate consideration of potential water quality impacts. The site plan review should include procedures for preconstruction review.

(f.) Procedures for receipt and consideration of information submitted by the public. This may include the opportunities for public comment during the project development process.

(g.) Procedures for inspections and enforcement of control measures at construction sites.

5. Post construction storm water management in new development and redevelopment.
The permittee must develop, implement and enforce a program to address storm water runoff from new development and redevelopment projects that disturb greater than one acre and discharge into the MS4.

The program must include projects less than one acre if the project is part of a larger common plan of development.

The post construction program must include:

(a.) To the extent allowable under state law, a regulatory mechanism to address post construction runoff from new development and redevelopment. If such a mechanism does not exist, development and adoption of a mechanism must be part of the program. If attempts to enforce this provision of the program are ineffective, the permittee may seek assistance from EPA of the state agency in enforcing this provision.

(b.) Procedures to ensure adequate long term operation and maintenance of best management practices.

(c.) Procedure to ensure that any controls that are in place will prevent or minimize impacts to water quality.

(d) The Massachusetts Highway Department may use the approved Storm Water Management Handbook as a tool to implement this provision.

6. <u>Pollution prevention and good housekeeping in community/facility operations.</u>
The permittee must

(a.) Develop and implement a program with a goal of preventing and/or reducing pollutant runoff from transportation facility operations. The program must include an employee training component.

(b.) Include, at a minimum, maintenance activities for the following : rest areas along interstates; weigh stations; material storage yards; new construction and land disturbance; roadway drainage system maintenance, and storm water system maintenance.

(c.) Develop schedules for maintenance activities described in paragraph (b) above.

(d) Develop inspection procedures and schedules for long term structural controls.

7. Cooperation between interconnected municipal separate storm sewer systems is encouraged. The permittee should identify interconnections within the system. These interconnections include both those leaving the system and those entering the system. The permittee should attempt to work cooperatively with an interconnected municipality in instances of discharges impacting either system.

8. MS4s which discharge to coastal waters with public swimming beaches should consider these waters a priority in implementation of the storm water management program.

9. The permittee should consider opportunities for ground water recharge and infiltration in the implementation of the minimum measures described above.

The permittee must evaluate physical conditions, site design, and best management practices to promote groundwater recharge and infiltration where feasible in the implementation of the control measures described above. During the implementation of the storm water management program, the permittee must address recharge and infiltration for the minimum control measures as well as any reasons for electing not to implement recharge and infiltration. Loss of annual recharge to ground water should be minimized through the use of infiltration measures to the maximum extent practicable.
Massachusetts Only: Permittees in areas identified as “high” or “medium” in the most recent Massachusetts Water Resources Commission’s *Stressed Basins in Massachusetts* report in effect at the time the permittee submits a Notice of Intent and accompanying storm water management program, must minimize the loss of annual recharge to ground water from new development and redevelopment, including but not limited to drainage improvements done in conjunction with road improvements, street drain

improvement projects and flood mitigation projects, consistent with Standard 3 of the Storm Water Management Policy in areas both within and outside of the jurisdiction of the Massachusetts Wetlands Protection Act.
(See http://www.state.ma.us/dem/programs/intbasin/stressed_basin)

C. Public Drinking Water Supply Requirements

1. MS4s which discharge to public drinking water sources and their protection areas (Class A and B surface waters used for drinking water and well head protection areas) should consider these waters a priority in implementation of the storm water management program.

2. Discharges to public drinking water supply sources and their protection areas (wellhead protection areas, Class A and Class B waters) should provide pretreatment and spill control capabilities to the extent practicable.

3. Discharges to Class A waters, Zone 1 wellhead protection areas, and the sanitary radius to supply wells should be avoided to the extent feasible.

D. Program Evaluation

1. The permittee must annually evaluate the compliance of the storm water management program with the conditions of this permit.

2. The permittee must evaluate the appropriateness of the selected Best Management Practices in efforts towards achieving the defined Measurable Goals. The SWMP may be changed in accordance with the following provisions:

(a.) Changes adding (but not subtracting or replacing) components, controls or requirements to the SWMP may be made at any time upon written notification to EPA and MADEP.
(b.) Changes replacing an ineffective or unfeasible BMP specifically identified in the SWMP with an alternative BMP may be requested in writing to EPA and MA DEP at any time. Unless denied, changes proposed in accordance with the criteria below shall be deemed approved and may be implemented 60 days from submittal of the request. If the request is denied, EPA or MA DEP, as applicable, will send a written explanation of the denial.
(c.) Modification requests, must include the following information:
i. an analysis of why the BMP is ineffective or infeasible (including cost prohibitive)
ii. expectations on the effectiveness of the replacement BMP, and
iii. an analysis of why the replacement BMP is expected to achieve the goals of the BMP to be replaced.
iv. Change requests or notifications must be in writing and signed in accordance with the signatory requirements of Part VI.

3. EPA or MADEP/NHDES may require changes to the SWMP as needed to:

(a.) Address impacts on receiving water quality caused or contributed to by discharges from the MS4;
(b.) To include more stringent requirements necessary to comply with a new Federal statutory or regulatory requirement; or
(c.) To include such other conditions deemed necessary to comply with the goals and requirements of the CWA.
(d.) Any changes requested by EPA or MADEP/NHDES will be in writing and will set forth the time schedule for the permittee to develop the changes and offer the opportunity to propose alternative program changes to meet the objective of the requested modification

E. Record Keeping

1. All records required by this permit must be kept for a period of at least five years. Records include information used in the development of the storm water management program, any monitoring, copies of reports, and all data used in the development of the notice of intent.

2. Records need to be submitted only when specifically requested by the permitting authority.

3. The permittee should make the records relating to this permit available to the public, including the storm water management program. The public may view the records during normal business hours. The permittee may charge a reasonable fee for copying requests.

F. Reporting

1. The permittee must submit an annual report. The initial report is due one year from the effective date of this permit and annually thereafter. The reports should contain information regarding activities of the previous calendar year. Reports should be submitted to EPA. At the following address:
United States Environmental Protection Agency
Water Technical Unit
P.O. Box 8127
Boston, MA 02114

Massachusetts transportation MS4s must also submit reports to:

Department of Environmental Protection
Division of Watershed Management
627 Main Street
Worcester, Massachusetts 01608

New Hampshire transportation MS4s must also submit reports to:

New Hampshire Department of Environmental Services
Water Division
Wastewater Engineering Bureau
P.O. Box 95
Concord, NH 03302-0095

2. The following information must be contained in the annual report:

(a) A self assessment review of compliance with the permit conditions.

(b) An assessment of the appropriateness of the selected BMPs.

(c) An assessment of the progress towards achieving the measurable goals.

(d) A summary of results of any information that has been collected and analyzed. This includes any type of data.

(e) A discussion of activities for the next reporting cycle.

(f) A discussion of any changes in identified BMPs or measurable goals.

(g) Reference any reliance on another entity for achieving any measurable goal.

G. Massachusetts State Permit Conditions

This permit is issued jointly by the U.S. Environmental Protection Agency and the Massachusetts Department of Environmental Protection under federal and state law, respectively. As such, all the terms and conditions of this permit are hereby incorporated into and constitute a discharge permit issued by the Commissioner of the MA DEP pursuant to M.G.L. Chap. 21, §43 and under regulations found at 314 CMR 3.00. Regulations found at 314 CMR 3.19 (Standard Permit Conditions) are incorporated into this permit by reference.

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

Refer to Part IX for 401 Certification Requirements.

PART VI - STANDARD PERMIT CONDITIONS

H. Duty to Comply

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

2. Penalties for Violations of Permit Conditions

The Director will adjust the civil and administrative penalties listed below in accordance with Civil Monetary Penalty Inflation Adjustment Rule (Federal Register: December 31, 1996, Volume 61, Number 252, pages 69359-69366, as corrected, March 20, 1997, Volume 62, Number 54, pages 13514-13517) as mandated by the Debt Collection Improvement Act of 1996 for inflation on a periodic basis. This rule allows EPA's penalties to keep pace with inflation. The Agency is required to review its penalties at least once every four years thereafter and to adjust them as necessary for inflation according to a specialized formula. The civil and administrative penalties listed below were adjusted for inflation starting in 1996

(a) Criminal

i. Negligent Violations. The CWA provides that any person who negligently violates permit conditions implementing sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a fine of not less than $2,500 nor more than $25,000 per day of violation or by imprisonment for not more than 1 year or both.

ii. Knowing Violations. The CWA provides that any person who knowingly violates permit conditions implementing sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a fine of not less than $ 5,000 not more than $50,000 per day of violation, or by imprisonment for not more than 3 years, or both.

iii. Knowing Endangerment. The CWA provides that any person who knowingly violates permit conditions implementing sections 301, 302, 306, 307, 308, 318, or 405 of the Act and who knows at that time that he is placing another person in imminent danger of death or serious bodily injury is subject to a fine of not more than $250,000 or by imprisonment for not more than 15 years, or both.

iv. False statement. The CWA provides that any person who knowingly makes any false material statement, representation, or certification in any application, record, report, plan or other document filed or required to be maintained under the Act or who knowingly falsifies, tampers with, or renders inaccurate, any monitoring device or method required to be maintained under the Act, shall upon conviction, be punished by a fine or not more than $10,000 or by imprisonment for not more that two years, or by both. If a conviction is for a violation committed after a first conviction of such person under this paragraph, punishment shall be by a fine of not more than $20,000 per day of violation, or by imprisonment of not more than four years, or by both.

b. Civil penalties- The CWA provides that any person who violates a permit condition implementing sections 301, 302, 306, 306, 307, 318 or 405 of the Act is subject to a civil penalty not to exceed $ 27,500 per day for each violation.

c. Administrative Penalties

The CWA provides that any person who violates a permit condition implementing sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to an administrative penalty, as follows:

i. Class I penalty. Not to exceed $11,000 per violation nor shall the maximum amount exceed $ 27,500.

ii. Class II penalty. Not to exceed $11,000 per day for each day during which the violation continues nor shall the maximum amount exceed $137,500.

B. Continuation of the Expired General Permit

If this permit is not reissued prior to the expiration date, it will be administratively continued in accordance with the Administrative Procedures Act and remain in force and in effect as to any particular permittee as long as the permittee submits a new Notice of Intent two (2) months prior to the expiration of this permit. However, once this permit expires, EPA cannot provide written notification of coverage under this general permit to any permittee who submits a Notice of Intent to EPA after the permit's expiration date. Any permittee who was granted permit coverage prior to the expiration date will automatically remain covered by the continued permit until the earlier of :

(1) Reissuance of this permit, at which time the permittee must comply with the Notice of Intent conditions of the new permit to maintain authorization to discharge; or
(2) The permittee's submittal of a Notice of Termination; or
(3) Issuance of an individual permit for the permittee's discharges; or
(4) A formal permit decision by the Director not to reissue this general permit, at which time the permittee must seek coverage under an alternative general permit or an individual permit.

C. Need to Halt or Reduce Activity not a Defense

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

D. Duty to Mitigate

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

F. Duty to Provide Information

The permittee must furnish to the Director or an authorized representative of the Director any information which is requested to determine compliance with this permit. The permittee shall also furnish to the Director upon request, copies of records required to be kept by this permit.

G. Signatory Requirement

i. All applications, reports, or information submitted to the Director shall be signed and certified. (See 40 CFR 122.22)

ii. The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation or both.

H. Oil and Hazardous Substance Liability

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

I. Property Rights

The issuance of this permit does not convey any property rights of any sort, nor any exclusive privileges nor does it authorize any injury to private property nor any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

J. Severability

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to the circumstances, and the remainder of this permit shall not be affected thereby.

K. Requiring an Individual Permit or an Alternative General Permit

i. The Director may require any person authorized by this permit to apply for and/or obtain either an individual NPDES permit or an alternative NPDES general permit. Any interested person may petition the Director to take action under this paragraph. Where the Director requires the permittee to apply for an individual NPDES permit, the Director will notify the permittee in writing that a permit application is required. This notification shall include a brief statement of the reasons for this decision, an application form, a statement setting a deadline for the permittee to file the application, and a statement that on the effective date of issuance or denial of the individual NPDES permit or the alternative general permit as it applies to the individual permittee, coverage under this general permit shall automatically terminate. Applications must be submitted to the Regional Office. The Director may grant additional time to submit the application upon request of the applicant. If the permittee fails to submit in a timely manner an individual NPDES permit application as required by the Director under this paragraph, then the applicability of this permit to the permittee is automatically terminated at the end of the day specified by the Director for application submittal.

ii. Any discharger authorized by this permit may request to be excluded from the coverage of this permit by applying for an individual permit. In such cases, the permittee must submit an individual application in accordance with the requirements of 40 CFR 122.26(c)(1)(ii), with reasons supporting the request, to the Director at the following address: Office of Ecosystem Protection, United States Environmental Protection Agency, One Congress Street- Suite 1100, Boston, Massachusetts 02114. The request may be granted by issuance of any individual permit or an alternative general permit if the reasons cited by the permittee are adequate to support the request.

iii. When an individual NPDES permit is issued to a discharger otherwise subject to this permit, or the discharger is authorized to discharge under an alternative NPDES general permit, the applicability of this permit to the individual NPDES permittee is automatically terminated on the effective date of the individual permit or the date of authorization of coverage under the alternative general permit, whichever the case may be. When an individual NPDES permit is denied to an operator otherwise subject to this permit, or the operator is denied for coverage under an alternative NPDES general permit, the applicability of this permit to the individual NPDES permittee is automatically terminated on the date of such denial, unless otherwise specified by the Director.

L. State/Tribal Environmental Laws

i. Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State/Tribal law or regulation under authority preserved by section 510 of the Act.

ii. No condition of this permit releases the permittee from any responsibility or requirements under other environmental statutes or regulations.

M. Proper Operation and Maintenance

The permittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. Proper operation and maintenance requires the operation of backup or auxiliary facilities or similar systems, installed by a permittee only when necessary to achieve compliance with the conditions of the permit.

N. Inspection and Entry

The permittee must allow the Director or an authorized representative of EPA or the State/Tribe, upon the presentation of credentials and other documents as may be required by law, to:

i Enter the permittee premises where a regulated facility or activity is located or conducted or where records must be kept under the conditions of this permit;

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

iii Inspect at reasonable times any facilities or equipment (including monitoring and control equipment).

PART VII - DEFINITIONS

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

Commencement of Construction means the initial disturbance of soils associated with clearing, grading or excavating activities or other construction activities.

Control Measure as used in this permit, refers to any BMP or other method, used to prevent or reduce the discharge of pollutants to waters of the United States.
CWA means the Clean Water Act, or the Federal Water Pollution Control Act, 33 U.S.C 1251 *et seq.*

Director means the Regional Administrator of the Environmental Protection Agency or an authorized representative.

Discharge when used without qualification means the "discharge of a pollutant."

Discharge of Storm Water Associated with Construction Activity as used in this permit, refers to a discharge of pollutants in storm water runoff from areas where soil disturbing activities (e.g. clearing, grading, or excavation), construction materials or equipment storage or maintenance (e.g. fill piles, borrow areas, concrete truck washout, fueling) or other industrial storm water directly related to the construction process are located. (See 40 CFR 122.26(b)(14)(x) and 40 CFR 122.26(b)(15) for the two regulatory definition of storm water associated with construction sites).

Discharge of Storm Water Associated with Industrial Activity is defined at 40 CFR 122.26(b)(14).

EPA means the United States Environmental Protection Agency

Facility or Activity means any NPDES "point source" or any other facility or activity (including land or appurtenances thereto) that is subject to regulation under the NPDES program.

General Permit means an NPDES permit issued under §122.28 authorizing a category of discharges under the CWA within a geographical area.

Indian Country, as defined in 18 U.S.C. 1151, means : (a) All lands within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and including rights-of-way running through the reservation; (b) all dependent Indian communities with the borders of the United States whether within the original or subsequently acquired territory thereof, and whether within or without the limits of a state; and (c) all Indian allotments, the Indian titles to which have not been extinguished, including rights-of-way running through the same. This definition includes all land held in trust for an Indian tribe.

Industrial Activity as used in this permit refers to the eleven categories of industrial activities included in the definition of discharges of storm water associated with industrial activity.

Industrial Storm Water as used in this permit refers to storm water runoff associated with the definition of discharges of storm water associated with industrial activity.

Large municipal separate storm sewer system means all municipal separate storm sewer systems that are either: (i) Located in an incorporated place with a population of 250,000 or mor as determined by the 1990 Decennial Census by the Bureau of the Census; or (ii.) Located in counties listed in Appendix H of 40 CFR 122, except municipal separate storm sewers that are located in the incorporated places, townships or towns within such counties; or (iii.) Owned or operated by a municipality other than those described in paragraph (b)(4)(i) or (ii) of this section and that are designated by the Director as part of the large or medium municipal separate storm sewer system due to the interrelationship between the discharges of the designated storm sewer and the discharges from municipal separate storm sewers described under paragraph (b)(4)(i) or (ii) of this section.(Complete definition found at 40 CFR 122.26(b)(4) and incorporated here by reference).

MADEP means Massachusetts Department of Environmental Protection.

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

Medium Municipal Separate Storm Sewer System means all municipal separate storm sewers that are either: (i) Located in an incorporated place with a population of 100,000 or more but less than 250,000, as determined by the 1990 Decennial Census by the Bureau of the Census (Appendix G of this part); or (ii.) Located in the counties listed in Appendix I, except municipal separate storm sewers that are located in the incorporated places, townships or towns within such counties; or (iii.) Owned or operated by a municipality other than those described in paragraph (b)(4)(i) or (ii) of this section and that are designated by the Director as part of the large or medium municipal separate storm sewer system due to the interrelationship between the discharges of the designated storm sewer and the discharges from municipal separate storm sewers described under paragraph (b)(7)(i) or (ii) of this section.(Complete definition found at 40 CFR 122.26(b)(7) and incorporated here by reference).

Municipal Separate Storm Sewer System means a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains); (i.) Owned or operated by a State, city, town, borough, county, parish, district, association or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district, or drainage district, or similar entity or an Indian tribe or an authorized tribal organization or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; and (iv) Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.

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

NHDES means New Hampshire Department of Environmental Services.

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

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

Pollutant is defined at 40 CFR 122.2. A partial listing from this definition includes: dredged spoil, solid waste, sewage, garbage, sewage sludge, chemical wastes, biological materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial or municipal waste.

Runoff Coefficient means the fraction of total rainfall that will appear at the conveyance as runoff.

State means any of the 50 States, the District of Columbia, Guam, the Commonwealth of Puerto Rico, the Virgin Islands, American Samoa, the Commonwealth of the Northern Mariana Islands, the Trust Territory of the Pacific Islands, or an Indian Tribe meeting the requirements of 40 CFR 123.31.

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

Storm Water Associated with Industrial Activity refers to storm water, that if allowed to discharge, would constitute a "discharge of storm water associated with industrial activity" as defined at 40 CFR 122.26(b)(14) and incorporated here by reference.

Waters of the United States means:

1. All waters which are currently used, were used in the past or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide.
2. All interstate waters, including interstate wetlands;
3. All other waters such as interstate lakes, rivers, streams, (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes or natural ponds the use, designation or destruction of which would affect or could affect interstate or foreign commerce including any such waters;
    a. Which are or could be used by interstate or foreign travelers for recreational or other purposes.
    b. From which fish or shell fish are or could be taken and sold in interstate or foreign or;
    c. Which are used or could be used for industrial purposes by industries in interstate commerce.
4. All impoundments of waters otherwise defined as waters of the United States under this definition;
5. Tributaries of waters identified in paragraphs (1) through (4) of this definition;
6. The territorial sea; and
7. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs 1 through 6 of this definition.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the CWA (other than cooling ponds as defined in 40 CFR 423.11(m) which also meet the criteria of this definition) are not waters of the United States. This exclusion applies only to manmade bodies of water which neither were originally created in waters of the United States (such as disposal areas in wetlands) nor resulted from the impoundment of waters of the United States. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by other federal agency for the purposes of the Clean Water Act jurisdiction remains with EPA.

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

PART VIII - REOPENER

If there is evidence indicating that the storm water discharges authorized by this permit cause, have the reasonable potential to cause, or contribute to a violation of a water quality standard, the permittee may be required to obtain an individual permit or an alternative general permit in accordance with Part VI.K of this permit, or the permit may be modified to include different limitations and/or requirements.
Permit modification or revocation will be conducted according to 40 CFR 122.62, 122.63, 122.64 and 124.5.

PART IX - 401 WATER QUALITY CERTIFICATION REQUIREMENTS

Massachusetts:

The Massachusetts Department of Environmental Protection in accordance with the provisions of MGL Ch. 21, s. 26-53, 314 CMR 4.00, 314. CMR 3.00, 314 CMR 9.00 and Section 401 of the Federal Clean Water Act (Public Law 92-500 as amended) issues this Section 401 Water Quality Certification for the *General Permit for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems* in Massachusetts. The Department has determined that compliance with the conditions of this permit will result in compliance with applicable water quality standards, as required by the Massachusetts Surface Water Quality Standards regulations (314 CMR 4.00) and with 314 CMR 9.04 and that the permittee will be in compliance with Sections 301, 302, 303, 306 and 307 of the Federal Clean Water Act. The Department issues this Water Quality Certification subject to the following conditions, which are to be added to the final permit as state water quality certification requirements. The conditions outlined below will be presented in the following order:

A. state statutes and regulations relating to water quality and surface water discharges;
B. adherence to the Massachusetts Storm Water Management Policy, March 1997;
C. other state laws, regulations, and policies
D. environmental priority resource areas designated for protection;
E. other Department Directives, and
F. permit compliance

A. State Water Quality Statutes, Regulations and Policies:

1. The permittee shall comply with the Massachusetts Clean Waters Act (Ch. 21 s. 26-53).

2. The permittee shall comply with the conditions in 314 CMR 4.00- Surface Water Quality Standards.

3. The permittee shall comply with the conditions in 314 CMR 3.00- Surface Water Discharge Permit Program.

4. The permittee shall comply with the Wetlands Protection Act, Ch. 131 s. 40 and its regulations, 310 CMR 10.00 and any Order of Conditions issued by a Conservation Commission or Superseding Order of Conditions issued by the Massachusetts Department of Environmental Protection.

B. Department of Environmental Protection Storm Water Management Policy:

1. The permittee shall comply with the Massachusetts Storm Water Management Policy, March 1997 and applicable Storm Water Performance Standards, as prescribed by state regulations promulgated under the authority of the Massachusetts Clean Waters Act, MGL c. 21, ss 23-56 and the Wetlands Protection Act, MGL c. 131 s. 40.

C. Other State Environmental Laws, Regulations, Policies:

1. The permittee shall comply with the Massachusetts Endangered Species Act (MESA)(MGL c. 131A and regulations at 321 CMR 10.00) and any actions undertaken to comply with this storm water permit, shall not result in non-compliance with the MESA.

2. The permittee shall not conduct activities under this permit that will interfere with implementation of mosquito control work conducted in accordance with Chapter 252 including, s. 5A thereunder and DEP Guideline Number BRP G01-02, West Nile Virus Application of Pesticides to Wetland Resource Areas and Buffer Zones, and Public Water Systems.

D. ***Resource Areas Required for priority consideration in Storm Water Management Program***

1. The permittee shall identify discharges to the following resource areas as a priority and indicate in their storm water management program how storm water controls will be implemented. Identified priority areas include:

a. public water supplies

b. public swimming beaches
c. Outstanding Resource Waters (as designated in 314 CMR 4.00)
d. shell fishing areas (open versus closed areas)
e. rivers, ponds, lakes and coastal waters which are on the Department's 303d list of impaired waters
f. cold water fishery river segments as identified in 314 CMR 4.00

E. Other Department Directives:

1. The Department may require the permittee to perform water quality monitoring during the permit term if monitoring is necessary for the protection of public health or the environment as designated under the authority at 314 CMR 3.00.

2. The Department may require one or more permittees covered under this general permit to provide measurable verification of the effectiveness of BMPs and other control measures in the permittee's management program, including water quality monitoring.

3. The Department has determined that compliance with this permit does not protect the permittee from enforcement actions deemed necessary by the Department under its associated regulations to address an imminent threat to the public health, or a significant adverse environmental impact which results in a violation of the Massachusetts Clean Waters Act. Ch. 21 ss 26-53.

4. The Department reserves the right to modify this 401 Water Quality Certification if any changes, modifications or deletions are made to the general permit. In addition, the Department reserves the right to add and/or alter the terms and conditions of its Section 401 Water Quality Certification to carry out its responsibilities during the term of this permit with respect to water quality.

F. Permit Compliance:

1. Should any violation of the Massachusetts Surface Water Quality Standards (314 CMR 4.00) or the conditions of this certification occur, the Department will direct the permittee to correct the violation(s). The Department has the right to take any action as authorized by the General Laws of the Commonwealth to address the violation of this permit or the MA Clean Waters Act and the regulations promulgated thereunder. Substantial civil and criminal penalties are authorized under MGL Ch. 21, Section 42 for discharging into Massachusetts's waters in violation of an order or permit issued by this Department. This certification does not relieve the permittee of the duty to comply with other applicable Massachusetts statues and regulations.

New Hampshire
No additional conditions added.

Addendum A
Endangered Species Guidance

A. Background

In order to meet its obligations under the Clean Water Act and the Endangered Species Act (ESA), and to promote the goals of those Acts, the Environmental Protection Agency (EPA) is seeking to ensure the activities regulated by this small MS4 general permit do not adversely affect endangered and threatened species and critical habitat. Small MS4 operators applying for permit coverage must assess the impacts of their storm water discharges, allowable non-storm water discharges, and discharge-related activities on Federally listed endangered and threatened species ("listed species") and designated critical habitat ("critical habitat"), to ensure that those goals are met. Prior to obtaining general permit coverage, applicants must meet the ESA eligibility provisions of this permit. EPA strongly recommends that applicants follow the guidance in this addendum at the earliest possible stage to ensure that measures to protect listed species and critical habitat are incorporated early in the storm water management program development.

Applicants also have an independent ESA obligation to ensure that their activities do not result in any prohibited "takes" of listed species[1]. Many of the measures required in this general permit and in these instructions to protect species may also assist in ensuring that the applicants activities do not result in a prohibited take of species in violation of section 9 of the ESA. If the MS4 operator has plans or activities in areas where endangered and threatened species are located, they may wish to ensure that they are protected from potential takings liability under ESA section 9 by obtaining an ESA section 10 permit or by requesting formal consultation under ESA section 7. Applicants that are unsure whether to pursue a section 10 permit or a section 7 consultation for takings protection, should confer with the appropriate U.S. Fish and Wildlife Service (FWS)[2] office or the National Marine Fisheries Service (NMFS).

The FWS and NMFS have identified two species of concern, the short nosed sturgeon and the dwarf wedge mussel. These species are found in the Merrimack River and the Connecticut River. Specifically, the sturgeon is in the Connecticut River (main stem) down stream of Turners Falls, Massachusetts. It is in the Merrimack River (main stem) below the Lawrence Dam.

The dwarf wedge mussel is located in the following areas:

1. The Connecticut River, North from Nothumberland, NH south to Dalton, NH
2. Historic location in North Thetford, NH
3. Connecticut River, south and Black River: 16 -18 miles along the CT river form North Hartland, NH to Aschutney, VT as well as 1 mile along the Black River, from the river mouth to Springfield, VT
4. Ashuelt River form below Surry Mt. Dam, 6 -7 miles south to Keane, NH
5. South Branch of Ashuelot River, 0.5 miles in East Swanzey, NH
6. Mill River; approximately 5 miles in Whatley, MA and Hatfield, MA as well as 1-2 miles along Mill River Diversion in Northampton, MA
7. Farmington River, Muddy Brook, Philo Brook and Podunk River; Philo Brook and Muddy Brook in Suffield, CT; Farmington River in North Bloomfield, CT and the Podunk River in South Windsor, CT

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[1] Section 9 of the ESA prohibits any person from "taking" a listed species (e.g., harassing or harming it) unless: (1) the taking is authorized through a "incidental take statement" as part of completion of formal consultation according to ESA section 7; (2) where an incidental take permit is obtained under ESA section 10 (which requires the development of a habitat conservation plan); or (3) where otherwise authorized or exempted under the ESA. This prohibition applies to all entities including private individuals, businesses, and governments.

[2] Discharges to marine waters may require consultation with the National Marine Fisheries Service instead.

Any small MS4 which discharges to these rivers must consult with the Services. EPA may designate the applicants as non-Federal representatives for the small MS4 general permit for the purpose of carrying out informal consultation with NMFS and FWS. By terms of this MS4 permit, EPA has automatically designated operators as non-Federal representatives for the purpose of conducting informal consultations. (See 50 CFR §402.08 and §402.13 and Part I.B.2.(e) of the permit) Permit coverage is only available if the applicant contacts the Services to determine that discharges are not likely to adversely affect listed species or critical habitat and informal consultation with the Services has been concluded and results in a written concurrence by the Services that the discharge is not likely to adversely affect an endangered or threatened species.

B. The ESA Eligibility Process

Before submitting a notice of intent (NOI) for coverage by this permit, applicants must determine whether they meet the ESA eligibility criteria by following the steps in Section "D" of this Addendum. Applicants that cannot meet any of the eligibility criteria, must apply for an individual permit.

C. The ESA Eligibility Criteria

The ESA eligibility requirements of this permit, may be satisfied by documenting that one or more of the following criteria has been met. Upon notification, EPA may direct an applicant to pursue eligibility under Criterion B.

Criterion A: No endangered or threatened species or critical habitat are in proximity to the MS4 or the points where authorized discharges reach the receiving waters.

Criterion B: In the course of a separate federal action involving the MS4, formal or informal consultation with the Fish and Wildlife Service and/or the National Marine Fisheries Service under Section 7 of the ESA has been concluded and that consultation
- Addressed the effects of the MS4 storm water discharges, allowable non-storm water discharges and discharge related activities on listed species and critical habitat; and
The consultation resulted in either a no jeopardy opinion or a written concurrence by FWS and/or NMFS on a finding that the storm water discharges, allowable non-storm water discharges, and discharge related activities are not likely to adversely affect listed species or critical habitat.

Criterion C: The activities are authorized under Section 10 of the ESA and that authorization addresses the effects of the storm water discharges, allowable non-storm water discharges, and discharge related activities on listed species and critical habitat. (Eligibility under this criterion is not likely. This criterion involves an MS4s activities being authorized through the issuance of a permit under section 10 of the ESA and that authorization addresses the effect of the MS4's storm water discharges and discharge related activities on listed species and designated critical habitat. MS4s must follow FWS and/or NMFS procedures when applying for an ESA Section 10 permit (see 50 CFR §17.22(b)(1) for FWS and §222.22 for NMFS). Application instructions for section 10 permits can be obtained by assessing the appropriate websites (www.fws.gov and www.nmfs.noaa.gov) or by contacting the appropriate regional office.)

Criterion D: Using the best scientific and commercial data available, the effects of the storm water discharges, allowable non-storm water discharges, and discharge related activities on listed species and critical habitat have been evaluated. Based on those evaluations, a determination is made by the permittee and affirmed after review by EPA that the storm water discharges, allowable non-storm water discharges, and discharge related activity will not affect any federally threatened or endangered species or designated critical habitat.

Criterion E: The storm water discharges, allowable non-storm water discharges, and discharge related activities where already addressed in another operator's certification of eligibility which includes the MS4 activities.

D. The Steps To Determine if the ESA Eligibility Criteria Can Be Met

To determine eligibility, you must assess (or have previously assessed) the potential effects of your known storm water discharges, allowable non-storm water discharges and discharge-related activities on listed species and critical habitat, PRIOR to completing and submitting a Notice of Intent (NOI). You must follow the steps outlined below and document the results of your eligibility determination.

Step1. Determine if You Can Meet Eligibility Criterion "A"

Criterion A. You can certify eligibility, according to Criterion A, for coverage by this permit if you can answer "No" to all of the following questions:

- Are there any Endangered Species in your county? Are there any Critical Habitats in your county?

- Are there any Endangered Species or Critical Habitat in proximity to your MS4 or discharge locations?

Use the guidance below to answer these questions, and to: "*Check for Listed Endangered Species in Your County,*" "*Check for Critical Habitat in Your County,*" and "*Check for Proximity to Your MS4 or MS4 Discharge Locations*."

If you answered "No" to the questions above, you have met ESA eligibility Criterion A. Skip to Step 4.

If you answered "Yes" to either of the questions above, Go to Step 2.

Check for Listed Endangered Species in Your County.

Look at the latest county species list to see if any listed species are found in your county. If you are located close to the border of a county or your MS4 is located in one county and your discharge points are located in another, you must look under both counties. Since species are listed and de-listed periodically, you will need the most current list at the time you are conducting your endangered species assessment.

Check for Critical Habitat in Your County.

Some (but not all) listed species have designated critical habitat. Exact locations of such habitat is provided in the endangered species regulations at 50 CFR part 17 and part 226. To determine if MS4 or discharge locations are within designated critical habitat, you should either:

- Review those regulations (50 CFR Parts 17 and 226) that specific critical habitat. These regulations can be found in many larger libraries or via the Government Printing Office website, www.access.gpo.gov ; or

- Contact the nearest Fish and Wildlife Service (FWS) office or National Marine Fisheries Service (NMFS) office. A list of FWS and NMFS offices for the areas of permit coverage is found in sections "F" and "G", respectively, of this Addendum; or

- Contact the Natural Heritage Program for your state. Heritage programs gather, manage, and distribute detailed information about the biological diversity found within their jurisdictions. They frequently have the most current information on listed species and critical habitat. Contact information for the Heritage program is provided in section "H" of this Addendum.

Check for Proximity to Your MS4 or MS4 Discharge Locations.

You must determine whether listed species or critical habitat are in proximity to your MS4 storm water discharges or allowable non-storm water discharges. Listed species and critical habitat are in proximity when they are:

- Located in the path or immediate area through which or over which point source storm water or allowable non-storm water flows to the point of discharge into the receiving water. This may also include areas where storm water from your MS4 enters groundwater that has a direct hydrological connection to a receiving water (e.g., groundwater infiltrates at your MS4 and re-emerges to enter a surface waterbody within a short period of time.)

- Located in the immediate vicinity of, or nearby, the point of discharge into receiving waters.

- Located in the area of an MS4 where storm water BMPs are planned or are to be constructed.

The area in proximity to be searched/surveyed for listed species will vary with the size of the MS4, the nature and quantity of the storm water discharges, and the type of receiving waters. You should use the method(s) which allow you to determine, to the best of your knowledge, whether listed species are in proximity to your particular MS4. These methods may include:

- Conducting visual inspections. This method may be particularly suitable for MS4s that are smaller in size or MS4s located in non-natural settings such as highly urbanized areas where there is little or no natural habitat. For other MS4s, a visual survey may not be sufficient to determine whether listed species are in proximity.

- Contacting the nearest State Wildlife Agency or U.S. FWS offices. Many endangered and threatened species are found in well-defined areas or habitats. That information is frequently known to state or federal wildlife agencies.

- Contacting local/regional conservation groups such as natural heritage programs (see section H below). These groups inventory species and their locations and maintain lists of sightings and habitats.

- Conducting a formal biological survey. MS4s with extensive storm water discharges may choose to conduct biological surveys as the most effective way to assess whether listed species are located in proximity and whether there are likely adverse effects.

Step 2. Determine If You Can Meet Eligibility Criteria "B", "C", or "E"

Criterion B. You can certify eligibility, according to Criterion B, for coverage by this permit if you can answer "Yes" to all of the following questions:

- Has consultation, under ESA Section 7, already been completed for discharges from your MS4[3]?

- Did the previously completed ESA Section 7 consultation consider all currently listed species and critical habitat and address your storm water, allowable non-storm water, and discharge-related activities?

[3] A formal or informal ESA Section 7 consultation on this or another federal action (e.g., New source review under NEPA, application for a dredge and fill permit under CWA Sec. 404, application for an individual NPDES permit, etc.) addressed the effects of your MS4 discharges and discharge-related activities on listed species and critical habitat. (See 50 CFR 402.13).

■ Did the ESA Section 7 consultation result in either a "no jeopardy" opinion by the Service (for formal consultations) or a concurrence by the Service that your activities would be "unlikely to adversely affect" listed species or critical habitat?

■ Do you agree to implement all measures upon which the consultation was conditioned?

If you answered "Yes" to all four questions above, you have met ESA eligibility Criteria B. Skip to Step 4.

If you answered "No" to any of the four questions above, check to see if you can meet Criteria C or E, or Go to Step 3.

Criterion C. You can certify eligibility, according to Criterion C, for coverage by this permit if you can answer "Yes" to all of the following questions:

■ Has an ESA Section 10 permit already been issued for discharges from your MS4[4]?

■ Does your ESA Section 10 Permit consider all currently listed species and critical habitat, and address your storm water, allowable non-storm water, and discharge related activities, for discharges from your MS4?

If you answered "Yes" to the two questions above, you have met ESA eligibility Criterion

C. Skip to Step 4.

If you answered "No" to either of the two questions above, check to see if you can meet Criterion E, or Go to Step 3.

Criterion E. You can certify eligibility, according to Criterion E, for coverage by this permit if you can answer "Yes" to all of the following questions:

■ Did another MS4 operator previously certify ESA eligibility for your MS4 area[5]?

■ Did the other operator's certification of eligibility consider all currently listed species and critical habitat and address your storm water, allowable non-storm water, and discharge related activities?

■ Do you agree to implement all measures upon which the other operator's certification was based?

Before you rely on another operator's certification, you should carefully review that certification along with any supporting information. You also need to confirm that no additional species have been listed or critical habitat designated in the area of your MS4 since the other operator's endangered species assessment was done. If you do not believe that the other operator's certification provides adequate coverage for your MS4, you should provide your own independent endangered species assessment and certification.

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[4] You have a permit under section 10 of the ESA and that authorization addresses the effects of your storm water discharges and discharge-related activities on listed species and critical habitat. You must follow FWS procedures when applying for an ESA section 10 permit (see 50 CFR 17.22(b)(1)).

[5] In order to meet the permit eligibility requirements by relying on another operator's certification of eligibility, the other operator's certification must apply to the location of your MS4 and must address the effects from your storm water discharges, allowable non-storm water discharges, and discharge-related activities on listed species and critical habitat.

If you answered "Yes" to all three questions above, you have met ESA eligibility Criteria

E. Skip to Step 4.

If you answered "No" to any of the three questions above, Go to Step 3.

Step 3. Determine If You Can Meet Eligibility Criterion "D"

Criterion D. You can certify eligibility, according to Criterion D, for coverage by this permit if you can answer "Yes" to all of the following questions:

■ Have you determined that your MS4's storm water discharges, allowable non-storm water discharges, and discharge-related activities are "not likely to adversely affect" listed species or critical habitat, and/or have you reached agreement with the U.S. FWS or NMFS on measures to avoid, eliminate, or minimize adverse affects?

■ Do you agree to implement all measures upon which the determination was conditioned?

Use the guidance below to understand adverse effect determinations, and to answer these questions.

If you answered "Yes" to the both questions above, you have met ESA eligibility Criterion D. Go to Step 4.

If you answered "No" to either of the questions above you are not eligible for coverage by this permit. You must submit an individual application for your discharges to EPA. (See 40 CFR 122.33(b)(2))

If you are unable to certify eligibility under Criterion A, B, C, or E, you must assess whether your storm water discharges, allowable non-storm water discharges, and discharge-related activities are likely to adversely affect listed species or critical habitat. "Storm water discharge-related activities" include: activities which cause, contribute to, or result in point source storm water pollutant discharges; and measures to control storm water discharges and allowable non-storm water discharges including the siting, construction, operation of best management practices (BMPs) to control, reduce or prevent water pollution. Please be aware that no protection from incidental takings liability is provided under this criterion.

The scope of effects to consider will vary with each MS4. If you are having difficulty in determining whether your MS4 is likely to cause adverse effects to a listed species or critical habitat, you should contact the appropriate office of the FWS, NMFS, or Natural Heritage Program for assistance. In order to complete the determination of effects it may be necessary to follow the consultation procedures in section 7 of the ESA. (See Criterion B information above, and section 7 consultation web link in section F below).

Upon completion of your assessment, document the results of your effects determination. If adverse effects are not likely, you are eligible under criterion "D" - proceed to Step 4 of this Addendum. Your determination may be based on measures that you implement to avoid, eliminate, or minimize adverse affects.

If the determination is "May Adversely Affect." You must contact the FWS and/or NMFS to discuss your findings and measures you could implement to avoid, eliminate, or minimize adverse affects. If you and the Service(s) reach agreement on measures to avoid adverse effects, you are eligible under criteria "D". Any terms and/or conditions to protect listed species and critical habitat that you relied on in order to complete an adverse effects determination, must be incorporated into your Storm Water Management Program (required by the permit) and implemented in order to maintain permit eligibility.

If endangered species issues cannot be resolved. If you cannot reach agreement with the Services on measures to avoid, eliminate, or reduce adverse effects, and the likely adverse effects cannot be otherwise addressed through meeting the other criteria , then you are not eligible for coverage under this general permit. You must seek coverage under an individual permit.

Effects from storm water discharges, allowable non-storm water discharges, and discharge-related activities which could pose an adverse effect include:

- *Hydrological*. Storm water discharges may cause siltation, sedimentation or induce other changes in receiving waters such as temperature, salinity or pH. These effects will vary with the amount of storm water discharged and the volume and condition of the receiving water. Where a discharge constitutes a minute portion of the total volume of the receiving water, adverse hydrological effects are less likely.

- *Habitat*. Excavation, site development, grading, and other surface disturbance activities, including the installation or placement of storm water ponds or BMPs, may adversely affect listed species or their habitat. Storm water associated with MS4 operation may drain or inundate listed species habitat.

- *Toxicity*. In some cases, pollutants in storm water may have toxic effects on listed species.

Step 4. Submit Notice of Intent and Document Results of the Eligibility Determination.

Once the ESA eligibility requirements have been met, and you have determined NHPA eligibility (see Addendum B), you may submit the Notice of Intent (NOI). Signature and submittal of the NOI constitutes your certification, under penalty of law, of your eligibility for permit coverage.

You must include documentation of ESA eligibility in the storm water management program required for the MS4. Documentation required for the various ESA eligibility criteria are as follows:

Criterion A: A copy of the most current county species list pages for the county(ies) where your MS4 and discharges are located. You must also include a statement on how you determined that no listed species or critical habitat are in proximity to your MS4 or MS4 discharge locations.

Criterion B: A copy of the Service's biological opinion or concurrence on a finding of "unlikely to adversely effect" regarding the ESA Section 7 consultation.

Criterion C: A copy of the Service's letter transmitting the ESA Section 10 authorization.

Criterion D: Documentation on how you determined adverse effects on listed species and critical habitat were unlikely.

Criterion E: A copy of the documents originally used by the other operator of your MS4 (or area including your MS4) to satisfy the documentation requirement of Criteria A, B, C or D.

E. Duty To Implement Terms and Conditions Upon Which Eligibility Was Determined

You must comply with any terms and conditions imposed under the ESA eligibility requirements to ensure that your storm water discharges, allowable non-storm water discharges, and discharge-related activities do not pose adverse effects or jeopardy to listed species and/or critical habitat. You must incorporate such terms and conditions into your MS4's Storm Water Management Program as required by the permit. If the ESA eligibility requirements of Part I.E cannot be met, then you may not receive coverage under this permit, and must apply for an individual permit.

F. U.S. Fish and Wildlife Service Offices

National Websites For Endangered Species Information.
Endangered Species Home page: http://endangered.fws.gov/
ESA Section 7 Consultations: http://endangered.fws.gov/consultations/index.html

U.S. FWS Region 5
Division Chief, Endangered Species
U.S. Fish and Wildlife Service
ARD Ecological Services
300 Westgate Center Drive
Hadley, MA 01035-9589

Regional, State, Field and Project Offices
Project Leader, USFWS
Rhode Island Field Office
Shoreline Plaza, Rt 1A
P.O. Box 307
Charlestown, RI 02813

Project Leader, USFWS
Maine Field Office
1033 South Main Street
Old Town, ME 04468

Project Leader, USFWS
New England Field Office
22 Bridge Street, Unit #1
Concord, NH 03301-4986

Project Leader, USFWS
Vermont Field Office
11 Lincoln Street
Winston Prouty Federal Building
Essex Junction, VT 05452

G. National Marine Fisheries Services

Website: http://www.nmfs.gov

Regional Office
Protected Resource Program
National Marine Fisheries Service
Northeast Region
One Blackburn Drive
Gloucester, MA 01930

Field Offices
Milford Field Office
National Marine Fisheries Service
212 Rogers Avenue
Milford, CT 06460

Protected Species Branch
NMFS
Northeast Fisheries Science Center
166 Water Street
Woods Hole, MA 02543

H. Natural Heritage Network

The Natural Heritage Network comprises 75 independent heritage program organizations located in all 50 states, 10 Canadian provinces, and 12 countries and territories located throughout Latin America and the Caribbean. These programs gather, manage, and distribute detailed information about the biological diversity found within their jurisdictions. Developers, businesses, and public agencies use natural heritage information to comply with environmental laws and to improve the environmental sensitivity of economic development projects. Local governments use the information to aid in land use planning.

The Natural Heritage Network is overseen by NatureServe, the Network's parent organization, and is accessable on-line at: http://www.natureserve.org/nhp/us_programs.htm, which provides website and other access to a large number of specific biodiversity centers.

Connecticut Natural Diversity Database
Natural Resources Center
Department of Environmental Protection

79 Elm Street, Store Level
Hartford, CT 06106

Maine Natural Areas Program
Department of Conservation
93 State House Station
Augusta, ME 04333
http://www.state.me.us/doc/mnap/home.htm

Massachusetts Natural Heritage & Endangered Species Program
Division of Fisheries and Wildlife
Route 135
Westborough, MA 01581
508/792-7270

New Hampshire Natural Heritage Inventory
Department of Resources & Economic Development
172 Pembroke Street, P.O. Box 30370
Concord, NH 03302
603/271-3623

Rhode Island Natural Heritage Program
Department of Environmental Management
Division of Planning & Development
83 Park Street
Providence, RI 02903
401/277-2776

Vermont Non-game & Natural Heritage Program
Vermont Fish & Wildlife Department
103 South Main Street, 10 South
Waterbury, VT 05671-0501
802/241-3700

Addendum B
Historic Properties Guidance

Applicants must determine whether their MS4's storm water discharges, allowable non-storm water discharges, or construction of best management practices (BMPs) to control such discharges, has potential to affect a property that is either listed or eligible for listing on the National Register of Historic Places.

For existing dischargers who do not need to construct BMPs for permit coverage, a simple visual inspection may be sufficient to determine whether historic properties are affected. However, for MS4s which are new storm water dischargers and for existing MS4s which are planning to construct BMPs for permit eligibility, applicants should conduct further inquiry to determine whether historic properties may be affected by the storm water discharge or BMPs to control the discharge. In such instances, applicants should first determine whether there are any historic properties or places listed on the National Register or if any are eligible for listing on the register (e.g., they are "eligible for listing").

EPA suggests that applicants first access the "National Register of Historic Places" information listed on the National Park Service's web page: http://www.cr.nps.gov/nr. The addresses for State Historic Preservation Officers are listed in Part II of this addendum. Applicants may also contact city, county or other local historical societies for assistance, especially when determining if a place or property is eligible for listing on the register.

The following three scenarios describe how applicants can meet the permit eligibility criteria for protection of historic properties under this permit:

(1) If historic properties are not identified in the path of an MS4's storm water and allowable non-storm water discharges or where construction activities are planned to install BMPs to control such discharges (e.g., diversion channels or retention ponds), then the applicant has met the NHPA eligibility criteria of this permit.

(2) If historic properties are identified but it is determined that they will not be affected by the discharges or construction of BMPs to control the discharge, the applicant has met the NHPA eligibility criteria of this permit.

(3) If historic properties are identified in the path of an MS4's storm water and/or allowable non-storm water discharges or where construction activities are planned to install BMPs to control such discharges, and it is determined that there is the potential to adversely affect the property, the applicant can still meet the NHPA eligibility criteria under of this permit, if he/she obtains and complies with a written agreement with the appropriate State or Tribal Historic Preservation Officer which outlines measures the applicant will follow to mitigate or prevent those adverse effects. The contents of such a written agreement must be included in the MS4's Storm Water Management Program.
In situations where an agreement cannot be reached between an applicant and the State Historic Preservation Officer, applicants should contact the Advisory Council on Historic Preservation listed in Part III of this Addendum for assistance.

The term “adverse effects” includes but is not limited to damage, deterioration, alteration or destruction of the historic property or place. EPA encourages applicants to contact the appropriate State or Tribal Historic Preservation Officer as soon as possible in the event of a potential adverse effect to a historic property. Applicants are reminded that they must comply with applicable State, Tribal and local laws concerning the protection of historic properties and places.

A. Internet Information on the National Register of Historic Places

The National Register of Historic Places is the Nation's official list of cultural resources worthy of preservation. Authorized under the National Historic Preservation Act of 1966, the National Register is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect our historic and archeological resources. Properties listed in the Register include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archeology, engineering, and culture. The National Register is administered by the National Park Service, which is part of the U.S. Department of the Interior.

An electronic listing of the ``National Register of Historic Places,'' as maintained by the National Park Service, can be accessed on the Internet at: http://www.cr.nps.gov/nr

B. State Historic Preservation Officers (SHPO)

Connecticut Historical Commission
59 South Prospect Street
Hartford, CT 06106
860/566-3005

Maine Historic Preservation Commission
55 Capital Street, Station 65
Augusta, ME 04333
207/287-2132

Massachusetts Historical Commission
220 Morrissey Boulevard

Boston, MA 02125
617/727-8470
TTD: 1-800-392-6090

New Hampshire Division of Historic Resources
P.O. Box 2043
Concord, NH 03302-2043
603/271-6435
TDD: 1-800-735-2964
Rhode Island Historic Preservation & Heritage Commission
Old State House
150 Benefit Street
Providence, RI 02903
401/222-2678

Vermont Division for Historic Preservation
National Life Building, Drawer 20
Montpelier, VT 05620-0501
802/828-3211

C. Advisory Council on Historic Preservation

The Advisory Council on Historic Preservation (ACHP) is an independent Federal agency that promotes the preservation, enhancement, and productive use of our Nation's historic resources, and advises the President and Congress on national historic preservation policy.

The goal of the National Historic Preservation Act (NHPA), which established ACHP in 1966, is to have Federal agencies act as responsible stewards of our Nation's resources when their actions affect historic properties. ACHP is the only entity with the legal responsibility to encourage Federal agencies to factor historic preservation into Federal project requirements.

As directed by NHPA, ACHP serves as the primary Federal policy advisor to the President and Congress; recommends administrative and legislative improvements for protecting our Nation's heritage; advocates full consideration of historic values in Federal decision making; and reviews Federal programs and policies to promote effectiveness, coordination, and consistency with national preservation policies.

Main Office

Advisory Council on Historic Preservation
Old Post Office Building
1100 Pennsylvania Avenue, NW, Suite 809
Washington, DC 20004
Phone: (202) 606-8503
Fax: (202) 606-8647/8672
E-mail: achp@achp.gov
Internet: http://www.achp.gov/

2.0 Town Characteristics

Characteristics of the Town of Adams provide important base line information needed to develop a Stormwater Management Plan that is tailored to the specific needs of the community. The Town characteristics are presented below.

2.1 Community Information and Demographics

The Town of Adams is located in northwestern Massachusetts, bordered by the City of North Adams to the north, Cheshire to the south, Savoy and Florida on the east, and Williamstown and New Ashford to the west. It is situated 15 miles northeast of Pittsfield, 60 miles east of Albany, 138 miles west of Boston and 158 miles north of New York City.

The Town is located in the valley of the South Branch of the Hoosic River. Adams has Mount Greylock on its western edge and the Hoosac Range on its eastern side. The Hoosic River flows northward through the center of town. State Rt. 8 is the major transportation corridor leading south to Cheshire, a rural-residential community and north to North Adams. Route 8 parallels the Hoosic River. Both the river and the road are the main development corridors in town.

The Town's economy was historically driven by industry. As with many towns in Massachusetts, Adams has close ties with the river that runs through it. At the onset of the industrial revolution, Adams drew upon the power and resources of the Hoosic River to grow and thrive as a mill town. The power of the river was harnessed to allow the early development of industry. The industrial economy was initially driven by textile and paper mills and mining operations. The building of the railroad further accelerated the Town's expansion with the population peaking in 1925. The connection with the Hoosic River was double edged – it was the resource that powered the mills, but its uncontained power also threatened the town itself. Between 1901 and 1938, four major floods destroyed much of the Town and the businesses that relied on the river. To reduce the possibility of the type of devastation experienced by the 1938 flood, in the 1950s the Army Corps of Engineers built the concrete flood control channel that now exists along the downtown stretches of the Hoosic River.

Economic recovery from this confluence of circumstance has been slow and only fractional. The Town's manufacturing base has declined dramatically over the last several decades, as has been typical of the entire Berkshire region. Though a significant amount of manufacturing still occurs in Adams, the Town is transitioning to a service based economy and is trying to capture a portion of the Berkshire tourism and recreation market. The Town is home to an abundance of significant natural, historical and recreational assets, such as Mount Greylock State Reservation, the Hoosic River, numerous historic sites and buildings, and the Ashuwillticook Rail Trail which currently extends southward to Lanesborough from downtown Adams with plans currently underway to extend it northward to North Adams, and eventually Williamstown. An aggressive revitalization process has also been underway in the downtown area. The Town has concentrated on façade and signage repairs through implementation of the Downtown Façade & Signage Improvement Program, with numerous businesses and building owners participating. Rehabilitation of the housing stock in Adams has been a priority as well through the Town's on-going Housing Rehabilitation Program. Adams is also implementing a complete renovation of Renfrew Park, an important regional recreational resource near the downtown area.

The following community information is provided to gain a general sense of the size, community and budget of Adams. This information is useful for the development of a Phase II Plan.

- Total Area = 20.4 square miles *(source: www.city-data.com)*
- 2000 Population = 8,809 *(source: U.S. Census Bureau, Census 2000)*
- Registered Voters = 5,766 *(source: Town Clerk, 2004)*
- 2001 School Enrollment = **1,229 (source: Adams-Cheshire Regional School System)*
- County = Berkshire
- Miles of Roads = 57 miles *(DPW, 2004)*
- Total Stormwater Outfalls = *284 (source: Town of Adams GIS)*
- Miles of Drain Pipes = *~30.7 (source: Town of Adams GIS)*
- Total Catch Basins and Drainage Manholes = *1,927(source: Town of Adams GIS)*
- 1999 Per Capita Income = $18,572 *(source: U.S. Census Bureau, Census 2000)*
- 1999 Median Family Income = $40,559 *(source: U.S. Census Bureau, Census 2000)*
- FY05 Residential Tax Rate = $17.56
  Commercial Tax Rate = $21.58 *(source: Assessors Office)*
- Town Operating Budget = $10,539,981 *(source: Town of Adams)*

* Includes number of students pre-K through Grade 12 in the Adams-Cheshire School District.

Town demographics indicate how public involvement and education about stormwater management and Phase II compliance may best be approached. For instance, the majority of Adams households are owner occupied. Therefore, fliers inserted in utility bills may reach the majority of the population. However, there is still a significant portion of households (40 %) that are renter occupied. An alternative means of reaching this segment of the community will be needed. Based on Census information, fliers and other outreach materials could be printed in English only as this is the predominant language spoken in Adams' households.

Table 2-1 Town of Adams Demographic Information		
2000 Population (U.S. Census Bureau, 2000 Census)		
Age	**Persons**	**Percent of total**
0-14 years	1,610	18.2%
15-24 years	950	10.7%
25-54 years	3,577	40.6%
55-64 years	872	9.9%
65+ years	1,800	20.4%
Total Population	**8,809**	
2000 Housing Tenure (U.S. Census Bureau, 2000 Census)		
	Units	**Percent of total**
Owner-Occupied	2,414	55.3%
Renter Occupied	1,578	36.2%
Vacant	360	8.3%
Seasonal	10	.2%
Total Units	**4,362**	
Race (U.S. Census Bureau, 2000 Census)		
White	8,635	98.0%
Black or African American	32	0.4%
Asian and Pacific Islands	25	0.3%
American Indian	7	>.1%
Other Race	24	0.3%
Persons of two or more races	86	1.0%

2.2 Land Use and Zoning

Zoning

Adams has a mix of zoning districts and regulations, especially along the Route 8 corridor and in the downtown area. Zoning districts are shown on Table 2-2. The Town has a dense "downtown core" mixed-use area as well as suburban areas and rural landscapes. There are four residential districts in Adams (R-1, R-2, R-3, and R-4). Much of the built-up neighborhoods generally around the downtown area are in the R-3 and R-4 zones. These districts have a minimum 12,000 and 10,000 square foot lot area dimensional requirement, respectively, with 90 and 70 feet of frontage required, respectively. Lots in the R-2, R-3, or R-4 zoning districts that are not connected to public sewer must conform to larger lot dimensions (1 acre) and setbacks.

Adams has an Open Space Zoning district that is mostly occupied by state parks. The Zoning Bylaw allows for Cluster Development for parcels in excess of five times the minimum lot size in several residential zones. To be approved under this provision, development must be superior to conventional development in preserving open space and utilizing natural features of the land. Cluster development allows for a density bonus of 20% over the number of dwelling units permitted under standard residential development. The cluster provisions have not been widely used. Planned Development is allowed, with the provision that not less than 20% of the land be preserved for recreation or open space. Adams also has a Planned Unit Resort Development provision, which outlines very specific site development guidelines.

Table 2–2. Adams Zoning Districts	
Residence Districts	**Business Districts**
R-1: Rural Residential	B-1: General Business
R-2: Low Density Residential	B-2: Extensive Business
R-3: Medium Density Residential	B-3: Forest recreation
R-4: High Density Residential	
Industrial Districts	**Open Space District**
I: Industrial	OS: Open Space
IP: Industrial Park	

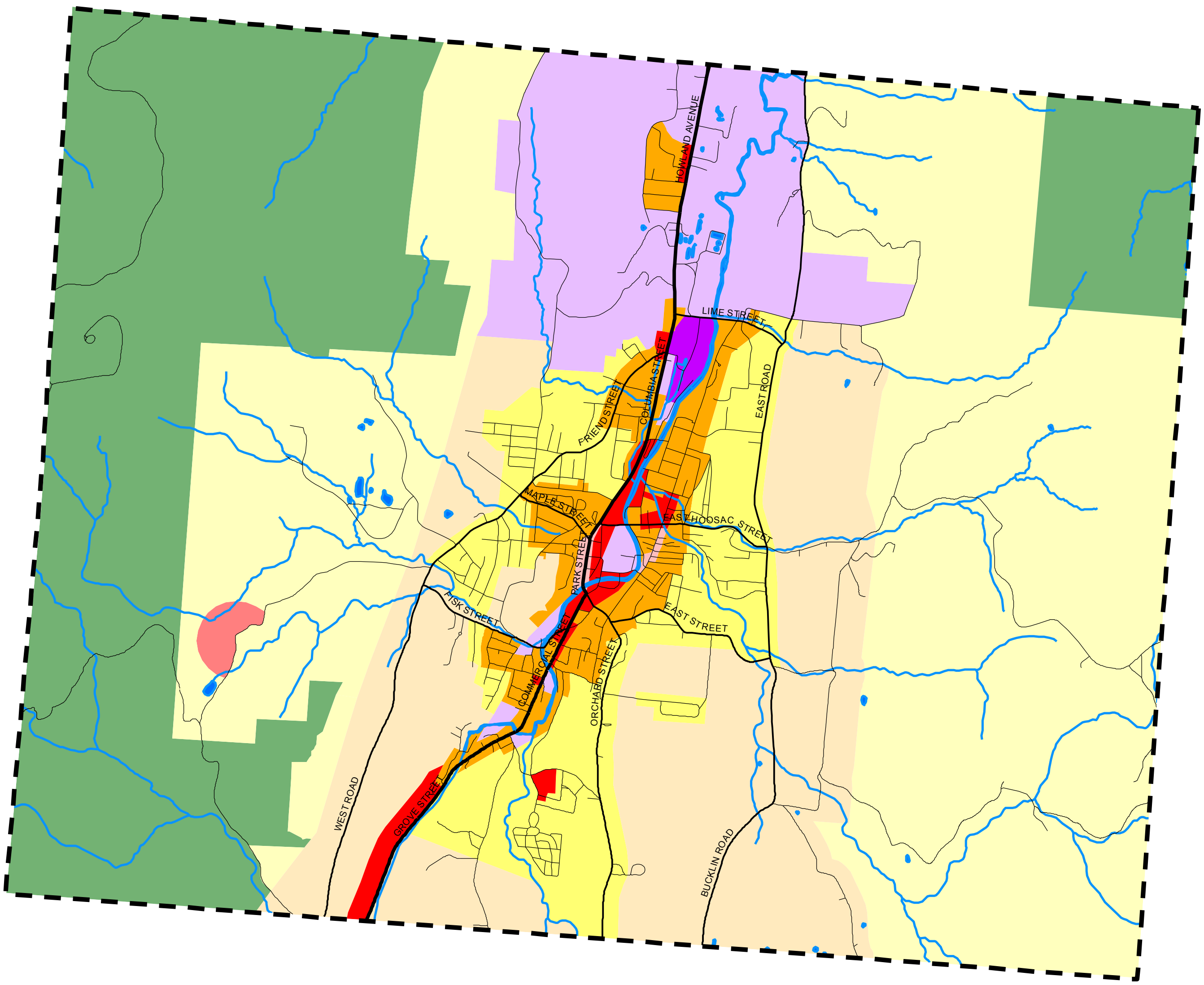
(Source: Town of Adams Zoning Bylaw)

The boundaries of these districts are shown on **Figure 2 – 1.** Table 2-3 shows the Intensity of Use Schedule in the Zoning Bylaw that provides additional details regarding development standards under each zoning district.

Table 2–3. Intensity of Use Schedule—For Principal Use

District	**Minimum Lot Area** (sq. ft.)	**Minimum Open Space** (%)	**Maximum Building Height** (ft.)
R-1	43,560	70	30
R-2	21,780	70	30
R-3	12,000	50	30
R-4	10,000	50	30
B-1	0	0	40
B-2	10,000	25	30
B-3	10,000	20	30
IP	43,560	25	40
I	20,000	25	40
OS	2 Acres	85	15

(Source: Town of Adams Zoning Bylaw)



Zoning

- B-1
- B-2
- B-3
- I
- IP
- OS
- R-1
- R-2
- R-3
- R-4

N
W E
S

0 2,500 5,000 7,500 Feet

Data Sources: Town of Adams, MassGIS

Figure 2-1

Zoning

Adams, Massachusetts

Current Land Use

Table 2-4 shows acreage by land use category based on an interpretation of 1999 aerial photographs. The pattern of land use within Town is depicted on Figure 2-2. Adams exhibits a compact development pattern with a densely developed downtown area and a mix of commercial and industrial uses, surrounded by a core of high-density residential development. Less dense residential development can be found in the more outlying areas. Topography plays a dominant feature in the land use pattern of the Town, with the east and west parts of Adams defined by the Hoosac Range and Mount Greylock, respectively. In addition to presenting natural barriers to development, much of the land in these outlying areas is protected open space.

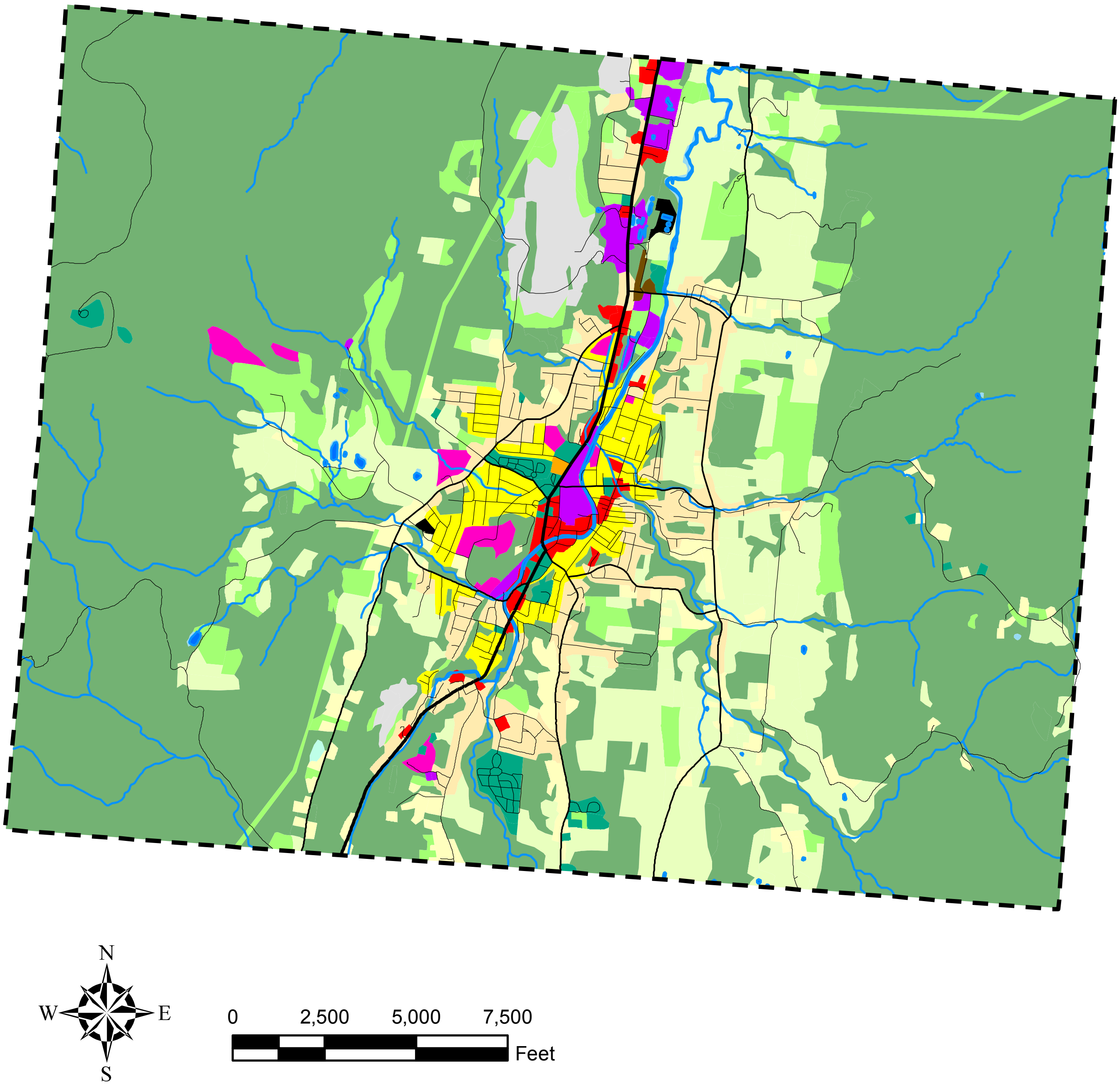
Table 2-4. Land Use

Land Use Category	Acres
Cropland	3,815.70
Forest	9,758.51
Wetland	3.56
Mining	229.40
Open Land	777.19
Participation Recreation	89.53
Multi-Family Residential	4.29
Residential less then 1/4 acre lots	341.72
Residential between 1/4 and 1/2 acre lots	682.63
Residential greater then 1/2 acre lots	386.00
Commercial	109.56
Industrial	133.71
Urban Open	148.50
Transportation	8.81
Waste Disposal	13.37
Water	35.37
Total	14,663.68

(Source: MassGIS)

Buildable Land Analysis

An assessment of buildable land, also commonly referred to as a buildout analysis, was conducted to predict where future development might occur in Adams. Such an analysis is an important tool for the Town to allow proactive planning to accommodate and better manage that development. The buildout analysis was conducted at the parcel level. Parcel data was combined and compared with land use data. The area of existing developed land and the area of protected open space were removed from the parcels. Remaining areas were then examined to determine if individual parcels were large enough to be subdivided into a



- Crop Land
- Forest
- Wetland
- Mining
- Open Land
- Participation Recreation
- Multi-Family Residential
- Residential less then 1/4 acre lots
- Residential between 1/4 and 1/2 acre lots
- Residential greater then 1/2 acre lots
- Commercial
- Industrial
- Urban Open
- Transportation
- Waste Disposal
- Water
- Stream, Brook
- Lake, Pond

Data Sources: MassGIS

Figure 2-2

Land Use

Adams, Massachusetts

second parcel. If a parcel was not large enough to be subdivided, it was removed from consideration for future development. Parcels suitable to be subdivided were then analyzed for environmental constraints. These remaining parcels had the area of wetlands, river protection areas, floodplains, and slopes greater than 25% removed from consideration for future development. The parcels that were left were reviewed again to ensure that there were no small polygons that were not buildable. The remaining area was considered buildable for future development. Table 2–5 shows the potential developable area by zoning district.

Table 2–5. Buildable Land by Zoning District

Zone	Total Acreage	Buildable Acreage	% Buildable
B-1	10.46	0.12	1.15%
B-2	170.14	11.27	6.63%
B-3	244.94	29.66	12.11%
I	1,284.17	685.77	53.40%
IP	11.36	5.98	52.64%
OS	313.69	6.83	2.18%
R-1	5,307.72	2,877.69	54.22%
R-2	4,041.66	1,544.28	38.21%
R-3	1,701.64	287.01	16.87%
R-4	63.69	23.26	36.51%
Total	13,149.45	5,471.87	41.61%

Buildable Land and Stormwater Management

Table 2-6 contains a brief analysis of the relationship between the remaining buildable land in Adams and the existing stormwater infrastructure. This analysis will allow the Town to better plan for future development including planning for infrastructure expansion or other non-structural Best Management Practices, such as enhanced regulations.

Table 2–6. Buildable Land and Stormwater Management

Zone	Consideration for Stormwater Management
B-1	Only .12 acres on B-1 are buildable for new development. There are no future stormwater considerations.
B-2	The remaining buildable land in the B-2 zone is off Grove Street and has full access to an existing stormwater infrastructure.
B-3	The B-3 buildable area is located in the area known as Greylock Glen. It currently does not have a stormwater system. A stormwater collection system will need to be part of the future development plan for the site.
I	Most of the Industrial Zoning is comprised by Specialty Minerals, Inc. property. Most of the buildable land would have access to stormwater infrastructure along Howland Avenue. There are portions of the Industrial Zone off Line Street and

Table 2–6. Buildable Land and Stormwater Management	
Zone	Consideration for Stormwater Management
	East Road. This smaller area would need to have the system upgraded.
IP	The IP zone has full access to the stormwater infrastructure.
OS	The small portion of OS that is buildable is off West Road and has no access to the stormwater infrastructure.
R-1	Most of the remaining buildable land in the R-1 zone does not have access to the stormwater infrastructure. Land off of East Hoosac Street has some access.
R-2	The remaining buildable land in the R-2 zone has partial access to the stormwater infrastructure. The portions that are closer to the downtown and are abutting a street tend to have the needed infrastructure while those areas that are farther away from the downtown core do not.
R-3	The remaining buildable land in the R-3 zone has good access to the stormwater infrastructure. Most of the buildable land is in the southern portion of Town close to roads that already have developed infrastructure.
R-4	The remaining buildable land in the R-4 zone has good access to existing stormwater infrastructure. The buildable land is scattered around the downtown area and in the northern section of Town.

Potential Growth Areas

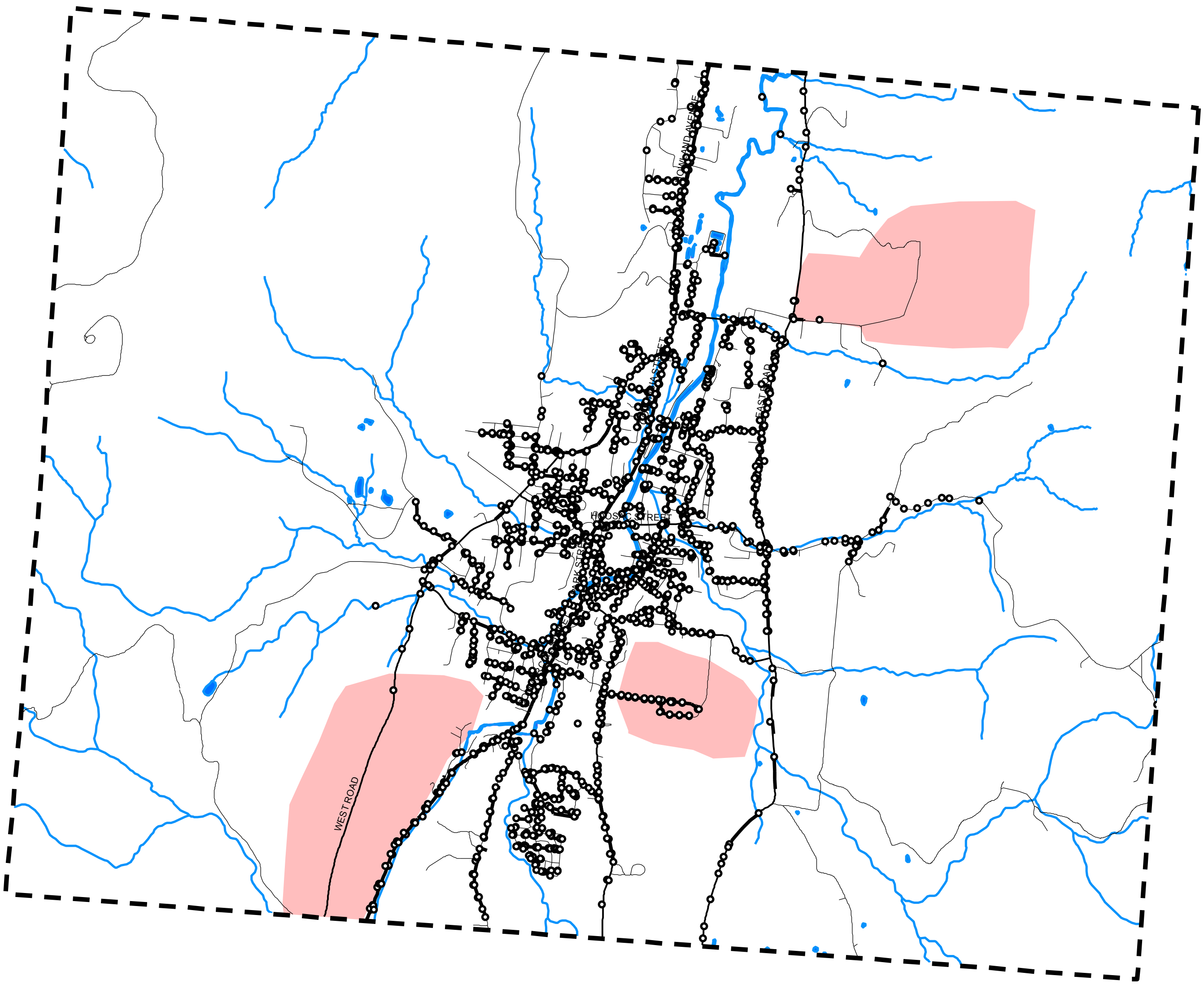
Several locations in Adams have been identified that could accommodate future growth. They are:

- Northern Area – off East Road and Spring Road
- Southern Area 1 – East Orchard Terrace
- Southern Area 2 – off West Road

These areas are shown on Figure 2-3.

A brief description of each area and implications for stormwater management is contained below.

- Northern Area – off East Road and Spring Road
  The storm drain system in this area consists of a few catch basins that drain the water across East Road and Spring Road. The area is generally undeveloped consisting mostly of forest and farmland where stormwater can infiltrate into the ground. The terrain slopes towards East Road. If developed, the stormwater system would have to be upgraded to handle the stormwater flow that would be flowing off the developed land.



Catch Basin
Storm Drain
GrowthAreas

Data Sources: Town of Adams, MassGIS

N
W E
S

Figure 2-3

Potential Growth Areas

Adams, Massachusetts

0 2,500 5,000 7,500
Feet

- Southern Area 1 – East Orchard Terrace
  East Orchard Terrace has an existing storm drain system established that flows down towards Orchard Street. Future development of this area would most likely tie into this existing system. Portions of East Orchard Terrace are already developed, while the remaining area is comprised of forest and farmland. The terrain generally slopes towards the northwest. Stormwater not captured on East Orchard Terrace can flow northwest towards existing systems on Orchard Street and East Street.

- Southern Area 2 – Off West Road
  There is no stormwater collection system on West Road. This area is characterized by several small hills and the stormwater flows in several directions throughout the area. The area is mostly wooded; however, there are a number of residences already on West Road. Stormwater infrastructure would need to be built to accommodate future development.

2.3 Water Bodies, Classification, Impairments and Existing Water Quality

The goal of the Phase II program is to improve the quality of receiving waters (waters that receive stormwater discharges) by preventing and/or minimizing pollutant loadings from stormwater discharges.

The federal Clean Water Act requires each state to review, establish, and revise water quality standards. Water quality standards must designate a use for a given body of water, as well as appropriate criteria for those uses. Criteria include such parameters as dissolved oxygen, temperature, pH, bacteria, color and turbidity, oil and grease, and taste and color. In Massachusetts, inland waters are designated as belonging to Class A (public water supply), Class B (habitat for aquatic life and suitable for primary contact recreation), or Class C (habitat for aquatic life and suitable for secondary contact recreation.) Additionally, states may designate sub-categories of a use with appropriate criteria. In Massachusetts, the subcategory “cold-water” is used to define waters where “dissolved oxygen and temperature criteria for cold water fisheries apply (314 C.M.R. 4.05).” Cold-water fisheries in Massachusetts are defined as, “waters in which the maximum mean monthly temperature generally does not exceed 68 degrees F (20 degrees C) and, when other ecological factors are favorable (such as habitat), are capable of sustaining a year-round population of cold water stenothermal aquatic life such as trout (314 C.M.R. 4.02).” The state is also required to develop and adopt an antidegradation policy to ensure that existing levels of water quality and use are maintained.

The Massachusetts Water Quality Standards can be found in the Code of Massachusetts Regulations: 314 CMR. 4.00. Waterbodies not listed in the tables in 314 CMR 4.00 are presumed to have specified designations. Stream segments identified below are presumed to be designated Class B High Quality Waters.

Section 303(d) of the Clean Water Act and the implementing regulations at 40 CFR 130.7 require states to identify those waterbodies that are not expected to meet surface water quality standards after the implementation of technology-based controls and to prioritize and schedule them for the development of a total maximum daily load (TMDL). A TMDL is the greatest amount of a pollutant that a waterbody can accept and still meet water quality standards for protecting public health and maintaining the designated beneficial uses of those waters for drinking, swimming, recreation, and fishing. A TMDL is implemented by specifying how much of that pollutant can come from point, nonpoint, and natural sources.

The entire portion of the Hoosic River in Adams is on the Massachusetts Year 2004 Integrated List of Waters as a Category 5 Water, "Waters requiring a TMDL." The listed cause of the pollution is pathogens. Historical studies indicate that nonpoint source pollution from stormwater is currently the greatest contributor to the degradation of water quality in the Hoosic River and its tributaries. The required TMDL is supposed to be prepared for the Hoosic River prior to 2012.

This portion of the Hoosic River is also one of the few remaining self-sustaining trout habitats in Massachusetts making it an important natural habitat for preservation. In the *Adams Downtown Development Plan* (2003) restoration of the Hoosic River was identified as key to developing the economic vitality, future growth, and the cultural based tourism potential of the Town.

The following major stream networks flow into the Hoosic River in Adams[1] or are important tributaries.

Dry Brook	*Tophet Brook*	*Reed Brook*
Miller Brook	*Pecks Brook*	*Hoxie Brook*
Southwick Brook	*Patton Brook*	*Unnamed Brook*
Cheesbro Brook		

[1] The headwaters of Bassett Brook, Class A, are located in Adams and flows into the Hoosic River in Cheshire.

Segment Descriptions

Hoosic River (segment MA11-03)[2] (Class B, Cold Water Fishery, High Quality Water[3]) (Category 5[4])(Pathogens)[5] This segment, the first of the mainstream Hoosic River (locally known as the *South Branch Hoosic River),* begins at the outlet of Cheshire Reservoir in Cheshire and ends at the Adams WWTP discharge in northern Adams. Nine tributaries drain to this segment of the Hoosic River including Dry, Pecks, Hoxie, Tophet, and Southwick brooks in Adams.

Hoosic Rover (segment MA11-04) (Class B, Warm Water Fishery) (Category 5)(Pathogens) This segment, the second of the mainstream Hoosic River, encompasses the remainder of the river between Adams WWTP discharge and the confluence with the North Branch Hoosic River. Cheesboro Brook drains to this segment of the Hoosic River in Adams. This segment of the Hoosic River flows in a northerly direction through the floodplain between the Hoosic and Taconic ranges. At the upstream segment of this segment, the Hoosic River receives the effluent from the Adams WWTP. A little further north, the Specialty Minerals, Inc. facility discharges quarry water and stormwater runoff into the Hoosic River.

Dry Brook (segment MA11-13) (Class B) (Category 3) Dry Brook, a Class B water, originates near the Windsor/Savoy line west of Jackson Road in Windsor. The brook flows southwest through a small wetland and continues to flow west along Cheshire Road, Windsor and Sand Mill Road, in Cheshire. The brook continues in a northwesterly direction, past the Hoosac Valley High School in Cheshire to its confluence with the Hoosic River just upstream of the USGS gage (01331500) in Adams.

Tophet Brook (MA11-19) (Class B High Quality Water) (Category 3) Tophet Brook originates in the Hoosac Range along the Savoy/Adams municipal boundary. The brook flows due south and crosses under East Hoosac Street/Adams Road and then turns southwest. Here the brook flows down a steep ravine and receives the flow from Patton Brook. Tophet Brook turns northwest towards its confluence with the Hoosic River in Adams. Two other tributaries, Reed and Miller Brooks also join Tophet Brook in its lower reach.

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[2] Refers to the Massachusetts Department of Environmental Protection waterbody identification number.

[3] Refers to The Massachusetts Water Quality Standards, Code of Massachusetts Regulations: 314 CMR. 4.00

[4] Refers to Massachusetts Year 2004 Integrated List of Waters. Category 1, “Waters attaining all uses;” Category 2, “Attaining some uses; other uses not assessed;” Category 3, No uses assessed;” Category 4, “Impairment not caused by a pollutant;” Category 5, Waters requiring a TMDL”

[5] Refers to cause of listing on the Massachusetts Year 2004 Integrated List of Waters.

Miller Brook: (Class B High Quality Water) The stream begins at a wooded spring in a wet areas in the Hoosac Range on the southwest side of East Hoosac Street. Flow is minimal in the small channel as it flows through a thickly forested area. A small tributary joins from the northeast. After the brook passes under East Hoosac Street, the riverbed becomes wider. At the East Street Bridge, the river is channelized. Below the bridge, the stream returns to a more natural step-pool state, and once again becomes forested with deciduous trees along its bank. Just above Richmond Street, the stream becomes channelized by the flood control chute. Miller Brook soon flows into Tophet Brook.

Reed Brook: (Class B High Quality Water) Reed Brook begins in a forested area in the Hoosac Range near the Savoy/Adams town line. It crosses under Walling Road and East Road before its confluence with Tophet Brook immediately northwest of the intersection with East Road and East Street.

Patton Brook (Class B High Quality Water) Patton Brook begins in a forested area in the Hoosac Range in Savoy and is largely in pristine condition until its confluence with Tophet Brook.

Pecks Brook (MA11-18) (Class B High Quality Water) (Category 2) (Aquatic Life, Aesthetics) Pecks Brook, a Class B High Quality Water, originates on the eastern slope of Saddle Ball Mountain in the Mount Greylock State Reservation in Adams. The brook flows southeast down a steep ravine, then turns northeast, and parallels West Mountain Road. It then flows through Dean's Pond (a small old mill pond), crosses under West Road, and joins with the Hoosic River in downtown Adams.

Hoxie Brook (Class B High Quality Water) Hoxie Brook begins on the forested slopes of Mount Greylock and runs east, parallel to Thiel Road, and crosses Friend Street, where it enters a residential section of Adams. Through much of the downtown, it is channelized and underground, emerging briefly near the new Adams Visitors Center before it runs beneath a parking lot and re-emerges near its confluence with the Hoosic River. Between Hoosac Street and the convergence of Hoxie Brook and the Hoosic River, the river flows through a broad concrete culvert topped by pavement. Abutting the Hoosic River flood chutes, Hoxie Brook emerges in a naturally vegetated stream bank.

Southwick Brook (Class B High Quality Water) Southwick Brook begins as a small stream, flowing out of the Savoy State Forest in the Hoosac Range. In its upper reaches the stream flows through a wooded landscape in a deep, scenic gully, trickling over and through large boulders. Southwick Brook crosses under East Road. Downstream, the brook changes in character, and is channelized in many places with concrete and stone riprap. The stream parallels Lime Street. Along Lime Street, many small bridges cross the stream, primarily to permit driveway access to houses on the north side of the brook. Erosion and efforts at bank stabilization are evident in this section immediately upstream of the confluence with the Hoosic River, just north of Lime Street.

Unnamed Brook (Class B High Quality Water) Unnamed Brook begins as an intermittent stream above the Specialty Minerals, Inc. property north of Adams. The upper section is primarily pools and riffles. It crosses under Notch Road through a culvert by a gate. A dam was observed below the culvert, followed by a series of small cascades. Just west of Friend Street the river runs through a concrete channel beneath a garage. Below this it is channelized in a ditch, and makes a sharp bend north at Pine Street. It disappears into a pipe underneath Howland Avenue. It then runs in a ditch beside Route 8 North and disappears in a pipe before Lime Street, making it impossible to determine its confluence with the Hoosic River.

Cheesbro Brook (Class B High Quality Water) Cheesbro Brook originates in the lower foothills of the Hoosac Range in the northwest corner of Town. It crosses under East Road before its confluence with the Hoosic River.

Existing Water Quality

A general summary of existing water quality in Adams is provided below, followed by more specific information based on recent and historical studies:

1. Water quality is best in the upper reaches of tributaries to the Hoosic River, originating in the forested hillsides of Mount Greylock and the Hoosac Range.
2. Based on historical stream monitoring data, the Hoosic River and contributing waterways appear to be relatively clean during dry weather conditions.
3. Water quality during non-storm conditions is slightly impacted as it enters the Hoosic River in downtown Adams.
4. Overall, water quality for the Hoosic River has improved greatly in the past 40 years, but further improvement is hindered due to stormwater impacts associated with impervious surfaces, increased runoff volumes and stormwater pollution.
5. Water quality is greatly affected during storm events due to elevated pollutants (namely bacteria) present in stormwater, as shown by the results of the stormwater sampling program.

Historical monitoring and water quality assessment efforts by MA DEP, the Berkshire Regional Planning Commission (BRPC) and the Hoosic River Watershed Association (HooRWA) highlight nonpoint sources of pollution as the largest contributors of pollutants to the Hoosic River and its tributaries. These studies emphasize the need to evaluate the characteristics and impacts of urban runoff. Based on historical reports and data from the 2004 stormwater sampling and illicit discharge investigations undertaken for this Plan, a summary list of water quality characteristics is provided below:

- The Hoosic River in Adams is impaired due to pathogens and the leading cause of pollution is bacteria from the storm drain system during rain or runoff events.
- Stormwater discharges result in significant bacteria loadings to the Hoosic River and its tributaries. These loadings are attributable to nonpoint sources of bacteria (e.g., pet waste, wildlife), potential sanitary sewer cross-connections, and damaged/failed sewer areas.
- As an example of the change in water quality conditions during a storm event, an *E. coli* concentration of 120,300 colonies/100 ml was measured at Hoxie Brook (downstream of Depot Street) during the September 17, 2004 stormwater sampling event. The highest recorded *E. coli* concentration at this location during previous dry weather in-stream assessments was 320 colonies/100 ml in August 2002 (HooRWA, 2003).
- Illicit discharges from sanitary sewer sources are present along the Hoosic River, as identified during outfall field screening undertaken for this Plan.

Historical water quality sampling data (1997-2002) and a map of sample locations are provided in **Appendix 2A**. A brief summary of the historical water quality reports is provided below:

- The DEP and its former Division of Water Pollution Control, Technical Services Branch conducted water quality surveys for the Hoosic River Basin in 1965, 1973, 1977, 1978, 1982, 1985, 1986, and 1991. The surveys showed steady progress in the improvement of water quality, particularly during the period of 1973 to 1985, which is largely attributed to the implementation of basin-wide wastewater treatment facilities. Water quality in the basin from 1986 to 1991 showed a slight decrease due to nutrient loadings and bacteria inputs, the sources of which were attributed to runoff from highly developed town centers along the river, such as Adams.

- DEP conducted a water quality assessment of the Hudson River Basin in 1997 to provide an assessment of aquatic life support, aesthetics, and to make recommendations for future water quality monitoring and assessments. The assessment included the Hoosic River Watershed that drains into the Hudson River in New York. The 1997 report outlined several recommendations for two sections of the Hoosic River in Adams and four Hoosic River sub-basins: Bassett Brook, Dry Brook, Pecks Brook, and Tophet

Brook. The majority of these sub-basins lie within Adams; however, portions lie within the towns of New Ashford, Cheshire, and Savoy. The recommendations for these river segments and sub-basins point to few point sources of pollution and focus heavily on nonpoint sources and the need for additional water quality sampling for the Hoosic River and its tributaries. The report also expresses the need for further land use evaluation.

- In 1998, the Berkshire Regional Planning Commission (BRPC) conducted an assessment of land use and nonpoint source pollution in the Hoosic River Watershed and determined the sources and types of pollutants that may be contributing to the Hoosic River due to current land activities in the watershed. This information would later be used in BRPC's "Stormwater Assessment in the Hoosic and Housatonic Watersheds" that was conducted from 1999 to 2000. The 2000 Stormwater Assessment in the Hoosic River Watershed did not include water quality sampling; however, it provided a detailed qualitative analysis of stormwater issues in the watershed so that appropriate BMPs could be chosen and implemented. The 2000 Stormwater Assessment also included an analysis of the relationship between land use/imperviousness and stormwater problems. The 2000 report concluded that there are significant water quality problems attributed to urban stormwater.

- In 2001, the Hoosic River Watershed Association (HooRWA) conducted bacteria sampling for two locations along the Hoosic River in Adams. Samples were collected on five separate days upstream of the Lime Street Bridge (monitoring location HR23.72) and upstream of the Route 8 Bridge opposite of the Old Stone Mill (monitoring location HR27.81). The sampling events consisted of four dry weather events in May, July, August, and September and one wet weather event in June. Analytical results showed that bacteria levels exceeded the DEP primary recreation threshold of 400 colonies/100 mL for both locations in June and HR27.81 in July. It is important to note that the July sample was a dry weather sample. The sampling study concluded that there is a need for more information on water quality during and immediately after storm events due to concerns about nonpoint source pollution.

- MA DEP conducted water quality monitoring in 2002 for the Hoosic River and its tributaries in Adams. Sample locations included upstream on Peck's Brook and Tophet Brook, downstream of Leonard Street on Dry Brook, and upstream of Lime Street on the Hoosic River. Water quality data has not been assessed or released; however, samples were analyzed for bacteria (fecal coliform and *E. coli*), total phosphorous, total suspended solids, ammonia nitrogen, dissolved oxygen, percent saturation, pH, conductivity, temperature, and total dissolved solids.

- HooRWA conducted a follow-up monitoring program in 2002 for the Hoosic River in accordance with the April 20, 2002 Final Quality Assurance Project Plan For Hoosic River Monitoring in 2002, DEP Project Number 2002-09/MWI. The sampling program included three sample locations in Adams for bacteria (fecal coliform and *E. coli*), total phosphorous, dissolved oxygen, total suspended solids, temperature, pH, conductivity, nitrate nitrogen, and turbidity. The study was designed to supplement and complement the 2002 DEP monitoring program for the Hoosic. The locations sampled by HooRWA in Adams were upstream and downstream on Hoxie Brook and on Peck's Brook.

  As presented in the 2003 report "Monitoring the Hoosic in 2002: Adams and North Adams," bacteria levels exceeded the 400 colonies/100 mL threshold for Peck's Brook and the downstream sample for Hoxie Brook on one occasion each for the six samples collected monthly from May through October. The August sample (490 colonies/100 mL) for Peck's Brook was considered a dry weather sample (less than 0.5 inches rainfall in last 24 hours). The May sample (600 colonies/100 mL) for the downstream location on Hoxie Brook was considered a wet weather sample.

  Almost all other monitoring rounds (wet weather and dry weather) for Hoxie Brook showed an increase in *E. coli* counts from the upstream to the downstream sites. The 2002 Monitoring Report concluded that the overall condition of the Hoosic River appears to be slightly better in 2002 than it was in 2001. The report also points out that there is an apparent degradation in water quality between the upstream and downstream sites on Hoxie Brook, illustrated by the majority of monitoring parameters.

2.4 Water Supplies

The municipal water supply in the town of Adams is the responsibility of the Adams Fire and Water District. The Fire District services over 90% of the population. The rest of the town's population receives its water supply from private wells. The Fire District provides water to lower elevations through a base system, while fourteen pumping stations, which draw from the base level system, serve higher elevations. The Adams Water District is supplied by four gravel-packed wells. The District draws an average of 1.7 million gallons per day (mgd) from this source. The District also maintains a surface supply as an emergency source.

The wells, called the Cheshire Harbor well field, are located on the east side of Route 8 in the Town of Cheshire, and are numbered one through four. Well #1 is inactive and is not expected to be used again. Well #2A, an 87 feet deep well, has an approved pumping rate of 860,000 gallons per day (gpd.) Well #3 is 101 feet deep and has a safe yield of 2.016 mgd and an approved pumping rate of 1.96 mgd. Well #4, the newest well, is approximately 81 feet deep with a safe yield of 2.3 mgd and an approved pumping rate of 2.3 mgd.

Well #4, which is presently used as the main source, is activated when the water level in the West Maple storage tank drops below the 34-foot mark. Well #4 can satisfy 100% of the town's needs. Well #3, which can supply approximately 85% of the town's needs is alternated with Well #4 on a monthly basis.

The Bassett Brook Reservoir, which the Water District decided to discontinue in 1995, is located west of Route 8 directly across from the wells. The Reservoir has a surface area of .33 acres, a total storage capacity of 2.4 million gallons per day, and a safe yield of .375 million gallons per day at an overflow elevation of 1049.42 above mean sea level. The reservoir has a tributary drainage area of approximately 2.5 square miles, which is largely forested and unpopulated. This source cannot be used without prior approval by the Department of Environmental Protection.

Treatment of the water supply consists of chemical pumps at each well. A Calciquest treatment system was installed at each well to sequester elevated levels of calcium found in the wells. The system is electrically wired to go on when the well pump is activated.

The distribution system has a total of 55 miles of cast iron pipe ranging in diameter from 4 inch to 20 inch. Pressure in the system ranges from 30 to 135 pounds per square inch (psi.) There are three pump stations and two storage tanks on the distribution system to augment pressure in the higher elevations of Town.

The three storage tanks are located on Glen Street, East Hoosac Street, and West Maple Street. The Glen St. tank has a capacity of 100,000 gallons, as does the East Hoosac St. tank. The West Maple tank, constructed in 1995, has a capacity of two million gallons.

Adams has tried, unsuccessfully, to implement wellhead protection zoning for the Cheshire Harbor well field in the Town of Cheshire.

2.5 Rare or Endangered Species, Critical Habitat and Essential Fish Habitat

Requirements for approval of the NPDES General Permit for Storm Water Discharges state that no federally listed endangered or threatened species or critical habitat be adversely affected by storm water flows, MS4's or discharge areas.

The United States Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NOAA Fisheries) share responsibility for administration of the Endangered Species Act. Before a plant or animal species can receive protection under the Endangered Species Act, it must first be placed on the Federal list of endangered and threatened wildlife and plants. An "endangered" (E) species is one that is in danger of extinction throughout all or a significant portion of its range. A "threatened" (T) species is one that is likely to become endangered in the foreseeable future. The USFWS also maintains a list of plant and animals native to the United States that are candidates or proposed candidates for possible addition to the Federal list. All of the USFWS actions, from proposals to listings to removals ("delisting"), are announced through the Federal Register.

Massachusetts – Federally Listed Threatened and Endangered Species

Animals – 20

Status	*Listing*
E	Beetle, American burying (*Nicrophorus americanus*)
E	Cooter (=turtle), northern redbelly (=Plymouth) (*Pseudemys rubriventris bangsi*)
T	Eagle, bald (lower 48 States) (*Haliaeetus leucocephalus*)
T	Plover, piping (except Great Lakes watershed) (*Charadrius melodus*)
E	Puma (=cougar), eastern (*Puma (=Felis) concolor couguar*)
E	Sea turtle, hawksbill (*Eretmochelys imbricata*)
E	Sea turtle, Kemp's ridley (*Lepidochelys kempii*)
E	Sea turtle, leatherback (*Dermochelys coriacea*)
T	Sea turtle, loggerhead (*Caretta caretta*)
E	Sturgeon, shortnose (*Acipenser brevirostrum*)
E	Tern, roseate (northeast U.S. nesting pop.) (*Sterna dougallii dougallii*)
T	Tiger beetle, northeastern beach (*Cicindela dorsalis dorsalis*)
T	Tiger beetle, Puritan (*Cicindela puritana*)
T	Turtle, bog (=Muhlenberg) (northern) (*Clemmys muhlenbergii*)
E	Wedgemussel, dwarf (*Alasmidonta heterodon*)
E	Whale, blue (*Balaenoptera musculus*)
E	Whale, finback (*Balaenoptera physalus*)
E	Whale, humpback (*Megaptera novaeangliae*)
E	Whale, right (*Balaena glacialis (incl. australis)*)
E	Whale, Sei (*Balaenoptera borealis*)

Massachusetts – Federally Listed Threatened and Endangered Species

Plants – 3

Status	Listing
E	Gerardia, sandplain (Agalinis acuta)
T	Pogonia, small whorled (Isotria medeoloides)
E	Bulrush, Northeastern (Scirpus ancistrochaetus)

Source: Listings by State and Territory as of 09/22/2005 http://ecos.fws.gov/tess_public/TESSWebpageUsaLists?state=MA

The State of Massachusetts maintains a list of rare and endangered species as well. The following list of rare and endangered species comes from the Massachusetts Natural Heritage and Endangered Species Program (NHESP). The State Rank indicates, Special Concern (SC) species are natives that have suffered a decline which could threaten the species, or have a small number, limited distribution, or specialized habitat. Threatened (T) species are likely to become endangered in the future. Endangered (E) species are in danger of extinction.

Wildlife and fisheries

As a result of Adams' dramatic natural setting, remote location, and abundance of protected land, it is home to a variety of unique aquatic and upland wildlife species, including some threatened, rare, and endangered species. Indigenous to the Adams area and particularly affected by water quality are the Longnose Sucker fish (*Catostomus catostomus*); the amphibian, Spring salamander (*Gyrinophyilus porphyriticus*); the crustacean, Appalachaian Brook Crayfish (*Cambarus bartonii*); and the Dragonfly/Damselfly, Lake Emerald (*Somatochlora cingulata*); all are considered by the NHESP to be of "special concern".

Below is a list of all fish, amphibians, birds, mammals and crustaceans that fall into the special concern category that have been identified in the Adams area:

Rare, Endangered and Threatened Species

Taxonomic Group	Scientific Name	Common Name	State Rank	Most Recent Observation
Fish	Catostomus catostomus	Longnose Sucker	SC	1991
Amphibian	Gyrinophilus porphyriticus	Spring Salamander	SC	1995
Bird	Accipiter striatus	Sharp-Shinned Hawk	SC	1945

Taxonomic Group	Scientific Name	Common Name	State Rank	Most Recent Observation
Bird	Dendroica striata	Blackpoll Warbler	SC	1997
Bird	Oporornis philadelphia	Mourning Warbler	SC	1990
Mammal	Sorex dispar	Long-Tailed Shrew	SC	2000
Crustacean	Cambarus bartonii	Appalachian Brook Crayfish	SC	1995
Dragonfly/Damselfly	Somatochlora cingulata	Lake Emerald	SC	1973
Beetle	Desmocerus palliatus	Elderberry Long-Horned Beetle	SC	1997

Source: Adams Open Space and Recreation Plan - 2003

Vegetation

The town of Adams has a varied landscape of large and small forest patches, open fields, and developed areas. The contrasting landscape is rich with a wide variety vegetation types. Below is a list of rare, endangered and threatened species that are indigenous to Adams. While many are found on State protected land there are areas where rare species and critical habitat exist along the banks of Miller Brook, Tophet Brook, Patton Brook, and Pecks Brook in a more urban setting. Special interest in identifying and protecting these species and habitats from storm water runoff should be paid to these areas.

Rare and Endangered Species of Vegetation

Scientific Name	Common Name	State Rank	Most Recent Observation
Acer nigrum	Black Maple	SC	1986
Amelanchier bartramiana	Bartram's Shadbush	T	1999
Arabis laevigata	Smooth Rock-Cress	T	1986
Blephilia hirsuta	Hairy Wood-Mint	E	1995
Carex baileyi	Bailey's Sedge	E	1995
Carex hitchcockiana	Hitchcock's Sedge	SC	1918
Carex tetanica	Fen Sedge	SC	1995

Scientific Name	Common Name	State Rank	Most Recent Observation
Conioselinum chinense	Hemlock Parsley	SC	1982
Equisetum scirpoides	Dwarf Scouring-Rush	SC	1998
Galium boreale	Northern Bedstraw	E	1995
Huperzia appalachiana	Appalachian Clubmoss	E	1909
Luzula parviflora ssp melanocarpa	Black-Fruited Woodrush	E	1999
Malaxis brachypoda	White Adder's-Mouth	T	No Date Recorded
Milium effusum	Woodland Millet	T	1997
Ribes lacustre	Bristly Black Currant	SC	1995
Rosa acicularis	Northern Prickly Rose	E	1919
Solidago macrophylla	Large-Leaved Goldenrod	T	1999
Sorbus decora	Northern Mountain-Ash	E	1997
Spiranthes romanzoffiana	Hooded Ladies'-Tresses	E	1903
Vaccinium vitis-idaea ssp minus	Mountain Cranberry	E	1999
Waldsteinia fragarioides	Barren Strawberry	SC	1922

Source: Adams Open Space and Recreation Plan - 2003

2.6 Historic Properties

Phase II and the NPDES General Permit for Stormwater Discharges requires that no adverse affects to historic sites via stormwater runoff be permitted.

Adams has numerous culturally and historically significant properties. Nationally significant are those that are listed on the National Park Service's National Register of Historic Places either as individual property listings or as Historic Districts. The National Register is the nation's official list of buildings, sites, structures, and objects important in American history, culture, architecture, or archaeology. A listing on the National Register must be associated with a historically significant event or person, must embody a distinct aspect of the built environment or must contain the likelihood of yielding information about recent history or pre-history.

National Register of Historic Places: Individual Property Listings

Numerous houses and buildings in Adams are identified as being historically significant at the national level. Table 2-7 lists the individual property listings which are mapped on Figure 2-4.

Table 2-7. National Register of Historic Places – Individual Property Listings

Listing Name	Location
Susan B. Anthony Birthplace	67 East Road
The Armory Block	39 - 45 Park Street
P.J. Barrett Block	70 – 76 Park Street
Berkshire Mill #1	1 Berkshire Square
Hoosac Street School	20 Hoosac Street
Jones Block	49 – 53 Park Street
Maple Street Cemetery (includes the cemetery as an individual property listing as well as numerous other items such as monuments, markers, gates, and walls associated with the cemetery.) (This was designated in June 2004. It is listed on the Massachusetts Cultural Resource Information System site http://mhc-macris.net/index.htm but is not listed on the National Park Service Site.)	Maple Street
Mausert Block	19 – 27 Park Street
Adams Ambulance Service (Firehouse)	47 Park Street
Phillips Woolen Mills (includes associated structures)	71 Grove Street

Table 2-7. National Register of Historic Places – Individual Property Listings	
Listing Name	**Location**
Pittsfield and North Adams Passenger Station and Baggage & Express House	10 Pleasant Street
Quaker Meetinghouse	Maple St. Cemetery
Simmons Block	86- 90 Park Street

(Source: National Park Service, http://nationalregisterofhistoricplaces.com, May 2005)

National Register of Historic Places: Historic Districts

In addition to individual property listings, there are two nationally significant historic districts in Adams.

- Summer Street National Register Historic District: This district along Crandall, Center, East, Liberty, Orchard and Summer Street is about 350 acres and contains 75 properties. This residential area contains a number of unique and architecturally distinctive private homes dating from the 1890s; the majority of these are in excellent condition.
- Mount Greylock Summit National Register Historic District: Five buildings, 10 structures and about 1,200 acres of the summit of the State Reservation make up this district. The designation is based on historic events at the site and the architecture of Bascom Lodge.
  (Source: National Park Service, http://nationalregisterofhistoricplaces.com

Locally Significant Historic Properties

The Town has recognized numerous historically and culturally significant properties in addition to nationally significant properties or areas. The following items were listed in the Town of Adams 2003 *Open Space* and Recreation Plan.

Proposed Local Historic Districts

- Park Street Historic District
- McKinley Square Historic District
- Summer Street Historic District (Commercial)
- Renfrew Historic District
- Thunderbolt Ski Trail

Locally Significant Historic Properties

- Joshua Lapham House Marker, Crandall Street
- Hale-Parker House, 100 Orchard Street
- Eleazer Browne House, 135 Orchard Street
- Edmund Jenks House, Orchard Street
- Jeremiah Bucklin House, Bucklin Road
- Burlingame House, Walling Road
- Captain Philip Mason House, East Road
- Staples Houses, East Lime and Lime Street
- Daniel MacFarlane House, 238 Columbia Street

- Town Meeting House, Old Columbia Street
- Abraham Howland Mansion, 378 Old Columbia Street
- Benjamin Lapham House, 91 Friend Street
- The Upton Houses, 140 Friend Street and the corner of Friend and Cross Streets
- Zacheus Hathaway House, 62 Notch Road
- The Isaac Killey House, 11 West Road
- Joseph Shove House, 12 West Road
- The Dean Grist Mill and Cotton Batting Factory, West Road
- Israel Cole Homestead and Underground Railroad Graves, West Road
- Bob's Hill, west of Park Street and just north of the Hoosac River

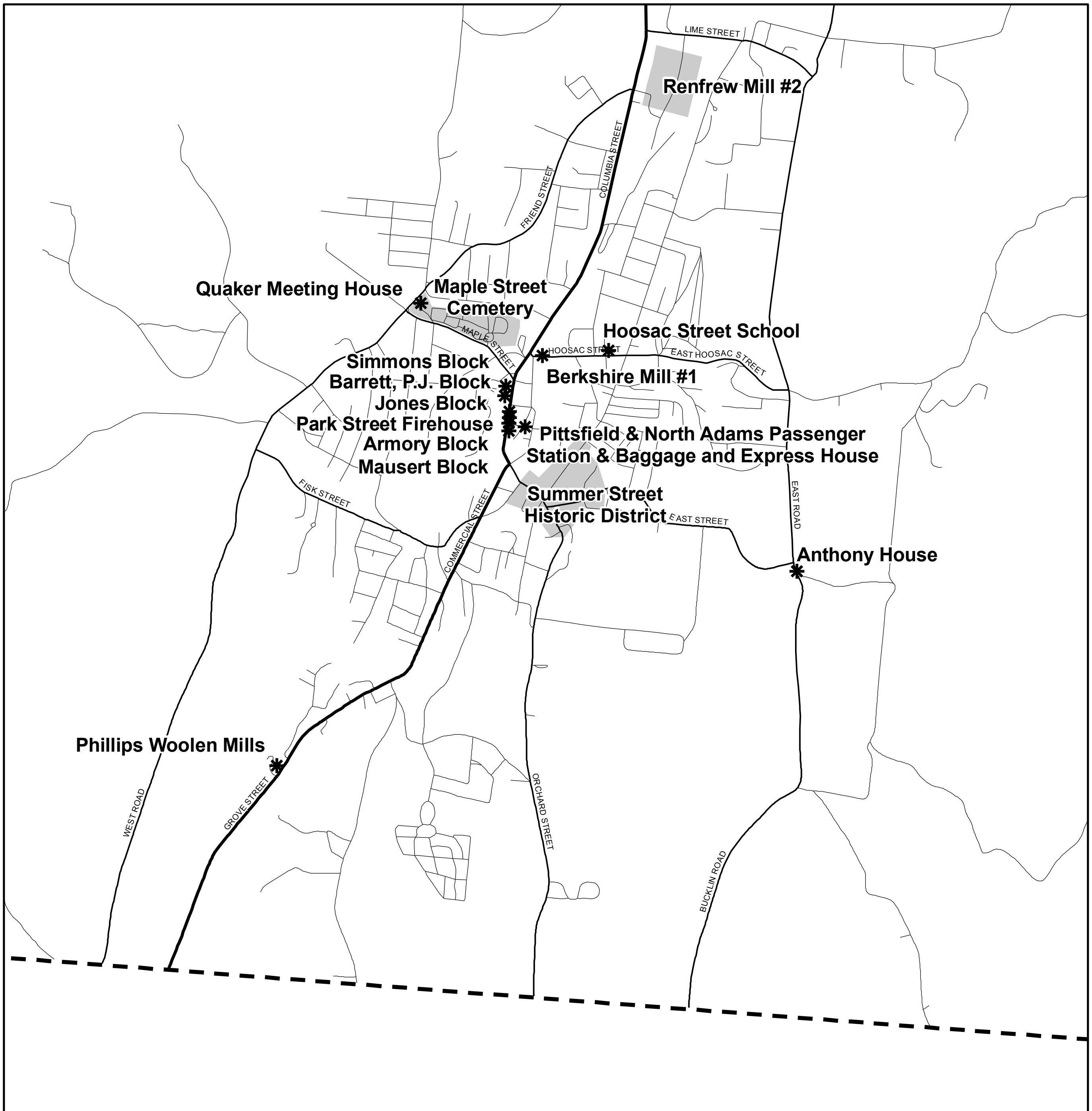
Churches
- First Baptist Church, 13 Commercial Street
- First Congregational Church, 42 Park Street
- St. Mark's Episcopal Church, Commercial and River Streets
- Notre Dame Roman Catholic Church, Columbia and Maple Streets
- St. Stanislaus Kostka Roman Catholic Church, Hoosac and Summer Streets
- St. Thomas Aquinas Roman Catholic Church, 2 Columbia Street

Cemeteries
- St. Stanislaus Kostka Cemetery and Grotto
- Bellevue Cemetery
- Cole Family Cemetery
- East Road Cemetery
- Daniel's Court Cemetery
- Orchard Street Burial Ground
- East Mountain Road Cemetery
- Maple Street Cemetery

Historic Resources and Stormwater Management

- Due to the large number of properties and size of the districts, an individual site assessment was not conducted for historic properties to determine if they are being affected by stormwater problems. Such an individual site assessment should be conducted.
- Most of the historic properties are located in the densely developed downtown area. The downtown area is characterized by a large impervious surfaces. It has been identified as a priority area for improved stormwater management. Historic property interests will need to be integrated into the implementation of stormwater management BMPs.

- The residents of Adams have a strong interest in historic preservation. There is an opportunity to employ “soft” BMPs to manage stormwater that appropriately fit into the historic nature of the property better than more “hard” engineered solutions.



✱ Historic Properties

Historic Properties

Data Sources: MassGIS

N
W E
S

0 2,500 5,000 7,500
Feet

Figure 2-4

Historic Properties

Adams, Massachusetts

2.7 Personnel, Organizations, and Interest Groups

Town of Adams

Stormwater management and control is intricately linked to land use management and development. Being within a "Home Rule" state, a number of municipal boards and departments are involved in local land use (and correspondingly, stormwater) management and regulation. Key Town departments and boards that will be involved with the implementation and success of the Stormwater Management Plan are:

- Planning Board

  Mass. General Laws c. 41, § 81A establishes Planning Boards. Planning Boards are responsible for the development and adoption of a Master Plan and an official map of the town.

  Mass. General Laws c. 41, § 81K—81GG, the Subdivision Control Act, delegates municipal powers chiefly to the Planning Board. The board adopts subdivision rules for the town. The Planning Board is the primary review board which reviews definitive subdivision plans. Mass. GeneraL Laws c. 40A, the Zoning Act, places the Planning Board in several key roles that may affect stormwater management. The Planning Board is authorized to draft and submit zoning amendments for consideration by the town. When a zoning amendment has been put forward, the Planning Board holds the public hearing and may report its recommendations to the local legislature. An unfavorable report by the Planning Board about a proposed zoning amendment means that proposed zoning amendment cannot be re-considered for Town Meeting vote should it fail at an initial Town Meeting.

  Planning Boards' other diverse roles in zoning include:

  - serving as the special permit granting authority;
  - are always a "party in interest" in administrative appeals, special permit applications, and variance petitions within the town and in adjacent cities and towns;
  - must consent whenever a repetitive petition is considered within two years after initial rejection; and
  - the Planning Board usually serves as site plan review authority, where applicable.

- Board of Health (BOH)

  BOH are established by Mass. General Laws c. 111, § 26 and Mass. General Laws c. 41, § 1. The Board of Health has a wide range of responsibilities but two main functions in the land use /

stormwater management area. First, the BOH has a role in the review of definitive subdivision plans pursuant to Mass. General Laws c. 41, § 81U. Case law has established that the BOH is chiefly concerned in this capacity with the on-site disposal of wastewater and drainage of the site.

Second, a BOH has broad powers, pursuant to Mass. General Laws c. 111, § 31, to enact reasonable regulations for the public welfare. This authority includes the power to abate or suppress activities that constitute a nuisance and to address other aspects of the development of land likely to raise a health concern.

In many towns, BOHs are often asked to provide advisory reviews in zoning applications.

- Board of Selectmen

  The Board of Selectmen may play a role in land use regulations. The Zoning Act empowers Boards of Selectmen to serve as special permit granting authorities. The Board may serve as licensing authority for various land use activities, from sale of used cars to earth removal

- Building Inspector

  Mass. General Laws c. 143, § 3 established the municipal post of Building Inspector. The Inspector takes a front-line position in zoning matters, overseeing the construction and safety of buildings. Mass. General Laws c. 40A, § 7 designates the building inspector as zoning enforcement agent. The building inspector issues or withholds permits, reviews enforcement requests, ensures compliance with municipal regulations, and administers the State Building Code.

  The building inspector, or building commissioner, must possess certain minimum qualifications, as described by 780 CMR 107.3. Because of 1992 Mass. Acts 168, § 1, every building inspector shall be certified by the board of building regulations and standards. The Building Inspector acts in an advisory role to the Planning Board over site plan approval.

- Conservation Commission

  Mass. General Laws c. 40, § 8C established Conservation Commissions. The Conservation Commission's chief responsibility is the local administration of the Massachusetts Wetlands Protection Act, Mass. General Laws. c. 131, § 40. Many Conservation Commissions have been delegated parallel authority under municipal ordinances or bylaws to protect wetlands. Adams does not have a local wetland protection bylaw. Typically, these rules are adopted pursuant to Mass. General Laws c. 40, § 21(1) and the Home Rule Amendment.

The Conservation Commission wears other important hats. In zoning matters, it may serve as an advisory board in the review of a special permit application. The Commission is responsible for town forests.

- Department of Community Development

  The Department of Community Development is the primary planning and development department responsible for environmental and community planning, and economic development. It provides technical assistance to the Board of Health, Zoning Board of Appeals, Planning Board, Conservation Commission, Historical Commission, and the Downtown Development Committee.

- Department of Public Works

  The Department of Public Works (DPW) oversees highways; DPW equipment and maintenance; parks and grounds (including the cemetery), and wastewater treatment. The DPW maintains town streets, sewers, parks, and flood control chutes. The DPW has many opportunities to improve the quality and impact of stormwater runoff.

Organizations and Interest Groups

Water is a regional resource that affects and is affected by others in the larger area. Other organizations or agencies are available to assist the Town to carry out a comprehensive stormwater management plan.

- Berkshire Conservation District
  The Berkshire Conservation District, BCD, is one of Massachusetts' sixteen conservation districts. BCD works in partnership with a number of federal, state, and local agencies and organizations to address soil erosion, water quality protection, and other natural resource and land management concerns.
- Berkshire Regional Planning Commission
  The Berkshire Regional Planning Commission (BRPC) is a public body corporate established under Massachusetts General Laws Chapter 40B, Regional Planning Law, and is the official area-wide planning agency in Berkshire County with comprehensive responsibilities which include, land use, environmental management, economic development, and transportation. BRPC provides technical planning services, including stormwater management. BRPC provides a stormwater education program, NEMO (Nonpoint Education for Municipal Officials), that could be used by the Town.
- Hoosic River Watershed Association

  The Hoosic River Watershed Association (HooRWA) is an advocacy group, working to promote the natural resources of the

Hoosic River waterways, protect and improve water quality, and increase the recreational opportunities for local residents. Since its creation in 1986, HooRWA has consistently challenged municipalities, industries, and farm operations to employ BMP's on their properties and minimize the impacts of their activities on the river. HooRWA works closely with other organizations and the Town of Adams on proposing management options for the future use of the Hoosic River. HooRWA has an active educational and outreach component and has established volunteer monitoring programs with local schools. They have also established Stream Teams to investigate and monitor distinct sections of the Hoosic River. These teams were involved in data collection for the Adams Stormwater Management Strategic Plan. They organize public activities such as Riverfest, an annual festival designed to improve awareness of the river.

- <u>Trout Unlimited</u>

  Trout Unlimited (TU) is a national organization, made up of small local chapters. The main objective of TU is to promote and protect clean waterways that will support recreational fishing. TU works closely in water quality monitoring efforts with HooRWA.

State Agencies

- <u>Executive Office of Environmental Affairs (EOEA)</u>

  EOEA is a state executive agency whose mission is to "protect and conserve natural resources in Massachusetts". EOEA is the parent organization of Department of Environmental Protection, Massachusetts Environmental Policy Act (MEPA), Department of Conservation and Recreation (DCR), and Department of Fish and Game (DFG), among others. EOEA has an important role in setting overall state policy related to stormwater.

- <u>Department of Environmental Protection (DEP)</u>

  DEP is the main environmental agency in the state responsible for administering laws concerning natural resources, waste, and hazardous materials. DEP has several sets of regulations that address the impact of stormwater discharges and was instrumental in developing the *Stormwater Management Policy Handbook*. DEP is also a major funding source of conservation, pollution abatement, and mitigation programs, including holding BMP workshops for members of the regulated community. Funding programs include Section 319 Nonpoint Source Pollution Grants and 604(b) Water Quality Management & Planning Grants, under which this assessment project was funded.

- <u>Department of Conservation and Recreation (DCR)</u>

The Department of Conservation and Recreation (DCR) is responsible for managing 4,016.8 acres in Adams. DCR's focus is on conducting educational programs, protecting environmental quality, maintaining park facilities, and prioritizing improvement projects. DCR administers the Massachusetts Forest Cutting Practices Act that affects stormwater runoff related to land clearing.

- Department of Fish and Game

  The Department of Fish and Game (DFG) is a regulatory agency responsible for administering state fish and game laws.

- Massachusetts Highway Department (MHD)

  MHD is the leading transportation agency in the state. MHD has responsibility for construction and maintenance of state highways. Roadways that parallel waterways and the management and maintenance practices that accompany them, such as Route 8 adjacent to the Hoosic River, impact water quality. In addition, MHD is also very important in setting policies for local DPWs.

Federal Agencies

- Environmental Protection Agency (EPA)

  EPA is the regulatory agency responsible for administering federal environmental regulations. The Hoosic River Watershed is located in EPA Region I, administered from Boston. EPA introduced Phase I and Phase II stormwater programs under the Clean Water Act (CWA) to preserve, protect and improve the quality of the Nation's rivers. EPA has oversight of National Pollutant Discharge and Elimination System (NPDES) permits.

- Natural Resources Conservation Service (NRCS)

  NRCS provides technical support to farmers who request help on farming and conservation issues. The NRCS has the opportunity to play a role in mitigating nonpoint source (NPS) pollution in the Hoosic River related to agriculture. NRCS is the agency through which USDA conservation programs are channeled and funded in Berkshire County.

- United States Army Corps of Engineers (USACE)

  The USACE is responsible for the construction of the concrete flood structure in Adams. Adams is responsible for maintenance of the structures according to an Operations and Maintenance Manual. Final jurisdiction for any possible modifications to the structure rests with the USACE. Any pollution mitigation efforts that alter the physical configuration of the structure or its function must be approved by USACE.

APPENDIX 2A

Historical Water Quality Data Summary (1997-2002)
Sample Location Map

Summary of Adams Historical Water Quality Data (1997-2002)

Location ID	HR 07A				MA0100315			HR23.72					HR27.81				
Description	Hoosic River, ~50 feet upstream/ south of Lime Street Bridge				Adams WWTP Outfall, ~2000 feet downstream of Lime Street Bridge			Hoosic River, Upstream of the Lime St. Bridge					Hoosic River, Upstream of Route 8 Bridge opposite the Old Stone Mill				
Collected By:	MA DEP				MA DEP			Hoosic River Watershed Association									
Sampling Date	8-Jul-97	12-Aug-97	16-Sep-97	9/16/1997 Duplicate	Jul-97	Aug-97	Sep-97	May-01	Jun-01	Jul-01	Aug-01	Sep-01	May-01	Jun-01	Jul-01	Aug-01	Sep-01
Wet or Dry Weather Classification	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Wet	Dry	Dry	Dry	Dry	Wet	Dry	Dry	Dry
Analysis (mg/L) unless otherwise noted																	
Fecal Coliform (colonies/100 mL)	1,400	-	120	1,500	-	-	-	~175	~1000	~300	~100	~375	~100	~875	~425	~75	~25
E. coli (colonies/100 mL)	180	-	2,200	340	-	-	-	-	-	-	-	-	-	-	-	-	-
Alkalinity	88	120	123	127	180	-	187	-	-	-	-	-	-	-	-	-	-
Hardness	<0.7	127	134	140	201	-	227	-	-	-	-	-	-	-	-	-	-
pH (standard units)	8.3	8.7	8.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Temperature (^{o}C)	20.5	19.9	16.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Oxygen	9.8	10.8	11.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Oxygen %	107	116	115	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Conductivity (us/cm)	233	303	313	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloride	15	19	22	22	52	-	61	-	-	-	-	-	-	-	-	-	-
Suspended Solids	11	2.8	<2.5	<2.5	-	<2.5	-	-	-	-	-	-	-	-	-	-	-
Total Dissolved Solids (g/L)	0.1	0.2	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Turbidity (NTU)	-	0.7	0.8	0.8	2.2	-	5.1	-	-	-	-	-	-	-	-	-	-
Total Kjeldahl Nitrogen	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ammonia	<0.02	<0.02	<0.02	<0.02	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate	0.19	0.41	0.45	0.44	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Phosphorous	0.02	0.016	0.01	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-

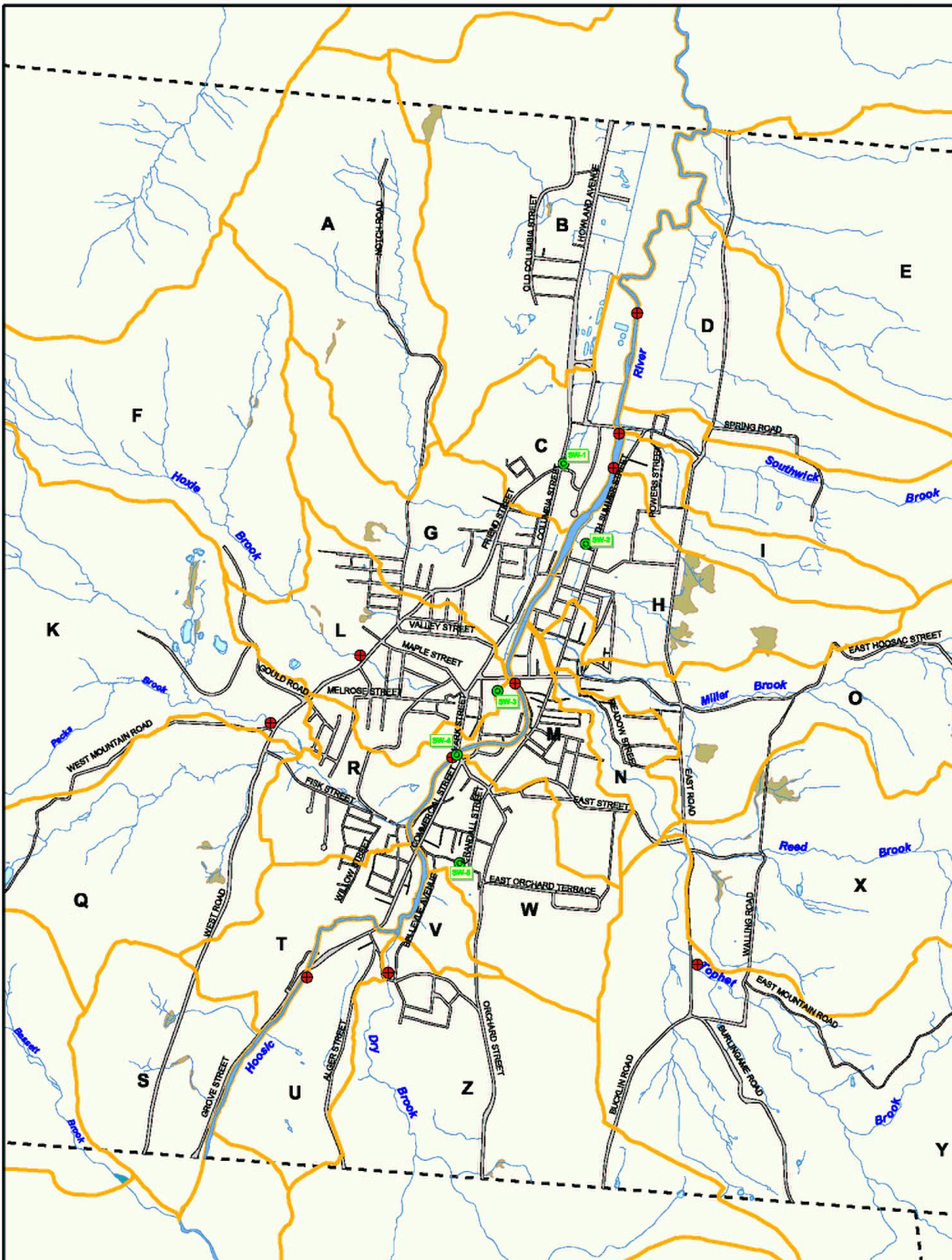
Location ID	PK00.21												
Description	On Peck's Brook upstream of the Ashuwillicook Trail bridge												
Collected By:													
Sampling Date	6-May-02	14-May-02	10-Jun-02	18-Jun-02	15-Jul-02	23-Jul-02	12-Aug-02	20-Aug-02	30-Aug-02	16-Sep-02	24-Sep-02	7-Oct-02	15-Oct-02
Wet or Dry Weather Classification	Dry	Wet	Dry	Dry	Dry	Dry	Dry	Dry	Wet	Wet	Dry	Dry	Dry
Analysis (mg/L) unless otherwise noted													
Fecal Coliform (colonies/100 mL)	-	30	-	30	-	220	-	500	-	-	340	-	110
E. coli (colonies/100 mL)	-	20	-	20	-	280	-	490	-	-	330	-	70
Alkalinity	-	-	-	-	-	-	-	-	-	-	-	-	-
Hardness	-	-	-	-	-	-	-	-	-	-	-	-	-
pH (standard units)	8.24	-	8.23	-	7.88	-	7.52	-	8.1	7.85	-	7.78	-
Temperature (^{o}C)	8.5	-	12.1	-	15.4	-	15.9	-	14.1	16.3	-	11.6	-
Dissolved Oxygen	12.3	-	10.6	-	9.51	-	9.28	-	10.4	9.48	-	10.26	-
Dissolved Oxygen %	105	-	98.5	-	95.1	-	93.7	-	93.3	96.7	-	94.6	-
Conductivity (us/cm)	140	-	210	-	180	-	250	-	230	160	-	220	-
Chloride	-	-	-	-	-	-	-	-	-	-	-	-	-
Suspended Solids	-	9	-	mdl	-	mdl		mdl		-	2	-	3
Total Dissolved Solids (g/L)	-	-	-	-	-	-	-	-	-	-	-	-	-
Turbidity (NTU)	0.7	-	0.29	-	0.16	-	0.04	-	0.28	7	-	mdl	-
Total Kjeldahl Nitrogen	-	-	-	-	-	-	-	-	-	-	-	-	-
Ammonia	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate	0.24	-	0.17	-	0.24	-	0.36		0.32	0.33	-	0.2	-
Total Phosphorous	-	0.02	-	0.01	-	0.04	-	0.02	-	-	0.01	-	mdl

Location ID	HX00.33												
Description	On Hoxie Brook downstream of the pipe that carries the brook beneath Adams												
Collected By:													
Sampling Date	6-May-02	14-May-02	10-Jun-02	18-Jun-02	15-Jul-02	23-Jul-02	12-Aug-02	20-Aug-02	30-Aug-02	16-Sep-02	24-Sep-02	7-Oct-02	15-Oct-02
Wet or Dry Weather Classification	Dry	Wet	Dry	Dry	Dry	Dry	Dry	Dry	Wet	Wet	Dry	Dry	Dry
Analysis (mg/L) unless otherwise noted													
Fecal Coliform (colonies/100 mL)	-	480	-	70	-	70	-	350	-	-	280	-	80
E. coli (colonies/100 mL)	-	600	-	80	-	60	-	320	-	-	280	-	80
Alkalinity	-	-	-	-	-	-	-	-	-	-	-	-	-
Hardness	-	-	-	-	-	-	-	-	-	-	-	-	-
pH (standard units)	8.31	-	8.2	-	8.02	-	7.72	-	8.16	7.94	-	8.05	-
Temperature (^{o}C)	10	-	12.5	-	16	-	17	-	14.6	17	-	12.2	-
Dissolved Oxygen	11.19	-	10.21	-	9.18	-	8.86	-	9.37	9.21	-	10.05	-
Dissolved Oxygen %	99.4	-	95.6	-	92.7	-	91.6	-	92.3	95.3	-	93.7	-
Conductivity (us/cm)	160	-	220	-	180	-	280	-	260	180	-	290	-
Chloride	-	-	-	-	-	-	-	-	-	-	-	-	-
Suspended Solids	-	8	-	1	-	mdl		2		-	mdl	-	mdl
Total Dissolved Solids (g/L)	-	-	-	-	-	-	-	-	-	-	-	-	-
Turbidity (NTU)	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Kjeldahl Nitrogen	-	-	-	-	-	-	-	-	-	-	-	-	-
Ammonia	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate	0.29	-	0.25	-	0.38	-	0.51		0.46	0.3	-	0.38	-
Total Phosphorous	-	0.02	-	0.02	-	mdl	-	0.01	-	-	0.01	-	mdl

Location ID	HX00.91												
Description	On Hoxie Brook off West St. and upstream of the pipe												
Collected By:													
Sampling Date	6-May-02	14-May-02	10-Jun-02	18-Jun-02	15-Jul-02	23-Jul-02	12-Aug-02	20-Aug-02	30-Aug-02	16-Sep-02	24-Sep-02	7-Oct-02	15-Oct-02
Wet or Dry Weather Classification	Dry	Wet	Dry	Dry	Dry	Dry	Dry	Dry	Wet	Wet	Dry	Dry	Dry
Analysis (mg/L) unless otherwise noted													
Fecal Coliform (colonies/100 mL)	-	20	-	40	-	150	-	90	-	-	20	-	70
E. coli (colonies/100 mL)	-	40	-	20	-	130	-	100	-	-	30	-	60
Alkalinity	-	-	-	-	-	-	-	-	-	-	-	-	-
Hardness	-	-	-	-	-	-	-	-	-	-	-	-	-
pH (standard units)	8.3	-	8.14	-	7.89	-	7.27	-	8.09	7.86	-	7.51	-
Temperature (^{o}C)	9.6	-	12.6	-	16.1	-	16.2	-	14.6	16.8	-	12.2	-
Dissolved Oxygen	11.7	-	10.63	-	9.65	-	9	-	9.57	9.46	-	9.72	-
Dissolved Oxygen %	102.3	-	99.7	-	98.3	-	91.2	-	94.3	97.6	-	90.4	-
Conductivity (us/cm)	160	-	220	-	190	-	250	-	250	180	-	270	-
Chloride	-	-	-	-	-	-	-	-	-	-	-	-	-
Suspended Solids	-	mdl	-	mdl	-	mdl		7		-	mdl	-	1
Total Dissolved Solids (g/L)	-	-	-	-	-	-	-	-	-	-	-	-	-
Turbidity (NTU)	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Kjeldahl Nitrogen	-	-	-	-	-	-	-	-	-	-	-	-	-
Ammonia	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate	0.22	-	0.26	-	0.36	-	0.49	-	0.42	0.28	-	0.37	-
Total Phosphorous	-	0.02	-	0.02	-	0.01	-	0.01	-	-	0.01	-	mdl

Notes:
MDL - concentration is below the Minimum Detectable Level
Data Sources:

Commonwealth of Massachusetts. 1997. Hudson River Basin 1997 Assessment Report. Executive Office of Environmental Affairs, Massachusetts Department of Environmental Protection, Bureau of Resource Protection, Division of Watershed Management.
Hoosic River Watershed Association. November 28, 2001. Monitoring the Hoosic: North Branch and Main Stem in 2001.
Hoosic River Watershed Association. February 3, 2003. Monitoring the Hoosic in 2002: Adams and North Adams.



LEGEND

- Stormwater Sample Locations
- Historical Monitoring Locations
- Drainage Subwatersheds
- Town Boundary

Hydrography

- Reservoir
- Wetland
- River
- Lake, Pond
- Stream, Brook

2000 0 2000 4000 Feet

SCALE: 1:24000

N W E S

Data Sources: MassGIS, Berkshire Regional Planning Commission (BRPC), CEI

Historical Water Quality Sample Locations

Adams, Massachusetts

Comprehensive Environmental Inc.

3.0 Characteristics of Stormwater Collection System

Natural and man-made flow conveyance systems can have significant impact on water quality. Topography, soil types and vegetation all play a role in the volume and rate of runoff that reaches a water body. Development also plays a large role in flow characteristics, since more runoff is generated and conveyed through man-made structures directly into surface waters. This section discusses the characteristics of the natural and man-made flow conveyance systems in Adams, how they impact water quality, and the general condition of existing infrastructure.

3.1 Natural Flow Conditions

The Town of Adams is situated between Mount Greylock to the west and the Hoosac range to the east. Till and bedrock dominate soils in the area. The Hoosic River is located in a valley traversing the length of the Town, which is fed through a network of streams that originate in the steep slopes characterizing the Town's east and west sides. There are seven major tributary streams that flow into the Hoosic River in Adams.[1] These are listed below:

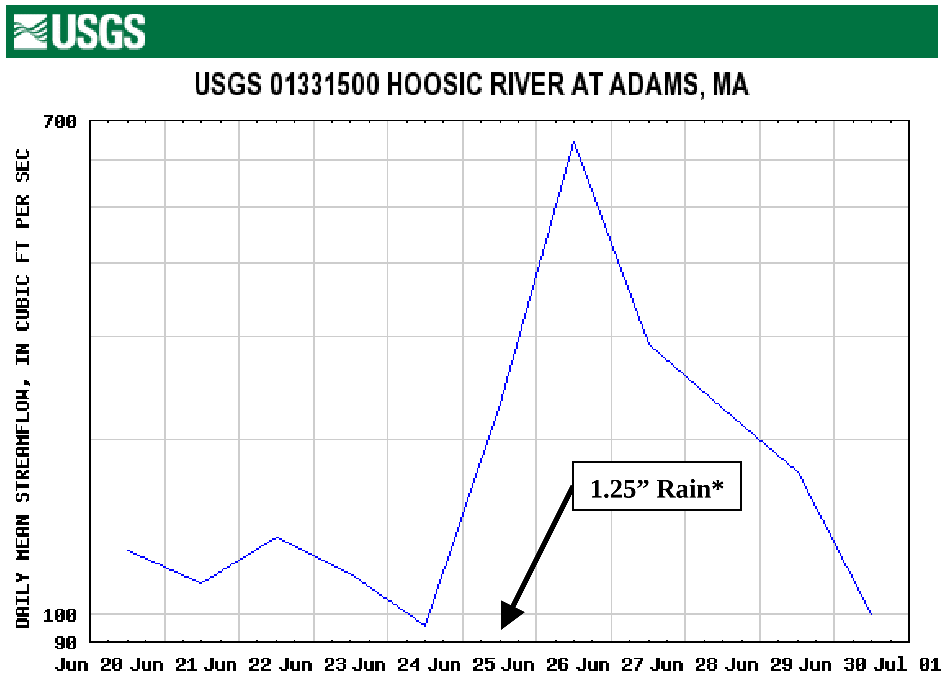
Dry Brook	*Tophet Brook*	*Reed Brook*
Miller Brook	*Pecks Brook*	*Hoxie Brook*
Southwick Brook		

Together, these tributaries and the Hoosic River comprise roughly 100 miles of streams and rivers (source: MA GIS). As shown on **Figure 3-1**, these stream networks have large drainage areas or subwatersheds that drain from the steep hillsides of the Hoosac Range and Mount Greylock into the valley and the Hoosic River. An overview of the stream networks in Adams is provided in **Figure 3-2**.

The upper reaches of drainage areas within Adams are mostly forested with commingled agricultural areas and grassy meadows from historical agricultural practices.[2] There are few significant wetland impoundments (approximately 0.3% of the land area in town or 54 acres, source: MA GIS) and lowland floodplains are limited. The steep slopes, hard soils, and limited natural floodplain storage result in quick, flashy flows to the

[1]Bassett Brook is located in Adams and flows into the Hoosic River in Cheshire.
[2]Agriculture was a dominant feature of the Adams landscape and economy in the early 1900s (approximately 40 farms) and continued to support the major expansion of industry in Town until the late 1950s when supermarkets became the cornerstone for food supply. Farm lands were settled with single-family houses and some land eventually became forested land, changing the Adams landscape. Source: In This Valley, A Concise History of Adams, Massachusetts. Eugene F. Michalenko. September 2000, rev. July 2002.

Hoosic River. This "quick draining" effect is quite unique to Adams due to its hydrographic setting and causes large flow fluctuations in the Hoosic River. As shown below, in June 2000 the flow of the Hoosic River in Adams changes drastically during a rain event, when compared to normal base flow.



**Data source: weatherunderground.com, daily history, North Adams weather station, June 25, 2000.*

3.2 Man-made Stormwater Infrastructure Conditions

Development in Adams focused along the Hoosic River Valley, leaving the upper reaches of the river's drainage area in relatively virgin conditions. Stormwater infrastructure, consisting of flood control chutes and engineered conveyance systems to quickly divert flows from developed areas to streams and the river, was built to manage stormwater flows and alleviate flooding conditions. Perhaps the most dominant stormwater feature in the urban landscape of Adams is the Hoosic River's flood control chutes.

Flood Control Chutes

Originally built in the early 1950s by the U.S. Army Corps of Engineers, the flood control chutes were designed to protect property and lives due to the devastating floods of 1901, 1927, 1936, 1938 and 1948. The Army Corps project confined the Hoosic River in a concrete channel for 2.2 miles of its 5.7 mile stretch through Adams. The lower portion of Tophet Brook is similarly confined.

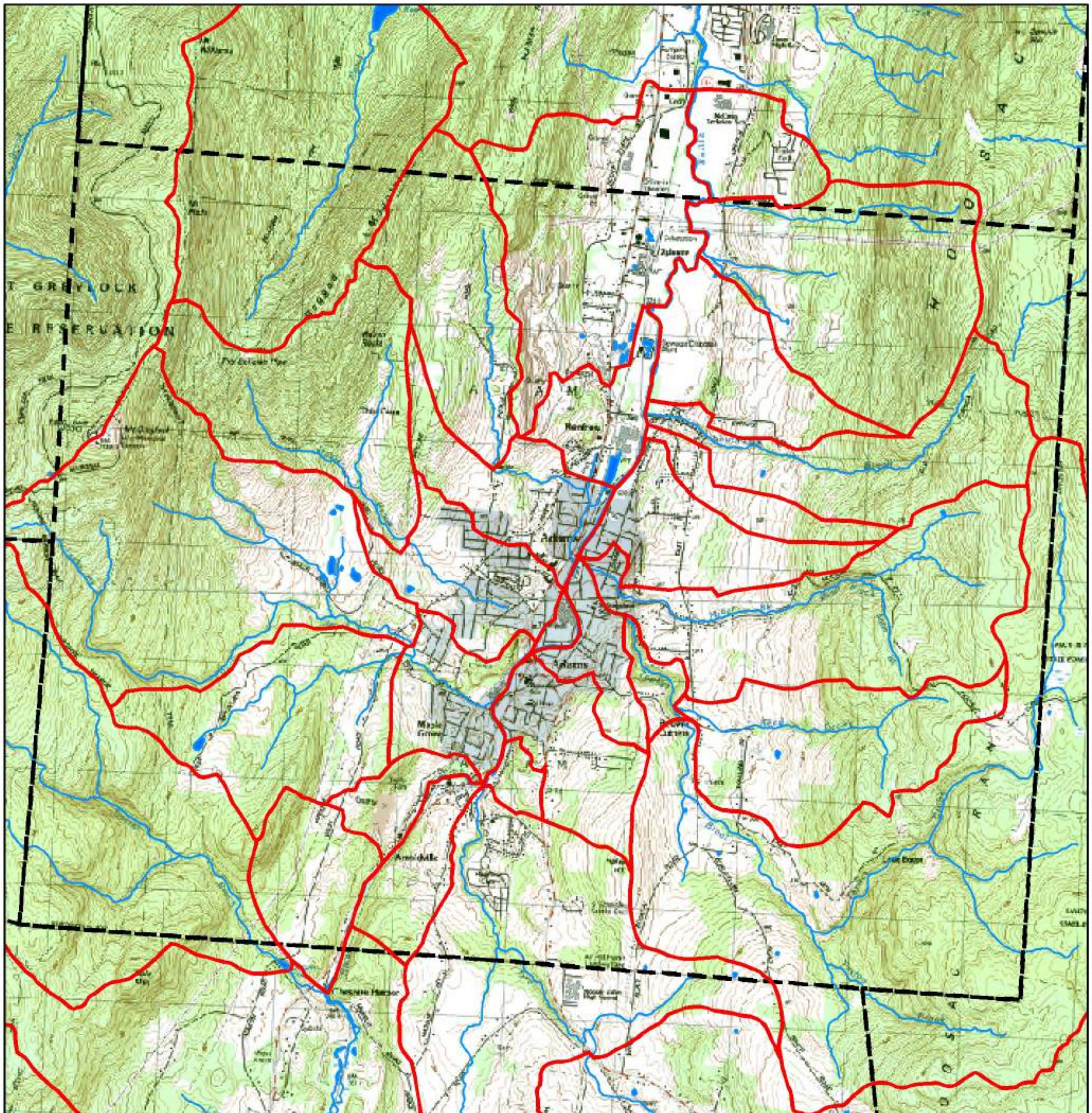


Figure 3-1

USGS Quadrangle with Subwatershed Boundaries

Adams, Massachusetts

Drainage Subwatershed

Stream, Brook

Lake, Pond

Town Boundary

Data Sources: MassGIS, USGS

0 2,500 5,000 7,500 Feet

N S E W

Comprehensive Environmental Inc.

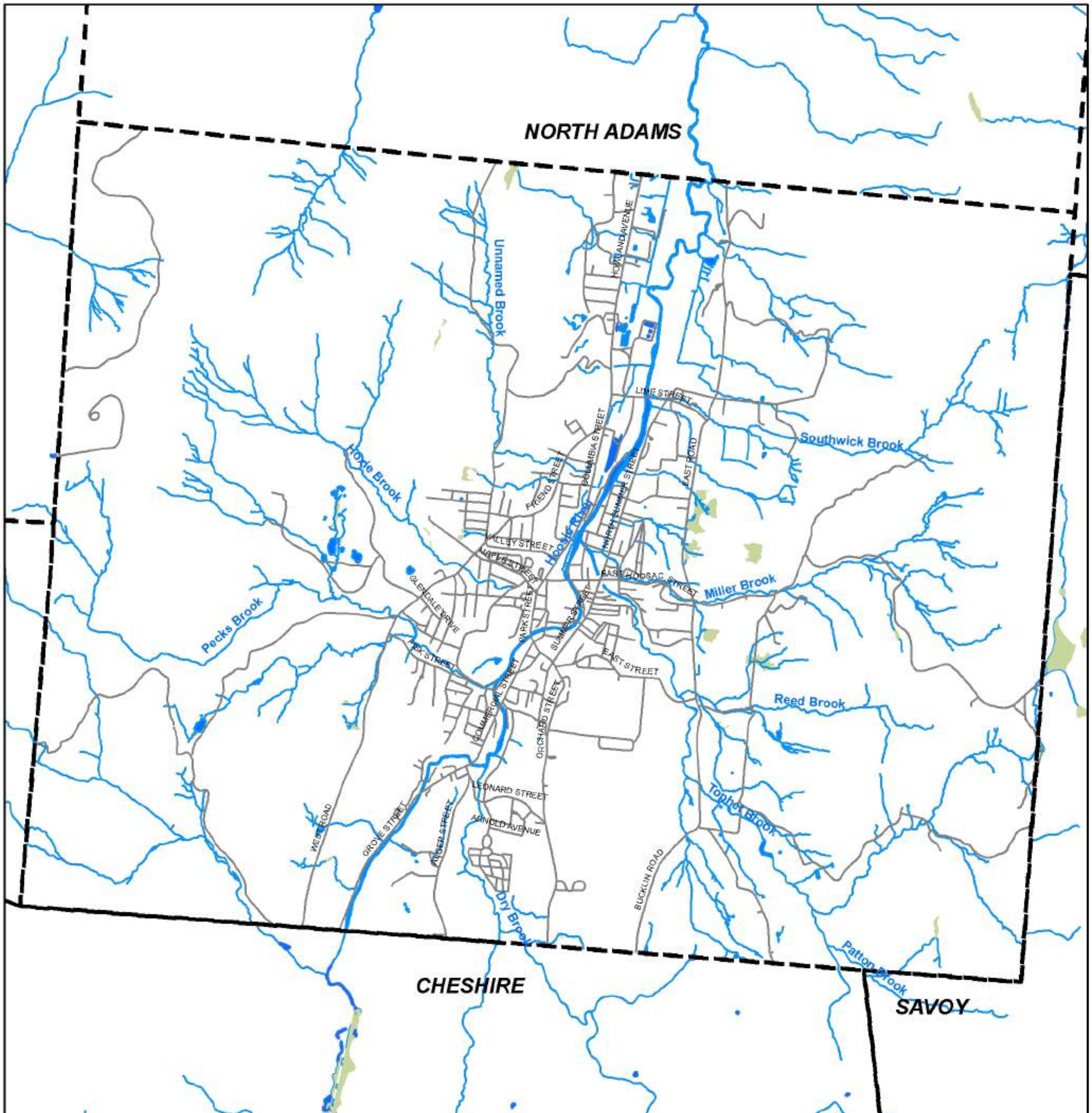


Figure 3-2

Stream, Brook
Lake, Pond
Wetland

Hydrographic Characteristics

N
W E
S

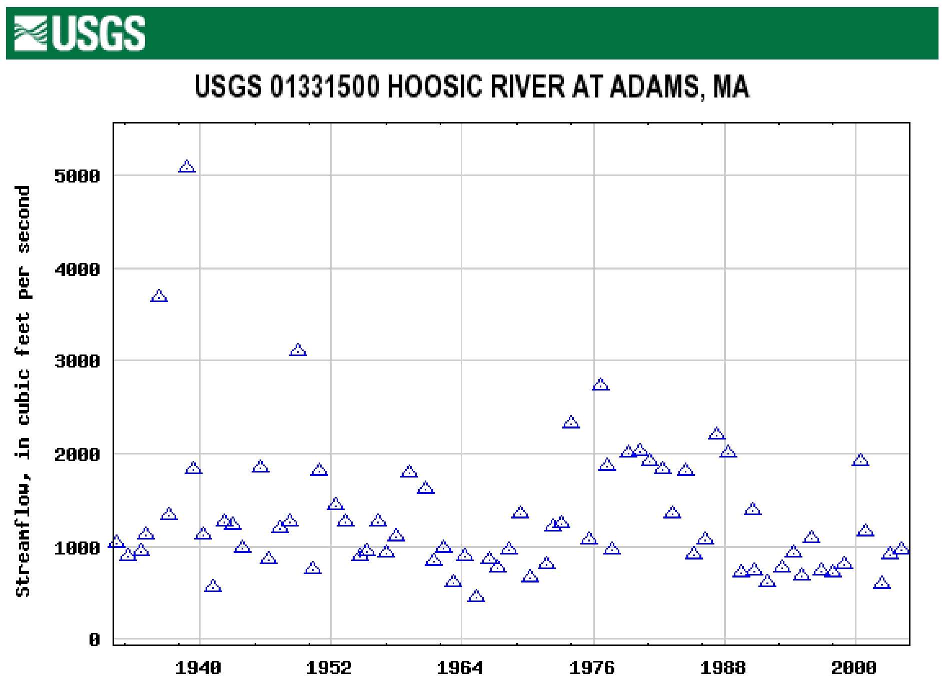
Adams, Massachusetts

Data Sources: MassGIS, USGS

0 2,500 5,000 7,500 Feet

Comprehensive Environmental Inc.

The Hoosic River flood control chutes are designed to provide protection against a flood discharge about 50% greater than the maximum flood of record (5,500 cfs), which occurred in September 1938 (1959 Operation & Maintenance Manual, U.S. Army Corps of Engineers, New York). Since construction of the flood control chutes, Adams has not experienced a major flood event comparable to the Town's history. The annual peak flows for the Hoosic River in Adams are illustrated below.



The flood control chutes comprise the most significant infrastructure, with more than 175 major drainage-related structures that consist of stormwater outfalls, dikes, levees, stilling basins, weirs, diversion channels, and sluice gates. A schematic layout of the flood control chutes is provided as **Figure 3-3** illustrating these structures and the extensive infrastructure in Adams.

Prior to the construction of the Hoosic River flood control chutes, the Hoosic River was heavily used by local industry, resulting in numerous diversions and detention ponds for process and cooling waters. **Figures 3-4** and **3-5** illustrate how the Hoosic River has changed since 1876 in contrast to today's conditions. These historic maps illustrate the overall infrastructure development in Adams associated with the Hoosic River and surrounding storm drain systems over the last century.

Stormwater Collection System

The majority of rainfall and runoff from urban areas in Adams is handled using standard stormwater collection systems such as catch basins, drainage manholes, and concrete pipes. In most cases, these pipes discharge directly to waterways and the Hoosic River. Stormwater is also conveyed by drainage swales and ditches along roads, some of which have been paved or lined with concrete due to high stormwater velocities and steep drainage areas. An example of a swale that is partially lined with concrete is provided below.

This site is a drainage swale along Glenn Street that is partially lined with concrete before it enters a 32" pipe that eventually discharges to the Hoosic River.

Some basic characteristics[3] of the Town's stormwater collection system are:

- 284 storm drain outfalls
- 1,596 catch basins
- 331 drainage manholes
- 161,885 linear feet (~30.7 miles) of drain pipe

A Town-wide Drainage System Map showing these characteristics is provided in **Appendix 3A**. The condition of some drainage structures were inspected as part of this Plan's initial investigations of potential illicit discharges and evaluation of BMP sites. The analysis was not a comprehensive drainage system inspection, rather a field screening effort to assess the overall condition of the drainage system, identify significant problem areas, and evaluate how these conditions affect water quality. The results of field efforts are outlined below, many of which are discussed further in subsequent sections of this report:

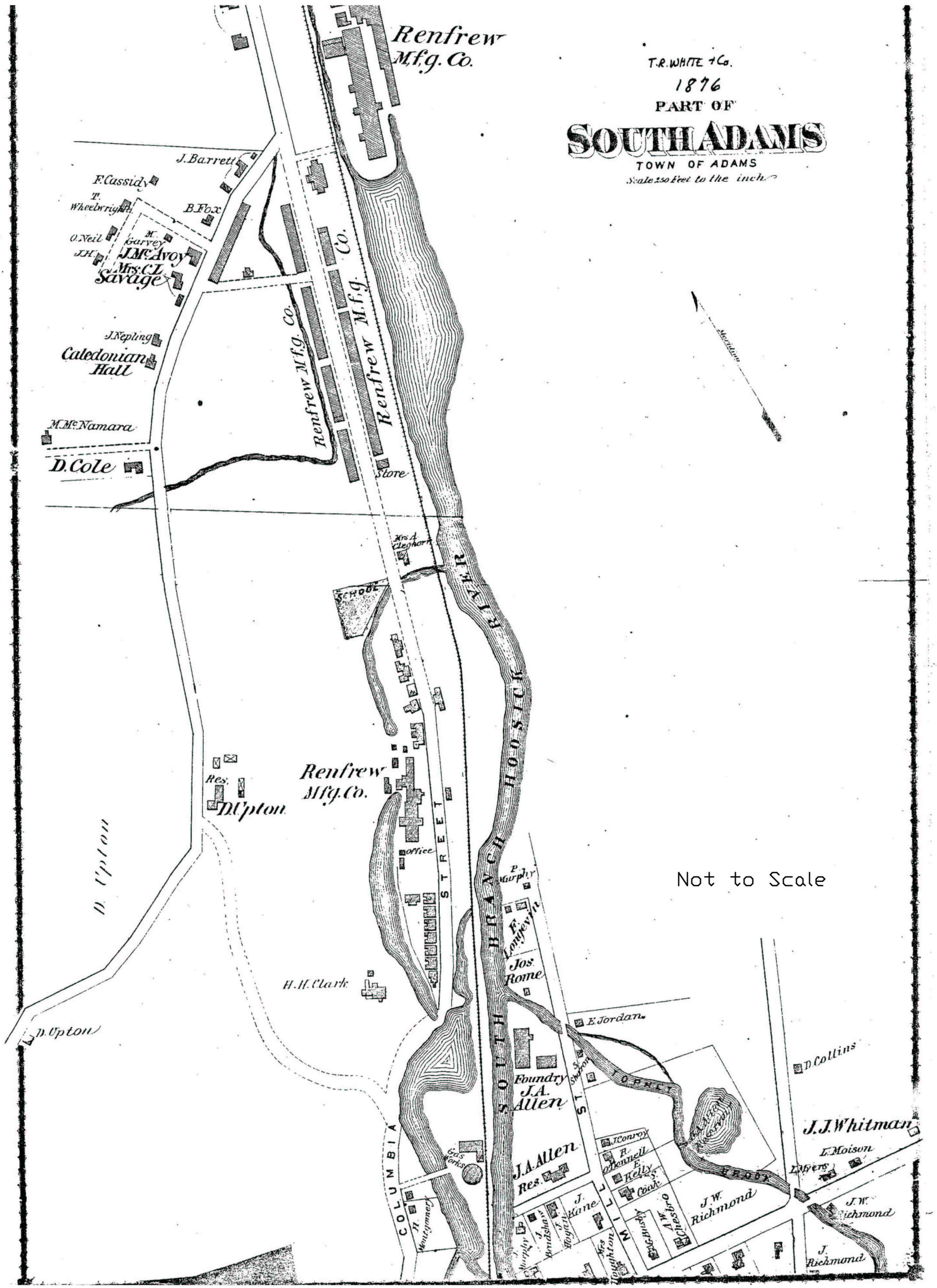
- Stormwater pollutants from roadways, parking lots, and buildings in the downtown area discharge to these drainage systems and enter the Hoosic River and its tributaries with little treatment.

- Catch basins in Town have sumps to collect solids (sediment, sand, debris) that settle out of the stormwater flow. However, many of these sumps are relatively shallow and only allow minimal settling of solids before the structure becomes full and

[3] Drainage characteristics are based on the Adams drainage system GIS data, generated by Cartographic Associates, Inc. (2003).

FIGURE 3-3. ADAMS FLOOD CONTROL CHUTES SCHEMATIC DIAGRAM

Source: Adams Flood Protection Works Operation & Maintenance Manual, 1959.



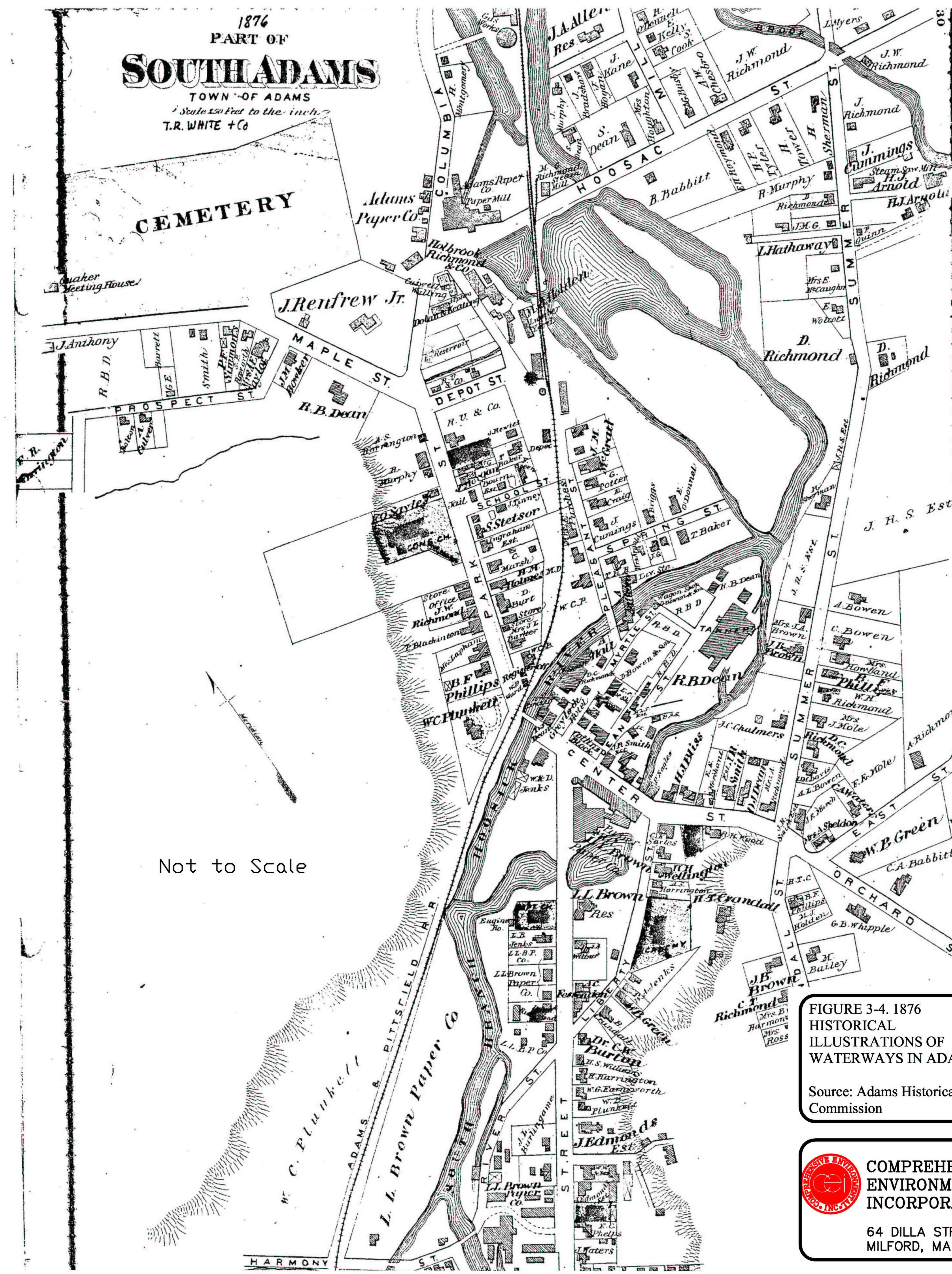


FIGURE 3-4. 1876 HISTORICAL ILLUSTRATIONS OF WATERWAYS IN ADAMS

Source: Adams Historical Commission

COMPREHENSIVE ENVIRONMENTAL INCORPORATED
64 DILLA STREET
MILFORD, MA 01757

FIGURE 3-5. 1894
HISTORICAL VIEW OF
WATERWAYS IN ADAMS

Source: Adams Historical Commission

COMPREHENSIVE
ENVIRONMENTAL
INCORPORATED
64 DILLA STREET
MILFORD, MA 01757

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MILFORD, MA 01757

FIGURE 3-6. AERIAL VIEW OF DOWNTOWN ADAMS ALONG THE HOOSIC RIVER

Image Source: Pictometry® International Corp., 11/14/02.

sediments are re-suspended or washed downstream into waterways.

- Additionally, due to the steep slopes and the large contributing drainage areas, stormwater quickly flows through the drainage system and sediments are re-suspended from the last storm and transported downstream. Examples of sediment transport through the drainage system are shown below shortly after a thunderstorm and during normal flow conditions.

Turbid water in Hoxie Brook shortly after a thunderstorm in the downtown area. To the right is the same location during normal "non-storm" conditions.

The effects of upstream erosion and sediment transport observed at a stormwater discharge to the Hoosic River at Spring Street.

- Stormwater infiltration systems are minimal and consist primarily of leaching brick/concrete block manholes or open bottom catch basins.

- The exact age of most stormwater structures is not well known. The majority of drainage structures along the Hoosic River are approximately 50 years old since they were built at the time of flood chute construction. Drainage structures upstream of the Hoosic River are likely much older (75-100 years old) and may be as old as the streets where they are located. However, drainage systems have changed over the years and there are no records that succinctly and accurately show these changes. Historically, sewer and drainage pipes were most likely one of the same that discharged directly to waterways, but there systems were disconnected and upgraded in the early 1900s up until the construction of the flood control chutes.

- The storm drainage system in Adams appears to be in relatively good physical condition based on field screening at stormwater inlets and outlets. Some storm drain structures, such as brick manholes, deteriorate over time and are repaired or replaced as needed. Pre-cast structures are used for new construction projects.

- The U.S. Army Corps of Engineers indicated that the flood control chutes and drainage system along the Hoosic River are in good condition and are functioning as designed. The Army Corps inspects the flood control chutes on an annual basis and submits an inspection report to the Town of Adams. The most common inspection issues are the growth of woody vegetation and the buildup of sediment that may damage concrete structures and restrict flows, thus decreasing the chute's flood capacity. The Adams DPW is responsible for following up on these recommendations and maintaining the flood control chutes, which also includes some land adjacent to the river and grassy levees.

- The results of outfall inspections conducted during the November 18, 2004 illicit discharge investigations indicated that most outfalls appear to be in good condition; however, some cracked, corroded and damaged pipes were observed. These conditions do not pose a threat to water quality but some structures require repair, such as outfall HO-P2, where the box culvert appears to be partially collapsed or the drainage system was previously abandoned at this location. This outfall is a 48" discharge to the Hoosic River from the west, immediately upstream of Park Street. Additional information is provided in Section 4.5 with field inspection sheets and maps in Appendix 4D.

- Many stormwater outfalls do not have outlet protection to prevent scouring and erosion downstream. In many cases, the discharge point for outfalls is a stream bed, bank, or a concrete chute and these direct stormwater discharges result in flashy stream flows. An example of significant bank erosion due to a combination of flashy stream flows and stormwater discharges is located on Hoxie Brook at the Gilead Street crossing. Bank erosion is occurring at this location and the culvert structure (stone arch and concrete wing wall) is damaged. Additional areas of concern are discussed in the Perennial Stream Assessment (Section 4.1), Hot Spot Analysis (Section 4.3) and Warm Spot evaluation (Stormwater QAPP, Technical Appendix).

- The most common condition observed at stormwater structures throughout Town is accumulated sediment and/or debris (see also Section 6.2 for storm drain maintenance). In some cases there are no structures to trap and collect any sediment before it is discharged from streets to waterways. For example, some catch basins in the downtown area along Park Street and Maple Street are located directly on top of the culvert that carries Hoxie Brook underground.

- The 1987 Infiltration/Inflow (I/I) Study of the sanitary sewer system identified numerous sources of infiltration and inflow due to direct catch basins connected to the sanitary sewer system, cracked and damaged pipes, damaged and leaking manholes, groundwater surcharging, potential inflow from streams, etc. A significant portion of the sanitary sewer system in Adams is constructed with vitrified clay pipe with some sections as much as 100 years old. A Sanitary Sewer System Map is provided in Appendix 3A. The Adams DPW indicates that many of the inflow sources were removed; however, not all of the I/I findings were addressed. Based on recent illicit discharge investigations and the results of the stormwater sampling program, it appears that direct and indirect cross connections between the drainage system and sanitary sewer system are present and are significantly impacting water quality. Surcharging of the sanitary sewer system and backflow may be entering the drainage system and waterways in Adams. This information is discussed further in Sections 4.4 and 4.5 with recommendations and additional information from the 1987 I/I Study provided in Appendix 4C.

- The stormwater collection system in Adams is designed to convey large stormwater flows with little consideration for water quality. Past practice for stormwater management was putting it in a pipe and sending it downstream and, if needed, making the pipe bigger to handle more stormwater from more developed areas. Average annual rainfall in Adams is about 38.26 inches (last 30 years) and results in an estimated 790 million gallons of runoff from urban areas in Adams (see runoff calculations – QAPP, Technical Appendix). **Figure 3-6** illustrates the large impervious surfaces in the downtown area that generate runoff with discharge to the Hoosic River. These large impervious surfaces also result in significant temperature increases for runoff that can affect local waterways and fish habitat.

3.3 Recommendations

A summary of key recommendations is provided below based on existing information for the drainage system and field observations. This information is also incorporated into the Recommendations and Implementation Plan in Section 8.0.

- Inspect stormwater outfalls for structural conditions and illicit discharges in accordance with the proposed Adams Illicit Discharge Detection and Elimination (IDDE) Plan (see also Technical Appendix) to develop a comprehensive database of outfall conditions to address maintenance needs. This should include more detailed reviews of the upgradient drainage network in areas that appear to be deteriorated or damaged due to age or excessive stormwater flows.

- Incorporate BMPs into the repair and upgrade of drainage systems (see also Section 4.6.3 for BMPs with redevelopment). Deep sump catch basins or leaching structures should be used if a drainage manhole has to be repaired or replaced. Vegetated swales or rip rap swales are preferred to the use of a concrete swale or pipe to convey runoff. BMPs for urban runoff should be incorporated into Town redevelopment projects and developers should be encouraged to incorporate BMPs into new projects.

- Evaluate the feasibility for maintenance dredging of flood control chute structures to maintain flow capacity and provide additional storage for future stormwater treatment and sediment removal. The U.S. Army Corps of Engineers inspects the condition of the flood control chutes annually and reports that vegetative and sediment maintenance are needed. The following areas require further evaluation for maintenance dredging/sediment removal and project coordination with the U.S. Army Corps (refer to **Figure 3-3** for locations):

    - Drop structure and stilling basin west of the Miller Street Bridge on Tophet Brook, just before its confluence with the Hoosic River, where a large sand/gravel bar has formed.
    - Pumping station and storage basin adjacent to Hoosac Street and to the west of the Hoosic River that is laden with sediment. The pumping station and basin were originally designed to provide water storage for fire protection at the nearby mills and are no longer in service.

A conceptual stormwater BMP was designed to include this area (refer to Section 4.6.2, *Hoxie Brook Downtown – Stream Restoration & Urban Runoff BMPs*).

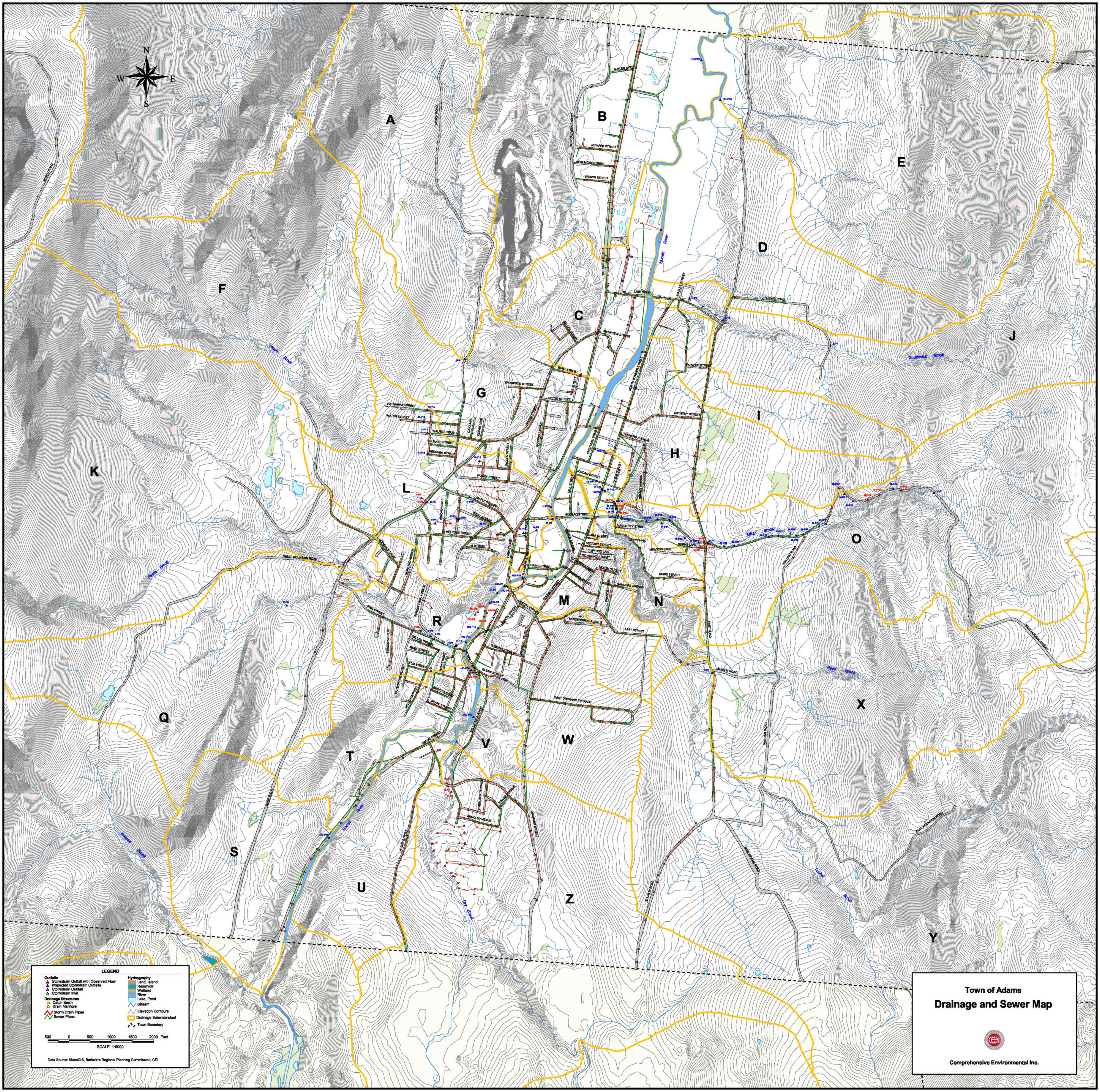
  - Other structures worth noting: weir upstream of Commercial Street; stilling basin on Hoosic River upstream of Tophet Brook; and stilling basin on Hoosic River west of North Summer Street, downstream of Crotteau Street and Adams DPW Yard.

- The 1959 Operation and Maintenance (O&M) Manual for the Hoosic River flood control chutes is designed to maintain the integrity of the flood control chutes and history demonstrates its effectiveness; however, there is little consideration for water quality. The O&M Manual should be evaluated in relation to water quality and current maintenance practices/requirements to determine if any modifications are warranted or possible. This will require coordination with the U.S. Army Corps of Engineers to adequately address topics such as maintenance dredging and future improvements, if any. As an example, the manual currently calls for cutting woody vegetation along the flood control chutes and levees. Modifications to allow woody vegetation along designated portions of the flood control chutes would provide some shade, resulting in lower water temperatures for aquatic life.

APPENDIX 3A

Town-Wide Drainage System Map

Sanitary Sewer System Map



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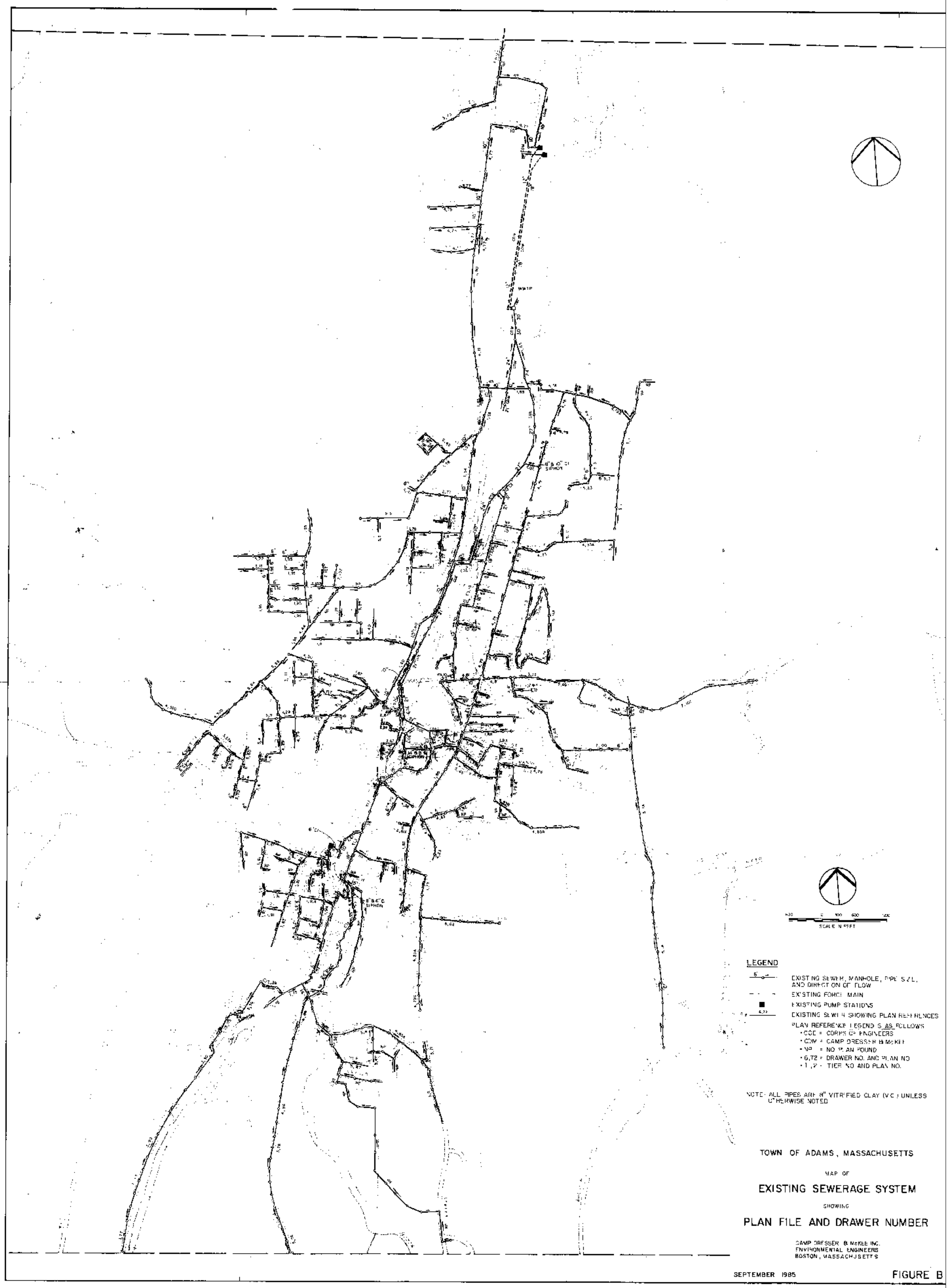
Town of Adams
Drainage and Sewer Map
Comprehensive Environmental Inc.
LEGEND
Outfalls
Stormdrain Outfall with Observed Flow
Inspected Stormdrain Outfalls
Stormdrain Outfall
Stormdrain Inlet
Drainage Structures
Catch Basin
Drain Manhole
Storm Drain Pipes
Sewer Pipes
Hydrography
Land, Island
Reservoir
Wetland
River
Lake, Pond
Stream
Elevation Contours
Drainage Subwatershed
Town Boundary
500 0 500 1000 1500 2000 Feet
SCALE: 1:9000
Data Source: MassGIS, Berkshire Regional Planning Commission, CEI



DR. 5
PL. 100 A

General Notes

1. This map has not been modified from its original version and has been provided in support of the Adams Stormwater Mangement Strategic Plan, June 2003.

DATA SOURCES:

1. This map was generated from a scanned image of the original "Town of Adams, Massachusetts Map of Existing Sewerage System Showing Plan File and Drawer Number" by Camp Dresser & McKee Inc., September 1985. The scanned image was provided to CEI by the Town of Adams Department of Public Works.

No.	Revision/Issue	Date

COMPREHENSIVE
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64 DILLA STREET
MILFORD, MA 01757

TOWN- WIDE SEWER MAP

ADAMS, MASSACHUSETTS

Project: 184–1
Sheet: 1 of 1
DRAWN BY:
CHECKED BY:
Scale: As Shown
Date: 6–5–03

4.0 Stormwater Assessment

A stormwater assessment was conducted to evaluate existing stormwater conditions and related water quality issues in Adams. This included:

- **A Perennial Stream Assessment** to evaluate the condition of the natural stream network made up of numerous perennial streams in Adams and identifies improvements needed at specific sites.
- **A Pollutant Loading Analysis** to determine areas with the greatest potential phosphorous loadings to surface waters. Phosphorous loads are an indicator of potential water quality impacts. The analysis was used to identify areas of concern or "hot spots" in Adams and develop the protocols of the Adams Stormwater Sampling Program to obtain additional water quality data within prioritized areas of concern.
- **A Hot Spot Analysis** through an evaluation of existing water quality data, field surveys, stormwater inspections and the pollutant loading analysis to identify locations in Adams that were suspected of having particular water quality problems. Hot spots are identified as the worst areas needing improvements.
- **A Stormwater Sampling Program** to characterize the water quality of actual stormwater flows in Adams which will help determine needed Best Management Practices.
- **An Illicit Discharge Detection and Elimination Program** to layout a method for finding and correcting illicit discharges, consistent with EPA's Phase II Stormwater Regulations.
- **Recommendations** for stormwater BMPs that the Town of Adams can implement to improve water quality.

These are discussed below along with findings, recommendations, and how they relate to the Phase II requirements.

4.1 Perennial Stream Assessment

A perennial stream assessment, commonly referred to as a stream team survey, is a useful way to assess and evaluate the condition of rivers and streams in a community. Water quality related problems such as bank erosion areas, illicit discharges, and illegal dumping areas can be identified. Water related opportunities, such as enhanced recreational access, can be identified as well. Data gathered during a stream team assessment can help identify sites for such activities as water quality monitoring, river clean-ups, installation of Best Management Practices, and river access. Bank erosion, riparian health, riparian buffer conditions, in-stream obstructions, and potential illicit discharges, spills or leaks were of particular interest for the Town of Adams' stormwater planning project. Another important aspect of a stream team survey is the involvement of volunteers. Engaging volunteers is a way to increase public awareness about a community's natural stream network. An engaged public can then advocate for improved management activities.

A stream team survey was completed for the perennial stream network in the Town of Adams in the summer and early fall 2002. The Massachusetts Riverways Program's training for Stream Teams methodology, also known as an "Adopt a Stream Shoreline Survey," was used. The Hoosic River Watershed Association (HooRWA) coordinated the survey, and worked with Town volunteers and employees and staff at the Berkshire Regional Planning Commission (BRPC) to assess stream conditions and prepare maps showing the findings. Summary results of that assessment are shown below. A copy of the full report, "Shoreline Survey Report: Perennial Streams in the Town of Adams" is contained in Volume 2 – Technical Material.

For the purposes of this assessment, the Adams perennial stream network was divided into the following segments:

- Hoosic River, Section 1, Leonard Street / Route 8 to Cheshire/Adams town line
- Hoosic River, Section 2, Aladco to Leonard Street (Route 8)
- Hoosic River, Section 3, Post Office to Aladco
- Hoosic River, Section 4, Hodges Cross Road to Center Street
- Dry Brook, Hoosic River to town line
- Tophet Brook
- Patton Brook
- Miller Brook
- Southwick Brook
- Pecks Brook
- Hoxie Brook
- Unnamed Brook

Summary Results

Overall, the natural stream network within Adams is an important resource to the Town. The network of tributary streams is also an underutilized asset. In the survey, many beautiful sections were explored that could host walking trails, swimming holes, and fishing spots. Access to many of them is limited, though the Ashuwillticook Rail Trail which follows segments of the Hoosic River in Adams, is a wonderful example of riverside recreational development.

Many of the more remote sections of the Town's streams are lightly used and appear to be in near-pristine condition. At the same time, many stretches of rivers and streams in Adams have been altered and channelized. There was evidence of dumping and discharges to the rivers.

Flood Control Channel

The Hoosic River is channelized by a flood control chute for over two miles through the center of town. Many of the tributaries are also channelized in these concrete structures as they approach the Hoosic River. In many other cases, individuals have attempted to stabilize the banks of tributaries and the Hoosic River using rip-rap, old tires, and retaining walls. Volunteers located many instances of these stabilization efforts to protect property. In many cases these structures are slowly eroding and becoming undermined by the river and streams.

This channelization is problematic in many ways. Although retaining walls might keep an individual piece of property from flooding or becoming damaged, it also increases the rate of runoff, which adds to the flooding and erosion problems downstream, and causes the streams to transport more sediment. The flood control structures, which include concrete bottoms, also severely inhibit the cleansing functions of a river. Because they are inhospitable to aquatic life and water flows smoothly, with little turbulence or aeration, contaminants are not broken down as swiftly as they might in a natural river. Also of concern is the lack of shading and vegetative buffer in these areas. Without shading, the river is prone to excessive heating and cooling, and minimal buffers don't help mitigate many of the problems caused by storm runoff.

Debris and Dumping

Debris and dumping is a major problem in Adams' streams and rivers. The most problematic areas are essentially dumping grounds. Many of these are old sites that contain old pipes, hunks of metal, and old cars and motorcycles. There is also evidence of more recent dumping, which suggests this is an ongoing problem. Volunteers located several dumps in or near streams that need immediate attention. Some of these are beyond the scope of a simple volunteer river clean-up and would require heavy equipment.

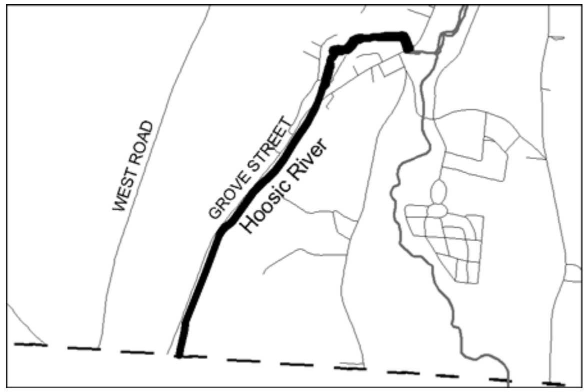
Pipes and Discharges

Many pipes were found that may discharge into the Hoosic River and tributaries. The Stream Team Survey performed a single visit to each pipe. It was therefore difficult to identify which of these were discharging harmful effluent, which were storm drains, and which were inactive or disconnected. Nevertheless, certain pipes had notable scum or discoloration. These were identified as warranting additional investigation.

Segment Summaries

Below are narrative descriptions of the segment summaries with assets, problems, and priority actions.

Hoosic River, Section 1, Leonard Street/ Route 8 to Cheshire/Adams town line



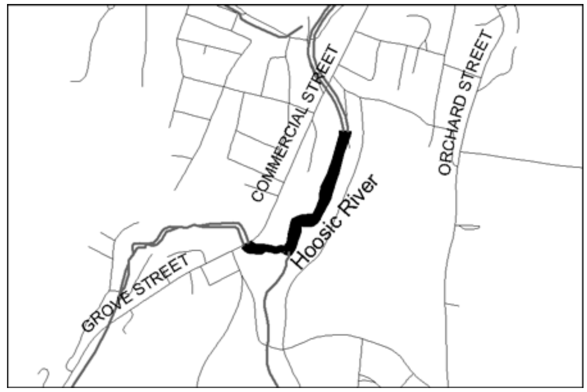
Narrative: After it crosses under Route 8, the river passes near old industrial/commercial sites on the south side. A great deal of trash was observed in this area. The north side is a good distance away from a residential area, where it was extensively shaded. The condition of the river in this area was good. There was strong flow. The river was 1- 2 feet deep in most parts and contained numerous pools.

Where the river crossed under the rail trail, the same conditions existed, although it was not as wooded. The Ashuwillticook Trail follows the stream from the upstream terminus of the section. Route 8 runs on the west side of the river in this area. The land use is residential. There is evidence of trash and home-made rip-rap, including tires in some sections, stabilizing the bank. The Ashuwillticook trail is located on the east side of the river and immediately beyond that another heavily wooded area. There was no agricultural land and no rip-rap. The river takes a nice shape and has some relatively steep banks, approximately 5-7 feet high, along the rail trail. Vegetation and wildlife were not evident when the section was surveyed, but in the summer this section is a fishing destination.

Assets	**Problems**	**Priority Actions**
Visually attractive, with excellent access provided by the rail trail	Trash and debris near Route 8	River clean-up
Fishing		

Hoosic River, Section 2, Aladco to Leonard Street (Route 8)

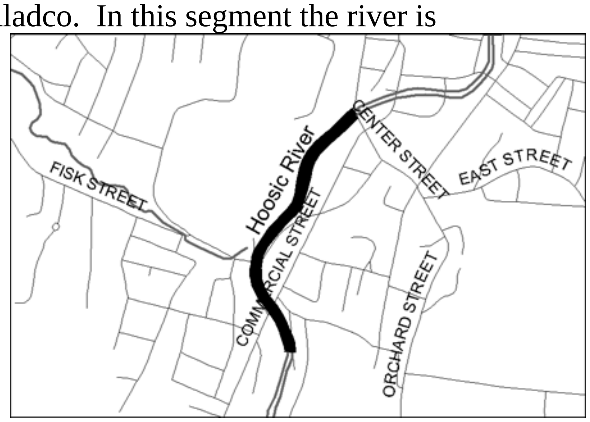
Narrative: This segment begins as the river regains its natural characteristics behind Aladco Laundry on Route 8. The east bank of the river is extremely steep as the river runs behind residences on Bellevue Ave. This area is characterized by heavy trash that may come from the houses above: mattresses, garbage, toys, metal, concrete blocks. This steep bank is severely eroded in sections. The river bends sharply to the west, providing very little access due to high, rocky bank conditions. Extensive vegetation cover was present—including in the middle of the river, which seemed to create pools but not constrict the water flow. Dry Brook enters from the east near a substantial pool created by an abandoned dam. On the west bank is the US Geologic Survey gauging station. Access to the gauging station is by a town right of way behind Grove Street. The area along an abandoned property by Leonard Street is also marred by extensive trash and debris. Apart from the trash, this is an attractive, secluded section of river, characterized by boulders, sand and cobbles, and heavy vegetation on the banks. The river runs clear, at a depth of greater than one foot, with only sparse pockets of foam.



Assets	Problems	Priority Actions
Attractive and secluded	Erosion on steep bank	Evaluate bank
	Lots of trash and debris	River clean up

Hoosic River, Section 3, Post Office to Aladco

Narrative: The segment begins behind the Adams Post Office, and continues, upstream, to Aladco. In this segment the river is channelized in a concrete flood control chute. Overall, the water runs swiftly, and the volume was somewhat high for this time of year due to recent rains. In several spots, leafy debris and grass was seen growing in the cracks in the concrete. There was also a sparse coating of algae. The Ashuwillticook Trail runs parallel to the river on the west side, approximately twenty yards back, providing visual access to the river. Behind the rail trail the land use is forested, or covered with vegetation. Land use on the east side of the river is residential and commercial, until it passes beneath Route 8 near Aladco. Trash is minimal along this segment, and the overall river condition is good. As it passes along the MacDermid Graphics building, the river is inaccessible on the west side. Just north of the MacDermid plant, a small, unnamed tributary enters the main stem from the west. This stream is marked by heavy iron rust/oxide along the bottom of the

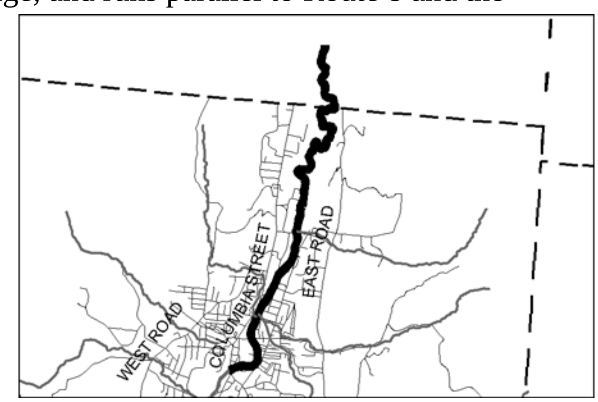


stream. Upstream on this tributary is a small wetland that is heavily vegetated, and largely clean of trash and debris. Nearby, Pecks Brook joins the Hoosic from the west.

The river is inaccessible on the west side as it passes Aladco. Behind the Aladco parking lot is a small roll dam in the chute. Across from Aladco, the walls of the chute become higher as the river makes a sharp bend. On the west side of the river, a small wetland has become established along the bank. Just upstream, the flood chute and the walls disappear. The substrate becomes cobble.
In this section, very little of the river is shaded by vegetation. Many pipes enter the river in this section, and during storm events some of them likely add runoff to the river. Since much of the land in this area is covered by impervious surfaces, the quality of the runoff may be impaired.

Assets	**Problems**	**Priority Action**
Visual access from rail trail	Debris and algae	Investigate water quality during storm events
Small wetland	Storm drains from impervious surfaces	

<u>Hoosic River, Section 4, Hodges Cross Road to Center Street</u>
Narrative: This section begins near McCann Technical School at the Hodges Cross Road Bridge, and runs parallel to Route 8 and the railroad tracks through a wide flood plain used for agriculture into the Town of Adams. From the beginning of the section to the start of the flood control chute, the river meanders a great deal, completing a 270 degree bend in one section. Although the surrounding land is agricultural, the river is shaded through much of this section, and there is heavy vegetation on the banks— both willows and brush.



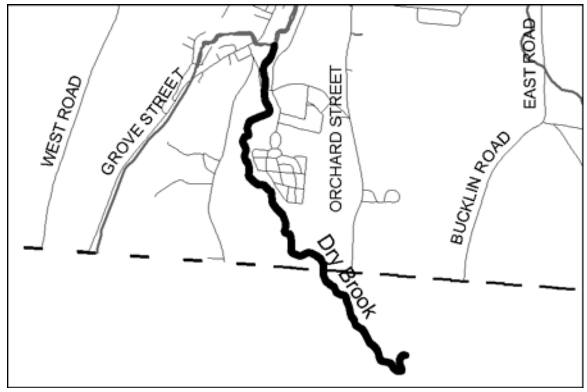
Near roads and access points, trash and debris were found. A ladder, cement blocks, mattress, iron beams and appliances were all found near the beginning of the section. Also, a cable used to support a high tension electricity tower has trapped a large amount of debris that has formed a dam that impedes flow near the Zylonite substation. Erosion was also well-documented. In several areas the silty clay banks were eroding into the river. In other spots, there was evidence of attempts to stabilize the banks with rip-rap and concrete blocks. As the river approaches downtown Adams, it becomes channelized into a concrete flood control chute which prevents access to the river.

Several pipes protrude in this section, the most notable being the Adams Wastewater Treatment Plant, which had a noticeable odor. Downstream, a milky discharge entered from a canal on the west side of the river—this is likely calcium carbonate from the SMI plant. Overall, this is a pleasant section of river, with potential for canoeing, though access points are quite limited. Fish and other aquatic life were spotted, and there were signs of large mammals using the river in this area. Much of the substrate consists of cobble, with occasional boulders and smaller sediment in the pools. Though the segment is primarily quick-water, there are occasional small rapids that could be negotiated in a canoe.

Assets	**Problems**	**Priority Actions**
Lots of shade, some areas good for picnicking	Water treatment plant is odorous	Evaluate water treatment plant discharge
Stream bed variable	Milky discharge within 200' of treatment plant steps	Evaluate Lime Street pipe discharge
Signs of animal life	Some foam near debris jam/island	Clear debris-trapping cable and debris jams to facilitate boating
Good for recreational boating and tubing in most locations	Low water upstream of plant (and crayfish a different color there)	Secure access points for boating
	Cow manure on Barnett's farm	
	At Lime Street bridge, dirty runoff from pipe	
	Past the high tension power lines– a cable is in the stream tangled in woody debris	

<u>Dry Brook, Hoosic River to town line</u>

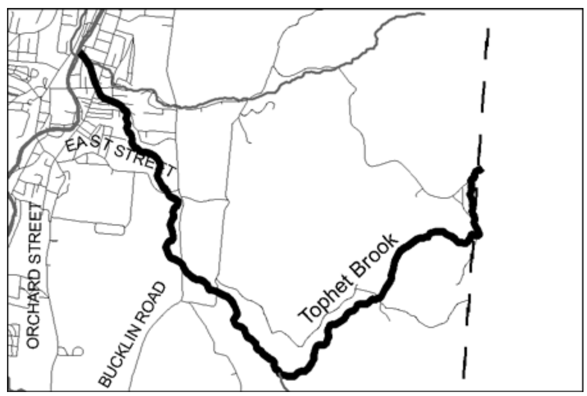
Narrative: Dry Brook is a beautiful stream, surprisingly debris-free in the way of natural construction and trash even as it passes through residences off of Leonard Street up to the cemetery. Near the cemetery it's fairly secluded on both sides. There is a steep ravine coming down from the cemetery, with some erosion, but the other side has a nice flat bank that reaches 20-30 yards out at some points with intermittent streams that feed in from the north. A nice swimming hole exists about halfway up through the cemetery that is between seven and eight feet deep. The stream is pretty wide in some spots, mostly a foot deeper or more. The stream is rocky, with boulders, cobbles and gravel. Water was clear and high quality, without odors. Frequent pools make this a particularly attractive section



Asset	Problem	Priority Action
High water quality, pools	Some trash	Clean up is a low priority

<u>Tophet Brook</u>

Narrative: Upstream of East Hoosac Street, Tophet Brook begins as a series of wetlands in the Savoy Mountain State Forest. Beaver activity was noted in several locations, though no beavers were observed. The river winds slowly through wetlands, agricultural land, and woods. Foam was observed in several locations at the edges of pools. Some siltation was also noted. The stream passes under a driveway through a culvert here, but downstream, the brook is remote and seems far from human activity. Below the driveway, the stream enters the deciduous woods in a steep valley, and has primarily a cobble bottom, with occasional bedrock portions. As the stream becomes steeper, it trickles through boulders, creating sizeable cascades. Just above High Bridge, some erosion was observed on the steep banks, and a debris jam had formed in the river.



The most spectacular site on Tophet Brook is the High Bridge Cascade. The cascade lies where a tributary enters from the west, in the area known as Little Egypt. Access to the stream here is difficult, since the bridge has been inoperable for many years. Nevertheless, this would be a prime parcel of land for protection and public access. The road that has replaced High Bridge is gated, making the pasture-land on the south side of the stream inaccessible to the public. Below High Bridge, the foundation of a millrace was noted, and nearby, a small tributary entered that was highly turbid—it seemed to be carrying a great deal of sediment from the gravel road on the north side of the stream. Much of the land on the north side of the river is in use as pasture. Upstream of the Patton Brook confluence, Tophet Brook tumbles over a series of large limestone ledges, and briefly passes through pasture land (a barbed wire fence is strung across the stream).

Immediately below where Patton Brook enters, the stream is spanned by a wooden bridge. It remains primarily strewn with cobbles and boulders, with periodic bedrock ledges until it becomes channelized in the flood control chute, approximately .75 miles above its confluence with the Hoosic. Until it reaches Walling Road, the south bank is primarily wooded with hemlocks, and the north bank is pasture and residential land. Near a man-made swimming hole, an island has formed and erosion was noted. Many blow-downs were present downstream, along with human debris, and even a car in the stream. There is a small vegetated buffer in this section, and in several spots livestock have access to the river. The East Road Bridge has an opening that is too small for Tophet Brook at high flows, and it has backed up the stream, resulting in gravel deposition above the bridge.

Below Bowens Corners, the river enters a section with steep banks, where it is well- shaded by willows and other trees. Although there is siltation in sections, in others, the river has scoured bedrock, and has created an outstanding swimming hole and a small waterfall. Many other cascades and deep pools exist, separated by sections of cobbles and gravel. From Bowens Corners to the start of the flood chute would be an excellent candidate for trail access—as of now, no formal access exists.

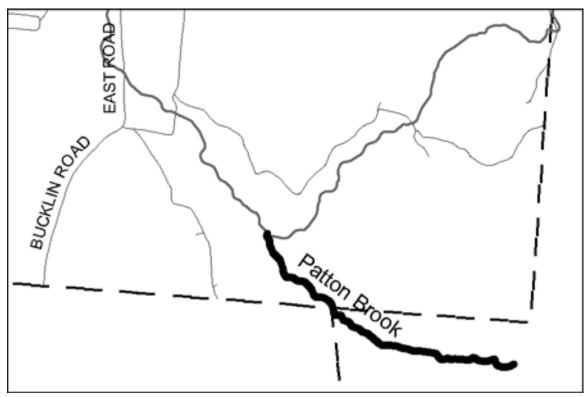
Above Summer Street, Tophet Brook becomes channelized within low concrete walls with a concrete bottom. Although the area is densely populated, the right bank is about fifty percent shaded. The stream runs under Summer Street and a parking lot before it re-emerges near the Miller Brook confluence. In this section, Tophet brook seems to carry much less water than it did upstream—perhaps it is losing water in the chute. Near its confluence with the Hoosic River, cobbles, vegetation and debris were noted in the flood control chute. Just south of the confluence is a church-owned park that might find more use as a municipal park.

Assets	**Problems**	**Priorities**
Gorgeous cascades and pools, including a downtown swimming hole and High Bridge	Road runoff upstream of Tophet Brook Farm	Mitigate sedimentation caused by road runoff near Tophet Brook Farm

Assets	Problems	Priorities
falls and pools		
High Bridge stonework	Near Walling Road, cows in stream; on Tophet Brook Farm, cows in riparian zone	Investigate fencing cattle out of stream
Church-owned park at confluence with Hoosic	One “green discharge” pipe	Investigate public access to Cascade
Trout	Bridge too small and askew of Brook at East Road	River clean-up on north bank near East Road.
	Flood chute inhospitable to aquatic life	Investigate trail access below Bowens Corners
	Trash and debris in river	

<u>Patton Brook</u>

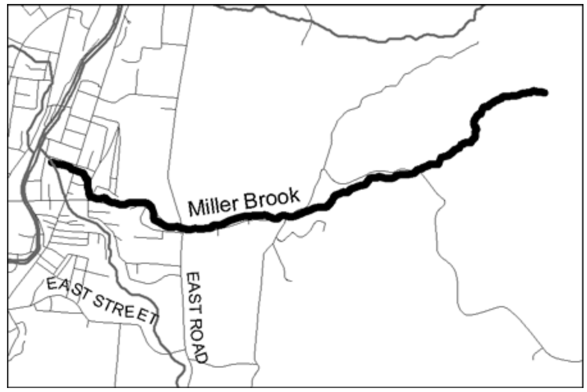
Narrative: Patton Brook originates high in the hills, and is largely in pristine condition. Most of its length is shaded by deciduous forest, with several patches of hemlock (perhaps 98% of the bank is shaded). The streambed is primarily cobbles, with gravel in the pools separated by miscellaneous boulders. In one spot, flow was blocked by a natural log jam. Although largely undisturbed, an old logging road parallels the stream on the east side, and there looked like active grazing near the tributary stream. Several small tributaries run through pasture land, and might carry sediment during storm events.



Assets	Problems	Priority Actions
Very picturesque	Evidence of cows	
Trout		
Some cascades/pools		
Heavily forested		

<u>Miller Brook</u>

Narrative: The stream begins at a wooded spring in a swampy area at approximately 550 feet of elevation. Flow is minimal in the small channel as it flows through a thickly forested area, and becomes steep. This section is characterized by large boulders. After a small tributary joins from the northeast (which on the day of the survey carried more water than Miller Brook), flow becomes steadier, and gravel bottoms in the many pools are visible through the clear water. After the brook passes under East Hoosac Street, the land is no longer primarily forested, the river bed became wider and bank erosion was visible in several locations. There was also trash and debris in this section of river.

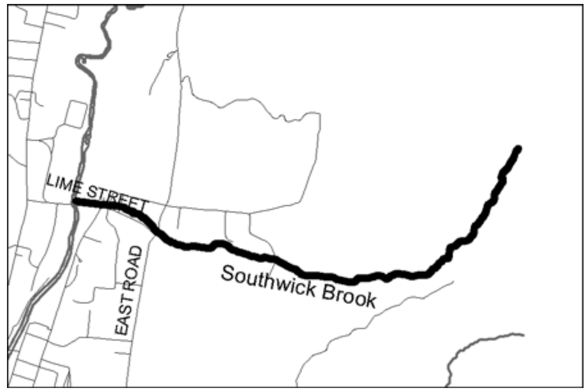


At the East Street Bridge, the river is channelized, and the bank has been stabilized by rip-rap and rocks on the west side of the river downstream of the bridge. Several pipes were noted at this location. Below the bridge the stream morphology returns to a more natural step-pool state, and once again becomes forested with deciduous trees. At approximately 270 feet elevation, banks become quite steep, and houses are built close to the stream. Just above Richmond Street, the stream becomes channelized by a flood control chute. It is shaded in places and open to the sun in others. Below Richmond Street some vegetation can be observed within the chute, and many roof drains empty into the river. Despite a rainfall event the day prior to the survey, there was no flow through this section. Flow is re-established downstream, and below Summer Street there are natural cobbles in the chute and vegetation. Miller Brook soon flows into Tophet Brook. (Note: It rained the night before the stream was surveyed. Despite this, the flow was observed to be no higher than normal.)

Assets	**Problems**	**Priority Actions**
Step/pool morphology – pretty. Clean, clear water	Steep driveways yield sediments in runoff	Prevention of street/stormwater runoff pollution
Little erosion despite steep banks	Flood control chute inhospitable to aquatic creatures	flood chute remediation
Reports of trout	Some garbage	River clean-up

<u>Southwick Brook</u>

Narrative: Southwick Brook begins as a small stream, flowing out of the Savoy State Forest, and the survey began where Spring Road crosses the brook, east of Adams. Through the first part of this section, the stream runs through the woods in a deep, scenic gully, trickling over and between large boulders. Some erosion was noted in this section

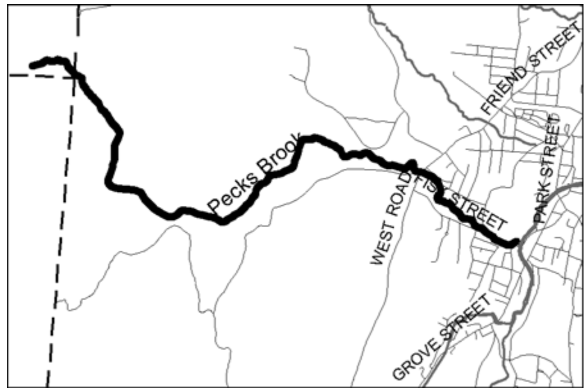


due to steep banks. One large concrete wall was noted near the stream bank. Downstream, a barbed wire fence paralleled the brook. A gravel road, maneuverable by a four wheel drive vehicle is able to cross the river. Nearby was a cache of trash bags full of debris. Where Southwick Brook crosses under East Road, it is channelized beneath a stone bridge, with a culvert entering from one side.

Downstream, the brook changes in character, and is channelized in many places with concrete, stone rip-rap and even old tires. In one section, trees have fallen into the river, which might impede flow at higher water. Along Lime Street, many small bridges cross the stream, primarily to permit driveway access to houses on the north side of the brook. Stream stability is clearly an important issue in the lower section of Southwick Brook—there is a great deal of erosion, and property owners have attempted to stabilize their banks by any means possible. There are many reports of property damage and flooding during high water. Stormwater seems to be more a problem of quantity than quality, since there are no suspect pipes, and land use is primarily forested and residential, rather than impervious. The bottom section was nearly dry on the day this was surveyed.

Assets	**Problems**	**Priority Actions**
Upper section very pretty cascading stream	Extensive erosion and rip-rap in lower section	Investigate strategies to stabilize banks and prevent erosion
High water quality	Bridges, and channelization may impede flow	Investigate strategies to prevent extensive flooding
	Some large debris – cars, metal, fallen trees from Springhill Farm downstream	Clean-up
	No public access	Investigate public access points
	Dry from Charles Street to Hoosic	
	Near Charles Street, a collapsing retaining wall and lots of industrial trash	
	Algae near Arbor Street	

Pecks Brook



Narrative: Pecks Brook was surveyed from the Hoosic River upstream. Dead fish were noted, as well as some litter and stone walls falling into the river. Erosion was observed under the bridge, along with Tyvek material and old, non-functioning pipes. In this segment of the river the streambed began as a flood control chute. Upstream it was primarily boulders and cobbles. Green algae and mosses seemed more prevalent here than in the upper headwaters. Near Fisk Street an old dam is present, with orange deposits that could be caused by rust from iron at the dam. Litter was observed here. Also in this area an old metal fence was observed, with trees falling into the river and bank erosion present. An odor was observed between Fisk Street and West Road. Just upstream the river splits into two branches.

On the South branch, there was evidence of deer. Several pipes were present. A cement spillway and orange scum were also observed. On the west side of West Road there was a sizeable log jam, but upstream the brook was in a more natural state. Bedrock ledges created habitat for fish, although "pool scum" was also noted. Above this area, a pipe crossed the river, but it did not flow into the stream.

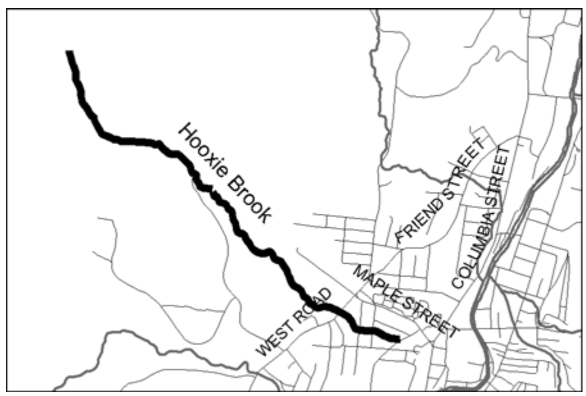
On the north branch, the stream crossed West Road, where a wall on the Linscott property was failing caused by erosion. A dam on the property is filled in with silt adjoining a wetland area, which seemed degraded by silt. Further upstream is Peck's Falls, a well known scenic landmark with trail access. No litter was observed in this area. Where the north branch splits, one tributary drains the Gould farm. There is a possibility that agricultural runoff might have a negative impact on stream quality. The other tributary drains the western area along the Gould trail—this branch seemed to have much less moss and algae than the Gould farm branch.

Assets	**Problems**	**Priority Actions**
Fisk Road Dam could serve as a recreational asset	Undermining at bridge near McDermott Graphics	Establish formal access points to waterfalls and pools
Trout	Lots of iron pipe. At the Dedek Mill, old water lines?	

Assets	Problems	Priority Actions
Shady	Large debris near Fisk Road Dam	Remove debris near Fisk Road Dam
Water-worn bedrock	Siltation behind dam with flow behind wing walls	
Pecks Falls and other waterfalls	Orange pool below dam	
Swimming hole upstream of Linscott dam (12' deep)		
	Erosion near West Road (also affecting dam)	Remediate erosion near West Road
	Tube in bridge closed	
	Cows in stream	

Hoxie Brook

Narrative: Hoxie Brook begins on the forested slopes of Mt Greylock and runs east, parallel to Thiel Road, and crosses Friend Street where it enters a residential section of Adams. Through much of the commercial center of town it is channelized and underground, emerging briefly near the new visitor center before it runs beneath a parking lot and re-emerges near its confluence with the Hoosic River.



The upper section, between Greylock Glen and Forest Park Ave is marked by heavy erosion, particularly in the section below West Road. One culvert was noted in this section, as was the dam at Forest Park, which was severely eroded and caving in. This section is primarily forested, though in sections there is primarily heavy brush lining the river banks. Land use in this section is agricultural and residential as well as undeveloped, and runoff from the orchard and farm may be a concern. Two wetlands exist in this section north of the stream, elsewhere, the river bottom is mixed, but predominantly cobbles. Wildlife abounds, and a woodpecker and kingfisher were spotted, as well as evidence of a black mink. This section was assessed as "very eroded."

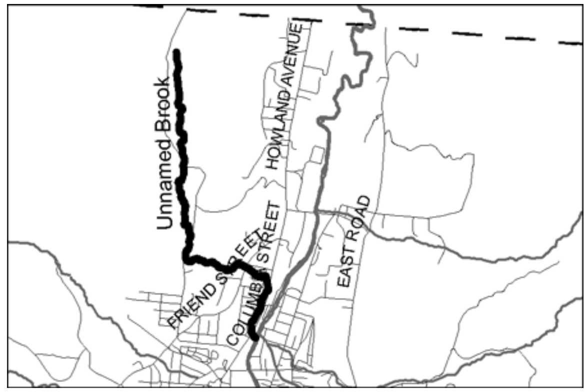
Between Hoosac Street and the Ashuwillticook Trail several locations merit mention. Near Hoosac Street a short stretch of the stream is daylighted, and supports healthy wetland vegetation on the banks of the stream. Nevertheless, this area traps debris and trash. Immediately upstream, near the entrance to the Meehan Mill, the brook is channelized in a culvert for approximately sixty feet. Upstream, behind Interior Alternatives the brook is daylighted for approximately 25 feet. This area needs immediate attention, since there are two sinkholes in the pavement, and the surface is buckling. Although it was dry on the day the survey took place, the surveyors were concerned about runoff from the parking lots and Hoosac Street during storm events. Additionally, many pipes were observed entering the stream. In this section, a small man-made dam has created a small, three foot deep pool. This section was characterized by gravel, cobble and sand substrate. This section was assessed as "fair."

Between Hoosac Street and the convergence of Hoxie Brook and the Hoosic River, the river flows through a broad concrete culvert topped by pavement. Abutting the Hoosic River flood chute, Hoxie Brook emerges in a naturally vegetated stream bank. The daylighted sections appear to have lush, healthy riparian vegetation. This section was assessed as "very good." The river abuts town and Massachusetts Department of Conservation and Recreation land that could be used to provide access for walking trails.

Assets	**Problems**	**Priority Actions**
Shaded	Stream is underground then daylighted then back underground again and again	Investigate educational signage for mini-wetland near Hoosic River confluence
Historic dam at Forest Park Ave.	Meehan Mill – lots of debris, problems with substrate	River clean up in problem sections
Upstream of Forest Park Ave., the valley is deep and narrow and the feeling is "mysterious, green, pristine"	Erosion at the new bike trail, east of the new visitors' center	Address erosion concerns in various locations
Mini-wetland near Hoosic River confluence	Upstream of Forest Park Avenue a dam is entirely silted in.	Evaluate Forest Park dam
	Sinkholes and buckling in pavement behind Interior Alternatives	Repair pavement, investigate daylighting near Visitors Center

Unnamed Brook

Narrative: Unnamed Brook begins as an intermittent stream above the Specialty Mineral International (SMI) property north of Adams. The upper section is primarily pools and riffles, nearly choked with vegetation and boulders. On the SMI land there is informal access. Gradient increases after it crosses under Notch Road through a culvert by a gate. A dam was observed below the culvert, followed by a series of small cascades. The nearby land is more residential here, but the stream is still in the woods. Just west of Friend Street the river runs through a concrete channel beneath a garage. Below this it is channelized in a ditch, and makes a sharp bend north at Pine Street. Along the west side of the baseball field, the river is shaded, until it disappears into a pipe underneath Howland Ave. It then runs in a ditch beside Route 8 North and disappears in a pipe before Lime Street. At this point, it became impossible to locate Unnamed Brook, though it is likely it joins the Hoosic River nearby.



Assets	Problems	Priority Actions
Quiet, pretty brook	Unclear where it enters the Hoosic	Locate confluence with Hoosic River

4.2 Pollutant Loading Analysis

A Quality Assurance Project Plan (QAPP) was developed to sample stormwater discharges in Town to assist in BMP design. The QAPP included a pre-screening land use pollutant loading assessment to identify areas anticipated to have higher pollutant loadings. This assisted with selection of sites for sampling and BMP design. The pollutant loading assessment is summarized below with detailed information included in the September 24, 2003 QAPP in Volume 2 of the Stormwater Management Strategic Plan.

The Town was divided into 26 drainage areas or sub-watersheds, using existing topographic and drainage maps. Land uses were assigned an impervious value, based on published literature and previous work undertaken by Berkshire Regional Planning Commission (BRPC).[1] Pollutant loadings were calculated for each sub-watershed using a Simple Method for estimating urban storm pollutant export (Schueler, Thomas. R., 1987). Forested areas were not included in the calculations to better target urban land use. Phosphorous was used as the pollutant indicator as it is straight forward to calculate and is the limiting nutrient in fresh water systems. The concept is that more developed, impervious areas will contribute higher levels of pollution, which is true for most pollutants.

The top ten drainage sub watersheds were ranked in order of priority based on annual total phosphorous loadings, as shown in **Table 4-1**. Land uses and sub watersheds with numerical ranking are shown in **Figure 4-1**.

Table 4-1. Phosphorous Loadings for Top Ten Sub watersheds

Rank	Sub watershed	Total Annual Phosphorous (pounds)
1	B	368.4
2	L*	285.7
3	C*	224.1
4	R	211.3
5	G	189.5
6	M	171.2
7	W*	170.2
8	H*	154.8
9	Z	154.8
10	O	151.6

*Sub watershed contains one or more QAPP stormwater sampling sites.

This assessment, combined with field assessments and historical data, supported sampling in more specific drainage sub watersheds (see Section 4.3), specifically, C, H, L and W. Sampling data is discussed in Section 4.4.

4.3 Hot Spot Analysis

CEI conducted field inspections of priority drainage sub watersheds and areas of concern previously identified by Town staff and BRPC as “warm spots” for water quality concerns. Drainage sub-watersheds, stormwater outfalls, receiving waters, and associated land uses were inspected to identify the best stormwater sampling sites that would be representative

[1] Berkshire Regional Planning Commission. 2000. *Stormwater Assessment in the Hoosic and Housatonic Watersheds.*

of the top pollution areas within Town. The database of field notes and potential stormwater sample locations are discussed more thoroughly in the stormwater QAPP and the Adams Illicit Discharge Detection and Elimination (IDDE) Plan (see Section 4.5 and Volume 2 Technical Materials of the Stormwater Management Strategic Plan).

Based on this information and analysis, ten water quality hot spots were identified and are summarized in **Table 4-2** below.

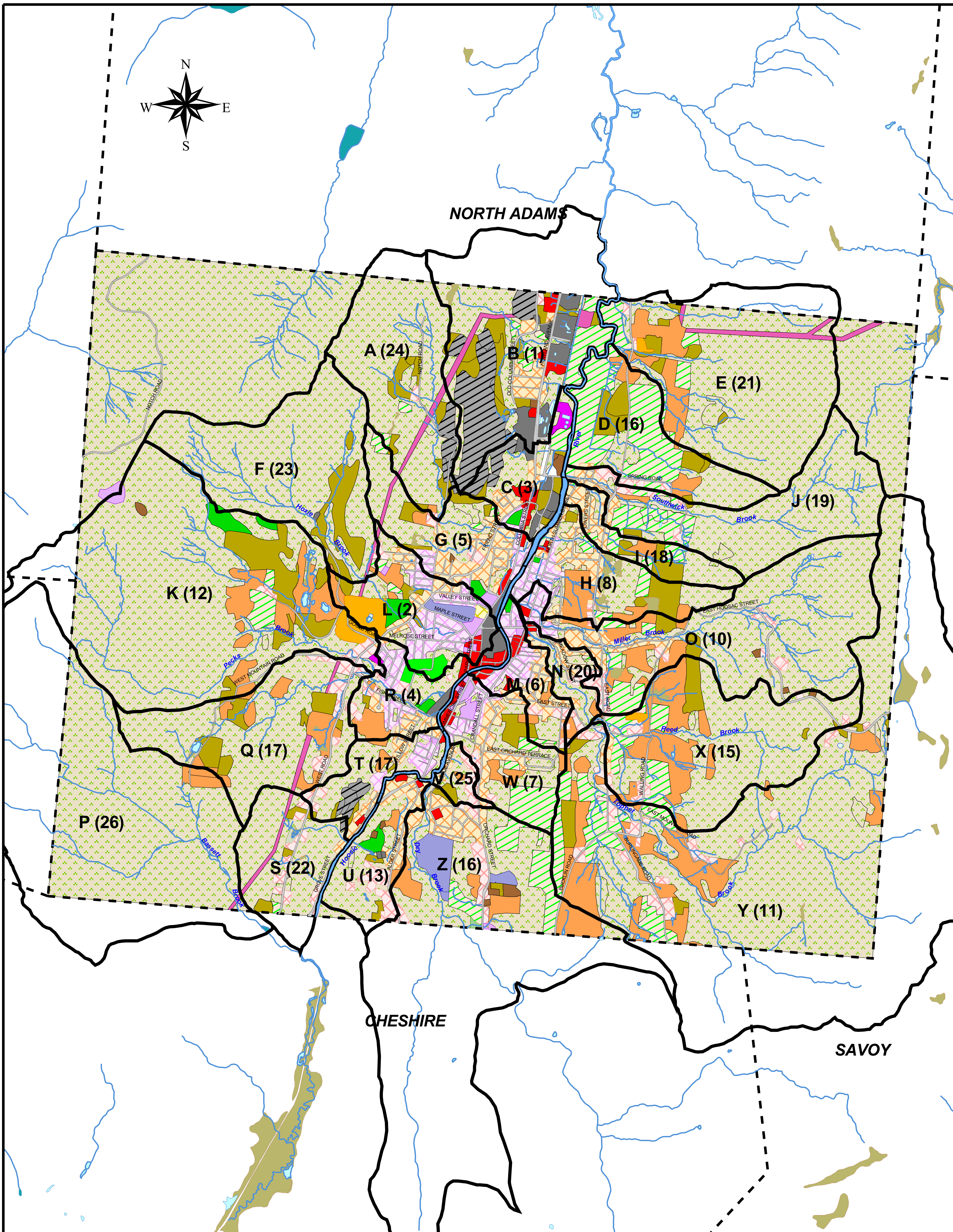
Table 4-2. Water Quality Hot Spots in Adams

Site #[1]	Site Locus[2]	Reason for Concern
1	Peck's Brook/Hoosic River at MacDermid Mill	Large impervious surface area. Unidentified pipes into river, sewer outfall to Hoosic River confirmed during IDDE activities.
3	**Hoosic River along Commercial Street near U.S. Post Office**	Largest contiguous impervious surface area in Town.
5	Hoxie Brook at Melrose/ Gilead Streets	Abandoned dump along stream bank. Possible contaminants leaching from rusted barrels. Significant bank erosion and culvert damage.
6	**Hoxie Brook/Hoosic River at Visitor Center and Depot St./Hoosac St.**	Large impervious surface area in downtown Adams. Hoxie Brook travels underground for ~4,500 feet. Old floor drain connections from former autobody shop to Hoxie Brook confirmed during IDDE activities. Undermining of culvert beneath former autobody shop. Bank erosion and stream degradation from Visitor Center to Hoosic River.
8	Upper Miller Brook at Hoosac Street	Roadside erosion, heavy sediment deposits, runoff directly into stream.
11	Hoosic River at "Aladco" Plant	Possible illicit discharge at laundry facility. Outdoor vehicle washing observed.
14	Reed Brook at Walling and East Street	Road runoff and erosion along East Street to Reed Brook.
15	**Pine Street Brook at Renfrew Street**	Apparent water quality degradation during storm events – often turbid and milky at times.
16	**DPW Facility at North Summer Street**	Drainage swale erosion and sediment deposits in close proximity to the Hoosic River.
17	**Glen Street west of Crandall Street**	Erosion of steep swale along road.

Notes:

1. Most site #s corresponds with warm spots (not necessarily priority) identified during previous field assessments, as discussed in the Adams Stormwater QAPP and IDDE Plan. Bold sites are associated with stormwater sampling sites.
2. See **Figure 4-2** for site locations.

The locations with the greatest potential for BMP implementation were selected for stormwater sampling, since a project goal is to develop future stormwater remediation projects designed to significantly improve water quality with follow-up stormwater remediation projects. In selecting sites, sample locations were eliminated if there were no opportunities for



LEGEND

Land Use

- Cropland
- Pasture
- Forest
- Wetland
- Mining
- Open Land
- Partial Recreation
- Water Based Recreation
- Residential (Multi-family)
- Residential (Less than 1/4 acre lots)
- Residential (1/4 to 1/2 acre lots)
- Residential (Larger than 1/2 acre lots)
- Commercial
- Industrial
- Urban Open
- Transportation
- Waste Disposal
- Water
- Powerlines
- Golf
- Marina
- Urban Public
- Cemetery
- Orchard
- Nursery

Hydrography

- Reservoir
- Wetland
- River
- Lake, Pond
- Stream, Brook

- Drainage Subwatersheds
- Town Boundary
- (1) Represents Subwatershed Priority Rank

2000 0 2000 4000 6000 Feet

SCALE: 1:40000

Data Sources: MassGIS, Berkshire Regional Planning Commission (BRPC), CEI

Figure 4-1

Land Use and Subwatershed Ranking

Adams, Massachusetts

Comprehensive Environmental Inc.

cost-effective BMPs, due to land constraints or ownership. A database of Town-owned lands, open space, and recreation lands was prepared from the Town's GIS (digital mapping system) to assist in screening potential sites for BMPs.

4.4 Stormwater Sampling Program

A stormwater sampling program was developed to characterize urban stormwater in Adams and identify priority sites for future stormwater remediation projects to reduce pollutant loadings associated with nonpoint sources of pollution. This section discusses the results of the stormwater sampling program.

Stormwater Sampling Results Summary

The results of the stormwater sampling program are summarized below, followed by a discussion of the QAPP, data by analytical parameter and stormwater sampling event characteristics as they affect the data.

- Stormwater sampling was conducted from March 31, 2004 to November 24, 2004 with the results presented in **Table 4-3**.
- Laboratory data sheets are provided in **Appendix 4B** and field inspection logs are provided with the full QAPP in Volume 2 Technical Materials of the Stormwater Management Strategic Plan.
- The bacteria results for all sample locations are very high at times, indicative of sewage.
- Total suspended solids results are not unusual for stormwater and total phosphorous results are typical for urban areas.

QAPP Summary

The methodology and details of the sampling program are available in the September 24, 2003 QAPP (See Volume 2 Technical Materials, Stormwater Management Strategic Plan). A brief overview of the 2004 sampling program is provided in **Table 4-4**. Current information for the Hoosic River indicates that water quality is impaired due to bacteria (pathogens, MA DEP 303d List) and nonpoint source pollution associated with urban runoff. The goal of the sampling program was to monitor stormwater discharges to the Hoosic River during "first flush" conditions at priority sites to obtain a better understanding of pollution impacts in Adams and the improvements that should be undertaken to address these impacts.

Stormwater sampling was completed by volunteers from the Adams Community Development Department and the Department of Public Works, as well as staff from the Berkshire Regional Planning Commission. Sampling teams were trained for stormwater sampling protocols in accordance with the QAPP. As the sampling program progressed, data and field sheets were reviewed by the QAPP Project Manager and QA/QC Officer for validation, verification, and reconciliation with data quality objectives. This included correspondence with the field team leader, laboratory, and DEP to ensure that samples were collected and analyzed in accordance with the QAPP. Any discrepancies were noted and discussed/resolved prior to the next sampling round. Examples include mislabeling sample lids from the chain of custody to the laboratory report and missing information for field data sheets that were later resolved.

<table>
<tr><th colspan="4">Table 4-4. Stormwater Sampling Program Overview</th></tr>
<tr><th>Sample ID & Site Location[1]</th><th>Sub watershed Location & Sample Drainage Area</th><th>Site Description</th><th>Laboratory Sampling Parameters & Frequency</th></tr>
<tr><td>SW-1
Renfrew & Columbia Streets</td><td>C (891 acres)</td><td>In-stream sample location downstream of the culvert that passes beneath Renfrew and Columbia Streets.</td><td rowspan="5">Parameters
Fecal coliform, E. coli, Total Phosphorous, Total suspended solids

Frequency
Four storm events with no rain 72 hrs prior to sampling.

Samples were collected during first flush conditions.

Sample times were calculated for each location based on storm flow travel times in each watershed.</td></tr>
<tr><td>SW-2
Adams DPW Facility</td><td>H (193 acres)</td><td>In-stream/stormwater discharge at the Adams DPW Facility downstream of the confluence of the two pipe discharges.</td></tr>
<tr><td>SW-3
Hoxie Brook</td><td>L (1,014 acres)</td><td>In-stream sample location on Hoxie Brook downstream of the rail trail crossing just upstream of the adjacent industrial parking lot.</td></tr>
<tr><td>SW-4
Adams Post Office</td><td>W (96 acres)</td><td>Sample location is a stormwater discharge pipe to the Hoosic River at the U.S. Post Office parking lot.</td></tr>
<tr><td>SW-5
Glen Street</td><td>W (64 acres)</td><td>Sample location is a concrete swale discharge before it goes underground in Glen Street.</td></tr>
</table>

Notes: 1) Stormwater sampling locations are shown on **Figure 4-3**.

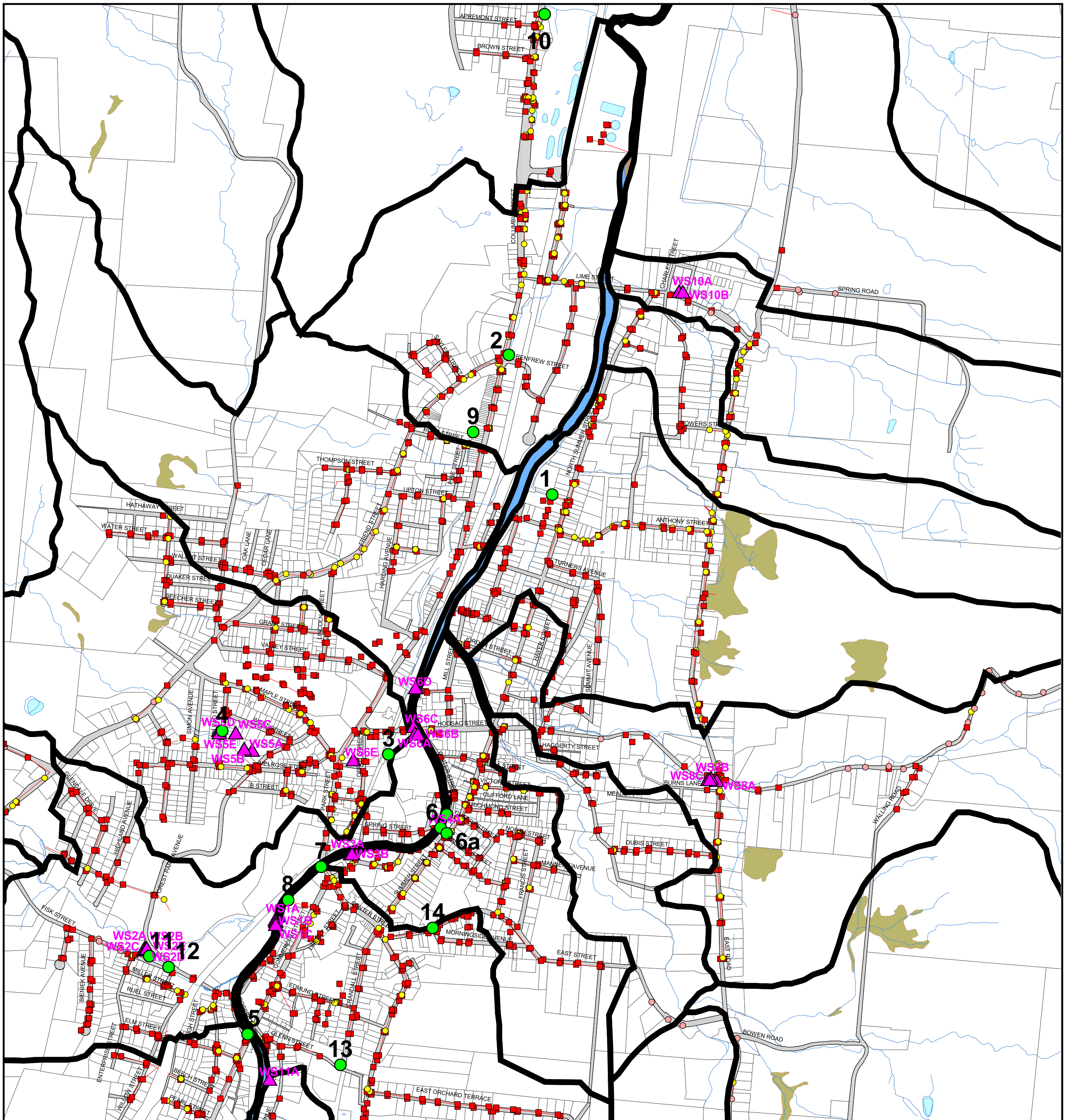
Two modifications to the QAPP were made during the sampling program: 1) changes in the sample collection methods (e.g., elimination of buckets); and 2) collection of samples during extended hours beyond the normal work day and at night to allow more opportunities for stormwater sampling events. Documentation for these QAPP modifications is provided in Volume 2 Technical Materials of the Stormwater Management Strategic Plan with the September 24, 2003 QAPP. Overall, most of the QA/QC criteria were fulfilled for stormwater sampling events and laboratory analysis criteria. However, some variations occurred during some sampling events, as follows:

- First flush timing was delayed for field duplicates (Event # 1);

Table 4-3. Adams Stormwater Sampling Results Summary

	Sampling Event 1 - March 31, 2004							Sampling Event 2 - August 12, 2004								Sampling Event 3 - September 17, 2004						Sampling Event 4 - November 24, 2004					
Sample ID & Location	**SW-1**	**SW-2**	**SW-3**	**SW-4**	**SW-5**	**SW-6**	**SW-5**	**SW-1**	**SW-2**	**SW-3**	**SW-4**	**SW-5**	**SW-5**	**SW-6**	**SW-6**	**SW-1**	**SW-2**	**SW-3**	**SW-4**	**SW-5**	**SW-6**	**SW-1**	**SW-2**	**SW-3**	**SW-4**	**SW-5**	**SW-6**
	Renfrew & Columbia Streets	Adams DPW Facility	Hoxie Brook	Adams Post Office	Glen Street	Glen Street Duplicate	Lab Duplicate for Glenn Street	Renfrew & Columbia Streets	Adams DPW Facility	Hoxie Brook	Adams Post Office	Glen Street	Lab Duplicate for Glenn Street	Field Duplicate	Lab Duplicate for Field Duplicate	Renfrew & Columbia Streets	Adams DPW Facility	Hoxie Brook	Adams Post Office	Glen Street	Glen Street Duplicate	Renfrew & Columbia Streets	Adams DPW Facility	Hoxie Brook	Adams Post Office	Glen Street	Duplicate
Analytical Parameters																											
Fecal Coliform (colonies/100 mL)	160	5,300	110	390	200	180	190	>300,000	72,000	56,000	-	61,000	58,840	80,000	-	86,000	75,000	160,000	53,000	91,000	80,000	600	700	3,100	1,900	-	-
e. Coli (colonies/100 mL)	60	4,100	90	350	180	170	170	>250,000	54,750	38,730		43,520	52,000	72,700	-	77,000	68,700	120,300	46,100	77,000	72,700	400	500	2,600	1,200	-	-
Total Suspended Solids (mg/L)	118	410	45	66	50	50	51	270	110	196		44	-	66	65	8	6	2	1	1	1	59	75	15	68	-	-
Total Phosphorous (mg/L)	0.228	1.014	0.117	0.276	0.124	0.122	0.125	0.772	0.417	0.556		0.560	0.561	0.403	-	0.203	0.227	0.211	0.218	0.201	0.187	0.21	0.34	0.07	0.26	-	-
Sampling Event Notes																											
Designated Collection Time After Flow is Observed	24 Min.	18 Min.	20 Min.	12 Min.	16 Min.	-	-	24 Min.	18 Min.	20 Min.	Sample not collected, sampling device lost in river.	16 Min.	-	-	-	24 Min.	18 Min.	20 Min.	12 Min.	16 Min.	-	24 Min.	18 Min.	20 Min.	12 Min.	Sample not collected, late afternoon sampling event.	Sample not collected, late afternoon sampling event.
Time Flow was Observed	9:46 AM	9:45 AM	9:54 AM	9:28 AM	9:30 AM	-	-	9:50 AM	-	10:00 AM		9:44 AM	-	-	-	-	-	2:00 PM	2:00 PM	2:10 PM	2:10 PM	3:45 PM	-	4:00 PM	4:00 PM		
Sample Collection Time	10:15 AM	10:27 AM	10:15 AM	9:40 AM	9:46 AM	10:00 AM	-	10:15 AM	10:05 AM	10:20 AM		10:00 AM	-	-	-	2:25 PM	2:15 PM	2:20 PM	2:12 PM	2:25 PM	2:28 PM	4:04 PM	3:56 PM	4:15 PM	4:10 PM		
Time Between Start of Flow and Sample Collection	29 Min.	42 Min.	21 Min.	12 & 19 Min.*	16 Min.	-	-	25 Min.	-	20 Min.		16 Min.	-	-	-	-	-	20	12	15	-	19	-	15	10		
Temp (^oC)	5	4.5	4	3.5	4	-	-	19	22.5	-		19	-	-	-	19	21	18	22	20	20	8	9.5	6.5	8		
Water Level/Flow	Normal	High	High	High	-	-	-	High	High	Normal		-	-	-	-	High	High	Normal	Normal	Low	Low	High	High	Normal	Normal		
Turbidity Observations	Cloudy	Very Cloudy	Cloudy	Very Cloudy	Cloudy	-	-	Very Cloudy	Very Cloudy	Cloudy		Clear	-	-	-	Cloudy	Cloudy	Cloudy	Cloudy	Cloudy	Cloudy	Very Cloudy	Cloudy	Cloudy	Clear		
Odor	None	None	None	None	None	-	-	None	None	None		None	-	-	-	None	None	None	None	Musty	Musty	None	None	None	None		
Other Relevant Observations	None	None	Litter	None	Some Trash	-	-	Trash	Grass Clippings	None		None	-	-	-	Litter	None	Trash	None	Leaves, Some Trash	Leaves, Some Trash	None	None	Trash	None		

Notes:
*TSS/TP was collected at 9:40 AM and bacteria was collected at 9:47 AM.



LEGEND

- Potential Sample Locations
- BRPC Warmspots (See September, 24 2003 QAPP)

Drainage Structures

- Catch Basin
- DI
- Drain Manhole
- Other
- Storm Drain Pipes

Hydrography

- Land, Island
- Reservoir
- Wetland
- River
- Lake, Pond
- Parcels
- Sub-watersheds

N W E S

1000 0 1000 2000 Feet

Source: BRPC & MA GIS

Figure 4-2

Field Map BRPC Warm Spots & Potential Sample Locations

- Sample could not be collected due to sampling device lost in river (Event # 2);
- Laboratory duplicate analysis was not performed for all sampling events (Event # 3 & # 4); and
- Field duplicates were not collected and a sample location was missed (Event # 4) due to storm event timing and staff constraints.

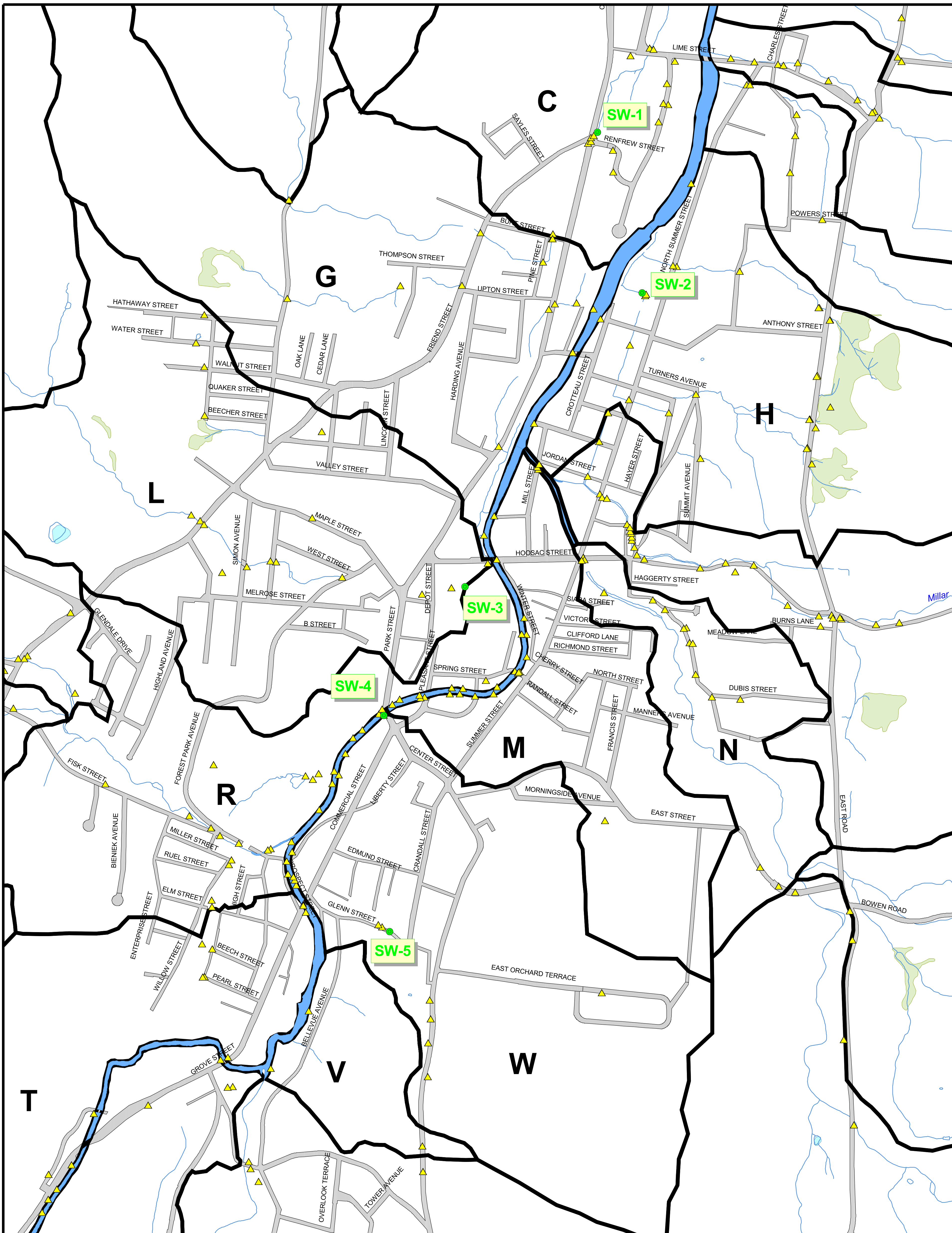
Despite these inconsistencies with the QAPP, the monitoring data trends are comparable from one storm event to another. Future stormwater sampling programs should emphasize equipment needs, training, and a thorough review of the QAPP requirements for all sampling program staff.

Bacteria Results

Sampling data for fecal coliform and E. coli bacteria are very high. These results are representative of sanitary wastewater or a major fecal waste source, particularly the values for sampling events # 2 and # 3. There is no specific standard or threshold for bacteria levels in stormwater discharges, rather existing standards are geared towards receiving waters. The Massachusetts water quality standard for E. coli bacteria in Class B waters is 200 colonies/100 ml. The 1997 Hudson River Basin Water Quality Assessment Report (MA DEP 2000) outlines a dry weather recreation threshold of 400 colonies/100 ml and a wet weather threshold of 2,000 colonies/100 ml. These thresholds are provided as guidance only and apply to in-stream concentrations, which are not comparable to individual stormwater outfalls.

However, some of the stormwater sample locations represent in-stream samples such as Hoxie Brook (SW-3), Pine Street Brook (SW-1) and the unnamed tributary at the DPW Facility (SW-2). Locations SW-1 and SW-2 are minor tributaries to the Hoosic River, but nonetheless are considered surface waters that had in-stream bacteria concentrations greater than the 2,000 colonies/100ml threshold during stormwater sampling events. Nearly all of these three locations exceeded the wet weather threshold during 3 out of 4 sampling events. Perhaps the most significant example of an in-stream bacteria concentration for a major tributary to the Hoosic River is the September 17, 2004 sample on Hoxie Brook that showed an E. coli count of 120,300 colonies/100ml. Even greater is the Pine Street Brook sample at Renfrew and Columbia Streets (SW-1) with an E. coli count greater than 250,000 colonies/100ml.

Irrespective of threshold comparisons for outfalls and tributaries, the stormwater sampling results demonstrate that bacteria loading from stormwater discharges is a significant contributor to the impairment of the Hoosic River.



LEGEND

Stormwater Sampling Location

Outfalls

Drainage Subwatersheds

Hydrography

Reservoir

Wetland

River

Lake, Pond

Stream, Brook

N

W E

S

1000 0 1000 2000 Feet

SCALE: 1:12000

Data Sources: MassGIS, Berkshire Regional Planning Commission (BRPC), CEI

Figure 4-3

Overview of Stormwater Sampling Locations

Adams, Massachusetts

Comprehensive Environmental Inc.

Typical bacteria sources that could potentially explain such high bacteria loading are provided below:

1. Significant deposits of animal fecal waste on land or in drainage systems due to the following potential scenarios:
   - Improper disposal of pet waste (observed during a field visit)
   - Rats, mice, pigeons, raccoons, etc. inhabiting drainage systems
   - Runoff from agricultural practices (manure piles, lagoons)

2. Cross-connections between the drainage and sewer systems and mixing of sanitary wastewater and stormwater, possibly due to:
   - Improper sewer connections
   - Back-up of sewer siphons
   - Sewer system surcharge and leakage through damaged pipes to subsurface soils and subsequent inflow to the drainage system
   - Backflow due to inadequate capacity of sewer systems caused by stormwater inflow associated with roof leaders, area drains, sump pumps, etc.

Untreated sanitary wastewater flows generally have bacteria concentrations that are too numerous to count or number in the hundreds of thousands of colonies. A sanitary wastewater flow that is diluted in stormwater, as a result of cross-connections between the sanitary sewer and drainage systems, provides a probable explanation for the very high bacteria results detected in stormwater samples; although, improper disposal of pet waste and animals inhabiting the drainage system are likely contributors since it was observed in the field. However, these sources generally do not produce a bacteria spike such as that observed at the Renfrew Street sample location SW-1 on August 12, 2004 (E. coli >250,000 colonies/100 ml).

Runoff from agricultural practices was not specifically targeted as part of the stormwater sampling program but was evaluated as a potential source based on land use. Based on Town and state MA GIS land use information and discussions with knowledgeable Town employees, agricultural land use (specifically cattle or dairy farms) is very limited in the sub watersheds and drainage areas where sampling occurred. Only two dairy farms are located in Adams, but neither of these operations are within any of the sample site sub watersheds.

Total Suspended Solids Results

Urban stormwater values for total suspended solids (TSS) can vary greatly and the range for the Adams data set is 1 to 410 mg/L. The Adams TSS data is a bit on the high side for some stormwater sampling sites and events, such as SW-2 (DPW Facility) for Event #1 and the data set for Event #2, when compared to the overall data set. This may be affected by numerous activities in the sub watershed around the time of sampling such as the storage of road materials (e.g., DPW Facility), land disturbances, recent street sweeping, and flashiness of the storm event. Lower TSS data may indicate that a recent "flush" occurred (just beyond the required minimum 3 days prior to sampling) so that there were fewer solids picked up with stormwater at the sampling date. For example, TSS data for Event # 3 is more consistent with historical stream data in Adams (refer to Section 2.3). In general, TSS data indicates the amount of solids that is in stormwater, which serve as the transport mechanism for many pollutants (i.e., pollutants stick to sediments) and result in toxicity and sedimentation of water bodies.

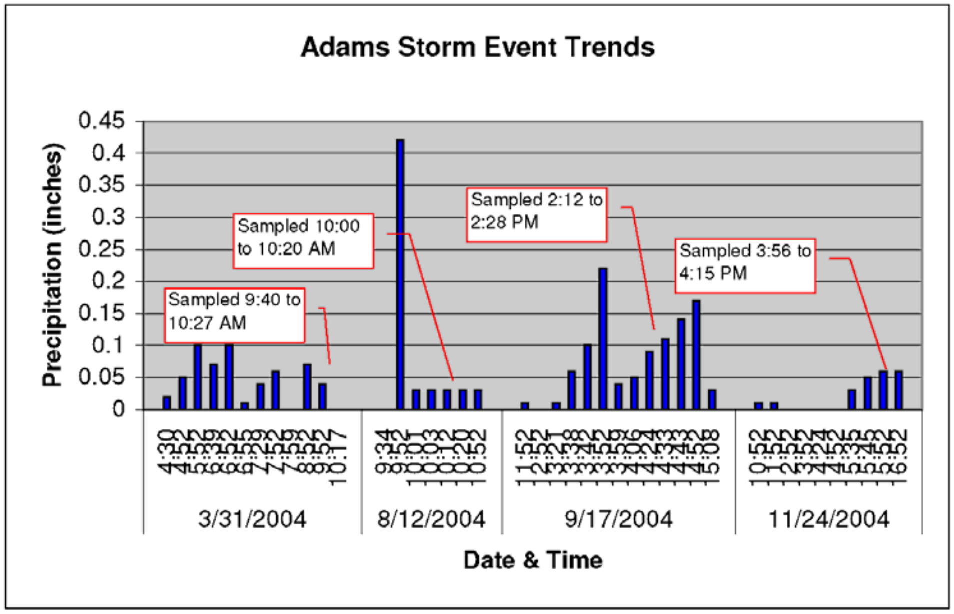
Total Phosphorous Results

The average concentration for total phosphorous in Adams stormwater is 0.32 mg/L (average for all results, including duplicates). As a reference point, published data for total phosphorous in urban runoff shows an average concentration of 0.46 mg/L (Urban Lake Management publication Vol. 3, No.4 - December 2001, by the Center for Watershed Protection). In-stream historical data for the Hoosic River and its tributaries in Adams shows a total phosphorous range between 0.01 mg/L and 0.04 mg/L.

Total phosphorous concentrations provide an estimate of pollutant loadings from stormwater and a gauge of water quality. In general, phosphorous can be used as an indicator of water quality impairment from urban areas. By itself, phosphorous is a nutrient that can cause eutrophication and impair water quality in high concentrations. Generally, lakes and ponds are affected most due to extended detention times.

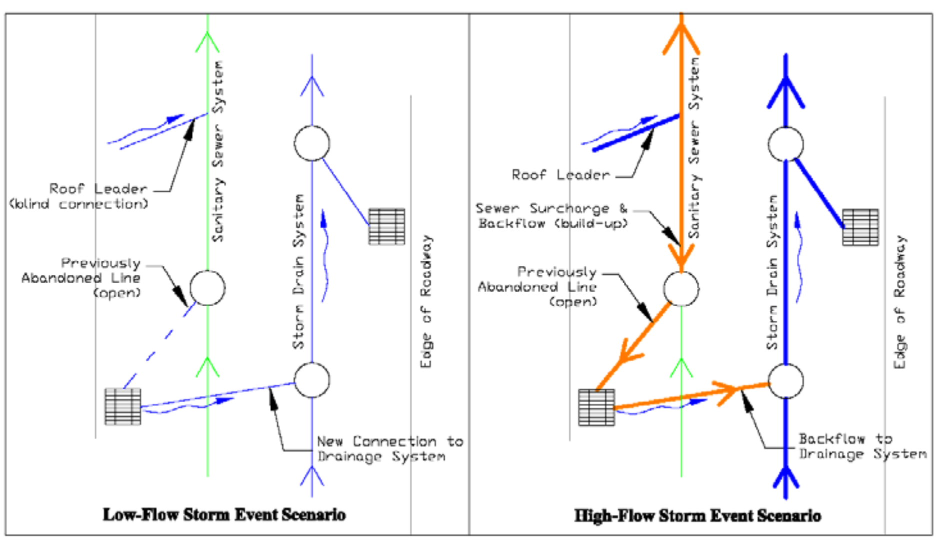
Storm Event Characteristics

A closer look into the rain storm characteristics of each stormwater sampling event reveals an interesting relationship that supports the possibility of backflow/cross-connections between the sanitary sewer and drainage systems, as discussed above. Precipitation data from the North Adams weather station is provided (data sheets are available in Volume 2 Technical Materials of the Stormwater Management Strategic Plan) for each storm event, as illustrated below.



Source: weatherunderground.com, daily history, North Adams weather station.

As shown, the August and September events were quick, flashy storm events and the March and November events were more gradual, smaller precipitation events. All stormwater samples were collected during first flush conditions, once flows discharged from the drainage system. However, the August and September events caused greater flows due to more water in a shorter period of time, which may have caused sanitary sewers to back up into the drainage system. In this case, the sewer system would not be able to handle the excess storm flow (due to connected area drains, roof leaders, etc.) and would back up into the drainage system through blind cross-connections or inadequately plugged abandoned lines. An example of this type of scenario is illustrated below.



Notes: This is a possible cross-connection scenario that would result in the high bacteria levels detected during storm events. Many variations for cross-connections are possible.

The 1987 I/I Study points out several sewer system issues and problem areas for the Town of Adams, including those described above and those outlined below, many of which fall within the stormwater sample site sub watersheds. The following observations were made based on review of the 1987 I/I Study and sampling results:

- Deterioration, blind connections and abandoned lines in the system indicate that changes have occurred over time and it is possible that some infrastructure modifications (sewer and drainage) unintentionally resulted in cross-connections between the sanitary sewer and drainage systems.
- In a recent example (2004), a residential sewer connection was made to an abandoned line on East Street near Morningside Avenue. The line was immediately disconnected once the contractor realized the error and connected to the active sanitary sewer line. This scenario, however, is equally likely for similar connections to and from the drainage system.
- The 1987 I/I Study recommended removing inflow sources such as area drains and catch basins and connecting to the drainage system. It is possible that some of the original discharge lines were not fully plugged and remain connected to the sanitary sewer system, acting as an inlet to the drainage system when the sewer system surcharges.
- The stormwater sampling results are indicative of sanitary waste mixing and the most probable causes for elevated bacteria in stormwater are improper connections (either direct or indirect).
- **Conclusion –** the apparent mixing of sanitary waste with stormwater is perhaps the most significant impact to the Hoosic River and requires the most immediate attention.

Based on these observations, a more detailed review of the 1987 I/I Study is needed to identify and address known sewer problems. Summary tables of sewer system problems from the 1987 I/I Study are provided in **Appendix 4C**. Sanitary waste discharges are discussed further in Section 4.5.

4.5 Illicit Discharge Detection & Elimination Program

An Illicit Discharge Detection and Elimination (IDDE) Plan was prepared as part of this project and is included in Volume 2 of the Stormwater Management Strategic Plan. This section summarizes the IDDE Plan and the results of recent implementation efforts to address non-stormwater discharges.

IDDE Program Summary

Every IDDE Program begins with an IDDE Plan, which serves as the basis for conducting investigations of the drainage system for non-stormwater flows and eliminating discharges that represent a pollution source (referred to as an "illicit discharge"). The IDDE Plan represents a strategy in the form of a work plan and contains the following:

- Prioritization of Illicit Discharge Detection and Elimination Activities: IDDE activities involve mapping stormwater outfalls, field inspection of stormwater outfalls and investigation and elimination of flow sources. These activities can be time consuming and costly, therefore, it is best to prioritize the areas of Town that have the greatest likelihood for illicit discharges and begin investigations there. The Adams prioritization scheme included an evaluation of historical water quality data and investigations, sewer system and drainage system infrastructure, and land uses. This resulted in the following prioritization of sub-watersheds:

    - High Priority – L & R
    - Moderate-High Priority – B, C, G, H, K, M, O, T, U, W, Z
    - Moderate Priority – A, D, E, F, I, J, N, P, Q, S, V, X, Y

- Identification of Illicit Discharges: this portion of the IDDE Plan outlines the process and procedures for conducting illicit discharge investigations, as well as parameters for sampling and data evaluation guidelines. EPA recommends the following sampling parameters under the Phase II stormwater guidelines:

    - *E. coli*, pH, specific conductivity, ammonia, temperature and surfactants

- Elimination of Illicit Discharges: methods for preventing and eliminating illicit discharges are discussed in the IDDE Plan. Enforcement to remove illicit discharges is discussed in greater detail in Volume 2 and relevant public education information has been incorporated into Section 7.0. This is important for future Phase II compliance since communities are required to incorporate information on illicit discharges into their public education and involvement programs, as well as develop a regulatory method/mechanism to prohibit and enforce the removal of illicit discharges.

    As the IDDE Program is implemented, the Town of Adams will be working to eliminate illicit discharges that are discovered and will continue to fulfill the requirements of the Phase II stormwater program, as well as improve water quality in Town.

IDDE Investigation Results

Recent field investigations for illicit discharges were conducted as outlined below:

- May 17 & 18, 2004 – as a result of stormwater sampling Event #1, location SW-2 was further evaluated as a potential illicit discharge due to an E. coli count of 4,100 colonies/100 ml and an elevated phosphorous level of 1.014 mg/L. The Adams DPW investigated the discharge by tracing the flow source during dry weather conditions and sampling for fecal coliform (analyzed by the Adams WWTP, colonies/100 ml) at the following upstream locations (see Figure 4-4):

    - SW-2A (flow from North Summer Street) = 47
    - SW-2B (flow from south of DPW Facility) = 417
    - SW-2C (north side of West Kittler Ave.) = 1,575
    - SW-2D (Kittler Ave. at Richmond Lane) = 105

  Location SW-2C is on the high side and indicates that an illicit discharge source may be present; however, there was no apparent flow at this location. It is possible that leachate from nearby sewers is contributing to this location and flow is not pronounced or easily discernable. The 1987 I/I Study indicates that a portion of the sewer at Kittler Ave. and North Summer Street has broken and damaged pipes, off-set joints and roots. Based on this information, this location requires further investigation to validate the bacteria source and evaluate the need for sewer system repairs.

- November 18, 2004 – Town personnel from DPW and Community Development conducted outfall inspections and illicit discharge investigations with CEI as part of an IDDE training effort and to implement the IDDE Plan. Field inspection data sheets, outfall maps and photos are provided in **Appendix 4D** and the results of the outfall inspections are summarized in **Table 4-5**. Field investigation highlights from Appendix 4D are provided below with sample photos:

    - Over 40 outfalls were inspected in sub-watersheds L, R, M and W. Fourteen of these outfalls were sampled for fecal coliform and portions of the drainage system were investigated to identify potential flow sources and screen for cross-connections. Outfall samples were not analyzed for additional parameters (e.g., E. coli, ammonia, surfactants) due to budget constraints for the project and laboratory capabilities at the Adams WWTP.

Table 4-5. Significant IDDE Field Screening Results for Stormwater Outfalls in Adams

Samples at Flowing Locations	**18-Nov-04**													
	M-1	**M-2**	**R-8**	**HO-P4**	**HO-P5**	**HO-P7**	**HO-P6**	**R-9**	**W-2**	**HO-P16**	**SW-3**	**Hoxie Mid**	**Upstream Hoxie**	**H-P4**
Sample ID & Location Aid (description)	Myrtle Street	Spring Street	Rail Trail/ Commercial Street	Commercial Street	Rail Trail/ Russell Field	Rail Trail/ Russell Field	Commercial Street	Harmony Street	Route 8	Route 8	Downstream Hoxie, Interior Alt., Hoosac Street	Middle of Hoxie, beneath downtown	Hoxie Brook @ West Street	Simon Ave., south of stream
Analytical & Field Parameters														
Fecal Coliform (colonies/100 mL)	0	470	10	0	10	0	0	0	30	0	80	170	150	Not Sampled*
Total Dissolved Solids (ppm)	470	716	229	405	216	245	321	173	239	469	134	119	126	554
Temp (oC)	10.7	8.3	10.5	13.0	8.4	11	9.2	9.4	9.1	10.8	7.8	7.5	8.3	10.8
pH	8.48	8.75	7.89	7.74	8.35	8.03	8.1	8.54	8.38	8.19	8.52	8.41	8.36	8.0
Conductivity (uS)	943	1434	464	811	429	500	633	361	477	938	276	239	252	1127
Sampling Notes														
Flow appearance/ color	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Cloudy/ milky	Clear	Clear	Clear	Clear	Clear	Clear
Odor	None	None	None	None	None	None	None	None	Sewage	None	None	None	None	Sewage
Other Relevant Observations		pigeon droppings	weep hole	sudden short flow	from stream	moss, orange	orange stains	leaves	pigeon droppings		leaves		leaves	pipe 1/2 submerged
Interpretation/ Recommendation														
Refer to #s Below	2	1	5	2	5	5	2	5	3	2	5	5	5	3, 4

*This outfall was observed after the cut-off time for analyzing samples at the Adams WWTP.

1. Trace flow to identify bacteria source & collect additional samples.
2. Trace flow, identify flow source. Elevated field parameters (conductivity or temperature) indicate an illicit discharge may be present, but not a likely bacteria source at this time.
3. Re-sample at outfall for bacteria, trace flow.
4. Investigate flow source, possibly nearby sewer for leaks.
5. Low priority. Conduct additional sampling in future to develop a data trend for comparison to Town-wide data, trace sources that significantly exceed threshholds outlined in the Adams Illicit Discharge Detection and Elimination Plan. Screen outfalls that discharge nearby to identify potential bacteria sources (Hoxie Brook locations).

- Previously unmapped stormwater outfalls were screened for illicit discharges to update the Town base map (see Appendix 4D). Outfalls were assigned ids that correspond with the contributing drainage subwatershed (e.g., M-1, M-2), unless they were previously inspected (e.g., BRPC field inspections in 2003).

- No apparent illicit discharge sources were detected at flowing outfalls based on bacteria sampling, but some areas require additional investigations to evaluate elevated field parameters (e.g., conductivity and temperature).

- At outfall HO-P4, a sudden short flow was observed. Although bacteria was not detected, field observations require additional investigation to confirm that the flow is not a pollutant source (e.g., wash water).

- A non-flowing suspect sewer outfall (HO-P12) was observed at the Hoosic River flood control chutes near MacDermid Mill.

- Direct floor drain connections from a former autobody shop and two suspect discharge pipes were observed in the underground portion of Hoxie Brook in downtown Adams. None of the pipes appeared to be plugged. Unidentified pipes could be an active or inactive roof leader or sanitary sewer discharge.

- Unknown pipes (i.e., roof leaders or sanitary sewer discharges) were observed in Hoxie Brook about mid-way through the underground portion of Hoxie Brook. The origin of these pipes could not be verified since there are no mapping reference points for this portion of the brook (i.e., field teams could not determine their location beneath downtown Adams).

- Portions of the underground culvert for Hoxie Brook are deteriorated and may not be structurally sound. Specific sites include the steel and concrete culvert near Depot Street, below the former autobody shop, and the stone arch culvert beneath the downtown (upstream of Park Street).

- Suspected outfall and unidentified pipes were observed at the Aladco Plant, but could not be confirmed (pipe appears to be below the Hoosic River water line).

4.6 Recommendations

The stormwater assessment activities under this project have resulted in a great deal of information on stormwater quality and its potential impacts to the Hoosic River and its tributaries. Based on this information, several recommendations referred to as Best Management Practices (BMPs)[2] have been developed to address water quality impacts. BMPs are broken down into two categories:

1) Non-Structural – generally includes activities such as field assessment and inspections, water quality sampling and river or stream cleanups.

2) Structural – consists of a physical structure, device or control to address stormwater issues. Examples include deep sump catch basins, water quality swales, infiltration islands, detention basins, sediment forebays, etc.

The stormwater assessment recommendations focus on the following key issues:

1. Stream degradation, erosion and habitat quality.
2. Reduction of pollutant loadings from urban areas.
3. Existing areas of concern and ongoing stormwater impacts.
4. Drainage and sanitary sewer system infrastructure.
5. Follow-up field investigations/assessments.
6. Opportunities for water quality improvements.

These BMP recommendations are discussed in more detail below.

4.6.1 Non-Structural BMPs

Stream Assessment Recommendations

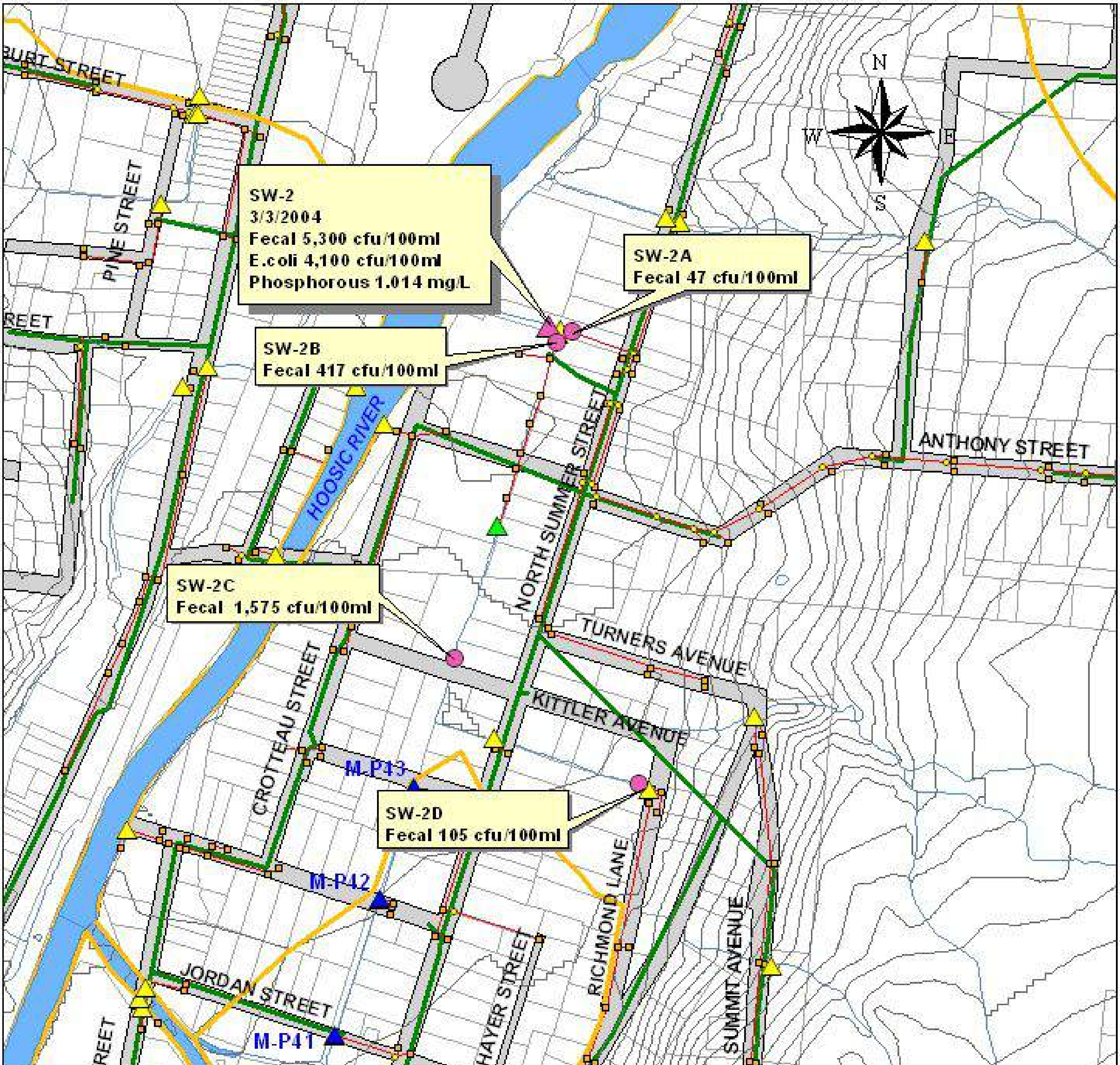
1. Conduct river clean-ups for the following river segments: Hoosic River, Section 1, Leonard Street/Route 8 to Cheshire/Adams town line; Hoosic River, Section 2, Aladco to Leonard Street (Route 8); Tophet Brook (north bank near East Road;) Miller Brook; Southwick Brook; Hoxie Brook.
2. Evaluate erosion in the following river segments: Hoosic River, Section 2, Aladco to Leonard Street (Route 8) (in the vicinity of Bellevue Avenue;) Southwick Brook (lower section).
3. Investigate water quality in the following river segments: Hoosic River, Section 3, Post Office to Aladco (in the vicinity of Aladco;) Hoosic River, Section 4, Hodges Cross Road to Center Street (in the vicinity of the water treatment plant and in the vicinity of Lime Street.)

[2] A Best Management Practice can be defined as any structure or activity that is employed as the most effective non-polluting practice

4. Remove debris in the following river segments: Hoosic River, Section 4, Hodges Cross Road to Center Street (at the cable supporting the high tension tower;) Pecks Brook (in the vicinity of Fisk Road Dam.)
5. Mitigate sedimentation/erosion in the following river segments: Tophet Brook (in the vicinity of the Tophet Brook Farm;) Pecks Brook (in the vicinity of West Road;) Hoxie Brook.
6. Investigate potential for access in the following river segments: Hoosic River, Section 4, Hodges Cross Road to Center Street; Tophet Brook (in the vicinity of the area known as the Cascade and in the vicinity of the Bowens Corners;) Southwick Brook; Pecks Brook (in the vicinity of Peck's Falls.)
7. Investigate pollution prevention opportunities in the following river segments: Tophet Brook (elimination of cows from riparian zone;) Miller Brook (prevention of stormwater runoff from driveways.)
8. Investigate flood prevention opportunities in the following river segment: Southwick Brook (lower section.)
9. Investigate educational opportunities in the following river segment: Hoxie Brook (in the vicinity of the Hoosic River confluence.)

Illicit Discharge Detection & Elimination/Water Quality Analysis

1. Conduct follow-up assessments and corrective actions to the May 17 & 18, 2004 and November 18, 2004 IDDE investigations to confirm and/or remove known illicit discharges from drainage systems and waterways. Significant problem areas are discussed in Section 4.5 above and recommendations for flowing outfalls are outlined in Table 4-5.
2. Address structural support issues for the culvert that carries Hoxie Brook beneath the former autobody shop and stacked stone arch portions upstream of Park Street.
3. Confirm and map all stormwater outfalls in Town, starting with the Hoosic River. Field verification from within the flood control chutes is advantageous for accurately identifying previously unmapped outfalls.
4. Continue screening outfalls in accordance with the IDDE Plan and sample flowing outfalls for bacteria and other parameters as budget allows. The Town of Adams should target at least 50 outfalls per year for outfall screening and illicit discharge investigations. Utilize the Adams WWTP for bacteria analysis as part of water quality assessment and IDDE activities.



LEGEND

- Bacteria Sample Location
- Stormwater Sample Location

Outfalls
- Inspected Stormdrain Outfalls
- Stormdrain Outfalls
- Stormdrain Inlet

Drainage Structures
- Catch Basin
- Drain Manhole

- Storm Drain Pipes
- Sewer Pipes

Hydrography
- Land, Island
- Reservoir
- Wetland
- River
- Lake, Pond
- Stream
- Elevation Contours
- Drainage Subwatershed

200 0 200 400 600 800 1000 Feet

Data Source: MassGIS, Berkshire Regional Planning Commission, CEI

Figure 4-4

Adams DPW
Illicit Discharge Investigation
May 2004

Comprehensive Environmental Inc.

5. Conduct stormwater sampling upstream of sites SW-1 through SW-5 to evaluate pollutant loadings from drainage areas upstream of the sanitary sewer system. Consider adding ammonia and surfactants to the list of analytical parameters and sampling during and after first flush during high flow storm events (e.g., >0.25" in 1 hour or less).
6. Conduct smoke testing of the drainage system to identify cross-connections from the sanitary sewer system that may be contributing pollutant loadings during storm events. Starting points should be based on the results of Task 5 above. Conduct smoke testing of unidentified pipes in the underground portion of Hoxie Brook.
7. Conduct a detailed review of the 1987 I/I Study for the sanitary sewer system to confirm the remaining problem areas that have not been addressed.
8. Evaluate the Town's existing Five Year Capital Improvement Plan with respect to sewer and drainage repairs to prioritize sewer repairs that will result in the greatest water quality improvement. This evaluation should incorporate the review of the 1987 I/I Study, as discussed above.
9. Continually evaluate new data for streams and the Hoosic River in Adams with existing efforts to mitigate stormwater impacts and pollution sources. This includes ongoing studies such as the MA DEP 2002 Water Quality Monitoring for Peck's Brook, Tophet Brook, Dry Brook, and the Hoosic River.
10. Inform residents about the effects of illicit discharges and illegal dumping through the results of IDDE activities. The results of field activities should be incorporated into the Town's stormwater public education program.

4.6.2 Structural BMPs and Conceptual Designs for Priority Stormwater Sites in Adams

Structural BMPs are used to treat stormwater by removing pollutants associated with sediment or providing natural attenuation of pollutants through infiltration and more "natural" stormwater conveyance systems (e.g., vegetated swales, islands, and detention ponds). The feasibility of these BMPs was evaluated for numerous sites in Adams based on field assessments, historical information related to water quality hot spots and site constraints, as discussed in Section 4.3 and the Adams stormwater QAPP. Based on this work, the following five priority stormwater sites were selected to develop conceptual BMP designs for future stormwater remediation and demonstration projects:

- Renfrew Park – Parking Lot BMPs (project completed)
- U.S. Post Office – Runoff Prevention Methods (RPMs)

- Adams DPW Yard – Wetlands Treatment
- Glen Street – Swale Rehabilitation/Stabilization and Cascading Check Dams
- Hoxie Brook Downtown – Stream Restoration and Urban Runoff BMPs

The focus of these proposed BMPs is to provide sediment removal and stormwater infiltration/treatment that will reduce pollutant loadings such as bacteria to receiving waters in Adams. Conceptual designs for the recommended BMPs are provided at this time. Final designs must be completed for construction and all of the recommended BMPs should be designed to meet the requirements of the Massachusetts Stormwater Management Policy for 80% removal of total suspended solids. However, some sites have large storm flows and multiple BMPs throughout the drainage area will be needed to meet this sediment removal efficiency. The conceptual designs for the five BMP sites are briefly discussed below followed by a comparative analysis. More detailed descriptions, designs and site photos are provided in **Appendix 4E**.

Renfrew Park – Parking Lot BMPs

BMP conceptual designs were submitted to the Town of Adams in advance of upcoming reconstruction activities for Renfrew Park with the intent of incorporating parking lot BMPs into the project. Some of the proposed BMPs, primarily leaching catch basins, were incorporated into the new construction (Renfrew Park Renovation Project, Phase I). Leaching catch basins that were incorporated into the project are shown on the conceptual designs in Appendix 4E, along with the other proposed BMPs.

Adams DPW Yard – Wetlands Treatment

The Adams DPW Yard along North Summer Street provides an opportunity rarely found for stormwater treatment near tributaries and the Hoosic River in Adams: sizable, vacant Town-owned land. This BMP site consists of a shallow marsh wetland treatment system and park.

Hoxie Brook Downtown – Stream Restoration and Urban Runoff BMPs

This site includes conceptual BMPs to address stream degradation, water quality, and stormwater issues at Hoxie Brook adjacent to the Ashuwillticook Rail Trail and the Adams Visitor Center on Hoosac Street in downtown Adams.

Glen Street – Swale Rehabilitation/Stabilization and Cascading Check Dams

This site consists of a steep drainage swale, approximately 320 feet long, adjacent to Glen Street at the intersection of Crandall Street. Stormwater remediation goals at this site include reducing/buffering stormwater flow velocities, sediment removal by check dams and some attenuation through infiltration (due to ponding) and vegetative plantings.

U.S. Post Office – Runoff Prevention Methods (RPMs)
The U.S. Post Office and commercial building along Commercial Street and Center Street represent one of the many impervious urban areas in downtown Adams along the Hoosic River. Minimal stormwater treatment occurs at these areas as stormwater is piped directly to the river. The goal of BMPs at this site is to prevent runoff and provide stormwater treatment to the best extent possible, while serving as a demonstration project for future redevelopment projects.

Comparative Analysis

A comparative analysis is provided in **Table 4-6** to weigh the potential water quality benefits of the conceptual BMP designs described above with implementation and maintenance costs, as well as other design and project considerations. The comparative analysis represents a subjective comparison of sites due to the varying considerations for BMPs and the potential water quality benefits.

The Renfrew Park parking lot BMPs have been temporarily removed from the following ranking since some conceptual BMPs have already been incorporated into the site and no further construction is expected. The remaining conceptual BMP sites are listed below in order of priority based on the priority ranking scheme outlined in **Table 4-7**.

1. Adams DPW Yard – Wetlands Treatment
2. Hoxie Brook Downtown – Stream Restoration and Urban Runoff BMPs
3. Glen Street – Swale Rehabilitation/Stabilization and Cascading Check Dams
4. U.S. Post Office – Runoff Prevention Methods (RPMs)

4.6.3 BMP Opportunities for Redevelopment

The cost of retro-fitting existing drainage systems and implementing structural BMPs in already developed areas is costly. However, when coordinated with proposed redevelopment activities, implementation becomes easier and more cost effective. The Adams Downtown Revitalization Program provides an ideal opportunity for the Town to encourage and incorporate stormwater BMPs into downtown redevelopment projects. BMP opportunities for redevelopment sites in downtown Adams and throughout Town are outlined below with conceptual design drawings provided in Appendix 4E.

BMPs for Pavement Redevelopment - stormwater runoff and treatment are difficult to mitigate in downtown Adams due to limited space and large impervious surfaces. However, stormwater runoff can be reduced and treatment effectiveness increased by handling small portions of runoff at numerous locations. Paved areas with low traffic can be used for stormwater treatment by infiltrating the first flush of storm events, as described in the BMPs below.

- **Brick Paver Gutter Line** – these BMPs can be incorporated into any parking or roadway redesign project where stormwater collects along the edge of a low traffic area such as on-street parking in downtown Adams. An example site is provided below.

On-street parking area and potential brick paver gutter line BMP in front of the Adams Town Hall.

- **Porous Pavement** – when properly maintained, porous pavement is an effective BMP for removing pollutants during first flush and small stormwater events. This BMP is ideal for redevelopment projects that involve parking areas, particularly temporary or seasonal parking. Porous pavement should also be considered as an alternative for walking paths and similar applications.

Table 4-6. Conceptual BMPs Comparative Analysis[1]						
Site & Conceptual BMPs	**Estimated Cost[2]**	**Maintenance & Comparative Costs**	**Reliability for Pollutant Removal**	**Implementation Constraints**	**Wildlife Habitat Potential**	**Additional Considerations**
Hoxie Brook Downtown – Stream Restoration & Urban Runoff BMPs	$395,000	Sediment removal from detention areas and stormwater structures every 1-2 years. Spring and fall park and greenery maintenance.	Moderate to High	Land ownership at adjacent industrial properties (owners contacted and cooperative)	High	High-profile site in downtown Adams adjacent to the Berkshire Visitor's Bureau. Ideal demonstration project for a variety of stormwater BMPs, waterway restoration & public education.
Glenn Street – Swale Rehabilitation/ Stabilization & Cascading Check Dams	$27,000	Sediment removal from detention basin and check dams every 1-2 years.	Moderate	Potential ownership/ easement issues. Steep slopes and equipment accessibility.	Moderate	The Town of Adams would like to construct this BMP as part of an in-house DPW construction project.
U.S. Post Office – Runoff Prevention Methods (RPMs)	$192,000	Spring and fall bioisland maintenance and sweeping of porous pavers and infiltration strips. Cleaning of roof leader dry wells every 5 years. Deep cleaning and removal of porous pavers, infiltration strips and bioisland inlets every 5 years to remove fine sediments and restore infiltration capacity.	Moderate	Land ownership for two properties, site constraints include soil type and groundwater elevations/ hydraulic loading along flood control chutes	Low	High-profile site in downtown Adams along the Hoosic River. High exposure site for demonstration project.
Adams DPW Yard – Wetlands Treatment	$106,000	Sediment forebay cleaning every 2 years. Spring and fall park and greenery maintenance. Wetland longevity ~20 years	High	Widely applicable if land is available. Potential ownership/ easement issues with Army Corps of Engineers	High	One of the few locations in Adams where ample Town-owned land is available.

Notes:

1. The conceptual BMPs comparative analysis is based on the "Comparative Assessment of the Effectiveness of Urban Best Management Practices" (Table 1) of the Design of Stormwater Wetland Systems, Thomas R. Schueler, Anacostia Restoration Team (October 1992).
2. Estimated costs for BMP implementation include engineering design and construction costs (without construction services or permitting) but do not include potential costs associated with land ownership, easements, etc. A more detailed cost estimate was provided for the Hoxie Brook BMP site (including permitting) in anticipation of an upcoming grant project at this location. These costs should be updated, as needed, in the next two years.

Table 4-7. Conceptual BMPs Priority Ranking Scheme				
Ranking Criteria	Hoxie Brook Downtown – Stream Restoration & Urban Runoff BMPs	Adams DPW Yard – Wetlands Treatment	Glenn Street – Swale Rehabilitation/ Stabilization & Cascading Check Dams	U.S. Post Office – Runoff Prevention Methods (RPMs)
Estimated Cost <$50,000 = 3 points $50,000 - $150,000 = 2 points >$150,000 = 1 point	1 point ► >$150,000	2 points ► <$150,000	3 points ► <$50,000	1 point ► >$150,000
Maintenance & Comparative Costs 1-2 year maintenance frequency = 2 points Seasonal maintenance frequency = 1 point	1 point ► seasonal maintenance	1 point ► seasonal maintenance	2 points ► 1-2 year maintenance	1 point ► seasonal maintenance
Reliability for Pollutant Removal[1] High = 3 points Moderate to High = 2 points Moderate = 1 point	2 points ► Moderate to high	3 points ► High	1 point ► Moderate	1 point ► Moderate
Implementation Constraints[2] Moderate to low difficulty = 2 points Moderate difficulty = 1 point	2 points ► Moderate to low difficulty	1 point ► Moderate difficulty	1 point ► Moderate to low difficulty	1 point ► Moderate difficulty
Wildlife Habitat Potential High = 3 points Moderate = 2 points Low = 1 point	3 points ► High	3 points ► High	2 points ► Moderate	1 point ► Low
Additional Considerations[3] High exposure BMP site = 3 points Moderate exposure BMP site = 1 point	3 points ► High exposure	1 point ► Moderate exposure	1 point ► Moderate exposure	3 points ► High exposure
Total Ranking Score	**12 points**	**11 points**	**10 points**	**8 points**

Notes:
1. Pollutant removal reliability is based on similar BMPs discussed in Table 1 of the Design of Stormwater Wetland Systems (Schueler, 1992) for typical stormwater pollutants (TSS, bacteria, phosphorous, various organic compounds).
2. Implementation constraints are based primarily on land ownership issues and whether or not site access is readily available or likely to be approved.
3. Additional considerations are based on exposure as a stormwater demonstration project (mainly in downtown Adams where people frequently visit).

Sample of porous asphalt pavement with 20% void space. Source: University of New Hampshire

BMPs for traffic areas, such as porous pavement must be evaluated and designed for cold weather conditions and sediment loadings from winter sanding to avoid ice problems and clogging. It should be noted that existing applications for these BMPs in New England are limited and most projects are being implemented on an experimental basis to determine their effectiveness. Based on this information, these BMPs should be implemented on a small scale before advocating their widespread use.

- **Swirl Concentrator** – this BMP is a high-velocity stormwater treatment unit designed to handle a portion of stormwater flow from large storm drain systems in urban settings with moderate open space. The swirl concentrator is most effective for removing sediment and attached pollutants, but offers very limited treatment for bacteria. These units could be used in some urban areas of Adams adjacent to the flood control chutes to treat stormwater before it discharges to the Hoosic River.

Example of a swirl concentrator during final construction.

- **Bioislands** – these BMPs have been incorporated into the BMP conceptual design for the U.S. Post Office and have great pollutant removal potential due to organic mass and plantings, while utilizing existing site features and minimizing loss of space. Bioislands are an attractive alternative to common curbed and mulched islands that offer little stormwater benefit.

- **Leaching Catch Basins** – this BMP is easily incorporated into roadway and parking lot drainage reconstruction projects and becomes especially cost-effective if the project requires the replacement of existing deteriorated catch basins or drainage manholes. Leaching catch basins or manholes can be added to drainage systems in-line or stormwater can be diverted from existing "solid" sump catch basins to leaching manholes. These BMPs are an ideal application for the future roadway and drainage reconstruction planned for Friend Street, which will be led by the State of Massachusetts in about 6 years.

- **Infiltration Dividers** – a portion of parking areas is not used for direct travel, such as the overhang of vehicles beyond the wheels, and infiltration dividers can be used at these locations. These BMPs provide stormwater infiltration and natural attenuation from plantings and can be used in any compact urban setting. Infiltration dividers are ideal for large parking lots to handle a portion of the total runoff. Example sites in downtown Adams include the U.S. Post Office and Big Y parking lot, as shown below.

View of downtown Adams and the parking lot at the Big Y Super Market.

APPENDIX 4-A

Perennial Stream Assessment

Shoreline Survey Report:

Perennial Streams

in the

Town of Adams

Surveyed: August-December, 2002
Submitted: May 2003

coordinated by:

the Hoosic River Watershed Association

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report compiled by:

Duncan Eccleston

Table of Contents:

Participants:

Vicki-Sue DeMarsico, Donna Cesan, Penny Fehr, Leigh Ann Adams, Tom Ennis, Jason Ennis, Russ Cohen, Robin Avery, Heather Linscott, Paula Oparowski, Holly Mann, Adam Garrison, Rachel Contenta, S. Zimmerman and others who assisted these primary investigators.

HooRWA Staff:

Lauren Stevens, Executive Director
Duncan Eccleston, Executive Director
Shelly Stiles, Assistant Director
Richard Schlesinger, Monitoring Coordinator

Organizational Partners:

Hoosic River Watershed Association
Town of Adams Community Development Office
Berkshire Regional Planning Commission

Methodology:

This stream-team survey was undertaken to assess the perennial stream network in the Town of Adams as a component of a 604 (b) stormwater assessment grant. The methodology used was that of the Massachusetts Riverways Program's training for Stream Teams, also known as an Adopt a Stream Shoreline Survey. Data gathered using Stream Team methodology can be used to identify sites for: water quality monitoring, river clean-ups, and river access. The Town had particular interest in bank erosion, riparian health, riparian buffer conditions, in-stream obstructions, and potential illicit discharges, spills or leaks. The Hoosic River Watershed Association (HooRWA) was contracted by the Town of Adams to coordinate the survey, and worked with the Town and the Berkshire Regional Planning Commission (BRPC) to assess the streams and map the stormwater system using GIS technology for this report.

The first step in Stream Team methodology was forming a focus group. This focus group, responsible for planning the survey, was composed of representatives from the HooRWA and the Town of Adams. A key role of the steering committee was to solicit volunteers for the survey—this was done through newspaper articles in the North Adams Transcript and the Advocate, as well as inviting likely Adams residents and HooRWA volunteers, staff and board members to participate.

HooRWA monitoring coordinator Richard Schlesinger, with the help of Lauren Stevens and Shelly Stiles (then HooRWA assistant director) used USGS topographic maps to divide the perennial stream network within the Town of Adams into sections to be inventoried by volunteers. These sections were selected to be a manageable length, and were anticipated to require an afternoon on the water by volunteers. The BRPC supplied enlarged section maps and orthophotos to be used by volunteers.

A training session for volunteers was planned by then-executive director of HooRWA Lauren Stevens, which took place in the Adams Town Hall on the evening of July 15. This training educated volunteers about erosion, riparian conditions, discoloration, substrate, inflow from pipes, river obstructions, channelizations, land use and riparian buffers, and other topics. Volunteers also learned more about important characteristics the Hoosic River and its tributaries, such as the "flashy" nature of the drainage, threats to the historically cold water ecosystem, and he importance of shading and vegetative buffers.

Using an interactive slide show, volunteers became familiar with important data, and learned to record their findings using photos, Adopt a Stream data sheets, a narrative description, and maps. The meeting concluded after volunteers selected streams of particular interest to them, or were assigned segments, and a follow-up priority-setting meeting was scheduled for the following week. Volunteers left the training equipped with section maps, orthophotos, data sheets, instructions, a safety briefing, and a letter of introduction from Adams Town Manager James Leitch to land-owners, explaining the purpose of the shoreline survey.

In the following week, many volunteers were able to survey part or all of their assigned sections, and participants re-convened to share their findings on the evening of July 22. The goal of this meeting was to determine the most significant assets and problems they encountered on their surveys, and suggest priority municipal actions. At this time, many sections were complete, but others had been surveyed but the paperwork was incomplete (Southwick Brook, Lower Hoosic River), and others had not been surveyed at all (Dry Brook, Unnamed Brook). Each volunteer who had walked their assigned section was asked to list the most striking assets and problems they encountered, as well as priority actions to remediate the problem. The information gathered at this meeting was incorporated into the data sheets submitted by volunteers, and appears in the form of a chart below each segment's narrative description in this final report. Completed reports were collected, and volunteers who had not completed their reports were asked to finish the segments, record their data, and return the results to HooRWA.

Collecting all of the important information for this report became an ongoing challenge. There was a leadership transition at HooRWA, with a new executive director, Duncan Eccleston, joining the organization at the end of August. During the transition, the project lost momentum, and as the weather got colder, certain volunteers became reluctant to complete their sections. With the assistance of Donna Cesan and Leigh Ann Adams, several missing segments were surveyed, data collected, photos taken, and results returned to HooRWA. In another case, a volunteer, who had done a careful job of surveying two segments, did not have the time to write up her data on the sheets provided, so Duncan Eccleston and Leigh Ann Adams worked with her to record her data directly into the database. For these two segments, original data sheets do not exist, though annotated maps and an extensive file of photos do.

Compiling the data into maps and a final report was another challenge. Some volunteers were more conscientious about following the Stream Team data sheet format than others, and not every form was filled out completely. Nearly every annotated map was returned with water damage, and often the writing was difficult to read, due to the challenge of record-keeping in the field. Although many volunteers took photos, they did not in every case.

The information gathered by the stream teams was keyed to GIS maps by the BRPC and added to Adams storm drainage system maps and Mass-GIS data to provide a complete snapshot of stormwater and the perennial streams in the Town of Adams. Each point was given a unique identifier, linked to a photo when possible, and categorized as a pipe, debris, miscellaneous point of interest, or channelization. These points correspond with an Excel database that lists the pertinent information for each point.

More general information about stream segments is included in this report in the narrative descriptions. The narratives completed by volunteers form the core of these descriptions, though in many circumstances, important information gleaned from data sheets, maps and photos was included to create a more useful and vivid description of the segment. Some volunteers walked upstream, others downstream. The narratives follow the path of the observers. Each volunteer was asked to evaluate their sections as "excellent", "good", "fair", "poor", or "degraded". These subjective evaluations are included for each section, but the reader should be forewarned that each segment was evaluated by a different volunteer, therefore they might be internally inconsistent. That is, a section rated as "good" by one volunteer, might have more erosion, debris, pipes, and areas for concern than one rated "fair" by a different volunteer. Without a single person surveying every segment this inconsistency is unavoidable, so little weight should be placed on these subjective evaluations.

Assessment of Conditions of the Town of Adams Perennial Stream Network:

The municipal center of the Town of Adams lies in the narrow flood plain of the Hoosic River, between the Greylock Massif to the west, and the Hoosic Range to the east. Tributaries to the Hoosic River in Adams generally tumble down the steep forested slopes, pass through lightly settled agricultural land, and into more populated residential, commercial, and industrial land before they join the Hoosic River or larger tributaries.

The steep drainage basins of these tributaries and the Hoosic River mean that flooding and erosion are ongoing problems for residents, and many steps have been taken, by the Army Corps of Engineers, the Town, and private citizens to protect their property from the river. The Hoosic River is channelized in flood control chutes for over two miles through the center of town, and many of the tributaries are also channelized in these concrete structures as they approach the Hoosic. In many other cases, individuals have attempted to stabilize the banks of tributaries and the Hoosic using rip-rap, old tires, and retaining walls. Volunteers located innumerable examples of these attempts to protect property, and in many cases these structures are slowly eroding and becoming undermined by the river and streams.

This channelization is problematic in many ways. Although retaining walls might keep an individual piece of property from flooding or becoming damaged, it also increases the rate of runoff, which adds to the flooding and erosion problems downstream, and causes the streams to transport more sediment. The flood control structures, which include concrete bottoms, also severely inhibit the cleansing functions of a river. Because they are inhospitable to aquatic life and water flows smoothly, with little turbulence or aeration, contaminants are not broken down as swiftly as they might in a natural river. Also of concern is the lack of shading and vegetative buffer in these areas. Without shading, the river is prone to excessive heating and cooling, and minimal buffers don’t help mitigate many of the problems caused storm runoff.

Debris is clearly a major problem in Adams’ streams and rivers, and the most troubling examples are essentially dumping grounds. Many of these are historic—ancient pipes, hunks of metal, even old cars and motorcycles—and undoubtedly degrade the water quality of the Hoosic River. There is also evidence of more recent dumping, which suggests this is an ongoing problem. Volunteers located several dumps in or near streams that need immediate attention, and some of these are beyond the scope of a simple volunteer river clean-up—heavy equipment and lots of man-power is needed. A clean-up undertaken by HooRWA between Leonard St/ Rt. 8 and the top of the flood control chutes (at a site identified by volunteers) removed an immense amount of trash and debris, but barely made a dent in the total. Much still remains.

Many pipes were found that may discharge into the Hoosic River and tributaries. Because a Stream Team Survey requires just one visit, it is difficult to know which of these are discharging harmful effluent, which are storm drains, and which are inactive or disconnected. Nevertheless, certain pipes had notable scum or discoloration that bears further investigation in the next phase of this assessment. The most likely have been identified as potential “warm spots” and monitoring these sites is recommended.

Despite these maters of concern, the river and stream network of Adams is a real asset to the town. In the survey, many beautiful sections were explored that could host walking trails, swimming holes, and fishing spots. Access to many is limited, though the Ashuwillticook Rail Trail is a wonderful example of riverside recreational development. Many of the more remote sections are lightly used, and the upper sections of many streams are in near-pristine condition. More than one volunteer was surprised by the beauty of their segments—in many streams the most accessible spots are the most abused, but the hidden valleys and headwaters are spectacular. Tophet Brook, which is channelized by flood control chutes in its lower reaches, has many fine pools, a stunning cascade in the Little Egypt area of town, and a vibrant and intact riparian ecosystem.

While many stretches of river in Adams have been altered, channelized, dumped in, and abused, many of these same streams are inherently pretty, seemingly untouched in sections, and appear blessed with clean water. The following segment assessments will help identify most degraded and pristine areas, so that restoration, mitigation, and protection can take place as appropriate.

Hoosic River, Section 1, Leonard St/ Rt. 8 to Cheshire/Adams town line

Surveyors: Leigh Ann Adams, S. Zimmerman

Subjective Evaluation: “good”

Narrative:
After it crosses under route 8, the river passes along some old industrial/commercial sites on the south side where a great deal of trash was observed. The north side is a good distance away from a residential area, really shaded back here, condition of the river was really healthy: good flow, 1-2 feet deep in most parts, lot of pools. When the river crosses under the rail trail, the same conditions exist, although it’s not as wooded since the Ashuwillticook trail follows the stream from here upstream. Route 8 runs on the West side of the river, with residential land use and evidence of trash and home-made rip-rap (tires in sections) stabilizing the bank. On the east side, however, is the trail and beyond that another heavily wooded area. No farms up this way, though and no rip rap, and the river takes a nice shape and has some relatively short steep banks, approximately 5-7 feet high along the rail trail. Vegetation and wildlife were not evident when the section was surveyed, but in the summer this section becomes a popular fishing destination.

Assets	Problems	Priority Actions
Pretty, with excellent access provided by the rail trail	Trash and debris near Rt. 8	River clean-up
Fishing		

Hoosic River, Section 2, Aladco to Leonard St. (Rt. 8)

Surveyors: Leigh Ann Adams, S. Zimmerman

Subjective Evaluation: “fair”

Narrative:
This segment begins as the river regains its natural characteristics behind Aladco Laundry on Rt. 8. The east bank of the river is extremely steep as the river runs behind residences on Bellevue Ave. This area is characterized by heavy trash that may come from the houses above: mattresses, garbage, toys, metal, concrete blocks. This steep bank is quite eroded in sections. The river bends sharply to the west, providing very little access due to high, rocky bank conditions. Lots of vegetation was present—including in the middle of the river, which seemed to create pools but not constrict the water flow. Dry Brook enters from the east near a substantial pool created by an abandoned dam, and on the west bank is the US Geologic Survey gauging station. There is access to this via a town right of way behind Grove St. The area along an abandoned property by Leonard Street is also marred by lots of trash and debris. Apart from the trash, this is a pretty, secluded section of river, characterized by boulders, sand and cobbles, and heavy vegetation on the banks. The river runs clear, at a depth of greater than one foot, with only sparse pockets of foam.

Assets	**Problems**	**Priority Actions**
Pretty and secluded	Erosion on steep bank	Evaluate bank
	Lots of trash and debris	River clean up

Hoosic River, Section 3, Post Office to Aladco

Surveyors: Leigh Ann Adams, Rachel Contenta

Subjective Evaluation: “good”

Narrative:
The segment begins behind the Adams Post Office, and was followed upstream to Aladco. The river here is channelized in concrete flood control chutes. Overall, the water runs swiftly, and the volume was somewhat high for this time of year due to recent rains. In several spots, leafy debris and grass could be seen growing in the cracks in the concrete. There was also a sparse coating of algae. The Ashuwillticook trail runs parallel to the river on the west side, approximately twenty yards back, providing visual access to the river. Behind the rail trail the land is forested, or covered with vegetation. On the east side of the river is residential and commercial property until it passes beneath Rt. 8 near Aladco. Trash is minimal along this segment, and overall condition is good. As it passes along the Graphic Arts Plant (GAP), the river is inaccessible on the west side. Just north of the graphics plant, a small, unnamed tributary joins the main flow from the west. This stream is marked by heavy iron rust/oxide along the bottom of the stream. Upstream on this tributary is a small wetland that is heavily vegetated, and largely clean of trash and debris. Nearby, Pecks Brook joins the Hoosic from the west.

The river is inaccessible on the west side as it passes Aladco, and behind the Aladco parking lot a small roll dam was observed in the chutes. Across from Aladco, the walls of the chutes become taller as the river makes a sharp bend. On the west side of the river, a small wetland has become established along the bank. Just upstream, the flood chutes end, the wall disappear, and the substrate becomes cobble.

In this section, very little of the river is shaded by vegetation. Many pipes enter the river in this section, and during storm events some of them likely add runoff to the river. Since much of the land in this area is covered by impervious surfaces, the quality of the runoff may be suspect.

Assets	Problems	Priority Action
Visual access from rail trail	Debris and algae	
Small wetland	Storm drains from impervious surfaces	Investigate water quality during storm events

Hoosic River, Section 4, Hodges Cross Road to Center Street

Surveyor: Vicki-Sue DeMarsico

Subjective Evaluation: “Good/Fair”

Narrative:
This section begins near McCann Technical School at the Hodges Cross Road Bridge, and runs parallel to Rt. 8 and the railroad tracks through a wide flood plain used for agriculture into the town of Adams. From the beginning of the section to the start of the flood control chutes, the river meanders a great deal, completing a 270 degree bend in one section. Although the surrounding land is agricultural, the river is shaded through much of this section, and there is heavy vegetation on the banks—both willows and brush.

Near roads and access points, trash and debris is a problem. A ladder, cement blocks, a mattress, iron beams appliances were all found near the beginning of the section. Also, a cable used to support a high tension electricity tower has caught a large amount of debris that has formed a dam that impedes flow near the Zylonite substation. Erosion was also well-documented: in several areas the silty clay banks were falling into the river. In other spots, there was evidence of attempts to stabilize the banks: rip-rap and concrete blocks had been piled to prevent further erosion. As the river approaches downtown Adams, it becomes channelized in concrete flood control chutes which prevent access to the river.

Several pipes enter in this section, the most notable being the Adams Wastewater Treatment Plant, which had a noticeable odor. Downstream, a milky discharge entered from a canal on the west side of the river—this is likely calcium carbonate from the SMI plant, which, though unsightly, is not a threat to water quality.

Overall, this is a pleasant section of river, with potential for canoeing, though access points are quite limited. Fish and other aquatic life were spotted, and there were signs of large mammals using the river in this area. Much of the substrate is cobbles, with occasional boulders and smaller sediment in the pools. Though the segment is primarily quick-water, there are occasional small rapids that could be negotiated in a canoe.

Assets	Problems	Priority Actions
Lots of shade, some areas good for picnicking	Water treatment plant stinky, with dead fish	Evaluate water treatment plant discharge
Stream bed variable	Milky discharge within 200' of treatment plant steps	Evaluate Lime Street pipe discharge
Signs of animal life	Some foam near debris jam/island	Clear debris-trapping cable and debris jams to facilitate boating
Boatable and good for tubing in most locations	Low water upstream of plant (and crayfish a different color there)	Secure access points for boating
	Cow manure on Barnett's farm	
	At Lime Street bridge, dirty runoff from pipe	
	Past the high tension power lines– a cable in the stream in a tangle of woody debris	

Dry Brook, Hoosic River to town line

Surveyor: Leigh Ann Adams, Rachel Contenta

Subjective Evaluation: “excellent/good”

Dry Brook is a beautiful stream, surprisingly debris-free in the way of natural construction and trash even as it passes through residences off of Leonard St up to the cemetery. Near the cemetery it's fairly secluded on both sides. There is a steep ravine coming down from the cemetery, with some erosion, but the other side has a nice flat bank that reaches 20-30 yards out at some points with intermittent streams that feed in from the north. A nice swimming hole exists about half way up through the cemetery that is between seven and eight feet deep. The stream is pretty wide in some spots, mostly a foot deeper or more. The stream is rocky, with boulders, cobbles and gravel. Because it was surveyed in the winter, vegetation/wildlife was limited to some turkeys and deer. Water was clear and high quality, without odors. Frequent pools make this a particularly attractive section

Asset	**Problem**	**Priority Action**
High water quality, pools	Some trash	Clean up is a low priority

Tophet Brook

Surveyors: Lauren Stevens, Shelly Stiles

Subjective Evaluation: “excellent”

Narrative:
Upstream of East Hoosac Street, Tophet Brook begins as a series of wetlands in the Savoy Mountain State Forest. Beaver Activity was noted in several locations, though no beaver were observed. The river winds slowly through wetlands, agricultural land, and woods here, and foam was observed in several locations at the edges of pools, and some siltation was also noted. The stream passes under a driveway through a culvert here, but downstream, the brook is remote and seems far from human activity. Below the driveway, the stream enters the deciduous woods in a steep valley, and has primarily cobble bottom, with occasional bedrock portions. As the stream becomes steeper, it trickles through boulders, creating sizeable cascades. Just above High Bridge, some erosion was observed on the steep banks, and a debris jam had formed in the river.

The most spectacular site on Tophet Brook is the High Bridge Cascade. The cascade lies where a tributary enters from the west, in the area known as Little Egypt. Access to the stream here is difficult, however, since the bridge has been inoperable for many years. Nevertheless, this would be a prime parcel of land for protection and public access. The road that has replaced High Bridge is gated, making the pasture-land on the south side of the stream inaccessible to the public. Below High Bridge, the foundation of a millrace was noted, and nearby, a small tributary entered that was highly turbid—it seemed to be carrying a great deal of sediment from the gravel road on the north side of the stream. Much of the land on the north side of the river is in use as pasture. Upstream of the Patton Brook confluence, Tophet Brook tumbles over a series of large limestone ledges, and briefly passes through pasture land (a barbed wire fence is strung across the stream).

Immediately below where Patton Brook enters, the stream is spanned by a wooden bridge. It remains primarily cobbles and boulders with periodic bedrock ledges until it become channelized in the flood control chutes, approximately .75 miles above its confluence with the Hoosic. Until it reaches Walling Road, the south bank is primarily wooded (hemlocks), and the north bank is pasture and residential land. Near a human-made swimming hole, an island has formed and erosion was noted. Many blow-downs were present downstream, along with human debris, and even a car in the stream. There is little buffer in this section, and in several spots livestock have access to the river. The East Road bridge has an opening that is to small for Tophet Brook at high flows, and it has backed up the stream, resulting in gravel deposition above the bridge.

Below Bowens Corners, the river enters a section with steep banks, where it is well-shaded by willows and other trees. Although there is siltation in sections, in others, the river has scoured bedrock, and created an outstanding swimming hole and a small waterfall. Many other cascades and deep pools exist, separated by sections of cobbles and gravel. From Bowens Corners to the start of the flood chutes would be an excellent candidate for trail access—as of now, no formal access exists.

Above Summer Street, Tophet Brook becomes channelized within low concrete walls, and soon a concrete bottom is added. Although the area is densely populated, the right bank is fifty percent shaded. The stream runs under Summer Street and a parking lot before it re-emerges near the Miller Brook confluence. In this section, Tophet brook seems to carry much less water than it did upstream—perhaps it is losing water in the chutes. Near its confluence with the Hoosic River, cobbles, vegetation and debris were noted in the flood control chutes. Just south of the confluence is a church-owned park that might find more use as a municipal park.

Assets	**Problems**	**Priorities**
Gorgeous cascades and pools, include a downtown swimming hole and High Bridge falls and pools	Road runoff upstream of Tophet Brook Farm	Mitigate sedimentiation caused by road runoff near Tophet Brook Farm
High Bridge stonework	Near Walling Road, cows in stream; on Tophet Brook Farm, cows in riparian zone	Investigate fencing cattle out of stream
Church-owned park at confluence with Hoosic	One “green discharge” pipe	Investigate public access to Cascade
Trout	Bridge too small and askew of Brook at East Road	River clean-up on north bank near East Rd.
	Flood chutes inhospitable to aquatic life	Investigate trail access below Bowens Corners
	Trash and debris in river	

Patton Brook

Surveyor: Tom Ennis

Subjective Evaluation: “excellent”

Narrative:
Patton Brook originates high in the hills, and is largely in pristine condition. The vast majority of its length is shaded by deciduous forest, with several patches of hemlock (perhaps 98% is shaded). The streambed is primarily cobbles, with gravel in the pools separated by miscellaneous boulders. In one spot, flow was blocked by a natural log jam. Although largely undisturbed, an old logging road parallels the stream on the east side for some time, and there looked like active grazing near the tributary stream. Several small tributaries run through pasture land, and might carry sediment during storm events.

Assets	**Problems**	**Priority Actions**
Very pretty	Evidence of cows	
Trout		
Some cascades/pools		
Heavily forested		

Miller Brook

Surveyors: Tom Ennis, Jason Ennis

Subjective Evaluation: mostly "excellent" at flood chute "degraded"

Description:
Although it had rained the night before the stream was surveyed, Miller Brook was no higher than normal. The stream begins at a wooded spring in a swampy are at approximately 550 feet of elevation. Flow is minimal in the small channel as it flows through a thickly forested area, and becomes steep—this section is characterized by large boulders. After a small tributary joins from the northeast (which on this day carried more water than Miller Brook), flow becomes steadier, and gravel bottoms in the many pools are visible through the clear water. After the brook passes under East Hoosac Street, the land is no longer primarily forested, the river bed became wider and bank erosion was visible in several locations. There was also trash and debris in this section of river.

At the East Street Bridge, the river is somewhat channelized, and the bank has been stabilized by rip-rap and rocks on the west side of the river downstream of the bridge. Several pipes were noted at this location. Below the bridge the stream morphology returns to a more natural step-pool state, and once again becomes forested with deciduous trees. At approximately 270 feet elevation, banks become quite steep, and houses are built close to the stream. Just above Richmond Street, the stream becomes channelized by flood control chutes, shaded in places, open to the sun in others. Below Richmond Street some vegetation can be observed within the chutes, and many roof drains empty into the river. Despite the previous night's rainfall, there was no flow through this section. Flow is re-established downstream, and below Summer Street, there are natural cobbles in the chutes and vegetation in spots. Miller Brook soon flows into Tophet Brook.

Assets	**Problems**	**Priority Actions**
Step/pool morphology – pretty. Cean, clear water	Steep driveways yield sediments in runoff	Prevention of street/stormwater runoff pollution
Little erosion despite steep banks	Flood control chutes inhospitable to aquatic creatures	flood chute remediation
Reports of trout	Some garbage	River clean-up

Southwick Brook

Surveyor: Vicki-Sue DeMarsico

Subjective Evaluation: “Good/ Fair”

Narrative:
Southwick Brook begins as a small stream, flowing out of the Savoy State Forest, and the survey began where Spring Rd crosses the brook, east of Adams. Through the first part of this section, the stream runs through the woods in a deep, scenic gully, trickling over and through large boulders. Some erosion was noted in this section due to steep banks, and one large concrete well was noted near the stream bank. Downstream, a barbed wire fence paralleled the brook. A gravel road, useable by a four wheel drive vehicle crossed the river, and nearby was a cache of trash—bags full of debris that had been abandoned. Where Southwick Brook crosses under East Rd, it is channelized beneath a stone bridge, with a culvert entering from one side.

Downstream, the brook changes in character, and is channelized in many places with concrete, stone rip-rap and even old tires. In one section, trees have fallen into the river, which might impede flow at higher water. Along Lime Street, many small bridges cross the stream, primarily to permit driveway access to houses on the north side of the brook. Stream stability is clearly an important issue in the lower section of Southwick Brook—there is a great deal of erosion, and property owners have attempted to stabilize their banks by any means possible. There are many reports of property damage and flooding during high water. Stormwater seems to be more a problem of quantity than quality, however, since there are no suspect pipes, and land use is primarily forested and residential, rather than impervious. The bottom section was nearly dry on the day this was surveyed.

Assets	**Problems**	**Priority Actions**
Upper section very pretty cascading stream	Extensive erosion and rip-rap in lower section	Investigate strategies to stabilize banks and prevent erosion
High water quality	Bridges, and channelizations may impede flow	Investigate strategies to prevent extensive flooding
	Some large debris – cars, metal, fallen trees from Springhill Farm downstream	Clean-up
	No public access	Investigate public access points
	Dry from Charles St. to Hoosic	
	Near Charles St., a collapsing retaining wall and lots of industrial trash	
	Algae near Arbor St.	

Pecks Brook

Surveyors: Heather Linscott, Robin Avery, Leigh Ann Adams

Subjective Evaluation: “good”

Narrative:
Pecks brook was followed from the Hoosic River upstream. Dead fish were noted, as well as some litter and stone walls falling into the river. Erosion was observed under the bridge, along with Tyvek material and old, non-functioning pipes. In this segment of river the streambed began as flood control chutes but became primarily boulders and cobbles, and green algaes and mosses seemed more prevalent here than upstream. Near Fisk St an old dam is present, with orange deposits that could be caused by rust from iron at the dam. Unfortunately there is litter here, and the area would benefit from a clean-up. One asset nearby was a convoluted series of potholes near the golf course, although an old metal fence also exists nearby, with trees falling into the river and bank erosion present. On one visit, an odor was observed between Fisk St and West Rd. Just upstream the river splits.

On the South branch, the team found evidence of deer, but there was also evidence of humans. Several pipes were present, and a cement spillway and orange scum was also observed. On the west side of West Road there was a sizeable log jam, but upstream the brook was in a more natural state. Bedrock ledges created habitat for fish, although “pool scum” was also noted. Above this area, a pipe crossed the river, but it did not flow into the stream.

On the north branch, the stream crossed West Road, where a wall was falling in on the Linscott property caused by erosion. A dam on the property is filled in with silt adjoining a wetland area, which seemed degraded by silt. Further upstream is Peck’s Falls, a well known scenic landmark with trail access—the surveyors were pleased to report no litter. Where the north branch splits, one tributary drains the Gould farm. There is a possibility that agricultural runoff might have a negative impact on stream quality. The other tributary drains the western area along the Gould trail—this branch seemed to have much less moss and algae than the Gould farm branch.

Assets	**Problems**	**Priority Actions**
Fisk Road Dam could be a really neat place	Undermining at bridge near McDermott Graphics	Establish formal access points to waterfalls and pools
Trout	Lots of iron pipe. At the Dedek Mill, old water lines?	
Shady	Large debris near Fisk Road Dam	Remove debris near Fisk Road Dam
Water-worn bedrock	Siltation behind dam with flow behind wing walls	
Pecks Falls and other waterfalls	Orange pool below dam	
Swimming hole upstream of Linscott dam (12’ deep)		
	Erosion near West Road (also affecting dam)	Remediate erosion near West Road
	Tube in bridge closed	
	Cows in stream	

Hoxie Brook

Surveyors: Donna Cesan, Penny Fehr

Subjective Evaluation: Upper: “very eroded” Middle: “fair” Lower: “good”

Narrative:
Hoxie Brook begins on the forested slopes of Mt Greylock and runs east, parallel to Thiel Rd, and crosses Friend St, where it enters a residential section of Adams. Through much of the commercial center of town it is channelized and underground, emerging briefly near the new visitor center before it runs beneath a parking lot and re-emerges near its confluence with the Hoosic River.

The upper section, between Greylock Glen and Forest Park Ave is marked by heavy erosion, particularly in the section below West Rd. One culvert was particularly notable in this section, as was the dam at Forest Park, which was severely eroded and caving in. This section is primarily forested, though in sections there is primarily heavy brush lining the river banks. Land use in this section is agricultural and residential as well as undeveloped, and runoff from the orchard and farm may be a concern. Two wetlands exist in this section north of the stream, elsewhere, the river bottom is mixed, but predominantly cobbles. Wildlife abounds, and a woodpecker and kingfisher were spotted, as well as evidence of a black mink. This section was assessed as “very eroded”.

Between Hoosac Street and the Ashuwillticook Trail several locations merit mention. Near Hoosac Street a short stretch of the stream is daylighted, and supports healthy wetland vegetation on the banks of the stream. Nevertheless, this area traps debris and trash. Immediately upstream, near the entrance to the Meehan Mill, the brook is channelized in a culvert for approximately sixty feet. Upstream, behind Interior Alternatives the brook is daylighted for approximately 25 feet. This area needs immediate attention, since there are two sinkholes in the pavement, and the surface is buckling. Although it was dry on the day the survey took place, the surveyors were concerned about runoff from the parking lots and Hoosac St during storm events. Additionally, many pipes were observed entering the stream. In this section, a small man-made dam has created a small, three foot deep pool. This section was characterized by gravel, cobble and sand substrate. This section was assessed as “fair”.

Between Hoosac St and the convergence of Hoxie Brook and the Hoosic River, the river flows through a broad concrete culvert topped by pavement. Abutting the Hoosic River flood chutes, Hoxie Brook emerges in a naturally vegetated stream bank. The daylighted sections appear to have lush healthy riparian vegetation. This section was assessed as “very good”, and the river abits town and DEM land that could be used to provide access for walking trails.

Assets	**Problems**	**Priority Actions**
Shaded	Stream is underground then daylighted then back underground again and again	Investigate educational signage for mini-wetland near Hoosic River confluence
Historic dam at Forest Park Ave.	Meehan Mill – lots of debris, problems with substrate	River clean up in problem sections
Upstream of Forest Park Ave., the valley is deep and narrow and the feeling is “mysterious, green, pristine”	Erosion at the new bike trail, east of the new visitors’ center	Address erosion concerns in various location
Mini-wetland near Hoosic River confluence	Upstream of Forest Park Avenue a dam is entirely silted in.	Evaluate Forest Park dam
	Sinkholes and buckling in pavement behind Interior Alternatives	Repair pavement, investigate daylighting near Visitors Center

Unnamed Brook

Surveyors: Lauren Stevens, Holly Mann

Subjective Evaluation: above Friend St, “excellent”

Narrative:
Unnamed Brook begins as an intermittent stream in the above the SMI property north of Adams. The upper section is primarily pools and riffles, nearly choked with vegetation and boulders. On the SMI land there is informal access. Gradient increases after it crosses under Notch Rd through a culvert by a gate. A dam was observed below the culvert, followed by a series of small cascades. The nearby land is more residential here, but the stream is still in the woods. Just west of Friend St the river runs through a concrete channel beneath a garage. Below this it is channelized in a ditch, and makes a sharp bend north at Pine St. Along the west side of the baseball field, the river is shaded, until it disappears into a pipe underneath Howland Ave. It then runs in a ditch beside Rt. 8 North and disappears in a pipe before Lime St. At this point, it became impossible to locate Unnamed Brook, though it is likely it joins the Hoosic River nearby.

Assets	**Problems**	**Priority Actions**
Quiet, pretty brook	Unclear where it enters the Hoosic	Locate confluence with Hoosic River

Appendix:

Tips for Shoreline Surveyors

Safety and Legalities

- Always walk with someone.
- Watch out for irate dogs. Walk cautiously and practice good dog etiquette.
- Do not drink the river water.
- Lifejackets are required by law for each person in the canoe.
- From September 15 to May 15 all canoe or kayak occupants must wear a U.S. Coast Guard Approved Personal Flotation Device.
- Wear long-sleeved shirts and pants to protect against, ticks, mosquitoes, poison ivy and nettles.
- Wear insect repellent if necessary.
- Consider landowner rights. Ask permission to cross private land, posted or not.
- Do not enter posted areas without permission. Take advantage of any public access points.

Environment:

- Don't walk on unstable banks; your footsteps could speed erosion.
- Be aware of wildlife and animal homes, for both of your sakes.

NEVER PUT YOURSELF INTO DANGER TO GATHER SURVEY INFORMATION.

If at anytime you feel uncomfortable about the stream conditions or surroundings, please STOP your Shoreline Survey. You and your safety are much more valuable than any of the objectives of the Shoreline Survey.

Checklist: What to take on your Survey

__ A buddy
___ Data sheets and map
___ Clipboard or other surface for writing
___ Two pencils color is good to mark on maps
___ Long-sleeved, snag-free clothing /pants (for bugs and thorns)
___ Sunblock
___ Sunglasses (polarized to see into the water better)
___ Lifejackets & paddles if canoeing
___ Camera and film
___ Gloves
___ Copy of letter sent out to landowners

Optional:

___ Rubber boots or waders
___ Yardstick or measuring tape (useful for pipes)
___ Compass
___ Field guides (in ziplock bags)
___ Food, for energy!

What you need to do:

Tonight: Coordinate with your segment team. Arrange canoes, meeting place, etc.

This weekend: Conduct the survey! Fill out the data sheets while you're on the river. With your team, fill out the *Summary Sheets*—the segment description and the priority Sheet--after you are finished surveying your segment. Return all *Data* and *Summary Sheets* (one set per team) to:

___ ________ ________ ________ ________

___ ________ ________ ________ ________ Return by: ________

This month: Attend action planning meeting, which will be held: ________

Massachusetts Riverways Programs/DFWELE

Figure 7.

SHORELINE SURVEY FIELD DATA SHEET

Segment begins:______________
Segment ends:______________

Observers:______________________________ Date:_______
Today's weather:______________________________
Weather over past 24 hours:______________________________

I. Instream Conditions:

A. Stream bottom:

1. What is stream bed made of?
Mark from 1 (most typical) to 6 (least typical)
_____Organic debris (leaves, twigs) _____Gravel (1/4 - 2")
_____Silt (mud) _____Cobbles (2 - 10")
_____Sand (1/16 to 1/4") _____Boulders (> 10")

2. What color is the stream bottom? *(Circle One)*
Black Brown Orange/Red Yellow Sandy Gray Other_________

B. Water

1. What Color is the water? *(Circle One)*
Clear Cloudy Tea Milky Muddy Other_________

2. Are there indications of... *(Circle)* Oily sheen Foam Scum Other_________
*Describe cause if obvious*______________________________

3. What is the water odor? *(Circle One)*
No odor Rotten eggs Musky Fishy Oily Ammonia Other_________

4. How deep is the water? *(Circle)* < = less than; > = greater than
< 1' > 1' > 2' > 3'

5. In your opinion, is the water level *(circle)* **higher** or **lower** than usual for this time of year?
If problem is severe state why. ______________________________

6. Is the water flowing..... *(Circle One)*
Quickly Slightly Almost still

7. Number of pools ______ Number of riffles ______ Don't know ______

8. Is the stream flow blocked by *(circle)* **trees**, **trash**, or **man-made objects**? **If yes locate on map.*

C. Stream vegetation

1. Are there areas of extremely dense or clogging aquatic vegetation in any section?
(Circle one) Yes or No **If yes locate on map*
*Describe cause if obvious.*______________________________

2. Are there areas on the stream bed or around pipes that are algae covered? ______
**If algae seems abnormally heavy locate on map.*

3. Are there wetlands in your section? If so, are they degraded by
(circle) phragmites purple loosestrife fill blockage of water ditches
disturbed stream banks pipes sediment trash other don't know

**If you have taken photographs, you could note locations by marking on map #1, #2,...#3, etc. Make sure you mark photos on back with date and location and direction of view. Be as specific as possible so that people can go back and compare later photographs. Mention nearby bridge, road, house, etc.*

II Stream Corridor Conditions...*Answer questions and *locate problem areas on map.*

A. Stream Bank

1. Do trees and shrubs overhang the stream and provide shade?________
*If yes estimate what % of bank is shaded.*______%

2. *Circle most widespread stream bank condition.*
Eroding Cleared/cut Developed(buildings or pavement) Wetlands/marsh
Riprap/channelized Lawns Forest Vegetated (shrubs, plants) Beaches

B. Pipes

*Describe pipes on pipe sheet and *locate on map as P1, P2,...P3 etc.*

C. Litter and Trash

*Describe below any potential cleanup areas. *Locate on map*

D. Fill, brush and clear cutting

**Locate on map as fill (F1, F2.. .F3) or clear cutting (CC1, CC2,...)* and *describe below.*

E. Runoff

Did you see runoff from any of the following? *(circle)*
Manure Farm animals Bridges/roadways Construction sites Sewage
Parking lots Lawn fertilizer Plowed fields Other sources_____________

F. Corridor

1. What are the land uses in your segment? *Check which ones*, and *circle the **dominant** land use type.*

____ Industrial	____ Landfill(s)	____ Wastewater treatment plant (s)
____ Commercial	____ Undeveloped/unprotected land	____ Junkyard(s)
____ Agricultural	____ Road(s)	____Illegal dump(s)
____ Residential	____ Railroad(s)	____Protected Conservation Land
____ Golf Course(s)	____ Parking lot(s)	____Other (describe)

2. Is there public access to the stream? If so, is access appropriate for... *(circle)* and **locate on map.*
canoeing fishing swimming walking(trails) other___________
*If there are areas which are **potential** access points, describe below and *locate on map.*

III. Wildlife...*Estimate number encountered and species in the following categories.*

A. Aquatic

1. Fish or evidence of fish? ________________________________
If possible, *describe species & size below.*

2. Other forms of aquatic life? *Circle type and if you can identify species, do so below:*
Aquatic insects Turtles Snails Salamanders Mussels Clams Other________

B. Aquatic/land Species

1. Animals or evidence of animals? *(Circle)*
Beaver Muskrat Otter Other ____________________

2. Water fowl? ______ *Identify species if you can.* _________________

3. Do you know if there are rare & endangered species of plants or animals in your segment?
*If so, identify.*____________________________________

IV. *Figure 7*: Shoreline Survey Summary Sheets

The summary sheets are designed to give a "big picture" of your segment. They provide the basis of the narrative description of segments in the Shoreline Survey Report. (See *Figure 13*.)

Shoreline Survey Summary Sheet

NARRATIVE DESCRIPTION
Describe your segment in a paragraph. (See samples below)

Samples:
Segment 1 extends from the headwaters near Sunshine Drive downstream approximately 0.5 miles and is a seriously damaged portion of the river. Most of the brush has been removed during construction of single family residences thereby reducing bank stability and subjecting the soil to erosion by water. Over 40% of the streambank has been affected to the point that it is now contributing excessive quantities of sediment. Trash, tires and yard debris are commonly seen through out this segment.

Segment 2 flows slowly through this 0.5 mile segment and is virtually undisturbed. The land is owned by the State Department of Fisheries and Wildlife. Vegetation within the upper bank ranges from thick stands of marsh grass to open woods of cedar trees.

Segment 6 flows south between the railroad and Interstate Highway 5 through dense blackberry, willow, marsh and other trees. Surface runoff from light industry at the southern section as well as railroad practices may be contributing sediments, toxins, oils and greases or nutrients.

Samples are taken from EPA's manual Streamwalk.

NARRATIVE DESCRIPTION FOR SEGMENT # __ OF THE __________(River, Brook). The segment begins at ______________ and ends at ____________________.

Figure 7.

SHORELINE SURVEY SUMMARY SHEET

Segment Begins______________________

Segment Ends______________________

Observer:______________________________ **Date:** ______________

Today's weather:____

Weather over past 24 hours:____________________________________

Please answer the following:

River quality: Looking back at your Field Data sheet and including observations,

1. Are there places which need to be monitored further? *(Circle)* **Yes No.** Identify.

2. Are there problem areas which require immediate action? *(Circle)* Yes No. Identify.

3. Are there places which require a clean up? (Circle) Yes No. Identify.

Habitat: How would you describe habitat in your section?

1. Adequate water flow for the season?
   (Circle) Yes No Don't know

2. Did you see evidence of siltation from roads, bridges, pipes, construction? Yes No If yes, *circle if widespread or localized.*

3. Majority of river bank vegetated, developed or clear cut?

4. Shade along stream?

5. Diverse number of species seen?

6. Did your section contain wetlands? *(circle)* Yes No
   - If yes, were they in your opinion *(circle)* healthy degraded
   - If degraded, were wetlands degraded by
     (circle) phragmites purple loosestrife fill blockage of water ditches disturbed stream banks pipes sediment trash other *(describe)*.

   - Should action be taken to restore wetlands in your section?
     (circle) Yes No Don't know

Overall, the section of the river is *(circle)*:
Excellent good fair poor degraded.

Land Protection: Did you find any large tracts of open land which need to be protected? Describe.

Did you find areas which could be explored for trail development or fishing or canoe access? Describe.

Are there informal access points? Describe.

Please hand these sheets to the Shoreline Survey Chair or to your Segment Captain. Thank you very much!

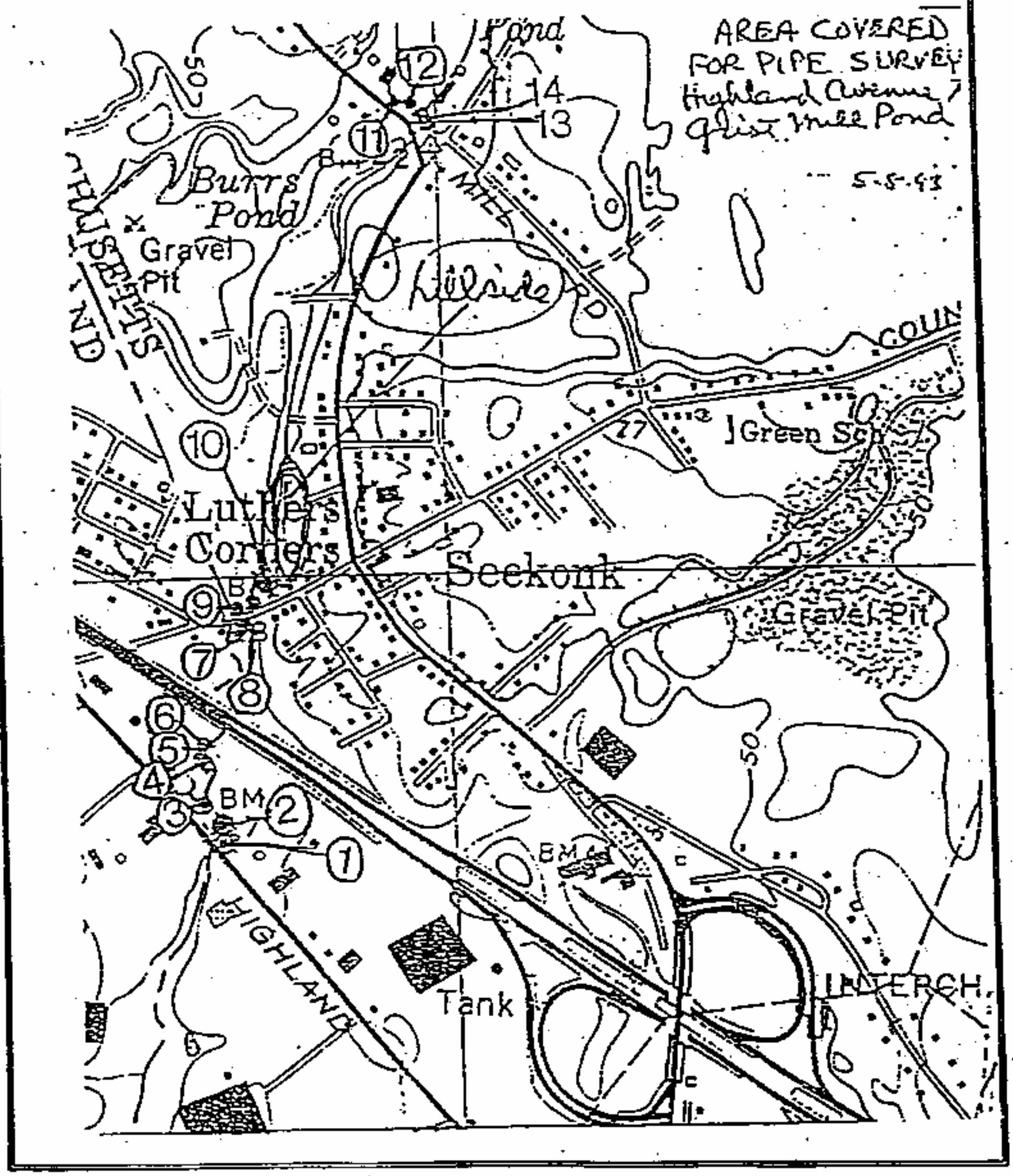
Figure 8. Pipe Survey

Segment#________________ Names of observers:________________

Pipe#	Date	Time	Weather today	Weather in last 48 hours	Pipe material	Pipe size/amount of flow	Color of flow	Odor	Comments
Sample #1	5/8/93	8:40AM	sunny + clear air temp 75° water T° 60°	Clear, no rain.	concrete good shape	constant moderate flow 36" diameter	reddish brown	fetid odor	Storm drain. needs to be rechecked.
1									

Massachusetts Adopt a Stream

Figure 9. Sample Pipe Survey Map. This is an enlarged U.S.G.S. topographic map with pipe numbers indicating location of pipes surveyed.



SAMPLE

Priority Sheet for Fictitious Brook, 1996
Shoreline Survey September, 1996
South River Watershed

SEGMENT # 2
TEAM MEMBERS Joe Smith and Mary Jones
SEGMENT BEGINS at the Washington Street Bridge
AND ENDS at Maple Street

Problems found by segment:	Assets found by segment:	Priorities by segment
1) constantly flowing pipe: oily sheen seen in water (on the south side of the Washington Street Bridge)	*1) possible access for canoes at Ash Street*	*1) Pipe discharging during dry weather (Washington Street Bridge)*
2) dumping and evidence of backhoe work and a great deal of sediment in river downstream (at industrial area off Commerce Street	*2) large undeveloped piece of land adjacent to Jones Park*	*2) Look into undeveloped land near Jones Park: could this be purchased by state, town or land trust? Are there other means of protection?*
3) trash including car parts (across the river from industrial area)	*3) Wildlife: wood ducks, great blue heron, muskrat holes, deer tracks in undeveloped piece of land*	*3) Trash: clean up?*
4) small amount of erosion of banks (near Ash Street at the new subdivision)	*4) good wetlands area with lots of wildlife*	*4) Backhoe work: Is the Conservation Commission aware of this?*

SEE REVERSE SIDE for your stream's PRIORITY SHEET

Adopt a Stream

Priority Sheet for the _______ Brook/River
Shoreline Survey (Date)___________
Watershed: ___________

SEGMENT # __
TEAM MEMBERS______________________________
SEGMENT BEGINS ____________________
AND ENDS ____________________

Problems found by segment:	Assets found by segment:	Priorities by segment
1)	1)	1)

(SEE REVERSE SIDE FOR SAMPLE PRIORITY SHEET)

Adopt a Stream

Commonwealth of Massachusetts
Department of Fisheries, Wildlife & Environmental Law Enforcement

Adopt-A-Stream

Shoreline Survey Focus Group

This approach is used when the Watershed Association, EOEA Watershed Team or Conservation Commission wants to get data for a particular purpose. Examples:

- Identifying sites for water quality monitoring
- Identifying sites that need cleanups
- Identifying sites for canoe access
- Building a constituency

The Watershed Association, EOEA Watershed Team or Conservation Commission often uses the data to create projects with opportunities for volunteers.

Forming a Focus Group
Watershed association, EOEA Watershed Team, Conservation Commission, folks call the Adopt-A-Stream Program (AAS). AAS supports the formation including the creation of a local steering committee (interested people, town officials (i.e. Concom & Board of Health), abutters, businesses, anglers, etc.)

↓

Planning:
Steering committee plans survey, does pr, invites volunteers, sets up training workshop

↓

Shoreline Survey:
Training: AAS conducts the training workshop. Combining data sheets and interactive slide show: a generic shoreline survey. Training is a night meeting 2-4 days before survey
Survey: done either as a one-day event or within a window of a couple of weeks. Data sheets, cameras, maps are primary tools. Sections are divided so that Survey takes approximately 2 hours.

↓

Priority Setting:
After filling out data sheets, Stream Team members determine which are the significant problems, assets, and priorities for work.

↓

Shoreline Survey Report:
Stream Teams with watershed association support prepares a report that can be formally presented to the town, EOEA Watershed Team, AAS Program, others. This is the official record.

OPTIONAL:
Some Focus Groups want to get volunteer's ideas and have an action-planning meeting. This is optional.

Action Planning:
At an action planning meeting, AAS staff facilitates meeting that looks at the priorities for work and determines (1) which problems should be reported; (2) short term projects; (3) long term projects.

The **Adopt-A-Stream Program** works to support and encourage local stream teams and communities in efforts to protect and restore the ecological integrity of the Commonwealth's watersheds: rivers, streams and adjacent lands.
If you know someone else who would be interested in our newsletter, please contact:
Rachel Calabro, Coordinator • Adopt-A-Stream Program • 251 Causeway Street, Suite 400 • Boston, MA 02114
(617) 626-1549 • email: Rachel.Calabro@state.ma.us • Also check out our web-site: Http://www.massriverways.org
Riverways Programs, Joan Kimball, Director
Department of Fisheries, Wildlife and Environmental Law Enforcement, David M. Peters, Commissioner
Executive Office of Environmental Affairs, Bob Durand, Secretary

APPENDIX 4-B

Laboratory Data & Field Inspection Sheets for Stormwater Sampling Events

BERKSHIRE ENVIRO-LABS, INC.
CORNER OF MAIN & CENTER STREETS
266 MAIN STREET, LEE, MASS. 01238 (413) 243-1416

Berkshire Regional Planning Commission

L- 562

RE: Adams Storm

SAMPLE NUMBER	135883
DATE COLLECTED	3/31/04
TIME COLLECTED	10:15am
COLLECTED BY	D.P.W.
SAMPLE LOCATION	SW-1 - Renfrew/Columbia

ANALYSIS	UNITS	RESULTS	DETECTION LIMIT	METHOD NUMBER	ANALYST	DATE ANALYZED
Fecal Coliform	/100ml	160	10	SM 9222 D	W.E.-B.W.	3/31/04
E. Coli	/100ml	60	10	Modified m TEC	W.E.-B.W.	3/31/04
Total Suspended Solids	mg/l	118	1	SM 2540 D	B.W.	3/31/04
Total Phosphorus (as P)	mg/l	0.228	0.01	SM 4500-P-B,E	B.W.	4/1/04

SAMPLE NUMBER	135884
DATE COLLECTED	3/31/04
TIME COLLECTED	9:45am
COLLECTED BY	D.P.W.
SAMPLE LOCATION	SW-2 - DPW Facility

ANALYSIS	UNITS	RESULTS	DETECTION LIMIT	METHOD NUMBER	ANALYST	DATE ANALYZED
Fecal Coliform	/100ml	5300	10	SM 9222 D	W.E.-B.W.	3/31/04
E. Coli	/100ml	4100	10	Modified m TEC	W.E.-B.W.	3/31/04
Total Suspended Solids	mg/l	410	1	SM 2540 D	B.W.	3/31/04
Total Phosphorus (as P)	mg/l	1.014	0.01	SM 4500-P-B,E	B.W.	4/1/04

SAMPLE NUMBER	135885
DATE COLLECTED	3/31/04
TIME COLLECTED	10:15am
COLLECTED BY	S.V./P.F.
SAMPLE LOCATION	SW-3 - Hoxie

ANALYSIS	UNITS	RESULTS	DETECTION LIMIT	METHOD NUMBER	ANALYST	DATE ANALYZED
Fecal Coliform	/100ml	110	10	SM 9222 D	W.E.-B.W.	3/31/04
E. Coli	/100ml	90	10	Modified m TEC	W.E.-B.W.	3/31/04
Total Suspended Solids	mg/l	45	1	SM 2540 D	B.W.	3/31/04
Total Phosphorus (as P)	mg/l	0.117	0.01	SM 4500-P-B,E	B.W.	4/1/04

< = Less Than > = Greater Than ND = Not Detected

William S. Enser, Jr.
Director

BERKSHIRE ENVIRO-LABS, INC.

CORNER OF MAIN & CENTER STREETS

266 MAIN STREET, LEE, MASS. 01238 (413) 243-1416

Berkshire Regional Planning Commission

L- 562

RE: Adams Storm

SAMPLE NUMBER	135886
DATE COLLECTED	3/31/04
TIME COLLECTED	9:42am
COLLECTED BY	S.V./P.F.
SAMPLE LOCATION	SW-4 - Hoosic/Post Office

ANALYSIS	UNITS	RESULTS	DETECTION LIMIT	METHOD NUMBER	ANALYST	DATE ANALYZED
Fecal Coliform	/100ml	390	10	SM 9222 D	W.E.-B.W.	3/31/04
E. Coli	/100ml	350	10	Modified m TEC	W.E.-B.W.	3/31/04
Total Suspended Solids	mg/l	66	1	SM 2540 D	B.W.	3/31/04
Total Phosphorus (as P)	mg/l	0.276	0.01	SM 4500-P-B,E	B.W.	4/1/04

SAMPLE NUMBER	135887
DATE COLLECTED	3/31/04
TIME COLLECTED	9:50am
COLLECTED BY	L.A.
SAMPLE LOCATION	SW-5 - Glenn Street

ANALYSIS	UNITS	RESULTS	DETECTION LIMIT	METHOD NUMBER	ANALYST	DATE ANALYZED
Fecal Coliform	/100ml	200	10	SM 9222 D	W.E.-B.W.	3/31/04
E. Coli	/100ml	180	10	Modified m TEC	W.E.-B.W.	3/31/04
Total Suspended Solids	mg/l	50	1	SM 2540 D	B.W.	3/31/04
Total Phosphorus (as P)	mg/l	0.124	0.01	SM 4500-P-B,E	B.W.	4/1/04

SAMPLE NUMBER	135888
DATE COLLECTED	3/31/04
TIME COLLECTED	10:00am
COLLECTED BY	L.A.
SAMPLE LOCATION	SW-6

ANALYSIS	UNITS	RESULTS	DETECTION LIMIT	METHOD NUMBER	ANALYST	DATE ANALYZED
Fecal Coliform	/100ml	180	10	SM 9222 D	W.E.-B.W.	3/31/04
E. Coli	/100ml	170	10	Modified m TEC	W.E.-B.W.	3/31/04
Total Suspended Solids	mg/l	50	1	SM 2540 D	B.W.	3/31/04
Total Phosphorus (as P)	mg/l	0.122	0.01	SM 4500-P-B,E	B.W.	4/1/04

< = Less Than > = Greater Than ND = Not Detected

William S. Enser, Jr.
Director

BERKSHIRE ENVIRO-LABS, INC.

WATER WASTEWATER AND ENVIRONMENTAL ANALYSIS
PHYSICAL CHEMICAL AND BACTERIOLOGICAL TESTING
LABORATORY AND FIELD MEASUREMENTS

CORNER OF MAIN & CENTER STREETS
266 MAIN STREET, LEE, MASS. 01238 (413) 243-1416

Berkshire Regional Planning Commission

L- 562

RE: Adams Storm - QC Report

SAMPLE NUMBER	135887						
DATE COLLECTED	3/31/04						
TIME COLLECTED	9:50am						
COLLECTED BY	L.A.						
SAMPLE LOCATION	SW-5 - Glenn Street			DUPLICATE			
ANALYSIS	UNITS	RESULTS		RESULTS			
Fecal Coliform	/100ml	200		190			
E. Coli	/100ml	180		170			

SAMPLE NUMBER	135887					
DATE COLLECTED	3/31/04					
TIME COLLECTED	9:50am					
COLLECTED BY	L.A.					
SAMPLE LOCATION	SW-5 - Glenn Street		DUPLICATE	SPIKE %		
ANALYSIS	UNITS	RESULTS	RESULTS	RECOVERED		
Total Phosphorus (as P)	mg/l	0.122	0.125	103%		
Nitrate (as N)	mg/l					
Alkalinity	mg/l					

SAMPLE NUMBER	135887					
DATE COLLECTED	3/31/04					
TIME COLLECTED	9:50am					
COLLECTED BY	L.A.					
SAMPLE LOCATION	SW-5 - Glenn Street		DUPLICATE			
ANALYSIS	UNITS	RESULTS	RESULTS			
pH	SU					
Total Suspended Solids	mg/l	50	51			

< = Less Than > = Greater Than ND = Not Detected

William S. Enser, Jr.
Director

Hoosic River Watershed Association

Monitors' Field Report Form

ate 03-31-04 Time 10:15am Site SLU-1 R. W FROM ? COLUMBIA

ampler(s) Name(s) M. SHERMAN, C. GELINAS, J. TAYLOR

ecent Weather Conditions: Characterize the last 24 hours by checking those that apply.

ky conditions: __ clear __ partly cloudy ✓ cloudy

ainfall: ✓ light rain __ moderate rain __ heavy rain

emperatures __ hot __ seasonable ✓ cool

oday's Weather Conditions:

_ clear __ cloudy ✓ rainy __ heavy rain ______ air temperature

-Stream Conditions: Characterize the condition of the river water by checking those that apply.

ater level and flow: ____ low ✓ normal ____ high

urbidity: ____ clear ✓ cloudy ____ very cloudy

dor: ____ fishy ____ sewage ✓ other (explain) NO SMELL

ater temperature: 5°C

pe of sample collected:

_bacteria ✓ total phosphorous (TP) ✓ total suspended solids (TSS)

am Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., debris (trash, tires, barrels, dirt or asphalt, etc.), signs of erosion or other disturbance.

TRASH (furniture downstream of sample site)

OW VIS: 9:46am TIME TAKEN: 10:15am

thing Else of Note?

Hoosic River Watershed Association

Monitors' Field Report Form

at 03-31-04 Time 09:45am Site SW-2 ADAMS DPW FACILITY

ampler(s) Name(s) MIKE SHERMAN, CHRIS GELINAS, JIM TAYLOR

ecent Weather Conditions: Characterize the last 24 hours by checking those that apply.

ky conditions: __ clear __ partly cloudy ✓ cloudy

ainfall: ✓ light rain __ moderate rain __ heavy rain

emperatures __ hot __ seasonable ✓ cool

oday's Weather Conditions:

clear __ cloudy ✓ rainy __ heavy rain ______ air temperature

-Stream Conditions: Characterize the condition of the river water by checking those that apply.

ater level and flow: ____ low ____ normal ✓ high

urbidity: ____ clear ____ cloudy ✓ very cloudy

dor: ____ fishy ____ sewage ✓ other (explain) NO SMELL

ater temperature: 4.5°C

pe of sample collected:

bacteria ✓ total phosphorous (TP) ✓ total suspended solids (TSS)

un Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., debris (trash, tires, barrels, dirt or asphalt, etc.), signs of erosion or other disturbance.

NO

FLOW VIS: 10:27 am

TIME TAKEN: 9:45am

recording error
- Flow visible 10:27
- Sample taken 9:45

thing Else of Note?

Hoosic River Watershed Association

Monitors' Field Report Form

Date 3/31/04 Time flow visible 9:54 AM Time sample collected 1) 10:15 AM

Site SW-3 Hoxie Brook

Sampler(s) Name(s) Sarah Voisin, Penny Tellier

Recent Weather Conditions: Characterize the last 24 hours by checking those that apply.

Sky conditions:	__ clear	__ partly cloudy	X cloudy
Rainfall:	X light rain	__ moderate rain	__ heavy rain
Temperatures	__ hot	X seasonable	__ cool

Today's Weather Conditions:

__ clear X cloudy X rainy __ heavy rain 12°C air temperature

In-Stream Conditions: Characterize the condition of the river water by checking those that apply.

Water level and flow: ___ low ___ normal X high
Turbidity: ___ clear X cloudy ___ very cloudy
Odor: ___ fishy ___ sewage X other (explain) None
Water temperature: 4°C

Type of sample collected:

✓ bacteria ✓ total phosphorous (TP) ✓ total suspended solids (TSS)

Stream Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., any debris (trash, tires, barrels, dirt or asphalt etc.), signs of erosion or other disturbance.

Litter

Anything Else of Note?

Plastic sheet in water upstream

Hoosic River Watershed Association

Monitors' Field Report Form

Date 3/31/04 Time flow visible 9:28 AM Time sample collected 9:40 AM 1st Plastic bottle

Site SW-4 Adams Post Office

Blank not used

Sampler(s) Name(s) Sarah Vinsin & Penny Feller

Recent Weather Conditions: Characterize the last 24 hours by checking those that apply.

Sky conditions:	X clear	__ partly cloudy	X cloudy
Rainfall:	__ light rain	X moderate rain	X heavy rain
Temperatures	__ hot	X seasonable	__ cool

Today's Weather Conditions:

__ clear __ cloudy X rainy __ heavy rain 21 °C air temperature

In-Stream Conditions: Characterize the condition of the river water by checking those that apply.

Water level and flow:	____ low	____ normal	X high
Turbidity:	____ clear	____ cloudy	X very cloudy
Odor:	____ fishy	____ sewage	X other (explain) None

Water temperature: 3.5° C

Type of sample collected:

√ bacteria √ total phosphorous (TP) √ total suspended solids (TSS)

(*) 9:47 — Brown bottle

Blank not used

Stream Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., any debris (trash, tires, barrels, dirt or asphalt, etc.), signs of erosion or other disturbance.

No

Anything Else of Note?

(*) Samples taken 7 mins. apart due to difficulty of sampling site.

Housatonic River Watershed Association

Monitors' Field Report Form

Date 3/31 Time flow visible 9:30A Time sample collected 9:46A

Site SW5 · GLENN ST.

Sampler(s) Name(s) LEIGH ANNE ADAMS

Recent Weather Conditions: Characterize the last 24 hours by checking those that apply.

Sky conditions:	__ clear	__ partly cloudy	✓ cloudy
Rainfall:	__ light rain	✓ moderate rain	__ heavy rain
Temperatures	__ hot	__ seasonable	__ cool

Today's Weather Conditions:

__ clear __ cloudy ✓ rainy __ heavy rain ______ air temperature

In-Stream Conditions: Characterize the condition of the river water by checking those that apply.

Water level and flow: ____ low ____ normal ____ high
Turbidity: ____ clear ✓ cloudy ____ very cloudy
Odor: ____ fishy ____ sewage ____ other (explain) NONE
Water temperature: 4°C

Type of sample collected:

✓ bacteria ✓ total phosphorous (TP) ✓ total suspended solids (TSS)

Stream Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., any debris (trash, tires, barrels, dirt or asphalt etc.), signs of erosion or other disturbance. SOME TRASH

Anything Else of Note?

Form No. | Page 1 of 1

Project Information

Project Name: ADAMS STORM
Project No.:
Project Location: ADAMS, MA
Project Manager: REBECCA BALKE
Sampler(s): L. ADAMS, S. VOISIN, P. FEHR, M. SHERMAN, J. TAYLOR, C. GELINAS
PO #: Lab Quote #:
Turn-Around: ( ) Standard 10 business days * ( ) Other (specify):
Note: TAT's less than 10 days must be pre-approved!

Client Information

Send Reports to: TOM MATUSZKO
Company: BRPC
Address: 1 FENN ST. SUITE 201, PITTSFIELD, MA 01201
Phone: 413·442·1521
Fax: 413·442·1523
Account # (Lab Use Only)
Reporting Requirements: ( ) Mail ( ) Priority
Preliminary: ( ) FAX ( ) Verbal by / /
Final: ( ) FAX ( ) Verbal by / /

Analyses (write test methods above & "X's"/ # of bottles below for each sample to be tested): TP, TSS, FECAL COLIFORM, E COLI

FILTRATION AND PRESERVATION
Please indicate filtration (0.45 um for dissolved metals) and preservation information below:

Filtration	Preservation
( ) Done	( ) Done
( ) Not Needed	( ) Not Needed
( ) Lab To Do *	( ) Lab To Do *

* Please specify which samples need to be filtered and/or preserved by the lab.

LAB ID (Lab Use Only)	Client/Field Sample ID	Collection Date	Collection Time	Sample Source/Matrix	TP	TSS	FECAL COLIFORM	E COLI	Sample Remarks (below)
	SW1 A	3.31.04	10:15A						
	B	3.31.04	10:03A						
	SW2 A	3.31.04	9:45A						
	B	3.31.04	9:45A						
	SW3 A	3.31.04	10:15A						
	B	3.31.04	10:21A						
	SW4 A	3.31.04	9:42A						
	B	3.31.04	9:50A						
	SW5 A	3.31.04	9:50A						
	B	3.31.04	9:46A						
	SW6 A	3.31.04	10:00A						
	SW6 B	3.31.04	10:02A						
				# OF BOTTLES					

* Sub-Contracted Analyses are not subject to our Standard 10 business day TAT's.

BERKSHIRE ENVIRO-LABS, INC.
Corner of Main & Center Streets
P.O. Box 113 Lee, MA 01238
Phone/Fax: (413) 243-1416

CHAIN-OF-CUSTODY RECORD

Notes: A = PLASTIC SAMPLE – TSS/TP
B = GLASS SAMPLE – Bacteria

Relinquished by:	Date/Time	Received by:	Date/Time

Condition of Samples Upon Arrival: ( ) Acceptable ( ) Problem(s)

Post-it® Fax Note 7671 | Date 4-2 | # of pages ▶ 1
To Rich Niles | From Laurie
Co./Dept. | Co. BRPC
Phone # | Phone # 413-442-1521
Fax # 800-331-0892 | Fax #

BERKSHIRE ENVIRO-LABS, INC.

CORNER OF MAIN & CENTER STREETS

266 MAIN STREET, LEE, MASS. 01238 (413) 243-1416

Berkshire Regional Planning Commission

L- 562

RE: Adams Storm

** REVISED 10/22/04 **

SAMPLE NUMBER	140478					
DATE COLLECTED	8/12/04					
TIME COLLECTED	10:15am					
COLLECTED BY	J.T./M.S./C.G./D.C./R.S./T.M.					
SAMPLE LOCATION	SW1		DETECTION	METHOD		DATE
ANALYSIS	UNITS	RESULTS	LIMIT	NUMBER	ANALYST	ANALYZED
Fecal Coliform	/100ml	>300000	10	SM 9222 D	W.E.-B.W.	8/12/04
E. Coli	/100ml	>250000	0	Colilert	W.E.-B.W.	8/12/04
Total Suspended Solids	mg/l	270	1	SM 2540 D	B.W.	8/15/04
Total Phosphorus (as P)	mg/l	0.772	0.01	SM 4500-P-B,E	B.W.	8/13/04

SAMPLE NUMBER	140479					
DATE COLLECTED	8/12/04					
TIME COLLECTED	10:05am					
COLLECTED BY	J.T./M.S./C.G./D.C./R.S./T.M.					
SAMPLE LOCATION	SW2		DETECTION	METHOD		DATE
ANALYSIS	UNITS	RESULTS	LIMIT	NUMBER	ANALYST	ANALYZED
Fecal Coliform	/100ml	72000	10	SM 9222 D	W.E.-B.W.	8/12/04
E. Coli	/100ml	54750	0	Colilert	W.E.-B.W.	8/12/04
Total Suspended Solids	mg/l	110	1	SM 2540 D	B.W.	8/15/04
Total Phosphorus (as P)	mg/l	0.417	0.01	SM 4500-P-B,E	B.W.	8/13/04

SAMPLE NUMBER	140480					
DATE COLLECTED	8/12/04					
TIME COLLECTED	10:20am					
COLLECTED BY	J.T./M.S./C.G./D.C./R.S./T.M.					
SAMPLE LOCATION	SW3		DETECTION	METHOD		DATE
ANALYSIS	UNITS	RESULTS	LIMIT	NUMBER	ANALYST	ANALYZED
Fecal Coliform	/100ml	56000	10	SM 9222 D	W.E.-B.W.	8/12/04
E. Coli	/100ml	38730	0	Colilert	W.E.-B.W.	8/12/04
Total Suspended Solids	mg/l	196	1	SM 2540 D	B.W.	8/15/04
Total Phosphorus (as P)	mg/l	0.556	0.01	SM 4500-P-B,E	B.W.	8/13/04

< = Less Than > = Greater Than ND = Not Detected

William S. Enser, Jr.
Director

WATER WASTEWATER AND ENVIRONMENTAL ANALYSIS
PHYSICAL CHEMICAL AND BACTERIOLOGICAL TESTING
LABORATORY AND FIELD MEASUREMENTS

BERKSHIRE ENVIRO-LABS, INC.

CORNER OF MAIN & CENTER STREETS
266 MAIN STREET, LEE, MASS. 01238 (413) 243-1416

Berkshire Regional Planning Commission

L- 562

RE: Adams Storm

** REVISED 10/22/04 **

SAMPLE NUMBER	140481					
DATE COLLECTED	8/12/04					
TIME COLLECTED	10:00am					
COLLECTED BY	J.T./M.S./C.G./D.C./R.S./T.M.					
SAMPLE LOCATION	SW5		DETECTION LIMIT	METHOD NUMBER	ANALYST	DATE ANALYZED
ANALYSIS	UNITS	RESULTS				
Fecal Coliform	/100ml	61000	10	SM 9222 D	W.E.-B.W.	8/12/04
E. Coli	/100ml	43520	0	Colilert	W.E.-B.W.	8/12/04
Total Suspended Solids	mg/l	44	1	SM 2540 D	B.W.	8/15/04
Total Phosphorus (as P)	mg/l	0.560	0.01	SM 4500-P-B,E	B.W.	8/13/04

SAMPLE NUMBER	140482					
DATE COLLECTED	8/12/04					
TIME COLLECTED	10:05am					
COLLECTED BY	J.T./M.S./C.G./D.C./R.S./T.M.					
SAMPLE LOCATION	SW6		DETECTION LIMIT	METHOD NUMBER	ANALYST	DATE ANALYZED
ANALYSIS	UNITS	RESULTS				
Fecal Coliform	/100ml	80000	10	SM 9222 D	W.E.-B.W.	8/12/04
E. Coli	/100ml	72700	0	Colilert	W.E.-B.W.	8/12/04
Total Suspended Solids	mg/l	66	1	SM 2540 D	B.W.	8/15/04
Total Phosphorus (as P)	mg/l	0.403	0.01	SM 4500-P-B,E	B.W.	8/13/04

SAMPLE NUMBER						
DATE COLLECTED						
TIME COLLECTED						
COLLECTED BY						
SAMPLE LOCATION			DETECTION LIMIT	METHOD NUMBER	ANALYST	DATE ANALYZED
ANALYSIS	UNITS	RESULTS				
Fecal Coliform	/100ml		10	SM 9222 D		
E. Coli	/100ml		0	Colilert		
Total Suspended Solids	mg/l		1	SM 2540 D		
Total Phosphorus (as P)	mg/l		0.01	SM 4500-P-B,E		

< = Less Than > = Greater Than ND = Not Detected

William S. Enser, Jr.
Director

BERKSHIRE ENVIRO-LABS, INC.

WATER WASTEWATER AND ENVIRONMENTAL ANALYSIS
PHYSICAL CHEMICAL AND BACTERIOLOGICAL TESTING
LABORATORY AND FIELD MEASUREMENTS

CORNER OF MAIN & CENTER STREETS
266 MAIN STREET, LEE, MASS. 01238 (413) 243-1416

Berkshire Regional Planning Commission

L- 562

RE: Adams Storm - QC Report
** REVISED 10/22/04 **

SAMPLE NUMBER	140481						
DATE COLLECTED	8/12/04						
TIME COLLECTED	10:00am						
COLLECTED BY	J.T./M.S./C.G./D.C./R.S./T.M.						
SAMPLE LOCATION	SW5			DUPLICATE			
ANALYSIS		UNITS	RESULTS	RESULTS			
Fecal Coliform		/100ml	61000	58840			
E. Coli		/100ml	43520	52000			

SAMPLE NUMBER	140481						
DATE COLLECTED	8/12/04						
TIME COLLECTED	10:00am						
COLLECTED BY	J.T./M.S./C.G./D.C./R.S./T.M.						
SAMPLE LOCATION	SW5			DUPLICATE	SPIKE %		
ANALYSIS		UNITS	RESULTS	RESULTS	RECOVERED		
Total Phosphorus (as P)		mg/l	0.558	0.561	103%		
Nitrate (as N)		mg/l					
Alkalinity		mg/l					

SAMPLE NUMBER	140482						
DATE COLLECTED	8/12/04						
TIME COLLECTED	10:05am						
COLLECTED BY	J.T./M.S./C.G./D.C./R.S./T.M.						
SAMPLE LOCATION	SW6			DUPLICATE			
ANALYSIS		UNITS	RESULTS	RESULTS			
pH		SU					
Total Suspended Solids		mg/l	66	65			

< = Less Than > = Greater Than ND = Not Detected

William S. Enser, Jr.
Director

Hoosic River Watershed Association

Monitors' Field Report Form

Date 08-~~14~~ 12-04 Time flow visible 9:50am Time sample collected 10:15am

Site SW-1 (RENFREW)

Sampler(s) Name(s) JIM TAYLOR, MIKE SHERMAN, CHRIS GELINAS

Recent Weather Conditions: Characterize the last 24 hours by checking those that apply.

Sky conditions:	__ clear	__ partly cloudy	✓ cloudy
Rainfall:	__ light rain	✓ moderate rain	__ heavy rain
Temperatures	✓ hot	__ seasonable	__ cool

Today's Weather Conditions:

__ clear ✓ cloudy ✓ rainy __ heavy rain 72° air temperature

In-Stream Conditions: Characterize the condition of the river water by checking those that apply.

Water level and flow:	____ low	____ normal	✓ high
Turbidity:	____ clear	____ cloudy	✓ very cloudy
Odor:	____ fishy	____ sewage	✓ other (explain) N/A

Water temperature: 19°C

Type of sample collected:

___ bacteria ✓ total phosphorous (TP) ✓ total suspended solids (TSS)

Stream Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., any debris (trash, tires, barrels, dirt or asphalt, etc.), signs of erosion or other disturbance. TRASH

Anything Else of Note?

(GLHS)

Hoosic River Watershed Association

Monitors' Field Report Form

Date 08-12-04 Time 10:20am Site SW-1 (RENFREW)

Sampler(s) Name(s) JIM TAYLOR, MIKE SHERMAN, CHRIS GELINAS

Recent Weather Conditions: Characterize the last 24 hours by checking those that apply.

Sky conditions: __ clear __ partly cloudy ✓ cloudy

Rainfall: __ light rain ✓ moderate rain __ heavy rain

Temperatures ✓ hot __ seasonable __ cool

Today's Weather Conditions:

__ clear ✓ cloudy ✓ rainy __ heavy rain 72° air temperature

In-Stream Conditions: Characterize the condition of the river water by checking those that apply.

Water level and flow: ____ low ____ normal ✓ high

Turbidity: ____ clear ____ cloudy ✓ very cloudy

Odor: ____ fishy ____ sewage ✓ other (explain) N/A

Water temperature: 19°C

Type of sample collected:

✓ bacteria ___ total phosphorous (TP) ___ total suspended solids (TSS)

ream Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., y debris (trash, tires, barrels, dirt or asphat, etc.), signs of erosion or other disturbance.

TRASH

nything Else of Note? ~~[illegible]~~ G696

(PLASTIC)

Hoosic River Watershed Association

Monitors' Field Report Form

Date 08-12-04 Time 10:05 AM Site SW-2 (DPW - ADAMS)

Sampler(s) Name(s) VIM TAYLOR, MIKE SHERMAN, CHRIS GELINAS

Recent Weather Conditions: Characterize the last 24 hours by checking those that apply.

Sky conditions: __ clear __ partly cloudy ✓ cloudy

Rainfall: __ light rain ✓ moderate rain __ heavy rain

Temperatures ✓ hot __ seasonable __ cool

Today's Weather Conditions:

__ clear ✓ cloudy ✓ rainy __ heavy rain 72° air temperature

In-Stream Conditions: Characterize the condition of the river water by checking those that apply.

Water level and flow: ____ low ____ normal ✓ high

Turbidity: ____ clear ____ cloudy ✓ very cloudy

Odor: ____ fishy ____ sewage ✓ other (explain) N/A

Water temperature: 22.5° C

Type of sample collected:

__ bacteria ✓ total phosphorous (TP) ✓ total suspended solids (TSS)

Stream Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., any debris (trash, tires, barrels, dirt or asphat. etc.), signs of erosion or other disturbance.

GRASS (JUST MOWED)

Anything Else of Note?

(OLHSS)

Hoosic River Watershed Association

Monitors' Field Report Form

Date 08-12-04 Time 10:07 am Site SW-2 (DPW - ADAMS)

Sampler(s) Name(s) JIM TAYLOR, MIKE SHERMAN, CHRIS GELINAS

Recent Weather Conditions: Characterize the last 24 hours by checking those that apply.

Sky conditions: __ clear __ partly cloudy ✓ cloudy

Rainfall: __ light rain ✓ moderate rain __ heavy rain

Temperatures ✓ hot __ seasonable __ cool

Todav's Weather Conditions:

__ clear ✓ cloudy ✓ rainy __ heavy rain 72° air temperature

In-Stream Conditions: Characterize the condition of the river water by checking those that apply.

Water level and flow: ____ low ____ normal ✓ high

Turbidity: ____ clear ____ cloudy ✓ very cloudy

Odor: ____ fishy ____ sewage ✓ other (explain) ______

Water temperature: 22.5° C

Type of sample collected:

✓ bacteria ___ total phosphorous (TP) ___ total suspended solids (TSS)

Stream Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., any debris (trash, tires, barrels, dirt or asphat. etc.), signs of erosion or other disturbance.

GRASS (JUST MOWED)

Anything Else of Note?

Hoosic River Watershed Association

Monitors' Field Report Form

Date 8/12/04 Time flow visible 10:00 Time sample collected 10:20

Site SW-3 HOXIE BROOK

Sampler(s) Name(s) Renie Speyer / Donna Cesari

Recent Weather Conditions: Characterize the last 24 hours by checking those that apply.

Sky conditions:	__ clear	__ partly cloudy	X cloudy
Rainfall:	X light rain	__ moderate rain	__ heavy rain
Temperatures	__ hot	X seasonable	__ cool

Today's Weather Conditions:

__ clear X cloudy X rainy __ heavy rain 74° air temperature

In-Stream Conditions: Characterize the condition of the river water by checking those that apply.

Water level and flow:	____ low	X normal	____ high
Turbidity:	____ clear	X cloudy	____ very cloudy
Odor:	____ fishy	____ sewage	____ other (explain) none

Water temperature: NA

Type of sample collected:

X bacteria X total phosphorous (TP) X total suspended solids (TSS)

Stream Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., any debris (trash, tires, barrels, dirt or asphalt, etc.), signs of erosion or other disturbance.

none

Anything Else of Note? no

6461

Hoosic River Watershed Association

Monitors' Field Report Form

Date 8/13/09 Time flow visible__________ Time sample collected__________

Site SW-4 - Post office

Sampler(s) Name(s) R. Speyer / D Cesan

Recent Weather Conditions: Characterize the last 24 hours by checking those that apply.

Failed sample: lost collection device in River

Sky conditions:	__ clear	__ partly cloudy	__ cloudy
Rainfall:	__ light rain	__ moderate rain	__ heavy rain
Temperatures	__ hot	__ seasonable	__ cool

Today's Weather Conditions:

__ clear __ cloudy __ rainy __ heavy rain ________ air temperature

In-Stream Conditions: Characterize the condition of the river water by checking those that apply.

Water level and flow:	____ low	____ normal	____ high
Turbidity:	____ clear	____ cloudy	____ very cloudy
Odor:	____ fishy	____ sewage	____ other (explain) ____________

Water temperature: __________

Type of sample collected:

___ bacteria ___ total phosphorous (TP) ___ total suspended solids (TSS)

Stream Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., any debris (trash, tires, barrels, dirt or asphalt, etc.), signs of erosion or other disturbance.

____

____

____

Anything Else of Note? ______________________________

____

____

____

Hoosic River Watershed Association

Monitors' Field Report Form

Date 8/12/04 Time flow visible 9:44 Time sample collected 10:00

Site SW-5

Sampler(s) Name(s) Tom Matusko

Recent Weather Conditions: Characterize the last 24 hours by checking those that apply.

Sky conditions: __ clear __ partly cloudy ✓ cloudy
Rainfall: ✓ light rain __ moderate rain __ heavy rain
Temperatures __ hot ✓ seasonable __ cool

Today's Weather Conditions:

__ clear __ cloudy ✓ rainy __ heavy rain 72F air temperature

In-Stream Conditions: Characterize the condition of the river water by checking those that apply.

Water level and flow: ____ low ____ normal ____ high
Turbidity: ✓ clear ____ cloudy ____ very cloudy
Odor: ____ fishy ____ sewage ____ other (explain) None
Water temperature: 19c

Type of sample collected:

✓ bacteria ✓ total phosphorous (TP) ✓ total suspended solids (TSS)

Stream Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., any debris (trash, tires, barrels, dirt or asphalt, etc.), signs of erosion or other disturbance.

No

Anything Else of Note? No

Hoosic River Watershed Association

Monitors' Field Report Form

Date 8/12/04 Time flow visible 9:44 Time sample collected 10:05

Site SW-6

Sampler(s) Name(s) T. Matuszko

Recent Weather Conditions: Characterize the last 24 hours by checking those that apply.

Sky conditions:	__ clear	__ partly cloudy	✓ cloudy
Rainfall:	✓ light rain	__ moderate rain	__ heavy rain
Temperatures	__ hot	✓ seasonable	__ cool

Today's Weather Conditions:

__ clear __ cloudy ✓ rainy __ heavy rain 72 F air temperature

In-Stream Conditions: Characterize the condition of the river water by checking those that apply.

Water level and flow:	____ low	____ normal	____ high
Turbidity:	✓ clear	____ cloudy	____ very cloudy
Odor:	____ fishy	____ sewage	____ other (explain) None

Water temperature: 19c

Type of sample collected:

✓ bacteria ✓ total phosphorous (TP) ✓ total suspended solids (TSS)

Stream Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., any debris (trash, tires, barrels, dirt or asphalt, etc.), signs of erosion or other disturbance.

No

Anything Else of Note? No

Form No. | Page 1 of 3

Project Information

Project Name: Adams Storm

Project No.:

Project Location: Adams, MA

Project Manager: Rebecca Balke

Sampler(s): ~~L. Adams~~ J. Taylor, M. Sherman, C. Golinas ~~R. Adams~~ D. Cesch, R. Speyer, T. Matuszko

PO #: Lab Quote#:

Turn-Around: ( ) Standard 10 business days * ( ) Other (specify):

Note: TAT's less than 10 days must be pre-approved!

Client Information

Send Reports to: Tom Matuszko

Company: BRPC

Address: 1 Fenn St, Suite 201, Pittsfield, MA 01201

Phone: 413-442-1521

Fax: 413-442-1523

Account # (Lab Use Only)

Reporting Requirements: ( ) Mail ( ) Priority

Preliminary: ( ) FAX ( ) Verbal by / /

Final: ( ) FAX ( ) Verbal by / /

FILTRATION AND PRESERVATION

Please indicate filtration (0.45 um for dissolved metals) and preservation information below:

Filtration	Preservation
( ) Done	( ) Done
( ) Not Needed	( ) Not Needed
( ) Lab To Do *	( ) Lab To Do *

* Please specify which samples need to be filtered and/or preserved by the lab.

ANALYSES (write test methods above & "X's"/ # of bottles below for each sample to be tested)

Lab ID (Lab Use Only)	Client/Field Sample ID	Collection Date	Collection Time	Sample Source/Matrix	TP	TSS	Fecal Coliform	E. coli	Sample Remarks (below)	# OF BOTTLES
	SW1 A	8/12/04	10:15 am		X	X				
	B	"	10:20				X	X		
	SW2 A	"	10:05		X	X				
	B	"	10:07				X	X		
	SW3 A	"	10:20		X	X				
	B	"	10:20				X	X		
	SW5 A	"	10:00		X	X				
	B	"	10:00				X	X		
	SW6 A	"	10:05		X	X				
	B	"	10:05				X	X		

OF BOTTLES

* Sub-Contracted Analyses are not subject to our Standard 10 business day TAT's.

BERKSHIRE ENVIRO-LABS, INC.
Corner of Main & Center Streets
P.O. Box 113 Lee, MA. 01238
Phone/Fax: (413) 243-1416

Notes: A = Plastic Sample
B = Glass Sample

Relinquished by:	Date/Time	Received by:	Date/Time
	8/12/04 2:25		8/12/04 2:25

Condition of Samples Upon Arrival: ( ) Acceptable ( ) Problem(s)

CHAIN-OF-CUSTODY RECORD

BERKSHIRE ENVIRO-LABS, INC.

CORNER OF MAIN & CENTER STREETS
266 MAIN STREET, LEE, MASS. 01238 (413) 243-1416

Berkshire Regional Planning Commission

L- 562

RE: Adams Storm

SAMPLE NUMBER	141860
DATE COLLECTED	9/17/04
TIME COLLECTED	2:25pm
COLLECTED BY	C. Gelinas/S. Voisin/T. Matuszko
SAMPLE LOCATION	SW1

ANALYSIS	UNITS	RESULTS	DETECTION LIMIT	METHOD NUMBER	ANALYST	DATE ANALYZED
Fecal Coliform	/100ml	86000	1000	SM 9222 D	W.E.-B.W.	9/17/04
E. Coli	/100ml	77000	100	Colilert	W.E.-B.W.	9/17/04
Total Suspended Solids	mg/l	8	1	SM 2540 D	B.W.	9/20/04
Total Phosphorus (as P)	mg/l	0.203	0.01	SM 4500-P-B,E	B.W.	9/21/04

SAMPLE NUMBER	141861
DATE COLLECTED	9/17/04
TIME COLLECTED	2:15pm
COLLECTED BY	C. Gelinas/S. Voisin/T. Matuszko
SAMPLE LOCATION	SW2

ANALYSIS	UNITS	RESULTS	DETECTION LIMIT	METHOD NUMBER	ANALYST	DATE ANALYZED
Fecal Coliform	/100ml	75000	1000	SM 9222 D	W.E.-B.W.	9/17/04
E. Coli	/100ml	68700	100	Colilert	W.E.-B.W.	9/17/04
Total Suspended Solids	mg/l	6	1	SM 2540 D	B.W.	9/20/04
Total Phosphorus (as P)	mg/l	0.227	0.01	SM 4500-P-B,E	B.W.	9/21/04

SAMPLE NUMBER	141862
DATE COLLECTED	9/17/04
TIME COLLECTED	2:20am
COLLECTED BY	C. Gelinas/S. Voisin/T. Matuszko
SAMPLE LOCATION	SW3

ANALYSIS	UNITS	RESULTS	DETECTION LIMIT	METHOD NUMBER	ANALYST	DATE ANALYZED
Fecal Coliform	/100ml	160000	1000	SM 9222 D	W.E.-B.W.	9/17/04
E. Coli	/100ml	120300	100	Colilert	W.E.-B.W.	9/17/04
Total Suspended Solids	mg/l	2	1	SM 2540 D	B.W.	9/20/04
Total Phosphorus (as P)	mg/l	0.211	0.01	SM 4500-P-B,E	B.W.	9/21/04

< = Less Than > = Greater Than ND = Not Detected

William S. Enser, Jr.
Director

BERKSHIRE ENVIRO-LABS, INC.

WATER WASTEWATER AND ENVIRONMENTAL ANALYSIS · PHYSICAL CHEMICAL AND BACTERIOLOGICAL TESTING · LABORATORY AND FIELD MEASUREMENTS

CORNER OF MAIN & CENTER STREETS
266 MAIN STREET, LEE, MASS. 01238 (413) 243-1416

Berkshire Regional Planning Commission

L- 562

RE: Adams Storm

SAMPLE NUMBER	141863					
DATE COLLECTED	9/17/04					
TIME COLLECTED	2:12pm					
COLLECTED BY	C. Gelinas/S. Voisin/T. Matuszko					
SAMPLE LOCATION	SW4		DETECTION	METHOD		DATE
ANALYSIS	UNITS	RESULTS	LIMIT	NUMBER	ANALYST	ANALYZED
Fecal Coliform	/100ml	53000	1000	SM 9222 D	W.E.-B.W.	9/17/04
E. Coli	/100ml	46100	100	Colilert	W.E.-B.W.	9/17/04
Total Suspended Solids	mg/l	1	1	SM 2540 D	B.W.	9/20/04
Total Phosphorus (as P)	mg/l	0.218	0.01	SM 4500-P-B,E	B.W.	9/21/04

SAMPLE NUMBER	141864					
DATE COLLECTED	9/17/04					
TIME COLLECTED	2:25pm					
COLLECTED BY	C. Gelinas/S. Voisin/T. Matuszko					
SAMPLE LOCATION	SW5		DETECTION	METHOD		DATE
ANALYSIS	UNITS	RESULTS	LIMIT	NUMBER	ANALYST	ANALYZED
Fecal Coliform	/100ml	91000	1000	SM 9222 D	W.E.-B.W.	9/17/04
E. Coli	/100ml	77000	100	Colilert	W.E.-B.W.	9/17/04
Total Suspended Solids	mg/l	1	1	SM 2540 D	B.W.	9/20/04
Total Phosphorus (as P)	mg/l	0.201	0.01	SM 4500-P-B,E	B.W.	9/21/04

SAMPLE NUMBER	141865					
DATE COLLECTED	9/17/04					
TIME COLLECTED	2:28pm					
COLLECTED BY	C. Gelinas/S. Voisin/T. Matuszko					
SAMPLE LOCATION	SW6		DETECTION	METHOD		DATE
ANALYSIS	UNITS	RESULTS	LIMIT	NUMBER	ANALYST	ANALYZED
Fecal Coliform	/100ml	80000	1000	SM 9222 D	W.E.-B.W.	9/17/04
E. Coli	/100ml	72700	100	Colilert	W.E.-B.W.	9/17/04
Total Suspended Solids	mg/l	1	1	SM 2540 D	B.W.	9/20/04
Total Phosphorus (as P)	mg/l	0.187	0.01	SM 4500-P-B,E	B.W.	9/21/04

< = Less Than   > = Greater Than   ND = Not Detected

William S. Enser, Jr.
Director

Project Information

Project Name: ADAMS STORM

Project No.:

Project Location: ADAMS, MA

Project Manager: Rebecca Balke

Sampler(s): C. Gelinas S. Voisin T. Matuszko

PO #: Lab Quote#:

Turn-Around: ( ) Standard 10 business days * ( ) Other (specify):

Note: TAT's less than 10 days must be pre-approved!

Client Information

Send Reports to: Tom Matuszko

Company: B.R.P.C

Address: 1 Fenn St, Suite 201 Pittsfield, MA 01201

Phone: 413-442-1521

Fax: 413-442-1523

Account # (Lab Use Only)

Reporting Requirements: ( ) Mail ( ) Priority

Preliminary: ( ) FAX ( ) Verbal by / /

Final: ( ) FAX ( ) Verbal by / /

Form No. Page of

FILTRATION AND PRESERVATION

Please indicate filtration (0.45 um for dissolved metals) and preservation information below:

Filtration	Preservation
( ) Done	( ) Done
( ) Not Needed	( ) Not Needed
( ) Lab To Do *	( ) Lab To Do *

* Please specify which samples need to be filtered and/or preserved by the lab.

ANALYSES (write test methods above & "X's"/ # of bottles below for each sample to be tested)

Lab ID (Lab Use Only)	Client/Field Sample ID	Collection Date	Collection Time	Sample Source/Matrix	TP	TSS	Fecal Coliform	E Coli	Sample Remarks (below)	# OF BOTTLES
	SW1 A	9/17/04	2:25		X	X				
	B	"	2:25				X	X		
	SW2 A	"	2:15		X	X				
	B	"	2:15				X	X		
	SW3 A	"	2:20		X	X				
	B	"	2:20				X	X		
	SW4 A	"	2:12		X	X				
	B	"	2:12				X	X		
	SW5 A	"	2:25		X	X				
	B	"	2:25				X	X		
	SW6 A	"	2:28		X	X				
	B	"	2:28				X	X		

* Sub-Contracted Analyses are not subject to our Standard 10 business day TAT's.

Notes: A = Plastic Sample
B = Glass Sample

BERKSHIRE ENVIRO-LABS, INC.
Corner of Main & Center Streets
P.O. Box 113 Lee, MA. 01238
Phone/Fax: (413) 243-1416

CHAIN-OF-CUSTODY RECORD

Relinquished by:	Date/Time	Received by:	Date/Time
[signature]	9/17/04 3:55	[signature]	9/17/04 3:55

Condition of Samples Upon Arrival: ( ) Acceptable ( ) Problem(s)

Hoosic River Watershed Association

Monitors' Field Report Form

Date ________ Time ________ Site ________________________

Sampler(s) Name(s) ________________________

Recent Weather Conditions: Characterize the last 24 hours by checking those that apply.

Sky conditions: __ clear __ partly cloudy __ cloudy

Rainfall: __ light rain __ moderate rain ✓ heavy rain

Temperatures __ hot ✓ seasonable __ cool

Today's Weather Conditions:

__ clear __ cloudy __ rainy ✓ heavy rain ________ air temperature

In-Stream Conditions: Characterize the condition of the river water by checking those that apply.

Water level and flow: ____ low ____ normal ✓ high

Turbidity: ____ clear ____ cloudy ____ very cloudy

Odor: ____ fishy ____ sewage ✓ other (explain) ________________________

Water temperature: ________

Type of sample collected:

__ bacteria ✓ total phosphorous (TP) ✓ total suspended solids (TSS)

ream Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., y debris (trash, tires, barrels, dirt or asphat, etc.), signs of erosion or other disturbance.

____

____

____

nything Else of Note? ________________________

____

____

Hoosic River Watershed Association

Monitors' Field Report Form

Date ____________ Time ____________ Site ______________________________

Sampler(s) Name(s) ____

Recent Weather Conditions: Characterize the last 24 hours by checking those that apply.

Sky conditions: __ clear __ partly cloudy __cloudy

Rainfall: __ light rain __ moderate rain __heavy rain

Temperatures __ hot __seasonable __cool

Today's Weather Conditions:

__ clear __cloudy __rainy __heavy rain ________air temperature

In-Stream Conditions: Characterize the condition of the river water by checking those that apply.

Water level and flow: ____low ____normal ____high

Turbidity: ____clear ____cloudy ____very cloudy

Odor: ____fishy ____sewage ____other (explain) ________________

Water temperature: ________

Type of sample collected:

__bacteria X total phosphorous (TP) X total suspended solids (TSS)

ream Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., y debris (trash, tires, barrels, dirt or asphat, etc.), signs of erosion or other disturbance.

____

____

____

nything Else of Note? ______________________________

____

____

Hoosic River Watershed Association

Monitors' Field Report Form

Date 9/17/04 Time flow visible 2:00 Time sample collected 2:20

Site SW 3 Hoxie Brook

Sampler(s) Name(s) Sarah Voisin

Recent Weather Conditions: Characterize the last 24 hours by checking those that apply.

Sky conditions:	✓ clear	✓ partly cloudy	✓ cloudy
Rainfall:	__ light rain	✓ moderate rain	__ heavy rain
Temperatures	__ hot	✓ seasonable	__ cool

Today's Weather Conditions:

__ clear ✓ cloudy ✓ rainy __ heavy rain 68° F air temperature

In-Stream Conditions: Characterize the condition of the river water by checking those that apply.

Water level and flow:	____ low	✓ normal	____ high
Turbidity:	____ clear	✓ cloudy	____ very cloudy
Odor:	____ fishy	____ sewage	✓ other (explain) no odor

Water temperature: 18 °C

Type of sample collected:

✓ bacteria ✓ total phosphorous (TP) ✓ total suspended solids (TSS)

Stream Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., any debris (trash, tires, barrels, dirt or asphalt, etc.), signs of erosion or other disturbance.

There was trash along the banks, probably from the rail trail

Anything Else of Note?

Hoosic River Watershed Association

Monitors' Field Report Form

Date 9/17/04 Time flow visible 2:00 Time sample collected 2:12

Site SW-4 Adams Post office

Sampler(s) Name(s) Sarah Voisin

Recent Weather Conditions: Characterize the last 24 hours by checking those that apply.

Sky conditions:	✓ clear	✓ partly cloudy	✓ cloudy
Rainfall:	__ light rain	✓ moderate rain	__ heavy rain
Temperatures	__ hot	✓ seasonable	__ cool

Today's Weather Conditions:

__ clear __ cloudy ✓ rainy __ heavy rain 68° F air temperature

In-Stream Conditions: Characterize the condition of the river water by checking those that apply.

Water level and flow:	____ low	✓ normal	____ high
Turbidity:	____ clear	✓ cloudy	____ very cloudy
Odor:	____ fishy	____ sewage	x other (explain) no odor

Water temperature: 72° F

Type of sample collected:

✓ bacteria ✓ total phosphorous (TP) ✓ total suspended solids (TSS)

Stream Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., any debris (trash, tires, barrels, dirt or asphalt, etc.), signs of erosion or other disturbance.

Nothing unusual around the banks

Anything Else of Note?

Hoosic River Watershed Association

Monitors' Field Report Form

Date 9/17/04 Time flow visible 2:10 Time sample collected 2:25 pm

Site SW5 Glen St

Sampler(s) Name(s) Tom Matuszko

Recent Weather Conditions: Characterize the last 24 hours by checking those that apply.

Sky conditions:	__ clear	__ partly cloudy	✓ cloudy
Rainfall:	✓ light rain	__ moderate rain	__ heavy rain
Temperatures	__ hot	✓ seasonable	__ cool

Today's Weather Conditions:

__ clear __ cloudy ✓ rainy __ heavy rain 68 air temperature

In-Stream Conditions: Characterize the condition of the river water by checking those that apply.

Water level and flow: ✓ low __ normal __ high
Turbidity: __ clear ✓ cloudy __ very cloudy
Odor: __ fishy __ sewage __ other (explain) Musty smell
Water temperature: 20°C

Type of sample collected:

✓ bacteria ✓ total phosphorous (TP) ✓ total suspended solids (TSS)

Stream Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., any debris (trash, tires, barrels, dirt or asphalt, etc.), signs of erosion or other disturbance.

- Leaves in drainage swale
- small amount of trash

Anything Else of Note?

Hoosic River Watershed Association

Monitors' Field Report Form

Date 9/17/04 Time flow visible 2:10 Time sample collected 2:20

Site SW6

Sampler(s) Name(s) Tom Matuszko

Recent Weather Conditions: Characterize the last 24 hours by checking those that apply.

Sky conditions:	__ clear	__ partly cloudy	✓ cloudy
Rainfall:	✓ light rain	__ moderate rain	__ heavy rain
Temperatures	__ hot	✓ seasonable	__ cool

Today's Weather Conditions:

__ clear __cloudy ✓ rainy __heavy rain ________air temperature

In-Stream Conditions: Characterize the condition of the river water by checking those that apply.

Water level and flow:	✓ low	____normal	____high
Turbidity:	____clear	✓ cloudy	____very cloudy
Odor:	____fishy	____sewage	____other (explain) Musty Smell

Water temperature: 20°C

Type of sample collected:

✓ bacteria ✓ total phosphorous (TP) ✓ total suspended solids (TSS)

Stream Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., any debris (trash, tires, barrels, dirt or asphalt, etc.), signs of erosion or other disturbance.

Leaves in drainage swale

Small amount of trash

Anything Else of Note?

BERKSHIRE ENVIRO-LABS, INC.

CORNER OF MAIN & CENTER STREETS
266 MAIN STREET, LEE, MASS. 01238 (413) 243-1416

WATER WASTEWATER AND ENVIRONMENTAL ANALYSIS
PHYSICAL CHEMICAL AND BACTERIOLOGICAL TESTING
LABORATORY AND FIELD MEASUREMENTS

Berkshire Regional Planning Commission

L- 562

RE: Adams Storm

SAMPLE NUMBER	143733
DATE COLLECTED	11/24/04
TIME COLLECTED	3:45pm
COLLECTED BY	J.T./M.S.
SAMPLE LOCATION	SW1

ANALYSIS	UNITS	RESULTS	DETECTION LIMIT	METHOD NUMBER	ANALYST	DATE ANALYZED
Fecal Coliform	/100ml	600	100	SM 9222 D	W.E.-B.W.	11/24/04
E. Coli	/100ml	400	100	Colilert	W.E.-B.W.	11/24/04
Total Suspended Solids	mg/l	59	1	SM 2540 D	B.W.	11/27/04
Total Phosphorus (as P)	mg/l	0.21	0.01	SM 4500-P-B,E	B.W.	12/8/04

SAMPLE NUMBER	143734
DATE COLLECTED	11/24/04
TIME COLLECTED	3:56pm
COLLECTED BY	J.T./M.S.
SAMPLE LOCATION	SW2

ANALYSIS	UNITS	RESULTS	DETECTION LIMIT	METHOD NUMBER	ANALYST	DATE ANALYZED
Fecal Coliform	/100ml	700	100	SM 9222 D	W.E.-B.W.	11/24/04
E. Coli	/100ml	500	100	Colilert	W.E.-B.W.	11/24/04
Total Suspended Solids	mg/l	75	1	SM 2540 D	B.W.	11/27/04
Total Phosphorus (as P)	mg/l	0.34	0.01	SM 4500-P-B,E	B.W.	12/8/04

SAMPLE NUMBER	143735
DATE COLLECTED	11/24/04
TIME COLLECTED	4:15pm
COLLECTED BY	D.C.
SAMPLE LOCATION	SW3

ANALYSIS	UNITS	RESULTS	DETECTION LIMIT	METHOD NUMBER	ANALYST	DATE ANALYZED
Fecal Coliform	/100ml	3100	100	SM 9222 D	W.E.-B.W.	11/24/04
E. Coli	/100ml	2600	100	Colilert	W.E.-B.W.	11/24/04
Total Suspended Solids	mg/l	15	1	SM 2540 D	B.W.	11/27/04
Total Phosphorus (as P)	mg/l	0.07	0.01	SM 4500-P-B,E	B.W.	12/8/04

< = Less Than > = Greater Than ND = Not Detected

William S. Enser, Jr.
Director

BERKSHIRE ENVIRO-LABS, INC.

CORNER OF MAIN & CENTER STREETS

266 MAIN STREET, LEE, MASS. 01238 (413) 243-1416

Berkshire Regional Planning Commission

L- 562

RE: Adams Storm

SAMPLE NUMBER	143736
DATE COLLECTED	11/24/04
TIME COLLECTED	4:10pm
COLLECTED BY	D.C.
SAMPLE LOCATION	SW4

ANALYSIS	UNITS	RESULTS	DETECTION LIMIT	METHOD NUMBER	ANALYST	DATE ANALYZED
Fecal Coliform	/100ml	1900	100	SM 9222 D	W.E.-B.W.	11/24/04
E. Coli	/100ml	1200	100	Colilert	W.E.-B.W.	11/24/04
Total Suspended Solids	mg/l	68	1	SM 2540 D	B.W.	11/27/04
Total Phosphorus (as P)	mg/l	0.26	0.01	SM 4500-P-B,E	B.W.	12/8/04

SAMPLE NUMBER	
DATE COLLECTED	
TIME COLLECTED	
COLLECTED BY	
SAMPLE LOCATION	

ANALYSIS	UNITS	RESULTS	DETECTION LIMIT	METHOD NUMBER	ANALYST	DATE ANALYZED
Fecal Coliform	/100ml		100	SM 9222 D		
E. Coli	/100ml		100	Colilert		
Total Suspended Solids	mg/l		1	SM 2540 D		
Total Phosphorus (as P)	mg/l		0.01	SM 4500-P-B,E		

SAMPLE NUMBER	
DATE COLLECTED	
TIME COLLECTED	
COLLECTED BY	
SAMPLE LOCATION	

ANALYSIS	UNITS	RESULTS	DETECTION LIMIT	METHOD NUMBER	ANALYST	DATE ANALYZED
Fecal Coliform	/100ml		100	SM 9222 D		
E. Coli	/100ml		100	Colilert		
Total Suspended Solids	mg/l		1	SM 2540 D		
Total Phosphorus (as P)	mg/l		0.01	SM 4500-P-B,E		

< = Less Than > = Greater Than ND = Not Detected

William S. Enser, Jr.
Director

Form No.	Page of

Project Information

Project Name: ADAMS STORM

Project No.:

Project Location: ADAMS MA

Project Manager: Rebecca Balke

Sampler(s):

PO #: Lab Quote#:

Turn-Around: ( ) Standard 10 business days * ( ) Other (specify):

Note: TAT's less than 10 days must be pre-approved!

Client Information

Send Reports to: Tom Matuszko

Company: B.R.P.C

Address: 1 Fenn St, Suite 201, Pittsfield, MA 01201

Phone: 413-442-1521

Fax: 413-442-1523

Account # (Lab Use Only)

Reporting Requirements: ( ) Mail ( ) Priority

Preliminary: ( ) FAX ( ) Verbal by / /

Final: ( ) FAX ( ) Verbal by / /

FILTRATION AND PRESERVATION

Please indicate filtration (0.45 um for dissolved metals) and preservation information below:

Filtration	Preservation
( ) Done	( ) Done
( ) Not Needed	( ) Not Needed
( ) Lab To Do *	( ) Lab To Do *

* Please specify which samples need to be filtered and/or preserved by the lab.

ANALYSES (write test methods above & "X's"/ # of bottles below for each sample to be tested)

Lab ID (Lab Use Only)	Client/Field Sample ID	Collection Date	Collection Time	Sample Source/Matrix	TP	TSS	Fecal Coliform	E Coli	Sample Remarks (below)	# OF BOTTLES
	SW1 A	11/24/04	3:45		X	X				
	B	"	3:45				X	X		
	SW2 A	11/24	3:55		X	X				
	B	"	3:56				X	X		
	SW3 A	"	4:15		X	X				
	B	"	4:15				X	X		
	SW4 A	"	4:10		X	X				
	B	"	4:10				X	X		
	SW5 A	"			X	X				
	B	"					X	X		
	SW6 A	"			X	X				
	B	"					X	X		

OF BOTTLES

* Sub-Contracted Analyses are not subject to our Standard 10 business day TAT's.

BERKSHIRE ENVIRO-LABS, INC.

Corner of Main & Center Streets

P.O. Box 113 Lee, MA. 01238

Phone/Fax: (413) 243-1416

Notes: A = Plastic Sample
B = Glass Sample

Relinquished by:	Date/Time	Received by:	Date/Time	Condition of Samples Upon Arrival
[signature]	11/24/05	[signature]	11/24/04 5:15	( ) Acceptable ( ) Problem(s)

CHAIN-OF-CUSTODY RECORD

Hoosic River Watershed Association

Monitors' Field Report Form

Date 11-24-04 Time flow visible 3:45pm Time sample collected 4:04pm

Site SW-1 Renfrew & Columbia

Sampler(s) Name(s) Jim Taylor, Mike Sherman

Recent Weather Conditions: Characterize the last 24 hours by checking those that apply.

Sky conditions:	__ clear	__ partly cloudy	✓ cloudy
Rainfall:	__ light rain	✓ moderate rain	__ heavy rain
Temperatures	__ hot	__ seasonable	✓ cool

Today's Weather Conditions:

__ clear ✓ cloudy __ rainy __ heavy rain 50° air temperature

In-Stream Conditions: Characterize the condition of the river water by checking those that apply.

Water level and flow:	____ low	____ normal	✓ high
Turbidity:	____ clear	____ cloudy	✓ very cloudy
Odor:	____ fishy	____ sewage	✓ other (explain) Cloudy

Water temperature: 8° C

Type of sample collected:

✓ bacteria ✓ total phosphorous (TP) ✓ total suspended solids (TSS)

6662 6662

Stream Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., any debris (trash, tires, barrels, dirt or asphalt, etc.), signs of erosion or other disturbance.

Anything Else of Note?

Hoosic River Watershed Association

Monitors' Field Report Form

Date 11-24-04 Time 3:50 PM Site SW-2 DPW

Sampler(s) Name(s) JIM TAYLOR, MIKE SHERMAN

Recent Weather Conditions: Characterize the last 24 hours by checking those that apply.

Sky conditions: __ clear __ partly cloudy ✓ cloudy

Rainfall: __ light rain ✓ moderate rain __ heavy rain

Temperatures __ hot __ seasonable ✓ cool

Today's Weather Conditions:

__ clear ✓ cloudy __ rainy __ heavy rain 50° air temperature

In-Stream Conditions: Characterize the condition of the river water by checking those that apply.

Water level and flow: ____ low ____ normal ✓ high

Turbidity: ____ clear ✓ cloudy ____ very cloudy

Odor: ____ fishy ____ sewage ✓ other (explain) Muddy

Water temperature: 9.50 C

Type of sample collected:

✓ bacteria ✓ total phosphorous (TP) ✓ total suspended solids (TSS)

G724 G724

[St]ream Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., [an]y debris (trash, tires, barrels, dirt or asphat, etc.), signs of erosion or other disturbance.

[An]ything Else of Note?

Hoosic River Watershed Association

Monitors' Field Report Form

Date 11/24/04 Time flow visible 4:00 Time sample collected 4:15 pm

Site SW#3

Sampler(s) Name(s) MARK MALLOY, Donna Cesan

Recent Weather Conditions: Characterize the last 24 hours by checking those that apply.

Sky conditions:	__ clear	__ partly cloudy	✓ cloudy
Rainfall:	__ light rain	✓ moderate rain	__ heavy rain
Temperatures	__ hot	__ seasonable	✓ cool

Today's Weather Conditions:

__ clear ✓ cloudy __ rainy __ heavy rain 50° air temperature

In-Stream Conditions: Characterize the condition of the river water by checking those that apply.

Water level and flow:	____ low	X normal	____ high
Turbidity:	____ clear	X cloudy	____ very cloudy
Odor:	____ fishy	____ sewage	____ other (explain) ____

Water temperature: 6.5°C

Type of sample collected:

✓ bacteria ✓ total phosphorous (TP) ✓ total suspended solids (TSS)

4585

Stream Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., any debris (trash, tires, barrels, dirt or asphalt, etc.), signs of erosion or other disturbance.

Anything Else of Note?

Hoosic River Watershed Association

Post Office

Monitors' Field Report Form

Date 11/24/04 Time flow visible 4:00 pm Time sample collected 4:10 pm

Site SW4 DEC

Sampler(s) Name(s) MARK MALLOY, DONNA CESAN

Recent Weather Conditions: Characterize the last 24 hours by checking those that apply.

Sky conditions:	__ clear	__ partly cloudy	✓ cloudy
Rainfall:	__ light rain	✓ moderate rain	__ heavy rain
Temperatures	__ hot	__ seasonable	✓ cool

Today's Weather Conditions:

__ clear ✓ cloudy __ rainy __ heavy rain 50° air temperature

In-Stream Conditions: Characterize the condition of the river water by checking those that apply.

Water level and flow: ____ low X normal ____ high
Turbidity: X clear ____ cloudy ____ very cloudy
Odor: ____ fishy ____ sewage ____ other (explain) ____________
Water temperature: 8°C

Type of sample collected:

✓ bacteria ✓ total phosphorous (TP) ✓ total suspended solids (TSS) G299

Stream Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., any debris (trash, tires, barrels, dirt or asphalt, etc.), signs of erosion or other disturbance. G299

Anything Else of Note?

Hoosic River Watershed Association

Monitors' Field Report Form

Date 11/24/08 Time flow visible__________ Time sample collected__________

Site SWS - GLEN STREET

Sampler(s) Name(s) Tom Matuszko

Recent Weather Conditions: Characterize the last 24 hours by checking those that apply.

Sky conditions:	__ clear	__ partly cloudy	__cloudy
Rainfall:	__ light rain	__ moderate rain	__heavy rain
Temperatures	__ hot	__seasonable	__cool

Today's Weather Conditions:

__ clear __cloudy __rainy __heavy rain ________air temperature

In-Stream Conditions: Characterize the condition of the river water by checking those that apply.

Water level and flow:	____low	____normal	____high
Turbidity:	____clear	____cloudy	____very cloudy
Odor:	____fishy	____sewage	____other (explain) ____________________

Water temperature: __________

Type of sample collected:

___bacteria ___total phosphorous (TP) ___total suspended solids (TSS)

Stream Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., any debris (trash, tires, barrels, dirt or asphalt, etc.), signs of erosion or other disturbance.

Anything Else of Note? Sample not collected

Hoosic River Watershed Association

Monitors' Field Report Form

Date 11/24/04 Time flow visible ________ Time sample collected ________

Site SW6

Sampler(s) Name(s) Tom Matuszko

Recent Weather Conditions: Characterize the last 24 hours by checking those that apply.

Sky conditions: __ clear __ partly cloudy __ cloudy
Rainfall: __ light rain __ moderate rain __ heavy rain
Temperatures __ hot __ seasonable __ cool

Today's Weather Conditions:

__ clear __ cloudy __ rainy __ heavy rain ________ air temperature

In-Stream Conditions: Characterize the condition of the river water by checking those that apply.

Water level and flow: ____ low ____ normal ____ high
Turbidity: ____ clear ____ cloudy ____ very cloudy
Odor: ____ fishy ____ sewage ____ other (explain) ________
Water temperature: ________

Type of sample collected:

___ bacteria ___ total phosphorous (TP) ___ total suspended solids (TSS)

Stream Bank Conditions: Do you notice anything unusual along the banks within view at the site? E.g., any debris (trash, tires, barrels, dirt or asphalt, etc.), signs of erosion or other disturbance.

Anything Else of Note? Sample not collected

APPENDIX 4-C

1987 I/I Study
Sewer System Problem Areas/Recommendations

TABLE IV-2

REHABILITATION RECOMMENDATIONS BASED ON

TELEVISION AND MANHOLE INSPECTIONS

AREA	REACH NAME	FROM	TO	SIZE (IN)	TYPE	TOTAL LENGTH (FT)	OBSV'D DEFECTS	REHABILITATION RECOMMENDATIONS & COMMENTS
1	Howland-Zylonite	S2-1	S1-2	6,10	VC	1,800	BP,CP,DP,R	MH rehab, Spot repair, C&TV, Root control, JT&S, Replace tap
5	Miller-Fisk	S2-94	S2-95	8	VC,CI	184	BJ,DP,L,OSJ,R	MH rehab, C&TV, Root control, JT&S,
6	Across the river	S2-99	S2-114	24,8,15	RCP,CI	2,602	BP,CP,DP,MD	MH rehab, Replace 450' of 15"pipe, Clean, JT&S, Replace taps
7	East/Orchard	S2-82C1	S2-83,82G	8	VC	953	CP,R,T,DP	MH rehab, Spot repair, C&TV, Root control, JT&S, Replace taps
7	Summer	S2-82	S2-84	8,12	AC,VC	1181	BP,CP,R,T	Spot repair, C&TV, Root control, JT&S, Replace taps
7	Commercial/Myrtle	S2-87	S2-89	15,18	VC	700	DP,L,T	MH rehab, Heavy cleaning, C&TV, JT&S, Replace tap
7	XC-Spring/Depot	S2-64	S2-69	21	RCP	809	R,T	Root control, C&TV, JT&S, Replace taps
8	East Hoosac	S2-120	S2-124	8	VC,CI	2,635	BP,CP,DP,L,MD,OSJ,R,T	MH rehab, Spot repair, Inspect services, Root control, C&TV, JT&S, Replace taps
8	N. Summer/Kittler	S2-39	S2-41	8	VC	650	BP,DP,L,OSJ,R,T	MH rehab, Spot repair, Root control, C&TV, JT&S, Replace taps
8	Winter	S2-49	S2-49A	8	VC	40	CP,OSJ	C&TV, JT&S
8	XC/Crotteau	S2-31	S2-34	18	AC	785	Blockage,CP,L,MD	MH rehab, Spot repair, C&TV, JT&S
9	Burt/Pine	S2-15J	S2-18,17D	8	VC	1,165	BP,CP,DP,L,MD,OSJ,T	Spot repair, Inspect services, C&TV, JT&S, Replace taps
9	Columbia	S2-15	S2-19,16	10,8	VC	3,389	BJ,BP,CP,DP,L,OSJ,R,T	Reloc watermains, MH rehab, Spot repair, Inspect services, Root control, C&TV, JT&S, Replace taps
9	Friend	S2-21	S2-52	8	VC	646	BP,CP,DP,T	Spot repair, C&TV, JT&S, Replace taps
9	Hoosic River	S2-25	S2-34	27	RCP	939	R,T	Inspect services, Root control, C&TV, JT&S
					TOTALS	18,478		

LEGEND

BJ = Bad Joint
BP = Broken Pipe
CP = Cracked Pipe

MD = Mineral Deposit
OSJ = Off-set Joint
R = Roots present

C&TV = Clean and TV inspect
JT&S = Joint testing and sealing

TABLE VIII-1

SEWER REACHES RECOMMENDED FOR REHABILITATION TO REDUCE INFILTRATION

Area	Reach Name	Location From	Location To	Appendix G Page No.
7	XC-Spring/Depot	S2-64	S2-69	G-7
8	Winter	S2-49	S2-49A	G-10
9	Hoosic River	S2-25	S2-34	G-15
8	XC/Crotteau	S2-31	S2-34	G-11
6	Across the river	S2-99	S2-114	G-3
9	Burt/Pine	S2-15J	S2-18,17D	G-12
9	Columbia	S2-15	S2-19,16	G-13
7	Commercial/Myrtle	S2-87	S2-89	G-6
9	Friend	S2-21	S2-52	G-14
8	N. Summer/Kittler	S2-39	S2-41	G-9

TABLE VIII-2

SEWER REACHES RECOMMENDED FOR ROOT CONTROL

Area	Reach Name	Location	
		From	To
8	East Hoosac	S2-120	S2-124
7	East/Orchard	S2-82-C-1	S2-83, 83G
7	Summer	S2-82	S2-84
5	Miller-Fisk	S2-94	S2-95
1	Howland-Zylonite	S2-1	S1-2

Table A-1:

Adams, Massachusetts TV Inpsection Data:

Gage Area	Street Name	Location (from/to)	Size (in)	Type	Length (ft)	Defects: BJ	BP	CP	DP	L	MD	OSJ	R	T	Estim Infilt (gpm)	Comment
K-1	XC-Howland/Zylonite	S1-43/S2-3-C	6	VC	142		2	4	1				1			STA 1+42 unable to proceed
K-1	XC-Howland/Zylonite	S2-3-C/S2-3	6													Unable to inspect
K-1	XC-Howland/Zylonite	S2-3/S1-2	10	VC	313				3							Dips 2-3 inches
K-5	Willard/Fisk	S2-95/S2-94	8	VC&CI	184	1			1	1		1	10			Pipe changes from VC to CI
K-6	Across the river	S2-114/S2-113														Line makes a 90 deg. prior entering MH#S2-113
K-6	Across the river	S2-111/S2-112	24	AC	190						2					
K-6	Across the river	S2-112/S2-113	24	AC	112											Appears to be a concrete bloc
k																
K-6	Across the river	S2-111/S2-110	24	AC	156											Leak at downstream connection
K-6	Across the river	S2-110/S2-109	24	AC	130											None observed
K-6	Across the river	S2-109/S2-107														Unable to inspect
K-6	Across the river	S2-107/S2-106	8	CI	75				1							Camera lens submerged
K-6	Across the river	S2-106/S2-105														Unable to fit camera into lin
e																
K-6	Across the river	S2-103/S2-102	8	VC	209											None observed
K-6	Across the river	S2-103/S2-105	8	CI	17											Unable to proceed
K-6	Across the river	S2-102/S2-101	15	VC	235		2	5						2		
K-6	Across the river	S2-100/S2-99-B														
K-6	Across the river	S2-99-B/S2-99-A														No connection to MH#S2-99-B
K-6	Across the river	S2-99-A/S2-99	15	VC	176				3							Unable to inspect
K-7	Orchard	S2-82-G/S2-82-F	8	VC	0											Camera submerged
K-7	Orchard	S2-82-F/S2-82-E	8	VC	114			2						1		Unable to string line
K-7	Orchard	S2-82-E/S2-82-D	8	VC	58									4		
K-7	Orchard	S2-82-D/S2-82-D1	8	VC	143											
K-7	East	S2-83/S2-82-D	8	VC	137			2					3			Pipe curves to the left
K-7	Summer	S2-82-D/S2-82-C1	8	VC	162	1		1				2				
K-7	Summer	S2-84/S2-82-C1	8	VC	294				1	1			10	3		
K-7	Summer	S2-82-C1/S2-82	12	AC	887											
K-7	Commercial	S2-89/S2-87-D	15	VC	74				2							None observed
K-7	Commercial	S2-87-D/S2-89	15	VC	8											Camera lens submerged
K-7	Commercial/Myrtle	S2-87-C/S2-87-D	12	VC	13		1									Concrete blockage
K-7	Myrtle	S2-87-D/S2-87-C	12	VC	27				1							
K-7	Myrtle	S2-87-B/S2-87-C	18	VC	78											
K-7	Myrtle	S2-87-A/S2-87-B	18	VC	192					1						None observed
K-7	Myrtle	S2-87/S2-87-A	18	VC	112											
K-7	XC-Spring/Depot	S2-69/S2-68	21	RCP	194								1			Camera lens submerged
K-7	Depot	S2-68/S2-64-A	21	RCP	102											
K-7	Depot	S2-64-A/S2-64-B	21	RCP	114									1		Camera lens submerged
K-7	Depot	S2-64-B/S2-64-C	21	RCP	273									2		Camera lens submerged
K-7	Depot	S2-64-C/S2-64	21	RCP	126											Camera lens submerged
K-8	East Hoosac	S2-124/S2-122-D														Camera lens submerged
K-8	East Hoosac	S2-122-D/S2-122-C	8	VC	217					2		1			1.00	Unable to inspect
K-8	East Hoosac	S2-122-C/S2-122-B	8	VC	58					3		1		2	3.50	
K-8	East Hoosac	S2-122-B/S2-122-C	8	VC	194						2		2	1		
K-8	East Hoosac	S2-122-A/S2-122-B	8	CI	8											
K-8	East Hoosac	S2-122-A/S2-122	8	VC	102				1		1	2				Blockage at invert
K-8	East Hoosac	S2-122/S2-121-F	8	VC	156			1				3	3			
K-8	East Hoosac	S2-121-F/S2-121-E	8	VC	247			1				1				
K-8	East Hoosac	S2-121-E/S2-121-D	8	VC	229			1				1				
K-8	Crotteau	S2-32-A/S2-32	18	AC	189			2		3	1				0.06	

Table A-1 (continued):

K-8	East Hoosac	S2-121-D/S2-121-C	8	VC	227		1	20					1	1		
K-8	East Hoosac	S2-121-A/S2-121	8	VC	62		1	2		1		1			5.00	
K-8	East Hoosac	S2-121/S2-120-A	8	VC	198							1		1		
K-8	East Hoosac	S2-120-A/S2-120	8	VC	143			1						4		
K-8	East Hoosac	S2-120/S2-120-A	8	VC	55					1				1	0.50	
K-8	Kittler	S2-41/S2-40	8	VC	122			1		1		2	4	1	0.50	
K-8	Kittler	S2-40/S2-41	8	VC	252			1	4			1	3	1		Concrete in joint @ 250
K-8	Crotteau	S2-34/S2-32-A														Unable to inspect
K-8	Burt	S2-49-A/S2-49	8	VC	40			1				1				
K-8	Burt	S2-40/S2-39														Unable to inspect
K-8	Burt	S2-32/S2-31	18	AC	266			2		3						
K-9	St. Martha	S2-18/S2-17-B	8	VC	53			2			3			1	0.06	
K-9	Pine	S2-17-B/S2-18	8	VC	241							1		1		
K-9	Pine	S2-17-B/S2-17-A	8	VC	237			10	5	1					0.25	
K-9	Pine/Burt	S2-17-SE/S2-17-D														No access to S2-17-SE
K-9	Pine/Burt	S2-17-D/S2-17-C	8	VC	54			1	1			2		2		
K-9	Pine/Burt	S2-17-C/S2-17-D	8	VC	67			1			1			1		
K-9	Burt/Park	S2-17-C/S2-17-A	8	VC&CI	203		1		2		1			1		
K-9	Columbia	S2-17-A/S2-17-C	8	VC	88				1					1		
K-9	Columbia	S2-17-NE/S2-17-D														No access to MH#S2-17-SE
K-9	Columbia	S2-17-A/S2-17-J	8	VC&CI	220		1	5	2	2	1	2			1.50	Pipe changes from (VC to CI &
vs.|																
K-9	Columbia	S2-19/S2-15-K	8	VC	14											Camera lens submerged
K-9	Columbia	S2-15-K/S2-15-J	8	VC	315	1		7	1	1					0.50	
K-9	Columbia	S2-15-J/S2-15-I	10	VC	204			4	4							Unable to proceed
K-9	Columbia	S2-15-I/S2-15-H	10	VC	55			3								
K-9	Columbia	S2-15-H/S2-15-I	10	VC	232			1								Camera lens submerged
K-9	Columbia	S2-15-H/S2-15-G	10	VC	204			1	2							
K-9	Columbia	S2-15-G/S2-15-F	10	VC	199		2	3	2	1					0.25	
K-9	Columbia	S2-15-E/S2-15-D	10	VC	37				1							Unable to dewater line
K-9	Columbia	S2-15-D/S2-15-C	10	VC	70			3	1							
K-9	Friend	S2-15-C/S2-15-B	10	VC	298		1	12	4				7		1.00	
K-9	Friend	S2-15-B/S2-15-A	10	VC	399		1	16	3	1		1	10		2.00	
K-9	Friend	S2-15-A/S2-15	10	CI&VC	212			1	3				4			
K-9	Friend	S2-15/S2-15-A	10	VC	22				1				2			
K-9	Friend	S2-52/S2-21-B	8	VC	52		1	1	1							
K-9	North Across River	S2-21-B/S2-52	8	VC	160				3					1		
K-9	North Across River	S2-21-B/S2-21-A	8	VC	221			2						2		
K-9	North Across River	S2-21-A/S2-21	8	VC	79									1		
K-9	Friend	S2-21/S2-21-A	8	VC	46			1						1		
K-9	Friend	S2-26/S2-25-D	27	RCP	170											None observed
K-9	Friend/Columbia	S2-25-D/S2-25-B	27	RCP	500											
K-9	Friend/Columbia	S2-25-B/S2-25-A	27	RCP	69								5			
K-9	Friend/Columbia	S2-16/S1-9-A	8	VC	106	1			4			1				
K-9	Friend/Columbia	S1-9-A/S1-9	10	VC	344		2	8	4	1				2	0.07	
		S1-9/S2-15-E	10	VC	24		1	1		2					14.00	

BJ-bad joint, BP-broken pipe, CP-cracked pipe, DP-dip in line, MD-mineral deposit, OSJ-offset joint, R-roots, T-tap problem

Table C-1:

Adams, Massachusetts Manhole Inspection Data: Photo Logs – Roll No. 1

Gage Area	Location	Manhole No	Photo No.	Inv. Shelf Debris	Surch.	General Condition	Leak rate (gpm)	Comment
K-8	E. Hoosac St	122-C	I-1	none	no	Good	–	Square MH, rough conc. base
K-8	E. Hoosac St	122-B	I-2	none	no	–	–	Square conc. MH, drop conn. difficult reach to T.V.
K-8	E. Hoosac St	122-A	I-3	none	no	Poor	–	Misaligned MH, tough to clean and T.V., solids built up on invert
K-6	E. Hoosac St	S2-122	I-4	none	no	Good	–	Square MH, rough base
K-6	X-country @ river (immed. bef. X-ing)	S2-105	I-5	none	yes	Good	–	Exterior recently plastered with mortar, pole to left of base is surcharge cause
K-6	X-country @ river (immed. bef. X-ing)	S2-105	I-13	none	no	Good	–	Interior good shape, no app. leaks turb. flow, not easily estimated
K-6	X-ing river bet. MH's S2-105 & S2-103	–	I-6	none	no	Fair	–	Reeves st. is directly behind wall S2-103 is on right of pic,higher than top of wall
K-6	on S2-103 side of S2-105, near river	–	I-7	none	no	Fair	*	Spring water running out of ground near loc. of pipe. Approx. 3-4 GPM (river is to bott. of pict)
K-6	X-country @ river	S2-106	I-8	none	no	Fair	–	External recently plastered with mortar
K-6	X-country @ river	S2-106	I-14	none	no	Poor	2-3	Internal poor cond, seepage at base, inv. at bott. of pic. (flow to right – low flow, plugged
K-6	X-country @ river	S2-107	I-9	none	no	Fair	–	Correct MH is MH not marked, some damage to external
K-6	X-country @ river	S2-107	I-11	none	no	Fair	–	Poor picture of int. (see #12)
K-6	X-country @ river	S2-107	I-12	none	no	Fair	–	Flow from 8" line into 24", very turb., base is rough & wet
K-8	E. Hoosac St @ Burns St	S2-122	I-10	none	no	Good	–	Internal dry, rough base, odd 3 way invert, small opening at base, low flow,
K-7	Spring St	G.W.G. #3	I-15,16	much	no	Fair	–	Dry, low clear flow moisture ring below GWM.
K-8	N. Hoosac @ Allen St	G.W.G. #2	I-17	some	no	Good	–	Debris on shelf, solids cought in invert, moist ring below GWM
K-8	N. Hoosac @ Allen St	G.W.G. #2	I-18	some	no	Good	–	walls in good shape,
K-7	Commercial (@ Park)	S2-89	I-19	none	no	Fair	–	Shallow, rough shelf, high flow (flow towards paper)
K-7	Commercial (@ Park)	87-A	I-20	none	no	Good	–	High flow, steel inv.
K-7	Int. Myrtle & Park	87-C	I-21	none	no	Good	–	Shallow, flow too high to estimate, no leaks, flow dir towards wall shown
K-7	Comm. St(@ Mc Donalds)	87-B	I-22	none	no	Good	–	Deep, dry base, high flow level, flow dir.towards top of photo, ladder on right
K-7	Myrtle St. @ Pleasant	S2-87	I-23	none	no	–	–	Crew set up over MH
K-7	Myrtle St. @ Pleasant	S2-87	I-24	none	no	Good	–	Moist base, flow too high to estimate

* High probability of infiltration in area MH's due to high groundwater table

Table C-1 (continued):

Adams, Massachusetts Manhole Inspection Data: Photo Logs – Roll No. 2 & 3

Gage Area	Location	Manhole No	Photo No.	Inv. Shelf Debris	Surch.	General Condition	Leak rate (gpm)	Comment
K-6	Reeves St	101-A	II-0	much	no	Good	–	Dry, slow deep flow
K-6	Reeves St. @ Glenn	S2-101	II-1	–	–	–	–	Equip. set up over MH
K-6	Reeves St. @ Glenn	S2-101	II-2	some	no	Fair	–	Moist,(rough shelf), slow flow
K-8	E. Hoosac St.	121-B	II-3	none	no	Good	–	Shallow, dry, flow towards side of MH shown
K-8	E. Hoosac St.	121-D	II-5	some	no	Fair	1/2-1	Shallow, moist
K-1	Howland (Zylonite)	S1-43	II-6	some	no	Fair	–	High flow rate, moist base
K-1	X-country (Zylonite)	3-C	II-9,10	some	no	Poor	3-4	Shallow, Square MH, evidence of infiltration through & around smaller supposedly out of service
K-1	X-country (Zylonite)	3-B	II-11	–	no	–	–	Top shown partially buried behind stone pile beneath tree limbs
K-8	E. Hoosac St.	121-A	II-12	some	no	Fair	–	Shallow, and invert dry
K-8	E. Hoosac St.	121-C	II-13	some	no	Good	–	Shallow, dry
K-8	X-country (DPW Garage)	32-A	II-14-16	–	–	–	–	Deep, moist (near river), high flow rate
K-8	Crotteau @ Sparrow	S2-34	II-17	some	no	Good	–	Deep, dry, high flow rate
K-9	Friend St.	15-M	III-16	much	no	–	–	Heavy cleaning
K-9	Upton & Columbia	S2-19	III-17,18	much	yes	Poor	–	Before cleaning MH by vac truck
K-9	Upton & Columbia	S2-19	III-19-21	much	yes	–	–	Town crew manning vac truck
K-9	Upton & Columbia	S2-19	III-22	some	yes	–	–	MH – After cleaning

Table C-1 (continued):

Adams, Massachusetts Manhole Inspection Data: Photo Logs - Roll No. 4

Gage Area	Location	Manhole No	Photo No.	Inv. Shelf Debris	Surch.	General Condition	Leak rate (gpm)	Comment
K-9	Friend St.	15-M	IV-0	–	no	–	–	Debris/grit taken from single run from 15-M - S2-16
K-9	Friend & Colombia	15-L	IV-1	–	no	–	–	Town and S&S crews cleaning to 15-M
K-9	Friend & Colombia	15-L	IV-2	–	no	–	–	Town and S&S crews cleaning to 15-M
K-1	Station St. near P.Sta	S2-3	IV-3	some	no	Good	–	Dry, 10" pipe, 1/2" sediment in invert
K-1	Station St. near P.Sta	S1-2	IV-4	some	no	Good	–	Dry, 10" pipe
K-9	Burt & Pine St.	S2-17	IV-5	–	yes	–	–	Surcharge
K-9	Pine st.	17-C	IV-6	–	–	–	–	Dry
K-9	Upton & Pine	S2-20	IV-7	–	yes	–	–	Somewhat surcharged
K-9	Burt St.(near Friend)	S2-18	IV-8	–	no	Good	–	Dry
K-9	Upton & Friend	S2-21	IV-9	–	no	–	–	High flow from Friend uphill
K-3	Friend St.	S2-52	IV-10	none	no	Good	–	Dry, High velocity
K-7	Orchard St.	82-P	IV-11	none	no	Fair	–	Moist, shallow, low flow
K-7	Summer & Orchard	82C-1	IV-12	much	yes	Poor	–	Surcharged due to sediment in invert
K-7	Summer near Orchard	82-C	IV-13	none	no	Good	–	High velocity, 10'pipe
K-7	Summer St.	S2-82	IV-14	none	no	Good	–	High velocity, 10'pipe
K-7	Off of Depot St.	S2-69	IV-15	some	no	Good	–	Too deep to measure
K-7	Depot & Maple	–	IV-16	–	–	–	–	Wrong MH, MH 64-A not found
K-7	Depot & Hoosac	S2-64	IV-17	–	yes	–	–	Too deep to measure
K-8	E. Hoosac (near Summer)	S2-120	IV-18	none	no	Fair	–	
K-8	E. Hoosac St.	121-F	IV-19	none	–	Fair	1/2-1	Wet inside
K-8	E. Hoosac St.	122-D	IV-20	none	no	Fair	–	Dry inside

Table D-1 (continued):

Adams, Massachusetts Rainfall Simulation Data:

Area Sketch	Street Name	Location	Photo No.	Observation	Storm Drn in Street	Dye Flood/trace Flood Sketch	Dye Sketch	Test Pos/neg	Rate (gpm) to sewer	Area Drained (sq.ft.)
K-8-8	E. Hoosac St	@ East Rd	38	Indirect CB	yes	K-8-6		pos	10	1500
K-8-13	E. Jordan St	Hse #35,39	–	Suspect roof leader	none					unk
K-8-13	E. Jordan St	Hse #37	43	Direct roof leader	none					1000
K-8-13	E. Jordan St	Hse #41	–	Suspect roof leader	none		K-8-4	pos	–	1500
K-8-20	E. Jordan St	Hse #46	–	Suspect roof leader	none					unk
K-8-30	East Rd	Hse #146	–	Suspect roof leader	yes					unk
K-8-26	East Rd	Hse #35	–	Suspect roof leader	yes					unk
K-8-28	East Rd	Hse #89	–	Suspect roof leader	yes					unk
K-8-27	East Rd	Hse #55	–	Suspect roof leader	yes					unk
K-8-19	Kittler Av	@ Richmond St	54	Smoking culvert wall	yes					–
K-8-19	Kittler Av	Hse #2	–	Suspect roof leader	none					unk
K-8-6	Meadow St	Hse #6	34	Suspect roof leader	none					unk
K-8-5	Meadow St	Hse #41	–	Flr Drn in Barn	none					–
K-8-5	Meadow St	S of Dubis St	33	Smk from hole in Gnd	none	K-8-2		neg	–	500
K-8-5	Meadow St	Hse #41	32	Susp. broken service	none					unk
K-8-6	Meadow St	Hse #30	31	Direct roof leader	none					1000
K-8-6	Meadow St	Hse #34	30	Susp. broken service	none	K-8-4		pos	–	100
K-8-6	Meadow St	Hse #10	–	Suspect roof leader	none					unk
K-8-5	Meadow St	Hse #42	29	Susp. broken service	none	K-8-3		neg	–	–
K-8-2	Mill St	Hse #14	26	Direct roof leader	yes					1000
K-8-2	Mill St	Hse #17	27	Direct roof leader	yes					1500
K-8-1	Murray St	Hse #23	23	Direct roof leader	yes					500
K-8-1	Murray St	Hse #10,18,21	25	Suspect roof leader	yes					unk
K-8-1	Murray St	Hse #23-1/2	24	Direct roof leader	yes					500
K-8-10	Potter St	Hse #3	40	Susp. broken service	none					25
K-8-20	Richmond La	Hse #25	–	Suspect area drain	yes					unk
K-8-20	Richmond La	Hse 20,25,26,27,32,49,53	–	Suspect roof leader	yes					unk
K-8-20	Richmond La	Hse #28,36	–	Suspect roof leader	yes		K-8-5	pos	–	2000
K-8-16	Summer St	@ Church School	47	Direct CB	yes					2500
K-8-13	Summer St	Hse #53	–	Suspect roof leader	yes					unk
K-8-13	Summer St	Hse #30	–	Suspect roof leader	yes		K-8-4	pos	–	1500
K-8-16	Summer St	Church	48	Direct roof leader	yes					5000
K-8-9	Summer St	Hse #107	39	Direct roof leader	yes					500
K-8-12	Summer St	Hse #69	–	Suspect roof leader	yes					unk
K-8-16	Summer St	Church School	46	Direct roof leader	yes					2500
K-8-9	Summer St	Hse #115,116	–	Suspect roof leader	yes					unk
K-8-16	Summer St	Old School Apts	49	Direct roof leader	yes					2000
K-8-12	Turner's Av	Hse #4,14,22	–	Suspect roof leader	yes					unk
K-8-12	Turner's Av	Hse #5	42	Direct roof leader	yes					1000
K-8-12	Turner's Av	mid Hse #14,22	41	Indirect CB	yes	K-8-7		pos	1	500
K-8-3	Weber St	Hse #1,9	–	Suspect roof leader	yes					unk
K-8-3	Winter St	Hse #30	–	Suspect roof leader	yes		K-8-2	pos		1000 *

Table D-1:

Adams, Massachusetts Rainfall Simulation Data:

Area Sketch	Street Name	Location	Photo No.	Observation	Storm Drn in Street	Dye Flood/trace Flood Sketch	Dye Sketch	Test Pos/neg	Rate (gpm) to sewer	Area Drained (sq.ft.)
K-2(8-17)	Lime St	Hse #215	51	Direct roof leader	yes					500
K-2(8-17)	Lime St	@ Summer St	50	Smoke from sidewalk	yes	K-8-8		pos	-	25
K-3-4	Beecher St	Hse #13,19	-	Suspect roof leader	yes		K-3-1	neg	-	-
K-3-4	Beecher St	Hse #5	-	Suspect roof leader	yes					unk
K-3-2	Cedar Ln	Hse #3,5,6	-	Suspect roof leader	yes					unk
K-3-1	Friend St	Hse #120,141	-	Suspect roof leader	yes					unk
K-3-5	Greylock Av	Opp. Quaker St	3	Indirect CB	yes	K-3-2		pos	25	1500
K-3-7	Hathaway St	Hse #2	-	Suspect roof leader	none					unk
K-3-6	Hathaway St	Near Greylock Av	4	Indirect CB	yes	K-3-3		neg	-	-
K-3-6	Hathaway St	Hse #9	-	SP conn. to sewer	none					sump
K-3-6	Hathaway St	Hse #23	5	Direct roof leader	none					500
K-3-3	Notch Rd	Hse #14	-	SP conn. to sewer	yes					sump
K-3-7	Notch Rd	Hse #53	-	Suspect roof leader	none		K-3-3	neg	-	-
K-3-5	Quaker St	Hse #14,15	-	Suspect roof leader	none		K-3-2	neg	-	-
K-3-4	Quaker St	Hse #7	-	Suspect roof leader	none					unk
K-3-5	Waters St	@ Greylock Av	2	Indirect CB	yes	K-3-1		neg	-	-
K-3-8	Waters St	White	-	Susp. driveway drain	yes		K-3-4	neg	-	-
K-3-5	Waters St	Hse #20	-	Suspect roof leader	yes		K-3-2	neg	-	-
K-3-3	West Rd	@ Valley St	1	Indirect CB	yes					1500
K-4-23	A St	Hse #12	20	Direct roof leader	yes					500
K-4-23	A St	Hse #12	21	Indirect CB	yes	K-4-5		neg	-	-
K-4-5	Albert St	near Cook St	6	2 Direct CB's, south	yes					5000]
K-4-5	Albert St	near Cook St	7	2 Direct CB's, north	yes					5000]
K-4-23	B St	Hse #5	-	Suspect roof leader	none		K-4-8	neg	-	-
K-4-23	B St	Hse #9,11	-	Suspect roof leader	none					unk
K-4-23	B St	Hse #7	-	Suspect roof leader	none		K-4-8	pos	-	1000 *
K-4-12	Burnett St	200' N of Grant St	-	Indirect CB	yes				-	unk
K-4-6	Columbia St	2 Churches & Rectory	-	Suspect roof leader	yes					unk
K-4-6	Columbia St	Hse #70	-	Suspect roof leader	yes					unk
K-4-6	Columbia St	400' N of Valley Rd	8	Indirect CB	yes					1500
K-4-6	Columbia Terr	@ Columbia St	-	Storm drain conn.?	yes					unk *
K-4-17	Country Club Av	White Hse	-	Suspect roof leader	yes					unk
K-4-12	Cross St	@ Grant St	-	Indirect CB	yes	K-4-2		pos	5	1000 *
K-4-13	Dean Dr	Hse #1	-	Suspect roof leader	none		K-4-3	neg	-	-
K-4-8	Depot St	@ School St	9	2 Indirect CB's	yes	K-4-1		pos	13	2500
K-4-16	Edward Av	Hse #13	-	Susp. driveway drain	yes		K-4-5	neg	-	unk
K-4-16	Edward Av	Hse #64	-	Suspect roof leader	yes		K-4-5	pos	-	1500
K-4-18	Forest Park St	Hse #31,33	-	Suspect roof leader	yes		K-4-6	pos	-	2000 *
K-4-18	Forest Park St	Hse #29	-	Suspect roof leader	yes		K-4-6	neg	-	-
K-4-18	Forest Park St	Hse #12,17,21	-	Suspect roof leader	yes					unk
K-4-21	Forest Park St	Hse #24	19	Direct roof leader	yes					2500
K-4-20	Gilead St	@ X-country	18	Smoke from ground	yes	K-4-4		neg	-	-
K-4-14	Grandview Terr	Hse #10	-	Suspect roof leader	yes		K-4-4	neg	-	-
K-4-12	Grant St	mid Cross & Burnett	17	Indirect CB	yes				-	unk
K-4-12	Grant St	mid Cross & Burnett	16	Smoke from lawn	yes	K-4-3		neg	-	-
K-4-16	Highland Av	Hse #19	-	Suspect roof leader	yes		K-4-5	neg	-	-
K-4-11	Lincoln St	Near Valley St	14	Indirect CB	yes					1500
K-4-23	Maple St	Hse #16	-	Suspect roof leader	yes					unk
K-4-10	Maple St	Armory	-	Susp. RL, area drain	none		K-4-2	neg	-	-
K-4-3	Marshall Av	Hse #14	-	Suspect roof leader	none		K-4-1	neg	-	-

Flow Isolation Reach	Cont. Gage Area	Number of In-miles	Approx. Sewer Age	Flow (gpd) Infiltrat.[1]	Infil/In-mi. (gpd/in-mi)	Comments
S1-26	K-6	11.14	5-55	600,382	53,894	MHI obs. gravel, rock & clear water in line.
S1-37	K-8	8.84	30-60	282,715	31,981	MHI obs. near brook w/ infilt.
S1-49	K-4	7.56	30	219,786	29,072	Check for cross connections.
S1-12	K-9	2.87	60	79,807	27,807	"
S1-39a	K-8	1.44	50-60	33,442	23,224	Check XC from Richmond to N.Summer
S1-7b	K-9	0.68	70	14,400	21,176	Questionable flow pattern; surch.
S1-44	K-3	11.38	35-70	191,424	16,821	Invest. Notch, West & Friend
S1-17	K-4	1.80	65	27,967	15,537	MHI-12 obs. questionable flow pattern
S1-29a	K-6	11.82	10-60	160,855	13,609	Surch. at siphon, invest. downstream of siphon
S1-39c	K-8	6.02	75	73,732	12,248	MHI-10 obs. brook may flow into sewer.
S1-30	K-7	2.40	50-60	27,750	11,563	"
S1-8,10,11	K-9	9.40	30-70	102,861	10,943	Surch.;possible overflow at inst. gage 11.
S1-16	K-4	3.58	30	36,545	10,208	Check for cross connections.
S1-35	K-7	6.51	50-60	64,800	9,954	MHI obs. evidence of infilt.
S1-4	K-2	9.20	35-55	87,593	9,521	MHI obs. broken pipe & gravel in MH
S1-38	K-8	18.43	60	161,068	8,739	Old interceptor near river.
S1-9	K-9	4.38	50-70	36,000	8,219	Concentrate on Friend.
S1-2	K-1	6.25	20	46,480	7,437	Needs cleaning/lime deposits
S1-45	K-8	3.18	55	23,244	7,309	"
S1-1	K-1	11.74	50	61,860	5,269	Used cont. gage for estimates
S1-42c	K-8	3.33	40	15,840	4,757	To be verified.
S1-5	K-2	3.59	35	16,921	4,713	"
S1-31b	K-7	0.76	30	2,880	3,789	"
S1-3	K-1	3.71	65	13,168	3,549	Needs cleaning/MHI observed clear water
S1-42b	K-8	1.52	10-30	5,040	3,316	"
S1-20	K-4	3.10	70	8,640	2,787	"
S1-40	K-8	5.83	55	14,963	2,567	"
S1-28	K-6	12.88	10-55	30,240	2,348	"
S1-6	K-3	5.20	30,50,80	11,520	2,215	Needs cleaning
S1-33	K-7	7.20	10,70	15,840	2,200	"
S1-42a	K-8	9.62	10-30	20,160	2,096	"
S1-23	K-6	2.80	60	5,760	2,057	"
S1-31a	K-7	5.83	30,70	11,520	1,976	"
S1-21b	K-4	0.76	50	1,440	1,895	"
S1-29b	K-6	0.90	60	1,440	1,600	"
S1-34a	K-7	9.19	30,60	14,400	1,567	MHI obs. evidence of inflow & surch.
S1-27	K-6	7.50	20-55	11,520	1,536	"
S1-21a	K-4	10.15	10-30,60	13,915	1,371	"
S1-32	K-7	2.37	55	2,880	1,215	"
S1-25	K-6	6.44	50-60	7,200	1,118	Indust. flow 40,000 gpd.
S1-22	K-4	7.89	30	8,640	1,095	"
S1-46	K-8	1.38	70	1,440	1,043	"
S1-47	K-4	7.94	55	7,685	968	"
S1-41	K-8	6.64	45-60	4,320	651	"
S1-0	K-5	13.56	55-65	7,800	575	Poor gage reliab., surch., requires FI on Fisk
S1-43	K-1	6.36	20	1,440	226	Serves Mall,and Deacon Plastics in N.Adams
S1-24	K-6	8.48	15	1,440	170	Regional High School line.
S1-18	K-4	17.48	50-70	2,880	165	MHI obs. clear water, evid of infilt.
S1-34b	K-7	0.23	60	0	0	"
S1-21c	K-4	0.45	50	0	0	"
S1-39b	K-8	0.91	50	0	0	"
S1-19	K-4	2.39	30	ND	ND	"
S1-50	K-6	3.84	70	ND	ND	Poor gage reliability.
S1-36,48	K-7	25.47	25,60,70	ND	ND	Suspect readings at Cont. gage 6 off.
S1-7a	K-9	5.47	30-60	ND	ND	Poor data; Upton & Friend are Old.
S1-13,WWTP	K-9	32.28	40	ND	ND	Interceptor surch.

Flow Isolation Reach	Cont. Gage Area	Corresp. Reach Phase-1	Number of In-miles	Approx. Sewer Age (yrs)	Flow (gpd) Infiltrat.	Infil/In-mi. (gpd/in-mi)	Comments
S2-111	K-6	S1-26	0.45	30	56,210	124,911	
S2-64	K-7	S1-48	2.59	30	238,470	92,073	
S2-101b	K-6	S1-26	1.14	55	92,800	81,404	
S2-32	K-8	S1-37	1.53	60	122,600	80,131	
S2-39a	K-8	S1-37	0.46	55	35,560	77,304	
S2-99a	K-6	S1-50	0.57	-	41,430	72,684	
S2-25	K-9	S1-15	4.86	30	339,070	69,767	
S2-109	K-6	S1-26	0.45	30	23,684	52,631	
S2-99b	K-6	S1-50	0.74	55	38,160	51,568	
S2-40a	K-8	S1-39c	0.68	75	30,320	44,588	
S2-110	K-6	S1-26	1.14	30	37,480	32,877	
S2-15a	K-9	S1-9,10	6.27	65	269,940	29,762	
S2-17	K-9	S1-8	2.80	45	ND	29,762	Surcharged
S2-21	K-9	S1-7	0.91	-	26,900	29,560	
S2-106	K-6	S1-26	0.46	55	11,390	24,761	Turbulent flow
S2-102	K-6	S1-26	0.97	55	22,560	23,258	
S2-120	K-8	S1-40	6.29	55	114,070	18,135	Turbulent flow
S2-112	K-6	S1-26	0.68	30	39,130	17,238	
S2-113b	K-6	S1-26	1.59	55	ND	17,238	
S2-87	K-7	S1-36	2.74	75	41,270	15,062	
S2-94B	K-5	S1-0	0.30	-	4,040	13,467	
S2-82	K-7	S1-35	3.55	55	47,520	13,386	
S2-90	K-7	S1-36	1.03	65	11,520	11,184	Pump sta. influences flow
S2-49b	K-8	S1-38	0.53	60	5,760	10,868	
S2-4	K-1	S1-2	1.42	-	36,000	10,619	
S2-3	K-1	S1-2	1.97	-	ND	10,619	Surcharged
S2-54	K-3	S1-44	0.98	-	8,640	8,816	
S2-41	K-8	S1-39c	0.74	75	6,250	8,446	
S2-117	K-6	S1-29a	1.29	30	8,640	6,698	
S2-113a	K-6	S1-26	0.46	-	2,880	6,261	
S2-48	K-8	S1-46	1.39	55,70	8,640	6,216	
S2-29	K-4	S1-16,17	5.00	30,60	30,500	6,100	
S2-5	K-1	S1-1	2.84	55	17,280	6,085	Lamped; line under creek OK
S2-7	K-1	S1-3	1.89	70	11,130	5,889	
S2-118	K-6	S1-29a	0.45	30	46,080	5,855	
S2-37	K-8	S1-37	1.52	15	8,640	5,684	
S2-58b	K-3	S1-44	0.80	45	4,350	5,438	
S2-46	K-8	S1-38	2.48	-	13,200	5,323	
S2-91	K-7	S1-36	2.20	45	11,520	5,236	
S2-30	K-4	S1-49	3.98	30	47,950	4,819	
S2-51	K-4	S1-49	1.79	30	ND	4,819	}Flows don't make sense
S2-61	K-4	S1-49	4.18	30	ND	4,819	}again.
S2-71	K-7	S1-30,31a	5.96	60	28,650	4,807	
S2-124	K-8	S1-42c	1.74	35	7,920	4,552	
S2-44	K-8	S1-45	0.63	65	2,760	4,381	
S2-6	K-1	S1-1	8.90	55	37,830	4,251	
S2-13	K-2	S1-4	3.11	35	10,975	3,529	
S2-18	K-9	S1-8	2.42	30	8,100	3,347	
S2-9	K-2	S1-4	2.19	45	7,315	3,340	
S2-83	K-7	S1-35	2.67	60	8,640	3,236	
S2-70b	K-7	S1-48	1.81	55	5,760	3,182	
S2-56	K-3	S1-6	5.21	55	15,840	3,040	
S2-55	K-3	S1-44	3.11	55	8,610	2,768	
S2-122	K-8	S1-40	1.06	-	2,880	2,717	
S2-94a	K-5	S1-0	0.53	65	1,440	2,717	
S2-97b	K-5	S1-0	2.28	-	5,760	2,526	
S2-1	K-1	S1-43	6.36	-	15,840	2,491	
S2-16a	K-9	S1-9	1.89	50	4,320	2,286	
S2-43	K-8	S1-45	0.45	75	990	2,200	
S2-38	K-8	S1-37	3.33	40	7,200	2,162	
S2-76	K-7	S1-31a	1.36	55	2,880	2,118	
S2-59	K-3	S1-44	1.36	45	2,880	2,118	
S2-34	K-8	S1-38	5.16	60	10,530	2,041	
S2-2	K-1	S1-2	2.86	20	5,760	2,014	Broken pipe
S2-16b	K-9	S1-9	1.46	60	2,880	1,973	
S2-60	K-4	S1-18	9.77	65	23,760	1,943	
S2-63	K-4	S1-18	2.46	45	ND	1,942	
S2-80b	K-7	S1-32	0.38	55	720	1,895	
S2-11	K-2	S1-4	1.06	45	1,985	1,873	
S2-100	K-6	S1-25	6.45	60	11,520	1,786	
S2-79	K-7	S1-33	3.26	60	5,760	1,767	
S2-35a	K-9	S1-15	0.83	55	1,440	1,735	
S2-72	K-4	S1-20,47	5.83	55	10,080	1,729	

1 --- Infiltration measured during high groundwater, April/May 1985

TABLE V-4: Summary of Phase-2 Infiltration Data, Prioritized by Infil/in-mi. (Continued)

Flow Isolation Reach	Cont. Gage Area	Corresp. Reach Phase-1	Number of In-miles	Approx. Sewer Age (yrs)	Flow (gpd) Infiltrat.	Infil/In-mi. (gpd/in-mi)	Comments
S2-49a	K-8	S1-46	1.70	-	2,880	1,694	
S2-75	K-7	S1-31a	1.74	35	2,880	1,655	
S2-123	K-8	S1-42a	9.62	20	15,840	1,647	
S2-10	K-2	S1-5	3.59	35	5,760	1,604	
S2-116b	K-6	S1-29b	0.90	70	1,440	1,600	
S2-65	K-4	S1-18	0.45	45	720	1,600	
S2-39b	K-8	S1-39b	0.91	55	1,440	1,582	
S2-35b	K-9	S1-15	0.98	55	1,440	1,469	
S2-125	K-8	S1-42c	1.59	35	2,160	1,358	
S2-80a	K-7	S1-32	0.55	55	720	1,309	
S2-115	K-6	S1-27	7.50	35	8,640	1,152	
S2-93	K-5	S1-0	1.37	55	1,440	1,051	
S2-88	K-7	S1-36	1.43	55	1,440	1,007	
S2-114	K-6	S1-28,24	21.37	15-55	20,160	943	
S2-36	K-2	S1-4	1.40	55	1,275	911	
S2-81	K-7	S1-33	3.26	15	2,880	883	
S2-95b	K-5	S1-0	5.16	60	4,320	837	
S2-8	K-1	S1-3	1.82	65	1,440	791	
S2-97a	K-5	S1-0	0.98	65	720	735	
S2-53	K-3	S1-44	2.12	30	1,440	679	
S2-74c	K-4	S1-47	0.53	55	360	679	
S2-121	K-8	S1-41	6.65	50	4,320	650	
S2-73a	K-4	S1-22a	18.05	30	11,520	638	
S2-74a	K-4	S1-47	1.21	55	720	595	
S2-104	K-6	S1-23	2.80	-	1,440	514	
S2-47	K-8	S1-38	8.54	60	3,720	436	
S2-74b	K-4	S1-47	1.13	35	360	319	
S2-19	K-9	S1-7	0.30	65	1,420	311	
S2-20	K-9	S1-7	4.26	60	ND	311	Unreliable measurement
S2-95a	K-5	S1-0	0.98	-	280	286	
S2-85	K-7	S1-34	6.21	30,50	1,440	232	
S2-40b	K-8	S1-39a	4.16	55	340	82	
S2-119	K-6	S1-29a	7.42	45	0	0	
S2-84a	K-7	S1-34	2.97	65	0	0	
S2-62	K-4	S1-18,20	3.00	70	0	0	
S2-116a	K-6	S1-29a	2.65	10	0	0	
S2-50	K-4	S1-18	1.70	70	0	0	
S2-77	K-7	S1-32	1.74	55	0	0	
S2-103	K-6	S1-26	1.36	55	0	0	
S2-27	K-9	S1-15	2.44	30	0	0	
S2-22	K-4	S1-17	0.38	70	0	0	
S2-96	K-5	S1-0	0.68	55	0	0	
S2-92	K-5	S1-0	1.28	65	0	0	
S2-26a	K-9	S1-15	1.79	30	0	0	
S2-12	K-2	S1-4	1.44	-	0	0	
S2-66	K-4	S1-18	0.91	45	0	0	
S2-45	K-8	S1-45	1.02	15	0	0	
S2-26b	K-9	S1-15	0.45	30	0	0	
S2-33	K-8	S1-37	2.46	55	0	0	
S2-86	K-7	S1-36	1.70	75	0	0	
S2-31	K-9	S1-15	0.99	60	0	0	
S2-24	K-9	S1-15	1.02	30	0	0	
S2-107	K-6	S1-26	0.68	55	0	0	
S2-67	K-4	S1-18	1.52	45	0	0	
S2-108	K-6	S1-26	1.36	30	0	0	
S2-57	K-3	S1-44	0.61	55	0	0	
S2-78	K-7	S1-33	0.68	30	0	0	
S2-73b	K-4	S1-22b	0.76	50	0	0	
S2-101a	K-6	S1-26	0.71	-	0	0	
S2-14	K-9	S1-13	13.34	25,65	0	0	
S2-15b	K-9	S1-9,10	0.61	65	0	0	
S2-89	K-7	S1-36	4.09	75	0	0	
S2-68	K-7	S1-48	1.78	30	0	0	
S2-98	K-6	S1-50	1.83	65	0	0	
S2-58a	K-3	S1-44	0.57	45	0	0	
S2-84b	K-7	S1-34	0.23	-	0	0	
S2-73c	K-4	S1-22c	0.45	-	0	0	
S2-42	K-8	S1-39c	2.50	35	0	0	
S2-52	K-3	S1-44	1.82	-	0	0	
S2-105	K-6	S1-26	0.45	55	ND	0	Surcharging
S2-69	K-7	S1-48	4.33	30	ND	0	Suspect wrong MH measured.
S2-28	K-9	S1-15	0.38	30	ND	0	
S2-23	K-9	S1-15	1.54	30	ND	0	Lime St. surcharged
S2-70a	K-7	S1-48	1.70	75	ND	0	
S2-0	K-9	S1-WWTP	5.54	20	ND	ND	

TABLE V-5
ADAMS, MA - I/I INVESTIGATION
FLOW ISOLATION GAGING RESULTS FOR AREA 1

Street	From/to	Phase 2 Flow Isol. Reach	Drawer/ Plan	Pipe Length (ft)	Equiv. Pipe Dia. (in)	Year Const.	Peak Reach Infilt. (gpd)	Peak Infilt. Rate (gpd/in-mi)
Howland Ave	N.Adams/XC	S2-1	np	4200	8	unk *	15,840	2,489
Old Columbia	Mid/Howland	S2-2	p5,73	1550	8	1964 *		
Howland Ave	Butler/XC	S2-2	np	450	6	unk *	5,760	2,014
XC	Howland/S2-3	S2-3	np	1300	8	unk *	ND	10,619
Zylonite	S2-3/WWTP	S2-4	np	750	10	unk *	36,000	10,619 "
Howland Ave	Lime/WWTP access	S2-8	p4,19	1200	8	1922 *	1,440	792
Howland Ave	WWTP acc/S2-7	S2-7	p1,80	1250	8	1917 *	11,130	5,877
Brown St	End/Howland	S2-6	p4,77	850	8	1931 *		
Apremont St	End/Howland	S2-6	p4,76	900	8	1930 *		
Newark St	End/Howland	S2-6	p4,75	950	8	1930 *		
Orcutt St	End/Howland	S2-6	p4,77	400	8	1930 *		
Howland Ave	Brown/Apremont	S2-6	p4,77,5	600	8	1936,41 *		
Howland Ave	S2-7/Apremont	S2-6	p4,77	550	8	1931 *		
Howland Ave	Apremont/Mid Howl.	S2-6	p4,77	1300	10	1931 *	37,830	4,250
Howland Ave	Mid Howl./Zylonite	S2-5	p4,77	600	10	1931 *		
Zylonite St	Howland/mid	S2-5	p4,77	450	10	1931 *		
Zylonite Sta.	Mid/S2-5	S2-5	np	450	10	unk *	17,280	6,083
TOTAL (GAGE 1):				17,750		*	125,280	4,463

TABLE V-6
ADAMS, MA - I/I INVESTIGATION
FLOW ISOLATION GAGING RESULTS FOR AREA 2

Street	From/to	Phase 2 Flow sol. Reach	Drawer/ Plan	Pipe Length (ft)	Equiv. Pipe Dia. (in)	Year Const.	Peak Reach Infilt. (gpd)	Peak Infilt. Rate (gpd/in-mi)
Wilfred Ave	End/Powers	S2-10	p5,23	650	6	1954 *		
Powers St	East/mid	S2-10	p5,3	700	6	1952 *		
Powers St	Mid/Lime	S2-10	p5,3;2,68	1350	8	1939,51 *	5,760	1,609
Spring Rd	End/East	S2-12	np	200	8	unk *		
East Rd	Spring/lime	S2-12	np	750	8	unk *	0	0
East Rd	Anthony/lime	S2-13	p5,1	2050	8	1951 *	10,975	3,533
Charles St	End/Lime	S2-9	np	300	8	unk *		
Davis St	End/Lime	S2-9	np	300	8	unk *		
Lime St	S2-11/S2-9	S2-9	p4,78;A	850	8	1930,39 *	7,315	3,330
Frederick Ln	End/N.Summer	S2-36	p4,78	250	4	1930 *		
N.Summer St	Frederick/Lime	S2-36	p4,78	800	8	1930 *	1,275	910
Lime St	East/S2-11	S2-11	p4,78;A	700	8	1930,39 *	1,985	1,872
TOTAL (GAGE 2):				8,900		*	27,310	2,136

TABLE V-8
ADAMS, MA - I/I INVESTIGATION
FLOW ISOLATION GAGING RESULTS FOR AREA 4

Street	From/to	Phase 2 Flow Isol. Reach	Drawer/ Plan	Pipe Length (ft)	Equiv. Pipe Dia. (in)	Year Const.	Peak Reach Infilt. (gpd)	Peak Infilt. Rate (gpd/in-mi)
West Rd	Mountain/Glendale	S2-73a	p4,30a	850	7.94	1973 *		
Dean Dr	End/Glendale	S2-73a	p5,57a	200	8	1963 *		
Mt View Dr	End/Glendale	S2-73a	p5,57a	350	6	1963 *		
Glendale Dr	West/Grandview	S2-73a	p5,57a	800	8	1963 *		
Grandview Ter	N End/XC	S2-73a	p5,50	600	6	1958 *		
Grandview Ter	S End/XC	S2-73a	p5,50	400	6	1958 *		
XC	Grandview/Highland	S2-73a	p5,4	300	8	1954 *		
Highland Av	End/XC	S2-73a	p5,4	1100	7.3	1953,55 *		
XC	Higiand/Edward	S2-73a	p5,4	450	8	1953 *		
Edward Av	XC/Melrose	S2-73a	p4,29	600	8	1947 *		
Gould Rd	End/West	S2-73a	p4,30d	1650	8	1973 *		
West Rd	Gould/Mid	S2-73a	p4,30d	450	8	1973 *		
West Rd	Mid/Marshall	S2-73a	p5,64	750	8	1961 *		
West Rd	End/Marshall	S2-73a	p5,55	600	8	1959 *		
Marshall Av	West/Melrose	S2-73a	p5,7	750	8	1953 *		
Highland Av	Mid/Melrose	S2-73a	p5,4	550	8	1953 *		
Country Club	Ends/Melrose	S2-73a	p4,29	850	8	1924 *		
Melrose St	Highland/Edward	S2-73a	p5,9	250	8	1953 *		
Melrose St	Edward/Gilead	S2-73a	p4,29	500	8	1924 *		
Melrose St	Gilead/For.Park	S2-73a	pT1,7	350	8	1936 *	11,520	638
Forest Park Av	End/Melrose	S2-73b	pT1,7	500	8	1936 *	0	0
Melrose St	Marmon/FPA	S2-73c	pT1,7	300	8	1936 *	0	0
Maple St	End/Gilead	S2-74a	p4,30	500	8	1924 *		
Gilead	Maple/S2-74	S2-74a	p4,88	300	8	1931 *	720	594
Simon Av	Ends/XC	S2-74b	p3,111	450	8	1951 *		
XC	Simon/Gilead	S2-74b	p3,111	300	8	1951 *	360	317
West St	Mid/Gilead	S2-74c	p1,89	350	8	1931 *	360	679
Gilead	End,S2-74/XC	S2-72	p4,88	600	8	1931 *		
XC	Gilead/FPA	S2-72	pT1,7	800	8	1936 *		
West St	Mid/FPA	S2-72	np	350	8	unk *		
Forest Park Av	Melrose/Maple	S2-72	pT1,7	700	8	1936 *		
XC	West--Maple	S2-72	np	550	8	unk *		
Maple St	End/FPA	S2-72	p1,87	350	8	1931 *		
Maple St	FPA/Columbia	S2-72	np	500	8	unk *	10,080	1,728
B St	End/Marmon	S2-62	p2,6	550	8	1918 *		
Marmon St	B/A	S2-62	p2,6	200	8	1918 *		
A St	Marmon/Melrose	S2-62	np	300	8	unk *		
Melrose St	A/Maple	S2-62	p2,69	500	8	1938 *		
Columbia St	Maple/S2-62	S2-62	p1.60	350	10	1917 *	0	0
Park St	End/Depot(XC)	S2-67	p2,67	500	8	1938 *		
Depot St	Park/School	S2-67	p2,67	500	8	1938 *	0	0
School St	Park/Depot	S2-66	p2,67	600	8	1938 *	0	0
E. Maple St	Park/Depot	S2-65	p2,67	300	8	1938 *	720	1,584
Depot St	School/Columbia	S2-63	p2,67	1300	10	1938 *	ND	1,942
Columbia St	S2-62/Valley	S2-60	p1,60	750	10	1917 *		
Cross St	End/Grant	S2-60	p1,39	500	8	1915 *		
Burnett St	End/Grant	S2-60	p3,84	400	8	1946,75 *		
Grant St	West/Burnett	S2-60	np	800	8	unk *		
XC	Grant/Valley	S2-60	np	300	10	unk *		
Valley St	End/Cross	S2-60	p1,6	400	8	1918 *		
Lincoln St	End/Valley	S2-60	p4,40	600	8	1925 *		
Valley St	Cross/Columbia	S2-60	np	1500	8	unk *		
XC	Valley/Mid Col.	S2-60	p1,60	750	10	1917 *	23,760	1,942
Columbia St	XC/S2-50	S2-50	p1,60	900	10	1917 *	0	0
Columbia St	S2-50/Cook	S2-22	p1,60	200	10	1917 *	0	0

TABLE V-8
ADAMS, MA - I/I INVESTIGATION
FLOW ISOLATION GAGING RESULTS FOR AREA 4
(Continued)

Street	From/to	Phase 2 Flow Isol. Reach	Drawer/ Plan	Pipe Length (ft)	Equiv. Pipe Dia. (in)	Year Const.	Peak Reach Infilt. (gpd)	Peak Infilt. Rate (gpd/in-mi)
Cook St	Columb/Albert	S2-29	p1,79	250	10	1919 *		
Albert St	Cook/INT	S2-29	pT3,10	500	10	1924 *		
INT	S1-49/Gage K4	S2-29	np	900	21	1957 *	30,500	6,100
INT	Depot/S1-19	S2-61	np	600	21	1957 *		
INT	S1-19/S2-61	S2-61	np	450	21	1957 *	ND	4,822
INT	S2-61/S2-51	S2-51	np	450	21	1957 *	ND	4,822
INT	S2-51/S2-30	S2-30	np	1000	21	1957 *	47,950	4,822
TOTAL (GAGE 4):				35,250		*	125,970	1,996

TABLE V-10
ADAMS, MA - I/I INVESTIGATION
FLOW ISOLATION GAGING RESULTS FOR AREA 6

Street	From/to	Phase 2 Flow Isol. Reach	Drawer/ Plan	Pipe Length (ft)	Equiv. Pipe Dia. (in)	Year Const.	Peak Reach Infilt. (gpd)	Peak Infilt. Rate (gpd/in-mi)
XC	Req.H.S./Bellevue	S2-114	np	5600	8	1970 *		
Orchard St	Mid/Leonard	S2-114	p5,2;71	1600	8	1964,74 *		
Tower Ave	End/Woods	S2-114	p5,2	300	8	1953 *		
Woods Dr	End/Overlook	S2-114	p5,2	850	8	1953 *		
Overlook Ter	Mid/Leonard	S2-114	p5,2;47	600	7.36	1953,57 *		
Arnold Ave	End/Bellevue	S2-114	np	950	8	unk *		
Overlook Ter	Mid/Bellevue	S2-114	p5,47	450	8	1957 *		
Bellevue Ave	Arnold/Leonard	S2-114	p1,92	950	8	1931 *		
Leonard St	Orchard/XC	S2-114	p485;58;192	2850	8	30,31,53,56*	20,160	944
Alger St	T.L./Leonard	S2-115	p4,86;5,78	4950	8	1930,67 *	8,640	1,152
Grove St	T.L./Quality	S2-119	p3,90;1,77	4450	8	1939,73 *		
Quality St	Grove/S2-119	S2-119	p3,113	450	8	1951 *	ND	5,849
Quality St	S2-119/S2-118	S2-118	p3,113	300	8	1951 *	46,080	5,849
XC	Quality/S2-117	S2-117	p5,39	850	8	1957 *	8,640	6,709
XC	S2-117/Commercial	S2-116a	p5,39	550	8	1957 *		
Back Row	End/Leonard	S2-116a	np	350	8	unk *		
Grove St	End/Leonard	S2-116a	p1,75	850	8	1922 *	0	0
Commercial St	Marsh/Leonard	S2-116b	p1,57	700	6.815	1908,23 *	1,440	1,594
Bellevue Ave	End/Glen	S2-104	np	1850	8	unk *	1,440	514
Leonard St	Commercial/XC	S2-113b	p4,85	300	8	1930 *		
XC	Leonard/S2-113	S2-113b	p5,40;485	250	24	1957,80 *	ND	17,217
XC	Bellevue/S2-113	S2-113a	np	300	8	unk *	2,880	6,336
XC	S2-113/S2-112	S2-112	p5,40;485	150	24	1957,80 *	39,130	17,217
XC	S2-112/S2-111	S2-111	p5,40;485	100	24	1957,80 *	56,210	123,662
XC	S2-111/S2-110	S2-110	p5,40;485	250	24	1957,80 *	37,480	32,982
XC	S2-110/S2-109	S2-109	p5,40;485	100	24	1957,80 *	23,684	52,105
XC	S2-109/S2-108	S2-108	p5,40;485	300	24	1957,80 *	0	0
XC	S2-108/S2-107	S2-107	p5,40;485	150	24	1957,80 *	0	0
XC	S2-107/S2-106	S2-106	p5,40;485	100	24	1957,80 *	11,390	25,058
XC	S2-106/S2-105	S2-105	p5,40;485	100	24	1957,80 *	ND	0
XC	S2-105/S2-103	S2-103	p5,40;485	300	24	1957,80 *	0	0
XC	S2-103/S2-102	S2-102	p5,40;485	200	24	1957,80 *	22,560	24,816
Reeves St	XC/Glen	S2-101b	p4,84	400	15	1930 *	92,800	81,664
Pearl St	End/Railroad	S2-100	p4,31	600	8	1951 *		
Beech St	End/Railroad	S2-100	p1,91a	300	8	1931 *		
Railroad St	Pearl/Elm	S2-100	p1,91;4,31	700	8	1930,25 *		
Temple St	End/Elm	S2-100	p1,91a	900	8	1930 *		
Elm St	RR/Commer.	S2-100	p1,91a	650	8	1930 *		
Commercial St	Marsh/XC	S2-100	p1,74	1100	8	1922 *	11,520	1,789
XC	Commer/Reeves	S2-99b	p4,84	500	7.8	1930 *	38,160	51,663
Glen St	Bell./Reeves	S2-101a	np	250	15	unk *	0	0
Glen St	Reeves/Commer.	S2-99a	np	200	15	unk *	41,430	72,917
Plunkett Ln	End/Commer.	S2-98	np	300	8	unk *		
Commercial St	Glen/Gage K-6	S2-98	pT1,1	450	16.07	1911 *	0	0
TOTAL (GAGE 6):				38,400		*	463,644	7,045

TABLE V-11
ADAMS, MA - I/I INVESTIGATION
FLOW ISOLATION GAGING RESULTS FOR AREA 7

Street	From/to	Phase 2 Flow Isol. Reach	Drawer/ Plan	Pipe Length (ft)	Equiv. Pipe Dia. (in)	Year Const.	Peak Reach Infilt. (gpd)	Peak Infilt. Rate (gpd/in-mi)
E.Orchard Ter	End/Orchard	S2-85	p5,62	1500	8	1956 *		
Orchard St	End/Jenks	S2-85	p1,77;423	2600	8	22,35,50 *	1,440	232
Jenks St	Orchard/Crandall	S2-84a	p1,77	350	8	1922 *		
Glen St	End/Crandall	S2-84a	P2,61	150	6	1952 *		
Crandall St	Glen/S2-84	S2-84a	p1,85;2,61	1500	8	1924,16 *	0	0
Crandall Ter	End/S2-84	S2-84b	np	150	8	unk *	0	0
Morningside Av	Mid/East	S2-83	np	700	8	unk *		
East St	Mid/Orchard	S2-83	p4,83;1,82	1000	8	1930,23 *	8,640	3,354
Orchard St	Mid/Summer	S2-82	p4,23(b)	1050	8	1921,40 *		
Crandal St	Gage/Summer	S2-82	p2,61	300	8	1933 *		
Summer St	S2-84/S2-82	S2-82	p1,85	1000	8	1924 *	47,520	13,346
Morningside Av	East/XC	S2-81	np	450	8	unk *		
East St	End/Second	S2-81	p4,83b	1700	8	1972 *	2,880	884
Francis Av	End/Manners	S2-79	p4,26	600	4	1924 *		
Manners Av	End/Second	S2-79	p4,26	750	8	1924 *		
Second St	East/Randall	S2-79	p1,38	400	8	1915 *		
Second St	Manners/Randall	S2-79	p4,26	250	8	1924 *		
Randall St	Second/S2-79	S2-79	p5,45	450	8	1957 *	5,760	1,768
Randall St	S2-79/Summer	S2-78	p5,45	450	8	1957 *	0	0
Francis Av	Mid/North	S2-80a	p1,93	150	6	1931 *		
North St	End/S2-80	S2-80a	p1,93	250	8	1931 *	720	1,311
Second St	Mid/North	S2-80b	p1,93	250	8	1931 *	720	1,901
North St	S2-80/First	S2-77	p1,93	200	8	1931 *		
First St	North/Smith	S2-77	p1,93	500	8	1931 *		
Smith St	First/S1-32	S2-77	p1,93	250	8	1931 *		
Smith St	Gage/Summer	S2-77	p1,93	200	8	1931 *	0	0
Victory St	End/Summer	S2-75	p2,102	1150	8	1951 *	2,880	1,653
Richmond St	End/Summer	S2-76	p1,88	900	8	1931 *	2,880	2,112
Summer St	Cherry/Spring	S2-71	p1,85	150	8	1924 *		
Spring St	Summer,Dean/Gavin	S2-71	p4,43	450	8	1926 *		
Siara St	End/Summer	S2-71	np	450	8	unk *		
Summer St	S2-82/S2-78	S2-71	p1,85	250	8	1924 *		
Clifford La	End/Summer	S2-71	np	600	8	unk *		
Cherry St	End/Summer	S2-71	p5,49	500	8	1957 *		
Summer St	Siara/Cherry	S2-71	p77,2	750	8	1915 *		
Gavin Av	Spring/Bedell	S2-71	pT3,10	350	18	1924 *	28,650	4,802
River St	Gage K-5/Commercia	S2-90	p1,61	550	10	1920 *	11,520	11,059
Linden St	End/Edmund	S2-91	np	250	8	unk *		
Danieis Ct	End/Edmund	S2-91	p2,73	450	8	1938 *		
Edmund St	Linden/Commerc.	S2-91	np	750	8	unk *	11,520	5,244
Commercial St	Gage K-6/S2-89	S2-89	pT1,1	1200	18	1911 *	0	0
Liberty St	End/Center	S2-88	p4,90	400	6	1929 *		
Center St	End/Dean	S2-88	p4,38	650	8	1925 *	1,440	1,000
Commercial St	S2-89/Center	S2-87	pT1,1	200	18	1911 *		
Center St	Comm/Dean	S2-87	pT1,1	200	14.25	1911 *		
Myrtle St	Center/S2-87	S2-87	pT1,1	450	18	1911 *	41,270	14,976
Pleasant St	End/Spring	S2-70b	4,73	300	8	1928 *		
Spring St	Pleasant/XC	S2-70b	p4,43	500	8	1926 *		
Pleasant St	End/Spring	S2-70b	np	400	8	1957 *	5,760	3,168

TABLE V-11
ADAMS, MA - I/I INVESTIGATION
FLOW ISOLATION GAGING RESULTS FOR AREA 7
(Continued)

Street	From/to	Phase 2 Flow Isol. Reach	Drawer/ Plan	Pipe Length (ft)	Equiv. Pipe Dia. (in)	Year Const.	Peak Reach Infilt. (gpd)	Peak Infilt. Rate (gpd/in-mi)
XC	Spring/S2-69	S2-69	np	750	21	1957 *		
Bedell Ln	Gavin/XC	S2-69	np	400	18	1957 *	ND	0
Dean St	Center/S2-86	S2-86	pT1,1	500	18	1911 *	0	0
Dean St	S2-86/Spring	S2-70a	pT1,1	500	18	1911 *	ND	0
XC	S2-69/Depot	S2-68	np	450	21	1957 *	0	0
Depot St	XC/Gage K-7	S2-64	np	650	21	1957 *	238,470	92,243
TOTAL (GAGE 7):				32,250		*	412,070	6,872

TABLE V-12
ADAMS, MA - I/I INVESTIGATION
FLOW ISOLATION GAGING RESULTS FOR AREA 8

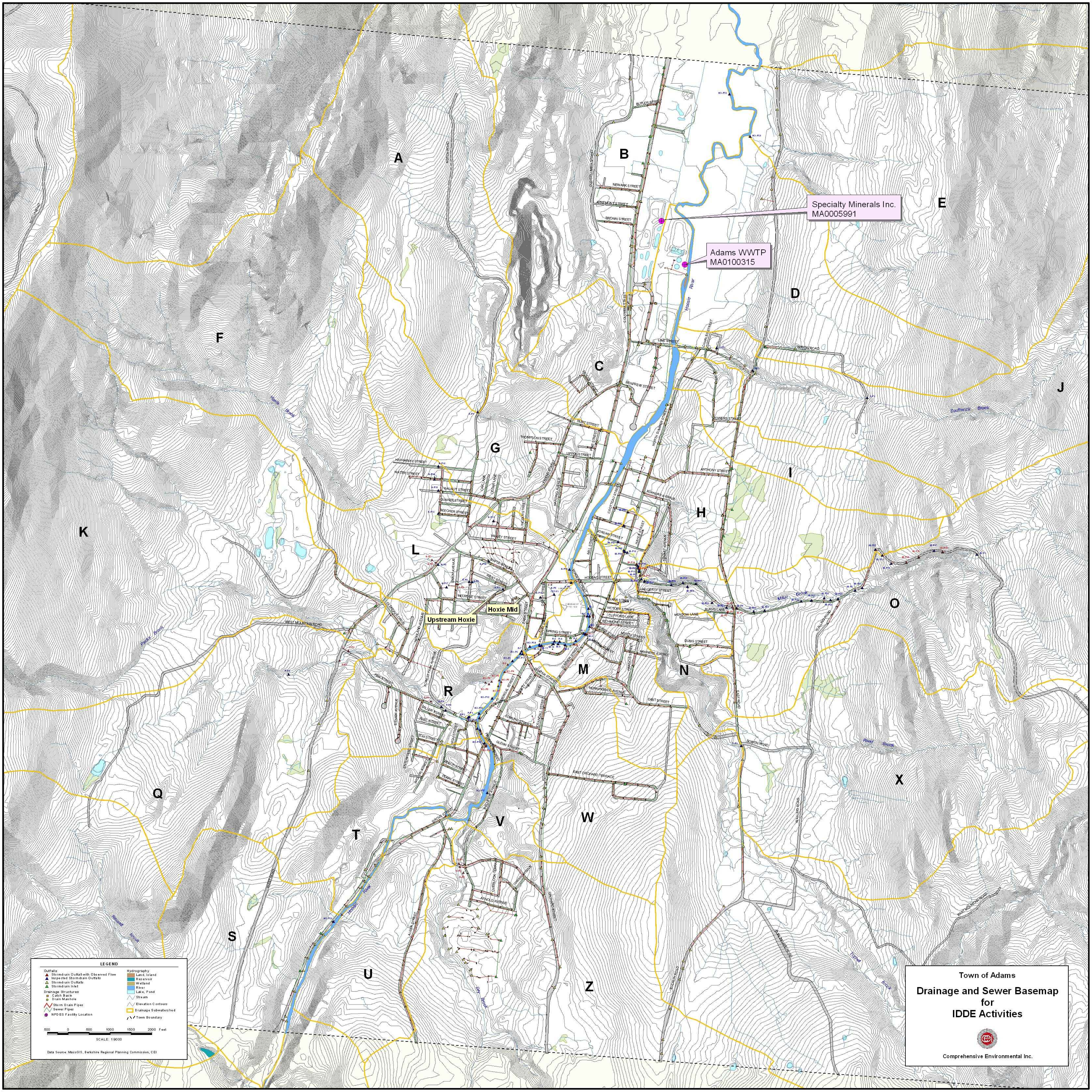
Street	From/to	Phase 2 Flow Isol. Reach	Drawer/ Plan	Pipe Length (ft)	Equiv. Pipe Dia. (in)	Year Const.	Peak Reach Infilt. (gpd)	Peak Infilt. Rate (gpd/in-mi)
East Rd	S.End/E.Hoosac	S2-123	p3,11;5,1	6350	8	52-61,73 *	15,840	1,646
East Rd	N.End/E.Hoosac	S2-120	p3,11;5,1	1000	8	52-61,73 *		
E. Hoosac St	East/N.Summer	S2-120	p4,81;3,72;	3150	8	30,34,39 *	114,070	18,141
E.Hoosac St	End/S2-125	S2-125	p2,101	1050	8	1948 *	2,160	1,358
E.Hoosac St	S2-125/East	S2-124	p2,101	1150	8	1948 *	7,920	4,545
Dubis St	End/Meadow	S2-121	p2,65;100	1250	7.27	1939,48 *		
Meadow Ln	End/Meadow	S2-121	np	350	8	unk *		
Haggerty St	End/Meadow	S2-121	p4,17	400	8	1922 *		
Meadow St	End/E.Hoosac	S2-121	p4,81;1,62;	2600	7.67	21,30,32,39*	4,320	651
Burns La	End/E.Hoosac	S2-122	np	700	8	unk *	2,880	2,715
N. Summer St	Murray/Kittler	S2-40b	p4,79	650	8	1930 *		
Baskin La	End/N.Summer	S2-40b	p3,72	600	8	1934 *		
E. Jordan St	End/N.Summer	S2-40b	np	300	8	unk *		
N. Summer St	E.Hoosac/Murray	S2-40b	p4,79	1200	8	1930 *	340	82
Summit Av	End/Richmond	S2-45	p5,74	900	6	1968 *	0	0
Richmond La	Summit/S2-44	S2-44	p4,18	550	6	1922 *	2,760	4,416
Richmond La	S2-44/S2-43	S2-43	np	400	6	unk *	990	2,178
Summit Av	Mid/John	S2-42	p5,74a	1000	8	1960 *		
John St	Summit/Richmond	S2-42	p3,114	650	8	1940 *	0	0
Richmond La	John/Kittler	S2-41	p1,5	650	6	1908 *	6,250	8,462
Kittler Av	Richmond/N.Summer	S2-40a	p1,5	450	8	1908 *	30,320	44,469
N. Summer St	Kittler/Turner	S2-39a	p4,79	175	14	1930 *	35,560	76,635
Turners Av	End/N.Summer	S2-39b	p2,63	600	8	1932 *	1,440	1,584
Weber St	End/Summer	S2-49b	np	350	8	unk *	5,760	10,862
Conrad St	End/Summer	S2-48	np	200	8	unk *		
Summer St	Weber/Hoosac	S2-48	pT1,2	400	8	1915 *		
Hoosac St	Summer/N.Hoosac	S2-48	p4,81	250	10	1930 *	8,640	6,249
Winter St	End/Weber	S2-49a	pT3,10	450	20	1924 *	2,880	1,690
Hoosac St	N.Hoosac/Mill	S2-47	p4,81	250	8	1930 *		
Winter St	Weber/Hoosac	S2-47	pT3,10	400	20	1924 *		
Hoosac St	Winter/Mill	S2-47	pT3,10	250	22	1924 *		
Allen St	End/Mill	S2-47	p3,115	500	8	unk *		
Jordan St	End/Mill	S2-47	np	450	10	unk *		
Mill St	Hoosac/Murray	S2-47	pT3,10	1400	15	1924 *	3,720	364
Murray St	Mill/Crotteau	S2-46	pT3,10	200	20	1924 *		
Murray St	End/Crotteau	S2-46	np	350	8	unk *		
Crotteau St	Murray/Staple	S2-46	pT3,10	350	18	1924 *	13,200	5,320
Staples St	End/Crotteau	S2-34	np	250	8	unk *		
W. Kittler Av	End/Crotteau	S2-34	np	300	8	unk *		
Cook St	Mid/Crotteau	S2-34	p1,79a	200	8	1940 *		
Crotteau St	Staple/S2-34	S2-34	pT3,10	1050	18	1924 *		
Sparrow St	End/Crotteau	S2-34	np	300	8	unk *	10,530	2,037
Potter St	End/Anthony	S2-38	p5,10	300	8	1952 *		
Anthony St	East/N.Summer	S2-38	p4,33	1900	8	24,38,56 *	7,200	2,160
XC	Donald/N.Summer	S2-37	p5,10	1000	8	1971 *	8,640	5,702
N. Summer St	Murray,End/XC	S2-33	p4,79	1125	8	1930 *		
XC	N.Summer/Crotteau	S2-33	np	500	8	unk *	0	0
Crotteau St	S2-34/S2-32	S2-32	p1,76	450	18	1922 *	122,600	79,917

TABLE V-13
ADAMS, MA - I/I INVESTIGATION
FLOW ISOLATION GAGING RESULTS FOR AREA 9

Street	From/to	Phase 2 Flow Isol. Reach	Drawer/ Plan	Pipe Length (ft)	Equiv. Pipe Dia. (in)	Year Const.	Peak Reach Infilt. (gpd)	Peak Infilt. Rate (gpd/in-mi)
Friend St	Gage K-3/Upton	S2-21	p1,96	600	8	unk *	26,900	29,590
Garfield St	End/Harding	S2-20	p5,11	300	8	1938 *		
McKinley St	End/Harding	S2-20	p3,110	300	8	1951 *		
Harding Av	End/Upton	S2-20	p1,78	1100	8	1922 *		
Kerr Av	End/Upton	S2-20	p4,27	550	6	1924 *		
Upton St	Harding/S2-20	S2-20	p1,78	700	8	1922 *	ND	311
Upton St	S2-20/Columbia	S2-19	p1,78	200	8	1922 *	1,420	311
Tracie Av	End/Thompson	S2-18	p5,5	200	8	1953 *		
Thompson St	End/Friend	S2-18	p5,5	900	8	1953 *		
Friend St	Thompson/Burt	S2-18	p5,48	500	8	unk *	8,100	3,341
St Martha St	End/Pine	S2-17	p1,99	350	8	1931 *		
Pine St	End/Burt	S2-17	p2,94	600	8	1940 *		
Burt St	Friend/Columbia	S2-17	p2,77	900	8	1939 *	ND	29,755
Hastings St	End/Hughes	S2-16a	np	250	8	unk *		
Hughes St	Hastings/Sayles	S2-16a	np	250	8	unk *		
Noonan St	End/Sayles	S2-16a	np	200	8	unk *		
Sayles St	NooNan/Friend	S2-16a	p2,45	550	8	1936 *	4,320	2,281
W. Burt St	End/Friend	S2-16b	p4,41	150	6	1955 *		
Friend St	W.Burt/Sayles+	S2-16b	p1,54;58	850	8	1913,26 *	2,880	1,975
Columbia St	Cook/Upton	S2-15a	p1,54	450	8	1914 *		
Columbia St	Upton/XC	S2-15a	p1,54	1550	10	1914 *		
Friend St	Sayles+/Columbia	S2-15a	p4,41	550	10	1914 *		
XC	Columbia/S1-10	S2-15a	p1,65	400	10	1921 *		
XC	S1-10/S1-11	S2-15a	p1,65	250	10	1921 *		
XC	S1-11/Lime	S2-15a	p1,65	200	10	1921 *	269,940	29,755
Columbia St	End/Lime	S2-15b	p1,65	400	8	1921 *	0	0
INT	Gage K-4/Siphon	S2-27	np	200	24	unk *		
INT	Siphon/S2-27	S2-27	np	300	27	1957 *	0	0
INT	S2-27/Siphon	S2-26a	np	350	27	1957 *	0	0
XC	Gage K-8/Siphon	S2-31	p1,76	250	21	1922 *	0	0
XC	Siphon/INT	S2-28	p1,76	100	20	1922 *	ND	0
Summer St	N. End/INT	S2-35a	p4,79	550	8	1930 *	1,440	1,728
Summer St	S. End/INT	S2-35b	p4,79	650	8	1930 *	1,440	1,462
XC	S2-35/S2-26	S2-26b	p4,79	300	8	1930 *	0	0
INT	Siphon/2S-25	S2-25	COE	950	27	1957 *	339,070	69,797
INT	2S-25/2S-24	S2-24	COE	200	27	1957 *	0	0
INT	2S-24/Lime	S2-23	COE	300	27	1957 *	ND	0
Lime St	Gage K-2/INT	S2-14	p4,78	500	8	1930 *		
INT	Lime/1S-15	S2-14	p1,65	200	24	1921 *		
Lime St	Columbia/INT	S2-14	p1,65	950	10.47	1921 *		
INT	1S-15/1S-14	S2-14	p1,65	200	24	1921 *		
INT	1S-14/1S-13	S2-14	p1,65	600	24	1921 *		
XC	A.P.W/Lime	S2-14	CDM	400	21	1962 *		
XC	Lime/1S-13	S2-14	CDM	1000	24	1962 *	0	0
INT	1S-13/WWTP		CDM	800	30	1962 *		
James River	JRC/WWTP		np	250	21	unk *	ND	ND
TOTAL (GAGE 9):				22,300		*	655,510	11,900

NORTH ADAMS
CHESHIRE
ZYLONITE
RENFREW
MAPLE GROVE
ARNOLDSVILLE
K-1
K-2
K-3
K-4
K-5
K-6
K-7
K-8
K-9
WWTP
SCALE IN FEET
600 0 300 600 1200
LEGEND
EXISTING FORCE MAIN
EXISTING SEWERS AND MANHOLES
CONTINUOUS GAGING TRIBUTARY BOUNDARY
K-2 GAGING AREA DESIGNATION
GAGING LOCATIONS
K-6 CONTINUOUS GAGING LOCATION
S1-50 PHASE I SPOT GAGING LOCATION
V-5 VISUAL INSPECTION LOCATION
S2-96 PHASE 2 SPOT GAGING LOCATION
SEWER SECTIONS RECOMMENDED FOR TV INSPECTION BUT NOT COMPLETED
SEWER SECTIONS TV INSPECTED
PS. EXISTING PUMPING STATION
GWG GROUNDWATER GAGING LOCATION
NOTE: ALL PIPE SIZES ARE 8-INCH UNLESS OTHERWISE NOTED
TOWN OF ADAMS, MASSACHUSETTS
INFILTRATION / INFLOW STUDY
MAP OF
EXISTING SEWERAGE SYSTEM
SHOWING
GAGING LOCATIONS, TRIBUTARY AREAS
AND TV INSPECTION RECOMMENDATIONS
CAMP DRESSER & McKEE INC
ENVIRONMENTAL ENGINEERS
BOSTON, MASSACHUSETTS
FEBRUARY 1987

FIGURE IV-1


Specialty Minerals Inc.
MA0005991
Adams WWTP
MA0100315
Upstream Hoxie
Hoxie Mid
A
B
C
D
E
F
G
H
I
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L
M
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S
T
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X
Z
LEGEND
Outfalls
Stormdrain Outfall with Observed Flow
Inspected Stormdrain Outfalls
Stormdrain Outfalls
Stormdrain Inlet
Drainage Structures
Catch Basin
Drain Manhole
Storm Drain Pipes
Sewer Pipes
NPDES Facility Location
Hydrography
Land, Island
Reservoir
Wetland
River
Lake, Pond
Stream
Elevation Contours
Drainage Subwatershed
Town Boundary
500 0 500 1000 1500 2000 Feet
SCALE: 1:9000
Data Source: MassGIS, Berkshire Regional Planning Commission, CEI
Town of Adams
Drainage and Sewer Basemap
for
IDDE Activities
Comprehensive Environmental Inc.


Hoxie beneath bank 2.JPG


Hoxie underground undermining.JPG


Hoxie underground suspect pipe.JPG


Hoxie underground stone arch.JPG


Hoxie underground suspect pipe 2.JPG


Hoxie beneath auto shop.JPG


Hoxie unknown pipe from auto shop.JPG


Hoxie damage beneath auto shop.JPG


Hoxie auto shop foundation.JPG


Hoxie auto shop floor drain.JPG


Hoxie instability beneath auto shop.JPG


Hoxie inside auto floor drain.JPG


Leachate at beginning of chutes - off Grove St.JPG


Equipment at beginning of chutes - off Grove St.JPG


Aladco pipes along building.JPG


Aladco suspect discharge location.JPG


Aladco suspect discharge location 2.JPG


Aladco suspect discharge location 3.JPG


H-P5.JPG


H-P5 (2).JPG


H-P6.JPG


H-P7.JPG


H-P4.JPG


View of Flood Chutes at Tophet & Miller Brook to H…


M-1.JPG


M-1 upstream.JPG


M-2.JPG


M-3.JPG


M-4.JPG


R-1.JPG


M-5.JPG


R-2.JPG


M-6.JPG


M-7.JPG


R-3.JPG


M-8.JPG


R-4.JPG


M-9.JPG


View of Flood Chutes.JPG


R-5.JPG


M-10.JPG


HO-P24.JPG


M-11.JPG


M-12.JPG


R-6.JPG


R-7.JPG


HO-P1.JPG


HO-P2.JPG


View of weep holes.JPG


HO-P3.JPG


R-8.JPG


R-8 (2).JPG


HO-P4.JPG


HO-P4, inside pipe.JPG


HO-P5.JPG


Weep hole adjacent to HO-P5.JPG


HO-P7.JPG


HO-P6.JPG

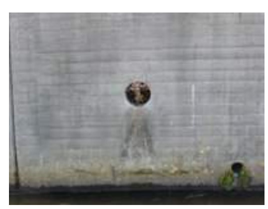

HO-P12.JPG


HO-P12 close-up.JPG


HO-P13 close-up.JPG


HO-P13.JPG


HO-P14.JPG


W-1.JPG

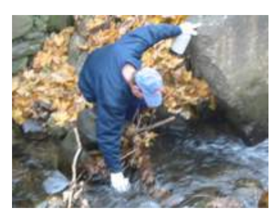

R-9.JPG


W-2 close-up.JPG


W-2.JPG


HO-P16.JPG


Upstream Hoxie.JPG


Upstream Hoxie 2.JPG

Hoxie beneath bank.JPG

Adams Stormwater Outfall Inspection Checklist

Outfall ID# M-1 **Location Aid** Myrtle St.

Date: 11/18/04 Time: 8:35 AM Weather Today: cloudy 40°F

Surveyor/Observer: Sarah Voisin Weather over past 72 hours: cloudy, 40's°F

Flow Observed (circle): YES NO

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	**Pipe Flow Depth (inches) Note: measure from pipe invert**	**Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance**	**Flow Appearance / Color**	**Flow Odor**	**~~Turbidity~~ TDS (PPM)**	**Temperature**	**pH**	**Conductivity**	**Comments and Notes**
	1" Depth	Depth	✓ Clear _ Cloudy/Milky _ Dark (Tea) _ Sheen _ Other *	✓ None _ Chemical _ Petroleum _ Sewage _ Other *	470	10.7°C	8.48	943	
2. Structure Details (pipe or other conveyance info.)	**Pipe Material**	**Pipe Condition**	**Channel, Ditch or Swale Condition**	**Diameter or Width (specify distance units)**	**Slope (degrees)**	**Outlet Structure**	**GPS Coordinates**	**Discharge directly to surface water?****	**Comments and Notes**
	_ Clay ✓ Concrete _ Corrugated Steel _ PVC _ Cast Iron	✓ Good _ Cracked _ Exposed Steel _ Corroded _ Other*	_ Good _ Clogged _ Debris _ Scoured or Eroded _ Other*	5'		_ Headwall _ Riprap _ No Outlet Protection _ Other*	______ Lat. ______ Lon.	_ Yes _ No If Yes, Provide Receiving Water Name	
3. Outfall Observations (general conditions at outfall)	**Deposits**	**Surrounding Vegetation**	**Erodibility**	**Land Use at Outfall**	**Land Use Upstream of Outfall**	**Appearance / Color**	**Odor**	**Sediment Depth (inches) (if present)**	**Comments and Notes**
	✓ None _ Grease/Oil _ Paper/Trash _ Foam _ Other *	✓ Little or No Distress _ Moderate Distress _ High Distress	_ Little or No Erosion _ Small Areas of Erosion _ Many Eroded Areas	_ Forest _ Agriculture ✓ Residential _ Commercial _ Industrial	_ Forest _ Agriculture ✓ Residential _ Commercial _ Industrial	_ Clear _ Cloudy/Milky _ Dark (Tea) _ Sheen _ Other *	_ None _ Chemical _ Petroleum _ Sewage _ Other *		Algae growth
4. Laboratory Analysis (check if submitted)	**Surfactant**	**Ammonia Concentration**	**E. coli**	**Oil & Grease (if oil or sheen is observed)**	**VOCs (if solvent odor is present)**	**Additional Field Comments and Notes**			
			✓			Photos 1+2			

Notes:

* Provide additional comments to describe the observations made for the category.

** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# M-2 **Location Aid** Spring St.

Date: 11/18/04 Time: 8:45AM Weather Today: cloudy 40°F
Surveyor/Observer: Sarah Voisin Weather over past 72 hours: cloudy 40's

Flow Observed (circle): YES NO

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	~~Turbidity~~ TDS (ppm)	Temperature	pH	Conductivity	Comments and Notes
	trickle Depth	Depth	✓ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	✓ None __ Chemical __ Petroleum __ Sewage __ Other *	~~7.16~~ 716	8.3°C	8.75	1434	pigeon droppings in flow
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	✓ Good __ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	36"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	______ Lat. ______ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	✓ None __ Grease/Oil __ Paper/Trash __ Foam __ Other *	✓ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture ✓ Residential __ Commercial __ Industrial	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		Algae growing down the wall
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			
			✓			Photo #3			

Notes:
* Provide additional comments to describe the observations made for the category.
** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# M-3 **Location Aid** Spring St.

Date: 11/18/04 Time: 8:50AM Weather Today: cloudy 40°F

Surveyor/Observer: Sarah Voisin Weather over past 72 hours: cloudy 40's

Flow Observed (circle): YES NO (NO circled)

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	Turbidity	Temperature	pH	Conductivity	Comments and Notes
	Depth ___ no flow	Depth ___	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *					staining
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	✓ Good __ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	18"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	______ Lat. ______ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	✓ None __ Grease/Oil __ Paper/Trash __ Foam __ Other *	✓ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture ✓ Residential __ Commercial __ Industrial	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			
						Photo #4			

Notes:

* Provide additional comments to describe the observations made for the category.

** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# m-4 **Location Aid** Spring St.

Date: 11/18/04 Time: 8:50AM Weather Today: cloudy, 40°F

Surveyor/Observer: Sarah Voisin Weather over past 72 hours: cloudy 40's

Flow Observed (circle): YES NO

1. Flow Observations (fill out this section only if flow is observed)	**Pipe Flow Depth (inches)** Note: measure from pipe invert	**Channel, Ditch or Swale Flow Depth (inches)** Note: measure from center of conveyance	**Flow Appearance / Color**	**Flow Odor**	**Field Monitoring Data (note: fill in units for each parameter)** **Turbidity**	**Temperature**	**pH**	**Conductivity**	**Comments and Notes**
	Depth ___ no flow	Depth ___	_ Clear _ Cloudy/Milky _ Dark (Tea) _ Sheen _ Other *	_ None _ Chemical _ Petroleum _ Sewage _ Other *					no flow, staining
2. Structure Details (pipe or other conveyance info.)	**Pipe Material**	**Pipe Condition**	**Channel, Ditch or Swale Condition**	**Diameter or Width (specify distance units)**	**Slope (degrees)**	**Outlet Structure**	**GPS Coordinates**	**Discharge directly to surface water?****	**Comments and Notes**
	_ Clay ✓ Concrete _ Corrugated Steel _ PVC _ Cast Iron	✓ Good _ Cracked _ Exposed Steel _ Corroded _ Other*	_ Good _ Clogged _ Debris _ Scoured or Eroded _ Other*	18"		_ Headwall _ Riprap _ No Outlet Protection _ Other*	___ Lat. ___ Lon.	_ Yes _ No If Yes, Provide Receiving Water Name	
3. Outfall Observations (general conditions at outfall)	**Deposits**	**Surrounding Vegetation**	**Erodibility**	**Land Use at Outfall**	**Land Use Upstream of Outfall**	**Appearance / Color**	**Odor**	**Sediment Depth (inches) (if present)**	**Comments and Notes**
	✓ None _ Grease/Oil _ Paper/Trash _ Foam _ Other *	✓ Little or No Distress _ Moderate Distress _ High Distress	_ Little or No Erosion _ Small Areas of Erosion _ Many Eroded Areas	_ Forest _ Agriculture _ Residential ✓ Commercial _ Industrial	_ Forest _ Agriculture ✓ Residential _ Commercial _ Industrial	_ Clear _ Cloudy/Milky _ Dark (Tea) _ Sheen _ Other *	_ None _ Chemical _ Petroleum _ Sewage _ Other *		
4. Laboratory Analysis (check if submitted)	**Surfactant**	**Ammonia Concentration**	**E. coli**	**Oil & Grease (if oil or sheen is observed)**	**VOCs (if solvent odor is present)**	**Additional Field Comments and Notes**			
						photo #5			

Notes:

* Provide additional comments to describe the observations made for the category.

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Adams Stormwater Outfall Inspection Checklist

Outfall ID# R-1 **Location Aid** End Spring St

Date: 11/18/04 Time: 8:52 Weather Today: Cloudy
Surveyor/Observer: Weather over past 72 hours: Dry, no rain

Flow Observed (circle): YES NO (NO circled)

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	Turbidity	Temperature	pH	Conductivity	Comments and Notes
	____ Depth	____ Depth	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *					
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	✓ Good __ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	18"		✓ Headwall __ Riprap __ No Outlet Protection __ Other*	____ Lat. ____ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	Pipe is in Concrete Chute
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	X None __ Grease/Oil __ Paper/Trash __ Foam __ Other *	__ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture ✓ Residential __ Commercial __ Industrial	__ Forest __ Agriculture __ Residential __ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			
						Pigeons in pipe Picture #6			

Notes:
* Provide additional comments to describe the observations made for the category.
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Adams Stormwater Outfall Inspection Checklist

Outfall ID# m-5 **Location Aid** down from Spring St

Date: 11/18/04 Time: 9:00 AM	Weather Today: cloudy 40°F
Surveyor/Observer: Sarah Voisin	Weather over past 72 hours: cloudy 40's

Flow Observed (circle): YES NO (NO circled)

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	Turbidity	Temperature	pH	Conductivity	Comments and Notes
	____ Depth no flow	____ Depth	_ Clear _ Cloudy/Milky _ Dark (Tea) _ Sheen _ Other *	_ None _ Chemical _ Petroleum _ Sewage _ Other *					Animal trap in pipe
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	_ Clay ✓ Concrete _ Corrugated Steel _ PVC _ Cast Iron	✓ Good ✓ Cracked _ Exposed Steel _ Corroded _ Other*	_ Good _ Clogged _ Debris _ Scoured or Eroded _ Other*	24"		_ Headwall _ Riprap _ No Outlet Protection _ Other*	______ Lat. ______ Lon.	_ Yes _ No If Yes, Provide Receiving Water Name	Pipe cracked & pulling away from cement wall
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	✓ None _ Grease/Oil _ Paper/Trash _ Foam _ Other *	✓ Little or No Distress _ Moderate Distress _ High Distress	_ Little or No Erosion _ Small Areas of Erosion _ Many Eroded Areas	_ Forest _ Agriculture ✓ Residential ✓ Commercial _ Industrial	_ Forest _ Agriculture ✓ Residential ✓ Commercial _ Industrial	_ Clear _ Cloudy/Milky _ Dark (Tea) _ Sheen _ Other *	_ None _ Chemical _ Petroleum _ Sewage _ Other *		
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			
						Picture #7			

Notes:

* Provide additional comments to describe the observations made for the category.

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Adams Stormwater Outfall Inspection Checklist

Outfall ID# R-2 **Location Aid** near Mechanic Co. near Spring St.

Date: 11/18/09 Time: 9:10 AM Weather Today: cloudy 40°F

Surveyor/Observer: Sarah Voisin Weather over past 72 hours: cloudy 40's°F

Flow Observed (circle): YES **NO**

	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	Field Monitoring Data (note: fill in units for each parameter): Turbidity	Temperature	pH	Conductivity	Comments and Notes
1. Flow Observations (fill out this section only if flow is observed)	Depth ____ no flow	Depth ____	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *					no flow minimal staining

	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
2. Structure Details (pipe or other conveyance info.)	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	✓ Good __ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	12"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	____ Lat. ____ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	

	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
3. Outfall Observations (general conditions at outfall)	✓ None __ Grease/Oil __ Paper/Trash __ Foam __ Other *	✓ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture ✓ Residential __ Commercial __ Industrial	__ Forest __ Agriculture ✓ Residential __ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		

	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes
4. Laboratory Analysis (check if submitted)						Picture #8

Notes:

* Provide additional comments to describe the observations made for the category.

** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# M-6 **Location Aid** Winter Street

Date: 11/19/04 Time: 9:10
Surveyor/Observer: Ruth Miles
Weather Today: Cloudy
Weather over past 72 hours: No Rain

Flow Observed (circle): YES **NO**

	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	Field Monitoring Data (note: fill in units for each parameter): Turbidity	Temperature	pH	Conductivity	Comments and Notes
1. Flow Observations (fill out this section only if flow is observed)	___ Depth	___ Depth	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *					

	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
2. Structure Details (pipe or other conveyance info.)	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	✓ Good __ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	12"		✓ Headwall __ Riprap __ No Outlet Protection __ Other*	______ Lat. ______ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	

	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
3. Outfall Observations (general conditions at outfall)	✓ None __ Grease/Oil __ Paper/Trash __ Foam __ Other *	__ Little or No Distress __ Moderate Distress __ High Distress	✓ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture __ Residential __ Commercial __ Industrial	__ Forest __ Agriculture __ Residential __ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		appears to be branches, feces, debris in pipe

	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes
4. Laboratory Analysis (check if submitted)						Flood Chute Discharge Picture #9

Notes:
* Provide additional comments to describe the observations made for the category.
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Adams Stormwater Outfall Inspection Checklist

Outfall ID# M-7 **Location Aid** bridge by Mechanic Co./near spring St.

Date: 11/18/04 Time: 9:15Am Weather Today: cloudy 40° F

Surveyor/Observer: Sarah Voisin Weather over past 72 hours: cloudy 40's F

Flow Observed (circle): YES NO

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	Turbidity	Temperature	pH	Conductivity	Comments and Notes
	___ Depth	___ Depth	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *					no flow
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	✓ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	__ Good ✓ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	12"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	______ Lat. ______ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	pipe is damaged; staining
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	✓ None __ Grease/Oil __ Paper/Trash __ Foam __ Other *	✓ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture ✓ Residential __ Commercial __ Industrial	__ Forest __ Agriculture ✓ Residential __ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			
						Picture #10			

Notes:

* Provide additional comments to describe the observations made for the category.

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Adams Stormwater Outfall Inspection Checklist

Outfall ID# R-3 **Location Aid** Myr He St.

Date: 11/18/04 Time: 9:30 am Weather Today: cloudy 40°F
Surveyor/Observer: Sarah Visn Weather over past 72 hours: cloudy 40's °F

Flow Observed (circle): YES NO

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	Turbidity	Temperature	pH	Conductivity	Comments and Notes
	____ Depth	____ Depth	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *					no flow
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	✓ Good __ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	~~15"~~ 12"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	____ Lat. ____ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	staining below pipe
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	✓ None __ Grease/Oil __ Paper/Trash __ Foam __ Other *	✓ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture ✓ Residential ✓ Commercial __ Industrial	__ Forest __ Agriculture ✓ Residential ✓ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			
						Picture #11			

Notes:
* Provide additional comments to describe the observations made for the category.
** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

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Adams Stormwater Outfall Inspection Checklist

Outfall ID# M-8 **Location Aid** Myrtle St.

Date: 11/15/04 Time: 9:28 Weather Today: Cloudy
Surveyor/Observer: Rich Niles Weather over past 72 hours: No Rain

Flow Observed (circle): YES NO (NO circled)

1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	Turbidity	Temperature	pH	Conductivity	Comments and Notes
					Field Monitoring Data (note: fill in units for each parameter)				
	___ Depth	___ Depth	_ Clear _ Cloudy/Milky _ Dark (Tea) _ Sheen _ Other *	_ None _ Chemical _ Petroleum _ Sewage _ Other *					

2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	_ ~~Clay~~ ✓ Concrete _ Corrugated Steel _ PVC _ Cast Iron	_ Good _ Cracked _ Exposed Steel ✓ Corroded _ Other*	_ Good _ Clogged _ Debris _ Scoured or Eroded _ Other*	24"		_ Headwall _ Riprap _ No Outlet Protection _ Other*	______ Lat. ______ Lon.	_ Yes _ No If Yes, Provide Receiving Water Name	

3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	_ None _ Grease/Oil _ Paper/Trash _ Foam _ Other *	_ Little or No Distress _ Moderate Distress _ High Distress	_ Little or No Erosion _ Small Areas of Erosion _ Many Eroded Areas	_ Forest _ Agriculture ✓ Residential _ Commercial _ Industrial	_ Forest _ Agriculture ✓ Residential _ Commercial _ Industrial	_ Clear _ Cloudy/Milky _ Dark (Tea) _ Sheen _ Other *	_ None _ Chemical _ Petroleum _ Sewage _ Other *		Debris Last section of pipe separating water flowing below pipe

4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes
						Picture # 12 Pigeons in Pipe

Notes:
* Provide additional comments to describe the observations made for the category.
** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# R-4 **Location Aid** Mrytle St.

Date: 11/18/04 Time: 9:35 AM	Weather Today: cloudy
Surveyor/Observer: Sarah Voisin	Weather over past 72 hours: no rain

Flow Observed (circle): YES **NO**

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	**Pipe Flow Depth (inches) Note: measure from pipe invert**	**Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance**	**Flow Appearance / Color**	**Flow Odor**	**Turbidity**	**Temperature**	**pH**	**Conductivity**	**Comments and Notes**
	Depth ____	Depth ____	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *					no flow

2. Structure Details (pipe or other conveyance info.)	**Pipe Material**	**Pipe Condition**	**Channel, Ditch or Swale Condition**	**Diameter or Width (specify distance units)**	**Slope (degrees)**	**Outlet Structure**	**GPS Coordinates**	**Discharge directly to surface water?****	**Comments and Notes**
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	✓ Good __ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	12"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	____ Lat. ____ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	

3. Outfall Observations (general conditions at outfall)	**Deposits**	**Surrounding Vegetation**	**Erodibility**	**Land Use at Outfall**	**Land Use Upstream of Outfall**	**Appearance / Color**	**Odor**	**Sediment Depth (inches) (if present)**	**Comments and Notes**
	✓ None __ Grease/Oil __ Paper/Trash __ Foam __ Other *	__ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Forest __ Agriculture ✓ Residential ✓ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		

						Additional Field Comments and Notes
4. Laboratory Analysis (check if submitted)	**Surfactant**	**Ammonia Concentration**	**E. coli**	**Oil & Grease (if oil or sheen is observed)**	**VOCs (if solvent odor is present)**	
						Picture # 13 Catch Basins

Notes:

* Provide additional comments to describe the observations made for the category.

** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# M-9 **Location Aid** Myrtle St

Date: 11/13/06 Time: 9:40 AM
Surveyor/Observer: Sarah V[illegible]

Weather Today: cloudy
Weather over past 72 hours: no rain

Flow Observed (circle): YES **NO** ✓

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	**Pipe Flow Depth (inches) Note: measure from pipe invert**	**Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance**	**Flow Appearance / Color**	**Flow Odor**	**Turbidity**	**Temperature**	**pH**	**Conductivity**	**Comments and Notes**
	___ Depth	___ Depth	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *					
2. Structure Details (pipe or other conveyance info.)	**Pipe Material**	**Pipe Condition**	**Channel, Ditch or Swale Condition**	**Diameter or Width (specify distance units)**	**Slope (degrees)**	**Outlet Structure**	**GPS Coordinates**	**Discharge directly to surface water?****	**Comments and Notes**
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	✓ Good __ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	15"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	______ Lat. ______ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	
3. Outfall Observations (general conditions at outfall)	**Deposits**	**Surrounding Vegetation**	**Erodibility**	**Land Use at Outfall**	**Land Use Upstream of Outfall**	**Appearance / Color**	**Odor**	**Sediment Depth (inches) (if present)**	**Comments and Notes**
	✓ None __ Grease/Oil __ Paper/Trash __ Foam __ Other *	__ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture ✓ Residential __ Commercial __ Industrial	__ Forest __ Agriculture ✓ Residential __ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		
4. Laboratory Analysis (check if submitted)	**Surfactant**	**Ammonia Concentration**	**E. coli**	**Oil & Grease (if oil or sheen is observed)**	**VOCs (if solvent odor is present)**	**Additional Field Comments and Notes**			
						Picture #14 Catch Basin			

Notes:
* Provide additional comments to describe the observations made for the category.
** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# R-5 **Location Aid** Spring St.

Date: 11/18/04 Time: 9:40AM Weather Today: cloudy
Surveyor/Observer: Sarah Voisin Weather over past 72 hours: no rain

Flow Observed (circle): YES NO

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	Turbidity	Temperature	pH	Conductivity	Comments and Notes
	Depth ____	Depth ____	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *					
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	✓ Good __ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	12"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	____ Lat. ____ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	✓ None __ Grease/Oil __ Paper/Trash __ Foam __ Other *	__ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			
						Picture #16 -other pipes coming into area behind pipe opening			

Notes:

* Provide additional comments to describe the observations made for the category.

** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# M-10 **Location Aid** Pleasant St.

Date: 11/18/04 Time: 9:40AM Weather Today: cloudy
Surveyor/Observer: Sarah Voisin Weather over past 72 hours: no rain

Flow Observed (circle): YES NO

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	**Pipe Flow Depth (inches) Note: measure from pipe invert**	**Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance**	**Flow Appearance / Color**	**Flow Odor**	**Turbidity**	**Temperature**	**pH**	**Conductivity**	**Comments and Notes**
	Depth ___	Depth ___	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *					
2. Structure Details (pipe or other conveyance info.)	**Pipe Material**	**Pipe Condition**	**Channel, Ditch or Swale Condition**	**Diameter or Width (specify distance units)**	**Slope (degrees)**	**Outlet Structure**	**GPS Coordinates**	**Discharge directly to surface water?****	**Comments and Notes**
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	✓ Good __ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	12"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	___ Lat. ___ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	
3. Outfall Observations (general conditions at outfall)	**Deposits**	**Surrounding Vegetation**	**Erodibility**	**Land Use at Outfall**	**Land Use Upstream of Outfall**	**Appearance / Color**	**Odor**	**Sediment Depth (inches) (if present)**	**Comments and Notes**
	✓ None __ Grease/Oil __ Paper/Trash __ Foam __ Other *	__ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture ✓ Residential ✓ Commercial __ Industrial	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		
4. Laboratory Analysis (check if submitted)	**Surfactant**	**Ammonia Concentration**	**E. coli**	**Oil & Grease (if oil or sheen is observed)**	**VOCs (if solvent odor is present)**	**Additional Field Comments and Notes**			
						Picture #17			

Notes:
* Provide additional comments to describe the observations made for the category.
** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

HO - P24

Adams Stormwater Outfall Inspection Checklist

Outfall ID# RI-UB **Location Aid** Pleasant St

Date: 11/18/04 Time: 9:43 AM Weather Today: cloudy

Surveyor/Observer: Sarah Voisin Weather over past 72 hours: no rain

Flow Observed (circle): YES (NO)

1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	Field Monitoring Data (note: fill in units for each parameter): Turbidity	Temperature	pH	Conductivity	Comments and Notes
	Depth ___	Depth ___	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *					

2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	✓ Good __ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	18"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	___ Lat. ___ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	

3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	__ None __ Grease/Oil __ Paper/Trash __ Foam ✓ Other *	✓ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		large amount of pigeon debris

4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes
						Picture # 18

Notes:

* Provide additional comments to describe the observations made for the category.

** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# M-1 **Location Aid** Pleasant St

Date: 11/18/04 Time: 9:45AM	Weather Today: cloudy
Surveyor/Observer: Sarah Voisin	Weather over past 72 hours: no rain

Flow Observed (circle): YES NO (NO circled)

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	Turbidity	Temperature	pH	Conductivity	Comments and Notes
	____ Depth	____ Depth	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *					no flow
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	__ Good __ Cracked __ Exposed Steel ✓ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	18"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	______ Lat. ______ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	Pipe has been patched, corroding at bottom
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	✓ None __ Grease/Oil __ Paper/Trash __ Foam __ Other *	✓ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			
						Photo #19			

Notes:

* Provide additional comments to describe the observations made for the category.

** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# R-6 **Location Aid** b/t Pleasant & Park St

Date: 11/18/04 Time: 9:48 AM Weather Today: cloudy
Surveyor/Observer: Sarah Voisin Weather over past 72 hours: ____

Flow Observed (circle): YES **NO**

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	Turbidity	Temperature	pH	Conductivity	Comments and Notes
	____ Depth	____ Depth	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *					no flow
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	✓ Good __ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	36"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	____ Lat. ____ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	__ None __ Grease/Oil __ Paper/Trash __ Foam __ Other *	__ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Forest __ Agriculture ✓ Residential ✓ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			
						- wood over where grate used to be - photo # 21			

Notes:
* Provide additional comments to describe the observations made for the category.
** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# R-7 **Location Aid** Park St.

Date: 11/18/04 Time: 9:50AM Weather Today: cloudy
Surveyor/Observer: Sarah Voisin Weather over past 72 hours: no rain

Flow Observed (circle): YES **NO** (circled)

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	Turbidity	Temperature	pH	Conductivity	Comments and Notes
	___ Depth	___ Depth	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *					
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	✓ Clay __ Concrete __ Corrugated Steel __ PVC __ Cast Iron	__ Good __ Cracked __ Exposed Steel ✓ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	15"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	___ Lat. ___ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	staining below pipe - corroded below pipe
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	✓ None __ Grease/Oil __ Paper/Trash __ Foam __ Other *	__ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			
						photo #22			

Notes:
* Provide additional comments to describe the observations made for the category.
** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# M-12 **Location Aid** Pleasant St.

Date: 11/18/04 Time: 9:45AM Weather Today: cloudy
Surveyor/Observer: Sarah Voisin Weather over past 72 hours: no rain

Flow Observed (circle): YES **NO**

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	Turbidity	Temperature	pH	Conductivity	Comments and Notes
	___ Depth	___ Depth	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *					
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	✓ Good __ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	12"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	______ Lat. ______ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	staining below pipe
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	✓ None __ Grease/Oil __ Paper/Trash __ Foam __ Other *	__ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			
						Photo # 20			

Notes:

* Provide additional comments to describe the observations made for the category.

** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# HO-P1 [illegible] **Location Aid** Park St. / Post office

Date: 11/18/04 Time: 9:55AM Weather Today: cloudy
Surveyor/Observer: Sarah Voisin Weather over past 72 hours: no rain

Flow Observed (circle): YES NO (NO circled)

1. Flow Observations (fill out this section only if flow is observed)	**Pipe Flow Depth (inches) Note: measure from pipe invert**	**Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance**	**Flow Appearance / Color**	**Flow Odor**	**Field Monitoring Data (note: fill in units for each parameter)** Turbidity	Temperature	pH	Conductivity	**Comments and Notes**
	___ Depth	___ Depth	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *					
2. Structure Details (pipe or other conveyance info.)	**Pipe Material**	**Pipe Condition**	**Channel, Ditch or Swale Condition**	**Diameter or Width (specify distance units)**	**Slope (degrees)**	**Outlet Structure**	**GPS Coordinates**	**Discharge directly to surface water?****	**Comments and Notes**
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	✓ Good __ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	48"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	______ Lat. ______ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	
3. Outfall Observations (general conditions at outfall)	**Deposits**	**Surrounding Vegetation**	**Erodibility**	**Land Use at Outfall**	**Land Use Upstream of Outfall**	**Appearance / Color**	**Odor**	**Sediment Depth (inches) (if present)**	**Comments and Notes**
	__ None __ Grease/Oil __ Paper/Trash __ Foam ✓ Other *	__ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		leaves [illegible]
4. Laboratory Analysis (check if submitted)	**Surfactant**	**Ammonia Concentration**	**E. coli**	**Oil & Grease (if oil or sheen is observed)**	**VOCs (if solvent odor is present)**	**Additional Field Comments and Notes**			
						photo # 23			

Notes:
* Provide additional comments to describe the observations made for the category.
** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# Ho - P2 **Location Aid** Park St.

Date: 11/18/04 Time: 9:57AM Weather Today: cloudy
Surveyor/Observer: Sarah Voisin Weather over past 72 hours: no rain

Flow Observed (circle): YES NO (NO circled)

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	Turbidity	Temperature	pH	Conductivity	Comments and Notes
	Depth ____	Depth ____	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *					
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	✓ Good __ Cracked __ Exposed Steel ✓ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	48"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	____ Lat. ____ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	Culvert collapsing
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	__ None __ Grease/Oil __ Paper/Trash __ Foam ✓ Other *	__ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion ✓ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		Sediment, growth & debris collected at bottom
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			
						Photo # 24			

Notes:
* Provide additional comments to describe the observations made for the category.
** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# Ho - P3 **Location Aid** Commercial St/ Rail Trail

Date: 11/18/04 Time: 10AM Weather Today: cloudy

Surveyor/Observer: Sarah Voisin Weather over past 72 hours: no rain

Flow Observed (circle): YES NO

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	Turbidity	Temperature	pH	Conductivity	Comments and Notes
	____ Depth	____ Depth	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *					
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	✓ Good __ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	15"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	____ Lat. ____ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	staining
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	__ None __ Grease/Oil __ Paper/Trash __ Foam ✓ Other *	__ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		leaves in pipes
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			
						photo #26			

Notes:

* Provide additional comments to describe the observations made for the category.

** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# R-8 **Location Aid** Rail Trail / Comm. St.

Date: 11/18/04 Time: 10:05 am Weather Today: cloudy

Surveyor/Observer: Sarah Voisin Weather over past 72 hours: no rain

Flow Observed (circle): YES (circled) NO

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	~~Turbidity~~ TDS (ppm)	Temperature	pH	Conductivity	Comments and Notes
	Depth ____ trickle	Depth ____	✓ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	✓ None __ Chemical __ Petroleum __ Sewage __ Other *	229	10.5°C	7.89	464	
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	✓ Clay __ Concrete __ Corrugated Steel __ PVC __ Cast Iron	__ Good __ Cracked __ Exposed Steel ✓ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	6"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	____ Lat. ____ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	moss growing
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	__ None __ Grease/Oil __ Paper/Trash __ Foam ✓ Other *	__ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	✓ Forest __ Agriculture __ Residential __ Commercial __ Industrial	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		moss
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			
			✓			photo #27-28 -weep hole			

Notes:

* Provide additional comments to describe the observations made for the category.

** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# H0-04 **Location Aid** Commercial St.

Date: 11/18/04 Time: 10:10AM Weather Today: cloudy

Surveyor/Observer: Sarah Voisin Weather over past 72 hours: no rain

Flow Observed (circle): YES NO

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	**Pipe Flow Depth (inches)** Note: measure from pipe invert	**Channel, Ditch or Swale Flow Depth (inches)** Note: measure from center of conveyance	**Flow Appearance / Color**	**Flow Odor**	~~Turbidity~~ TDS (ppm)	**Temperature**	**pH**	**Conductivity**	**Comments and Notes**
	trickle Depth	Depth	✓ Clear _ Cloudy/Milky _ Dark (Tea) _ Sheen _ Other *	✓ None _ Chemical _ Petroleum _ Sewage _ Other *	405	13°C	7.74	811	possible flow - trickle cannot be reached
2. Structure Details (pipe or other conveyance info.)	**Pipe Material**	**Pipe Condition**	**Channel, Ditch or Swale Condition**	**Diameter or Width (specify distance units)**	**Slope (degrees)**	**Outlet Structure**	**GPS Coordinates**	**Discharge directly to surface water?****	**Comments and Notes**
	_ Clay ✓ Concrete _ Corrugated Steel _ PVC _ Cast Iron	✓ Good _ Cracked _ Exposed Steel _ Corroded _ Other*	_ Good _ Clogged _ Debris _ Scoured or Eroded _ Other*	48"		_ Headwall _ Riprap _ No Outlet Protection _ Other*	____ Lat. ____ Lon.	_ Yes _ No If Yes, Provide Receiving Water Name	
3. Outfall Observations (general conditions at outfall)	**Deposits**	**Surrounding Vegetation**	**Erodibility**	**Land Use at Outfall**	**Land Use Upstream of Outfall**	**Appearance / Color**	**Odor**	**Sediment Depth (inches) (if present)**	**Comments and Notes**
	_ None _ Grease/Oil _ Paper/Trash _ Foam ✓ Other *	_ Little or No Distress _ Moderate Distress _ High Distress	_ Little or No Erosion _ Small Areas of Erosion _ Many Eroded Areas	_ Forest _ Agriculture _ Residential ✓ Commercial _ Industrial	_ Forest _ Agriculture ✓ Residential ✓ Commercial _ Industrial	_ Clear _ Cloudy/Milky _ Dark (Tea) _ Sheen _ Other *	_ None _ Chemical _ Petroleum _ Sewage _ Other *		moss; vegetation growing
4. Laboratory Analysis (check if submitted)	**Surfactant**	**Ammonia Concentration**	**E. coli**	**Oil & Grease (if oil or sheen is observed)**	**VOCs (if solvent odor is present)**	**Additional Field Comments and Notes**			
			✓			photo # 29-30 -suddenly flow increased - tested water & shortly after flow stopped			

Notes:

* Provide additional comments to describe the observations made for the category.

** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# Ho-P5 **Location Aid** Rail Trail / Russel Field

Date: 11/18/04 Time: 10:15AM Weather Today: cloudy

Surveyor/Observer: Sarah Voisin Weather over past 72 hours: no rain

Flow Observed (circle): YES NO

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	~~Turbidity~~ TDS (ppm)	Temperature	pH	Conductivity	Comments and Notes
	2 3/4" Depth	Depth ____	✓ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	✓ None __ Chemical __ Petroleum __ Sewage __ Other *	216	8.43°C	8.35	429	
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	__ Good ✓ Cracked __ Exposed Steel ✓ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	60"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	____ Lat. ____ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	__ None __ Grease/Oil __ Paper/Trash __ Foam ✓ Other *	__ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	✓ Forest __ Agriculture __ Residential __ Commercial ✓ Industrial	✓ Forest __ Agriculture __ Residential __ Commercial ✓ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		moss
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			
			/			Photo #31 - flow from stream near Russell Field			

Notes:

* Provide additional comments to describe the observations made for the category.

** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# HO-P7 **Location Aid** Rail Trail / Russel Field

Date: 11/18/04 Time: 10:25AM	Weather Today: cloudy
Surveyor/Observer: Sarah Voisin	Weather over past 72 hours: no rain

Flow Observed (circle): YES* NO

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	~~Turbidity~~ TDS (PPM)	Temperature	pH	Conductivity	Comments and Notes
	1 3/4" Depth	___ Depth	✓ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	✓ None __ Chemical __ Petroleum __ Sewage __ Other *	245	11°C	8.03	500	
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	__ Good __ Cracked __ Exposed Steel ✓ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	36"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	______ Lat. ______ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	__ None __ Grease/Oil __ Paper/Trash __ Foam ✓ Other *	__ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	✓ Forest __ Agriculture __ Residential __ Commercial ✓ Industrial	✓ Forest __ Agriculture __ Residential __ Commercial ✓ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		moss? orange material
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			
			✓			photo # 33			

Notes:
* Provide additional comments to describe the observations made for the category.
** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# Ho-P6 **Location Aid** commercial St.

Date: 11/18/04	Time: 10:25 AM	Weather Today: cloudy	
Surveyor/Observer: Sarah Voisin		Weather over past 72 hours: no rain	

Flow Observed (circle): YES NO

1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	Field Monitoring Data (note: fill in units for each parameter) ~~Turbidity~~ TDS (ppm)	Temperature	pH	Conductivity	Comments and Notes
	Depth ___ trickle	Depth ___	_ Clear _ Cloudy/Milky _ Dark (Tea) _ Sheen ✓ Other *	✓ None _ Chemical _ Petroleum _ Sewage _ Other *	321	9.2°C	8.1	633	~~could not sample~~ - orange material

2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	_ Clay ✓ Concrete _ Corrugated Steel _ PVC _ Cast Iron	✓ Good _ Cracked _ Exposed Steel ✓ Corroded _ Other*	_ Good _ Clogged _ Debris _ Scoured or Eroded _ Other*	48"		_ Headwall _ Riprap _ No Outlet Protection _ Other*	___ Lat. ___ Lon.	_ Yes _ No If Yes, Provide Receiving Water Name	

3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	_ None _ Grease/Oil _ Paper/Trash _ Foam ✓ Other *	_ Little or No Distress _ Moderate Distress _ High Distress	_ Little or No Erosion _ Small Areas of Erosion _ Many Eroded Areas	_ Forest _ Agriculture ✓ Residential ✓ Commercial _ Industrial	_ Forest _ Agriculture ✓ Residential ✓ Commercial _ Industrial	_ Clear _ Cloudy/Milky _ Dark (Tea) _ Sheen _ Other *	_ None _ Chemical _ Petroleum _ Sewage _ Other *		orange material coming out of pipe

4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes
			✓			photo #34 - took sample - small flow

Notes:
* Provide additional comments to describe the observations made for the category.
** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# Ho - P12 **Location Aid** McDermit Mill

Date: 11/18/04 Time: 10:35AM Weather Today: cloudy

Surveyor/Observer: Sarah Voisin Weather over past 72 hours: no rain

Flow Observed (circle): YES **NO**

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	**Pipe Flow Depth (inches) Note: measure from pipe invert**	**Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance**	**Flow Appearance / Color**	**Flow Odor**	**Turbidity**	**Temperature**	**pH**	**Conductivity**	**Comments and Notes**
	Depth ____	Depth ____	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum ✓ Sewage __ Other *					
2. Structure Details (pipe or other conveyance info.)	**Pipe Material**	**Pipe Condition**	**Channel, Ditch or Swale Condition**	**Diameter or Width (specify distance units)**	**Slope (degrees)**	**Outlet Structure**	**GPS Coordinates**	**Discharge directly to surface water?****	**Comments and Notes**
	✓ Clay __ Concrete __ Corrugated Steel __ PVC __ Cast Iron	__ Good __ Cracked __ Exposed Steel ✓ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	12"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	____ Lat. ____ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	
3. Outfall Observations (general conditions at outfall)	**Deposits**	**Surrounding Vegetation**	**Erodibility**	**Land Use at Outfall**	**Land Use Upstream of Outfall**	**Appearance / Color**	**Odor**	**Sediment Depth (inches) (if present)**	**Comments and Notes**
	__ None __ Grease/Oil __ Paper/Trash __ Foam ✓ Other *	__ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture __ Residential ✓ Commercial ✓ Industrial	__ Forest __ Agriculture __ Residential __ Commercial ✓ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		~~tod~~ paper/ debris
4. Laboratory Analysis (check if submitted)	**Surfactant**	**Ammonia Concentration**	**E. coli**	**Oil & Grease (if oil or sheen is observed)**	**VOCs (if solvent odor is present)**	**Additional Field Comments and Notes**			
						Photo # 35-36 - sanitary sewer waste, smells like sewer			

Notes:

* Provide additional comments to describe the observations made for the category.

** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# Ho-P13 **Location Aid** Prospect /Harmony

Date: 11/18/04 Time: 10:40AM Weather Today: Cloudy
Surveyor/Observer: Sarah Voisin Weather over past 72 hours: no rain

Flow Observed (circle): YES NO (NO circled)

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	Turbidity	Temperature	pH	Conductivity	Comments and Notes
	Depth ___	Depth ___	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *					
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	__ Good ✓ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	12"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	______ Lat. ______ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	Wall is cracking
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	__ None __ Grease/Oil __ Paper/Trash __ Foam __ Other *	__ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture __ Residential __ Commercial ✓ Industrial	__ Forest __ Agriculture __ Residential __ Commercial ✓ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			
						Photo # 37-38			

Notes:
* Provide additional comments to describe the observations made for the category.
** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# Hb - D14 **Location Aid** Prospect / Harmony St

Date: 11/18/04 Time: 10:45AM Weather Today: cloudy

Surveyor/Observer: Sarah Vairm Weather over past 72 hours: no rain

Flow Observed (circle): YES NO

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	**Pipe Flow Depth (inches) Note: measure from pipe invert**	**Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance**	**Flow Appearance / Color**	**Flow Odor**	**Turbidity**	**Temperature**	**pH**	**Conductivity**	**Comments and Notes**
	Depth ____	Depth ____	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *					
2. Structure Details (pipe or other conveyance info.)	**Pipe Material**	**Pipe Condition**	**Channel, Ditch or Swale Condition**	**Diameter or Width (specify distance units)**	**Slope (degrees)**	**Outlet Structure**	**GPS Coordinates**	**Discharge directly to surface water?****	**Comments and Notes**
	__ Clay __ Concrete __ Corrugated Steel __ PVC ✓ Cast Iron	__ Good __ Cracked __ Exposed Steel ✓ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	12"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	____ Lat. ____ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	
3. Outfall Observations (general conditions at outfall)	**Deposits**	**Surrounding Vegetation**	**Erodibility**	**Land Use at Outfall**	**Land Use Upstream of Outfall**	**Appearance / Color**	**Odor**	**Sediment Depth (inches) (if present)**	**Comments and Notes**
	__ None __ Grease/Oil __ Paper/Trash __ Foam __ Other *	__ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture __ Residential __ Commercial ✓ Industrial	__ Forest __ Agriculture __ Residential __ Commercial ✓ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		
4. Laboratory Analysis (check if submitted)	**Surfactant**	**Ammonia Concentration**	**E. coli**	**Oil & Grease (if oil or sheen is observed)**	**VOCs (if solvent odor is present)**	**Additional Field Comments and Notes**			
						Pipe has been sealed w/ concrete photo # 39			

Notes:

* Provide additional comments to describe the observations made for the category.

** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# ~~MW03~~ W-1 **Location Aid** Prospect / Harmony St.

Date: 11/18/04 Time: 10:45AM Weather Today: cloudy

Surveyor/Observer: Sarah Voisin Weather over past 72 hours: no rain

Flow Observed (circle): YES NO (NO circled)

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	**Pipe Flow Depth (inches) Note: measure from pipe invert**	**Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance**	**Flow Appearance / Color**	**Flow Odor**	**Turbidity**	**Temperature**	**pH**	**Conductivity**	**Comments and Notes**
	Depth ___	Depth ___	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *					
2. Structure Details (pipe or other conveyance info.)	**Pipe Material**	**Pipe Condition**	**Channel, Ditch or Swale Condition**	**Diameter or Width (specify distance units)**	**Slope (degrees)**	**Outlet Structure**	**GPS Coordinates**	**Discharge directly to surface water?****	**Comments and Notes**
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	✓ Good __ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	12"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	___ Lat. ___ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	
3. Outfall Observations (general conditions at outfall)	**Deposits**	**Surrounding Vegetation**	**Erodibility**	**Land Use at Outfall**	**Land Use Upstream of Outfall**	**Appearance / Color**	**Odor**	**Sediment Depth (inches) (if present)**	**Comments and Notes**
	__ None __ Grease/Oil __ Paper/Trash __ Foam ✓ Other *	__ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture ✓ Residential __ Commercial __ Industrial	__ Forest __ Agriculture ✓ Residential __ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		plant growth coming out of pipe
4. Laboratory Analysis (check if submitted)	**Surfactant**	**Ammonia Concentration**	**E. coli**	**Oil & Grease (if oil or sheen is observed)**	**VOCs (if solvent odor is present)**	**Additional Field Comments and Notes**			
						Photo # 40			

Notes:

* Provide additional comments to describe the observations made for the category.

** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# R-9 **Location Aid** Harmony St.

Date: 11/18/04 Time: 10:50AM Weather Today: cloudy
Surveyor/Observer: Sarah Voisin Weather over past 72 hours: no rain

Flow Observed (circle): YES NO

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	~~Turbidity~~ TDS (PPM)	Temperature	pH	Conductivity	Comments and Notes
	Depth trickle	Depth	__ Clear ✓ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	✓ None __ Chemical __ Petroleum __ Sewage __ Other *	173	9.4°C	8.54	361	
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	✓ Good __ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	30"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	______ Lat. ______ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	__ None __ Grease/Oil __ Paper/Trash __ Foam ✓ Other *	__ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture __ Residential __ Commercial ✓ Industrial	__ Forest __ Agriculture __ Residential __ Commercial ✓ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		leaves
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			
			✓			Photo #41			

Notes:
* Provide additional comments to describe the observations made for the category.
** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# W-2 **Location Aid** Rt 8

Date: 11/18/04 Time: 10:55AM Weather Today: cloudy
Surveyor/Observer: Sarah Voisin Weather over past 72 hours: no rain

Flow Observed (circle): YES NO

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	~~Turbidity~~ TDS (ppm)	Temperature	pH	Conductivity	Comments and Notes
	3" Depth	___ Depth	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum ✓ Sewage __ Other *	239	9.1°C	8.38	477	
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	__ Good ✓ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	60"		__ Headwall __ Riprap __ No Outlet Protection __ Other*	______ Lat. ______ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	pipe is cracked
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	__ None __ Grease/Oil __ Paper/Trash __ Foam ✓ Other *	__ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture ✓ Residential ✓ Commercial __ Industrial	__ Forest __ Agriculture ✓ Residential ✓ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		moss; pigeon feathers; droppings
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			
			✓			photo # 42-43			

Notes:
* Provide additional comments to describe the observations made for the category.
** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# Ho-P16 **Location Aid** R+8

Date: 11/18/04 Time: 10:58AM
Surveyor/Observer: Sarah Voisin
Weather Today: cloudy
Weather over past 72 hours: no rain

Flow Observed (circle): YES NO

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	~~Turbidity~~ TDS (ppm)	Temperature	pH	Conductivity	Comments and Notes
	1/2" Depth	___ Depth	_ Clear _ Cloudy/Milky _ Dark (Tea) _ Sheen _ Other *	✓ None _ Chemical _ Petroleum _ Sewage _ Other *	469	10.8°C	8.19	938	
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	_ Clay ✓ Concrete _ Corrugated Steel _ PVC _ Cast Iron	✓ Good _ Cracked _ Exposed Steel _ Corroded _ Other*	_ Good _ Clogged _ Debris _ Scoured or Eroded _ Other*	24"		_ Headwall _ Riprap _ No Outlet Protection _ Other*	___ Lat. ___ Lon.	_ Yes _ No If Yes, Provide Receiving Water Name	
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	✓ None _ Grease/Oil _ Paper/Trash _ Foam _ Other *	_ Little or No Distress _ Moderate Distress _ High Distress	_ Little or No Erosion _ Small Areas of Erosion _ Many Eroded Areas	_ Forest _ Agriculture _ Residential _ Commercial ✓ Industrial	_ Forest _ Agriculture _ Residential _ Commercial ✓ Industrial	_ Clear _ Cloudy/Milky _ Dark (Tea) _ Sheen _ Other *	_ None _ Chemical _ Petroleum _ Sewage _ Other *		
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			
			✓			photo # 44			

Notes:
* Provide additional comments to describe the observations made for the category.
** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# SW-3 **Location Aid** Interior Alt./Hoosac St.

Date: 11/18/04 Time: 11:20 AM
Surveyor/Observer: Sarah Voisin
Weather Today: cloudy
Weather over past 72 hours: no rain

Flow Observed (circle): YES NO

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	~~Turbidity~~ TDS (ppm)	Temperature	pH	Conductivity	Comments and Notes
	Depth	11" Depth	✓ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	✓ None __ Chemical __ Petroleum __ Sewage __ Other *	134	7.8°C	8.52	276	
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	__ Clay __ Concrete __ Corrugated Steel __ PVC __ Cast Iron	__ Good __ Cracked __ Exposed Steel __ Corroded __ Other*	✓ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*			__ Headwall __ Riprap __ No Outlet Protection __ Other*	______ Lat. ______ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	__ None __ Grease/Oil __ Paper/Trash __ Foam ✓ Other *	✓ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion ✓ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		leaves
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			
						photo # Downstream Hoxie Brook			

Notes:

* Provide additional comments to describe the observations made for the category.

** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# upstream Hoxie **Location Aid** Hoxie Brook/West

Date: 11/18/04 Time: 11:35AM Weather Today: cloudy
Surveyor/Observer: Sarah Voisin Weather over past 72 hours: no rain

Flow Observed (circle): YES (circled) NO

1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	Field Monitoring Data (note: fill in units for each parameter): ~~Turbidity~~ TDS (ppm)	Temperature	pH	Conductivity	Comments and Notes
	Depth ___	Depth ___	✓ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	✓ None __ Chemical __ Petroleum __ Sewage __ Other *	126	8.3°C	8.36	252	

2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	__ Clay __ Concrete __ Corrugated Steel __ PVC __ Cast Iron	__ Good __ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged ✓ Debris __ Scoured or Eroded __ Other*			__ Headwall __ Riprap __ No Outlet Protection __ Other*	______ Lat. ______ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	leaves/twigs

3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	__ None __ Grease/Oil __ Paper/Trash __ Foam ✓ Other *	✓ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion ✓ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture ✓ Residential __ Commercial __ Industrial	__ Forest __ Agriculture ✓ Residential __ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		leaves

4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes
			✓			Photo # 45 – 48

Notes:

* Provide additional comments to describe the observations made for the category.

** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# Hoxie M&D **Location Aid** Middle of Hoxie beneath Downtown

Date: 11/18/04 Time: 12:00	Weather Today:
Surveyor/Observer: Rich Niles	Weather over past 72 hours:

Flow Observed (circle): YES NO

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	~~Turbidity~~ TDS	Temperature	pH	Conductivity	Comments and Notes
	Depth	6" Depth	✓ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	✓ None __ Chemical __ Petroleum __ Sewage __ Other *	119 ppm	7.5	8.41	239	
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	__ Clay __ Concrete __ Corrugated Steel __ PVC __ Cast Iron	__ Good __ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged __ Debris ✓ Scoured or Eroded __ Other*			__ Headwall __ Riprap __ No Outlet Protection __ Other*	______ Lat. ______ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	Undermined Stone Arch
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	__ None __ Grease/Oil __ Paper/Trash __ Foam ✓ Other * Some sticks + leaves	__ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture __ Residential __ Commercial __ Industrial	__ Forest __ Agriculture __ Residential ✓ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *		Beneath Downtown
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			
			✓			Some undermining at stone arch culvert.			

Notes:

* Provide additional comments to describe the observations made for the category.

** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# H-P5 **Location Aid** West Rd - Marshal Ave (East side)

Date:	Time: 1500	Weather Today:
Surveyor/Observer: M Sherman		Weather over past 72 hours:

Flow Observed (circle): YES **NO**

1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	Field Monitoring Data (note: fill in units for each parameter): Turbidity	Temperature	pH	Conductivity	Comments and Notes
	Depth -	Depth -	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen ✓ Other *	__ None __ Chemical __ Petroleum __ Sewage ✓ Other *	-	-	-	-	NO Flow

2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	__ Clay ✓ Concrete __ Corrugated Steel __ PVC __ Cast Iron	✓ Good __ Cracked __ Exposed Steel __ Corroded __ Other*	✓ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	12"		✓ Headwall __ Riprap __ No Outlet Protection __ Other*	______ Lat. ______ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	

3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	✓ None __ Grease/Oil __ Paper/Trash __ Foam __ Other *	✓ Little or No Distress __ Moderate Distress __ High Distress	✓ Little or No Erosion __ Small Areas of Erosion __ Many Eroded Areas	__ Forest __ Agriculture ✓ Residential __ Commercial __ Industrial	__ Forest ✓ Agriculture __ Residential __ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen ✓ Other *	__ None __ Chemical __ Petroleum __ Sewage ✓ Other *		

4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes

Notes:
* Provide additional comments to describe the observations made for the category.
** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# 14-P6 **Location Aid** West Rd. Marshall Ave (west side)

Date:________ Time: 1508 Weather Today:________
Surveyor/Observer: M Sherman Weather over past 72 hours:________

Flow Observed (circle): YES NO

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	Pipe Flow Depth (inches) Note: measure from pipe invert	Channel, Ditch or Swale Flow Depth (inches) Note: measure from center of conveyance	Flow Appearance / Color	Flow Odor	Turbidity	Temperature	pH	Conductivity	Comments and Notes
	Depth____	Depth____	_ Clear _ Cloudy/Milky _ Dark (Tea) _ Sheen _ Other *	_ None _ Chemical _ Petroleum _ Sewage _ Other *					
2. Structure Details (pipe or other conveyance info.)	Pipe Material	Pipe Condition	Channel, Ditch or Swale Condition	Diameter or Width (specify distance units)	Slope (degrees)	Outlet Structure	GPS Coordinates	Discharge directly to surface water?**	Comments and Notes
	_ Clay ✓ Concrete _ Corrugated Steel _ PVC _ Cast Iron	✓ Good _ Cracked _ Exposed Steel _ Corroded _ Other*	_ Good _ Clogged _ Debris _ Scoured or Eroded _ Other*	12"		✓ Headwall _ Riprap _ No Outlet Protection _ Other*	____ Lat. ____ Lon.	_ Yes _ No If Yes, Provide Receiving Water Name	
3. Outfall Observations (general conditions at outfall)	Deposits	Surrounding Vegetation	Erodibility	Land Use at Outfall	Land Use Upstream of Outfall	Appearance / Color	Odor	Sediment Depth (inches) (if present)	Comments and Notes
	✓ None _ Grease/Oil _ Paper/Trash _ Foam _ Other *	✓ Little or No Distress _ Moderate Distress _ High Distress	_ Little or No Erosion _ Small Areas of Erosion _ Many Eroded Areas	_ Forest _ Agriculture ✓ Residential _ Commercial _ Industrial	_ Forest ✓ Agriculture _ Residential _ Commercial _ Industrial	_ Clear _ Cloudy/Milky _ Dark (Tea) _ Sheen ✓ Other *	_ None _ Chemical _ Petroleum _ Sewage ✓ Other *		
4. Laboratory Analysis (check if submitted)	Surfactant	Ammonia Concentration	E. coli	Oil & Grease (if oil or sheen is observed)	VOCs (if solvent odor is present)	Additional Field Comments and Notes			

Notes:
* Provide additional comments to describe the observations made for the category.
** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# 12-P-7 **Location Aid** West Rd - Mendall Ave (west side)

Date: 11/12/04 Time: 1512 Weather Today: ____

Surveyor/Observer: M Sherman Weather over past 72 hours: ____

Flow Observed (circle): YES NO (NO circled)

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	**Pipe Flow Depth (inches)** Note: measure from pipe invert	**Channel, Ditch or Swale Flow Depth (inches)** Note: measure from center of conveyance	**Flow Appearance / Color**	**Flow Odor**	**Turbidity**	**Temperature**	**pH**	**Conductivity**	**Comments and Notes**
	____ Depth	____ Depth	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen __ Other *	__ None __ Chemical __ Petroleum __ Sewage __ Other *					
2. Structure Details (pipe or other conveyance info.)	**Pipe Material**	**Pipe Condition**	**Channel, Ditch or Swale Condition**	**Diameter or Width (specify distance units)**	**Slope (degrees)**	**Outlet Structure**	**GPS Coordinates**	**Discharge directly to surface water?****	**Comments and Notes**
	✓ Clay __ Concrete __ Corrugated Steel __ PVC __ Cast Iron	__ Good ✓ Cracked __ Exposed Steel __ Corroded __ Other*	__ Good __ Clogged __ Debris __ Scoured or Eroded __ Other*	12"		__ Headwall __ Riprap ✓ No Outlet Protection __ Other*	____ Lat. ____ Lon.	__ Yes __ No If Yes, Provide Receiving Water Name	
3. Outfall Observations (general conditions at outfall)	**Deposits**	**Surrounding Vegetation**	**Erodibility**	**Land Use at Outfall**	**Land Use Upstream of Outfall**	**Appearance / Color**	**Odor**	**Sediment Depth (inches) (if present)**	**Comments and Notes**
	__ None __ Grease/Oil __ Paper/Trash __ Foam __ Other *	✓ Little or No Distress __ Moderate Distress __ High Distress	__ Little or No Erosion __ Small Areas of Erosion ✓ Many Eroded Areas	__ Forest ✓ Agriculture __ Residential __ Commercial __ Industrial	__ Forest ✓ Agriculture __ Residential __ Commercial __ Industrial	__ Clear __ Cloudy/Milky __ Dark (Tea) __ Sheen ✓ Other *	__ None __ Chemical __ Petroleum __ Sewage ✓ Other *		
4. Laboratory Analysis (check if submitted)	**Surfactant**	**Ammonia Concentration**	**E. coli**	**Oil & Grease (if oil or sheen is observed)**	**VOCs (if solvent odor is present)**	**Additional Field Comments and Notes**			

Notes:

* Provide additional comments to describe the observations made for the category.

** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

Adams Stormwater Outfall Inspection Checklist

Outfall ID# A-84 **Location Aid** ~~Smo~~ Simon Ave south side out stream

Date: 11/7/08 Time: 1530 Weather Today: Cloudy
Surveyor/Observer: M Sherman Weather over past 72 hours: Sunny

Flow Observed (circle): YES NO

					Field Monitoring Data (note: fill in units for each parameter)				
1. Flow Observations (fill out this section only if flow is observed)	**Pipe Flow Depth (inches)** Note: measure from pipe invert	**Channel, Ditch or Swale Flow Depth (inches)** Note: measure from center of conveyance	**Flow Appearance / Color**	**Flow Odor**	~~Turbidity~~ TDS	**Temperature**	**pH**	**Conductivity**	**Comments and Notes**
	10 Depth	10 Depth	✓ Clear _ Cloudy/Milky _ Dark (Tea) _ Sheen _ Other *	_ None _ Chemical _ Petroleum ✓ Sewage _ Other *	554	10.8 C	8.00	1127	
2. Structure Details (pipe or other conveyance info.)	**Pipe Material**	**Pipe Condition**	**Channel, Ditch or Swale Condition**	**Diameter or Width (specify distance units)**	**Slope (degrees)**	**Outlet Structure**	**GPS Coordinates**	**Discharge directly to surface water?****	**Comments and Notes**
	_ Clay ✓ Concrete _ Corrugated Steel _ PVC _ Cast Iron	_ Good ✓ Cracked _ Exposed Steel _ Corroded _ Other*	_ Good ✓ Clogged ✓ Debris _ Scoured or Eroded _ Other*	18	75°	_ Headwall _ Riprap ✓ No Outlet Protection _ Other*	______ Lat. ______ Lon.	_ Yes _ No If Yes, Provide Receiving Water Name	
3. Outfall Observations (general conditions at outfall)	**Deposits**	**Surrounding Vegetation**	**Erodibility**	**Land Use at Outfall**	**Land Use Upstream of Outfall**	**Appearance / Color**	**Odor**	**Sediment Depth (inches) (if present)**	**Comments and Notes**
	_ None _ Grease/Oil _ Paper/Trash _ Foam ✓ Other *	_ Little or No Distress _ Moderate Distress _ High Distress	_ Little or No Erosion _ Small Areas of Erosion _ Many Eroded Areas	_ Forest _ Agriculture ✓ Residential _ Commercial _ Industrial	_ Forest _ Agriculture ✓ Residential _ Commercial _ Industrial	✓ Clear _ Cloudy/Milky _ Dark (Tea) _ Sheen _ Other *	_ None _ Chemical ✓ Petroleum _ Sewage _ Other *		
4. Laboratory Analysis (check if submitted)	**Surfactant**	**Ammonia Concentration**	**E. coli**	**Oil & Grease (if oil or sheen is observed)**	**VOCs (if solvent odor is present)**	**Additional Field Comments and Notes**			
						lot of Build up in Swale leaves + debris			

Notes:
* Provide additional comments to describe the observations made for the category.
** Discharges directly to surface waters are defined as: any conveyance or discernable concentrated flow (i.e., pipe, swale, ditch) other than overland sheet flow that enters a body of water.

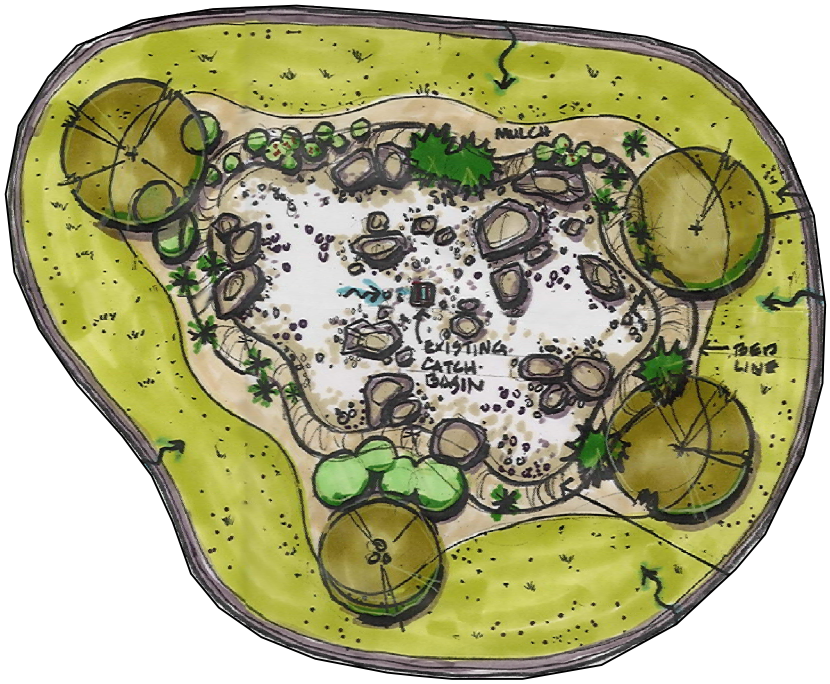
Site: Renfrew Park – Parking Lot BMPs

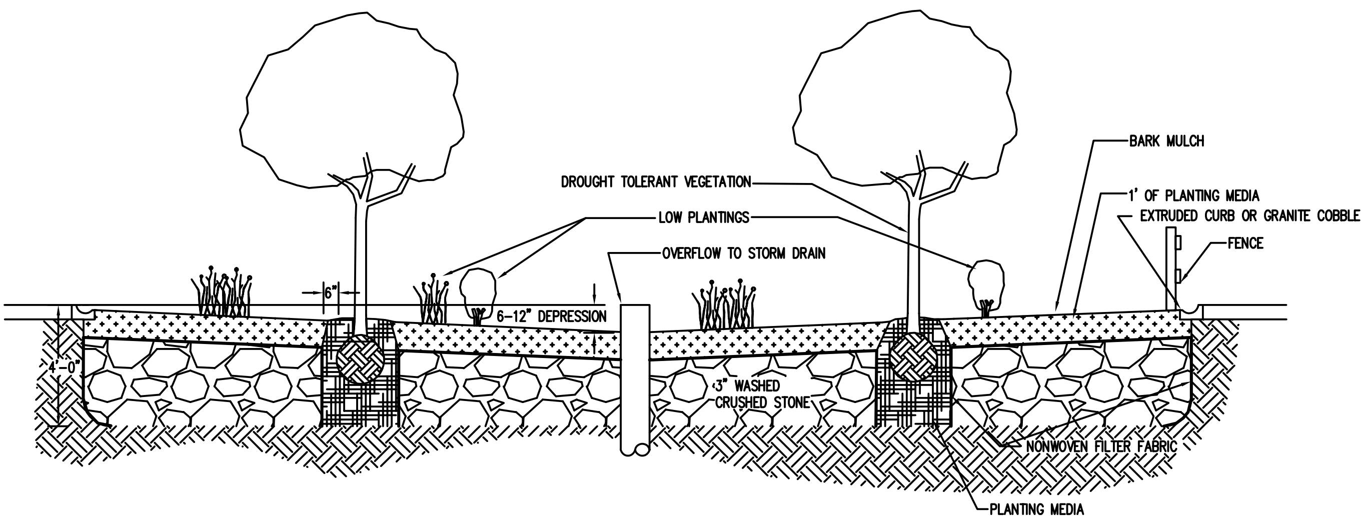
Cost: N/A, some BMPs already constructed

BMP Rank: N/A

Description of Stormwater BMPs:

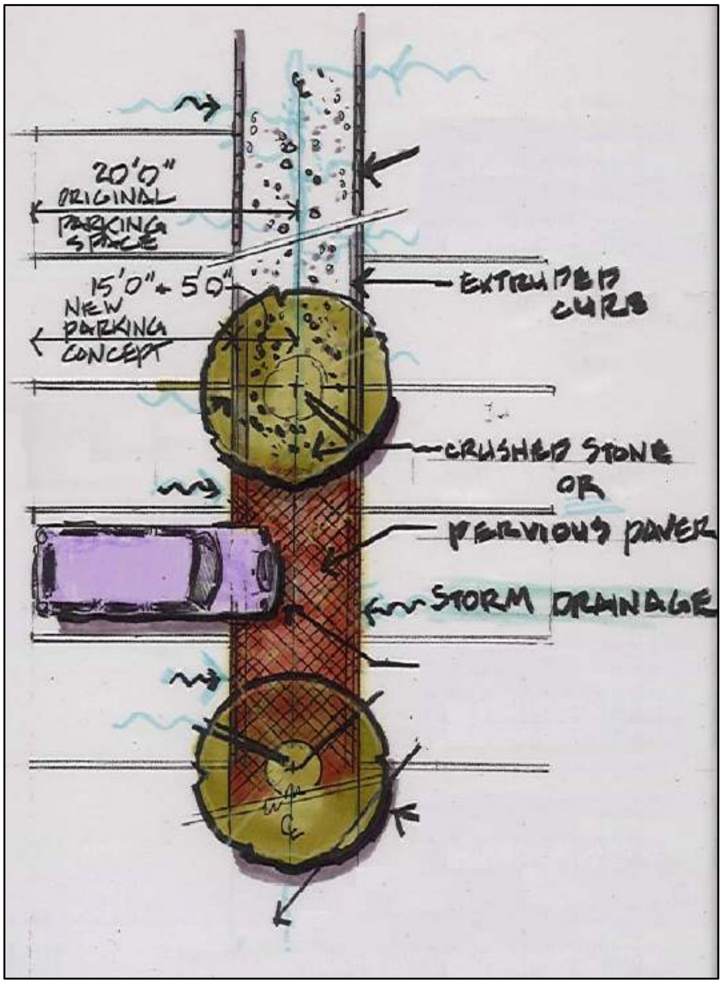
- Stormwater BMPs at this site will be used to treat first flush stormwater events, maximize infiltration and reduce peak stormwater flows to Pine Street Brook.
- A portion of runoff is diverted from Friend Street to an infiltration divider that will also handle approximately half of the parking lot runoff through infiltration. This will treat stormwater from Friend Street, as well as the adjacent parking lot, reducing runoff volumes and providing first flush stormwater treatment.
- The infiltration divider will overflow into a series of leaching manholes to maximize infiltration before discharging to Pine Street Brook.
- Additional leaching catch basins and overflow infiltration galleries handle additional parking lot runoff along the park side of the lot.
- Porous pavement and underlying infiltration galleries can be used in combination with the aforementioned leaching catch basins to handle parking lot runoff, primarily first flush.
- An infiltration bioisland can be incorporated into the landscape near Friend Street and Columbia Street to treat a portion of the parking lot at this location.

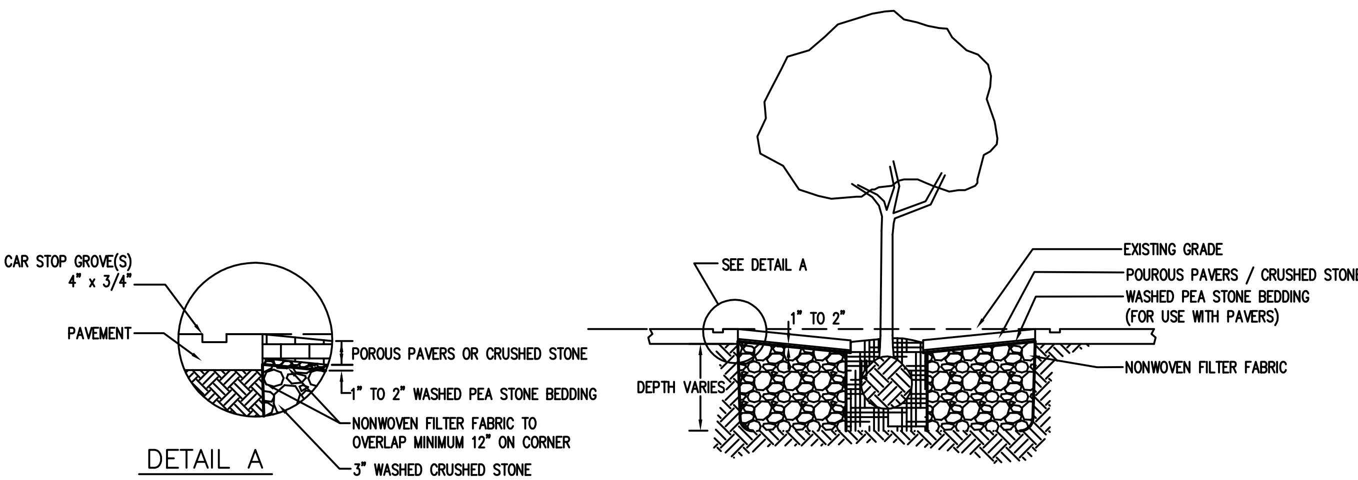




BIO ISLAND

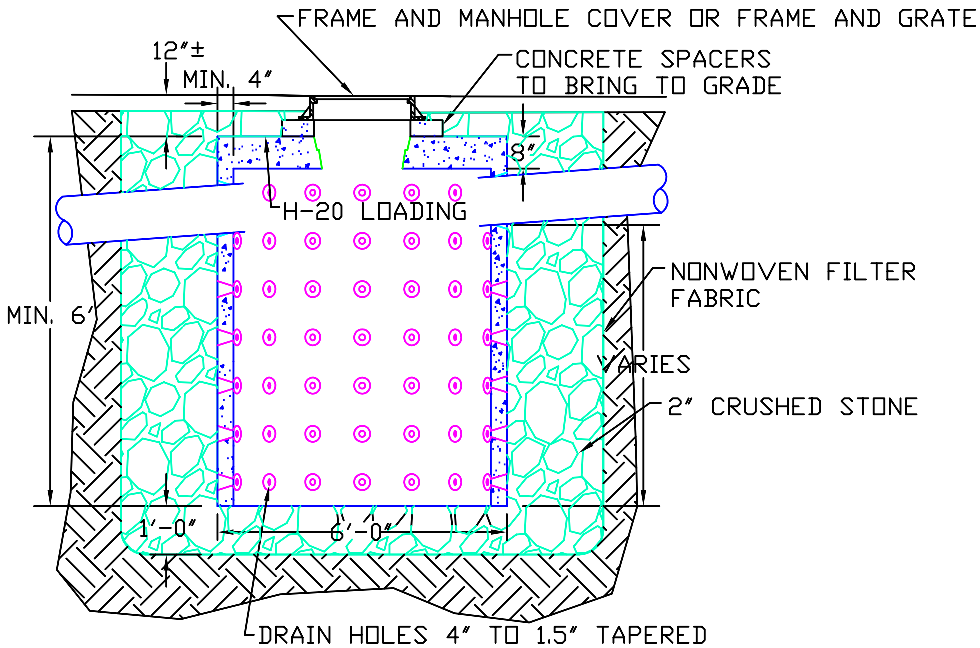
COMPREHENSIVE
ENVIRONMENTAL
INCORPORATED





INFILTRATION DIVIDER

COMPREHENSIVE
ENVIRONMENTAL
INCORPORATED



LEACHING CATCH BASIN

COMPREHENSIVE
ENVIRONMENTAL
INCORPORATED

VIEW OF RENFREW PARK BALLFIELD WITH FRIEND STREET IN BACKGROUND

PINE STREET BROOK (UPSTREAM OF FRIEND STREET PARKING LOT)

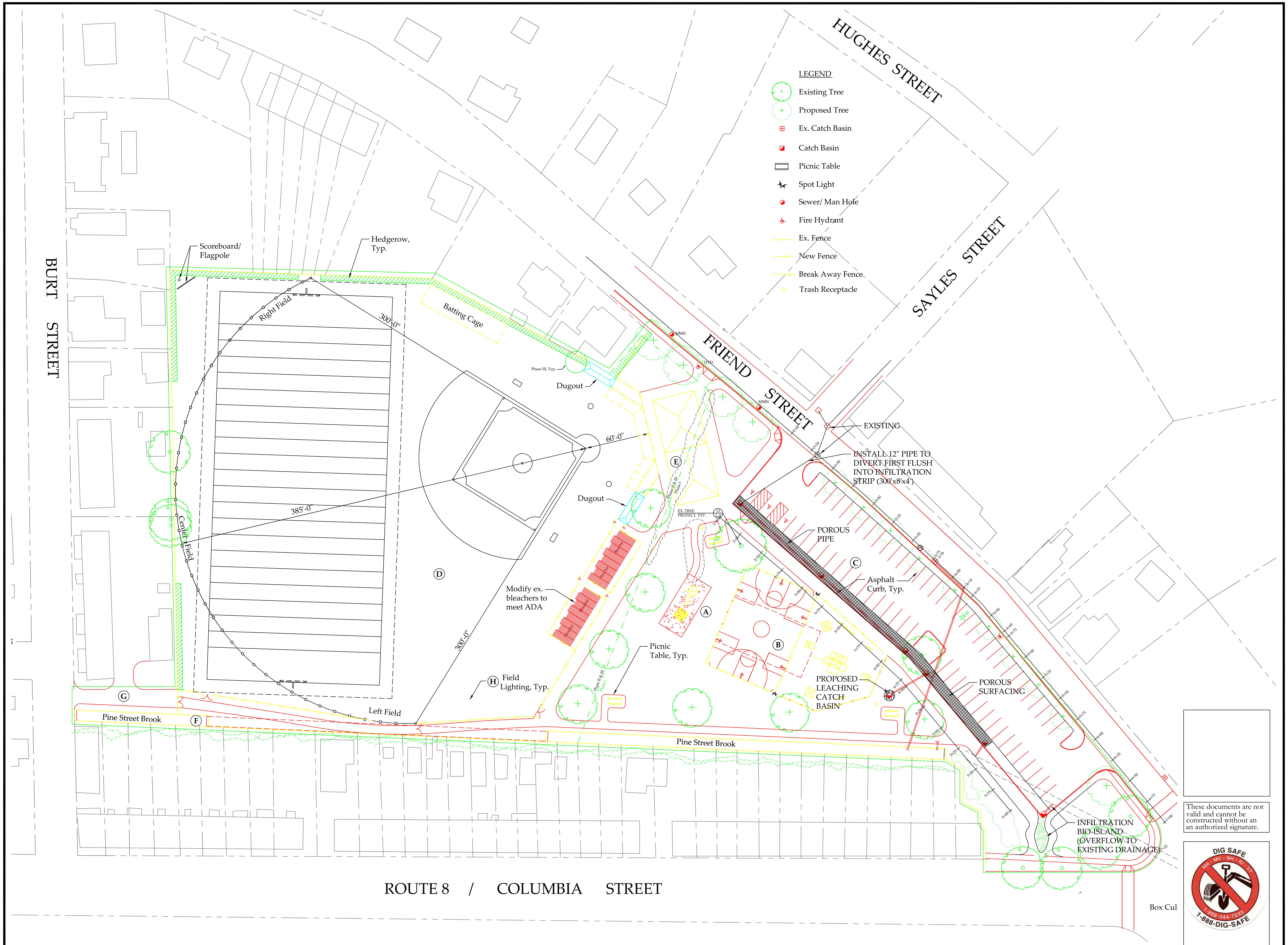
FRIEND STREET PARKING LOT UNDER CONSTRUCTION

UNDEVELOPED SITE AT THE FRIEND STREET PARKING LOT

RENFREW PARK BMP
SITE PICTURES

COMPREHENSIVE ENVIRONMENTAL INCORPORATED

64 DILLA STREET
MILFORD, MA 01757



CEI-CHANGES:

1. SEVERAL OPTIONS ARE SHOWN ON THE DRAWING AND CAN BE USED IN ANY COMBINATION.

2. BIOISLAND AT LOWER CORNER OF PARKING LOT TO BE SIZED TO HOLD 1" OF RUNOFF FROM PARKING LOT DRAINING TO IT.

3. INFILTRATION DIVIDER SIZED TO HOLD 1" OF RUNOFF FROM PARKING LOT. ADDITIONAL SIZE TO BE ADDED TO TREAT DIVERTED STORMWATER FROM FRIEND STREET. SURFACING TO BE POROUS PAVERS OR LANDSCAPING TO ALLOW SURFACE INFILTRATION. DEEP SUMP CATCH BASINS ONLY NECESSARY AT INFILTRATION DIVIDER BEGINNING AND END.

4. LEACHING CATCH BASINS TO HOLD 1" OF RUNOFF DRAINING TO EACH CATCH BASIN.

5. VEGETATED BUFFER STRIP ALONG FRIEND STREET SHRUNKEN TO ALLOW INFILTRATION DIVIDER TO FIT ON LOWER SIDE TO COLLECT ALL OF PARKING LOT RUNOFF.

6. SEE PDF OF COMBINED BMPS FOR EXAMPLES.

Renfrew Field

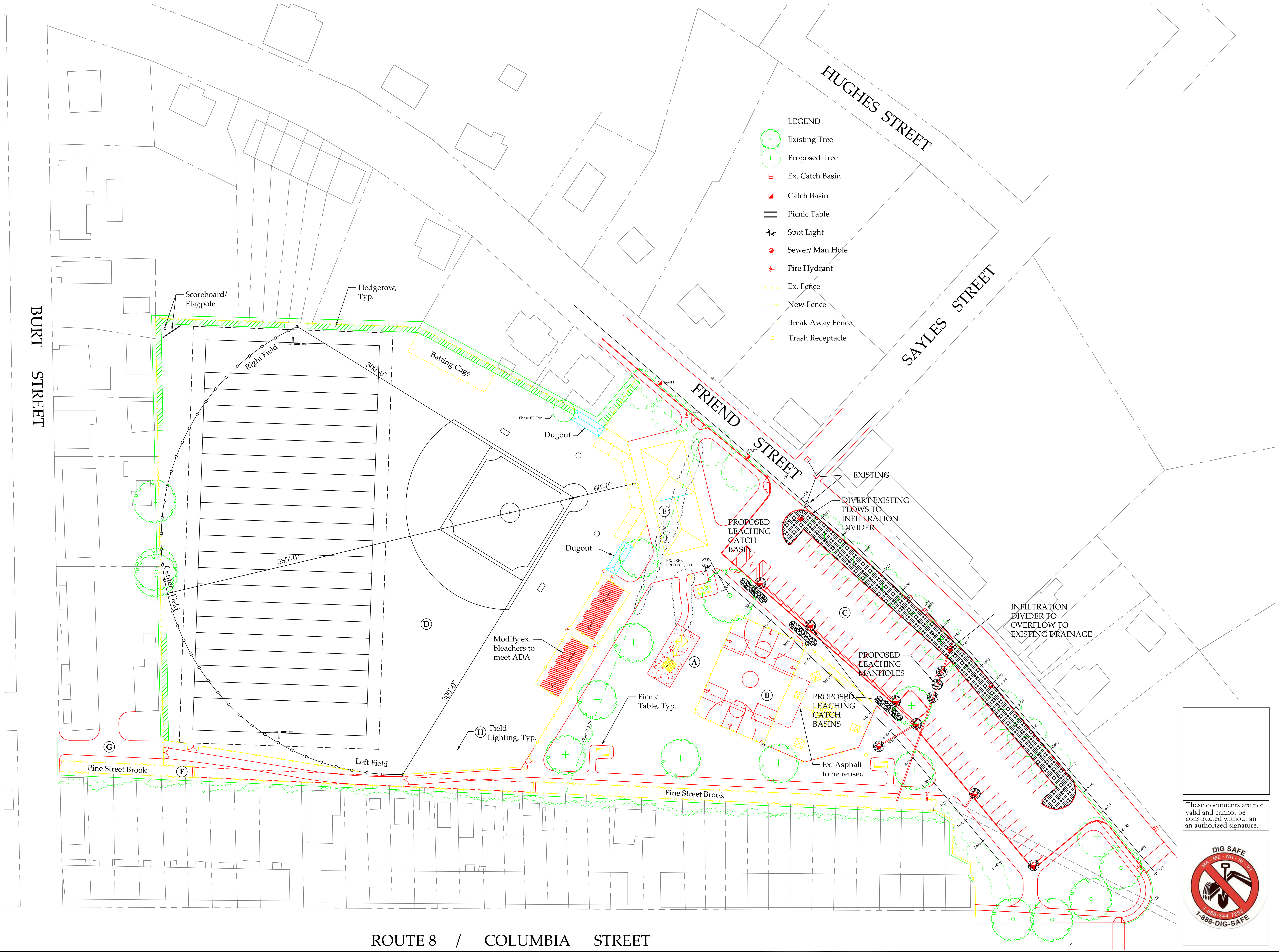
Adams, MA

Master Plan

Okerstrom·Lang Ltd.
Landscape Architects

17 Bridge Street
Great Barrington, MA 01230
413-528-6523
www.okerstromlang.com

September 10, 2003
Scale: 1"=40'-0"
Sheet No.
L-1



These documents are not valid and cannot be constructed without an authorized signature.

CEI-CHANGES:

1. SEVERAL OPTIONS ARE SHOWN ON THE DRAWING AND CAN BE USED IN ANY COMBINATION.

2. CONVERT CATCH BASINS TO DEEP SUMP LEACHING CATCH BASINS. INSTALL LEAKOFF WITH CRUSHED STONE TO PROMOTE INFILTRATION.

3. INFILTRATION DIVIDER INSTALLED BETWEEN FRIEND STREET AND PARKING LOT. DIVIDER TO OVERFLOW THROUGH CATCH BASIN INTO EXISTING DRAINAGE. SURFACING TO BE POROUS PAVERS OR LANDSCAPED TO ALLOW SURFACE INFILTRATION.

4. INSTALL LEACHING MANHOLES INLINE INTO EXISTING DRAINAGE PIPE.

5. SEE PDF OF COMBINED BMPS FOR EXAMPLES.

Renfrew Field

Adams, MA

Master Plan

Okerstrom·Lang Ltd.
Landscape Architects

17 Bridge Street
Great Barrington, MA 01230
413-528-6523
www.okerstromlang.com

September 10, 2003
Scale: 1"=40'-0"
Sheet No.
L-1

Site: Hoxie Brook Downtown – Stream Restoration & Urban Runoff BMPs

Cost: $395,000*

BMP Rank: 2

Description of Stormwater BMPs:

- This site includes the following BMPs: restoration of natural stream buffers; stream bank stabilization; creating detention areas for sediment removal; parking lot runoff treatment; and an educational component with walkways and an information kiosk.
- Previous construction has destroyed the natural buffer strip along the stream banks. Native trees and shrubs will be planted along the upper stream segment to shade the stream and recreate that environment. A 25’ streamscape buffer will be constructed which will serve to filter/treat runoff from the adjacent visitor's center parking lot.
- An educational kiosk will be installed along the main walkway and the proposed loop walkway for passers-by to read about the BMP project, stormwater management and waterway protection.
- The portion of the stream between the rail trail crossing and industrial parking lot will be renovated to improve surface water quality. This will include construction of weir walls to create a second waterfall and detention area. Existing sediment will be excavated from the two pools to increase detention. The second wall will also aid in protecting the water main running through the stream.
- Stream banks between the rail trail crossing and industrial parking lot are eroding due to high stream flows associated with stormwater runoff. The eroding stream banks will be stabilized and planted with native trees and shrubs to protect the stream.
- Sediment from stormwater events and stream bank erosion has partially clogged the culvert that passes beneath the industrial parking lot. The sediment will be removed from the culvert under the parking lot to prevent flooding.
- The 92,000 square foot gravel parking area will have its gravel surface removed and will be loamed and seeded to create a pervious surface, which will reduce runoff and the migration of fines from the parking area. An infiltration divider will be constructed to collect and infiltrate overland flow from the parking area. During icing periods, water may enter the infiltration divider through the catch basin at the end of the structure.
- Large stormwater flows over the gravel and paved parking area have caused a section of the stream retaining wall and parking lot to collapse. A double grated deep sump catch basin will be installed to collect the stormwater and divert it to a baffle tank to remove sediment. Following this pretreatment, the water will flow into two leaching manholes to infiltrate into the ground. An overflow pipe will be installed for stormwater which will be discharged into the stream after being treated in the baffle tank.

*This BMP conceptual design cost has been prepared for engineering design, permitting and construction of the project and does not include construction service costs.

- A 10” water main passes through the stream in this open stream segment. It will be stabilized with crushed stone and rip rap protection on top. A chain link fence will be installed around the open stream to prevent trash and debris from entering the stream.
- The final stretch of open stream before it enters the twin culverts beneath Hoosac Street has eroded stream banks and sediment has accumulated in the culverts due to stormwater events and stream bank erosion. The eroded stream bank will be stabilized with gabions and erosion control fabric and sediment will be removed from the twin culverts. The banks will be seeded with a wetland plant mix.
- Gabion weir walls will be installed at the twin pipe outlet to create a detention area to treat stormwater. The area adjacent to the open channel will be dredged and seeded with a wetland plant mix to improve the detention and treatment of stormwater flows to this area. This will treat stormwater flows from the adjacent parking lot, as well as the larger watershed that feeds the stream.

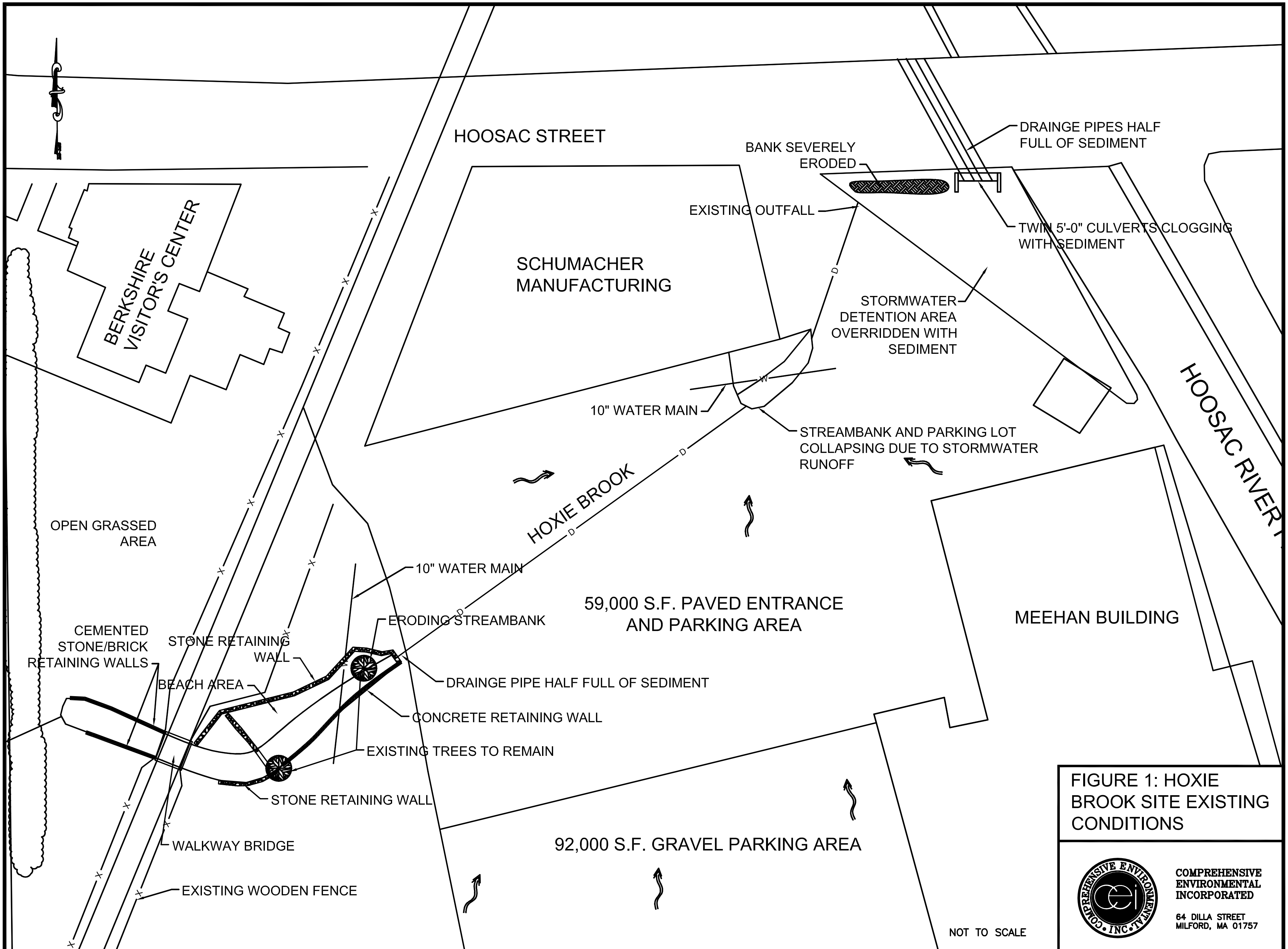


FIGURE 1: HOXIE BROOK SITE EXISTING CONDITIONS

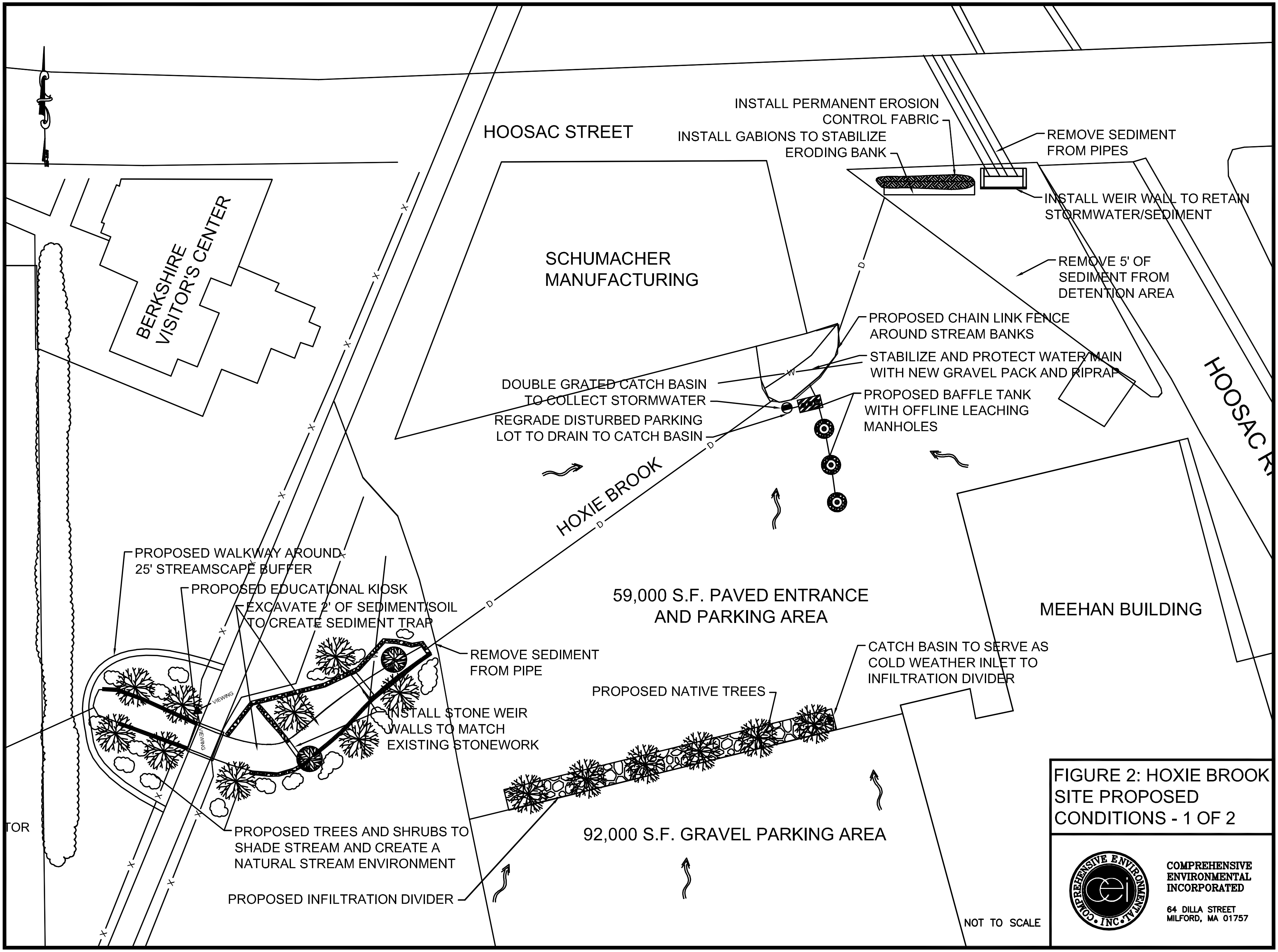


FIGURE 2: HOXIE BROOK SITE PROPOSED CONDITIONS - 1 OF 2

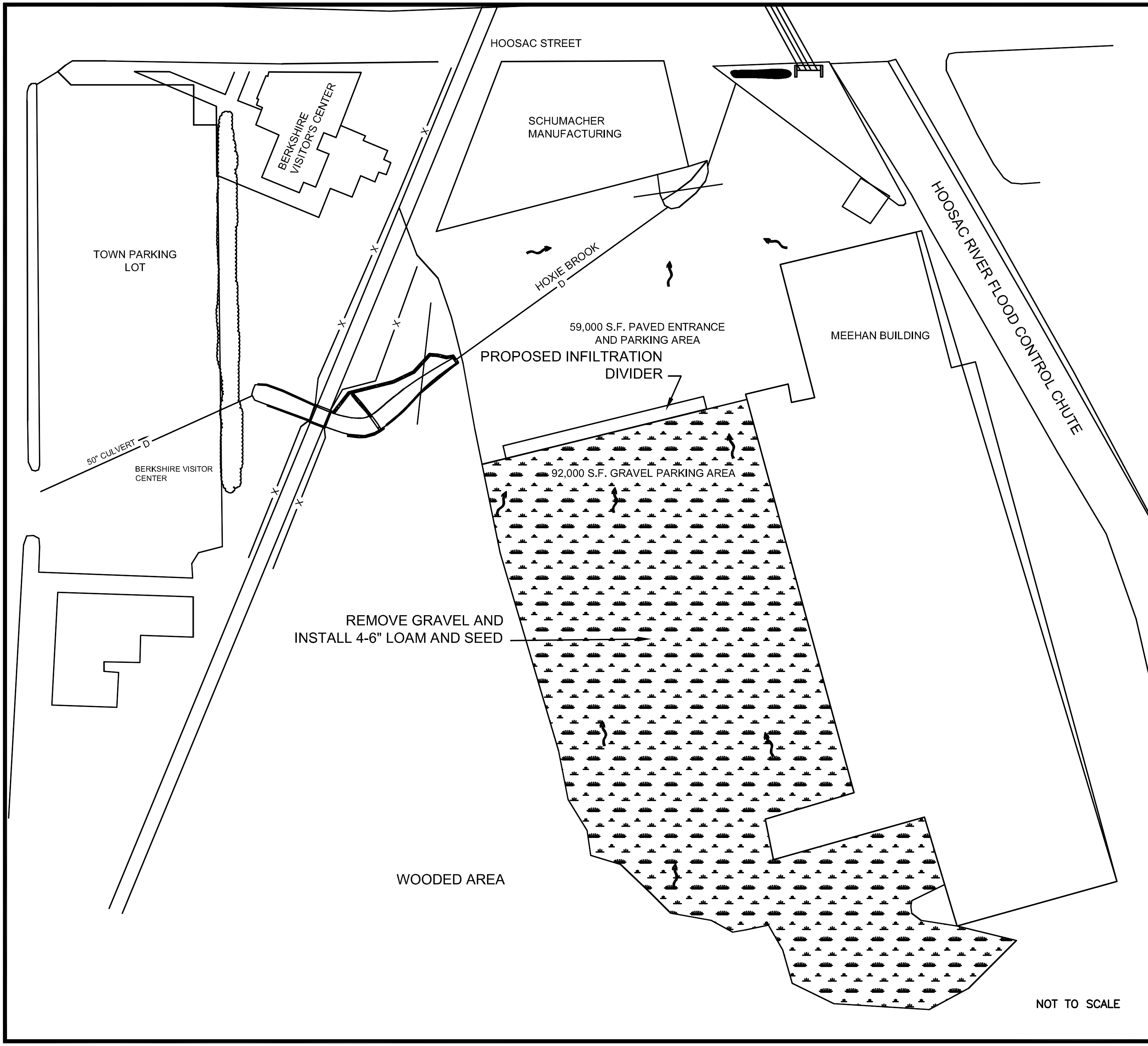


FIGURE 3: HOXIE BROOK SITE PROPOSED CONDITIONS - 2 OF 2

COMPREHENSIVE ENVIRONMENTAL INCORPORATED
64 DILLA STREET
MILFORD, MA 01757

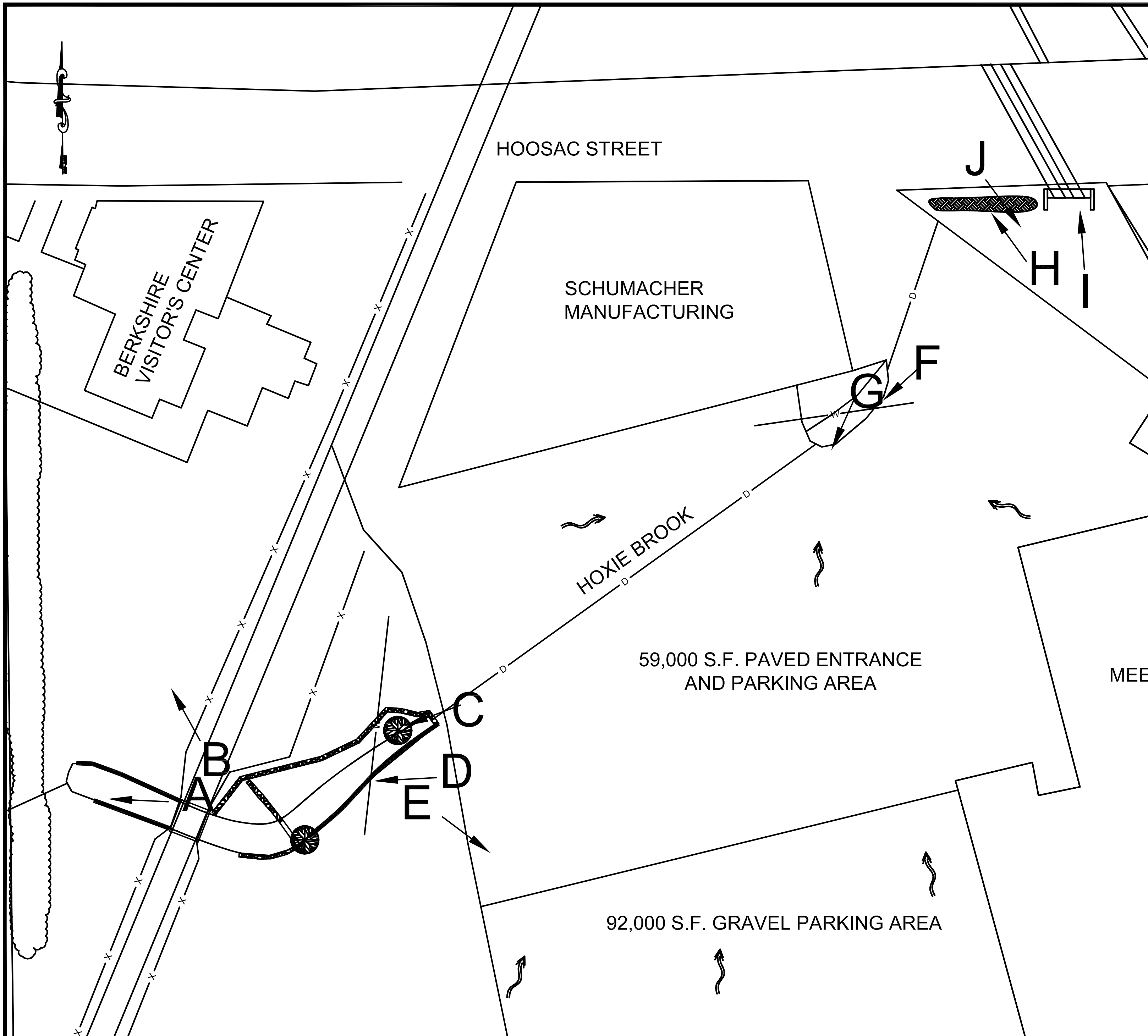


FIGURE 4: HOXIE BROOK SITE PICTURE LOCATIONS

COMPREHENSIVE ENVIRONMENTAL INCORPORATED
64 DILLA STREET
MILFORD, MA 01757

A – RETAINING WALL COLLAPSING NEAR CULVERT

B – UNFORESTED AREA ALONG STREAMBANK

C – STREAMBANK EROSION BETWEEN TREE AND CULVERT

D – COLLAPSING STONE AROUND WATERFALL

E – GRAVEL PARKING AREA TO BE LOAMED AND SEEDED

F – COLLAPSING RETAINING WALL IN OPEN STREAM SEGMENT

FIGURE 5: HOXIE BROOK SITE PICTURES I

COMPREHENSIVE ENVIRONMENTAL INCORPORATED

64 DILLA STREET
MILFORD, MA 01757

G – RETAINING WALL COLLAPSING INTO STREAM

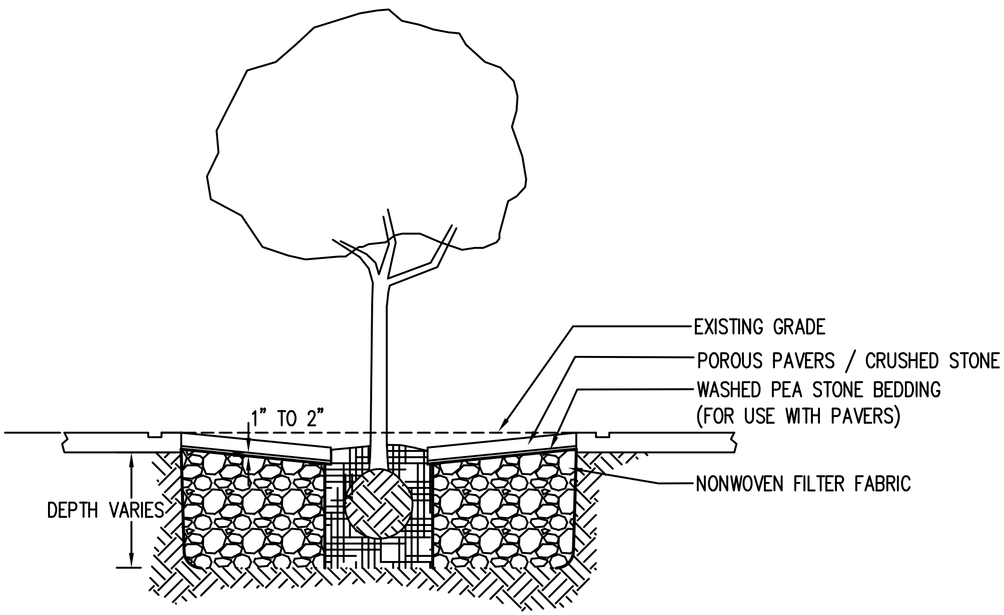
H – BANK BEING ERODED BY STORMWATER FROM OUTFALL

I – DETENTION AREA AND CULVERTS FILLED IN WITH SEDIMENT.

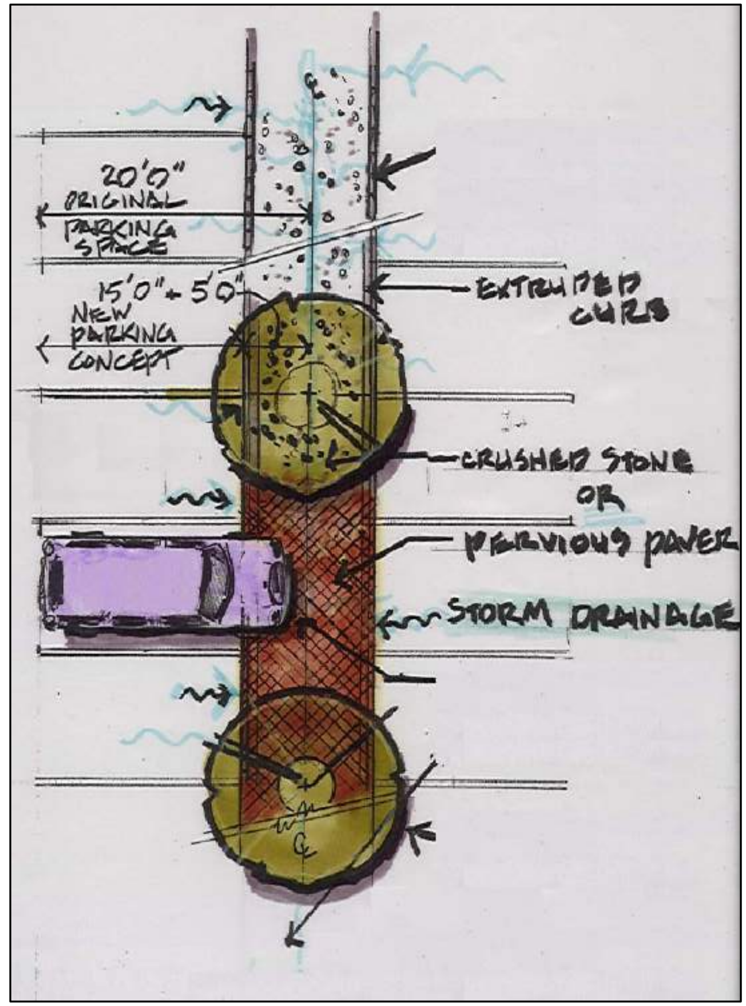
J – DETENTION AREA OVERVIEW

FIGURE 6: HOXIE BROOK SITE PICTURES II

COMPREHENSIVE ENVIRONMENTAL INCORPORATED
64 DILLA STREET
MILFORD, MA 01757



SECTION VIEW



PLAN VIEW

FIGURE 7: TYPICAL INFILTRATION DIVIDER

COMPREHENSIVE ENVIRONMENTAL INCORPORATED

64 DILLA STREET
MILFORD, MA 01757

Site: Adams DPW Yard – Wetlands Treatment

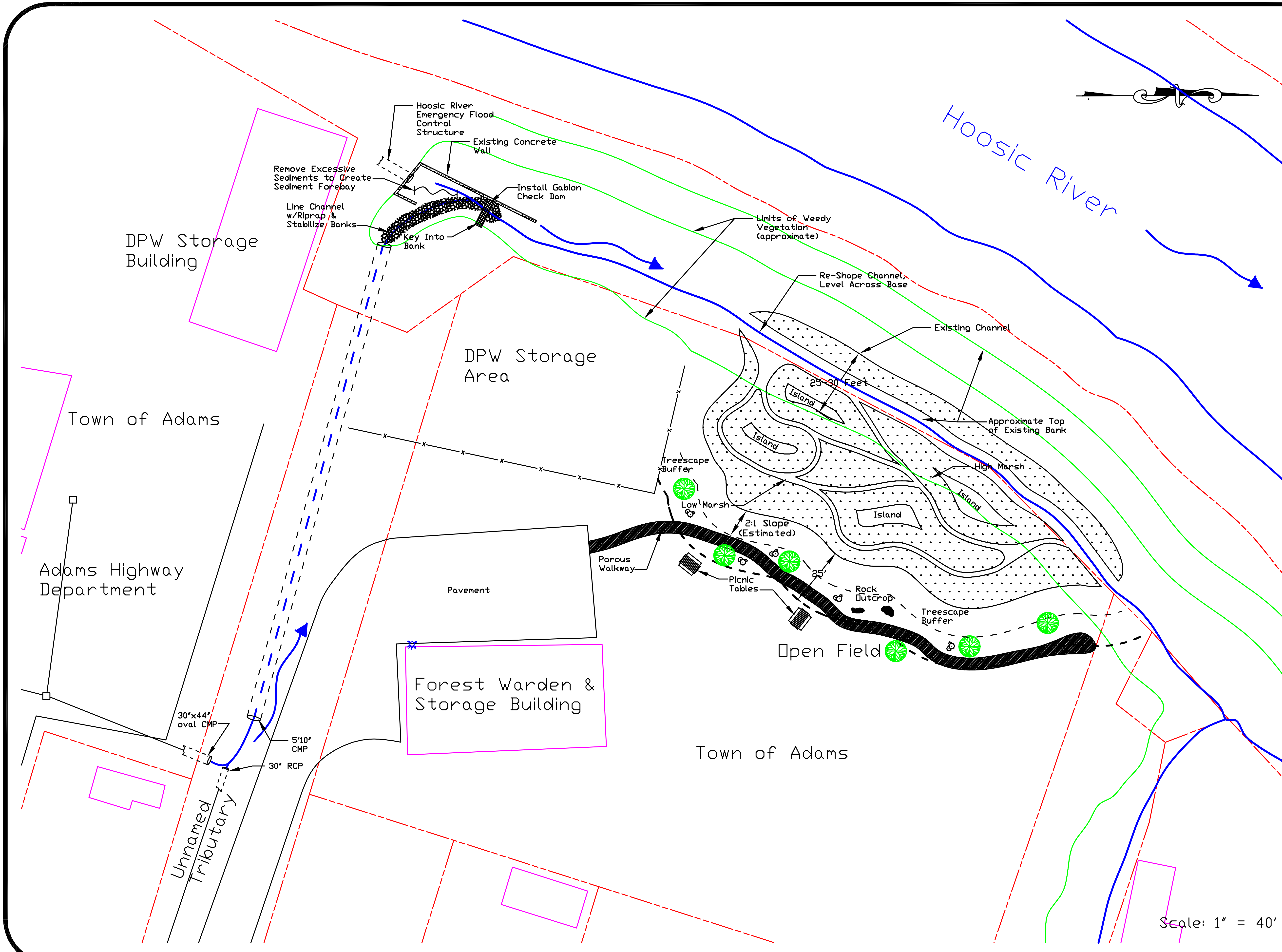
Cost: $106,000*

BMP Rank: 1

Description of Stormwater BMPs:

- Stormwater BMPs at this site utilize existing drainage features and Town-owned land to remove sediment and provide wetlands treatment/attenuation of nutrients (phosphorous) and bacteria before discharging to the Hoosic River.
- An unnamed tributary and stormwater systems at the DPW Yard flow through existing drainage channels along the Hoosic River. This steady base flow will be used to support a wetland treatment system downstream.
- The beginning of the channel, near the Hoosic River flood control structure, will be reshaped to create a forebay for sediment removal. The forebay includes a rip rap channel lining and bank stabilization with a gabion check dam to increase ponding and settling of sediments prior to wetland treatment.
- The drainage channel that flows parallel to the Hoosic River will be reshaped with a level base to increase contact with grassy vegetation and maximize stormwater treatment. The drainage channel will expand into a shallow marsh wetland for natural attenuation of stormwater pollutants before discharging to the Hoosic River. The partial off-line wetland treatment system will allow high flows to pass through the existing drainage channel without damaging the wetland treatment system.
- The wetland detention basin cannot handle all stormwater events due to the size of the drainage area (~193 acres) and land availability, but is intended to provide treatment for low to moderate stormwater flows and at least handle first flush stormwater flows.
- This stormwater treatment conceptual design is based on a shallow marsh wetland system (Design of Stormwater Wetland Systems, Thomas R. Schueler, October 1992) with meandering flow paths of high and low marsh conditions to support a variety of wetland plants. Islands, vegetated banks and tree plantings have been incorporated into the BMP conceptual design to add aesthetic value and support wildlife habitat.
- A walkway and park will be incorporated into the design for beautification and to establish a buffer to protect the shallow marsh wetland. This park will serve as a picnic area and promote public education of stormwater treatment systems with information signs along the walkway.

*This BMP conceptual design cost has been prepared for engineering design and construction of the project and does not include permitting or construction service costs.



General Notes

1. This site plan was developed from the Town of Adams Assessor's map. Some buildings were added with the assistance of aerial photographs provided by MassGIS. This site plan is intended to show approximate site features for the purpose of developing conceptual BMPs for stormwater remediation, as outlined in the 2005 Adams Stormwater Management Strategic Plan.

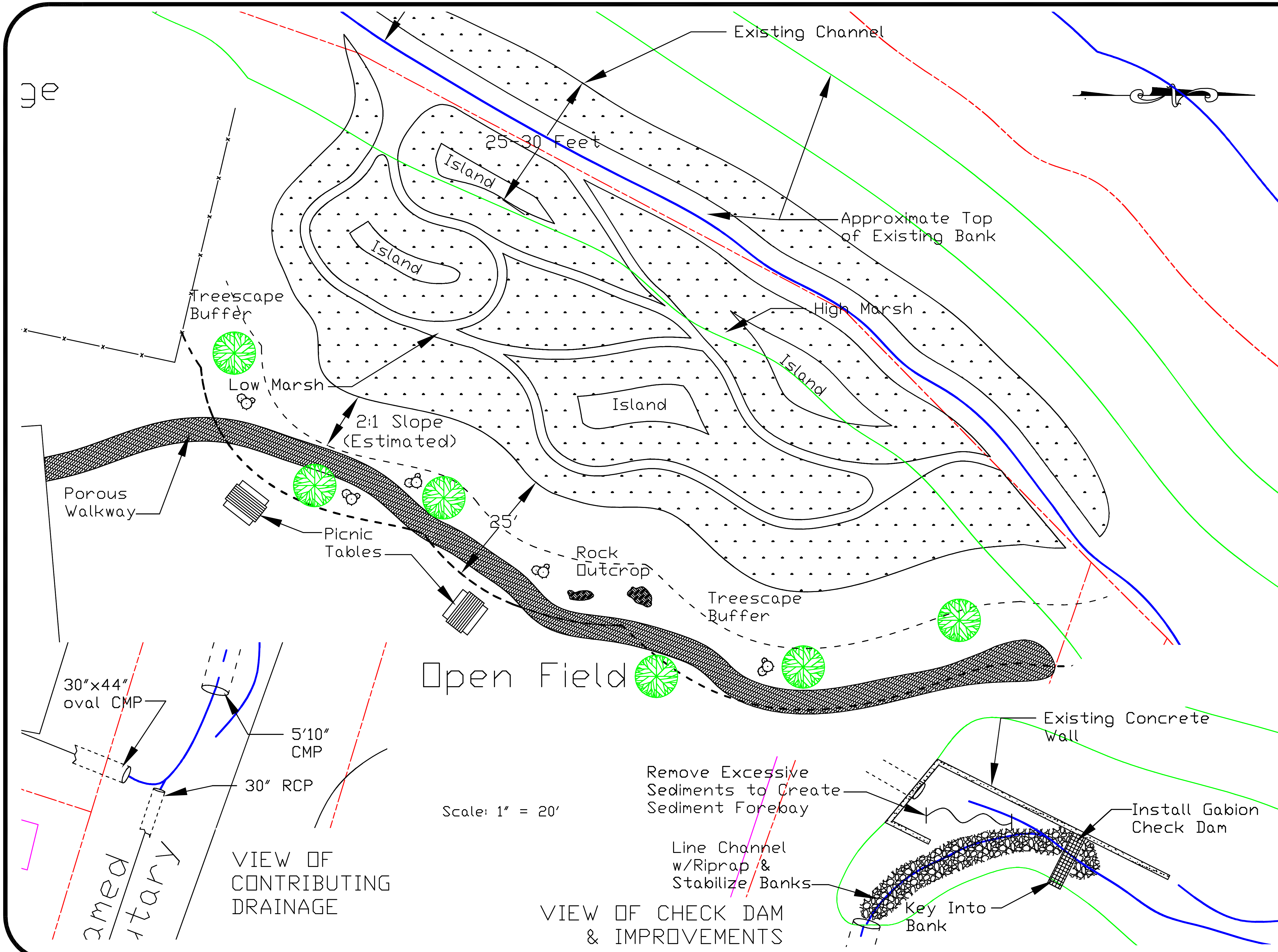
No.	Revision/Issue	Date

COMPREHENSIVE ENVIRONMENTAL INCORPORATED
64 DILLA STREET
MILFORD, MA 01757

Adams DPW Yard - Town of Adams Conceptual BMPs for Stormwater Remediation

Adams Stormwater Management Assessment Project: DEP 604(b) Project 2002-02

Project: 184-1	Sheet 1 of 2
Date: 1/19/04 DESIGNED BY: RN CHECKED BY: RB	
Scale: AS NOTED	



General Notes

1. This site plan was developed from the Town of Adams Assessor's map. Some buildings were added with the assistance of aerial photographs provided by MassGIS. This site plan is intended to show approximate site features for the purpose of developing conceptual BMPs for stormwater remediation, as outlined in the 2004 Adams Stormwater Management Strategic Plan.

No.	Revision/Issue	Date

COMPREHENSIVE ENVIRONMENTAL INCORPORATED
64 DILLA STREET
MILFORD, MA 01757

Adams DPW Yard - Town of Adams Conceptual BMPs for Stormwater Remediation

Adams Stormwater Management Assessment Project: DEP 604(b) Project 2002-02

Project: 184-1
Sheet: 2 of 2
Date: 1/19/04
DESIGNED BY: RN
CHECKED BY: RB
Scale: AS NOTED

CULVERT SECTION OF UNNAMED TRIBUTARY

BEGINNING OF SWALE ALONG THE HOOSIC RIVER, PROPOSED CHECK DAM IMPROVEMENT AREA

PROPOSED WETLAND TREATMENT SITE

EXISTING UNNAMED TRIBUTARY ALONG THE HOOSIC RIVER

DPW YARD BMP SITE PICTURES

COMPREHENSIVE ENVIRONMENTAL INCORPORATED

64 DILLA STREET
MILFORD, MA 01757

Site: Glenn Street – Swale Rehabilitation/Stabilization & Cascading Check Dams

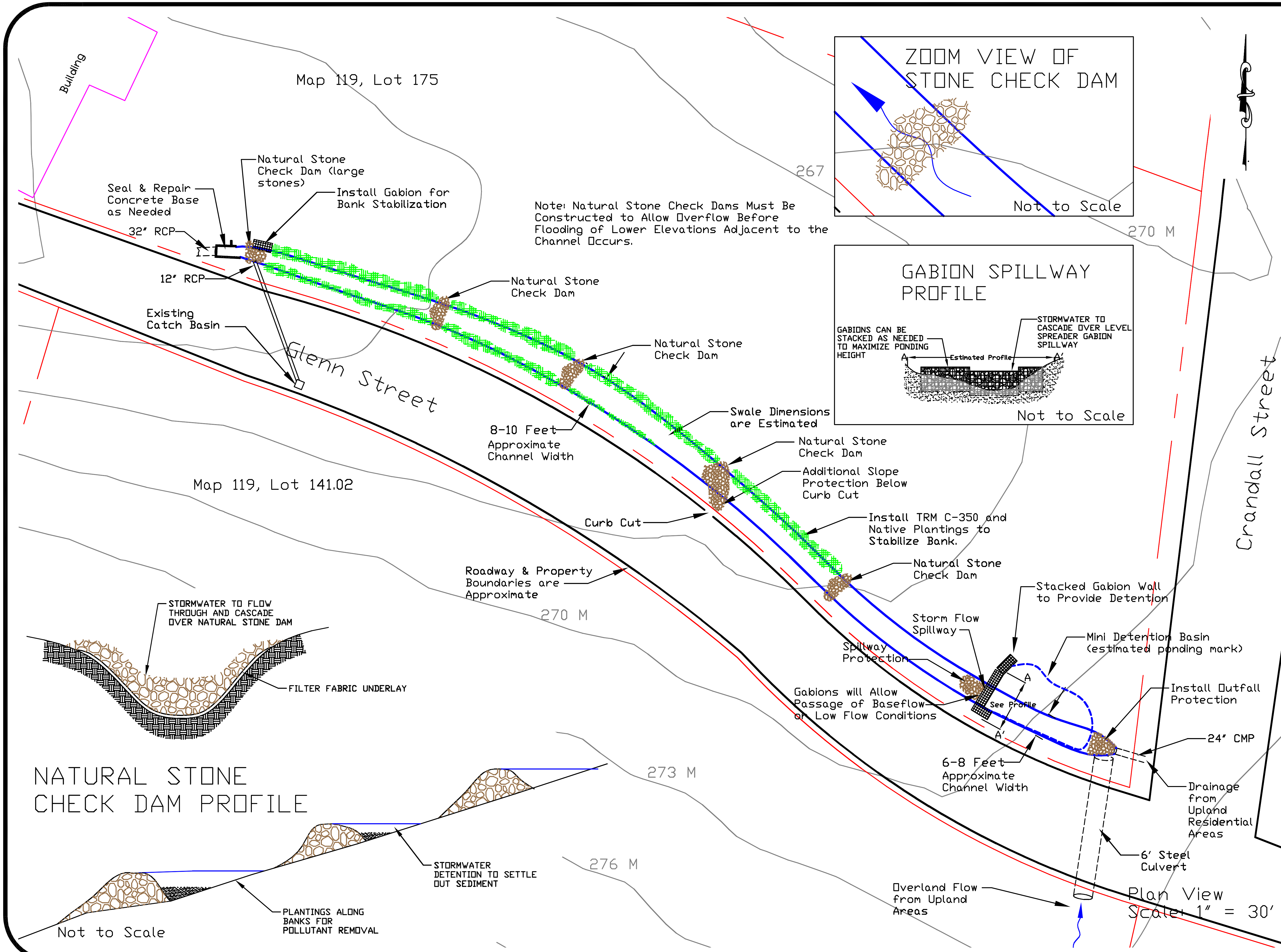
Cost: $27,000*

BMP Rank: 3

Description of Stormwater BMPs:

- The existing drainage swale at this site will be used to maximize stormwater detention, infiltration and treatment by using a mini detention basin and cascading gabion check dams.
- The mini detention basin will be constructed at the beginning of the rocky swale within the existing site contours using a gabion wall spillway. The detention basin will act as a plunge pool for sediment removal and to buffer initial stormwater flows at this steep site to prevent scouring.
- A series of check dams will be installed at various points along the swale to continually buffer stormwater flows and pond stormwater for sediment removal, as well as infiltration. Check dams will be constructed of natural stones to match the landscape and will create a cascading waterfall effect down the swale during storm events, making the site an appealing and effective BMP.
- Turf reinforcing material (TRM C-350) will be installed to stabilize the eroding banks of the swale and provide a vegetative support material. Plantings will be installed along the banks to increase pollutant removal through natural attenuation.
- Additional natural stones will be placed at the curb cut along Glenn Street to provide outfall protection and prevent erosion at this location.
- A gabion will be installed at the storm drain outfall at the end of the swale to prevent erosion and the concrete inlet to the 32” pipe beneath Glenn Street will be repaired.

*This BMP conceptual design cost has been prepared for engineering design and construction of the project and does not include permitting or construction service costs.



General Notes

1. This site plan was developed from GIS data provided by BRPC, MassGIS and the Town of Adams Assessor's map. This site plan is intended to show approximate site features for the purpose of developing conceptual BMPs for stormwater remediation, as outlined in the 2005 Adams Stormwater Management Strategic Plan.

No.	Revision/Issue	Date

COMPREHENSIVE ENVIRONMENTAL INCORPORATED
64 DILLA STREET
MILFORD, MA 01757

Glenn Street Site - Town of Adams Conceptual BMPs for Stormwater Remediation

Adams Stormwater Management Assessment Project: DEP 604(b) Project 2002-02

Project: 184-1
Date: 3/15/04
DESIGNED BY: RN
CHECKED BY: RB
Scale: AS NOTED
Sheet 1 of 1

EXISTING SWALE AT THE INTERSECTION OF GLENN ST. AND CRANDALL ST.

DEPRESSED AREA AND CHANNELIZED SWALE

DRAINAGE DISCHARGES TO THE EXISTING SWALE

END OF SWALE WHERE IT ENTERS THE CLOSED DRAINAGE SYSTEM IN GLENN STREET

ERODED SWALE ALONG GLENN STREET

GLENN STREET BMP
SITE PICTURES

COMPREHENSIVE ENVIRONMENTAL INCORPORATED
64 DILLA STREET
MILFORD, MA 01757

Site: U.S. Post Office – Runoff Prevention Methods (RPMs)

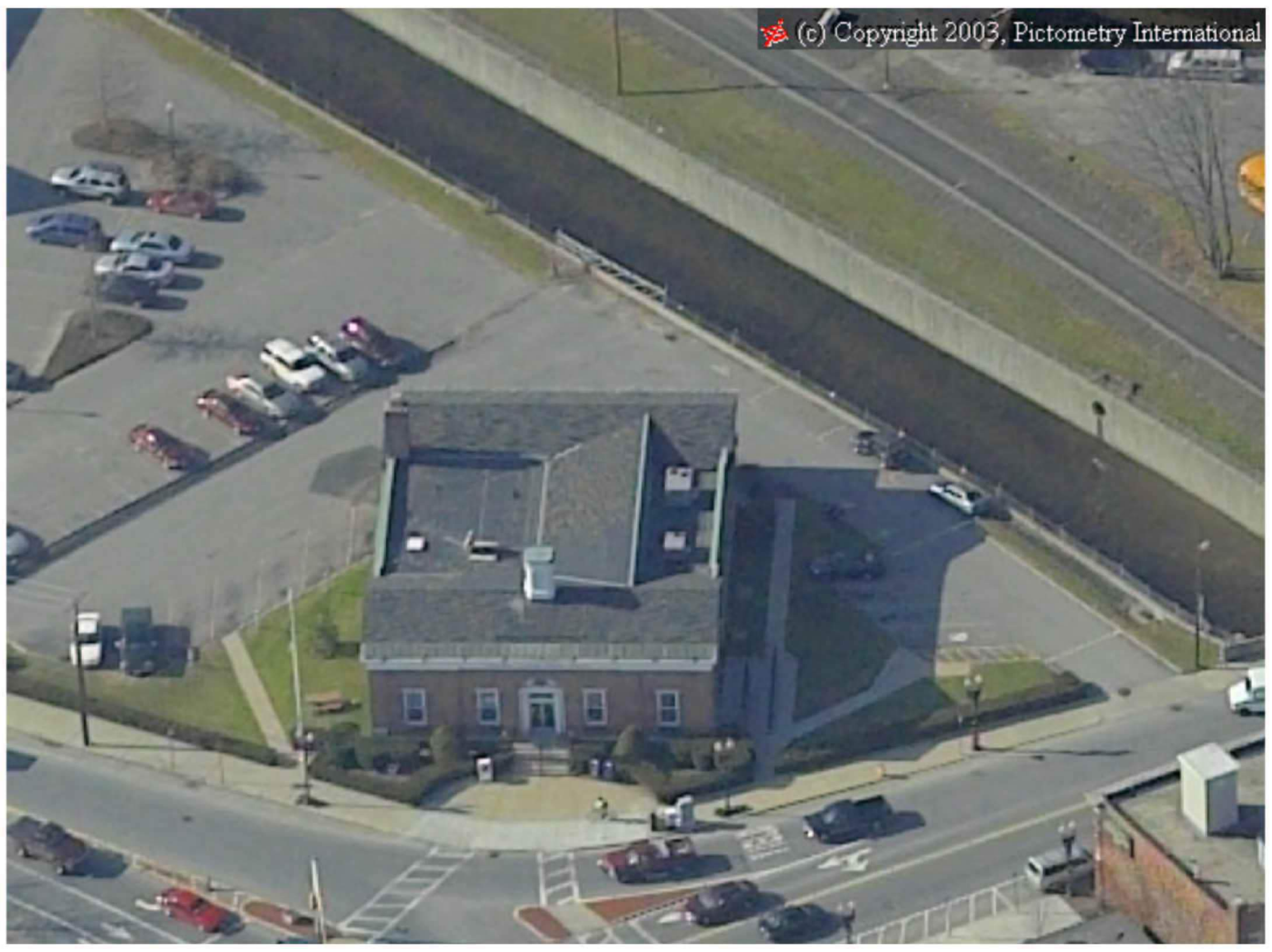
Cost: $192,000*

BMP Rank: 4

Description of Stormwater BMPs:

- Stormwater BMPs at this site will prevent runoff to the best extent possible and maximize infiltration and treatment before discharging to the Hoosic River.
- Stormwater will be handled by a combination of runoff prevention methods (RPMs) to prevent/reduce runoff and provide stormwater treatment at least during first flush conditions for small storm events. These methods at the site include: roof leader dry wells, bioislands, infiltration dividers and strips, diversion berms, vegetated swales and porous pavers.
- Storm flows from roof leaders create excess stormwater discharges from the site and result in more stormwater volume to treat, as well as increased flashiness of the Hoosic River. Roof leader dry wells will be used for on-site recharge and to remove/decrease this flow from the stormwater treatment equation.
- Vegetated swales will be used to treat stormwater along the Hoosic River prior to entering existing storm drain structures. Site conditions require only rehabilitation of existing swale areas.
- Infiltration dividers and strips (porous pavers) will be used to handle portions of the stormwater flow. These BMPs do not compromise parking space and bioislands have been incorporated into existing landscaped islands or excess paved areas at the site (e.g., large paved area west of 1 Commercial Place).

*This BMP conceptual design cost has been prepared for engineering design and construction of the project and does not include permitting or construction service costs.



AERIAL VIEW OF THE U.S. POST OFFICE IN DOWNTOWN ADAMS

HOOSIC RIVER FLOOD CONTROL CHUTE ALONG THE U.S. POST OFFICE SITE

PROPOSED INFILTRATION STRIP (POROUS PAVERS) AND GRASSY SWALE REPLACEMENT SITES

EXISTING GRASSY SWALE ALONG 1 COMMERCIAL STREET PROPERTY (CONTOUR TO COLLECT PARKING LOT RUNOFF)

PROPOSED GRASSY SWALE SITE

PROPOSED INFILTRATION DIVIDER SITE AT 1 COMMERCIAL PLACE

U.S. POST OFFICE
BMP SITE PICTURES
1 OF 2

COMPREHENSIVE ENVIRONMENTAL INCORPORATED
64 DILLA STREET
MILFORD, MA 01757

PROPOSED BIOISLAND SITE USING EXISTING LANDSCAPE BEDS AT 1 COMMERCIAL PLACE

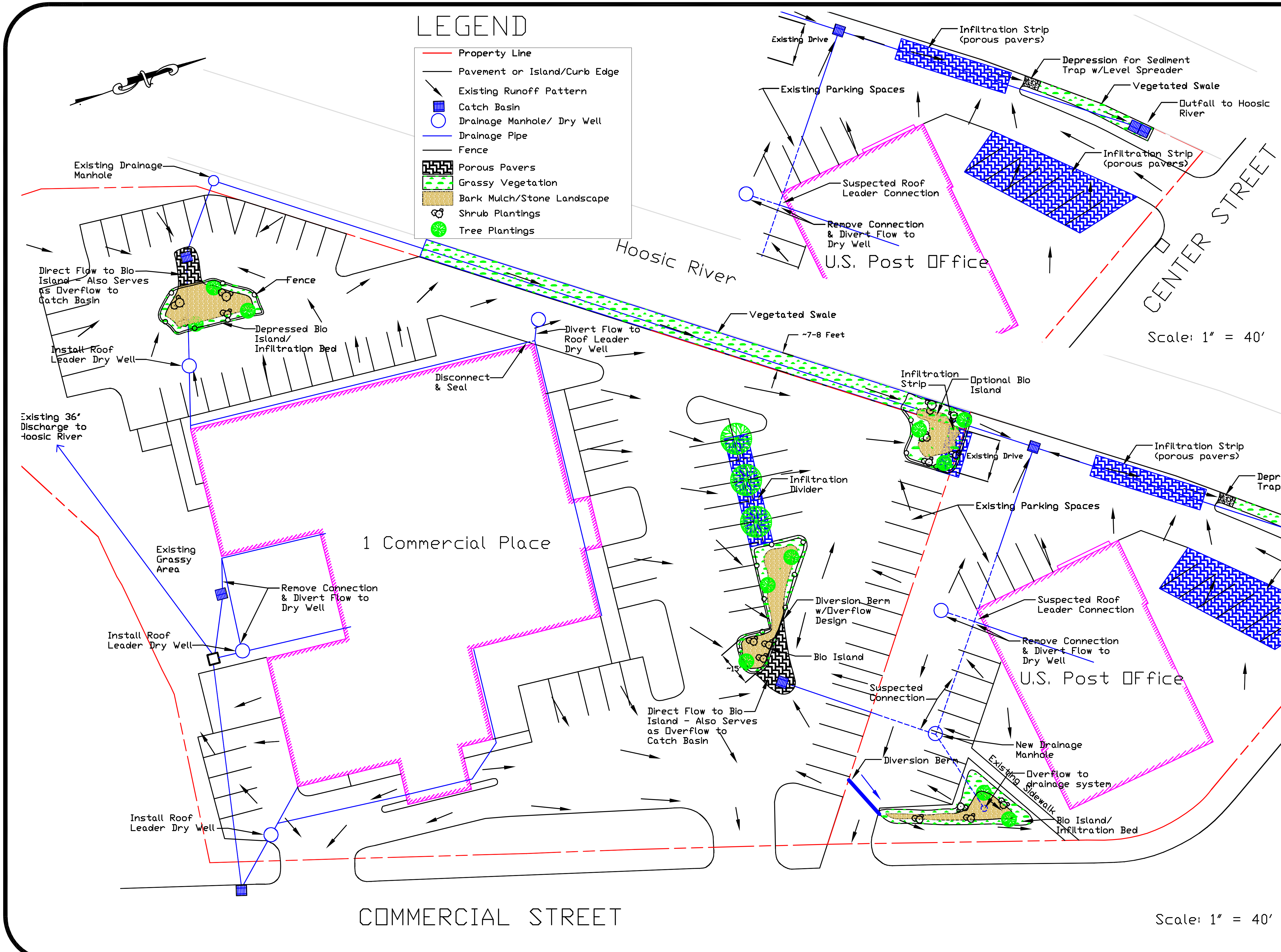
PROPOSED BIOISLAND SITE IN OPEN GRASSY AREA AT THE U.S. POST OFFICE

PROPOSED BIOISLAND SITE AT 1 COMMERCIAL STREET NEXT TO THE HOOSIC RIVER (RIGHT)

U.S. POST OFFICE
BMP SITE PICTURES
2 OF 2

COMPREHENSIVE ENVIRONMENTAL INCORPORATED

64 DILLA STREET
MILFORD, MA 01757



General Notes

1. This site plan was developed from scanned images of the following drawings: "Site Plan" by Cambridge Seven Associates, Inc., 2/4/87; "1 Commercial Place Landscape Plan" by Dr. Lahey's Garden, 2/4/88; and "Soil Excavation Location" by EMCON, 8/23/95. Site plans were manually overlayed based on property boundaries and are intended to show approximate site features for the purpose of developing conceptual BMPs for stormwater remediation.

2. Overland drainage patterns and subsurface drainage structures are based on field inspections by CEI and locations are approximate.

3. See Sheet 2 for Infiltration Strip and Roof Leader Dry Well/ Leaching Catch Basin details.

4. See Sheet 3 for Bio Island and Infiltration Divider details.

No.	Revision/Issue	Date

COMPREHENSIVE ENVIRONMENTAL INCORPORATED
64 DILLA STREET
MILFORD, MA 01757

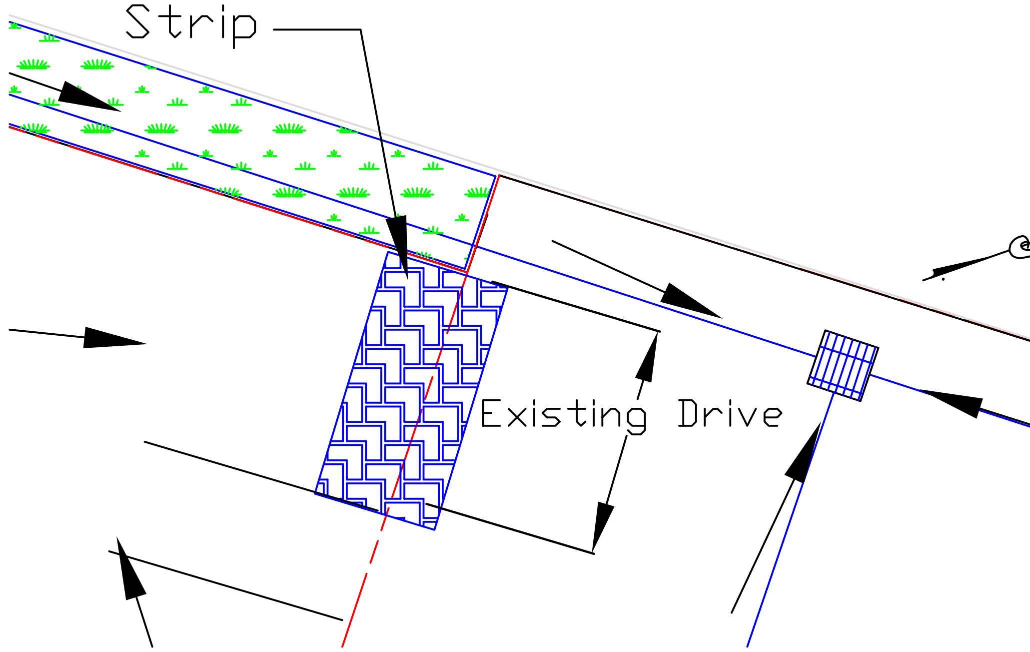
U.S. Post Office & 1 Commercial Place - Town of Adams
Conceptual BMPs for Stormwater Remediation

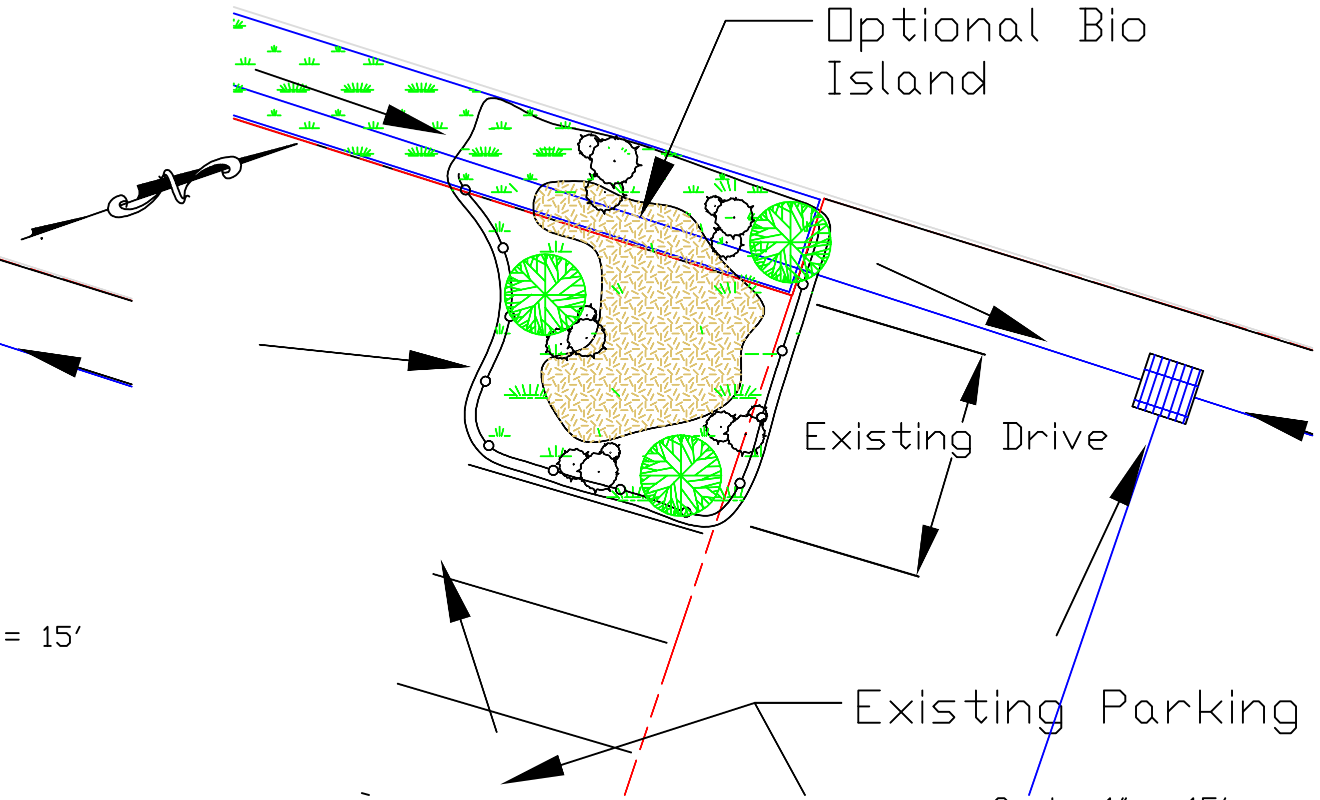
Adams Stormwater Management Assessment Project: DEP 604(b) Project 2002-02

Project: 184-1
Date: 5/10/04
DESIGNED BY: RN
CHECKED BY: RB
Scale: AS NOTED

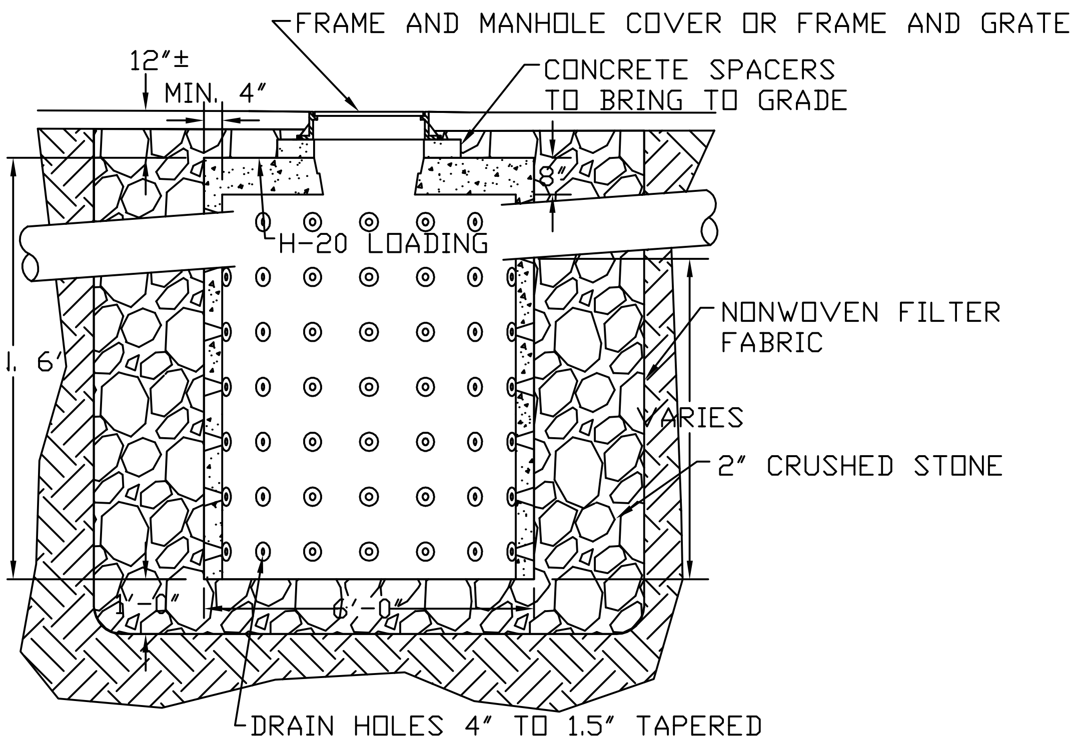
Sheet 1 of 3

Alternative BMPs



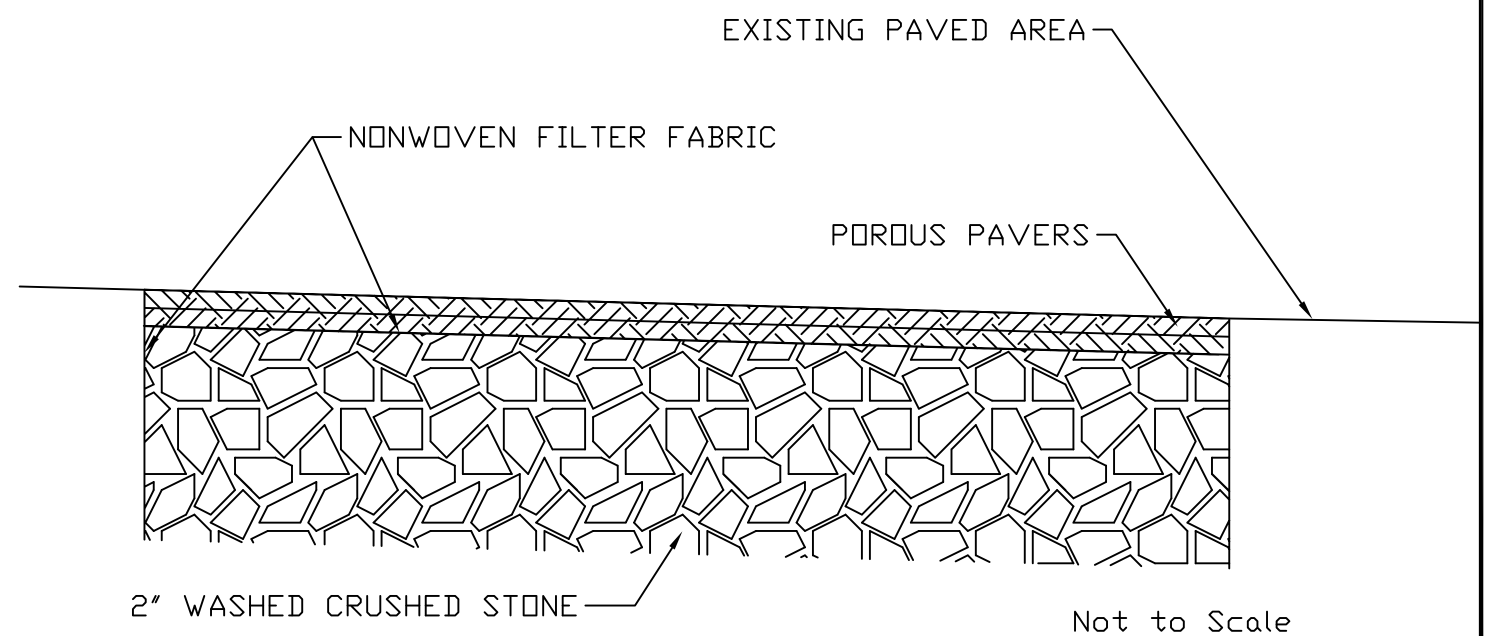


Roof Leader Dry Well/ Leaching Catch Basin



Not to Scale

Infiltration Strip



Not to Scale

General Notes

1. Infiltration strips, leaching catch basins and roof leader dry wells to be sized to hold 1" of runoff from respective contributing drainage areas.

No.	Revision/Issue	Date

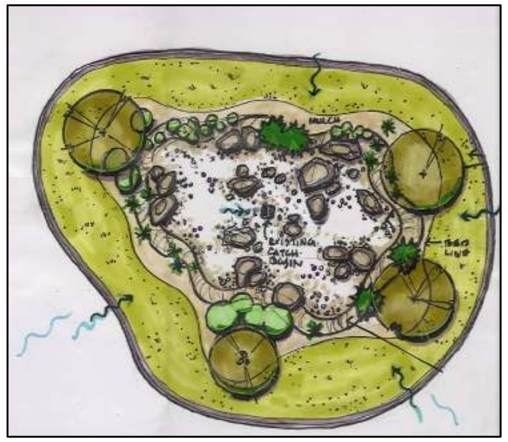
COMPREHENSIVE ENVIRONMENTAL INCORPORATED
64 DILLA STREET
MILFORD, MA 01757

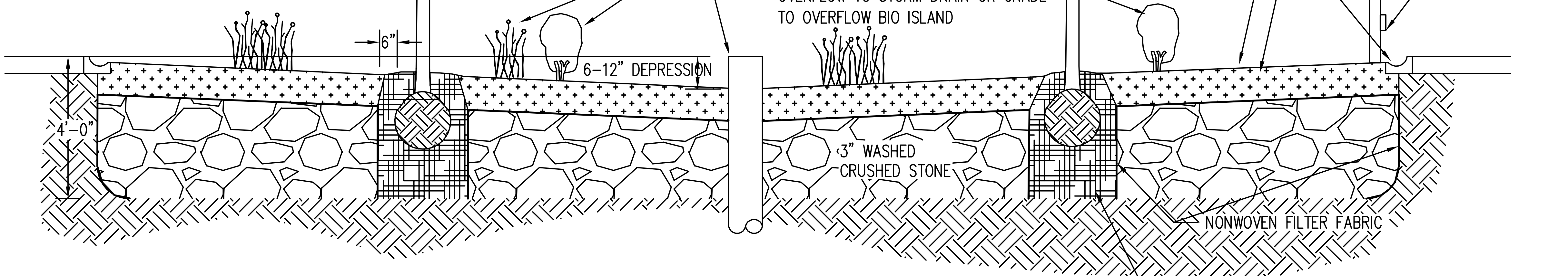
U.S. Post Office & 1 Commercial Place - Town of Adams
Conceptual BMPs for Stormwater Remediation

Adams Stormwater Management Assessment Project: DEP 604(b) Project 2002-02

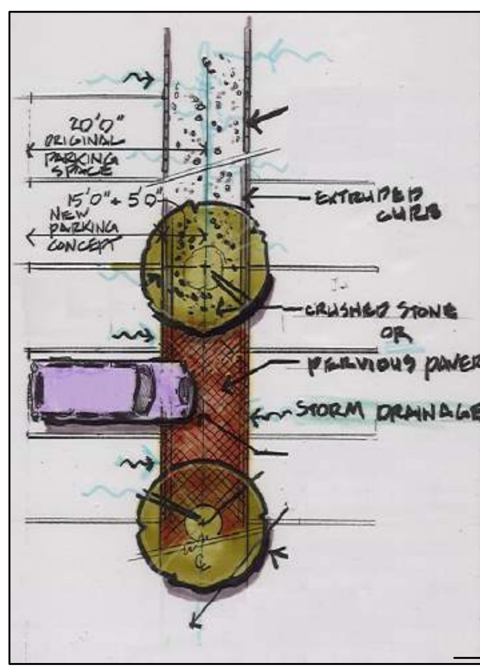
Project: 184-1
Date: 5/10/04
DESIGNED BY: RN
CHECKED BY: RB
Scale: AS NOTED
Sheet 2 of 3

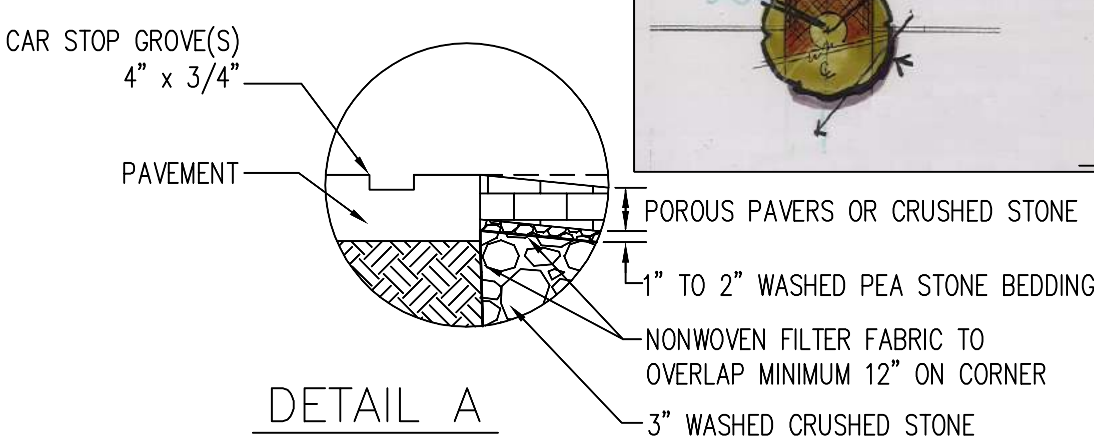
Bio Island



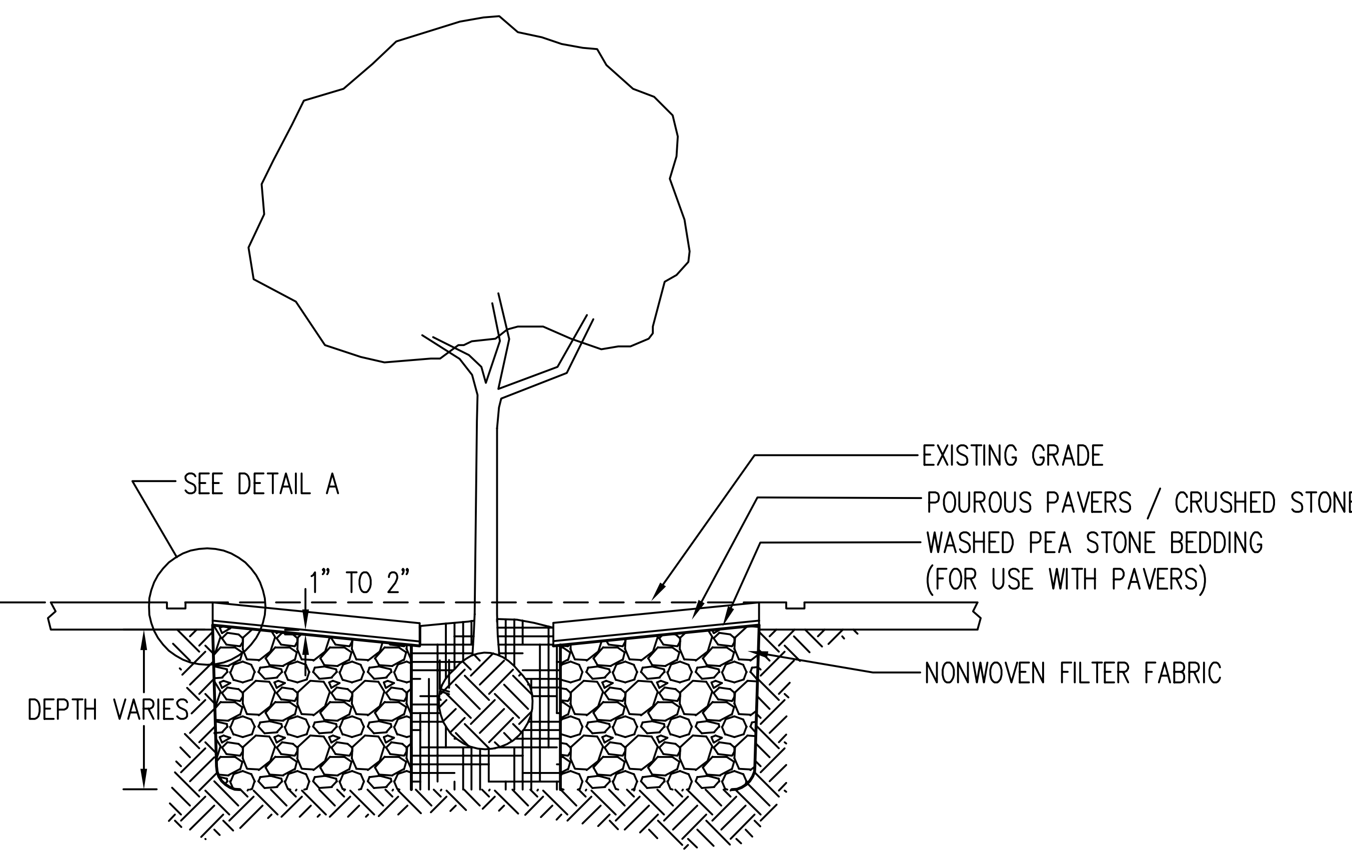


Infiltration Divider





DETAIL A



Not to Scale

General Notes

1. Bio Islands and infiltration dividers to be sized to hold 1" of runoff from respective contributing drainage areas.

No.	Revision/Issue	Date

COMPREHENSIVE ENVIRONMENTAL INCORPORATED
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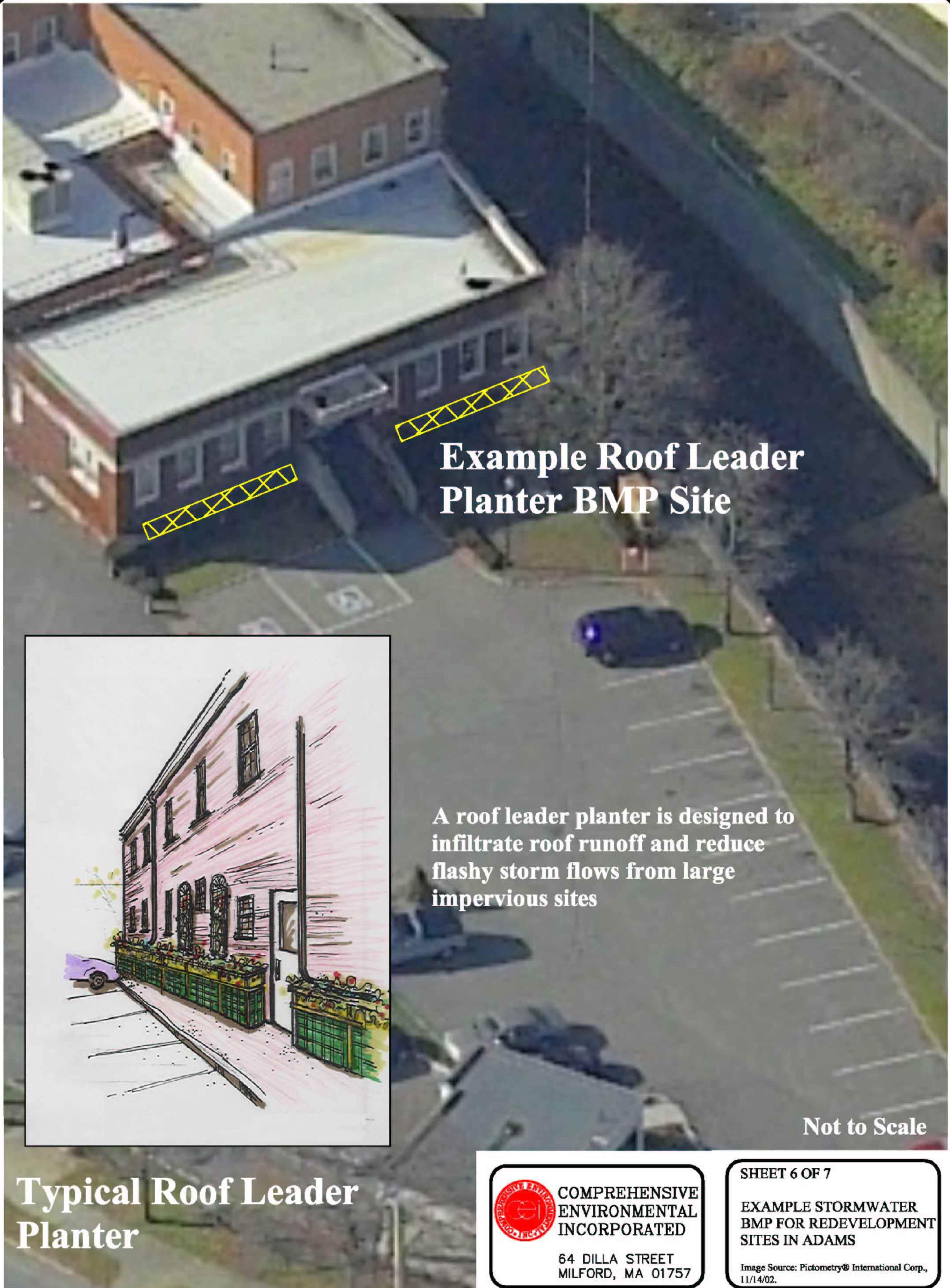
MILFORD, MA 01757

U.S. Post Office & 1 Commercial Place - Town of Adams
Conceptual BMPs for Stormwater Remediation

Adams Stormwater Management Assessment Project: DEP 604(b)
Project 2002-02

Project: 184-1
Date: 5/10/04
DESIGNED BY: RN
CHECKED BY: RB
Scale: AS NOTED
Sheet: 3 of 3

Conceptual BMP Designs for Redevelopment Projects



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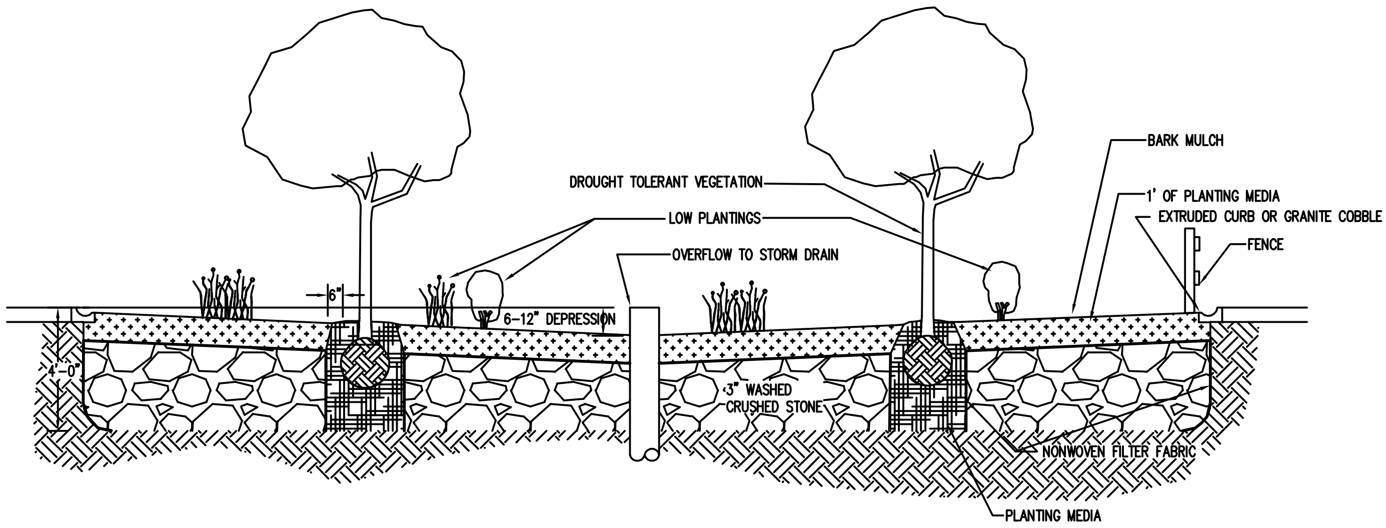
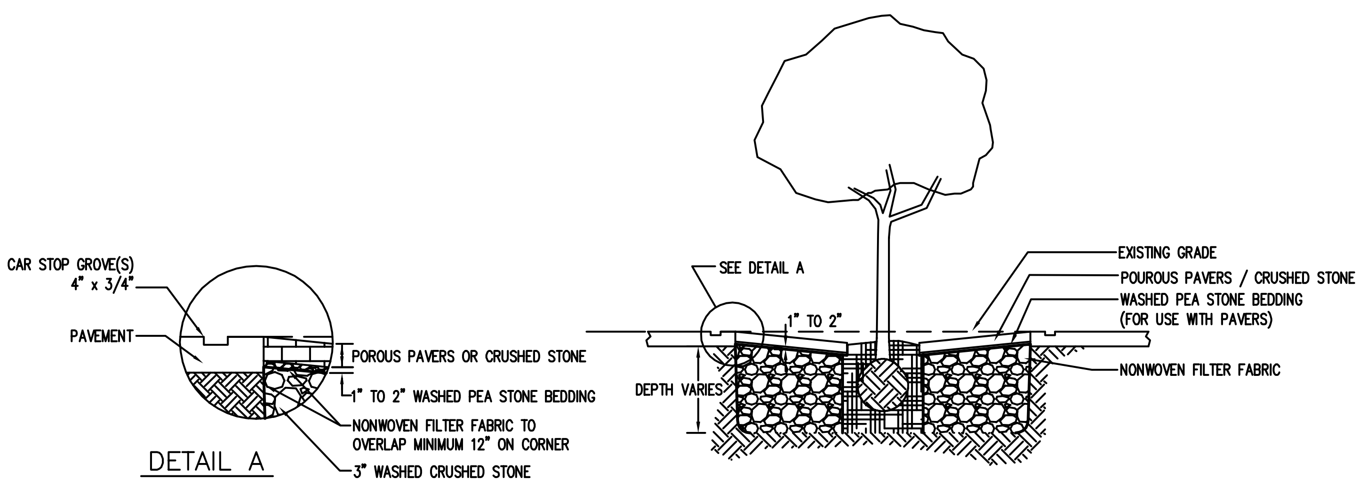
SHEET 6 OF 7

EXAMPLE STORMWATER
BMP FOR REDEVELOPMENT
SITES IN ADAMS

Image Source: Pictometry® International Corp., 11/14/02.



Typical Bioisland Profile



Typical Infiltration Divider Profile

Not to Scale

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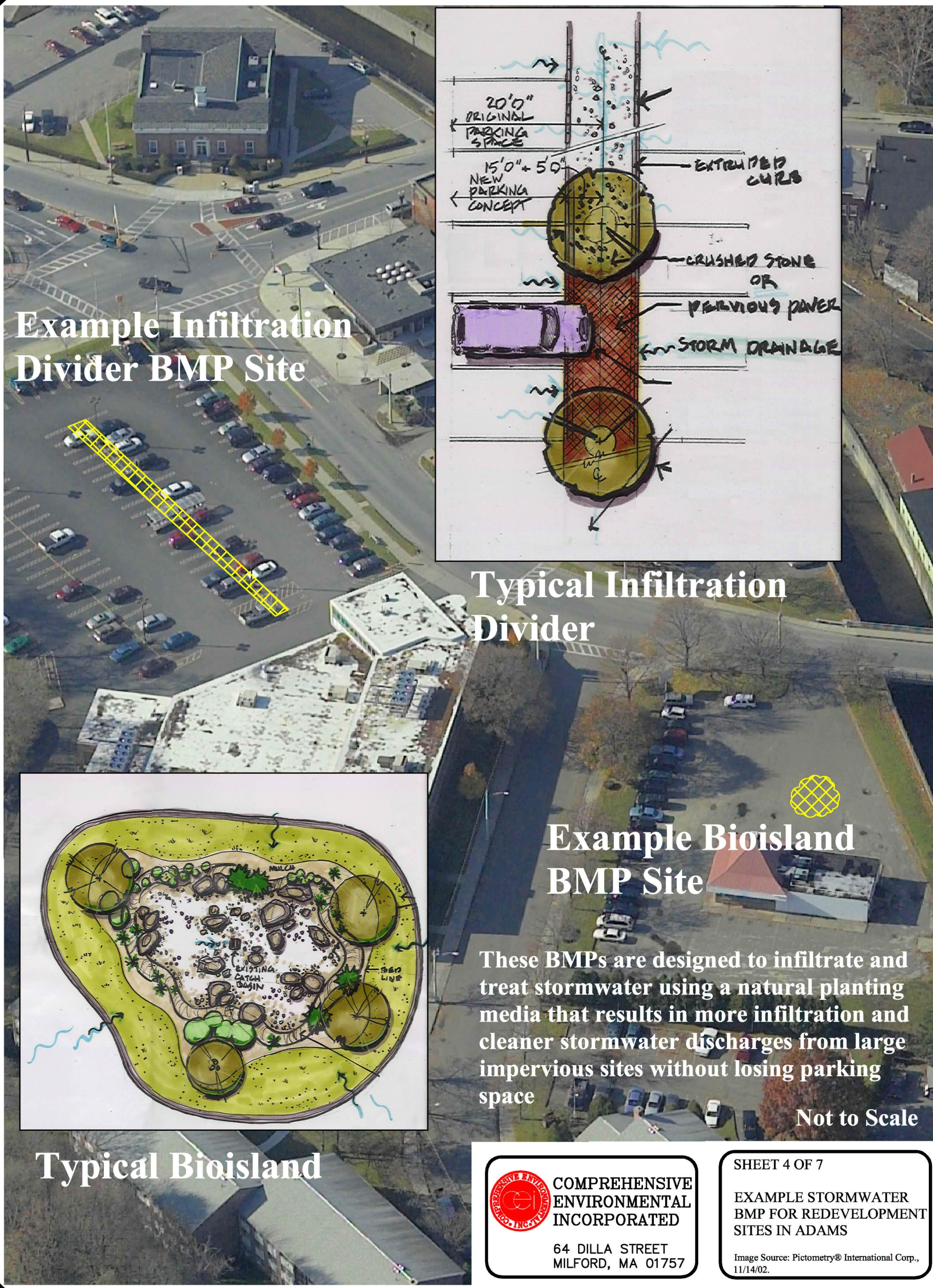
SHEET 5 OF 7

EXAMPLE STORMWATER
BMP FOR REDEVELOPMENT
SITES IN ADAMS

Image Source: Pictometry® International Corp.,
11/14/02.



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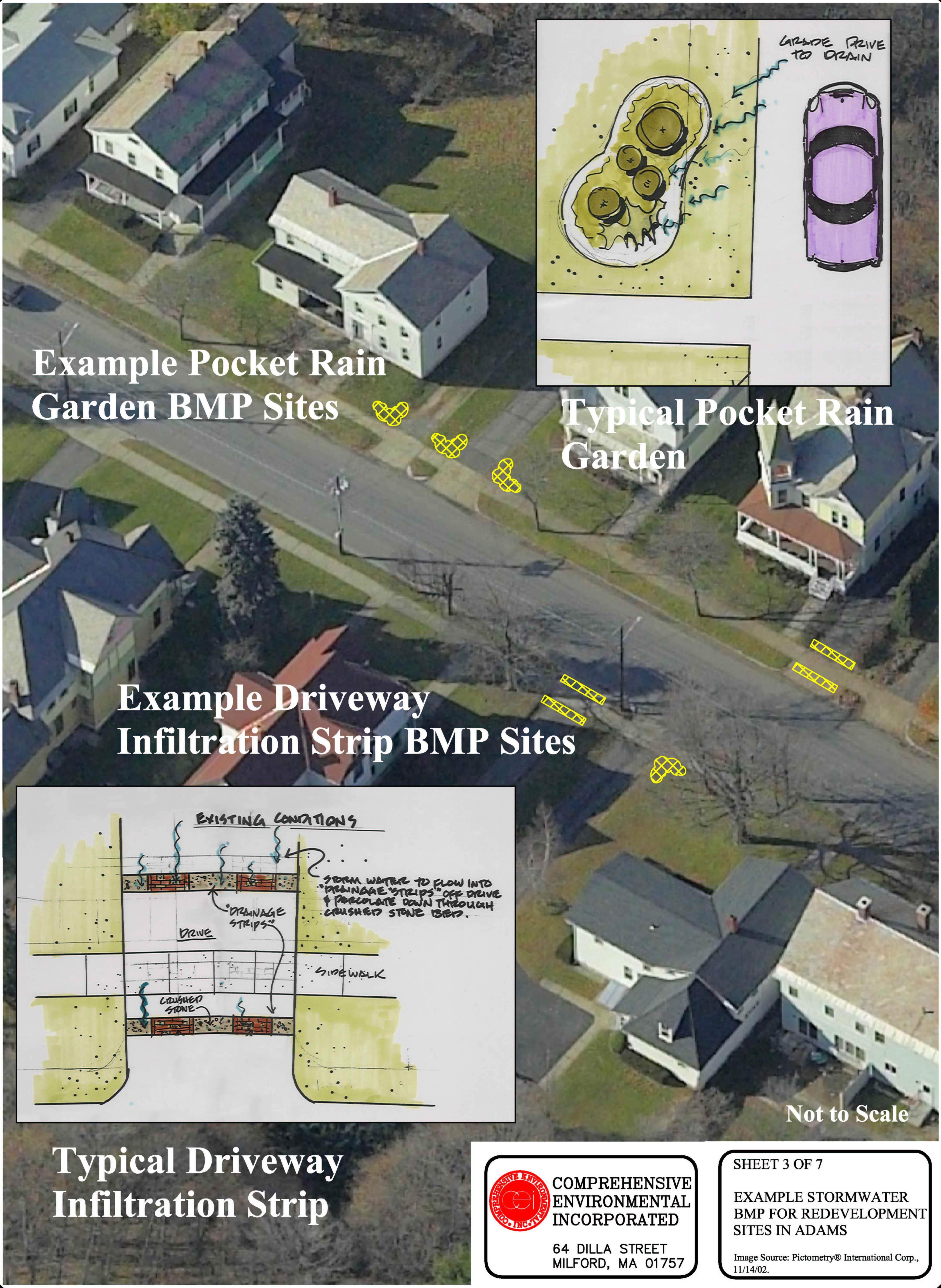
EXAMPLE STORMWATER BMP FOR REDEVELOPMENT SITES IN ADAMS

Image Source: Pictometry® International Corp., 11/14/02.



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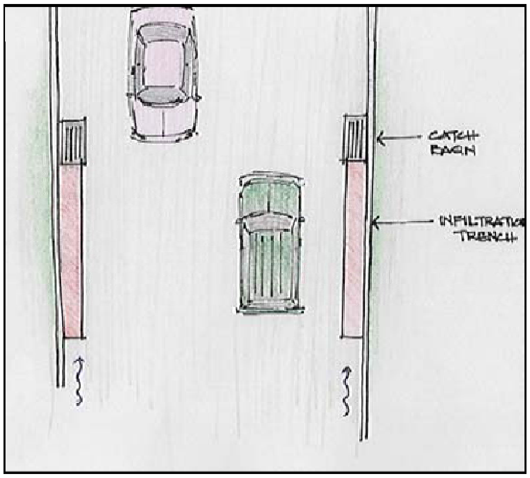
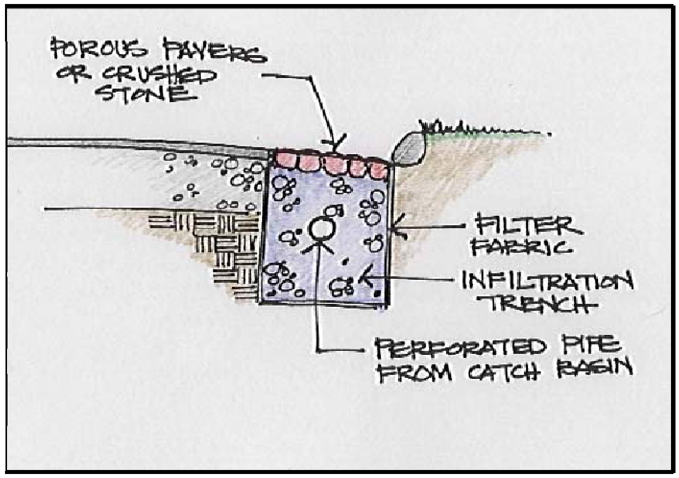
SHEET 3 OF 7

EXAMPLE STORMWATER BMP FOR REDEVELOPMENT SITES IN ADAMS

Image Source: Pictometry® International Corp., 11/14/02.





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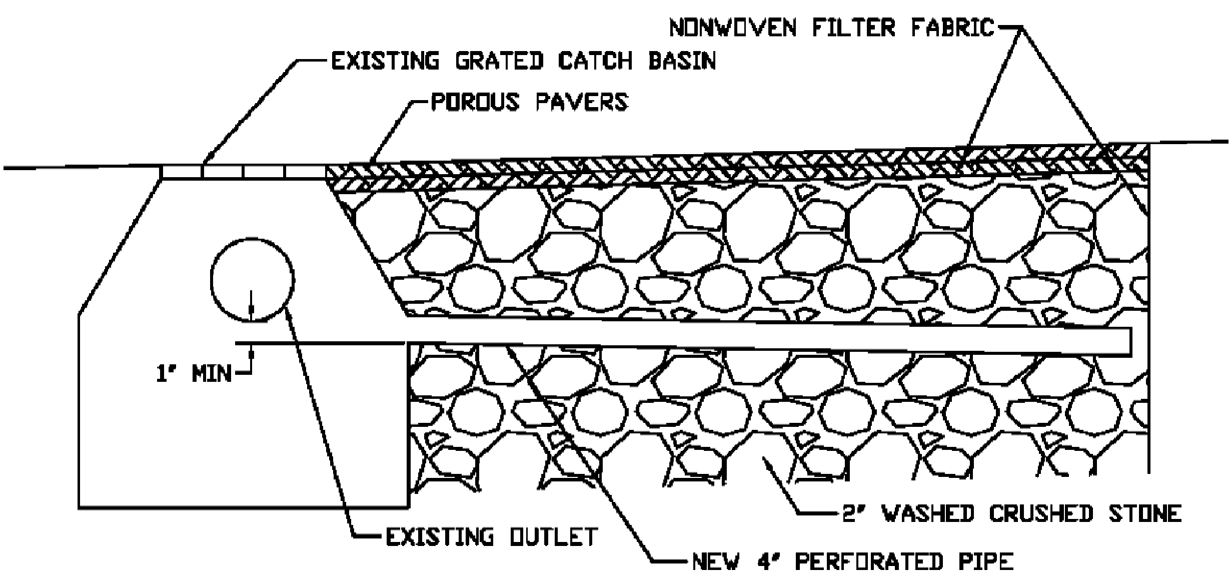

Typical Brick Paver Gutterline BMP

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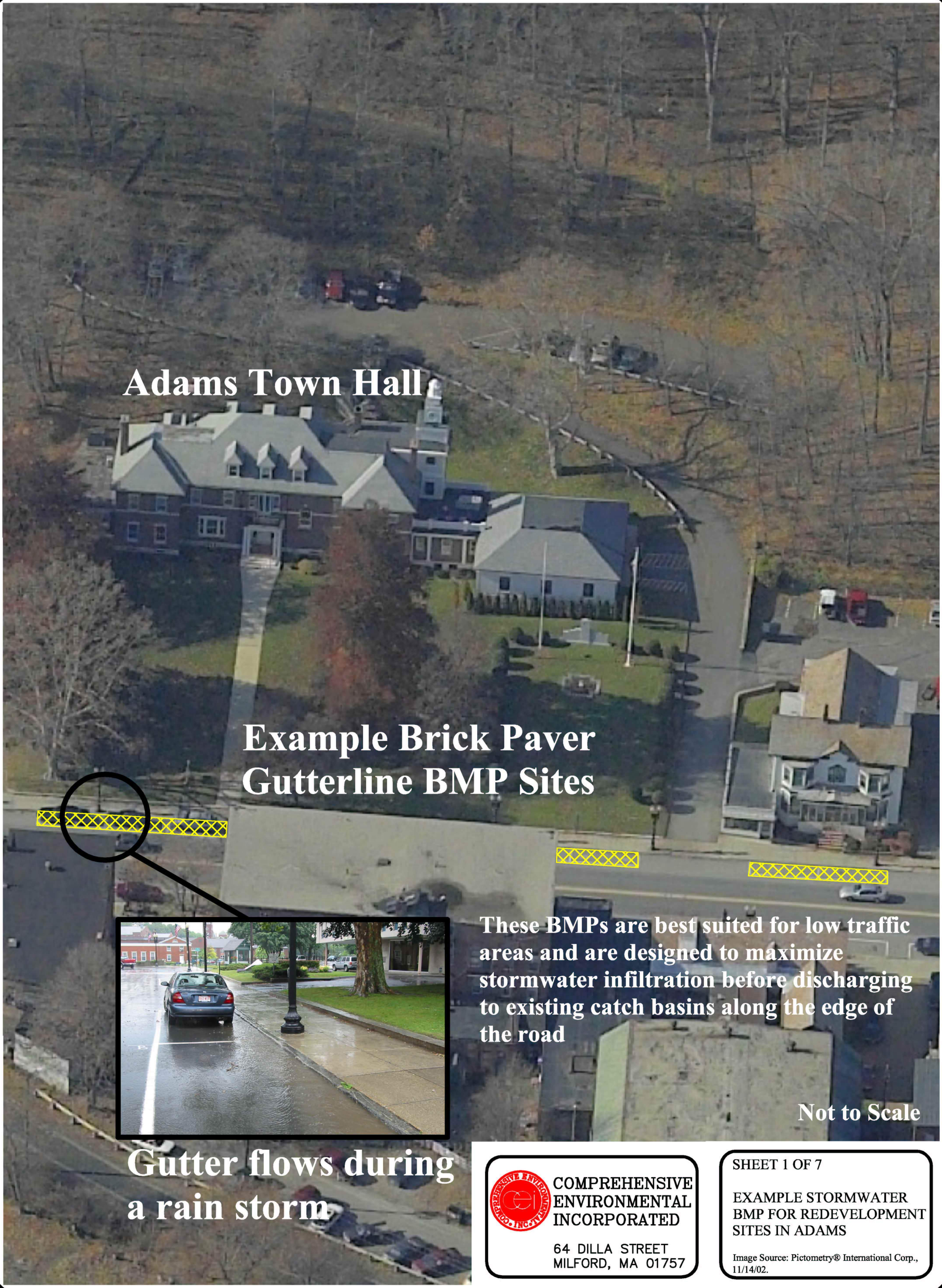
MILFORD, MA 01757

SHEET 2 OF 7

EXAMPLE STORMWATER BMP FOR REDEVELOPMENT SITES IN ADAMS

Image Source: Pictometry® International Corp., 11/14/02.



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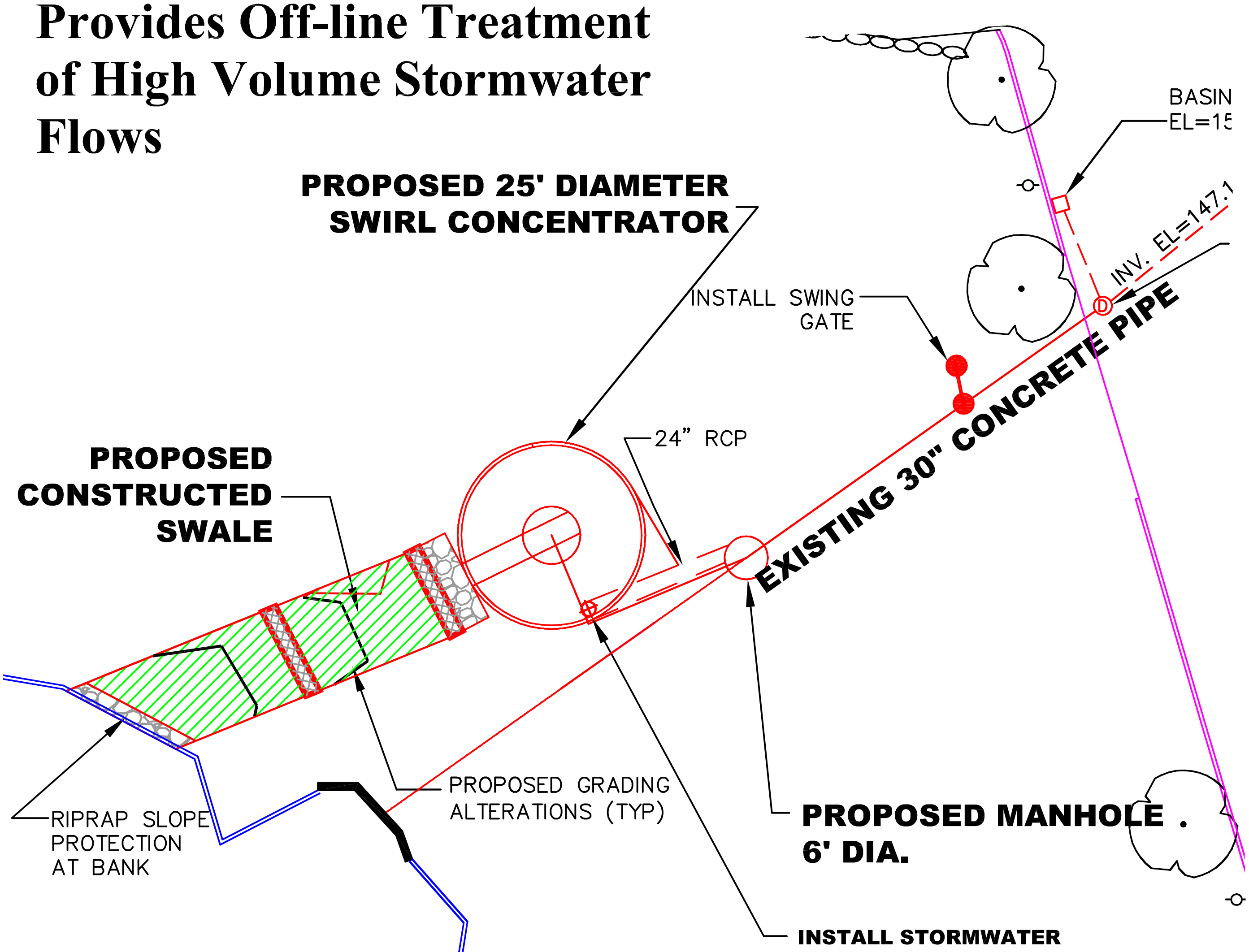
SHEET 1 OF 7

EXAMPLE STORMWATER BMP FOR REDEVELOPMENT SITES IN ADAMS

Image Source: Pictometry® International Corp., 11/14/02.

A Swirl Concentrator Provides Off-line Treatment of High Volume Stormwater Flows



Swirl Concentrator During Final Construction

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SHEET 7 OF 7

EXAMPLE STORMWATER
BMP FOR REDEVELOPMENT
SITES IN ADAMS

Image Source: Pictometry® International Corp., 11/14/02.

6.0 Pollution Prevention & Good Housekeeping for Municipal Operations

This section evaluates existing municipal operations and presents pollution prevention and good housekeeping practices that the Town of Adams can use to address water quality protection, as well as fulfill Control Measure 6 of the Phase II stormwater requirements.

Control Measure 6 of the Phase II Stormwater rule requires regulated operators of MS4s to examine their municipal operations and to alter them as needed to reduce pollutants to stormwater discharges. The alteration of municipal operations should focus on reducing pollution from streets, parking lots, open spaces and storage and vehicle maintenance areas. Improvements to land development and flood management practices and the maintenance of storm drain systems should also be considered to reduce pollutant impacts.

The Department of Public Works (DPW) conducts municipal operations in Adams and consists of the following four divisions: 1) Equipment and Maintenance; 2) Highways; 3) Parks and Grounds, including the cemeteries; and 4) Wastewater Treatment. The Adams DPW is responsible for the following operations: maintenance of town streets, drainage systems, sewers, and town vehicles; planting/maintenance of trees on town property; maintenance of the town's playing fields, parks, and playgrounds; and maintenance of town cemeteries, cemetery/burial records for research and sale of burial lots. Existing and recommended BMPs for municipal operations are discussed below.

6.1 Existing & Recommended BMPs for Municipal Operations

Existing municipal operations were discussed with DPW personnel. No site inspections were conducted with the exception of the Adams Parks Department sites. Based on these operations, recommendations were developed to be more protective of water resources. Municipal operations are broken down into those conducted throughout town and at specific municipal facilities.

6.1.1 Town-wide Municipal Operations

BMPs for town-wide municipal operations include those associated with:

- Parks, Cemeteries, Open Space and Recreation Maintenance
- Road Maintenance
- Winter Roadway Treatments
- Town Waste Disposal
- Snow Disposal

Parks, Cemeteries, Open Space & Recreation Maintenance

A Management Plan was developed in June 2004 for the Adams Parks Division to minimize potential environmental impacts from the maintenance of town-owned lands. The Management Plan was funded by the Massachusetts Department of Environmental Protection under the Municipal Environmental Stewardship Program with project development and coordination efforts by the Berkshire Regional Planning Commission and the Town of Adams. It included a review of existing sites maintained by the Parks Division and recommendations to make operations more protective of water resources. A summary of key recommendations is provided in **Appendix 6A** and a copy of the Management Plan is provided in Volume 2 of this plan.

Road Maintenance

The Department of Public Works uses pavement management practices and conducts some roadway repairs and re-surfacing. Erosion and sediment controls are used on some projects; however, additional BMPs can be incorporated into road maintenance operations as outlined below:

- Ensure that all road maintenance and repairs (including utility repairs) are conducted in a manner to prevent erosion of materials into nearby surface waters. For example, filter socks can be used for dewatering activities during utility repairs.
- Utilize BMPs from the Massachusetts Unpaved Roads BMP Manual (BRPC 2001), which outlines numerous BMPs in a "user-friendly" format that should be followed for the maintenance of dirt road surfaces, ditches, culverts, stormwater outlets and steep banks for erosion and sediment control.
- Other road maintenance activities such as paving and painting operations should only be performed during dry weather conditions and care should be taken to not spray or spill materials into the drainage system.
- The Town of Adams should provide spill control materials for roadway crew vehicles to assist in the cleanup of small spills that may occur during road maintenance activities. Some towns have placed small, affordable spill kits behind the seat of highway trucks and have found that the easy accessibility results in more effective cleanup of spills that may otherwise reach a catch basin or sensitive area.

Winter Roadway Treatments

Salt used for winter roadway treatments is toxic to aquatic life and fish. The Adams DPW indicates that there are no salt restricted areas in town and winter roadway treatments generally consist of adequate application of deicing materials to make roadways safe. The Adams DPW uses liquid calcium chloride (CaCl) as a salt catalyst for de-icing activities. Generally, salt catalysts can maximize salt effectiveness and minimize overall material use. Although deicing is a necessary component of DPW operations for public safety, the following activities can be performed to minimize over application[1]:

- Routinely calibrate sand/salt spreaders and use sand/salt spreaders that are capable of adjusting application rates to achieve an optimal application rate according to roadway characteristics (e.g., width and design).
- Train existing and new employees for effective application of deicing materials.
- Use ice-cutting plow blades to reduce the need and/or volume of de-icing materials.
- Consider alternative deicing agents or catalysts (e.g., magnesium chloride) to maximize the effectiveness of salt applications and reduce the overall volume needed for road treatment.
- Utilize weather and roadway monitoring systems to adjust deicing activities to changing conditions; minimize improper roadway pretreatment techniques (e.g., salting prior to a storm that does not occur). These methods for gauging the most appropriate deicing action can vary greatly in price; however, they can be as simple as the local radar tracking system or weather station (e.g., North Adams) that provides updated storm information or become more complex with integrated roadway temperature sensors to indicate and predict freezing road conditions.

Solid and Hazardous Waste Disposal

The Town of Adams landfill closed in 1996 and solid waste disposal is handled through a transfer and recycling facility in town. The Adams Board of Health sponsors annual household hazardous waste collection days. The Town of Adams also conducts leaf composting at the Adams Wastewater Treatment Facility with leaves collected from streets and from residents at the Recycling Center. Loam is the final compost product, which is used for spring repairs (i.e., snow plow damage) and landscape projects throughout town.

As discussed above, some BMPs are already in place to ensure proper disposal of solid and hazardous wastes in town. Additionally, composting activities demonstrate the Town's conservation of natural resources. To more effectively target and emphasize stormwater and

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[1] Methods for reducing salt and deicing activities may require some pilot testing and are suggested as alternatives for consideration by the Town of Adams. Some of these alternatives are discussed in more detail in the EPA Fact Sheet "Minimizing Effects from Highway Deicing", EPA 832-F-99-016 available at http://www.epa.gov/OW-OWM.html/mtb/ice.pdf.

water quality protection, the Town of Adams should implement the following BMPs:

- Send out mailers to inform residents on the proper methods for rubbish disposal, recycling, and special disposal of regulated materials or equipment as they relate to stormwater and water quality protection. This information should be incorporated into the public education/outreach and participation/involvements activities discussed in Section 7.0.
- Ensure that composting activities are conducted in accordance with DEP Guidelines. DEP has developed a detailed Leaf and Yard Waste Compost Guideline that can be used for compost site operations and reference. The Environmental Impact Control Measures included in the Guideline outline BMPs to minimize stormwater and resource impacts such as: diverting runoff away from compost materials and providing treatment for compost runoff. The Adams compost site needs to be evaluated with respect to the DEP Leaf and Yard Waste Compost Guideline to determine if any site modifications are needed to address runoff and water quality.

Snow Disposal

Existing snow disposal activities in Adams are conducted near the Adams landfill due to limited disposal options elsewhere. The Town of Adams should ensure that snow disposal practices comply with the Massachusetts Snow Disposal Guidelines Policy No. BRPG01-01 (see **Appendix 6B**). In general, the following activities should be avoided:

- Disposal to waterways
- Disposal at sites with steep slopes that may result in erosion of soils
- Dumping in sanitary landfills, gravel pits and public or private water supply protection areas
- Disposal on top of storm drain catch basins or in stormwater drainage swales or ditches

BMPs for Stormwater Projects

The Phase II stormwater rule recommends procedures to ensure that new flood management projects are assessed for water quality impacts and that existing projects are assessed for incorporation of additional water quality protection devices or practices. For example, BMPs implemented to control floods should also be designed to improve water quality.

Routine stormwater designs and drainage repairs should also consider water quality. For example, the use of a vegetated swale for stormwater conveyance to remedy drainage or erosion problems alongside roadways will provide more water quality protection than direct piping to a nearby drainage system or water body. Another BMP opportunity for water quality improvement associated with drainage repairs includes installing leaching catch basins or deep sump catch basins to replace deteriorated or failed structures during roadway improvement projects. The typical cost difference to install a leaching manhole is roughly 15% greater than the installation of a similar solid manhole (CEI estimate). Refer to Section 4.6 for example structural BMPs and opportunities that can be used in Adams.

Municipal Operations Periodic Evaluation

A Town-Wide Municipal Operations Checklist for the Adams DPW to conduct inspections is provided in Appendix 6A. The Town of Adams should document protocols for municipal operations using this checklist or another format to track activities and ensure that best management practices are continued in the future. Documentation of these practices can also assist in evaluating staff needs, providing budget information, and scheduling work. Municipal operations and facilities should be evaluated annually using the Town-Wide Municipal Operations Checklist and documented in a binder at the Adams DPW. This provides an opportunity for the Town to evaluate past and future practices for municipal operations as they relate to water quality. For example, the frequency of catch basin cleaning and street sweeping should be evaluated in relation to sediment loadings to waterways to determine if some areas of Town require more frequent cleaning.

In most communities subject to the Phase II Stormwater requirements, a designated Town employee or consultant will evaluate municipal operations and existing BMPs to determine if they are effectively working to improve water quality. Part of the Phase II Annual Report requirements includes an evaluation of progress towards the Measurable Goals established in the Town's Stormwater Notice of Intent (NOI). BMPs and measurable goals for municipal operations in Adams are outlined in Section 8.0 - Recommendations and Implementation Plan.

6.1.2 Municipal Maintenance/Storage & Industrial Facilities

General Maintenance/Storage Facilities

Municipal operations at maintenance/storage facilities can have a significant impact on water quality (e.g., vehicle fueling and maintenance, fertilizer storage). Appendix 6A contains BMP recommendations for specific facilities that were developed as part of the Adams Parks Department Management Plan. General best management practices (BMPs) for all facilities are outlined in the Municipal Operations Checklist in Appendix 6A. Municipal facilities such as the DPW Garage, Recycling Center and Bellevue Cemetery Garage should be inspected monthly using the Facility Pollution Prevention Inspection

Checklist provided in Appendix 6A. Major town-owned facilities in Adams that are most likely to impact stormwater are discussed below.

Individual Facilities

Adams DPW Garage

The Adams Department of Public Works Garage on North Summer Street is a high priority site for BMP implementation due to the nature of site activities (e.g., equipment and material storage, vehicle maintenance, and fueling operations) and its proximity to the Hoosic River. The Town of Adams developed a draft Stormwater Pollution Prevention Plan (SWPPP) with assistance from the Berkshire Regional Planning Commission (BRPC) in March 2003. The SWPPP is designed to address stormwater pollution at the site and makes recommendations for measures to protect water quality. Based on information contained in the SWPPP and site information provided by Adams DPW, the following activities are recommended for the DPW Garage:

- Finalize the DPW SWPPP and implement BMP recommendations.
- Develop a Spill Prevention Control and Countermeasure (SPCC) Plan for the DPW Garage due to the storage of oil greater than 1,320 gallons at the site, as required by the Federal Oil Pollution Prevention regulation at 40 CFR 112 - Oil Pollution Prevention and Response; Non-Transportation-Related Onshore and Offshore Facilities.

Adams Recycling Center and Wastewater Treatment Facility

The Town of Adams and BRPC evaluated the Adams Recycling Center and Wastewater Treatment Facility, with assistance from the U.S. Environmental Protection Agency, for compliance with the federal stormwater regulations during the 2002/2003 winter. These types of facilities fall under the industrial categories that require a stormwater permit and SWPPP; however, the compliance evaluation showed that the facilities are eligible for the "No Exposure Certification" since they do not have stormwater discharges associated with industrial activity. As a reminder, the "No Exposure Certification" must be maintained at these facilities and the Town is responsible for operations at these and all town-owned facilities to reduce stormwater pollution. At a minimum, the "No Exposure Certification" must be submitted to EPA every five years. The "No Exposure Certification" form and instructions can be found at http://www.epa.gov/npdes/pubs/noexpoform_app4.pdf.

6.2 Stormwater Inspection and Maintenance Plan

Lack of maintenance to structural stormwater controls, including catch basins and stormwater treatment devices can have adverse effects on stormwater quality and that of receiving water bodies due to re-entry of pollutants into the stormwater as it passes through the structure. An inspection and maintenance schedule can help reduce pollutant loads from the drainage network. Currently, the Adams DPW sweeps streets in town at least twice a year with weekly sweeping in the downtown area during the summer months. The Adams DPW indicates that street sweepings are used as fill at a steep slope adjacent to the old landfill in town, per DEP oral approval.

Street sweeping prevents materials from entering the drainage system; however, there is no removal of stormwater residuals from drainage structures (e.g., catch basin cleaning) due to issues associated with the handling and disposal of these materials (see Section 6.3), as well as inadequate funding on a regular basis. Additionally, there is no inspection schedule for the storm drain system or Town-owned BMPs. Drainage system improvements are addressed as problems arise. Recommendations for water quality improvement are provided below:

- Develop an inspection and maintenance plan for existing town-owned BMPs. This will help the Town work towards compliance with the Phase II regulations, since an inspection and maintenance plan is required. The inspection and maintenance plan should outline components to be inspected, the inspection frequency, what to look for during inspections, and what conditions trigger maintenance. A standardized inspection form will help streamline these activities (see Appendix 6A for an example BMP inspection form). Maintenance activities can then be based on the results of the inspection. As data is collected, the inspection frequencies can be reduced as appropriate. The inspection and maintenance plan should also incorporate a policy for disposing of maintenance-generated wastes (i.e., stormwater residuals, see Section 6.3).

- Sweep all streets in town at least twice a year and sweep areas prone to sediment accumulation on a more frequent basis, such as the downtown area, which is swept weekly. The Adams DPW should develop a sweepings priority plan to maximize sediment removal in areas that are likely to result in the greatest water quality impact. The plan can be a simple map that highlights priority areas, seasonal timing and cleaning frequency. The sweeping plan should be based on how much sediment collects in each area, proximity to surface waters and whether stormwater BMPs are present to collect sediment before it reaches surface waters. The goal of the street sweepings plan is to prevent sediment from entering the drainage system and surface waters since the current sediment removal capacity is limited in some areas. Thorough and effective street sweeping may also decrease the cleaning frequency for catch basins and other drainage structures.

An example of a high priority area is the downtown area along Park Street and Maple Street where catch basins are located directly on top of the culvert that carries Hoxie Brook underground. At these locations, there is no opportunity for sediment removal other than street sweeping. Other high priority areas include road crossings at waterways and major drainage features (e.g., swales, ditches). Additionally, the timing of sweeping activities in the spring should be scheduled to occur as soon as possible after roadway sediments thaw.

- Clean all catch basins and drainage manholes in town at least once each year or as needed to ensure sediments never reach the invert of the drainage outlet pipe. One method for developing a cleaning schedule is to log the volume of sediment removed from various drainage networks/areas in Town and prioritize the networks/areas by these volumes (i.e., greater volumes require more frequent cleaning). Information on the condition of drainage structures should also be documented during cleaning efforts to plan for drainage improvement projects. The Adams DPW submitted a request for the FY2006 budget to purchase a vacuum truck for drainage system cleaning.

- At a minimum, other town-owned BMPs (e.g., swales, ditches) should be inspected on an annual basis and cleaned as needed.

6.3 Handling and Disposing of Stormwater Residuals

Stormwater residuals (i.e., street sweepings and catch basin cleanings) contain elevated levels of pollutants from roadways and must be properly handled and disposed to prevent impact to runoff and groundwater resources. This is a key component of the Phase II requirements and MA DEP regulations and policies. Proper handling consists of containing the materials during transport and storage to prevent migration with wind and rain. Currently, there is minimal removal of stormwater residuals from drainage structures (e.g., catch basin cleaning) in Adams due to the lack of funding for cleaning and disposal. Historically, stormwater residuals were disposed in the Adams landfill but this has closed, limiting cost-effective disposal options.

The following options are available for disposal of catch basin cleanings and street sweepings:

- Catch Basin Cleanings – Catch basin cleanings are regulated under the Solid Waste Regulations, 310 CMR 19.00. There are currently two disposal options available: 1) Catch basin cleanings may be disposed at a landfill without any prior testing, unless there is reason to suspect the materials are contaminated. Contaminated materials must be handled and disposed in accordance with 310 CMR 30.000 Massachusetts Hazardous Waste Regulations. This may require testing and special disposal costs. Nearby facilities that accept these materials are provided in **Table 6-1**, with rough disposal costs provided in **Table 6-2**. 2) A Beneficial Use Determination (BUD) application (310 CMR 19.060) may be filed with DEP for reuse. Potential uses for catch basin cleanings, with a BUD, may include fill for road right-of-ways, mixing with road bed material and mixing with compost if the organic content is high, although the use of this compost will likely be limited.

  As a potential disposal cost alternative, a BUD could be filed for reuse of catch basin cleanings as daily cover at an approved landfill. This would result in a cost savings for reuse as daily cover as opposed to a solid waste disposal premium. A copy of the Draft Interim Guidance Document for Beneficial Use Determination Regulations, 310 CMR 19.060, March 18, 2004 has been provided in Appendix 6B for reference. This document outlines potential reuse scenarios for street sweepings and catch basin cleanings with a risk-based approach to guide applicants for developing a BUD application.

- Street Sweepings – Street sweepings are regulated by the Solid Waste Regulations, 310 CMR 19.00 and through the DEP Policy #BWP-94.092 (provided in Appendix 6B). The policy outlines the following storage and reuse options: 1) Street sweepings collected from residential areas may be used under public road surfaces or as fill in borrowed areas outside residential and other sensitive areas or can be landfilled without DEP approval. 2) Sweepings collected from commercial/retail business districts and industrial/manufacturing areas (Urban Center Roads), can be landfilled without DEP approval and may be used as daily cover. Any other uses require filing a BUD and DEP approval.

Table 6-1. Potential Disposal Facilities for Stormwater Residuals

Facility Name	Location	Distance (approx.)
Stockbridge Sludge Landfill	Stockbridge, MA	30 miles
Northampton Landfill	Northampton, MA	38 miles
Granby-Holyoke Landfill	Granby, MA	55 miles
Chicopee Landfill	Chicopee, MA	67 miles
Hardwick Landfill	Hardwick, MA	68 miles

Agawam Landfill-Bondis Island	Agawam, MA	70 miles
Gardner Landfill	Gardner, MA	80 miles

Table 6-2. Estimated Disposal Costs for Stormwater Residuals

Facility Name	Street Sweepings*	Catch Basin Cleanings*
Northampton Landfill	$25-35/ton	$70-80/ton
Chicopee Landfill	$40-50/ton	$95-105/ton

*These costs are estimated based on transportation and tipping/disposal fees to the receiving facility. Cost estimates are provided for informational purposes only and should not be relied upon for budget or planning purposes. Actual prices may vary and quotes must be obtained from the receiving facility and haulers.

6.4 Municipal Training

The Phase II rule requires that Town employees be trained on how to incorporate the pollution prevention/good housekeeping BMPs discussed above. Town training programs for stormwater and groundwater are intended to teach employees about stormwater management, potential sources of contaminants, and BMPs for water quality protection. An awareness of pollution prevention efforts throughout Town can significantly decrease the potential water quality impact of municipal operations and other activities.

Existing municipal training programs can be tied into water quality training efforts. For example, Fire Department employees are typically familiar with oil and hazardous material spill training techniques. Such training efforts focus on protecting human health and the environment and can be used to convey stormwater awareness and pollution prevention efforts as well.

The requirements of Phase II impact several town departments and boards including the DPW, Community Development (including inspection services), Planning Board, Conservation Commission, and Board of Health, depending on how the town sets up compliance and enforcement actions. Each of the officials involved in Phase II regulated issues and water quality protection should be trained specifically in the areas that apply to them. For example, DPW personnel should be trained in appropriate operations to minimize stormwater impacts, while the Building Inspector should be trained to identify stormwater impacts from construction projects as part of a routine inspection.

Town of Adams, with assistance from BRPC or its consultant, should develop a municipal training program for water quality protection in accordance with the Phase II requirements. The program should include the following key elements, which can be tailored specifically to town operations.

- Stormwater Management Strategy & Phase II Program Overview
- Town Department Responsibilities

- Town Drainage System, Water Supply and Water Quality
- Spill Prevention and Response
- Good Housekeeping
- Material Management Practices
- Maintenance of Town-Owned Lands
- Stormwater Inspections
- Illicit Discharge Detection
- Construction Sites and Development

Training should be conducted annually and may be minimized after the first year to include refresher topics.

6.5 Municipal Operations Staffing & Responsibilities

In most communities, as is the case with Adams, municipal operations related to stormwater fall under the responsibility and workload of the Department of Public Works. Based on discussions with the Adams DPW there is not enough staff to implement stormwater activities. The Town of Adams needs to increase available staff and distribute responsibilities to ensure effective BMP implementation for municipal operations, as well as other components of the Adams Stormwater Management Strategic Plan.

Staffing needs can be assisted partly through the coordination and combination of efforts between town departments; however, some capital investment in staffing and equipment may be needed. For example, the Adams Conservation Commission could work with the Department of Public Works to develop a salt reduction strategy. The Town of Adams can also work with other local agencies and watershed groups such as BRPC and the Hoosic River Watershed Association to assist in BMP implementation.

The Town of Adams should consider hiring an employee to handle the following stormwater responsibilities for pollution prevention:

- Implement and monitor BMPs for municipal operations.
- Develop and implement an inspection and maintenance plan for the storm drain system.
- Conduct monthly pollution prevention inspections at municipal facilities and evaluate municipal operations annually.
- Maintain compliance with the DPW Garage SWPPP and No Exposure requirements for the Adams Recycling Center and Wastewater Treatment Plant.
- Maintain compliance with the Adams Parks Department Management Plan and implement BMP recommendations.
- Coordinate and document DPW operations and water quality results related to stormwater improvements and investigations of

the storm drain and sanitary sewer systems (e.g., coordinate illicit discharge investigations).

Appendix 6A

BMP Recommendations – Adams Parks Department Management Plan

Municipal Industrial Operations Stormwater Checklist

Facility Pollution Prevention Inspection Checklist

Sample BMP Inspection Form

Summary of BMP Recommendations
Adams Parks Department Management Plan (June 2004)

<table>
<tr><th>Site ID or General Activities</th><th>BMP Recommendations</th></tr>
<tr><td>1. Bellevue Cemetery</td><td>
Paint indoors or use drop cloths for outdoor painting of park benches and small equipment.
Store hazardous materials in fire rated cabinets with appropriate labels and ensure that only approved portable containers are used for equipment refueling.
Continue to store vehicles and equipment indoors.
Ensure that any future vehicle and equipment maintenance activities are performed indoors.
Cut grass to 3 inches or greater.
Establish a mowing buffer zone (e.g., 50 feet) to the large swale at the entrance to the cemetery and mow grass within this area to 5 inches.
Seed swales with wildflowers and grasses to minimize maintenance needs.
Utilize space adjacent to the garage for the tree replanting program.
Utilize hay bales around catch basins or in swales until vegetation is fully established at disturbed areas.
Sweep roadways, inspect and maintain on-site drainage structures at least annually and report maintenance needs to DPW.
Avoid leaving grass clippings on paved areas draining to the storm drain system.
</td></tr>
<tr><td>2. Maple Street Cemetery</td><td>
Cut grass to 3 inches or greater.
Replace lost trees as part of the tree replanting program.
Utilize hay bales around catch basins or in swales until vegetation is fully established at disturbed areas.
Sweep roadways, inspect and maintain on-site drainage structures at least annually and report maintenance needs to DPW.
Avoid leaving grass clippings on paved areas draining to the storm drain system.
</td></tr>
<tr><td>3. Quality Playground</td><td>
Cut grass to 3 inches or greater.
Avoid leaving grass clippings on paved areas draining to the storm drain system.
</td></tr>
<tr><td>4. Siara Street Field</td><td>
Cut grass to 3 inches or greater.
Avoid leaving grass clippings on paved areas draining to the storm drain system.
</td></tr>
<tr><td>5. Russell Field</td><td>
Cut grass to 3 inches or greater at park areas and 2.5 to 3 inches at athletic field areas.
Establish a no mow zone and increased height (5 inches) mowing buffer to the stream that flows along the athletic field and park. Maximize the mowing buffer (depending on athletic field constrains) to 50 feet if possible.
Seed buffer zones with wildflowers and grasses as an alternative to mowing.
Use trees from the replanting program to help establish and maintain a buffer to the stream, as part of park beautification.
</td></tr>
<tr><td>6. Valley Street Field</td><td>
Coordinate turf management activities with the Adams Little League to ensure that fertilizers are applied in accordance with the manufacturer's specifications and pesticides are applied by a licensed applicator. A condition for allowing the Little League to apply chemicals should include a 50 foot “no-application zone” around the perimeter of the field to establish a buffer to nearby drainage systems.
Discuss irrigation practices with the Little League to coordinate irrigation activities with rainfall appropriately. Consider a rain sensor for the irrigation system to water according to soil moisture and rainfall events.
Cut grass to 2.5 to 3 inches.
Avoid leaving grass clippings on paved areas draining to the storm drain system.
</td></tr>
</table>

Summary of BMP Recommendations Continued	
7. Reid Field	• Cut grass to 2.5 to 3 inches. • Establish a mowing buffer zone (e.g., 50 feet) to the unnamed tributary at the eastern portion of the field. Maximize the mowing buffer based on athletic field constraints.
8. Renfrew Athletic Field	• Cut grass to 3 inches or greater at park areas and 2.5 to 3 inches at athletic field areas. • Establish a mowing buffer zone (e.g., 50 feet) to Pine Street Brook. Maximize the mowing buffer based on athletic field constraints.
9. DPW Garage and Forest Warden Property	• Continue to store vehicles and equipment indoors. • Continue existing vehicle and equipment washing practices and ensure that outdoor vehicle washing is not conducted at other sites in town. • Establish a mowing buffer zone (e.g., 50 feet) to the unnamed tributary that flows through the property and the on-site swales. Maximize the mowing buffer based on athletic field constraints. • Avoid leaving grass clippings on paved areas draining to the storm drain system.
10. Bowe Field	• Cut grass to 3 inches or greater. • Coordinate cleanup activities with the Adams Agricultural fair to ensure that animal waste is thoroughly cleaned up and properly disposed.
11. Hoosic River Control Chutes	• Cut grass to 3 inches or greater. • Establish a mowing buffer zone and/or seed buffer zones with wildflowers and grasses as an alternative to mowing. • Ensure that grass clippings are not dispersed into the Hoosic River or the adjacent storm drain system.
12. Memorial Park	• Cut grass to 3 inches or greater. • Avoid leaving grass clippings on paved areas draining to the storm drain system.
13. Town Common	• Cut grass to 3 inches or greater. • Avoid leaving grass clippings on paved areas draining to the storm drain system.
BMP Recommendations for General Activities	
Chemical Applications & General Use	• For future chemical applications, the following should be implemented: licensing of Parks Department employees for the application of pesticides; incorporate written protocols for chemical applications into this Management Plan that are consistent with the principles of an Integrated Pest Management (IPM) Plan; and establish “no application” zones for sites within 50 feet of waterways or significant drainage features, such as storm drains, ditches, channels or swales. • The Parks Department should continually try to use non-hazardous or alternative cleaners for Parks Department operations, regardless of outdoor usage. These practices will highlight the Parks Department’s efforts to “lead by example” for pollution prevention throughout town.
Spill Containment & Control	• Incorporate spill prevention, control and cleanup training into existing training programs or procedures. • Acquire spill kits for all Parks Department vehicles. • Continue existing practices to ensure that care is used to prevent spills. Ensure that on-site refueling activities are conducted as far as possible from waterways or significant drainage features. • As a general rule, establish a 50’ no-fueling zone along waterways and significant drainage features.

Municipal Industrial Operations Stormwater Checklist

Use for Annual Evaluation

Municipal Industrial Operations Stormwater Checklist

Date of Inspection: _______________ Inspector: _____________________

Location(s) Inspected: ____

Number of Potential Stormwater Issues Identified: ______

This checklist is intended as a guide for evaluating stormwater impacts that may occur from operations at municipal facilities and throughout town. Major categories of operations are presented below with a list of common activities that can impact stormwater. Municipal employees should check YES or NO for each item or not applicable (N/A) or not reviewed (N/R) for the category. **Items checked NO indicate that corrective action or further evaluation is needed to reduce stormwater impacts.** Generally, the checklist question is the answer for the corrective action.

For Specific Sites, Consider the Following Characteristics that Relate to Stormwater Pollution Prevention

- Stormwater Discharge Point(s) (outfalls)
- Drainage Patterns and Direction of Flow
- Nearby Surface Water Bodies (e.g., stream, river, wetland) Receiving Site Runoff
- Structural Stormwater Control Measures/Devices
- Locations of Industrial Activities and Significant Materials Exposed to Stormwater
- Types of Pollutants Likely to be Discharged from Each Drainage Area

A. Municipal Operations Related to Parks, Golf Courses, Cemeteries, and Trees
☐ N/A ☐ N/R

1. Was an equal or lesser amount of fertilizers and pesticide used throughout Town compared to last year or previous uses?
   ☐ YES ☐ NO

2. Are fertilizers and pesticides applied only during light rain or dry weather conditions (should not be applied during heavy rain conditions)?
   ☐ YES ☐ NO

3. Were fertilizers and pesticides applied as needed based on inspected conditions (should avoid use on a regular or scheduled basis)?
   ☐ YES ☐ NO

4. Were other methods of pest control employed instead of chemical treatment (e.g., physical weeding, horticultural techniques)?
 YES NO

5. Do licensed town employees or a certified arborist apply the fertilizers and pesticides in town?
 YES NO

6. Do the application rates and methods for fertilizers and pesticides always follow the manufacturers specifications?
 YES NO

7. Was care used to prevent applying fertilizers or pesticides near stormwater drainage locations?
 YES NO

8. Were fertilizers and pesticides applied at least 75 feet from wetlands and waterways?
 YES NO

B. Roadway/Bridge Maintenance and Repair Activities N/A N/R

1. Are storm water BMPs (i.e., oil water separators, detention basins, retention/infiltration devices, vegetative swales), throughout Town and at municipal facilities, maintained/cleaned out to ensure proper operation?
 YES NO

2. Is there an inspection schedule for stormwater structural BMPs?
 YES NO

3. Are erosion and sediment controls used during roadway and bridge maintenance or repair activities?
 YES NO

4. Are roadways and Town-owned facilities swept at least once a year or more in the downtown areas?
 YES NO

5. Are any other routine cleanups performed (e.g., roadside trash pick-up, municipal facility spring cleaning)?
 YES NO

6. Are catch basins cleaned at least annually or as needed to prevent materials from accumulating at or above the invert of the outlet pipe?
 YES NO

7. Are stormwater residuals (i.e., catch basin cleanings, muck from sediment forebays) handled and disposed in accordance with DEP Policies?
 YES NO

8. Are stormwater quality and BMPs considered during roadway or bridge reconstruction projects? An example could be installing a vegetative swale along a roadway instead of an additional catch basin with a direct discharge to a receiving water body.
 YES NO

9. Are filter socks or other BMPs used for dewatering activities during construction or repairs?
 YES NO

10. Are roadway maintenance activities, particularly paving and sealing activities, performed during dry weather only to prevent contamination of runoff?
 YES NO

11. Are paving tools (e.g., rakes, shovels) and equipment cleaned with a solvent fluid at a designated maintenance facility (i.e., Highway Garage)?
 YES NO

12. Are pollution prevention materials such as drip pans and absorbent materials used to limit or contain leaks and spills from paving equipment or materials?
 YES NO

13. Are salt and sand spreaders routinely calibrated to prevent over-application of deicing and sand materials?
 YES NO

14. Are salt and sand spreaders capable of adjusting application rates to achieve an optimal application rate according to roadway characteristics such as road width and design, traffic concentration, and proximity to surface waters?
 YES NO

15. Are employees trained in the proper application of deicing materials, the timing of applications, and types of deicing materials in consideration of water quality and aquatic habitat (i.e., environmental awareness)?
 YES NO

16. Do routine road salting activities throughout town conform to salt use restricted areas, if any, for water quality protection?
 YES NO

17. Are alternative materials (e.g., liquid salt catalysts that maximize salt effectiveness and minimize overall material use) used for deicing operations? This can result in a decrease in pollutant loading to runoff and environmental impact.
 YES NO

18. Are any monitoring systems in place to evaluate roadway conditions in an effort to adjust deicing activities as temperature and weather conditions change? A Road Weather Information System (RWIS) often includes meteorological sensors, pavement sensors, site-specific forecasts, temperature profiles of roadways, a weather advisor, communications, and planning.
 YES NO

19. Does the town generally use roadway pretreatment techniques (e.g., salting and applying de-icers prior to storms)? This can sometimes result in applying excess salt materials.
 YES NO

20. Are ice-cutting plow blades used to reduce the need for deicing materials?
 YES NO

21. Is snow disposal being conducted in accordance with DEP's Snow Disposal Guidelines? There should be no disposal to waterways, sites with steep slopes, sanitary landfills, gravel pits, public or private water supply protection areas or on top of storm drain catch basins or in stormwater drainage swales of ditches.
 YES NO

C. Vehicle Fueling Operations **N/A** **N/R**

1. Are spill and overfill prevention devices present on fuel dispensing equipment (i.e. automatic shut-offs, pump control switches, and emergency pump shut-off switches)?
 YES NO

2. Is the fueling area covered to prevent rain contact?
 YES NO

3. Is storm water prevented from flowing across the fueling area?
 YES NO

4. Are oil/water separators used in storm drains in the fueling area?
 YES NO

5. Is the fueling area cleaned using only dry methods (no hosing or washing)?
 YES NO

6. Are there spill control materials nearby the fueling area?
☐ YES ☐ NO

7. Are employees trained on the proper use and management of fueling station (i.e., no topping off fuel tanks, not leaving vehicle unattended during fueling, or washing down fueling area)?
☐ YES ☐ NO

D. Vehicle/Equipment Maintenance and Waste Handling ☐ **N/A** ☐ **N/R**

1. Are maintenance areas, outdoors and around solvent parts cleaners free of any signs of spills or leaks?
☐ YES ☐ NO

2. Do maintenance areas appear to be well maintained and organized?
☐ YES ☐ NO

3. Is liquid cleaning of parts at a centralized station (e.g., parts washer)?
☐ YES ☐ NO

4. Are solvents non-chlorinated?
☐ YES ☐ NO

5. Are any non-hazardous or alternative cleaners used at the site?
☐ YES ☐ NO

6. Is all maintenance conducted indoors; or at least fluid changes?
☐ YES ☐ NO

7. Are waste fluids handled and disposed of properly (i.e., manifested offsite, recycled – they should not be dumped down floor or sink drains)?
☐ YES ☐ NO

8. Have employees received any training for hazardous waste handling and disposal operations (e.g., 40-hour HAZWOP training or other)?
☐ YES ☐ NO

9. Is there any written protocol for site operations (i.e., parts cleaning, spill response, and disposal)?
☐ YES ☐ NO

10. Are floor drains connected to a tight tank or the sanitary sewer or closed (they should not be connected to the storm sewer system)? Are all other plumbing connections known?
☐ YES ☐ NO

11. Are work areas cleaned using only dry methods (unless drains are connected to a tight tank or the sewer, areas should not be washed or hosed down with water)?
 YES NO

12. Are spills cleaned and disposed of properly using appropriate absorbents (e.g., rags and speedi-dry)?
 YES NO

13. Are oil filters completely drained before recycling or disposal?
 YES NO

14. Are incoming vehicles and equipment checked for leaking oil and fluids?
 YES NO

15. Is the site free of wrecked or salvage vehicles?
 YES NO

16. If wrecked or salvage vehicles are generally stored onsite, are measures taken to prevent or contain leaks from such vehicles (i.e., drip pans, draining of fluids, storing under cover)?
 YES NO

17. Are used batteries stored under cover and leaking batteries stored in leak proof secondary containers?
 YES NO

18. Are vehicles or equipment washed indoors?
 YES NO

E. Painting Operations **N/A** **N/R**

1. Are paint wastes collected (i.e., with tarps, drip pans, etc.) and disposed of properly?
 YES NO

2. Are wastes from sanding contained (i.e., they should not be allowed to be carried away by the wind)?
 YES NO

3. Is paint equipment that minimizes overspray used (i.e., electrostatic spray equipment, air-atomized spray guns, high-volume/low-pressure spray guns, gravity-feed guns)?
 YES NO

4. Are employees trained to use spray equipment correctly?
☐ YES ☐ NO

5. Are combustible paint supplies stored in a fire-resistant cabinet and labeled appropriately?
☐ YES ☐ NO

F. Loading and Unloading of Bulk Materials (including salt) ☐ N/A ☐ N/R

1. Are tank trucks and material delivery vehicles located where spills or leaks can be contained?
☐ YES ☐ NO

2. Are petroleum storage containers (underground and aboveground) and dispensing equipment (tank truck dispensing hoses) equipped with spill and overfill prevention devices (i.e., high level alarms, automatic shut-offs, sight-level gauges)?
☐ YES ☐ NO

3. Are loading/unloading areas covered to prevent exposure to rainfall?
☐ YES ☐ NO

4. Is storm water prevented from flowing across the loading/unloading area?
☐ YES ☐ NO

5. Are employees trained in proper loading/unloading procedures to prevent spillage of materials?
☐ YES ☐ NO

6. For outdoor salt loading operations; is the loading operation performed on an impervious surface that is thoroughly cleaned after loading operations?
☐ YES ☐ NO

G. Above-Ground Storage Tanks ☐ N/A ☐ N/R

1. Are overflow protection and leak detection devices installed?
☐ YES ☐ NO

2. Are bollards or other physical barriers located around tanks to prevent vehicle damage?
☐ YES ☐ NO

3. Are the tanks visually inspected on a periodic basis (e.g., weekly) to identify problem areas before a release?
☐ YES ☐ NO

4. Is routine preventative maintenance performed for tanks?
☐ YES ☐ NO

5. Is access to all parts of the tanks provided for adequate inspection?
☐ YES ☐ NO

6. Is the tank integrity tested periodically?
☐ YES ☐ NO

7. Are tanks double-walled, bermed, or surrounded by a secondary containment system?
☐ YES ☐ NO

8. Do municipal facilities with petroleum stored on-site have a storage capacity less than 1,320 gallons, either in a single container or aggregate (sum of containers greater than 55-gallons capacity)?
☐ YES ☐ NO

9. Are spill control materials (e.g., pads, booms, catch basin covers) available to contain a release?
☐ YES ☐ NO

10. Are employees familiar with how to respond to a spill (e.g. procedures for notifying appropriate authorities and procedures for containing, diverting, isolating, and cleaning up spills)?
☐ YES ☐ NO

H. Materials Storage and Handling **☐ N/A** **☐ N/R**

1. Are salt piles and sand/salt mixture piles completely protected from rain and are coverings free of holes?
☐ YES ☐ NO

2. Are dumpsters sealed to prevent waste leachate from escaping?
☐ YES ☐ NO

3. Are sand piles and other roadway process materials located/contained such that they will not contribute sediment to storm water runoff from the site?
☐ YES ☐ NO

4. Are sand piles and other roadway process materials located at least 100 feet from surface waters and/or wetlands?
☐ YES ☐ NO

5. Is the site free of organic refuse and/or compost operations?
☐ YES ☐ NO

6. Are composting operations contained and are stormwater diversion structures in place to prevent migration with stormwater?
 YES NO

7. Are composting operations conducted at least 100 feet from surface waters, wetlands or direct stormwater conduits (e.g., swales, catch basins)?
 YES NO

8. Are all other processed materials completely protected from rain (i.e., virgin oil, waste oil, batteries)?
 YES NO

9. Are flow diversion devices (such as gutters, drains, sewers, dikes, berms, swales, and graded pavement) used to convey stormwater away from material storage areas?
 YES NO

10. Are periodic material inventories conducted to identify if MSDSs are available for all materials used throughout municipal facilities?
 YES NO

11. Is the material inventory and associated storage locations reviewed for sources of potential stormwater contamination?
 YES NO

12. Are the hazardous materials labeled appropriately and stored in designated storage containers, areas, or on pallets with appropriate labels or signs?
 YES NO

13. Are hazardous materials stored in a manner (e.g., sufficient aisle space) that provides access for inspections and ease of material transport to prevent spillage?
 YES NO

14. Are hazardous materials stored away from high-traffic areas to reduce the likelihood of accidental damage and spills?
 YES NO

15. Is any preventative maintenance performed for storage areas to prevent a release due to equipment failure?
 YES NO

16. Are employees familiar with the proper storage and handling practices for hazardous materials?
 YES NO

I. Other Pollution Prevention BMPs ☐ **N/A** ☐ **N/R**

1. Does any Town department (i.e., Public Works, Building Inspector, Board of Health or Conservation Commission) conduct any inspections for stormwater BMPs or stormwater issues such as erosion and contamination?
   ☐ YES ☐ NO

2. Are there any employee training efforts throughout the year (e.g., employee awareness efforts for BMP monitoring, spill reporting procedures, spill drills, operating manuals and standard procedures aimed at pollution prevention, and training about good housekeeping practices)?
   ☐ YES ☐ NO

3. Is there any system or procedure for internal reporting of stormwater management issues (e.g., a Storm Water Pollution Prevention Team for specific municipal facilities) to prevent and contain potential stormwater contamination?
   ☐ YES ☐ NO

4. Are records maintained for inspections, stormwater system maintenance, repairs and modification of storage tanks and storage areas, spills, leaks, or other discharges throughout Town or at specific municipal facilities?
   ☐ YES ☐ NO

5. List any other stormwater pollution prevention BMPs or additional comments from the above categories.

Facility Pollution Prevention Inspection Checklist

Use for Monthly Inspections

CHECKLIST A – FACILITY POLLUTION PREVENTION INSPECTION				Completed by: Date:
Item	**Pollution Prevention Target Area or Activity**	**YES**	**NO**	**Comments or Needed Improvement**
1	Is the fueling station free of spills or leaks (inspect pumps and surrounding area, note stained concrete or asphalt and sheen, if any)?			
2	Does all fuel dispensing equipment appear to be intact and functioning properly?			
3	Is the sand/salt mix pile adequately contained to prevent migration with stormwater?			
4	Is the sand/salt loading area free of significant loose materials?			
5	Is there any evidence of leaks or deterioration of the CaCl AST and associated piping, fittings, etc.?			
6	Are all hazardous or raw materials (e.g., drums, paint buckets, paving materials) contained, covered or stored indoors to adequately protect against contact with stormwater?			
7	Is there any excessive (beyond 5 cubic yards volume) outdoor storage of scrap metal and equipment?			
8	Are all outdoor rubbish containers equipped with a lid and free of holes and leaks?			
9	Are there any significant vehicle and equipment leaks or drips throughout the facility?			
10	Are there any significant leaks or drips from outdoor snow plow equipment?			
11	Are all road/earth material storage locations adequately contained and are adequate erosion/sediment controls in place to prevent migration of materials with stormwater?			
12	Is there sufficient space between (>6 inches) catch basin sediment and pipe inverts at all catch basin locations at the site?			
13	Is there any evidence of erosion or significant sediment accumulation at stormwater discharges from the site?			
14	Is there any evidence of outdoor vehicle washing at the site?			

Note: Attach additional sheets for comments, if necessary. Record items checked “NO” in the Record of Correction of Deficiencies Discovered During Facility Inspection. Use Checklist B to track the correction of deficiencies discovered during the facility inspection.

CHECKLIST B – RECORD OF CORRECTION OF DEFICIENCIES DISCOVERED DURING FACILITY INSPECTION		Completed by: Date:
Deficient Item	**Corrective Action or Improvement**	**Date of Correction**

Note: Refer to items on Checklist A (e.g., 1, 4, 7). Deficiencies noted during the inspection must be corrected as soon as practicable, but no later than 14 days from the inspection.

Sample BMP Inspection Form

Use to Inspect BMPs as Part of the
Stormwater Inspection & Maintenance Plan

BMP Inspection

BMP ID #	Type of BMP	Does BMP appear to be working properly?	Is maintenance required?	Maintenance Access	Sediment Accumulation	Sediment Depth	Deposits	Structural Condition	Erodibility	Vegetation	Comments
	__ Leaching Catch Basin __ Proprietary Unit __ Swale __ Detention Pond __ Forebay __ Other*	__ Yes __ No*	__ Yes __ No	__ Easy __ Moderate __Difficult	__ None __ Slight build up __ Heavy build up	_____ inches	__ None __ Grease/Oil __ Grass Clippings/Compost __ Trash/Debris __ Other*	__ N/A __ Good __ Corroded __ Cracked __ Exposed Steel __ Other*	__ N/A __ None __ Channeling/Depressions __ Bank Erosion __ Displaced Riprap __ Other*	__ N/A __ No Distress __ Distressed __ Sparse __ Undesirable Woody __ Invasive Plants	
	__ Leaching Catch Basin __ Proprietary Unit __ Swale __ Detention Pond __ Forebay __ Other*	__ Yes __ No*	__ Yes __ No	__ Easy __ Moderate __Difficult	__ None __ Slight build up __ Heavy build up	_____ inches	__ None __ Grease/Oil __ Grass Clippings/Compost __ Trash __ Other*	__ N/A __ Good __ Corroded __ Cracked __ Exposed Steel __ Other*	__ N/A __ None __ Channeling/Depressions __ Bank Erosion __ Displaced Riprap __ Other*	__ N/A __ No Distress __ Distressed __ Sparse __ Undesirable Woody __ Invasive Plants	
	__ Leaching Catch Basin __ Proprietary Unit __ Swale __ Detention Pond __ Forebay __ Other*	__ Yes __ No*	__ Yes __ No	__ Easy __ Moderate __Difficult	__ None __ Slight build up __ Heavy build up	_____ inches	__ None __ Grease/Oil __ Grass Clippings/Compost __ Trash __ Other*	__ N/A __ Good __ Corroded __ Cracked __ Exposed Steel __ Other*	__ N/A __ None __ Channeling/Depressions __ Bank Erosion __ Displaced Riprap __ Other*	__ N/A __ No Distress __ Distressed __ Sparse __ Undesirable Woody __ Invasive Plants	
	__ Leaching Catch Basin __ Proprietary Unit __ Swale __ Detention Pond __ Forebay __ Other*	__ Yes __ No*	__ Yes __ No	__ Easy __ Moderate __Difficult	__ None __ Slight build up __ Heavy build up	_____ inches	__ None __ Grease/Oil __ Grass Clippings/Compost __ Trash __ Other*	__ N/A __ Good __ Corroded __ Cracked __ Exposed Steel __ Other*	__ N/A __ None __ Channeling/Depressions __ Bank Erosion __ Displaced Riprap __ Other*	__ N/A __ No Distress __ Distressed __ Sparse __ Undesirable Woody __ Invasive Plants	
	__ Leaching Catch Basin __ Proprietary Unit __ Swale __ Detention Pond __ Forebay __ Other*	__ Yes __ No*	__ Yes __ No	__ Easy __ Moderate __Difficult	__ None __ Slight build up __ Heavy build up	_____ inches	__ None __ Grease/Oil __ Grass Clippings/Compost __ Trash __ Other*	__ N/A __ Good __ Corroded __ Cracked __ Exposed Steel __ Other*	__ N/A __ None __ Channeling/Depressions __ Bank Erosion __ Displaced Riprap __ Other*	__ N/A __ No Distress __ Distressed __ Sparse __ Undesirable Woody __ Invasive Plants	
	__ Leaching Catch Basin __ Proprietary Unit __ Swale __ Detention Pond __ Forebay __ Other*	__ Yes __ No*	__ Yes __ No	__ Easy __ Moderate __Difficult	__ None __ Slight build up __ Heavy build up	_____ inches	__ None __ Grease/Oil __ Grass Clippings/Compost __ Trash __ Other*	__ N/A __ Good __ Corroded __ Cracked __ Exposed Steel __ Other*	__ N/A __ None __ Channeling/Depressions __ Bank Erosion __ Displaced Riprap __ Other*	__ N/A __ No Distress __ Distressed __ Sparse __ Undesirable Woody __ Invasive Plants	
	__ Leaching Catch Basin __ Proprietary Unit __ Swale __ Detention Pond __ Forebay __ Other*	__ Yes __ No*	__ Yes __ No	__ Easy __ Moderate __Difficult	__ None __ Slight build up __ Heavy build up	_____ inches	__ None __ Grease/Oil __ Grass Clippings/Compost __ Trash __ Other*	__ N/A __ Good __ Corroded __ Cracked __ Exposed Steel __ Other*	__ N/A __ None __ Channeling/Depressions __ Bank Erosion __ Displaced Riprap __ Other*	__ N/A __ No Distress __ Distressed __ Sparse __ Undesirable Woody __ Invasive Plants	
	__ Leaching Catch Basin __ Proprietary Unit __ Swale __ Detention Pond __ Forebay __ Other*	__ Yes __ No*	__ Yes __ No	__ Easy __ Moderate __Difficult	__ None __ Slight build up __ Heavy build up	_____ inches	__ None __ Grease/Oil __ Grass Clippings/Compost __ Trash __ Other*	__ N/A __ Good __ Corroded __ Cracked __ Exposed Steel __ Other*	__ N/A __ None __ Channeling/Depressions __ Bank Erosion __ Displaced Riprap __ Other*	__ N/A __ No Distress __ Distressed __ Sparse __ Undesirable Woody __ Invasive Plants	

* Provide additional comments to describe the observations made for the category.

Appendix 6B

DEP Snow Disposal Guidelines - BRPG01-01

Reuse & Disposal of Street Sweepings - BWP 94.092

Draft Interim Guidance Document for Beneficial Use Determination Regulations, 310 CMR 19.060, March 18, 2004

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
ONE WINTER STREET, BOSTON, MA 02108 617-292-5500

ARGEO PAUL CELLUCCI
Governor

JANE SWIFT
Lieutenant Governor

BOB DURAND
Secretary

LAUREN A. LISS
Commissioner

BUREAU OF RESOURCE PROTECTION
SNOW DISPOSAL GUIDELINES

Effective Date: March 8, 2001 Guideline No. BRPG01-01

Applicability: Applies to all federal, state, regional and local agencies, as well as to private businesses.

Supersedes: BRP Snow Disposal Guideline BRPG97-1 issued 12/19/97, and all previous snow disposal guidance

Approved by: ____________________________________
Glenn Haas, Assistant Commissioner
for Resource Protection

PURPOSE: To provide guidelines to all government agencies and private businesses regarding snow disposal site selection, site preparation and maintenance, and emergency snow disposal options that are acceptable to the Department of Environmental Protection, Bureau of Resource Protection.

APPLICABILITY: These Guidelines are issued by the Bureau of Resource Protection on behalf of all Bureau Programs (including Drinking Water Supply, Wetlands and Waterways, Wastewater Management, and Watershed Planning and Permitting). They apply to public agencies and private businesses disposing of snow in the Commonwealth of Massachusetts.

INTRODUCTION

Finding a place to dispose of collected snow poses a challenge to municipalities and businesses as they clear roads, parking lots, bridges, and sidewalks. While we are all aware of the threats to public safety caused by snow, collected snow that is contaminated with road salt, sand, litter, and automotive pollutants such as oil also threatens public health and the environment.

As snow melts, road salt, sand, litter, and other pollutants are transported into surface water or through the soil where they may eventually reach the groundwater. Road salt and other pollutants can contaminate water supplies and are toxic to aquatic life at certain levels. Sand washed into waterbodies can create sand bars or fill in wetlands and ponds, impacting aquatic life, causing flooding, and affecting our use of these resources.

There are several steps that communities can take to minimize the impacts of snow disposal on public health and the environment. These steps will help communities avoid the costs of a contaminated water supply, degraded waterbodies, and flooding. Everything we do on the land has the potential to impact our water resources. Given the authority of local government over the use of the land, municipal officials and staff have a critically important role to play in protecting our water resources.

The purpose of these guidelines is to help municipalities and businesses select, prepare, and maintain appropriate snow disposal sites before the snow begins to accumulate through the winter.

RECOMMENDED GUIDELINES

These snow disposal guidelines address: (1) site selection; (2) site preparation and maintenance; and (3) emergency snow disposal.

1. SITE SELECTION

The **key** to selecting effective snow disposal sites is to locate them **adjacent to or on pervious surfaces in upland areas** away from water resources and wells. At these locations, the snow meltwater can filter in to the soil, leaving behind sand and debris which can be removed in the springtime. The following areas should be avoided:

- Avoid dumping of snow into any waterbody, including rivers, the ocean, reservoirs, ponds, or wetlands. In addition to water quality impacts and flooding, snow disposed of in open water can cause navigational hazards when it freezes into ice blocks.

- Do not dump snow within a Zone II or Interim Wellhead Protection Area (IWPA) of a public water supply well or within 75 feet of a private well, where road salt may contaminate water supplies.

- Avoid dumping snow on DEP-designated high and medium-yield aquifers where it may contaminate groundwater (see the next page for information on ordering maps from MassGIS showing the locations of aquifers, Zone IIs, and IWPAs in your community).

- Avoid dumping snow in sanitary landfills and gravel pits. Snow meltwater will create more contaminated leachate in landfills posing a greater risk to groundwater, and in gravel pits, there is little opportunity for pollutants to be filtered out of the meltwater because groundwater is close to the land surface.

^ Avoid disposing of snow on top of storm drain catch basins or in stormwater drainage swales or ditches. Snow combined with sand and debris may block a storm drainage system, causing localized flooding. A high volume of sand, sediment, and litter released from melting snow also may be quickly transported through the system into surface water.

Site Selection Procedures

It is important that the municipal Department of Public Works or Highway Department, Conservation Commission, and Board of Health work together to select appropriate snow disposal sites. The following steps should be taken:

a) Estimate how much snow disposal capacity is needed for the season so that an adequate number of disposal sites can be selected and prepared.

b) Identify sites that could potentially be used for snow disposal such as municipal open space (e.g., parking lots or parks).

c) Sites located in upland locations that are not likely to impact sensitive environmental resources should be selected first.

d) If more storage space is still needed, prioritize the sites with the least environmental impact (using the site selection criteria, and local or MassGIS maps as a guide).

MASSGIS Maps of Open Space and Water Resources

If local maps do not show the information you need to select appropriate snow disposal sites, you may order maps from MassGIS (Massachusetts Geographic Information System) which show publicly owned open spaces and approximate locations of sensitive environmental resources (locations should be field-verified where possible). Different coverages or map themes depicting sensitive environmental resources are available from MassGIS on the map you order. At a minimum, you should order the Priority Resources Map. The Priority Resources Map includes aquifers, public water supplies, DEP-approved Zone II's, Interim Wellhead Protection Areas, Wetlands, Open Space, Areas of Critical Environmental Concern, NHESP Wetlands Habitats, DEP Permitted Solid Waste facilities, Surface Water Protection areas (Zone A's) and base map features. The cost of this map is $25.00. Other coverages or map themes you may consider, depending on the location of your city or town, include Outstanding Resource Waters and DEP Eelgrass Resources. These are available at $25.00 each, with each map theme being depicted on a separate map. Maps should be ordered from MassGIS via the Internet at http://www.state.ma.us/mgis. Maps may also be ordered by fax at (617) 626-1249 (order form available from the MassGIS web site) or mail. For further information, contact MassGIS at (617) 626-1189.

2. SITE PREPARATION AND MAINTENANCE

In addition to carefully selecting disposal sites before the winter begins, it is important to prepare and maintain these sites to maximize their effectiveness. The following maintenance measures should be undertaken for all snow disposal sites:

- A silt fence or equivalent barrier should be placed securely on the downgradient side of the snow disposal site.
- To filter pollutants out of the meltwater, a 50-foot vegetative buffer strip should be maintained during the growth season between the disposal site and adjacent waterbodies.
- Debris should be cleared from the site prior to using the site for snow disposal.
- Debris should be cleared from the site and properly disposed of at the end of the snow season and no later than May 15.

3. EMERGENCY SNOW DISPOSAL

As mentioned earlier, it is important to estimate the amount of snow disposal capacity you will need so that an adequate number of upland disposal sites can be selected and prepared.

If despite your planning, upland disposal sites have been exhausted, snow may be disposed of near waterbodies. A vegetated buffer of at least 50 feet should still be maintained between the site and the waterbody in these situations. Furthermore, it is essential that the other guidelines for preparing and maintaining snow disposal sites be followed to minimize the threat to adjacent waterbodies.

Under extraordinary conditions, when all land-based snow disposal options are exhausted, disposal of snow that is **not obviously contaminated** with road salt, sand, and other pollutants may be allowed in certain waterbodies under certain conditions. **In these dire situations, notify your Conservation Commission and the appropriate DEP Regional Service Center <u>before</u> disposing of snow in a waterbody.**

Use the following guidelines in these emergency situations:

- Dispose of snow in open water with adequate flow and mixing to prevent ice dams from forming.
- Do not dispose of snow in saltmarshes, vegetated wetlands, certified vernal pools, shellfish beds, mudflats, drinking water reservoirs and their tributaries, Zone IIs or IWPAs of public water supply wells, Outstanding Resource Waters, or Areas of Critical Environmental Concern.
- Do not dispose of snow where trucks may cause shoreline damage or erosion.

^ Consult with the municipal Conservation Commission to ensure that snow disposal in open water complies with local ordinances and bylaws.

FOR MORE INFORMATION

If you need more information, contact one of DEP's Regional Service Centers:

Northeast Regional Office, Wilmington, (978) 661-7677
Southeast Regional Office, Lakeville, (508) 946-2714
Central Regional Office, Worcester, (508) 792-7683
Western Regional Office, Springfield, (413) 755-2214

or

Call Thomas Maguire of DEP’s Bureau of Resource Protection in Boston, at (617) 292-5602.

Snow guidance 3-8-01b

REUSE AND DISPOSAL OF STREET SWEEPINGS

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BUREAU OF WASTE PREVENTION

FINAL POLICY # BWP-94.092

This Policy provides guidance on the Department of Environmental Protection's requirements, standards, and approvals for handling, reuse and disposal of street sweepings.

____
Date

By Signature on Original
Carl F. Dierker,
Assistant Commissioner,
Bureau of Waste Prevention

POLICY # BWP-94.092
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1 POLICY STATEMENT AND SCOPE

This Policy explains the Department of Environmental Protection's requirements for managing street sweepings. Street sweepings are solid waste subject to the Massachusetts solid waste regulations. The options for managing street sweepings are as follows.

1. Use the street sweepings in accordance with the pre-approved uses described in Section 4 of this policy.

2. Use the street sweepings for a beneficial use after obtaining prior approval from the Department under the provisions of the solid waste regulations, 310 CMR 19.060, Beneficial Use of Solid Wastes.

3. Dispose of street sweepings at a permitted solid waste landfill.

The provisions and requirements for managing street sweepings under these options are the subject of this policy.

2 APPLICABILITY

This policy applies to the reuse or disposal of street sweepings that are generated in the ordinary and customary maintenance of roadways. The policy does not apply to catch basin cleanings or street sweepings mixed with catch basin cleanings or other wastes. The policy does not apply to the material generated as the result of the clean up of an oil or hazardous material spill.

Street sweepings are not exempt from the Hazardous Waste Regulations, 310 CMR 30.000, and must be handled as hazardous waste when they exhibit any of the characteristics of a hazardous waste. If there is no evidence of unusual contamination, the Department does not require street sweepings to be routinely tested, but, as is the case with any waste, the generator has the ultimate responsibility for determining whether the waste is a hazardous waste.

3 DEFINITIONS

<u>Department</u> or <u>DEP</u> means the Massachusetts Department of Environmental Protection.

<u>Public Way</u> means the strip of land over and under a publicly owned, paved road or highway and includes the publicly owned land adjacent to the road or highway.

<u>Street Sweepings</u> means materials consisting primarily of sand and soil generated during the routine cleaning of roadways but may also contain some leaves and other miscellaneous solid wastes collected

during street sweeping. Street sweepings does not mean the material generated during the clean up of a spill or material from other structures associated with a roadway such as catch basins.

Urban center roads means local roads in central commercial and retail business districts and industrial and manufacturing areas.

4 PRE-APPROVED USES, RESTRICTIONS AND CONDITIONS

This policy allows street sweepings to be used in several applications. No approval from the Department is required when the restrictions and conditions identified in this policy are adhered to. However, sweepings shall not be used unless prior approval is obtained from the owner of the location where the sweepings are to be used.

4.1 Use at Landfills

Street sweepings may be used for daily cover at lined or unlined permitted solid waste landfills and need no prior DEP approval if the sweepings satisfy the requirements for daily cover material specified at 310 CMR 19.130(15).

4.2 Use as Fill in Public Ways

Street sweepings shall be used for fill in public ways without prior approval from the Department only when the following restrictions and conditions are observed:

The sweepings have not been collected from Urban Center Roads (see definition);

The sweepings are used under the road surface or as fill along the side of the road within the public way;

The sweepings are not used in residential areas;

The sweepings are kept above the level of the groundwater;

The sweepings are not used in designated "No Salt Areas";

The sweepings are not used within the 100 foot buffer zone of a wetland or within wetland resource areas including bordering vegetative wetlands and riverfront areas;

The sweepings are not used within 500 feet of a ground or surface drinking water supply.

4.3 Use As an Additive to Restricted Use Compost

Street sweepings shall be used as an additive to compost without prior approval from the Department only when the following restrictions and conditions are observed:

The sweepings have not been collected from Urban Center Roads (see definition);

The compost is used only in public ways;

The compost is not used in residential areas;

The compost is kept above the level of the groundwater;

The compost is not used in designated "No Salt Areas";

The compost is not used within the 100 foot buffer zone of a wetland or within wetland resource areas including bordering vegetative wetlands and riverfront areas;

The compost is not used within 500 feet of a ground or surface drinking water supply.

5 OTHER USES

Any use not pre-approved in the preceding section requires prior Department approval under the Beneficial Use provisions of the Solid Waste Management Facility Regulations at 310 CMR 19.060. A "Beneficial Use Determination" or BUD can be made only after the submission of an application characterizing the waste and describing the proposed beneficial use.

6 DISPOSAL

While the beneficial use of street sweepings is strongly encouraged, the Department does not prohibit the disposal of street sweepings. Street sweepings may be disposed in either lined or unlined permitted solid waste landfills without prior approval from the Department.

7 HANDLING

7.1 Collection of Street Sweepings

Although DEP does not regulate the collection of street sweepings, collection practices should be compatible with intended uses. For example, sweepings from Urban Center Roads are not approved for the uses allowed for sweepings from other areas. Keeping sweepings from

Urban Center Roads separate from sweepings from other areas will make the full benefits of this policy available.

This policy does not cover sweepings known to be contaminated by spills, and such sweepings should be collected separately and kept segregated. Depending on the contamination and circumstances, the handling of contaminated sweepings may be governed by the Massachusetts Contingency Plan, 310 CMR 40, the Massachusetts Hazardous Waste Regulations, 310 CMR 30, the Massachusetts Site Assignment Regulations for Solid Waste Facilities, 310 CMR 16 or the Massachusetts Solid Waste Management Facility Regulations, 310 CMR 19.

7.2 Storage

Street sweepings shall be temporarily stored prior to use, only when the following conditions are satisfied:

> Storage must be at the site where the sweepings are generated (in the public way) or at a location, such as a DPW yard, that is under the control of the governmental entity which is doing the sweeping or has contracted for the sweeping;
>
> The sweepings shall be protected from wind and rain to the extent necessary to prevent dust, erosion and off-site migration;
>
> The sweepings shall not be stored within the 100 foot buffer zone of a wetland or within wetland resource areas including bordering vegetative wetlands and riverfront areas;
>
> The sweepings shall not be stored within 500 feet of a ground or surface drinking water supply;
>
> Storage shall incorporate good management practice and result in no public nuisance;
>
> Storage must be temporary. Street sweepings shall be used within one year of collection unless the DEP Regional Office in the region where the sweepings are stored grants a written extension. An extension may be granted when it is demonstrated that all storage conditions will continue to be satisfied and the stored sweepings will be put to a specific identified use prior to the expiration of the extension period.

7.3 Preparation Prior to Use

Solid waste, such as paper, auto parts and other trash, shall be removed from the sweepings prior to use. Leaves, twigs and other organic matter should also be removed when good engineering practice indicates this is necessary to produce a material that is suitable for the intended use.

8 BACKGROUND

The Department has consistently classified street sweepings as solid waste subject to Massachusetts General Law Chapter 111, Section 150A and the Massachusetts Solid Waste Regulations (<u>Site Assignment Regulations for Solid Waste Facilities</u>, 310 CMR 16.00 and <u>Solid Waste Management Facility Regulations</u>, 310 CMR 19.000). There has been confusion among some in the regulated community about this classification.

Prior to the development of this policy, the options for handling street sweepings were limited to:

1. Disposal at a permitted solid waste landfill,

2. Use as cover at a permitted solid waste landfill or

3. Use in accordance with a Beneficial Use Determination (BUD). BUD decisions are made on a case-by-case basis and require the submittal of a formal application to the Department containing data showing the chemical composition of the street sweepings.

The simplest of these options was either to use the sweepings for landfill cover or to dispose of the sweepings at the local landfill. As many local landfills close, these options become less available to many communities. However, transporting sweepings to a distant landfill involves increased transportation costs and possibly payment of tipping fees.

To clarify the requirements and to provide simpler and less expensive alternatives for handling street sweepings, the Department undertook the development of this policy. Because useful studies of the chemical composition of street sweepings could not be found in the literature, the Department solicited the help of municipalities and state agencies in conducting a study of the composition of street sweepings from various types of areas. The results showed that sweepings from all areas, except Urban Center Roads, were similar with the main constituents of concern being total petroleum hydrocarbons (TPH) and polynuclear aromatic hydrocarbons (PAHs). Very limited data from Urban Center Roads indicated that sweepings from these areas may be more contaminated than sweepings from other areas.

The test results indicate that sweepings may contain levels of contamination that are unsuitable for unrestricted use. However, except for sweepings from Urban Center Roads, the levels of contamination were consistent and low enough to allow the use of sweepings in restricted applications without requiring testing or pre-approval as long as certain conditions were met. Sweepings from urban areas were excluded from some pre-approved uses. This situation could change when more data are available from Urban Center Roads.

This policy makes it possible for municipalities, state agencies and other governmental entities to handle street sweepings in an environmentally sound manner with a minimum of paperwork and expense.

9 ADDITIONAL INFORMATION

For additional copies of this policy, permit application forms or other DEP documents (except regulations) call any DEP Regional Office and ask for the Service Center or call the DEP Infoline in Boston. The permit application number for a Beneficial Use Determination is BWP SW-13 (Major) and BWP SW-30 (Minor).

Many DEP documents, including this policy, are available via modem from the DEP electronic bulletin board system, (617)292-5546. Information about the DEP and some documents are also available from the DEP's internet site at http://www.magnet.state.ma.us/dep.

Copies of all Massachusetts regulations, including the solid waste regulations, may be purchased from the State House Bookstore, (617)727-2834. The solid waste regulations are:

310 CMR 16.000, Site Assignment Regulations for Solid Waste Facilities

310 CMR 19.000, Solid Waste Management Facility Regulations

Questions about the Provisions of the Policy

If you have technical questions about the policy, please call any DEP office and ask to speak with a staff member about the provisions of the policy.

DEP InfoLine: from area code 617 and outside MA: (617)338-2255
from area codes 413 and 508: (800)462-0444
e-mail: infoline@state.ma.us

DEP Western Regional Office
436 Dwight Street
Springfield, MA 01103
Main Number: (413)784-1100
Service Center: extension 214

DEP Central Regional Office
627 Main Street
Worcester, MA 01605
Main Number: (508)792-7650
Service Center: (508)792-7683

DEP Northeast Regional Office
10 Commerce Way
Woburn, MA 01801
Main Number: (617(932-7600
Service Center: (617)932-7677

DEP Southeast Regional Office
20 Riverside Drive
Lakeville, MA 02347
Main Number: (508)946-2700
Service Center: (508)946-2714

DEP Boston Office
Division of Solid Waste
One Winter Street
Boston, MA 02108
(617)292-5960

Draft Interim Guidance Document for Beneficial Use Determination Regulations 310 CMR 19.060

March 18,2004

Massachusetts Department of Environmental Protection

Bureau of Waste Prevention

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Appendicies

Executive Summary

This Beneficial Use Determination Guidance Document provides information to assist the applicant in preparing an application for beneficial use in accordance with the Beneficial Use Regulations, 310 CMR 19.060. The Guidance also includes a table of numerical values for secondary material constituents calculated using predefined exposure assumptions.

The information contained in this document is intended solely as guidance. This Policy does not create any substantive or procedural rights, and is not enforceable by any party in any administrative proceeding with the Commonwealth. This Policy provides recommendations and guidance on approaches the Department considers acceptable for meeting the performance standards set forth in the Solid Waste Management Facility Regulations, 310 CMR 19.000 and discussed in this document.

DEP will use the information submitted by the applicant to determine if a proposed use of a secondary material can be accomplished without creating a significant risk, causing an adverse impact, or resulting in nuisance conditions. It is incumbent upon the applicant to demonstrate and otherwise provide DEP with sufficient information to determine if issuing a Beneficial Use Determination (BUD) is warranted.

There are four categories of uses for secondary materials. Each category is held to the same general standard of protection of public health, safety and the environment. However, within each category are options for demonstrating that this standard has been met. The scope of work required for each option should be consistent with the nature and extent of contamination and the type of use proposed. Therefore, uses of materials with lesser contamination and greater material control have a simpler demonstration to make. The categories include:

- Beneficial Use of Secondary Materials in Commercial Products
- Beneficial Use of Secondary Materials in Regulated Systems
- Beneficial Use of Secondary Materials in Restricted Applications
- Beneficial Use of Secondary Materials in Unrestricted Applications.

The Department has developed a quantitative risk assessment approach for use in restricted and unrestricted applications for use when evaluating risk. This approach is similar to the approach used by the Bureau of Waste Site Cleanup as documented in the Massachusetts Contingency Plan (MCP, M.G.L. Chapter 21E), but contoured to the goals of the Bureau of Waste Prevention. The assessment incorporates three methods for establishing criteria for comparison with secondary material constituent concentrations. Method 1 incorporates a list of hazardous material values that have been calculated based upon a predetermined set of exposure scenarios. Secondary materials that contain constituents of concern that do not exceed these values have demonstrated no significant risk to the public health, safety and the Environment. Method 2 may be used to derive risk criteria when unavailable in the Method 1 assessment. Method 3 involves an assessment of total risk based on site-specific information.

Where an Applicant is interested in obtaining a BUD in more than one state, there is an opportunity to pursue multi-state review of BUD applications. To do so the applicant must notify DEP at the beginning of the application process. For more information about multi-state review, see *“APPLICANT GUIDANCE DOCUMENT FOR MULTI-STATE BENEFICIAL USE DETERMINATIONS FOR NON-HAZARDOUS MATERIALS,”* which is available upon request.

This document does not provide solid waste facility siting guidance pursuant to 310 CMR 16.00 nor does it affect traditional recycling activities for which exemptions from site assignment exist pursuant to 310 CMR 16.05.

For further information

On the Web

Risk Assessment: Office of Research & Standards,
*http://www.state.ma.us/dep/ors/orspubs.ht*m

Solid Waste Regulations & Best Management Practices:

Bureau of Waste Prevention, Solid Waste
http://www.state.ma.us/dep/ors/orspubs.htm
or contact (sean.griffin@state.ma.us) (617) 292-5967 or
James Doucett, Bureau of Waste Prevention.
(James.Doucett@state.ma.us) (617) 292-5868

1 Application Process

The BUD application process is divided into two phases: 1) pre-application, and 2) application (see figure1). During the pre-application phase, the applicant provides the Department with a clear picture of the proposed beneficial use, and then, working with the Department, outlines the steps necessary to demonstrate that the proposed use meets the requirements of the beneficial use regulations.

1.1 Determination of Applicability

In some instances, an applicant may want an interpretation from the Department to determine if an activity is exempt from solid waste regulations pursuant to 310 CMR 16.05. The proponent may request a Determination of Applicability. A Determination of Applicability is a prescreening tool used by the Department to evaluate general information about a secondary material and use. The required information for the Determination of Applicability is found at 310 CMR 19.060(2), Determination of Applicability, and includes:

- A facility or operation description
- A list of products currently and historically manufactured by the facility
- A description of the secondary material
- Specifications for use of the secondary material
- A list of licenses, permits or other prior approvals issued for the use of the secondary material

The distinction between a solid waste and a product or commodity in commerce is not a bright line. The request for a Determination of Applicability should make the case for the activity as a commercial operation based upon the information submitted.. The request does not have to be comprehensive, as is necessary for a beneficial use application, nor is sampling a prerequisite. General information that is readily available should usually suffice.

1.2 Pre-Application

The pre-application process provides an opportunity for the applicant to receive specific guidance on submitting a comprehensive application. The applicant initiates the pre-application process by submitting pre-application information to the Department and requesting guidance. Upon receipt of the request the Department may: schedule a pre-application meeting; advise the applicant to submit a formal application (BWP SW 13 or 30); or determine that a BUD is not warranted. The information may be in a format of the applicants choosing, such as a draft of the application, but it should contain the information found at 310 CMR 19.060 (6), General Application Requirements, which includes:

- A physical and chemical characterization of the secondary material
- A general description of the secondary material (i.e. visual appearance, matrix, etc.)
- Identification of proposed amounts to be used
- A description of how the secondary material will be used
- Identification of the material it is replacing, if applicable, and specifications for use
- A description of the facility or operation that will use the material
- Identification of risk management techniques and best management practices (BMPs) to be employed in the use of the secondary material

- Identification of the proposed location of use, if applicable, or types of locations where the secondary material will be used (e.g. highway rights-of-way, industrial zoned properties, etc.)

This information will allow the Department to conduct a cursory review and to anticipate issues that may need to be discussed with the Applicant. Although the applicant may have conducted testing prior to the pre-application process, the Department recommends that comprehensive, statistically valid sampling, if necessary, be performed after consultation with the Department. The Department will provide specific application requirements, including the appropriate category of review, upon request.

1.3 Filing the Application

The application phase begins the official permit timeline and is initiated by the submittal of the completed application, transmittal form, and application fee if applicable, pursuant to 310 CMR 4.00. In most cases the review component of the process is 60-90 days. Sixty days is the standard timeline for reviews of technically complete applications. However, an incomplete or deficient application will trigger an additional 30-day technical review period. If the scope of the proposal warrants an individual rule, pursuant to 310 CMR 4.05, the applicant and Department will work together to develop a more appropriate schedule and fee with milestones and deadlines.

1.3.1 Where to File

Applicants should submit applications for sites in a specific town(s) or DEP region(s) to the appropriate regional office, c/o Solid Waste Section Chief, Bureau of Waste Prevention. The Department regional office mailing address information is found on the Web at www.mass.gov/dep/. BUDs issued by a region are valid only in the issuing regions.

If applicants want to use the material in more than one region, applicants should submit applications for statewide beneficial use to:

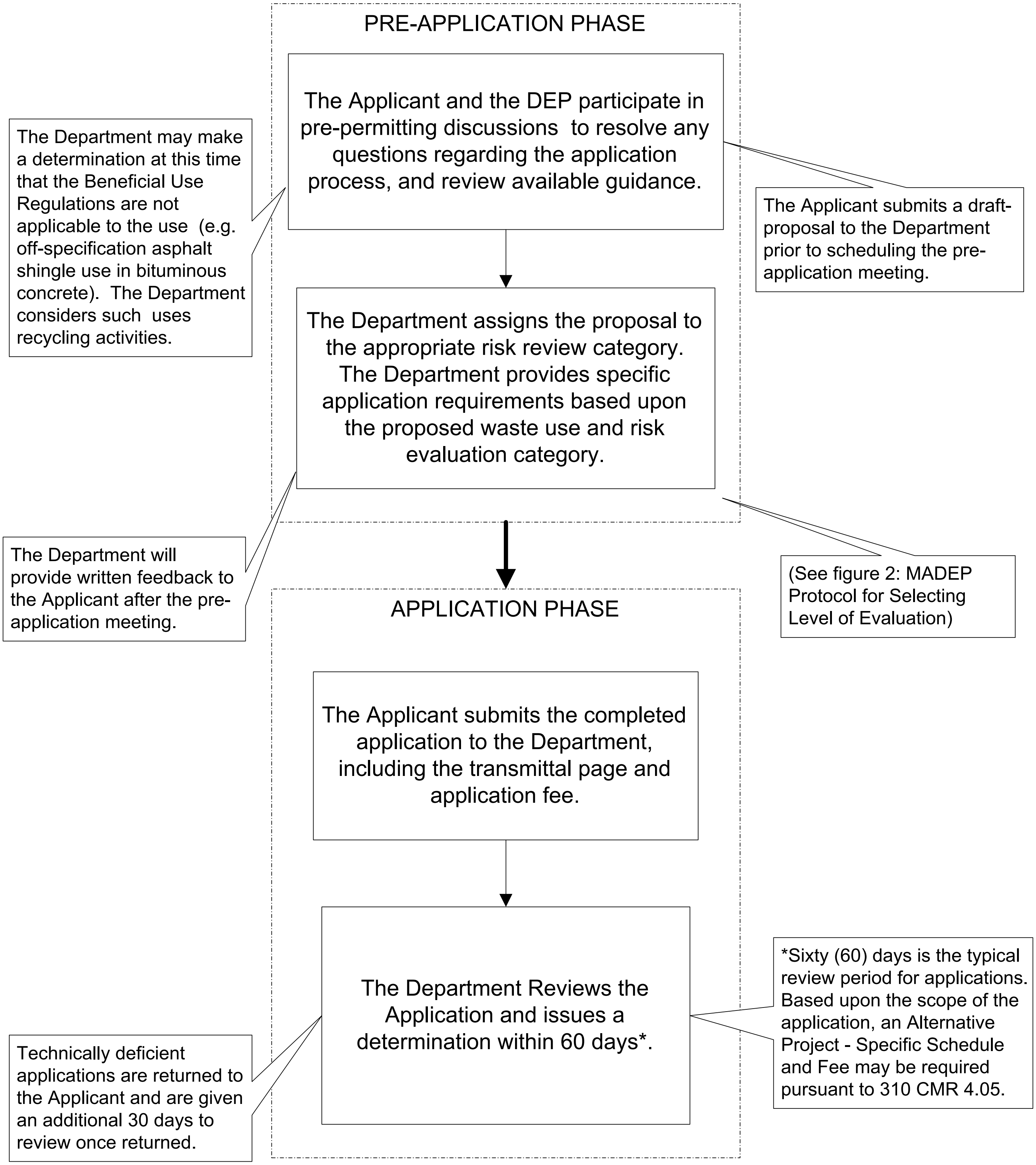
The Department of Environmental Protection
c/o Waste Branch Chief
Bureau of Waste Prevention, 9th floor
One Winter Street
Boston, MA 02108

A statewide BUD authorizes the applicant to use the secondary material throughout the Commonwealth.

1.3.2 Generic BUDs

Occasionally, the Department will issue Generic Beneficial Use Determinations as policies. These policies are specific to certain waste-use combinations and are authorized for any party provided that the user conforms to all the conditions contained in the policy. The Department's policy on contaminated soil use as daily cover at landfills (Comm. 97-001) is an example of the type of policy that is

Figure 1: Application Process Overview



considered a generic BUD. Consult the Department's home page on the web at www.state.ma.us/dep for a list of statewide generic BUDs.

1.3.3 Processing of Secondary Materials

When a solid waste is processed, a facility site assignment is required pursuant to Chapter 111: Section 150A, Solid Waste Disposal Facilities; Maintenance and Operation; Applications For Site Assignment. Limited processing of secondary materials intended for beneficial use may be allowed without a site assignment if this processing is typical of processing of similar industrial products or feedstock materials.

However, the Department will inform the applicant if a site assignment, Determination of Need (DON) or other appropriate mechanism is necessary pursuant to 310 CMR 16.00, Site Assignment Regulations.

1.4 Demonstration Projects

The Department may grant temporary approval for a pilot project or demonstration project pursuant to 310 CMR 19.062, Demonstration Projects or Facilities. Demonstration project approvals are granted, solely at the Department's discretion, when the information gathered during the demonstration project will determine if the secondary material is an effective substitute for the material it is replacing or assist the Department in making a long-term determination regarding the potential for significant risk or adverse impact to public health, safety and the environment. The application requirements will be determined on a case-by-case basis.

2 Secondary Material Testing

2.1 Sampling, Analytical and Data Quality

Any person applying to beneficially use secondary materials needs to ensure that analytical and other data used in support of any application are scientifically valid and defensible, and of a level of precision and accuracy commensurate with its stated or intended use. Applications that do not conform to these criteria will be rejected. The following provides guidance to assist applicants in complying with these requirements.

2.2 Mixtures

Sampling performed to evaluate potential risk or identify adverse impacts shall be conducted on the material as used based upon industry specifications or specifications as developed to meet a specific need. The basis for determining the content of products produced using secondary materials should be determined prior to chemical characterization. It may be necessary to perform sampling on the secondary material as well and this should be detailed in the Quality Assurance Plan as discussed in section 2.5. Final mix ratios should not be based upon a dilution factor in order to conform to an established Department standard, value or criteria.

2.3 Secondary Material Characterization.

The application should address all potential constituents of concern (COC) that may reasonably be expected to be contained in the secondary material. These include secondary material precursor constituents, products of formation resulting from the mixing of materials, cross contamination resulting from the contact with other materials in the waste stream or during their primary use, or the presence of proprietary ingredients that may contain COCs. If a secondary material is not adequately characterized the beneficial use may be denied.

Depending on the secondary material and its proposed beneficial use, sampling and chemical analyses may be required to determine or confirm the nature of the constituents present and determine their concentration. In these cases, a well thought out sampling plan should be developed and implemented (see Section 2.4) to ensure that the data generated is representative of the secondary material.

2.4 Sampling And Analytical Test Methods.

Sampling methods should consider in situ conditions and other factors, such as mix ratios, that contribute to releases of COCs.
It is the applicant's responsibility to insure that the analytical and sampling methods used and the data generated are appropriate and meet performance requirements (e.g. equipment sensitivity; reproducibility; etc.). Because of the diversity of secondary material constituents, it is impossible to identify specific sampling and analytical protocols to cover all situations. A variety of test methods exist that may be appropriate for chemical analyses of secondary materials (for example, see EPA SW846 at http://www.epa.gov/epaoswer/hazwaste/test/main.htm). The applicant must ensure that the methods selected are appropriate and meet necessary data quality objectives. It should be noted that if secondary material-specific COCs are identified that are not included on a method-specific target analyte list, then these additional analytes must also be incorporated into the sampling and analytical plan with appropriate calibration and QA/QC verification.

In every case, the reporting limit, based on the concentration of the lowest calibration value for each COC, must be less than or equal to the applicable BUD standard or other criteria, as appropriate (i.e., Method 1 Standards, risk management criteria; background concentration; etc.) In some cases, this may require analytical modifications, such as increased sampling weight or volume, to increase sensitivity. All such modifications should be reported.

2.5 Quality Assurance Plans.

In order to ensure that appropriate performance criteria are established and met, the applicant should, for every application, prepare a BUD Quality Assurance Plan (QAP).. The QAP is a comprehensive document that details the QA/QC protocols and goals for a specific data collection activity.

In preparing QAPs, the following sources of information should be consulted. These sites provide detailed information on the content and preparation methods for developing an acceptable QAP.

- http://www.state.ma.us/dep/bwsc/files/data/QAQCDocs.htm
- http://www.epa.gov/epaoswer/hazwaste/test/main.htm
- SW846 (chapter 1 and chapter 9)
- http://www.state.ma.us/dep/bwsc/files/data/samevrep.pdf
- MA DEP's Quality Assurance and Quality Control Guidelines for Sampling, Data Evaluation and Reporting Activities.

- http://www.epa.gov/r10earth/offices/oea/r0qadrg.htm
- US EPA's Data Review Guidelines

Common QA/QC requirements that should be included in any BUD sample collection and analysis effort are listed below. QAPs that do not include these components may be viewed as unacceptable unless a valid, detailed scientific explanation is provided.

QAPs should specify:

1. trip blanks with each batch of samples submitted to the lab for analysis of VOCs and VPH;
2. an equipment blank for analysis of all parameters. If more than 20 samples are to be taken, one blank per 20 samples should be submitted;
3. triplicate samples for a matrix spike (ms) and matrix spike duplicate (msd) analysis, with one triplicate set for every 20 samples;
4. blind duplicate samples and blind proficiency standards;
5. certification by responsible parties (laboratory director; consultant in charge; applicant) that sampling records and analytical data were reviewed and that all elements of the QAP were complied with or, if not, that all deviations were identified and adequately explained.

In addition, applicants must ensure that all staff involved with any component of the sampling and analysis plan, including those collecting samples as well as the selected laboratory:

1) Review the Project's QAP and identify any exceptions or qualifications.
2) Verify, document and maintain sample integrity (containers, preservatives, holding times, etc.)
3) Perform the requested analyses in strict conformance with the specified method and any applicable DEP method requirements.
4) Maintain complete records of all sample submittals and analytical process data.

2.6 Representative Sampling

The Department experience with BUD applications shows that statistical representation is not often considered when sampling secondary materials. This section is meant to provide a brief summary of some key statistical concepts and terms; provide references for consultation; and to emphasize the importance that statistically based testing plays in demonstrating protection to the public health, safety and the environment. Proper analysis will allow the applicant to gain the necessary information with the minimum of expense and effort. However, the physical and chemical diversity of materials, as well as the dissimilarity of storage facilities (lagoons, open piles, tanks, drums, etc.) and sampling equipment associated with them, preclude a detailed consideration in this guidance document of any specific sampling plan. Consequently, the burden of responsibility for developing a technically sound sampling plan rests with the applicant.

In most cases, the objective of a beneficial use application sampling plan is to adequately characterize the secondary material. Frequently, it is impossible, or at least impractical, to take measurements of all the entire waste material (the population). Statistical analysis is a tool for drawing conclusions about a population by evaluating a sample size that is smaller than the entire population in order to make judgments about the entire population. Statistically valid sampling plans will have samples that are representative of the population. The purpose of the sampling plan is to derive a mean concentration (the mean concentration is the average of sample readings) that may not be the true mean (the average of the entire population) but some measure of central tendency and dispersion about the true mean. The measure of the dispersion around the mean is called the standard deviation (or standard error) and is calculated based upon the assumption that the distribution of the concentration of any contamination within a solid waste resembles a bell curve. It is important to note at this time that although a variety of distribution curves exist for varying populations, the curve for contamination within a solid waste is considered to be a normal distribution. There are methods for testing the correctness of this assumption; however, this usually requires a great number of samples beyond what is typical for solid waste analysis.

Since one cannot be 100% sure that the mean concentration is equal to the true concentration, the closer the mean concentration is to the regulatory threshold the more important it is for added precision. For purposes of evaluating solid wastes, the probability level (confidence interval) of 80 % has been selected. That is to say that for each chemical COC, a confidence interval (CI) is described around the true mean for which 80 out of 100 samples are expected to fall. The 80% CI is then compared with the appropriate regulatory threshold. Because the normal bell shaped curve is presumed for the distribution of samples around the true mean there is actually only a 10% chance (not 20%) that the threshold is equaled or exceeded. Consequently, the CI employed to evaluate solid wastes is, for all practical purposes, a 90% interval. For example, if a regulatory threshold is 5 mg/Kg and the calculated mean concentration within a waste is 4 mg/Kg then the upper range of the CI (the range for which 80 out of 100 samples are expected to fall based upon the bell curve) must also be below the regulatory threshold of 5 mg/Kg.

It is prudent to collect a greater number of samples than indicated by the preliminary estimates of the mean and standard deviation in the event that poor estimates were chosen. The information described in this section was derived from the EPA Guidance Document, *Test Methods for Evaluating Solid Waste,* SW-846.

2.7 Reporting.

Analytical results must be reported in conformance with DEP's requirements for the submittal as a whole and for the specified analyses.

Reports should include:

- Sample information (matrix, preservative, temperature on receipt, etc.)
- Request for analysis
- Method citation(s)
- Custody records
- Case narrative detailing anomalies, comments and qualifications to data.

- Analytical results (to include individual reporting limits for individual analytes, dilutions, extraction/pretreatment, etc.)
- QA/QC results (surrogate recovery, method blanks, standard deviation, etc., as applicable)
- Laboratory analytical certification (method followed, acceptance criteria met, and documentation of method modifications or anomalies)

3 CATEGORIES OF BENEFICIAL USE

Assessment options for evaluating COCs are specific to categories of use. The Department developed these categories to tailor the application requirements to similar types of uses. The categories differ in their potential for releases of, and exposures to, COC.

The categories include the following:

Category 1: Beneficial Use of Secondary Materials in Commercial Products

Products manufactured from secondary materials or secondary materials that are directly used as products are considered commercial products under the following conditions:

- When the product is used in a manner that is consistent with industry accepted product specifications or performance standards;
- When the product is controlled and managed throughout its lifecycle in a manner that effectively limits potential for illegal or inadvertent disposal or releases of hazardous material to the environment and exposure to people;
- When any adverse impacts or significant risks to public health, safety and the environment, including, but not limited to, nuisance conditions and public welfare impacts, can be evaluated by demonstrating conformance with the conditions stipulated in section 4.3;
- Products applied to the land cannot be considered commercial products.

Category 2: Beneficial Use of Secondary Materials in Regulated Systems

This category is applicable to beneficial uses that the Department already regulates through an existing permit, order or approval (e.g. landfill cover use is addressed through DEP Policy Comm. 97-001).

Category 3: Beneficial Use of Secondary Materials in Restricted Applications

Secondary materials that are beneficially used in applications that utilize risk management techniques in order to prevent adverse impact or significant risks to public health, safety and the environment, including, but not limited to, nuisance conditions and public welfare impacts, shall be reviewed in accordance with this section.

Category 4: Beneficial Use of Secondary Materials in Unrestricted Applications.

Secondary materials that are beneficially used in applications that do not limit exposure to potential human or environmental receptors from secondary material constituents are reviewed in accordance with this section when constituents have the potential to adversely impact or create a risk to public health, safety, or the environment, including, but not limited to, nuisance conditions or public welfare impacts when improperly stored, treated, transported, disposed of, used, or otherwise managed. Unrestricted beneficial use proposals are subject to the most comprehensive risk evaluations.

4 OPTIONS FOR EVALUATING CONSTITUENTS OF CONCERN (COCs) IN SECONDARY MATERIALS

4.1 Performance Standards

All beneficial use applications must demonstrate that the proposed beneficial use will not create significant risk or cause adverse impacts to the public health, safety, and the environment or result in nuisance conditions. The Applicant may demonstrate this by conforming to specific performance criteria included in the regulation and discussed in sections 4.2 and 4.3. These vary by category and may include consistency with background COC concentrations; consistency with COC concentrations in a traditional manufactured product (subject to specific limitations as discussed below); and consistency with DEP risk management criteria.

4.2 Critical Contaminants of Environmental Concern (CCCs)

CCCs are a subset of the universe of Contaminants of Concern (see Appendix – 2 for a full listing). This list includes compounds that pose an elevated threat to public health and the environment for the reasons identified below, and therefore are of particular concern. The list includes compounds that exhibit several of the following properties: 1) persistence in the environment; 2) ability to bioaccumulate; 3) potent toxicity; and/or 4) widespread presence in the environment at levels of concern. Under the BUD program, concentrations of CCCs in secondary materials must be demonstrated to be consistent with background levels and meet other applicable requirements for beneficial use in categories 3 and 4.

4.3 CATEGORY 1- Beneficial Use of Secondary Materials in Commercial Products

Category 1 beneficial uses may be approved provided that:

A. Concentrations of COC are demonstrated to be consistent with or below those in the traditional material it is replacing. This determination can be made through a statistical comparison of the concentrations of COC in samples of the secondary material with concentrations of COCs in samples of the traditional material. Applicants may be able to make this demonstration based on existing data or general information regarding the composition of the original and secondary materials.

Note that Category 1 approvals are not applicable to "products" intended for, or that will likely result in, unrecoverable dissemination in the environment (e.g. soil additives/amendments).

OR

B. Concentrations of all COC are demonstrated to be below MA background soil levels;

4.4 CATEGORY 2- Beneficial Use of Secondary Material in Regulated Systems

If the use of a secondary material is subject to an existing facility permit, order, policy, regulation or other approval, the use is considered adequately regulated for purposes of the Solid Waste Facility Regulations, 310 CMR 19.000. However, if there are any aspects of the beneficial use not covered that have the potential to create significant risk or cause adverse impacts to the public health, safety, and the environment or result in nuisance conditions then these concerns will be regulated under a BUD. When all solid waste concerns are overseen by an existing faciliy permit, order, policy, regulation or other approval, a BUD is not required. In all cases, the storage, transfer, processing, treatment, use and disposal of the secondary material shall be achieved using best management practices that prevent adverse impacts and significant risks to public health, safety and the environment, including, but not limited to, nuisance conditions and public welfare impacts.

4.5 CATEGORY 3: Beneficial Use of Secondary Materials in Restricted Applications

Category 3 beneficial use applications may be approved provided:

A. Concentrations of all COC are below Upper Contamination Limits (See Section - 5*.2.1.5, Upper Contamination Limits (UCLs)*).

AND

B. The proposed beneficial use, considering all COC, can be demonstrated to be in compliance with all applicable risk criteria using BUD Risk Assessment (RA) Methods 1 and/or 2, or Method 3 (note Methods 1 and 2 may be used together; Methods 1 and 2 cannot be combined with Method 3). If using a Method 1 BUD RA then concentrations must fall below the appropriate BUD Method 1 category (e.g. S-1/GW-2 or S-2/GW1 etc). If using a Method 3 BUD RA then assessments must use exposure pathways appropriate to the beneficial use.

OR

C. Concentrations of all COC are demonstrated, through sampling, to be below DEP approved MA background soil levels;

OR

D. The applicant can adequately demonstrate that environmental release and exposure pathways are substantively eliminated over the product's lifecycle under conditions of the beneficial use and DEP concurs. This option is not applicable to Unrestricted Beneficial Use (Category 4) proposals.

For Critical Contaminants of Concern (CCC)

If Critical Contaminants of Concern (CCC) are present then the applicant must demonstrate compliance with acceptable risk limits as in (B) above

AND

Demonstrate consistency with background (as in C above). (D) is not an option for CCC.

4.6 CATEGORY 4- Beneficial Use of Secondary Material in Unrestricted Applications

Category 4 beneficial use applications may be granted if:

A. Concentrations of all COC are below UCLs.

AND

B. The proposed beneficial use, considering all COC, can be demonstrated to be in compliance with all applicable risk criteria using BUD RA Methods 1 and/or 2, or Method 3 (note Methods 1 and 2 may be used together; Methods 1 and 2 cannot be combined with Method 3). Because use in this category is unrestricted, COC concentrations must fall below the most stringent BUD Method 1 standard or Method 2 values must be derived using the guidance discussed below or Method 3 assessments must be completed using conservative (residential-type) exposure pathways.

OR

C. Concentrations of all COC are demonstrated to be below DEP approved MA background soil levels.

For Critical Contaminants of Concern (CCC).

If Critical Contaminants of Concern (CCC) are present then the applicant must demonstrate compliance with acceptable risk limits as in (B) above;

AND

Demonstrate consistency with background (as in C above).

5 BUD RISK ASSESSMENT METHODS

The BUD risk assessment approach is based on, but not identical to, that used under the MCP (M.G.L. Chapter 21E Subpart I: Risk Characterization) to address hazardous waste sites in MA. Although the methodologies are similar, significant differences exist. In order to understand these differences and avoid potential delays in processing and reviewing BUD applications, it is important that the following guidance be reviewed carefully. Project proponents are advised to retain consultants with expertise in MA and USEPA risk assessment methods to complete BUD risk assessment work.

For a BUD to be approved the applicant must make an adequate demonstration that public health, safety and welfare and the environment will not be endangered because of the beneficial use. Criteria that may be used to make this determination for each of the beneficial use categories are discussed in Section 4, Options For Evaluating Constituents Of Concern In Secondary Materials. In all cases, the burden of proof rests with the applicant who must make this demonstration using appropriate data and methods. The level of complexity of the assessment required depends on the nature of the secondary material and the proposed beneficial use. Unrestricted beneficial use applications require very thorough and comprehensive assessments.

The following section provides guidance on risk assessment methods that applicants may use to evaluate beneficial use risks. In order to enhance consistency and to minimize potential creation of liability under the MCP associated with secondary material use and to streamline the process, BUD risk assessment methodologies have been based on those used in the MA MCP program. These methods are summarized below. Sections of the MCP risk assessment guidance and related documents, where more detailed information may be obtained, are identified. Differences between the MCP approach and that used to evaluate BUD risks are highlighted.

5.1 BACKGROUND: MCP RISK ASSESSMENT APPROACH

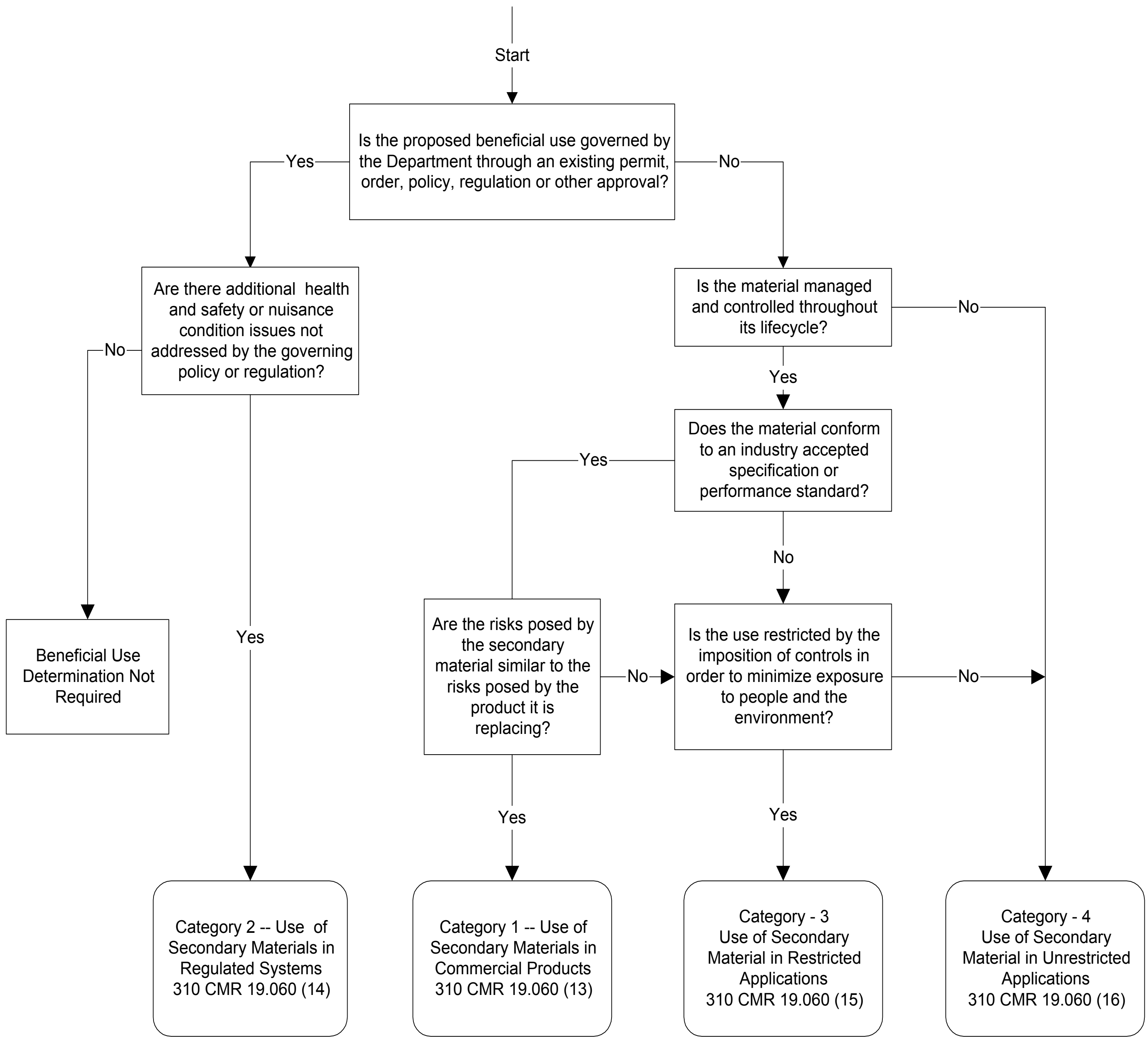
In Massachusetts, hazardous waste sites are assessed and cleaned-up under the regulations known as the Massachusetts Contingency Plan ("MCP"). The MCP specifies conditions under which contamination must be reported to the Department and conditions under which site contamination would pose "No Significant Risk" of harm to health, safety, public welfare and the environment. In the case of BUDs, if constituents in secondary materials are not adequately characterized and risks appropriately assessed, use of secondary materials has the potential of creating liability under the MCP.

The MCP provides three approaches for characterizing risks and the need for remediation at sites. These are: 1) use of standards established by DEP (Method 1); 2) use of standards developed by the applicant using appropriate methods as delineated by DEP (Method 2); and, 3) comprehensive site-specific risk evaluation (Method 3).

Method 1 standards include three categories for groundwater and three categories for soil. Method 2 provides for the derivation of a standard if one is not available under Method 1, using methods and risk management criteria specified by DEP. Method 3 involves an assessment of total risk based on site-specific information.

Under the MCP, sites must be cleaned up until constituent concentration risks meet the applicable risk management criteria or until concentrations are consistent with background. If feasible, background concentrations must be achieved.

Figure 2: Flowchart for Defining the Appropriate Waste Use Category



5.2 BUD RISK ASSESSMENT APPROACH

The BUD risk assessment approach parallels that used under the MCP. Key differences are summarized below, followed by guidelines for the appropriate use of the Method 1-3 options to assess BUD risks.

5.2.1 Key Differences: BUD vs. MCP Methods.

5.2.1.1 Risk Management Criteria.

The risk management criteria used in the BUD program differ from those established under the MCP. More stringent health protective criteria have been used in the BUD process to prevent the introduction of new constituents into the environment to prevent the creation of new environmental contamination. The MCP, on the other hand, is for the cleanup of existing contamination. The risk management criteria established under the MCP and the BUD program are compared in Table 1.

Table 1: Risk Management Criteria

Risk Type	**Risk Management Criteria (acceptable risk level)**	
	BUD Program	**MCP**
Individual Chemical Risk		
Cancer	0.5 X E-06	1 X E-06
Non-cancer	HI = 0.1	HI = 0.2
Total Risk		
Cancer	0.5 X E-05	1 X E-05
Non-cancer	HI = 0.5	HI = 1

5.2.1.2 Basis for Determining Background

BUD background values rely on the 50th percentile of appropriate sample distributions. In contrast, under the MCP, upper-range values were generally used. For example, under the MCP, the 90th percentile of an applicable distribution of contaminant concentrations in "clean" soils was used to establish generic background values for metals *(http://www.state.ma.us/dep/ors/files/backtu.pdf)*. These values are used in the

MCP to evaluate consistency of site contamination with background. Under the BUD process, consistency with background requires a demonstration that secondary material constituent concentrations are at or below the 50^{th} percentile of an appropriate background soil concentration data set. To derive generic background values such data must be derived from samples of clean soils (e.g. rural, uncontaminated soils). Site specific background balues may also be derived and used in the case of Categories 1-3. These must be appropriate to the proposed use and/or site of use and must again be based on the 50^{th} percentile. (note that hte MCP background values for PAHs were based on fill materials that are expected to have somewhat elevated levels compared to undisturbed soils. Thus, these were not used in the derivation of the BUD Method 1 values.)

5.2.1.3 Reportable Concentrations ("RCs")

Under the MCP, contamination in groundwater or soil must be reported to DEP if any concentration exceeds the applicable Reportable Concentration in either groundwater or soil. For use of secondary materials containing chemical COCs, reportable concentrations ***are not applicable.*** All secondary materials containing COCs, whether or not their concentrations are above or below RCs, must be evaluated through the BUD process using appropriate methodologies.

5.2.1.4 Basis of Values

In contrast to the derivation of the MCP Method 1 standards, drinking water standards and guidelines are not always adopted, when available, as the basis for the BUD Method 1 Values. The drinking water standards and guidelines are not all risk based. These values may take into account additional considerations, such as feasibility and cost issues, in their derivation. Because the BUD program addresses the potential introduction of new contamination into the environment, DEP concluded that it was inappropriate to establish BUD Method 1 Values using values that may be based on the feasibility and costs of treatment and cleanup of existing contamination. Instead, BUD Method 1 Values are based on risk, background concentrations, detection limits and nuisance conditions (odor potential).

For some chemicals the drinking water standard or guideline may be lower than the value derived using these alternatives (e.g. due to the inclusion of an additional uncertainty factor for possible carcinogens for which slope factors are not available). In these cases the drinking water value has been used in the derivation of the BUD standard.

5.2.1.5 Upper Contamination Limits (UCLs)

Under the MCP, DEP established Upper Concentration Limits for chemicals to limit the extent to which a site-specific risk assessment can be used to justify high residual concentrations of contaminants. In the MCP, if site concentrations exceed the UCLs established for groundwater or soil, the site cannot be considered "permanently cleaned up", except in the case of soil contaminants encapsulated beneath an engineered barrier.

For BUD evaluations, if constituent concentrations exceed the MCP UCLs, the material cannot be considered acceptable for beneficial use under Categories 3-4. It is important to note that compliance with UCLs does not mean that the material is acceptable for beneficial use. Compliance with all the other appropriate beneficial use decision criteria must also be demonstrated.

5.2.1.6 Critical Contaminants of Environmental Concern (CCCs)

As previously discussed special provisions are included in the BUD regulations for CCCs, which are not included in the MCP. Under the BUD program, concentrations of CCCs in secondary materials must be demonstrated to be consistent with background levels *and* meet other applicable requirements for beneficial use in categories 3 and 4.

6 RISK ASSESSMENT OPTIONS FOR BUDS

6.1 BUD Method 1

Method 1 may be used to assess beneficial use risks for any beneficial use category when Method 1 standards are available for all COCs in the secondary material. Each constituent must meets its applicable Method 1 standard. In addition the aggregate or summed risk of all constituents present must meet the BUD risk management criteria (Table 1).

The Beneficial Use Method 1 Values are presented in Appendix 5. These values differ from the MCP Method 1 values. As noted previously, the BUD Method 1 values are based on different risk management criteria which establish a higher bar for demonstrating that a secondary material beneficial use does not endanger public health and the environment.

6.1.1 Applicability and Interpretation

6.1.1.1 Beneficial Use of Secondary Materials in Unrestricted Applications

For all unrestricted beneficial use applications the concentrations of all COCs must be below the most conservative (lowest) Method 1 value from Table 1. If COCs are present for which Method 1 values do not exist, the applicant must either develop a Method 2 value using approved DEP methods (see Section

6.2) or must complete a Method 3 assessment. If toxicity data do not exist that allow for completion of a Method 2 or 3 assessment, the material may not be used in Category 4 (Unrestricted Beneficial Use) applications unless consistency with background is demonstrated.

6.1.1.2 Beneficial Use of Secondary Materials in Restricted Applications

For Restricted Beneficial Use Applications (BUD Category 3), COC concentrations must be compared to the Method 1 value most appropriate to the release and exposure pathways of concern for the beneficial use in question, as discussed below.

If the use substantively eliminates release and exposure pathways, DEP may determine that a quantitative risk assessment is not needed. Such a determination is contingent upon the applicant providing detailed information and data demonstrating that release and exposure pathways are, in fact, adequately controlled under current and future conditions of the beneficial use.

6.1.2 BUD Method I Values

1) Groundwater –1 (GW-1) values apply to any beneficial uses that may result in releases within Current and Potential Drinking Water Source Areas. These values are calculated assuming the potable use of the water.

2) Groundwater – 2 (GW-2) values apply to beneficial uses within 30 feet of an occupied building where the depth to groundwater is 15 feet or less. These values are calculated assuming the infiltration of vapors from a dissolved groundwater source of contamination.

3) Groundwater –3 (GW-3) values apply to beneficial uses that may directly impact any groundwater, and are calculated assuming that the groundwater will discharge to a nearby water body. The GW-3 values are based on the aquatic toxicity of chemicals.

4) Soil - The BUD Soil Values are based on a range of exposure scenarios. The most stringent values (S-1) assume long-term exposure to children and adults, while the least stringent values (S-3) are based on short-term, infrequent, adult-only exposures. The appropriate Soil Categories for comparison depend upon the accessibility of the beneficially used material (e.g., depth); nature of the material vis-à-vis potential exposure pathways; the nature of the potential receptors exposed (e.g., child or adult); the frequency of exposure; and, the intensity of the exposure that could result from the beneficial use.

6.2 BUD Method 2.

For COCs lacking established Method 1 values, the applicant may assess potential risks using Method 2. Detailed guidance on appropriate methods is available at http://www.state.ma.us/dep/ors/orspubs.htm. Applicants must keep in mind the differences between the BUD and MCP approaches as discussed in Section 4.2.1. This approach must be used if the applicant wishes to use Method 1 values to evaluate other secondary material constituents. Alternatively, the total waste risk may be assessed using Method 3 (Section 5.3). Method 2 may also be used to derive modified values that account for exposure and release variables specific to a proposed restricted beneficial use. In Method 2 the applicant derives a value for the chemical in question using appropriate data, methods and risk management criteria as specified by DEP. Method 2 values are thus functionally equivalent to Method 1 values but are derived by the applicant.

6.3 BUD Method 3.

The third method for characterizing risk relies on a use-specific risk assessment approach analogous to the site-specific approach under the MCP. Detailed guidance on appropriate methods is available at http://www.state.ma.us/dep/ors/orspubs.htm. Applicants must keep in mind the differences between the BUD and MCP approaches as discussed in Section 5.2.1. A Method 3 assessment describes and quantifies the current and future exposures that would occur attributable to the proposed beneficial use and compare the estimated risks to the Total Waste Cancer and Noncancer Risk Limits specified in the BUD regulations. If the risk assessment includes limitations on site use, such as a prohibition of residential development, such limitations must be included in a deed notification. Such notification shall be recorded in the registry of deeds or in the registry section of the land court for the district wherein the property lies. Such notification shall describe the limitations on the use of the property and reference to the Department file number or other Department means for identifying the file

A use-specific risk assessment could be used to demonstrate that constituent concentrations higher than the published Method 1 Values pose “No Significant Risk” due to limited exposure potential with a given beneficial use. A Method 3 assessment is also required if exposure pathways, which were not considered in the derivation of Method 1 and Method 2 values, exist.

As stipulated in the Regulations, dilution may not be used to meet risk criteria. Thus, when using Method 3 to assess compliance with the acceptable risk criteria, exposure point concentrations must be based on the COC concentrations in the secondary material product as used. Additives may only be used if they are required to impart a critical function or attribute to the final material to be beneficially used.

APPENDICES

Appendix 1. Definitions

310 CMR 16.00 refers to the siting regulations that address solid waste management facilities. These include siting requirements for landfills, municipal waste combustors, and transfer and processing facilities.

Adverse Impact means an injurious impact that is significant in relation to the public health, safety, or environmental interest being protected. Adverse Impact refers to qualitative impacts resulting from beneficial uses that may affect people and the environment. The Massachusetts Department of Environmental Protection is responsible for protecting human health and the environment by ensuring clean air and water, through the safe management and disposal of solid and hazardous wastes. DEP's role under Article 97 of the Massachusetts Constitution is the guarantor of the people's right to "clean air and water", as well as "the natural scenic, historic and aesthetic qualities of the environment.

Beneficial Use means the use of a material as an effective substitute for a commercial product or commodity.

Beneficial Use Determination (BUD) means the permitting by a State environmental agency of the use of a non-hazardous RCRA solid waste in a product, or used as a product itself, when certain environmental and public health standards are met. In general, for such a waste to be beneficially used it must have chemical and physical properties similar to the raw material that it is replacing or, when incorporated into another product, its use must contribute to the effectiveness of the final product.

Commercial means of, relating to, or being goods, often unrefined, produced and distributed in large quantities for use by industry.

Constituents of Concern ("constituent") means any component of a secondary material that may present a risk of injury to health or the environment.

Critical Contaminants of Environmental Concern (CCCs) are a subset of the universe of Contaminants of Concern (see Appendix – 2 for a full listing). This list includes compounds that pose a elevated threat to public health and the environment because they exhibit: 1) persistence in the environment; 2) ability to bioaccumulate; 3) potent toxicity; and/or 4) widespread presence in the environment at levels of concern.

Destructive Practices means any process that results in breakage of products manufactured using secondary materials increasing surface area and potentially releasing COCs to the environment.

Exposure Pathway means the mechanism by which human or environmental receptors inhale, consume, absorb, or otherwise take in oil and/or hazardous material at an Exposure Point.

Performance Data means any parameter or piece of information collected or produced from measurements, analyses or models of environmental processes, conditions and effects of COCs on human health and the environment including results from laboratory analyses, demonstration or pilot project and the work performed to obtain, use, or report information pertaining to process, method, procedure, equipment, system or facility.

Quality Assurance (QA) means an integrated system of management activities involving planning, implementation, assessment, reporting, and quality improvement to ensure that a process, item, or service is of the type and quality needed and expected.

Quality Control (QC) means the overall system of technical activities that measures the attributes and performance of a process, item, or service against defined standards to verify that they meet the stated requirements established by the customer; operational techniques and activities that are used to fulfill requirements for quality.

RCRA means the Resource Conservation and Recovery Act.

Recyclable or Recyclable Material means a material that has the potential to be recycled and which is pre-sorted and not contaminated by significant amounts of toxic substances.

Recycle means to recover materials or by-products that are:

a) Reused; or
b) Used as an ingredient or a feedstock in an industrial or manufacturing process to make a marketable product; or
c) Used in a particular function or application as an effective substitute for a commercial product or commodity.

"Recycle" does not mean to recover energy from the combustion of a material.

Regulated Systems means any storage, transfer, processing, treatment, use, or disposal activity governed, approved, or otherwise ordered by the Department.

Restricted Applications means uses of secondary materials that utilize risk management techniques in order to prevent adverse impacts to the public health, safety and the environment.

Secondary Material means a discarded material that has the potential to be recycled and is not classified as a "recyclable material" – i.e. not pre-sorted, contains COCs, or is used at facilities and operations to which 310 CMR 16.00 applies.

Solid Waste or Waste means useless, unwanted or discarded solid, liquid or contained gaseous material resulting from industrial, commercial, mining, agricultural, municipal or household activities that is abandoned by being disposed or incinerated or is stored, treated or transferred pending such disposal, incineration or other treatment, but does not include:

(a) Hazardous wastes as defined and regulated pursuant to 310 CMR 30.000;

(b) Sludge or septage which is land applied in compliance with 310 CMR 32.00;

(c) Waste-water treatment facility residuals and sludge ash from either publicly or privately owned waste-water treatment facilities that treat only sewage, which is treated and/or disposed at a site regulated pursuant to M.G.L. c. 83, §§ 6 & 7 and/or M.G.L. c. 21, §§ 26 through 53 and the regulations promulgated thereunder, unless the waste-water treatment residuals and/or sludge ash are co-disposed with solid waste;

(d) Septage and sewage as defined and regulated pursuant to 314 CMR 5.00, as may be amended, and regulated pursuant to either M.G.L. c. 21, §§ 26 through 53 or 310 CMR 15.00, as may be amended, provided that 310 CMR 16.00 does apply to solid waste management facilities which co-dispose septage and sewage with solid waste;

(e) Ash produced from the combustion of coal when reused as prescribed pursuant to M.G.L. c. 111, § 150A;

(f) Solid or dissolved materials in irrigation return flows;

(g) Source, special nuclear or by-product material as defined by the Atomic Energy Act of 1954, as amended;

(h) Those materials and by-products generated from and reused within an original manufacturing process; and

(i) Compostable or recyclable materials when composted or recycled in an operation not required to be assigned pursuant to 310 CMR 16.05(2) through (5).

Unrestricted Applications means uses of secondary materials that result in unlimited routes of exposure to human and environmental receptors from secondary material constituents.

Appendix 2: CRITICAL CONTAMINANTS OF CONCERN LIST

MADEP has identified the following compounds as critical contaminants of concern for assessment under the revised BUD regulations. These compounds include the Level 1 and Level 2 priority Persistent Bioaccumulative Toxic Chemicals PBTs identified under the Binational Toxics Strategy (http://www.epa.gov/glnpo/bns/chemicals.html) as well as select compounds from the RCRA Waste Minimization PBT Chemical List (http://www.epa.gov/fedrgstr/EPA-WASTE/1998/November/Day-09/f29952.htm). MADEP has also included the brominated diphenyl ether compounds as a group on this list because of their persistence, bioaccumulative nature and toxicity, as well as data that demonstrates that environmental levels and exposures to these chemicals are close to those associated with overt toxicity and are increasing. Lead has been included because of its toxicity to children.

Modifications to this list may be made as new information becomes available.

Binational Toxics Strategy Level 1 Substances:

aldrin/dieldrin
benzo(a)pyrene
chlordane
DDT, DDD, DDE
hexachlorobenzene
alkyl-lead
mercury and its compounds
mirex
octachlorostyrene
PCBs
dioxins and furans
toxaphene

Binational Toxics Strategy Level 2 Substances:

cadmium and cadmium compounds
1,4-dichlorobenzene
3,3'-dichlorobenzidine
dinitropyrene
endrin
heptachlor (and heptachlor epoxide)
hexachlorobutadiene and hexachloro-1,3-butadiene
hexachlorocyclohexane
4,4'-methylenebis(2-chloroaniline)
pentachlorobenzene
pentachlorophenol
tetrachlorobenzene (1,2,3,4- and 1,2,4,5-)
tributyl tin
PAHs as a group, including anthracene, benzo(a)anthracene, benzo(ghi)perylene,perylene, and phenanthrene[2]

Other Compounds of Concern To DEP

Brominated diphenyl ethers
Lead

Select Compounds from the Draft RCRA Waste Minimization PBT Chemical List

Chlorinated Solvents:
- Chloroform
- 1,1-Dichloroethane
- 1,1,1-Trichloroethane

Chlorobenzenes:
- 1,2-Dichlorobenzene
- 1,3-Dichlorobenzene
- 1,2,4-Trichlorobenzene

Other Halogenated Organics:
- 4-Bromophenyl phenyl ethers

Pesticides
- alpha-Endosulfan
- beta-Endosulfan
- Methoxychlor
- Pentachloronitrobenzene

- 2,4,5-Trichlorophenol

Organonitrogens:
- Nitrobenzene

Nonhalogenated Phenolics:
- Phenol
- 2,4,6-tris-(1,1-Dimethylethyl)phenol

Phthalate esters:
- Bis-(2-ethylhexyl) phthalate
- Butylbenzyl phthalate
- Dibutyl phthalate

Polycyclic aromatic hydrocarbons:
- Acenaphthene
- Acenapthylene
- Anthracene
- Fluoranthene
- Fluorene
- 2-Methylnaphthalene
- Naphthalene
- Pyrene

Metals
- Antimony
- Arsenic
- Beryllium
- Chromium
- Copper
- Nickel
- Selenium
- Zinc
- Cyanide

Appendix 3. Permit Schedule

Application Phase Process Steps	Purpose	Applicant Actions	Department Actions	Timetable	Fee
Pre-Application / Determination of Applicability Phase					
Preliminary Application / Determination of Applicability Meeting	To obtain sufficient information to classify the use. Provide guidance to the applicant.	Submit pre-application information	Meet with the applicant. Explain the beneficial use process. Identify approval standards. Provide final application requirements.	Applicant submits preliminary information at least 10 business days prior to meeting.	NA
Beneficial Use Category Determination	To establish review criteria based upon material use and potential hazards.	NA	Decide which review category is applicable to the beneficial use.	Prior to the pre-application meeting, if possible.	NA
Scope of Evaluation Determination	Determine final application requirements.	NA	Specify specific application requirements. Identify standards for approval. Establish timeline and fee, if applicable.	Within 10 business days after the pre-application meeting.	NA
At the end of the pre-application phase the Department will have assigned the application to a tier review category, provided the applicant with characterization requirements and standards for review, and established the timeline and fee for individual rule permit applications.					
Application Phase					
Administrative Review	Ensure application contains necessary information.	Applicant submits full application.	Department reviews the application to assess administrative completeness.	Tier I: 30 days Tier II: 30 days Tier III: 30 days Tier IV: 30 days	Tier I: $ Tier II: $ Tier III: individual rule Tier IV: individual rule
First Technical Review	Review application to ensure use is safe.	The applicant has 180 days from receiving a technical deficiency to respond to the technical deficiency.	Department reviews the application for technical completeness and issues BUD or deficiency.	Tier I: 30 days Tier II: 30 days Tier III, Tier IV: individual rule	
Second Technical Review	Review application to ensure use is safe (if necessary).	Submits deficient information. If deficient again the BUD is denied.	In the case that technical information is inadequate the applicant shall submit requested information.	Tier I: 30 days Tier II: 30 days Tier III, Tier IV: individual rule	

Appendix 4: References

Massachusetts Department of Environmental Protection (DEP). July, 1988. Ash Sampling and Analysis Guidance. SWM-9-7/88 (as further clarified in 7/97 DEP communications to facility operators).

Massachusetts Department of Environmental Protection. (DEP). July, 1995. Guidance for Disposal Site Risk Characterization – in Support of the Massachusetts Contingency Plan. Bureau of Waste Site Cleanup and Office of Research and Standards.

United States Environmental Protection Agency (US EPA). December, 1989. Risk Assessment Guidance for Superfund (Volume 1) – Human Health Evaluation Manual (Part A) – Interim Final. Office of Emergency and Remedial Response.

United States Environmental Protection Agency (US EPA). 1997a. Compilation of Air Pollutant Emission Factors, AP-42. 5th ed. Supplement C. Office of Air Quality Planning and Standards. Research Triangle Park, NC.

United States Environmental Protection Agency (US EPA). 1997b. Exposure Factors Handbook. National Center for Environmental Assessment

United States Environmental Protection Agency (US EPA). 1997c. Health Effects Assessment Summary Tables (HEAST). Solid Waste and Emergency Response. FY 1997 Update.

United States Environmental Protection Agency (US EPA). 1997d. Emission Factor Documentation for AP-42 Section 2.4 – Municipal Solid Waste Landfills –Revised.

United States Environmental Protection Agency (US EPA). February, 1998. User's Manual – Landfill Gas Emissions Model. Air Pollution Prevention and Control Division; Control Technology Center; and Office of Research and Development.

United States Environmental Protection Agency (US EPA). 2001. Integrated Risk Information System (IRIS) database. http://www.epa.gov/ngispgm3/iris/subst/index.html.

7.0 Public Participation / Outreach and Participation / Involvement

The Stormwater Phase II Rule requires the development and implementation of a municipal public education and outreach program. Phase II requirements are to: *"implement a public education program to distribute educational materials to the community, or conduct equivalent outreach activities about the impacts of stormwater discharges on local waterbodies and the steps that can be taken to reduce stormwater pollution: and determine the appropriate best management practices (BMPs) and measurable goals for this minimal control measure."*

Public education is crucial to the success of a stormwater management program because it creates greater support for the program. Support increases compliance with management practices contained in the program. Broad public support improves the likelihood of approval of future local funding requests to implement BMPs contained in the program.

In addition, municipalities are required to involve the public in the stormwater management program. Towns are encouraged to involve the public in the development, implementation and review of their stormwater management programs and practices. The goal is to involve a diverse cross-section of people who could offer a variety of concerns, ideas, and connections during program development and implementation.

This plan outlines the Town of Adams's approach to a public education program that meets the requirements of Phase II. The plan includes a diverse array of educational outreach and participation programs in an attempt to reach as wide an audience as possible.

Table 7-1 (a,b,c) shows the summarized educational plan. The Education Plan is directed at three target audiences, the general public, businesses and institutions and municipal officials. This is due to the different impacts each audience has on stormwater runoff and the different strategies needed to inform and involve them.

The Education Plan **(Table 7-1 (a,b,c)**, is broken down into three sections for each target audience: 1) proposed education topics; 2) proposed outreach activities; and 3) proposed participation and involvement activities. The education topic column describes various problems and aspects related to pollutant transport in Adams. The educational program will cover these topics. The outreach column lists the specific activities recommended through this program to deliver the educational message to the target audience. The participation and involvement column lists ways for Adams to involve the target audience in an activity designed to improve stormwater management. Specific educational material and outreach activities can be further tailored to different population groups, to different types of businesses such as garden centers and vehicle repair shops. The various parts of the Education Plan are described in greater detail in the narrative following **Table 7-1(a,b,c).** Section 8, the Best Management Practices Plan, identifies specific recommendations.

The education program may begin small due to time, personnel and financial constraints. This program can grow as greater interest is generated and more people and groups become involved, taking on some of the responsibilities of education and outreach. Volunteers, students, retirees, and interested organizations can help and/or direct education programs reducing the workload to the town.

Table 7-1a. Adams Stormwater Education and Participation Summary

Target Audience **= General Public**		
Proposed topics to be covered in the Education Program*	**Proposed education & outreach activities to relay educational material to the target audience ***	**Proposed participation activities to involve participants in stormwater management ***
• Pet Waste • Lawns & Gardens - Yard Debris Disposal - Erosion Control Practices - Fertilizer Use and Application - Herbicide Use and Application • Motor Vehicles - Proper Maintenance - Leak Prevention - Washing and Cleaning - Proper Storage • Septic Systems • Illicit and Indirect Discharges/ Connections • Household Waste	• Pet Waste Signage and Other Outreach • Mailings (with tax bills) • Press releases • Web Site (post Stormwater Management Strategic Plan) • Stormwater Material Displays • Displays at Town Hall • Displays at local events • Information Workshops, Public Meetings, and Presentations to Civic Groups and Organizations	• Pet Waste Bags in the Downtown Area • Storm Drain Marking/ Stenciling • River Clean-Ups • Classroom Education and School Field Trips • Stream Team Assessments • River Walks • Volunteer Water Quality Monitoring • Increased Participation in Watershed Association (Hoosic River Watershed Association) activities. - State of the River Conference, Riverfest

Table 7-1a. Adams Stormwater Education and Participation Summary		
Target Audience = General Public		
Proposed topics to be covered in the Education Program*	**Proposed education & outreach activities to relay educational material to the target audience ***	**Proposed participation activities to involve participants in stormwater management ***
Reduction and Recycling • Illegal Dumping • Household Hazardous Materials: Storage, Use, Disposal • Better Site Design for New Development	• Local Cable Broadcasts (of Selectmen Meetings)	• Bike Tours along the Ashuwillticook Rail Trail • Riparian Tree/Shrub Planting

Table 7-1b. Adams Stormwater Education and Participation Summary		
Target Audience = Businesses and Institutions		
Proposed topics to be covered in the Education Program*	**Proposed education & outreach activities to relay educational material to the target audience ***	**Proposed participation activities to involve participants in stormwater management ***
• Housekeeping Practices • Catch Basins • Motor Vehicles - Proper Maintenance - Leak Prevention - Washing and Cleaning - Proper Storage • Hazardous Materials: Storage, Use, Disposal • Stormwater BMPs • Illicit Discharges • Better Site Design for	• Mailings • Fact Sheets • Information Workshops, Public Meetings, and Presentations to Civic Groups and Organizations • Web Site • Promotional Items	• Storm Drain Marking/ Stenciling • "Clean Stream" Participation Incentives • Adopt-A-Stream • Employee Training • Implement Stormwater BMPs

Table 7-1b. Adams Stormwater Education and Participation Summary		
Target Audience **= Businesses and Institutions**		
Proposed topics to be covered in the Education Program*	**Proposed education & outreach activities to relay educational material to the target audience ***	**Proposed participation activities to involve participants in stormwater management ***
New Development and Re-development		

Table 7-1c. Adams Stormwater Education and Participation Summary		
Target Audience **= Municipal Officials**		
Proposed topics to be covered in the Education Program*	**Proposed education & outreach activities to relay educational material to the target audience ***	**Proposed participation activities to involve participants in stormwater management ***
• Erosion and Sedimentation Control • Site Design Review Practices - Impervious Surfaces (parking lots) - Development on Steep Slopes • Best Management Practices for Stormwater Treatment • Low Impact Design BMPs for Stormwater Management • Evaluation of Stormwater Drainage Calculations	• Short Frequent Seminar Trainings • Brief Trainings as part of Regular Meetings. • Succinct Written Material/Handouts • "Hands-on" Trainings as Components of Site Visits	• Participation at Hoosic Watershed Team Meetings • Participation in Frequent Trainings • Participation in Formalized Training Programs • Regular Presentations to the Board of Selectmen • Preparation of and Participation in Stormwater Management Grant Programs

* (Note: Table 7-1(a,b,c) does not necessarily show one-to-one correspondence between the topic and outreach and participation activities. A bullet point in one column does not necessarily directly relate to the one directly aside it. For instance, information for

the General Public about motor vehicles may be distributed through mailings, displays and workshops.)

7.1 General Public

The general public is the largest target audience and has the most to gain from reducing the impacts of stormwater runoff. Cleaner water allows greater potential for use of water resources for recreational activities such as fishing, swimming, and nature observation. Actions taken by residents can also decrease community costs associated with the use and maintenance of expensive stormwater treatment facilities and treating degraded water quality and stream banks. This section describes the proposed education topics for the general public, recommended activities to educate the general public and proposed ways to actively involve the public in stormwater management.

Proposed Education Topics for the General Public

The following is a list of topics that will be included in the public education program for the Town of Adams. Education materials will generally inform residents of the impacts these topic areas can have, and describe actions that residents can take to reduce those impacts. Educational material is readily available from a wide variety of sources, including many over the World Wide Web. Adams will use these sources and adapt them for the town's use.

- Pet Waste - Pet waste contains harmful pathogens that can be washed into nearby water bodies degrading water quality. Pet waste is especially problematic in the downtown area that gets extensive use from "dog walkers." In addition to a water quality problem, pet waste, especially dog feces, is a nuisance and contributes to the overall sense of degradation of an area. Adams is making strong efforts to re-vitalize the downtown. Pet waste takes away from those efforts. Section 14-5 of the General Code for the Town of Adams requires animal handlers to remove animal feces on public property, punishable by a fine of $50 for each offense. The educational material will address proper handling of pet waste.

- Lawns and Gardens – Residents in the Town of Adams generally take pride in the appearance of their yards and properties, which are generally neat, tidy and well kept. However, many aspects of lawn and garden maintenance can degrade water quality including disposal of yard debris, erosion control measures, and fertilizer, pesticide and herbicide use and application. The educational material will cover proper yard maintenance.

  Yard Debris*:* Improper disposal of yard waste can clog storm drains, causing local flooding. In addition, decaying yard waste can allow bacteria, oxygen-consuming materials, phosphorus and nitrogen to be released into local streams and rivers. A river or stream bank is a convenient location to dispose of yard waste. "Just dump it over the bank," is a common attitude. The stream team assessment identified numerous locations where yard waste was improperly disposed.

Erosion control measures: Sediment from erosion can cloud the water in a river or stream and "smother" habitat areas for aquatic plants and wildlife. Erosion can fill-in flood storage areas, increasing the likelihood of downstream flooding. Erosion can clog culverts, leading to high maintenance costs. Inappropriate erosion controls, as well as abandoned vehicles, tires, and appliances are problems. The stream team assessment identified numerous erosion sites and inappropriate erosion control measures.

Fertilizers: Fertilizers contain large amounts of phosphorus and nitrogen that can promote excessive aquatic vegetation and algal blooms that can deplete the oxygen in the water for fish and other wildlife.

Pesticide and herbicides: Stormwater runoff can pick-up and convey pesticides to streams and rivers. These pesticides can be harmful to wildlife. In strong enough concentrations pesticides can be harmful to humans as well, especially children who are generally more susceptible to lower concentrations than adults are. Stormwater runoff can pick-up and convey fertilizers and pesticides to nearby water bodies.

Motor Vehicles – Many aspects of motor vehicles can create water quality impacts, including improper maintenance practices, an improperly maintained vehicle, leaky vehicles, improper washing and cleaning and improper storage. The educational material will cover proper motor vehicle maintenance and storage to minimize water quality impacts.

Properly maintained vehicles: Proper vehicle maintenance includes good maintenance practices while working on vehicles so that spills from such items as cleaning solvents do not end up in stormwater. Properly maintained vehicles also have cleaner emissions. Emission residuals, even in tiny amounts, can enter stormwater.

Leak Prevention: Vehicle fluids such as engine oil, gasoline, hydraulic fluid, transmission fluid, brake fluid and engine coolant can leak on to road surfaces and wash into storm drains leading into nearby surface waters during storm events. These fluids can directly kill plant and wildlife, deplete oxygen levels, and block sunlight.

Washing and Cleaning: Soap, scum, and oily grit from vehicle washing enters storm drains and then rivers and streams. Soap

contains phosphates, which can cause excess algae to grow using up oxygen in the water.
Proper Vehicle Storage: Vehicles stored outdoors for long periods can leak and corrode, with these materials washed into storm drains and ending up in nearby streams.

- Septic Systems – A municipal sanitary sewer system serves much of the Town of Adams. Some locations in town, however, are not in the sanitary system service area. These locations rely on individual on-site septic systems. These areas are in the outskirts of town and generally in areas where headwater stream tributaries are located. Improperly maintained septic systems can seep untreated septic wastes, including pathogens (bacteria and viruses) and nutrients into nearby streams. Proper use and maintenance of septic systems will be conveyed in education materials.

- Illicit Discharges/Connections - An illicit discharge is a non-stormwater discharge due to illegal connections to the storm drain system. These occur when a drainpipe is improperly connected to the storm drain system producing a discharge of some type of inappropriate flow into the storm drainpipe. Because of these illicit connections, waste enters into storm drains or directly into local waters. Illicit discharges from residences can be the result of a failing septic system or illegal dumping practices. An illicitly connected floor or garage shop drain connected to the storm drain system is an example as well. In addition to illicit connections as defined by EPA's Phase II regulations, a number of other indirect discharges may contribute to water quality problems such as cellar sump pumps. These may be problematic because typically cellars store hazardous materials that may mix with stormwater. Other indirect discharges that might create water pollution are dumping, irrigation overflows, swimming pool discharges, and car washing. Illicit discharges, as well as indirect discharges will be included in the educational material.

- Household Waste Reduction and Recycling – Appropriate solid waste management practices and recycling are important ways to prevent pollution from occurring. The "four R's" of solid waste management form the basis of an effective solid waste management program: 1. **R**educe the amount of trash discarded; 2. **R**euse containers and products; 3. **R**ecycle used materials, and compost; and 4. **R**espond to the solid waste dilemma by reconsidering other options. For the past 9 years, Adams has averaged about a 12% recycling rate (according to DEP statistics; Massachusetts Municipal Recycling Rates FY 1995-2001 and FY 2002-2003.) This is substantially lower than other Berkshire County municipalities (Dalton: ~34%; Great Barrington:

~30%; North Adams: ~ 30%; Pittsfield: ~ 20%.) Solid waste management practices and recycling will be included in educational material.

- Illegal Dumping – Debris from illegal dumping, in addition to creating an eyesore that all residents must endure, can contain toxic waste that can leak into rivers and streams. Debris items, such as six-pack rings and plastic bags can choke, suffocate or disable aquatic life such as fish and ducks. The stream team assessment identified numerous illegal dumping sites.

- Household Hazardous Material – Many commonly used household products such as cleaning products, car maintenance items, and home improvement items, such as paint, strippers, and brush cleaners contain toxic material that if not properly stored, used and disposed of can end up in rivers and streams, either by being transported over the land surface or direct dumping into storm drains. Proper handling, use and disposal practices, including appropriate disposal methods and locations, will be addressed in education materials.

- Better Site Design for New Development – Numerous practices are available to minimize water quality impacts from new development. Design practices can limit the amount of impervious surface (i.e. using wooden decks, brick paths, rock gardens,) employ vegetated strips (using native vegetation which generally requires less fertilizer, less pesticide, and less irrigation) as components of landscape design, minimize cutting and clearing of natural vegetation, and keeping development away from ecologically sensitive areas. Educational material will be prepared for perspective homebuilders to use to make their new home more "water friendly."

Proposed Education and Outreach Activities for the General Public

Once the public education materials have been collected and adapted to the Town of Adams, it will be distributed or presented to residents. The following outreach methods will be used in the Town of Adams to educate residents about the potential impacts of stormwater runoff.

- Pet Waste Signage and Other Outreach - Adams installed pet waste bags in the downtown area in September 2002. Adams took this approach because the volume of dog waste on downtown sidewalks was increasing. It was the town's hope that residents would use the pet waste bags, rather than receive a fine. Pet waste signs and poles were also installed. Pet waste signage will continue and will be used in conjunction with other educational material about pet waste management.

- Mailings - Mailings in the form of fact sheets, brochures, fliers, and newsletters will be periodically distributed to the public relevant to the topic areas previously identified. This educational material will be included in regular mailings to town residents, such as in tax bills. Mailings reach a wide audience of residents, especially when they are a part of a regular, periodic mailing.

- Press Releases - Local newspapers will be used as a medium for press releases to educate residents and inform them of upcoming events. Newspapers can reach a wide audience. The copy of the article from the North Adams Transcript (See the Appendix) is an example of such material. Future releases will be coordinated with other educational efforts, such as mailings, meetings or events.

- Web Site - Adams has a well-developed website. A section will be devoted to stormwater management. This section will include the Executive Summary of the Adams Stormwater Management Strategic Plan, copies of educational material and fact sheets, and information about upcoming events, such as river clean-ups, and river walks. The web site provides easy accessibility for residents to obtain education material and information about upcoming events. Residents will be made aware of the web page section through mailings.

- Stormwater Material Displays – A display that includes posters, brochures, fact sheets, Executive Summaries of the Stormwater Management Strategic Plan, event announcements, and other material for residents to view or take will be prepared. This display will be periodically set up in areas where residents frequently pass, such as main entranceways and voting areas. It will be periodically updated to include information about progress towards specific items and to recognize achievements of groups or individuals such as stream team assessments, clean ups, and "Clean Stream" and Adopt-A-Stream business and institution participants. Space will be made available at public places such as the library and schools to exhibit the display. In schools, it will be displayed in conjunction with stormwater educational programs whenever possible. "Clean Stream" and Adopt-A-Stream participants will be given the opportunity to exhibit this display at their business or institution.

- Displays at Town Hall – The main entryway in the Town Hall receives a relatively large volume of resident foot traffic. Various displays are regularly exhibited at that location. The stormwater display should be exhibited in this location at least once a year to show basic information about stormwater management (to coincide with mailed material) and activities, accomplished and planned, related to stormwater management.

- Displays at Local Events – The Susan B. Anthony Celebration is a popular summer event in Adams. The stormwater display should be exhibited at this event. In addition, someone who can explain the Stormwater Management Strategic Plan and good stormwater management practices and solicit volunteers should staff it.

- Informational Workshops, Public Meetings and Presentations to Civic Groups – Adams has numerous Civic Organizations and Clubs such as the Lions Club, Elks Lodge, Maple Grove Civic Club, Adams Garden Club, and Polish American Club that have regular meetings and are frequently looking for speakers and presentations. This is a good venue to get the word out about stormwater management because it offers the opportunity for a question and answer format. This same format should be used for at least one public meeting per year about stormwater management as well. An introductory workshop will be prepared and initially delivered at these venues. Update workshops (one per year) will be prepared and delivered to announce the prior year's accomplishments and events and activities upcoming in the next year.

- Local Cable Broadcasts – Meetings of the Adams Board of Selectmen are regularly covered by the local cable channel and viewed by a relatively large number of Adams' residents. This is a good vehicle to get the word out about stormwater management activities. Presentations about stormwater management will be made at Board of Selectmen meetings on a regular basis. An initial presentation will be made about the Stormwater Management Strategic Plan. Subsequent, more succinct, presentations will be given on an as-needed basis to announce significant accomplishments and announce upcoming events and activities.

Proposed Participation and Involvement Activities for the General Public

Broad based engagement of the public is the best way to obtain a long lasting, effective stormwater management program. The following measures will be used to increase community involvement in stormwater management.

- Pet Waste Bags in the Downtown Area – Pet waste bags are available in two locations in the downtown area: 1. Park Street next to the Ashuwillticook Trail; and 2. On Hoosac Street next to the *Discover the Berkshires* Adams Visitor Center. The DPW provides funds for this program. The DPW periodically inspects the dispensers and refills them as necessary. To make this program more effective it should be coordinated with other outreach efforts such as mailings. Once adequate public outreach has been provided, strict enforcement of the town's current law requiring the cleanup of animal feces by the handler should occur.

- Storm Drain Marking/Stenciling - Storm drain stencils or marking programs create public awareness about the connection of water quality and storm drains. Storm drain marking projects also create opportunities for various groups of volunteers to participate in preventing degradation of water quality in town. Installing semi-permanent buttons or stenciling storm drains with words and symbols is an effective way of reducing the dumping of pollutants into drains. HooRWA has an interest in developing a storm drain stenciling program with the Town of Adams. A potential way to combine this activity with a school program is to have some type of "design contest" in the schools, whereby students could design the "stencil." If it is not feasible to mark all storm drains in town because of time and money constraints, stenciling should begin in the highest priority sub-basins and proceed to lower priority sub-basins.

- River Clean-Up - A river clean-up program is a great way for people to literally get their hands dirty and get fast results from their efforts. Trash in a river can degrade water quality, harm wildlife and people, and is an eyesore in a community. Participants volunteer to walk or paddle an identified length of a river or stream collecting and removing trash and recording the types of garbage that has been removed. Working within a river can give people a greater appreciation of this complex ecosystem. The Steam Team Assessment identified numerous locations where trash was located. These sites should be prioritized, with the worst ones cleaned first. Photographs taken before and after cleanup activities can be used to document the results of these efforts. This program may involve the use of boats and other equipment depending on the scope of involvement and available resources. The town can be involved by allowing the use of town equipment to remove large or heavy items and by hauling and disposing of collected trash. Enhancements to a basic clean-up program may include an onsite expert to teach people about river ecology.

- Classroom Education and School Field Trips - A classroom education program can consist of a relatively simple one-day presentation or can be fully integrated into a school curriculum. A program can focus on one grade level or many depending on the resources available and the schools willingness to participate. Organizations such as *Project Wet* ("an international, interdisciplinary, water science and education program for formal and non-formal educators of kindergarten to grade 13 students") and *Green Teacher* ("a magazine by and for educators to enhance environmental and global education across the curriculum at all grade levels") can aid in preparing an education program. HooRWA has a strong interest in developing and delivering an educational program. In the summer of 2005, HooRWA is enhancing its web site as a teacher resource. In the 2005 – 2006 school year, HooRWA is planning teacher workshops about how to use existing river education resources, and school field trips to visit river sites.

- <u>Stream Team Assessments</u> – A stream team assessment is a useful way to assess and evaluate the condition of rivers and streams in a town. Water quality related problems such as bank erosion areas, discharges, and illegal dumping areas can be identified. Water related opportunities, such as enhanced recreational access, can be identified as well. Data gathered during a stream team assessment can help identify sites for such activities as water quality monitoring, river clean-ups, installation of Best Management Practices, and river access. Another important aspect of a stream team assessment is the use of volunteers. Engaging volunteers is a way to increase public awareness about and management involvement in a town's stream network. Stream team assessments are not meant to be static events. They are meant to provide an ongoing presence, as "watchers" or "keepers" of river segments. Stream teams can be leaders to implement items identified in the assessments, such as correcting problems or developing enhancements. Stream team assessments have been conducted for the Hoosic River (at least twice) and its tributaries. These assessments, however, have not led to an ongoing presence by active Adams residents. To be more effective, such an active presence should be developed. HooRWA was the primary sponsor of the previous assessments and would be a strong candidate to coordinate and conduct an ongoing stream team assessment program.

- <u>River Walks</u> – River walks provide a low investment – high return opportunity to raise overall awareness of water related issues. Walks can include a variety of subject areas, such as plant identification, habitat discovery, or land use "investigation." Such walks can be tailored to a wide variety of constituent groups that might have differing capabilities. The Hoosic River is the pre-eminent river in northern Berkshire County. However, the flood control project has contributed to a lessoning of awareness by town residents of its important ecological significance. River walks are ways to have residents re-connect with the river. HooRWA would be a strong candidate to coordinate or conduct these walks.

- Volunteer Water Quality Monitoring – Volunteer monitoring programs encourage residents to learn about water resources. Taking samples of perennial streams is a great way to monitor water quality and identify potential problems areas that may have otherwise gone unnoticed. High levels of bacteria, phosphorus, road salt, and sediment can all be attributed to stormwater runoff and can have adverse impacts on stream ecology. HooRWA has conducted a successful water quality monitoring program for several years. HooRWA has conducted this program according to a DEP/EPA approved Quality Assurance Project Plan. HooRWA's program has not made extensive use of Adams volunteers. Greater involvement by Adams' residents would allow expansion of the program. Another important component of a volunteer monitoring program is to document improvements to water quality. Improvement to water quality is an important way to generate continued enthusiasm and support for the stormwater management program.

- Participation at Hoosic River Watershed Association Events - The Hoosic River Watershed Association (HooRWA) has several events and activities that bring attention to and awareness of the Hoosic River, related tributaries and surrounding watershed. HooRWA hosts regularly scheduled activities like canoe rides and nature walks. In addition, Riverfest (traditionally Memorial Day Weekend) and the State of the River Conference (generally in late winter/early spring) are two regularly scheduled events, that provide a celebration and an in-depth review of the current condition of the river. In prior years, outreach to Adams residents and participation by Adams residents regarding these events has been limited. Increased participation by Adams residents at these events would provide a two-way opportunity. It would allow Adams residents the opportunity to learn about other activities occurring in the larger watershed. In addition, it would provide non-Adams residents an opportunity to learn about Adams' proactive stormwater program. This exchange of information would build mutual support between the two interests.

- Riparian Tree/Shrub Planting Program – Re-establishing forested or shaded buffers along the banks of a watercourse is an important way to restore a river's natural ecosystem and reduce the impacts from stormwater. Vegetation along stream banks can stabilize the bank, thereby preventing sedimentation, and can trap and filter pollutants. Plants intercept rainfall, absorbing and transpiring moisture, and thereby reduce runoff and flood potential. Plants also provide shade, which reduces runoff temperatures. Shade along stream banks can provide safe havens for fish from the hot summer sun. This is especially important along the flood control chutes. Water quality data has shown that the main chute through the downtown area dramatically increases water temperature (by as much as 7 degrees from one end to the other in the summer.) This elevated water temperature puts an extreme stress on fish (especially trout, which is a cold-water fish) and other species. In addition, trees and shrubs can enhance neighborhood aesthetics.

The town is currently working with the United States Army Corps of Engineers to examine the potential to restore the flood control project to a more natural setting. One option being considered is re-establishing vegetation along the banks of the project to provide shade. This option is being considered for both the concrete channel and the rip-rap areas downstream of the concrete channel. Recent and ongoing efforts at downtown re-vitalization have identified the Hoosic River as a cornerstone for the success of those efforts. Previous public "Design Charettes" have identified the desire for a more natural setting adjacent to the river. Bank re-vegetation efforts are important components to those efforts. This program can be coordinated either by the town or by volunteers and/or interested organizations such as a garden club.

- Bike Tours along the Ashuwillticook Rail Trail – The Ashuwillticook Rail Trail is a popular recreational asset used by many town residents. The Rail Trail loosely parallels the course of the Hoosic River. Fun bike tours with educational stops could raise overall awareness of the river and riverine ecosystem. Part of HooRWA's mission is to advance environmental awareness. HooRWA would be a strong candidate to coordinate or conduct these tours. These could initially be conducted in conjunction with other events or activities such as the Susan B. Anthony Days celebration or the Adams Agricultural Fair.

7.2 Businesses and Institutions

Many business and institution activities can contribute to stormwater pollution. For instance, poor housekeeping practices and large impervious parking lots can affect water quality in a community. Large expensive stormwater treatment facilities, such as detention ponds, frequently are built to handle runoff from business and institution sites. These systems can be eyesores in a community. If they are not properly maintained, which is often the case, they do not treat stormwater as they were designed. Encouraging good stormwater management practices and providing incentives can be an effective way for towns to approach businesses and institutions. Participation in municipal stormwater management programs can provide good publicity to a business or institution. Treating stormwater on site can also help minimize or decrease municipal costs associated with the use and maintenance of expensive stormwater treatment facilities. In turn this can help a municipality keep taxes low. This section describes the proposed education topics for businesses and institutions, recommended activities to educate businesses and institutions and proposed ways to involve businesses and institutions in stormwater management.

Proposed Education Topics for Businesses and Institutions

The following is a list of topics that will be included in the public education outreach and participation efforts to businesses and institutions of the Town of Adams. Educational material will inform businesses and institutions of the impacts related to these topic areas, and describe ways to reduce them. These elements can be stand-alone items. However, this educational program would be more effective if it were integrated into other items such as an employee training program, "Clean Stream" initiative, or Adopt-A-Stream program.

- Housekeeping Practices – Good housekeeping practices for businesses and institutions are important because of their overall size and scale. Typically, these are large properties, have large impervious surface areas, use relatively large amounts of hazardous materials, have numerous employees, and result in a large amount of solid waste. Keeping a property clean from trash and debris, properly storing materials, and properly conducting site maintenance (landscaping, snow removal, impervious surface sweeping) are all ways to reduce the impacts of stormwater runoff. These practices help keep debris, litter and unwanted contaminants from being picked up by stormwater and entering nearby surface waters. Educational material will focus on a range of good housekeeping practices for businesses and institutions.

- Catch Basins - Businesses and institutions may be unaware of catch basins located on their property and of their responsibility to clean them. Unmaintained catch basins can fill up with sediment and debris. When they do, they no longer function as intended and contribute to stormwater pollution. Educational material will be distributed to businesses and institutions about identifying and locating catch basins on their property, water quality functions of catch basins, the importance of pollution prevention (i.e. dumping,) and maintenance practices and schedules.

- Motor Vehicles – Water quality issues related to motor vehicles are generally the same for businesses and institutions as they are for homeowners: proper maintenance; leak prevention; washing and cleaning; and proper storage. The difference with businesses and institutions is a matter of scale. Whereas a homeowner may maintain one or two vehicles, a business or institution may have a fleet, thereby magnifying the potential threat. In addition, these vehicles may be large sized vehicles, with greater storage capacity for vehicular fluids and are highly used, warranting more frequent maintenance and cleaning. Educational material will be prepared and distributed to businesses and institutions about maintaining their fleet

- Hazardous Materials: Storage, Use, Disposal – Businesses and institutions frequently deal with large volumes of hazardous material, such as cleaners and solvents, car maintenance items, and petroleum products. If not properly stored, used and disposed of these can end up in rivers and streams, either by being transported over the land surface or direct dumping into storm drains. Protocols need to be clearly developed and available to a potentially large number of employees who may be exposed to these items. Proper handling, use and disposal practices including appropriate disposal methods and locations will be addressed in educational materials.

- Stormwater BMPs – Stormwater BMP effectiveness is directly related to their long-term maintenance and management. Businesses and institutions may have inherited a stormwater BMP from a previous owner and are unaware of its operation, water quality treatment function and its maintenance schedule. Educational material will be provided to businesses and institutions about the typical stormwater BMPs that may be on their property, how that BMP functions as a water treatment device and proper maintenance practices.

- Illicit Discharges - An illicit discharge is a non-stormwater discharge due to illegal connections to the storm drain system. Because of these illicit connections, contaminated wastewater enters into storm drains or directly into local waters. Illicit connections may be intentional (i.e., illegal dumping activities) or may be unknown to the business owner or institution manager and often are due to the connection of floor drains to the storm sewer system. Educational material will be prepared and distributed to businesses and institutions about conducting a field survey to identify outfalls on their property, preparing a map, conducting a dry-weather survey, conducting water quality sampling, tracing the source of the discharge and removing the source of that discharge.

- Better Site Design for New Development and Re-development – Businesses and institutions can benefit from low impact development (LID) practices that emphasize on-site stormwater collection and treatment. Businesses and institutions can use numerous LID measures, such as increased green space, vegetated infiltration islands, Bioretention Cells, Bioretention Swales, Permeable Pavement Blocks, Infiltration Trenches, Level Spreaders, Grass Filter Strips, and Storm Water Wetlands. LID still allows land to be developed, but in a cost-effective manner that helps mitigate potential environmental impacts. Incorporating low impact development into development or re-development practices helps to systematically balance environmental and cost issues. These measures can reduce long-term management and maintenance costs to property owners as well. Information will be provided about LID measures that businesses and institutions can use in their next development or re-development project.

Proposed Education and Outreach Activities for Businesses and Institutions

Once the public education materials have been collected/developed, they will be distributed and conveyed to businesses and institutions. The following outreach methods will be used in the Town of Adams to educate businesses and institutions.

- Mailings - Mailings of fact sheets, brochures, fliers, and newsletters will be distributed to businesses and institutions. This will be done by inclusion of the educational material with regular tax bills.

- Fact Sheets – Topic-specific fact sheets will be developed and distributed in conjunction with the "Clean Stream" and Adopt-A-Stream programs and will cover the topics identified previously.

- Informational Workshops, Public Meetings, Presentations to Civic Groups and Organizations - An introductory workshop will be prepared about the Stormwater Management Strategic Plan and stormwater management practices. This will initially be presented at a meeting of the Downtown Development Committee. A list of the informational topics described previously will be distributed. Businesses and institutions will be solicited to determine their interest in workshops about other topics. Topic specific workshops for businesses and institutions will be prepared and delivered as interest warrants.

- Web Site - A subsection of the Town's stormwater education link will be tailored to the impacts of stormwater from businesses and institutions with links to fact sheets relevant to the topic areas. Businesses and institutions will be made aware of the web page section by mailings. "Clean Stream" and Adopt-A-Stream participants will be posted on the web site.

- Promotional Items – Stormwater management promotional items, such as door hangers, bookmarks, refrigerator magnets, key chains are effective ways to raise constant awareness of stormwater issues while at the same time giving a business the opportunity for increased advertising. A program for promotional items will be developed and made available to interested businesses.

Proposed Participation and Involvement Activities for Businesses and Institutions

- Storm Drain Marking/Stenciling – Businesses and institutions can actively participate in a storm drain marking programs in numerous ways, including identifying and marking storm drains on their property, allowing and encouraging employees to participate in storm drain marking programs on company time, and providing funding for program coordination or supplies. Businesses and institutions could also initiate onsite employee trainings about storm drains. Business and institution participation in storm drain marking could be part of the "Clean Stream" program described below.

- "Clean Stream" Participation Incentives - A "Clean Stream" Program is a way to recognize businesses and institutions for good stormwater practices. Through this program specific stormwater Best Management Practices would be identified. These would include such items as employee training, landscaping practices, treatment of hazardous materials, vehicle maintenance and operation, and impervious surfaces management. Parameters could be established relating to stormwater runoff reduction, as well as implementing low impact development practices. Site evaluations would be conducted. Those businesses and institutions meeting specified standards on the established parameters would be recognized as "Clean Stream" participants. These participants would be formally recognized through award presentations at public meetings, such as a Town Meeting or Selectmen's meeting and meetings of civic organizations. Participants would also be posted on the website and listed in local newspapers on a regular basis. This Program could be used in conjunction with an Adopt-A-Stream Program.

- Employee Training - A training program can be encouraged at businesses and institutions to educate employees about practices that can reduce the impacts of stormwater runoff. Topics would include those identified previously, such as good housekeeping, catch basins, motor vehicles, hazardous materials, illicit discharges, better site design and a general primer about stormwater BMPs. The program would be coordinated with distribution of the fact sheets. It would also be coordinated with the informational workshops presented to the general public except that in this instance the trainer would go to specific businesses and institutions instead of civic groups. In some instances, a professional trainer may be warranted to explain a highly technical topic. An employee training program could be a component of a larger “Clean Stream” effort.

- Adopt-A-Stream – An Adopt-A-Stream program is an effort where participants become the primary caretakers of an identified stretch of a river or stream. Businesses and institutions could have their employees “adopt” a section of a stream or sponsor and provide funding for another organization, such as a youth organization or school group, to do so. Responsibilities for “adopting” a river or stream section could include stream clean-ups, stream bank assessments, monitoring water quality and assisting with enhancement projects, such as plantings and erosion control. Signs could be posted indicating which business or institution adopted a stream section. This program, in addition to providing environmental benefits, provides good advertising for a business or institution.

- Implement Stormwater BMPs at Business and Institution Sites – Business and institution sites typically have not been developed to be “stormwater friendly.” Frequently large areas of impervious surfaces, vehicles storage and maintenance, hazardous material use and storage are associated with these sites. Businesses and institutions could be encouraged and solicited to implement stormwater low impact development BMPs, using practices such as infiltration islands, perimeter vegetated swales, or a small wetland retention system. Incentives could include complete or partial funding of the project through state and local resources, publicity, and tax relief. The Massachusetts Department of Environmental Protections 319 Nonpoint Source Pollution Grant is one such program that might provide funding.

7.3 Municipal Officials

Municipal officials, including Planning Board members, Conservation Commission members and the Building Inspector review and approve new developments and re-development projects. These individuals are on the “front-lines” of stormwater management. In addition to the necessary local regulatory framework, as described in Section 5, thorough knowledge and understanding of stormwater management practices is needed by Board members to fully implement an effective stormwater management program. A survey and interviews of Planning Board members and Conservation Commission members about stormwater related issues was conducted. Survey results are contained as an Appendix to this section.

Overall, the Adams Planning Board and Conservation Commission members had a generally good understanding of what stormwater was and its relationship to impervious surfaces. The importance of and methods for stormwater treatment were less understood. Stormwater flow, re-directing the water away from specific areas, was generally deemed more important than pollutant attenuation. Control of erosion was also identified as an important concern.

The overwhelming consensus of the Planning Board was that there has been very little official training about site design review techniques and sediment and erosion control techniques. There had been no training related to evaluating drainage calculations and reviewing BMP designs. Training about the relationship between impervious surface and water quality and quantity was desired as well by the Planning Board. Planning Board members believed that more training would be beneficial.

Conservation Commission members, primarily because of the training opportunities provided by the Massachusetts Association of Conservation Commissions have had more training. The Conservation Commission unanimously agreed that more training is desirable, especially on alternative site design techniques.

Short informational sessions as part of monthly meetings and individual seminars directed to the specific Board or Commission were the preferred training methods. Succinct handouts would accompany both of these trainings.

Planning Board and Conservation Commission members were in strong agreement that the public does not understand the effect of nonpoint source pollution on the water resources of Adams.

The Phase II rule requires that town employees be trained on how to incorporate the pollution prevention/good housekeeping BMPs discussed in Section 6. Town training programs for stormwater and groundwater are required to teach employees about stormwater management, potential sources of contaminants, and BMPs for water quality protection.

The Town of Adams, with assistance from BRPC or its consultant, should develop a municipal training program for water quality protection in accordance with the Phase II requirements. The program should include the following key elements, which can be tailored specifically to town operations.

- Stormwater Management Strategy & Phase II Program Overview
- Town Department Responsibilities
- Town Drainage System, Water Supply and Water Quality
- Spill Prevention and Response
- Good Housekeeping
- Material Management Practices
- Maintenance of Town-Owned Lands

- Stormwater Inspections
- Illicit Discharge Detection
- Construction Sites and Development

Training should be conducted annually and may be minimized after the first year to include refresher topics. Greater detail is provided in Section 6.4.

Proposed Education Topics for Municipal Officials

This section describes the proposed education topics for municipal officials, recommended activities for municipal officials, and proposed ways to actively involve municipal officials in stormwater management. These items are primarily aimed at officials involved in the design and permitting of development projects.

Based on discussions with Planning Board and Conservation Commission members educational material for the following topics will be prepared.

- <u>Erosion and Sedimentation Control</u> – Erosion and sediment control training is extremely important in Adams, especially given the "flashy" nature of the rivers and streams in town. Numerous areas of erosion were identified in the Stream Team Assessment.

- <u>Site Design Review Practices</u> – Good site design can minimize stormwater impacts. Items such as how to design on steep slopes, (designing with the contours of the land), designing to minimize clearing, and designing to work with rather than against natural flow conditions can help prevent the need for impervious surfaces and can minimize erosion and flooding. Another added benefit of good stormwater design practices is that developments built to these standards generally enhance and "fit in" to the overall community character and pre-existing development. Volunteers serving on Planning Board and Conservation Commissions routinely review site plans to determine compliance of the proposed development with land use regulations. A major consideration of site plan review, however, should be the proposed development's impact on water resources, particularly from polluted stormwater runoff, or "nonpoint source pollution." Traditionally, stormwater management has emphasized water quantity, with little concern for water quality. To address both of these factors in a comprehensive manner, each site plan should contain a stormwater management plan that details the impact of proposed land use on water quantity and quality, both on-site and within the watershed. Volunteer Board and Commission members can review plans for compliance with general planning guidelines related to stormwater management with a minimum of training.

- Best Management Practices for Stormwater Treatment – When reviewing development proposals Planning Board and Conservation Commissions can be presented with a wide range of stormwater BMPs, including detention basins, retention ponds, constructed wetlands, infiltration trenches and basins, dry wells, sand filters, water quality inlets, deep sump catch basins, sediment traps and drainage channels. A basic understanding of how these BMPs function is necessary to determine if they are appropriate for the site, if the calculations have been appropriately performed to be able to handle and treat the expected volume of runoff, and to determine if proposed maintenance practices are adequate.

- Low Impact Design BMPs for Stormwater Management - Low Impact Development (LID) is a relatively innovative stormwater management approach with a basic principle that is modeled after nature: manage rainfall at the source using uniformly distributed decentralized micro-scale controls. LID's goal is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to its source. Techniques are based on the premise that stormwater management should not be seen as stormwater disposal. Instead of conveying and managing/treating stormwater in large, costly end-of-pipe facilities located at the bottom of drainage areas, LID addresses stormwater through small, cost-effective landscape features located at the lot level. These landscape features, known as Integrated Management Practices (IMPs), are the building blocks of LID. Almost all components of the urban environment have the potential to serve as an IMP. This includes not only open space, but also rooftops, streetscapes, parking lots, sidewalks, and medians. LID is a versatile approach that can be applied equally well to new development, urban retrofits, and redevelopment/revitalization projects. An important source of information about LID is the Low Impact Development Center, Inc. The Low Impact Development Center is a non-profit 501 (c) (3) organization dedicated to research, development, and training for water resource and natural resource protection issues. The Center (http://www.lowimpactdevelopment.org) focuses on furthering the advancement of Low Impact Development technology.

- Evaluation of Stormwater Drainage Calculations – The Massachusetts Stormwater Policy establishes consistent performance standards to address stormwater impacts. These performance standards are increasingly complex and generally require a trained specialist to prepare them. It is not necessarily the responsibility of volunteer Board or Commission members to be able to prepare engineered calculations but they should have a general familiarity with them.

Proposed Education and Outreach Activities for Municipal Officials

Members of the Planning Board and Conservation Commission are volunteers who fit their municipal responsibilities into their day-to-day activities. As volunteers, they generally have little available time to attend specialized training. Frequently, municipal budgets are limited and provide limited, if any, funding to attend specialized training. The training program most likely to be used by Planning Board and Conservation Commission members is one with the following characteristics:

- Short frequent seminar trainings
- Brief trainings as part of regular meetings
- Training accompanied by succinct written material/handouts
- "Hands-on" trainings as components of site visit

These trainings would occur at a public meeting. They would be open to the public and other municipal officials. Training topics would be posted on the web site.

Adams could use two programs to assist them in providing this training. One program is the NEMO program. NEMO stands for Nonpoint Education for Municipal Officials. The Connecticut Cooperative Extension Program developed this program. Because Cooperative Extension is an educational organization, NEMO is an educational approach to address the issues of nonpoint source pollution and watershed management. NEMO deals with the land use impacts to water quality and targets its education efforts at local land use decision-makers. NEMO (http://nemo.uconn.edu/index2.htm has prepared a wide range of readily available material that could be used in a municipal training program. The Berkshire Regional Planning Commission has adapted components of the NEMO program for use in Berkshire County and could work with the town on this program.

The second program Adams could use to provide training to municipal officials is the Berkshire Conservation Agent Program. This is a program that Adams already participates in where the services of a professional Conservation Agent are available to the town on a project-by-project basis. Specific Conservation Commission trainings could be prepared by the Conservation Agent and delivered to the Conservation Commission and other municipal officials.

Proposed Participation and Involvement Activities for Municipal Officials

- Participation on Hoosic Watershed Team Meetings – For several years the Massachusetts Executive Office of Environmental Affairs sponsored the Watershed Initiative. The overall goal of this state program was to better coordinate the activities of state agencies, on a watershed basis, especially related to issuing state permits. Another goal was to form closer partnerships and collaboration between state agencies, non-profit organizations and municipalities. The state was divided into 27 major watersheds. A Watershed Team Leader was assigned to each of the major watersheds. Regular (monthly) team meetings were held amongst the various parties. These meetings provided a good opportunity to exchange information and form working partnerships between the various interest groups. The state sponsored Watershed Initiative has been discontinued. However, participants on the Hoosic Watershed Team have continued to meet. Adams has maintained an active presence on the Hoosic Watershed Team with participation by the Department of Community Development, Department of Public Works, Waste Water Treatment Plant Operator, and private citizens. Adams will continue to participate on the Hoosic Watershed Team as a way to advance their stormwater management program.

- <u>Participation in Frequent Trainings</u> – The effectiveness of frequent trainings at regular Board or Commission meetings will depend on them being regularly utilized. This will require that Chairs regularly include them as part of the meeting agenda and members regularly participate.

- <u>Participation in Formalized Training Programs</u> – Specialized training will continue to be an important supplement to trainings as part of monthly meetings. Specialized training will keep members current about the latest changes to laws and regulations as well as provide information about the latest technological practices. Efforts should continue to make trainings, such as those sponsored by state agencies, available to town boards, commissions, and staff.

- <u>Regular Presentations to the Board of Selectmen</u> – The Board of Selectmen is in a unique role in a town because it often serves as a clearinghouse about the activities of various other Boards and town employees. Boards of Selectmen also have the opportunity to consider the comprehensive needs of the town. The Board of Selectman should be periodically updated about stormwater management activities.

- <u>Preparation of and Participation in Stormwater Management Grant Programs</u> – The town can seek several grants or funding sources to improve its stormwater management practices. These include the Massachusetts Department of Environmental Protections 319 Nonpoint Source Pollution Grant Program (nonpoint source pollution remediation,) the Massachusetts Environmental Trust (water quality monitoring and environmental education,) and the United States Army Corps of Engineers Section 1135 Aquatic Ecosystem Restoration Program (for restoration of the flood control project.) A demonstration of broad based local interest, involvement, and support increases the success rate for obtaining these funds. In addition, the successful implementation of the grant activities is greatly enhanced by active participation of municipal boards, officials and employees. Adams will continue to pursue available stormwater management funding opportunities and involve a wide local constituency in those efforts.

Greater detail about specific recommendations, the tasks needed to accomplish the recommendations, the party most likely responsible to take the lead with implementation, measure goals and a timetable are shown in Section 8 on the Best Management Practices Plan.

Appendix 7

Town of Adams Stormwater Management Questionnaire

North Adams Transcript Article

Town of Adams Stormwater Management Questionnaire

Your name... 7 members of the Conservation Commission responded – the following are their answers:

The following questions relate to how stormwater affects your responsibilities as outlined by the Wetland Protection Act.

When considering stormwater which of the following is your greatest concern?
(Check Box)
Quantity: Redirecting the flow away from or to a particular area or □ *4*
Quality: Controlling pollutants/nutrients and temperature change □ *3*

What do you see as contributing the most problems pertaining to stormwater issues? (Number in sequence of importance #1 being most important)

Rooftop runoff *1,2,6,7,8,10* (5.6)	Open space/Parks *1*,1,4,8,9,9,10 (7)*
Parking lots *3,3,4,4,4,7,7 (4.5)*	Agriculture *2,3,4,4,5,10 (4.6)*
Driveways *2,5,5,5,6,7 (5)*	Forests *2,4,5,11,11,11 (7.3)*
Sidewalks *4,6,7,8,10,11 (7.6)*	Commercial sites *1,3,5,7,9,11 (6)*
Roads *1,1,1,2,3,3,6 (2.4)*	Industrial sites *2,2,6,6,8,9 (5.5)*
Lawns *3,8,8,9,10,10 (8)*	Other/Name *1)mountain side (Adams is located in a valley)*

** If located on a mountainside.*

Which side effects of increased runoff are of most concern: (number in sequence of importance #1 being most important?)

Increased "flashiness" (sudden flooding) of watershed *1,1,1,2,3,5,6, (2.7)*	Pathogens (disease causing bacteria) in the waterways *4,6,6,7,9,10 (7)*
Erosion *1,1,2,2,3,3,4 (2.3)*	Increased elevation of floodplain *5,5,6,10,10,11 (7.8)*
Sediment buildup in waterways *2,2,3,3,7,8 (4.1)*	Nutrients in waterways *4,6,7,7,8,8, (6.6)*
Debris in water bodies *2,3,4,4,4,5,9 (4.4)*	Change of stream form 1,1,2,5,6,8 (3.8)
Increased toxic contaminants in Waterways *3,4,7,8,9,9,10 (6.2)*	Change in water temperature 5,7,9,9,10,10 (8.3)

Which of the following Best Management Practices related to stormwater management are you familiar with?: (check the ones you are familiar with)

Detention basins *7*	Water quality/Deep sump catch basins *6*
Drainage channels *5*	Infiltration basins *4*
Water quality swales *7*	Infiltration trenches *3*
Sediment traps *5*	Other (name)

Approximately how much formal training have you gained in site design/development techniques specifically in relation to stormwater?
□ None or Self-trained*4* □ Attended some workshops*2* □ Formal classroom training*1*

Please identify the workshops or other training from which you've benefited:

1) *Mass. Conservation Commission workshop*
2) *Courses in Environmental Science at Berkshire Community College*

Would training be helpful to broaden your knowledge of good and alternative site design techniques? □ Yes *7* □ No

In addition to site design, are there other areas of education/training that would help you in meeting your responsibilities as a member of the Conservation Commission?

1) *We are requesting timely information on the changes to the wetlands protection law. We require a detailed interpretation of the law change and the effect of that change on a local Conservation Commission*
2) *Storm water management practices*

What type of training works best for you? (i.e. circle the following individual seminars 2, short informational sessions as part of your monthly meetings *2*, handouts *3*, or other – please describe below)

Are you most often involved in projects before or after contamination or degradation of a resource area has occurred?

□ Before *6* □ After *2 (we've had very few)*

Knowing the limits of the Conservation Commission's jurisdiction, do you believe water quality is adequately protected from stormwater impacts in Adams?

□ Yes *3* □ No *1* □ Somewhat *4*

Given the relationship of increased impervious surfaces to water quality and quantity do you feel it is appropriate for the Conservation Commission to

recommend alternative site designs to an applicant that will reduce overall imperviousness?

□ Yes *7* □ No

In your review of projects how much/what type of consideration is given to the effect of a new development on the area beyond the site itself?

□ None □ Some *2* □ A lot □ Depends on site *6*

Is the type and amount of information you typically receive regarding stormwater management issues adequate for you to conduct a thorough review?

□ Yes *6* □ Somewhat lacking *1* □ Usually lacking □ No

Do you think the public adequately understands impacts on our water resources from nonpoint source pollution ? □ Yes □ No *7*

The Massachusetts Wetlands Protection Act establishes the purview of and resource areas to be protected by the local Conservation Commission.

Do you think your efficacy related to these regulations and stormwater issues could be improved by establishing new town by-laws that support your responsibilities?

□ Yes □ No *7*

If yes, how?

In what areas do you feel the Town needs to have supplemental requirements or review authority?

Control of erosion and sedimentation *4*
Stormwater management for smaller sites *2*
Long-term maintenance of stormwater BMP's *2*
Steep slope development *3*
Potential stormwater damage to private property *2*

Thank you for your time.
Please return this questionnaire via fax or mail by Feb. ? to:

Attn: Sari Calame
Berkshire Regional Planning Commission
1 Fenn Street, Suite 201

Summary

The CC is equally split between which is more important – the directing of storm water flow and controlling the pollutants etc. in storm water runoff.

Based on Averaging the scores the largest contributors to storm water issues (in order from the greatest to the least) are:

1) Roads
2) Parking Lots
3) Agriculture
4) Driveways
5) Industrial Sites
6) Rooftop runoff
7) Commercial Sites and Lawns
8) Open Space / Parks
9) Forests and Industrial sites
10) Sidewalks

NB: Rooftop Runoff, Forests, Open Space and Commercial Sites (6,7,8 & 9) had the greatest discrepancy in individual placement of importance – (before averaging the answers out).

Based on Averaging the scores the results of runoff of greatest concern (in order from the greatest to the least) are:

1) Erosion
2) Increased flashiness of watershed
3) Change of stream form
4) Sediment buildup in waterways
5) Debris in water bodies
6) Increased toxic contaminants
7) Nutrients in water
8) Pathogens in waterways
9) Increased elevation of floodplain
10) Change in water temperature

NB Debris in the water, pathogens in the waterways and change in stream form (5,8 & 10) had the greatest discrepancy in individual placement of importance – (before averaging the answers out).

Knowledge of BMP's related to storm water management seems quite well developed.

Training:
All felt they had some form of training in site design/development techniques relating to storm water ranging from self trained (57%), workshops (29%) and formal classroom training (14%)

Training has been given by Mass. Conservation Commission and courses in Environmental Science from BCC.
They unanimously agreed that more training in good and alternative site design techniques would be very helpful.
The preferred type of training would be:

1) handouts
2) short informational sessions as part of their monthly meetings
3) individual seminars

They request more timely updates in the Wetlands Protection Law and the effect on the job they do and more information on storm water management practices.

They most often get involved in problems concerning contamination or degradation of a resource area before the problem occurs.
They are split between believing that their water is and is not adequately protected from storm water impacts.

All agree that it is appropriate for the Con.Com. to recommend reduction of impervious surfaces in site designs.

When looking at new projects the effect of runoff onto other sites mostly depends on the site itself but the level of concern appears less than that of the Planning Board.

As a group they mostly are comfortable with the level of information regarding storm water management.

They unanimously agree that the public does NOT understand the effect of nonpoint source pollution on the water resources of Adams.

They unanimously agree that the introduction of new by-laws would NOT improve their efficacy related to their responsibilities under the Mass. Wetlands Protection Act over resource areas related to storm water issues.
However – they do believe the town should have more requirements/authority over:

1) Erosion and sedimentation control
2) Development on steep slopes
3) Storm water management on smaller sites
4) Long term maintenance of storm water BMP's
5) Potential storm water damage to private properties.

<u>Town of Adams Stormwater Management Questionnaire</u>

Your name…3 members of the Planning Board Responded – the following are their answers:

When you hear the term "stormwater" what do you think of?

1) *Temporary flow of water caused by heavy storm, or runoff from winter snow, ice melt at a fast rate,*
2) *Rain water runoff*
3) *Water runoff impervious surfaces*

When considering stormwater which of the following is your greatest concern? (Check Box)

Quantity: Redirecting the flow away from or to a particular area or □ *2*

Quality: Controlling pollutants/nutrients and temperature change □ 0

What do you see as contributing the most problems pertaining to stormwater issues?
(Number in sequence of importance #1 being most important)

Rooftop runoff *4,7,10 (7)*	Lawns 9,10,11 (10)	Agriculture 11,12,12 (11.6)
Parking lots 1,5,7 (4.3)	Open space/Parks 6,7,10 (7.6)	Steep slopes 1,3,5 (3)
Driveways 2,6,8 (5.3)	Forests 4,11,12 (9)	Other (Name): Basins (6)
Sidewalks 8,9,13 (10)	Commercial Sites 1,2,8 (3.6)	
Roads 3,4,5 (4)	Industrial sites 2,3,9 (4.6)	

Why? (Describe for your top two choices)

1) *Impact on other areas*
2) *A.Water flows down from mountain areas – mountains also form many wet area forming streams.B. Sites consume previous grassy /tree site with buildings and blacktop.*
3) *Hard surface. Large area*

Which side effects of increased runoff are of most concern? (number in sequence of importance, #1 being most important)

Increased "flashiness" (sudden flooding) of watershed *2,2,4 (2.7)*	Pathogens (disease causing bacteria) in the waterways *2,4,9 (5)*
Erosion *1,1,5 (2.3)*	Increased elevation of floodplain *5,5,8 (6)*
Sediment buildup in waterways *3,6,6 (5)*	Nutrients in waterways *7,7,8 (7.3)*
Debris in water bodies *3,6,7 (5.3)*	Change of stream form *4,9,10 (4.3)*
Increased toxic contaminants in Waterways *1,3,10 (4.7)*	Change in water temperature *8,9,10 (9)*

Give a brief description of what Best Management Practices (BMPs) are related to stormwater management

1) *Control of runoff and protection of other areas.*
2) *Working with a certain party or business for a sensible solution. Laws must be modified to fit with a project. Flexibility is the key.*
3) *-*

Which of the following Best Management Practices related to stormwater management are you familiar with? (check the ones you are familiar with) NB: only one person responded.

Detention basins *1*	Water quality/Deep sump catch basins
Drainage channels *1*	Infiltration basins
Water quality swales *1*	Infiltration trenches
Sediment traps *1*	Other (name)

Which measures, if any, are imposed to specifically address erosion control and sediment conditions <u>before</u> *and* <u>after</u> construction? (Check each that applies) NB: 2 out of 3 responded

Surface stabilization (mulching/seeding etc) *1*
Runoff control (temporary/permanent diversion) *2*
Sediment control (sediment trap etc.) *2*
Runoff conveyance (swale, rip-rap etc) *2*
Stream crossings (temporary and permanent) *1*
Streambank protection/stabilization *2*
Site preparation (construction road stabilization etc) *2*
Preserving natural vegetation *2*

Have you been trained in how to assess any of the following related how they affect stormwater?

A) Review site design techniques	□ Yes *1 somewhat*	□ No *2*
B) Review sediment and erosion control techniques	□ Yes *1 somewhat*	□ No *2*
C) Evaluate drainage calculations	□ Yes	□ No *3*
D) Review BMP designs	□ Yes	□ No *3*

Would training in any of the above be helpful to broaden your knowledge?

A	□ Yes *3*	□ No
B	□ Yes *3*	□ No
C	□ Yes *3*	□ No
D	□ Yes 3	□ No

What type of training works best for you? (i.e. circle the following: individual seminars *(1)*, short informational sessions as part of your monthly meetings *(2)*, handouts, or other – please describe below) 2 out of 3 answered.

Do you know that there is a relationship between the overall percentage of impervious surfaces in your Town to water quality and quantity? □ Yes *1* □ No *2*

In your review of projects, how much/what type of consideration is given to the effect of a new development on the area beyond the site itself?

□ None □ Some □ A lot *2* □ Depends on site *1*

When reviewing drainage regulations do you concentrate on road coverage only or look at the whole "built-out area" (roof tops, driveways etc) when sizing stormwater BMPs/pipes etc? □ Road coverage □ Whole area *3*

Do you know what nonpoint source pollution is? □ Yes *1 (sort of)* □ No *2*

What are your concerns with nonpoint source pollution? 1 answer
1) only if pollution is/would be permanently detrimental to area.

Local bylaws are established to benefit the community's general welfare. Protecting natural features can enhance the Town's ability to better control nonpoint source pollution and improve the community's overall health.

Do you think the Town of Adams Zoning By-law adequately protects?

Natural resource areas (rivers, streams and wetlands, aquifers)	□ Yes *2*	□ No *1*
Native vegetation	□ Yes *2*	□ No *1*
Mature trees	□ Yes *1*	□ No *2*
Open space	□ Yes *3*	□ No
Soils/gravels	□ Yes *2*	□ No *1*
Slopes	□ Yes *2*	□ No *1*
Community character	□ Yes *2*	□ No *1*

Thank you for you time.
Please return this questionnaire to the Kelly at the Community Development Department by **Friday, February 6, 2004. (If you need more time, just let Kelly know)**

If you have any questions about the survey, please contact Donna at the Department at 743-8317 or 743-8315.

You can also contact Sari Calame at Berkshire Regional Planning Commission

Tel: (413)442-1521
Fax: (413)442-1523
scalame@berkshireplanning.org

Summary

There is general understanding that "storm water" refers to snow/ice melt and rainfall and is related to the amount of impervious surfaces.

Redirecting the water away from specific areas is more important than the pollutants etc.in the runoff.

Based on Averaging the scores the largest contributors to storm water issues (in order from the greatest to the least) are:

1) Steep slopes
2) Commercial Sites
3) Roads
4) Parking Lots
5) Industrial Sites
6) Driveways
7) Rooftop Runoff
8) Open Space / Parks
9) Forests
10) Lawns and Sidewalks
11) Agriculture

NB: Forests, Commercial Sites and Industrial Sites (9,2 & 5) had the greatest discrepancy in individual placement of importance – (before averaging the answers out).

The top three reasons given for why the above answers were reached were

1) the impact on surrounding areas
2) Steep slopes increase runoff problems
3) Increased impervious surfaces, and reduced grassy/natural areas result in heavier runoff flow.

A later question revealed that only 1 out of the 3 understands the relationship between increased impervious surface and water quality and quantity.

Based on Averaging the scores the results of runoff of greatest concern (in order from the greatest to the least) are:

1) Erosion
2) Increased flashiness of watershed
3) Change of stream form
4) Increased toxic contaminants
5) Pathogens in the waterways
6) Sediment buildup in waterways
7) Debris in waterbodies
8) Increased elevation of floodplain
9) Increased nutrients in the waterway
10) Change in water temperature

NB Increased toxic contaminants and pathogens in the waterways (4 & 5) had the greatest discrepancy in individual placement of importance – (before averaging the answers out).

Q: What are BMP's?
A: Again – more concerned with redirecting runoff away from other areas.
Laws need to be modified to achieve a "sensible solution"

There is knowledge of some BMP practices related to storm water management, but there is room for a deeper level of understanding of available options.

There is a better understanding of how to control erosion and sediment buildup.

Training:
The overwhelming consensus is that there has been very little official training about site design review techniques and sediment/erosion control techniques and **NO training** related to evaluation drainage calculations and reviewing BMP designs

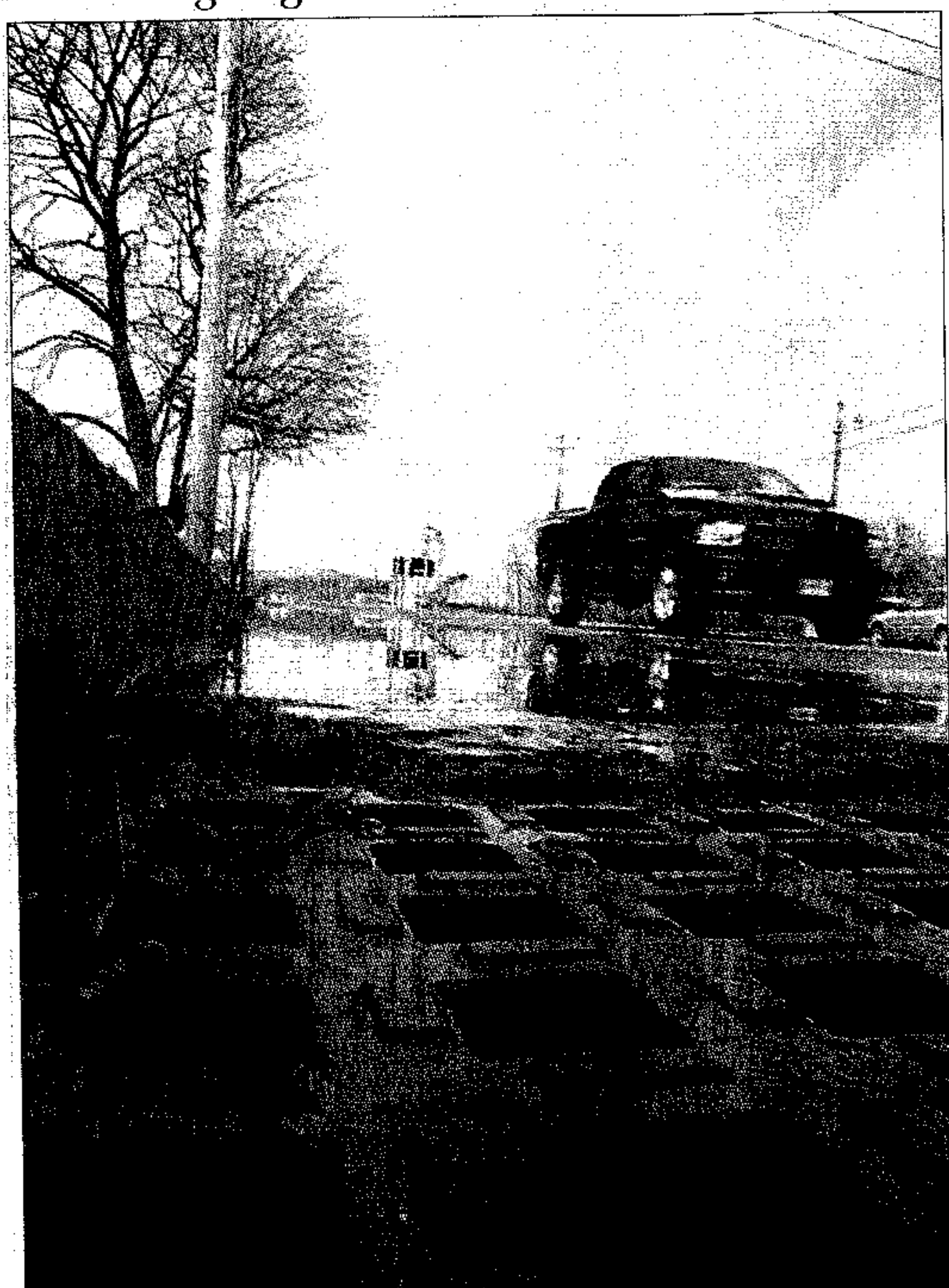
Training in the relationship of impervious surface to water quality and quantity is needed.
Also in why it is important to protect the water quality (not just where the water flows)
Nobody was sure what nonpoint pollution is

There was unanimous agreement that training would be beneficial.
The preferred type of training would be:
1) short informational sessions as part of their monthly meetings
2) individual seminars

Q: Do current by-laws protect natural feature sufficiently?
A: In general the answer was yes – the only disagreement was that mature trees are NOT protected enough.

North Adams Transcript
MAR 28 2005
BERKSHIRE REGIONAL PLANNING COMMISSION
pt.com Friday, March 25, 2005 • North Adams, Massachusetts Fifty cents

No going down the drain for Adams



A sewer along Route 8 in Adams.

Adams gets proactive about water runoff

By Hinda Mandell
North Adams Transcript

ADAMS — The town of Adams is taking proactive measures to protect the area's waterways and comply with environmental regulations not yet in effect for the town, according to Director of Community Development Donna Cesan.

The Environmental Protection Agency is working with local governments across the country to address polluted runoff of rainwater into storm drains. The purpose of this program — Storm Water Phase II — is to improve the quality of the nation's water sources.

According to Cesan, when rain hits the sidewalks it flushes chemicals, grease, dust, pet waste and other types of refuse on its surface down the storm drain. Eventually, this waste makes its way into the Hoosic River, untreated and unclean, through storm drainage systems.

When rain hits the sidewalks it flushes chemicals, grease, dust, pet waste and other types of refuse on its surface down the storm drain.

According to information from an EPA publication provided by Cesan, phase I of the project addressed storm water runoff in sewer systems servings populations of 100,000 or more, as well as construction affecting five acres of land or more.

Adams is working on a draft of a "storm water management strategic plan," said Cesan. This information "will guide the town on how to meet the Storm Water Phase II requirements."

Cesan expects that the town will need to comply with the program regulations within three to five years. Adams received government funding in 2002 — a water quality management planning grant from the state — to work ahead on this strategic plan. The town has until June to turn in a completed strategic plan to the state. This funding allowed Adams to hire a civil engineer from Comprehensive Environmental Inc., an engineering firm with expertise in municipal storm water drainage. Over the next several years the town will implement this plan.

While small towns do not need to immediately comply with the program, Adams is hoping "to get a leg up," said Cesan.

"We hope to be a model for other smaller communities," she said.

According to the spokesman

Please see ADAMS, Page A8

Adams: Won't be waiting to be told

Continued from Page A1

for the state's Department of Environmental Protection, Edmund Coletta, the EPA expects to see progress before that deadline five years down the road.

"The Environmental Protection Agency usually wants to see communities make progress. They don't want to see communities wait until the last year," he said.

Taking a proactive stance in complying with these future regulations gives the town more time to be in compliance, while also acting in a cost-effective manner, Cesan said.

While implementing the strategic plan, the town will address such issues as the timeliness of street cleaning. For example, the Adams Department of Public Works cleans the streets each spring — disposing of salt, sand and other debris — which prevents waste from entering the drainage system and polluting the Hoosic River.

However, the timeliness of the street cleaning is important, said Cesan. If it happens later in the spring months, then more pollutants can enter the storm water pipes, and subsequently, the river.

Cesan also said that educating the public plays a critical role in getting the word out about activities that might have a detrimental effect on natural water-bodies. Awareness programs in schools might contribute to a decrease in the amount of pollutants in storm water runoff. After all, said Cesan, recycling became successful when students brought awareness into their homes from schools.

The strategic plan also hopes to address "illicit discharges," said Cesan, which she described as "inappropriate connections between storm drainage and sewer pipes."

Before drainage systems were in place, some grungy contents of sewer pipes flowed into the river. As part of the strategic plan, the town will map out and identify these illicit discharges, which also include cracked or leaking sewer pipes and overflow from septic tanks.

"Mistakes happen over time," said Cesan. "Nobody knows about it because it's all happening underground."

8.0 Recommendations & Implementation Plan

The Best Management Practices (BMP) Implementation Plan (Table 8-1) portrays a comprehensive approach for the Town of Adams to improve water quality and work towards compliance with the six Minimum Control Measures of the Phase II Stormwater Regulations. This BMP Plan is a summary of the recommended implementation measures provided in previous sections (3.0 through 7.0) and outlines existing and required measures to meet Phase II. For consistency with the six minimum measures, the BMPs are organized into six categories in Table 8-1: 1) Public Education and Outreach; 2) Public Participation/ Involvement; 3) Illicit Discharge Detection and Elimination; 4) Construction Site Runoff Control; 5) Post-Construction Runoff Control; and 6) Pollution Prevention and Good Housekeeping.

The BMP Plan also outlines the responsible party(ies) for implementing each BMP, the measurable goals for each BMP, and a five-year implementation schedule. This schedule is consistent with the time period under a normal Phase II permit, except the current Phase II permit term started in May 2003. Table 8-2 also portrays cost estimates for some BMPs based on Town input and the potential need for contractor assistance.

Notice of Intent and NPDES Stormwater Permit

When the Town of Adams is formally in EPA's Phase II Program, it will be required to file the required Notice of Intent (NOI) form: BRP WM 08A – NPDES Stormwater General Permit Notice of Intent for Discharges from Small Municipal Separate Storm Sewer Systems (MS4s). The NOI would contain a summary of the information discussed in the Town's Stormwater Management Strategic Plan, specifically Table 8-1, as well as the names of receiving waters and the number of stormwater discharges to those waters. Attached to the NOI would be a detailed five-year schedule of the BMPs consistent with Table 8-1.

Section B of the NOI form asks the applicant to determine if the eligibility criteria for protection of listed endangered species, critical habitat and historic places have been met. Although the Town of Adams is not required to file a NOI at this time, BMPs are included in Table 8-1 for the evaluation of these places to fulfill the permit eligibility in accordance with the permit guidance in Addendum B.

The NOI would outline the Town's intentions for meeting the Phase II regulations and complying with the NPDES General Permit for MS4s. Implementation of this plan would fulfill the requirements outlined in the

NPDES General Permit for MS4s. In addition to the implementation activities outlined in this plan, the Town would also have to perform the following activities throughout the duration of the permit (see Appendix 8A for a copy of the NPDES General Permit).

- **Program Evaluation –** Conduct annual evaluations of the Stormwater Management Program for compliance with permit conditions. This evaluation would include a determination of the appropriateness of the selected BMPs in efforts towards achieving the measurable goals outlined in Table 8-1. The Town would be required to notify EPA and DEP of additions or modifications to the Stormwater Management Program, some of which may require EPA or DEP approval. EPA or DEP may require that changes be made to the Stormwater Management Program over the permit term.

- **Record Keeping –** Maintain records that pertain to the Stormwater Management Program for a period of at least five years. Records need to be made available to the public. The Town may charge a reasonable fee for copying. Records would not need to be submitted to EPA or DEP unless specifically requested.

- **Reporting –** Submit an annual report to EPA and DEP at one year from the effective date of the permit and annually thereafter.

Adams is not yet formally included in the Phase II Program and therefore is not required to submit the NOI or maintain permit conditions. However, the Town would benefit from conducting an annual evaluation of the Stormwater Management Program as well as maintaining stormwater records consistent with the Phase II Program. In addition to placing the town in an advantageous position should it become included in the Phase II Program, these practices would: ensure the long-term effectiveness of the Program; provide additional support/leverage and position the town to obtain future grants; and justify future spending requests for environmental and water quality improvement efforts.

Table 8-1. Stormwater Best Management Practices Plan for Phase II Compliance

BMP ID	BMP Description[1.]	Implementation							
		Tasks for each BMP	Responsible Dept./Person	Measurable Goal	Year				
					2005	2006	2007	2008	2009
1. Education and Outreach for the General Public, Businesses and Institutions and Municipal Officials									
1A	Develop and Distribute Stormwater Fact Sheet to Residents (7.1)	1. Develop a stormwater fact sheet based on the Adams Stormwater Assessment Project.	Community Development	Copies of materials. Distribution to at least 75% of residents	Completed June 2005	*	*	*	*
		2. Mail to all residents in Town annually as the beginning of a series of fact sheets on different stormwater topics each year.			*	*	*	*	*
		3. Direct audiences to the stormwater section of the Town's website.			*	*	*	*	*
1B	Distribute Brochures and Fact Sheets to Residents and Businesses (7.1, 7.2)	1. Obtain and adapt topic specific education materials. Specific topics for identified target audiences are identified in Section 7 of the Stormwater Management Plan.	Community Development	Copies of materials. Distribution to at least 75% of residents and 90% of businesses	*	*	*	*	*
		2. Mail to residents and businesses with tax bills (twice/yr) and direct audience to stormwater section of website.			*	*	*	*	*
		4. Prepare and distribute Fact Sheet series to businesses.			*	*	*	*	*
		3. Direct audiences to the stormwater section of the Town's website.			*	*	*	*	*
1C	Send out Stormwater Press Releases (7.1)	1. Send press releases to all local papers twice/year regarding the stormwater management program, the educational mailings, and the importance of stormwater management at each home.	Community Development	Copies of articles	Partially complete - March 2005	*	*	*	*
1D	Develop Stormwater Section of Town Web Site (7.1, 7.2)	1. Identify vendor or town staff to create new stormwater section of web site.	Community Development and Town Website Manager	Measure number of hits annually	*	*			
		2. Review other stormwater sites from across the country.			*	*			
		3. Prepare site. Include Executive Summary of Stormwater Management Strategic Plan. List "Clean Stream" business participants.			*	*			
		4. Regularly update site as warranted.				*	*	*	*
		5. Measure hits annually.				*	*	*	*
1E	Create and Exhibit a Stormwater Educational Display (7.1)	1. Prepare materials for display.	Community Development with Town Administrator, Event Coordinators, Businesses	Track quantity of educational materials taken quarterly by display users / visitors	*	*			
		2. Identify locations (e.g., Town Hall, schools, businesses) and events (e.g. Susan B. Anthony Days, Agricultural Fair, State of the River Conference, Riverfest) and person(s) to maintain site.			*	*	*	*	*
		3. Place and re-stock "take home" materials (e.g., brochures, fact sheets) at the site.				*	*	*	*
		4. Update display site with new information and additional materials, as needed.				*	*	*	*
1F	Develop and Present Informational Workshops and Public Meetings (7.1, 7.2)	1. Identify vendor or town staff to create and present stormwater informational workshops.	Community Development	Track number of workshop participants through attendance sheets	*	*			
		2. Prepare materials for workshops. Tailor material to likely audiences, such as business owners (including by business type,) residential property owners, gardeners.				*			
		3. Identify and secure venues to give workshops.				*			
		4. Update workshop content as necessary (at least yearly) and give updates at previously identified venues.					*	*	*

Table 8-1. Stormwater Best Management Practices Plan for Phase II Compliance

BMP ID	BMP Description[1.]	Implementation							
		Tasks for each BMP	Responsible Dept./Person	Measurable Goal	Year				
					2005	2006	2007	2008	2009
1. Education and Outreach for the General Public, Businesses and Institutions and Municipal Officials									
1G	**Promotional Items for Businesses (7.2)**	1. Identify vendor or town staff to create and present a program for stormwater promotional items to businesses. Where possible, integrate it with a "Clean Stream" participant.	Community Development	Track number of businesses using this program	*	*			
		2. Conduct the stormwater promotional item program.				*	*	*	*
1H	**Local Cable Broadcasts of Board of Selectmen's Meetings (7.1, 7.3)**	1. Develop initial presentation about the Stormwater Management Strategic Plan.	Community Development, Department of Public Works, Board of Selectmen, Town Administrator	Copies of cable TV tapes of presentations	*				
		2. Inform residents of presentation to the Board of Selection through the web site.			*				
		3. Show initial presentation at a Board of Selectmen meeting. Make sure that meeting is covered by local cable access.			*				
		4. Give update presentation to the Board of Selectmen, at meeting covered by cable television, at least annually thereafter.				*	*	*	*
1I	**Greater Participation at HooRWA Events (7.1)**	1. Provide increased outreach to Adams resident about events.	HooRWA, Community Development	Track participation by Adams residents and interests at events		*			
		2. Set State of the River Conference Agenda to include presentation about Adams Stormwater Management activities.				*	*	*	*
		3. Exhibit Adams stormwater management display at Riverfest and State of the River Conference.				*	*	*	*

Notes:
1. BMP descriptions are based on recommendations discussed in the Stormwater Management Strategic Plan. The section number where these recommendations appear in the Plan is noted in parentheses.

Table 8-1. Stormwater Best Management Practices Plan for Phase II Compliance

BMP ID	BMP Description[1.]	Implementation: Tasks for each BMP	Implementation: Responsible Dept./Person	Implementation: Measurable Goal	Year: 2005	Year: 2006	Year: 2007	Year: 2008	Year: 2009
2. Participation and Involvement by the General Public, Businesses and Institutions, and Municipal Officials									
2A	**Establish / Continue Pet Waste Bags in the Downtown Area (7.1)**	1. Install pet waste bag dispensers and signage in the downtown area.	Department of Public Works, Community Development	Record number of bags placed in dispensers	**Completed prior**				
		2. Periodically (at least weekly in spring, summer, fall) monitor and inspect dispensers. Re-stock bags as necessary.				*	*	*	*
		3. Develop and conduct educational outreach about pet waste, consistent with other components of the Education Plan Program (i.e. mailings, press releases, website, displays, presentations.)				*	*	*	*
		4. Aggressively enforce bylaw requiring clean up of animal feces.						*	*
2B	**Stormwater Management Grant / Funding Programs (7.3)**	1. Identify staff person to lead this grant effort.	Community Development, Department of Public Works, Town Administrator	Amount of funding secured for stormwater programs	*				
		2. Identify potential grant or funding sources. Explore wide range of options, including state, federal, and non-profit grants and private funding sources such as banks, business sponsorship.			*	*	*	*	*
		3. Conduct activities to foster broad-based partnerships to enhance the likelihood of success in obtaining grant funds and ensure successful project implementation.			*	*	*	*	*
		4. Prepare applications / funding requests.			*	*	*	*	*
2C	**Mark Storm Drains (7.1, 7.2)**	1. Identify vendor or staff person and interested volunteers or watershed group(s) to develop, coordinate and participate in this program. Coordinate with businesses and institutions, such as securing participation, sponsorship or employee training. Coordinate with other programs such as "Clean Stream" and "Adopt-A-Stream."	Community Development in partnership with HooRWA	50% of storm drains marked by year 5		*			
		2. Identify / secure funding to conduct marking program.				*	*		
		3. Identify catch basins to be marked in highest priority sub-basins.				*			
		4. Select and purchase storm drain markers, (stencils). Conduct school design "contest" of stencil.				*			
		5. Mark catch basins starting in highest priority sub-basins.				*	*		
		6. Mark catch basins in moderate-high priority sub-basins.					*	*	
		7. Identify marked storm drains on storm drain base map.				*	*	*	
2D	**Stormwater Management Training Program for Municipal Officials (6.4, 7.3)**	1. Identify vendor or staff person to coordinate training program for municipal officials.	Community Development, Planning Board, Conservation Commission, in partnership with Berkshire Regional Planning Commission	Attendance lists of participants	*	*			
		2. Identify / secure funding to conduct the training program.			*	*			
		3. Obtain / develop training material. Revise and update as necessary.				*	*	*	*
		4. Establish training program schedule. Coordinate with "Good Housekeeping" Training (6T.)				*	*	*	*
		5. Conduct training program.				*	*	*	*
		6. Regularly inform Board and Commission members about formalized trainings offered by public, private and non-profit entities.			*	*	*	*	*

Table 8-1. Stormwater Best Management Practices Plan for Phase II Compliance

BMP ID	BMP Description[1.]	Implementation: Tasks for each BMP	Responsible Dept./Person	Measurable Goal	Year: 2005	2006	2007	2008	2009
2. Participation and Involvement by the General Public, Businesses and Institutions, and Municipal Officials									
2E	**Establish "Clean Stream" Program**	2. Identify / secure funding to conduct the "Clean Stream" program.	Community Development with cooperation from businesses and institutions	Number of "Clean Stream" participants		*	*		
		3. Prepare list of Clean Stream parameters ("how to" packets describing the program and various activities) for distribution to interested businesses and institutions.					*	*	
		4. Identify and secure interested businesses or institutions to participate in the program.					*	*	
		5. Conduct site evaluations against established parameters.						*	*
		6. Recognize participants via the web site, press releases, the display, and at presentations.					*	*	*
2F	**Establish an Adopt-A-Stream Program (7.2)**	1. Identify vendor or staff person to develop and coordinate this program.	Community Development in partnership with HooRWA and with strong support from area businesses and institutions	Miles of stream segments "adopted"		*	*		
		2. Identify / secure funding to conduct the Adopt-A-Stream program.				*	*		
		3. Prepare "how to" packets describing the program and various activities for distribution to interested businesses and institutions.				*			
		4. Identify and secure interested businesses to participate in the program.				*			
		5. Conduct on-going Adopt-A-Stream activities.				*	*	*	*
		6. Recognize participants via the web site, press releases, the display, and at presentations.				*	*	*	*
		7. Continue to evaluate streams through stream team assessments and integrate ongoing stream team assessment results into future clean-up sites.				*	*	*	*
2G	**Conduct River Clean-ups (7.1, 7.2)**	1. Identify vendor or staff person and interested volunteers or watershed group(s) to conduct and participate in the program.	Community Development, Department of Public Works in partnership with HooRWA and other local groups	Highest priority sites completely cleaned within 5 years		*	*		
		2. Identify / secure funding to conduct clean-ups.							
		3. Using Stream Team Assessment results identify highest priority clean-up sites. Coordinate clean-ups with segments identified in the Adopt-A-Stream (2F) and "Clean Stream" Programs (2E.)				*	*		
		4. Arrange clean-up logistics. Coordinate with the DPW.				*	*		
		5. Conduct clean-up of highest priority sites.				*	*		
		6. Conduct ongoing clean-ups using updated results of stream team assessments.					*	*	*
2H	**Conduct Employee Trainings at Participating Businesses or Institutions (7.2)**	1. Identify vendor or staff person to solicit and identify potential businesses and institutions to participate in this program.	Community Development in partnership with businesses and institutions	An employee training series presented to at least one business or institution per year	*	*			
		2. Identify / secure funding to conduct trainings.							
		3. Prepare or coordinate training program - secure and adapt material, arrange times and locations, and secure presenters as necessary.				*	*		
		4. Conduct trainings.							
		5. Recognize participants via the web site, press releases, the display, and at presentations.				*	*	*	*

Table 8-1. Stormwater Best Management Practices Plan for Phase II Compliance

BMP ID	BMP Description[1.]	Implementation: Tasks for each BMP	Responsible Dept./Person	Measurable Goal	Year: 2005	2006	2007	2008	2009
2. Participation and Involvement by the General Public, Businesses and Institutions, and Municipal Officials									
2I	**Implement Stormwater BMPs at Business or Institution Sites (7.2)**	1. Identify vendor or staff person to solicit and identify potential business sites as candidates for this item.	Community Development, Department of Public Works	At least one BMP installation at the end of 5 years		*	*	*	*
		2. Research and identify suitable incentives.				*	*		
		3. Work with property owners to identify and design acceptable BMPs.				*	*	*	
		4. Prepare and secure incentive package such as grant application. Secure commitment from property owner to go forth with the incentive effort.				*	*	*	*
		5. If incentive package request is successful, install BMP.					*	*	*
2J	**Stream Team Assessments (7.1)**	1. Identify vendor or staff person and interested volunteers or watershed group(s) to conduct and participate in the program.	Community Development with HooRWA and Youth Center, Inc.	Stream Team Assessments conducted for major stream segments every 2 years	*	*			
		2. Identify and secure funding for vendor services or reimbursement of costs.			*	*			
		3. Conduct organizational activities including identification and prioritizations of stream segments, volunteer solicitation, volunteer training, preparation of volunteer field work materials, and volunteer oversight.				*	*		
		4. Conduct assessments and related follow-up, including write-up of findings, photograph and map documentation, and prioritization of needed site specific activities (i.e. clean-up, erosion control, monitoring, etc.)				*	*	*	*
		5. Provide ongoing presence related to implementing needed activities.				*	*	*	*
		6. Recognize efforts of participants via the web site, press releases, the display, and at				*	*	*	*
2K	**Classroom Education and Field Trip Program (7.1)**	1. Coordinate with HooRWA to insure that Adams stormwater items get integrated into existing teacher training effort and school field trips.	Community Development with HooRWA	Number of school children exposed to educational training related to Adams stormwater items	*				
		2. Work with HooRWA to explore possible expansion of the classroom education program. Seek and obtain a sustainable source of funds for regular operation of this program.			*	*			
		3. Work with schools to expand curriculum to included Adams stormwater items.				*	*		
		4. Explore opportunities with the Massachusetts College of Liberal Arts to develop / integrate K - 12 stormwater education program into MCLA curriculum.					*	*	
		5. Explore opportunities to integrate K - 12 stormwater education program into future development of Greylock Glen site.					*	*	*
2L	**Conduct Volunteer Water Quality Monitoring (7.1)**	1. Coordinate with HooRWA's monitoring program to monitor for stormwater impacts.	Community Development with HooRWA	Number of sites where samples have been taken		*			
		2. Identify and secure funding for reimbursement of monitoring costs.				*			
		3. Expand volunteer monitors to include Adams residents.				*	*		
		4. Train personnel/volunteers to conduct sampling according to appropriate protocols.				*	*	*	*
		5. Implement stormwater monitoring program. Conduct sampling.					*	*	*
		6. Interpret and widely disseminate results (as part of other activities such as mailings, presentations, Board of Selectmen updates.)					*	*	*
		7. Use results to correct identified problems and improve water quality.					*	*	*

Table 8-1. Stormwater Best Management Practices Plan for Phase II Compliance

BMP ID	BMP Description[1.]	Implementation: Tasks for each BMP	Responsible Dept./Person	Measurable Goal	Year: 2005	2006	2007	2008	2009
2. Participation and Involvement by the General Public, Businesses and Institutions, and Municipal Officials									
2M	**Conduct River Walks (7.1)**	1. Identify interested volunteers or watershed group(s) to conduct and participate in the program.	Community Development with HooRWA	Number of participants			*		
		2. Develop and promote walk itineraries.					*		
		3. Conduct walks. Take pictures and interview participants to use with other outreach efforts, such as the display board.					*	*	*
2N	**Participation at Hoosic Watershed Team Meetings (7.3)**	1. Include broad range of Adams officials on the Hoosic Team e-mail list serve. Update as necessary.	Community Development, Department of Public Works, Town Administrator, Selectmen, HooRWA	Number of Adams representatives attending meetings	Ongoing	*	*	*	*
		2. Coordinate between Adams officials as to the most appropriate attendee(s) to the upcoming meeting.			Ongoing	*	*	*	*
		3. Participate at meetings.			Ongoing	*	*	*	*
		4. Conduct follow-up activities / networking between meetings.			Ongoing	*	*	*	*
2O	**Participation in Watershed Association Events (7.1, 7.3)**	1. Provide targeted outreach to Adams residents about Watershed Association events.	HooRWA	Number of Adams residents attending events	*	*	*	*	*
		2. Integrate an Adams component to Riverfest (i.e. stormwater display) and State of the River Conference.			*	*	*	*	*
		3. Participate at events.				*	*	*	*
2P	**Conduct Bike Tours along the Ashuwillticook Rail Trail (7.1)**	1. Identify vendor, staff person, interested volunteers or watershed group(s) to coordinate and run this effort. This is a good summer intern activity and could be combined with other water related intern activities.	Community Development in partnership with HooRWA with involvement from area schools and colleges	Number of participants	*	*			
		2. Identify / secure funding is a vendor is used or to reimburse for volunteer expenses.			*	*			
		3. Prepare interpretive program.				*			
		4. Advertise and solicit participants.				*	*	*	*
		5. Conduct Tours.				*	*	*	*
2Q	**Riparian Tree / Shrub Planting Program (7.1)**	1. In conjunction with activities specific in 6D, monitor efforts of flood control chute restoration project.	Department of Public Works, Community Development, Selectmen, Conservation Commission, Hoosic Watershed Team Members and Volunteers	Record the number, location, and kind of tree or shrub planted and monitor the overall mortality / survival rate					
		2. Evaluate the potential for tree and shrub planting along the banks of the flood control structure. If favorable conditions exist complete steps 3-7.							
		3. Adjust Operations and Maintenance Plan as necessary.							
		4. Recruit volunteers and organizations for plantings.				*			
		5. Prioritize areas to plant shrubs and trees and determine planting species (use native species) to be used at each location.				*			
		6. Obtain funding and plants.					*		
		7. Plant trees and shrubs.					*	*	*

Notes:
1. BMP descriptions are based on recommendations discussed in the Stormwater Management Strategic Plan. The section number where these recommendations appear in the Plan is noted in parentheses.

Table 8. Stormwater Best Management Practices Plan for Phase II Compliance

BMP ID	BMP Description[1]	Implementation: Tasks for each BMP	Responsible Dept./Person	Measurable Goal	Year: 2005	2006	2007	2008	2009
3. Illicit Discharge Detection and Elimination									
3A	**Develop Illicit Discharge Prohibition Bylaw**	1. Determine whether amendments to existing bylaws, rules, and regulations or a separate general bylaw will be used to prohibit illicit discharges.	Community Development	Adopted Illicit Discharge Prohibition Bylaw approved by the Attorney General's Office	*				
		2. Prepare amendments or new bylaw and present draft to public.				*			
		3. Submit bylaw amendments or new bylaw for Town Meeting.				*	*		
3B	**Develop a Storm Drain System Base Map (3.0)**	1. Develop a drainage base map showing town features (roads, hydrography, resource waters and topography).	Department of Public Works and Community Development	95 % of system mapped on GIS	**Completed in 2003**				
		2. Map storm drain system using historical mapping projects, existing plans, and knowledge of town employees.							
		3. Field verify drainage system connections.							
		4. Create a GIS base map and database for the storm drain system.							
3C	**Field Verify all Stormwater Outfalls and Update Base Map (4.5)**	1. Field verify 42 storm system outfalls in sub-basins L & R.	Department of Public Works and Community Development	All outfalls field verified by 2008	**Completed November 2004**				
		2. Field verify remaining storm system outfalls to the Hoosic River and the highest priority sul basins L & R.				*	*		
		3. Locate and field verify storm system outfalls in the moderate-high priority sub-basins B, C, G, H, K, M, O, T, U, W and Z.				*	*		
		4. Locate and field verify storm system outfalls in the moderate priority sub-basins A, D, E, F, I, J, N, P, Q, S, V, X and Y.					*	*	
		5. Add outfall information to the existing GIS base map and compile inspection sheets to document maintenance needs.			**42 updated**	*	*	*	
3D	**Screen all Stormwater Outfalls for Illicit Discharges in Accordance with the Adams IDDE Plan (3.0 & 4.5)**	1. Inspect outfalls for dry weather flows as part of the inspections under BMP 3B and screen dry weather flows for illicit discharges as outlined in the Adams IDDE Plan. Sample for bacteria and other parameters as budget allows.	Department of Public Works and Community Development	50 outfalls screened each year and all outfalls screened by 2009	**42 screened in 2004**	*	*	*	*
		2. Seek sources of illicit discharges one by one and provide enforcement using newly adopted illicit discharge ordinance authority.				*	*	*	*
3E	**Conduct Follow-up Assessments and Corrective Actions to the May 17 & 18, 2004 and November 18, 2004**	1. Conduct additional water quality sampling (if needed) and trace flow sources (see Table 4-5 in the Stormwater Management Strategic Plan).	Department of Public Works and Community Development	All corrective actions completed by 2007		*			
		2. Identify illicit discharge source, contact owner(s) and physically disconnect the source.				*	*		
3F	**Conduct a Detailed Review of the 1987 I/I Study for the Sanitary Sewer System (4.5)**	1. Confirm the remaining problem areas for the sanitary sewer system that have not been addressed since the 1987 I/I Study. Cross-reference DPW projects, repairs and other sewer projects with the I/I Study findings and recommendations for further investigatior	Department of Public Works and Community Development	Documented findings, maps and fixed areas. Five (5) problem areas to be fixed each year	*	*			
		2. Compile a list of remaining problem areas and areas that were not previously evaluated as part of the 1987 I/I Study.				*			
		3. Prioritize repairs based on the greatest potential for water quality improvement and need for immediate repairs (e.g., likelihood of sewer failures).					*		
		4. Procure funding and begin sewer repairs.					*	*	*

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BMP ID	BMP Description[1]	Implementation: Tasks for each BMP	Responsible Dept./Person	Measurable Goal	Year: 2005	2006	2007	2008	2009
3. Illicit Discharge Detection and Elimination									
3G	**Evaluate the Town's existing Five-year Capital Improvement Plan for Sewer and Drainage Repairs (4.6.1)**	Evaluate the Town's sewer and drainage projects in the CIP and prioritize sewer repairs that will result in the greatest water quality improvement. Incorporate the review of the 1987 I/I Study (BMP 3E).	Department of Public Works and Community Development	Prioritized list of improvement areas over five years			*		
3H	**Conduct Stormwater Sampling Upstream of Stormwater Sample Sites SW-1 through SW-5 (4.6.1)**	1. Identify stormwater sample locations upstream of urban areas associated with sample sites SW-1 through SW-5. Calculate sample times based on watershed characteristics	Department of Public Works and Community Development	3 stormwater events sampled, water quality report	*				
		2. Conduct stormwater sampling in accordance with the 2003 Adams QAPP and consider adding ammonia and surfactant parameters. Consider sampling during and after furst flush during high flow storm events (e.g., >0.25" in 1 hour or less).				*	*		
		3. Evaluate water quality data, storm event characteristics and historical water quality data and prepare a report of findings.					*		
3I	**Conduct Smoke Testing of the Drainage System to Identify Cross Connections with the Sanitary Sewer System (4.5)**	1. Begin smoke testing of the drainage system based on the results of BMPs 3E & 3G and/or the contributing drainage network upstream of stormwater sample sites SW-1 through SW-5. Refer to the Adams IDDE Plan for guidance.	Department of Public Works and Community Development	Identified illicit connections are removed within one year of discovery		*	*	*	*
		2. Conduct smoke testing of the unidentified pipes that enter the underground portion of Hoxie Brook.				*			
		3. Document findings, maps and next steps to remove identified illicit connections. Contact owner(s) and physically disconnect the source.				*	*	*	*
3J	**Evaluate Stormwater Discharges to Endangered Species Habitat and Historic Places**	1. Designate a responsible individual and/or retain a consultant to conduct the evaluation.	Community Development, Conservation Commission, and Contractor		*				
		2. Develop project needs for the evaluation (species and historic places lists) based on the EPA guidance document and Town characteristics identified in Sections 2.5 and 2.6 of the Stormwater Management Strategic Plan.		Final list of endangered species and historic places	*				
		3. Conduct evaluations in accordance with EPA's guidance document.		Results of evaluation		*			
3K	**Continually Evaluate New Water Quality Data for Waterways in Adams (4.6.1)**	1. Evaluate new water quality data with historical water quality data to identify potential areas of concern, refine water quality improvement/mitigation efforts or document water quality improvements over time.	Department of Public Works and Community Development	Documented water quality findings, key points for further investigation	*	*	*	*	*
		2. Evaluate illicit discharge investigation data, stormwater and stream data as it becomes available. This includes ongoing studies such as the MA DEP 2002 water quality monitoring for Peck's Brook, Tophet Brook, Dry Brook and the Hoosic River.			*	*	*	*	*
3L	**Incorporate Information on Illicit Discharges into Public Education and Outreach Topics (4.6.1)**	1. Incorporate public education materials on hazards associated with illegal discharges and improper disposal of waste with the public education program.	Department of Public Works, Community Development, and Board of Health	Copies of materials	*	*	*	*	*
		2. Incorporate the results of IDDE field efforts and water quality findings into the public education program.				*	*	*	*
3M	**Consider Establishing a**	1. Identify department to receive calls.	Department of Public Works, Board of Health, and	Log of complaints and		*			
		2. Advertise (with public education materials) who to call to report dumping or other inappropriate inputs to the MS4.				*			

Table 8. Stormwater Best Management Practices Plan for Phase II Compliance

BMP ID	BMP Description[1]	Implementation							
		Tasks for each BMP	Responsible Dept./Person	Measurable Goal	Year				
					2005	2006	2007	2008	2009
3. Illicit Discharge Detection and Elimination									
	Hotline for Illicit Discharges	3. Develop protocol for addressing complaints.	Adams Fire District	actions taken		*			
		4. Keep records of complaints and actions taken.				*	*	*	*

Notes:
1. BMP descriptions are based on recommendations discussed in the Stormwater Management Strategic Plan. The section number where these recommendations appear in the Plan is noted in parentheses.

Table 8. Stormwater Best Management Practices Plan for Phase II Compliance

BMP ID	BMP Description[1]	Implementation			Year				
		Tasks for each BMP	Responsible Dept./Person	Measurable Goal	2005	2006	2007	2008	2009
4. Construction Site Runoff Control									
4A	**Establish Adequate Erosion and Sediment Control and Stormwater Measures**	1. Prepare erosion and sediment control and stormwater management measures for incorporation into the proposed Stormwater Management and Sediment Control Bylaw that address: standards for acceptable control measures; requirements for stormwater/erosion control plans; procedures for Town plan review and approval; and adeqate enforcement and penalty measures.	Community Development	Endorsed Criteria for Stormwater Management and Erosion and Sediment Control		*			
		2. Conduct workshops with Planning Board, Conservation Commission, Selectmen, etc. to present the draft criteria/measures.				*			
		3. Conduct public meetings on the proposed criteria for stormwater management and erosion and sediment control, as needed.				*			
4B	**Adopt a "Standalone" Stormwater Management and Erosion Control Bylaw (5.3)**	1. Complete the final draft of a Town of Adams Stormwater Management and Erosion Control Bylaw based on the review of state and CEI model bylaws.	Community Development	Adopted Erosion and Sediment Control Bylaw Provisions		*			
		2. Conduct workshops with Planning Board, Conservation Commission, Selectmen, etc. to present the draft erosion and sediment control measures.				*			
		3. Conduct Public Hearing on the proposed erosion and sediment control measures and prepare revised language, as needed.				*			
		4. Prepare Town Meeting Warrant; seek Town Meeting approval.				*	*		
4C	**Amend the Zoning Bylaw to incorporate new development standards consistent with water quality goals (5.3)**	1. Prepare final draft amendments to the Zoning Bylaw that incorporate new development standards.	Community Development	Adopted Zoning Bylaw Amendments approved by the Attorney General's Office	*	*			
		2. Conduct workshops with Planning Board, Zoning Board of Appeals, Downtown Committee, Selectmen, etc. to present the draft Bylaw amendments.				*	*		
		3. Conduct Public Hearing(s) on the Bylaw amendments and prepare revised language, as needed.				*	*		
		4. Prepare Town Meeting Warrant; seek Town Meeting approval.					*		
4D	**Amend the Subdivision Rules and Regulations consistent with water quality goals**	1. Prepare final draft amendments to the Subdivision Regulations that incorporate new development standards consistent with water quality goals and objectives.	Community Development	Adopted Amendments to the Town's Subdivision Regulations		*			
		2. Conduct workshops with Planning Board on the proposed amendments to the Subdivision Regulations.				*			
		3. Conduct Planning Board Public Hearing(s) on the Amended Subdivision Regulations; Prepare revised language, as needed.				*	*		

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BMP ID	BMP Description[1]	Implementation							
		Tasks for each BMP	Responsible Dept./Person	Measurable Goal	Year				
					2005	2006	2007	2008	2009
4. Construction Site Runoff Control									
4E	**Establish New Site Plan Review Requirements (5.3)**	1. Prepare final draft amendments to the Zoning Bylaw that incorporate improved site plan review requirements.	Community Development	Adopted Provisions for Enhanced Site Plan Review		*			
		2. Conduct workshops with Planning Board, Zoning Board of Appeals, Selectmen, etc. to present the draft site plan amendments to the Zoning Bylaw.				*			
		3. Conduct Public Hearing(s) on the site plan Bylaw amendments and prepare revised language, as needed.				*	*		
		4. Prepare Town Meeting Warrant; seek Town Meeting approval.					*		

Notes:
1. BMP descriptions are based on recommendations discussed in the Stormwater Management Strategic Plan. The section number where these recommendations appear in the Plan is noted in parentheses.

Table 8. Stormwater Best Management Practices Plan for Phase II Compliance

BMP ID	BMP Description[1]	Implementation							
		Tasks for each BMP	Responsible Dept./Person	Measurable Goal	Year				
					2005	2006	2007	2008	2009
5. Post Construction Runoff Control									
5A	**Integrate Stormwater Management and Water Quality Protection Goals in the Revision of the Town's Comprehensive Plan (5.6)**	1. Evaluate the Town's general land use pattern and determine future land use areas in the Plan that should be modified to protect water quality.	Community Development	Adopted Comprehensive Plan Revision	*	*			
		2. Consider establishing a comprehensive greenway system within Adams based on the protection of undisturbed riparian areas along the Town's tributary stream network.				*			
		3. Evaluate existing developed areas for redevelopment with opportunites to integrate water quality BMPs over time.				*	*		
		4. Work with the Adams Fire District to establish a growth area boundary to define areas appropriate for utility extensions.				*	*		
5B	**Incorporate Low Impact Development (LID) provisions into the Zoning Bylaw and Subdivision Regulations (5.6)**	1. Prepare draft amendments to the Zoning Bylaw that incorporate LID provisions.	Community Development	Adopted Zoning Bylaw and Subdivision Regulations Amendments		*			
		2. Prepare draft amendments to the Town's Subdivision Regulations that incorporate LID provisions.				*			
		3. Conduct workshops with Planning Board, Selectmen, and General Public to present the draft LID provisions.				*			
		4. Conduct Public Hearing(s) on the Bylaw amendments and prepare revised language, as needed.				*			
		5. Prepare Town Meeting Warrant for the proposed amendments to the Zoning Bylaw; seek Town Meeting approval.				*	*		
5C	**Develop Relevant Best Management Practices for Redevelopment**	1. Develop appropriate BMPs for redevelopment to improve water quality over time as previously developed areas redevelop.	Community Development	Implement Redevelopment Best Management Practices		*			
		2. Prepare draft amendments to Town bylaws/regulations as appropriate to incorporate standards for redevelopment BMPs.				*			
		3. Conduct Public Hearing(s) on the Bylaw amendments and prepare revised language, as needed.				*			

Table 8. Stormwater Best Management Practices Plan for Phase II Compliance

BMP ID	BMP Description[1]	Implementation: Tasks for each BMP	Responsible Dept./Person	Measurable Goal	Year: 2005	2006	2007	2008	2009
5. Post Construction Runoff Control									
5D	**Develop Tree Protection and Replacement Requirements**	1. Develop criteria for tree protection/replacement for integration in the Town's Zoning Bylaw, erosion control requirements, and site plan review process.	Community Development	Adopted Requirements for Tree Protection and Replacement		*	*		
		2. Prepare draft amendments to Town bylaws/regulations as appropriate to incorporate tree protection provisions.				*	*		
		3. Conduct Public Hearing(s) on the Bylaw amendments and prepare revised language, as needed.					*		
5E	**Establish an Improved Environmental Assessment Process focused on Water Quality and Stormwater Impacts (5.6)**	1. Evaluate the Town's existing site plan review and subdivision review requirements and develop specific langauge to incorporate environmental assessment criteria.	Community Development	Adopted provisions for an improved environmental assessment process		*	*		
		2. Prepare draft amendments to Town bylaws/regulations as appropriate to incorporate improved standards for environmental assessment of development impacts on stormwater and water quality.				*	*		
		3. Conduct Public Hearing(s) on the Bylaw amendments and prepare revised language, as needed.					*		
		4. Prepare Town Meeting Warrant for the proposed amendments to the Zoning Bylaw; seek Town Meeting approval.					*		

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BMP ID	BMP Description[1]	Implementation: Tasks for each BMP	Responsible Dept./Person	Measurable Goal	Year: 2005	2006	2007	2008	2009
6. Pollution Prevention and Good Housekeeping									
6A	**Develop an Inspection and Maintenance Plan (protocol) for the Storm Drain System and Begin Inspections (6.2)**	1. Develop a written inspection/maintenance plan (protocol) for structural BMPs and the drainage system throughout Town. The plan will include the information discussed in BMPs 6B, 6C and 6D should outline components to be inspected, the inspection frequency, what to look for during inspections, and what conditions trigger maintenance.	Department of Public Works	Written protocols and schedule		*			
		2. Perform inspection and maintenance, modifying frequency as necessary.		Records of inspections and maintenance		*	*	*	*
		3. Develop an in-house policy for handling maintenance generated wastes (i.e., catch basin cleanings, street sweepings, sediments from detention ponds).				*	*		
6B	**Clean Catch Basins & Stormwater Structures (6.2)**	1. Procure funding for drainage system cleaning equipment.	Department of Public Works	Clean all catch basins annually	**Purchase of a vacuum truck was requested for the**				
		2. Clean all catch basins and drainage manholes in Town at least once each year or as needed to ensure sediments never reach the invert of the drainage outlet pipe.				*	*	*	*
		3. Record the volume of sediment removed from various drainage networks/areas in Town and prioritize the networks/areas by these volumes (i.e., greater volumes require more frequent cleaning).				*	*	*	*
		4. Modify cleaning frequency based on inspection results and the maintenance plan (BMP 6A).					*	*	*
6C	**Sweep Streets in Town to Reduce Sediment Loadings to Waterways (6.2)**	1. Continue to sweep all streets in Town at least twice a year and sweep areas prone to sediment accumulation on a more frequent basis, such as the downtown area, which is currently swept weekly.	Department of Public Works	Sweep all streets 2x/yr., downtown weekly	**Ongoing**				
		2. Develop a sweepings priority plan to maximize sediment removal in areas that are likely to result in the greatest water quality impact. Utilize a map that highlights priority areas, seasonal timing and cleaning frequency based on how much sediment collects in each area, proximity to surface waters and whether stormwater BMPs are present to collect sediment before it reaches surface waters. The timing of sweeping activities in the spring should be scheduled to occur as soon as possible after roadway sediments thaw.		Priority plan of sweeping based on water quality impact		*			
6D	**Develop an In-house Policy for Management of Stormwater Residuals (6.3)**	1. Evaluate potential reuse sites for stormwater residuals (e.g., street sweepings) in Town in accordance with the existing DEP Street Sweeping Policy #BWP-94.092 (Appendix 6B).	Department of Public Works	In-house, written protocol for reuse of street sweepings	*	*			
		2. Evaluate potential reuse sites in Town for stormwater residuals (street sweepings and catch basin cleanings) under a Beneficial Use Determination (BUD). File a BUD once viable reuse options have been determined. This option can be completed with or without Task 1 above.		BUD filed for reuse of catch basin cleanings and/or street sweepings	*	*			
		3. As a final option, procure funding for disposal of stormwater residuals and dispose of materials in accordance with local landfill requirements and MA DEP regulations (refer to Tables 6-1 and 6-2 for potential disposal facilities and estimated costs).		Volume of material removed from the drainage system		*	*	*	*

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BMP ID	BMP Description[1]	Implementation: Tasks for each BMP	Responsible Dept./Person	Measurable Goal	Year 2005	2006	2007	2008	2009
6. Pollution Prevention and Good Housekeeping									
6E	**Evaluate the Feasibility for Maintenance Dredging of Flood Control Chute Structures (3.3)**	1. Designate a responsible individual or Department to evaluate the existing drop structures, stilling basins and storage basins along the Hoosic River. Coordinate the evaluation with the U.S. Army Corps of Engineers.	Department of Public Works and Community Development	Evaluation with recommendations completed by end of 2006	*				
		2. Review construction drawings and conduct field reviews along the Hoosic River flood control chutes to evaluate sites for sediment removal and future stormwater treatment based on needed maintenance areas.				*			
		3. Evaluate the drop structure and stilling basin west of the Miller Street Bridge on Tophet Brook, just before its confluence with the Hoosic River, where a large sand/gravel bar has formed.				*			
		4. Evaluate the pumping station and storage basin adjacent to Hoosac Street and to the west of the Hoosic River that is laden with sediment.				*			
		5. Evaluate other structures: weir upstream of Commercial Street; stilling basin on Hoosic River upstream of Tophet Brook; and stilling basin on Hoosic River west of North Summer Street, downstream of Crotteau Street and Adams DPW Yard.				*			
		6. Prepare a summary report of findings and recommendations.				*			
6F	**Update the 1959 Operation and Maintenance (O&M) Manual for the Hoosic River Flood Control Chutes (3.3)**	1. Evaluate the 1959 O&M Manual in relation to water quality and current maintenance practices/requirements to determine if any modifications are warranted or possible. Coordinate the evaluation with the U.S. Army Corps of Engineers.	Department of Public Works and Community Development	Updated O&M Manual by end of 2006		*			
		2. Propose modifications based on maintenance needs and water quality benefits.				*			
		3. Adopt the updated O&M Manual.				*			
6G	**Address Structural Support Issues for the Culvert that Carries Hoxie Brook Downtown (4.5)**	1. Conduct a detailed inspection of the structural integrity of the culvert beneath the former autobody shop along Depot Street and the stacked stone arch portions upstream of Park Street.	Department of Public Works and Community Development	No further deterioration of the culvert. All major repairs completed by end of 2007		*			
		2. Develop a list of construction/repair needs and recommendations for problem areas.				*			
		3. Procure funding and begin repairs.				*	*		
6H	**Incorporate BMPs into the Repair and Upgrade of Drainage Systems (3.3, 4.6.3 & 6.1.1)**	1. Utilize deep sump catch basins or leaching structures when drainage manholes are repaired or replaced.	Department of Public Works and Community Development	75% of drainage structure replacements utilize deep sumps		*	*	*	*
		2. Construct vegetated swales or rip rap swales instead of concrete swales or pipes to convey runoff, where feasible.		Number of new or improved swales		*	*	*	*
		3. Incorporate BMPs into downtown reconstruction projects and roadway redevelopment projects (refer to Appendix 4E for conceptual BMPs at redevelopment sites).		1 demonstration project constructed by 2007			*	*	*
6I	**Implement BMPs at Priority Stormwater Remediation Sites in Town (4.6.2)**	1. Select a project site for construction of structural BMPs based on the Conceptual BMP sites evaluated in Section 4.6.2.	Department of Public Works and Community Development	1 demonstration project constructed by 2007	*				
		2. Pursue/procure funding (e.g., s319 grant) for design and construction of BMPs.			*	*			
		3. Construct BMPs and document water quality results.					*		
		4. Pursue additional BMP sites as grant or Town projects.					*	*	*

Table 8. Stormwater Best Management Practices Plan for Phase II Compliance

BMP ID	BMP Description[1]	Implementation							
		Tasks for each BMP	Responsible Dept./Person	Measurable Goal	Year				
					2005	2006	2007	2008	2009
6. Pollution Prevention and Good Housekeeping									
6J	**Implement the SWPPP & BMP Recommendations at the Adams DPW Garage (6.1.2)**	1. Finalize the DPW Garage Stormwater Pollution Prevention Plan (SWPPP) that was developed by BRPC in March 2003.	Department of Public Works	Final SWPPP, implemented by 2006	*				
		2. Begin the recommendations outlined in the SWPPP and ensure ongoing compliance.				*	*	*	*
6K	**Develop a SPCC Plan for the Adams DPW Garage (6.1.2)**	1. Retain a qualified contractor to develop or assist in the development of a Spill Prevention Control and Countermeasure (SPCC) Plan, as required by the Federal Oil Pollution Prevention regulation at 40 CFR 112 - Oil Pollution Prevention and Response; Non-Transportation-Related Onshore and Offshore Facilities.	Department of Public Works	Final SPCC Plan, implemented by 2006	*				
		2. Finalize the SPCC Plan and ensure ongoing compliance at the DPW Garage.				*	*	*	*
6L	**Maintain "No Exposure Certification" at the Adams Recycling Center and Wastewater Treatment Facility (6.1.2)**	1. Currently, the Adams Recycling Center and Wastewater Treatment Facility qualify for the "No Exposure Certification" under the industrial stormwater permit requirements. The Town must maintain this certification and reduce stormwater pollution at these facilities.	Department of Public Works	No industrial materials/ activities exposed to stormwater at the sites. Certification forms filed with EPA	*	*	*	*	*
		2. Submit the "No Exposure Certification" form to EPA every five years for each facility.					*		
6M	**Evaluate the Adams Compost Site to Address Runoff and Water Quality (6.1.1)**	1. Review the Adams compost site, map drainage and evaluate runoff treatment methods in accordance with the Environmental Impact Control Measures in the DEP Leaf and Yard Waste Compost Guideline.	Department of Public Works and Conservation Commission	Photos and sketches to document conditions/ changes at the site	*				
		2. Develop and construct BMPs or site modifications to comply with the DEP Guideline and minimize water quality impact.				*			
6N	**Implement the Adams Parks Management Plan for the Maintenance of Town-Owned Lands (6.1.1)**	1. Complete the recommendations developed in the June 2004 Management Plan for the Adams Parks Division to minimize potential environmental impacts from the maintenance of Town-owned lands and make operations more protective of water resources. See the summary of recommendations provided in Appendix 6A and the full Management Plan in Volume 2 of the Adams Stormwater Management Strategic Plan.	Department of Public Works and Parks Division	Recommendations completed by end of 2006 and ongoing thereafter	*	*			
		2. Ensure ongoing BMPs are regularly completed and the Management Plan is reviewed on an annual basis.		Updated plan as needed		*	*	*	*
6O	**Minimize Over Application of Winter Roadway Treatments (deicing) (6.1.1)**	1. Routinely calibrate sand/salt spreaders and use sand/salt spreaders that are capable of adjusting application rates to achieve an optimal application rate according to roadway characteristics (e.g., width and design).	Department of Public Works	All spreaders calibrated	*	*	*	*	*
		2. Train existing and new employees for effective application of deicing materials.		Annual training session	*	*	*	*	*
		3. Consider additional deicing management techniques: using ice-cutting plow blades to reduce the need and/or volume of de-icing materials; alternative deicing agents or catalysts (e.g., magnesium chloride) to maximize the effectiveness of salt applications and reduce the overall volume needed for road treatment; and weather and roadway monitoring systems to adjust deicing activities to changing conditions to indicate and predict freezing road conditions.		Effective and safe winter roadway treatments. with minimal use of deicing materials	*	*	*	*	*

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BMP ID	BMP Description[1]	Implementation: Tasks for each BMP	Responsible Dept./Person	Measurable Goal	Year 2005	2006	2007	2008	2009
6. Pollution Prevention and Good Housekeeping									
6P	**Incorporate Stormwater Pollution Prevention BMPs into Roadway Maintenance Operations (6.1.1)**	1. Ensure that all road maintenance and repairs (including utility repairs) are conducted in a manner to prevent erosion of materials into nearby surface waters. Use filter socks for dewatering activities during utility repairs and silt fence/hay bales to contain earth stockpiles.	Department of Public Works	Erosion controls used on all DPW projects	*	*	*	*	*
		2. Utilize BMPs from the Massachusetts Unpaved Roads BMP Manual (BRPC 2001), which outlines numerous BMPs for the maintenance of dirt road surfaces, ditches, culverts, stormwater outlets and steep banks for erosion and sediment control.		Copy of manual at DPW office	*	*	*	*	*
		3. Perform activities such as paving and painting operations only during dry weather conditions and take care to not spray or spill materials into the drainage system.		No spills or water quality impacts	*	*	*	*	*
		4. Provide spill control materials for roadway crew vehicles to assist in the cleanup of small spills that may occur during road maintenance activities.		Spill materials readily available for roadway crews	*	*	*	*	*
6Q	**Ensure Compliance for Snow Disposal in Town (6.1.1)**	1. Review the current snow disposal sites in Adams to ensure compliance with the Massachusetts Snow Disposal Guidelines Policy No. BRPG01-01 (see Appendix 6B).	Department of Public Works and Conservation Commission	Photos and sketches to document conditions/ changes at the site	*				
		2. Modify snow disposal activities or locations, if needed, to comply with the Guidelines.				*			
		3. Ensure compliance for all other snow disposal activities in Town by avoiding the following: disposal to waterways; disposal at sites with steep slopes that may result in erosion of soils; dumping in sanitary landfills, gravel pits and public or private water supply protection areas; and disposal on top of storm drain catch basins or in stormwater drainage swales or ditches.			*	*	*	*	*
6R	**Conduct Periodic Evaluations of Municipal Operations (6.1.1)**	1. Evaluate municipal operations and facilities annually using the Town-wide Municipal Operations Checklist and document the results in a binder at the Adams DPW. The evaluation should address past and future practices for municipal operations as they relate to water quality and outline changes for water quality improvements. For example, the frequency of catch basin cleaning and street sweeping should be evaluated in relation to sediment loadings to waterways to determine if some areas of Town require more frequent cleaning. 2. Modify municipal operations based on the results of the evaluation to improve water quality.	Department of Public Works, Community Development, and Conservation Commission	Record of evaluation, completed checklist		*	*	*	*
6S	**Conduct Monthly Pollution Prevention Inspections for Municipal Maintenance/ Industrial Facilities (6.1.2)**	1. Inspect the DPW Garage, Recycling Center and Bellevue Cemetery Garage using the Facility Pollution Prevention Inspection Checklist provided in Appendix 6A. All facilities can be inspected at once and the results can be compiled onto one checklist. 2. Modify municipal operations at facilities as needed to follow the pollution prevention practices outlined on the checklist.	Department of Public Works	Completed checklists and corrective actions	*	*	*	*	*

Table 8. Stormwater Best Management Practices Plan for Phase II Compliance

BMP ID	BMP Description[1]	Implementation							
		Tasks for each BMP	Responsible Dept./Person	Measurable Goal	Year				
					2005	2006	2007	2008	2009
6. Pollution Prevention and Good Housekeeping									
6T	**Conduct Town Employee Stormwater Training (6.4)**	1. Identify program coordinator.	Department of Public Works, Community Development, Police Department, Fire District, and Consultant	Attendance sheet and copy of program		*			
		2. Evaluate the need for stormwater training for all Town departments (e.g., Police Department, Adams Fire District) based on their current and potential pollution prevention roles.				*			
		3. Prepare or contract curriculum/course materials.				*			
		4. Conduct annual stormwater training session for Town departments. Provide separate stormwater training sessions, if needed, depending on the preference of different Town Departments.				*	*	*	*
6U	**Consider Hiring a Town Employee to Handle Stormwater Pollution Prevention (6.5)**	1. Develop a job description, responsibilities (refer to Section 6.5), qualifications and salary for a new employee to handle stormwater pollution prevention and other DPW tasks.	Department of Public Works, Community Development, Police and Fire Departments, and Consultant	Attendance sheet and copy of program		*			
		2. Present the proposed position at Town meeting.					*		
		3. Procure funding and hire a stormwater pollution prevention officer.					*	*	

Notes:
1. BMP descriptions are based on recommendations discussed in the Stormwater Management Strategic Plan. The section number where these recommendations appear in the Plan is noted in parentheses.

Appendix 8

NPDES General Permit Requirements

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
GENERAL PERMIT FOR STORM WATER DISCHARGES
FROM SMALL MUNICIPAL SEPARATE STORM SEWER SYSTEMS

Authorization to discharge under the National Pollutant Discharge Elimination System

In accordance with the provisions of the Clean Water Act, as amended, (33 U.S.C. §1251 et. seq. (the Act) operators of small municipal separate storm sewer systems, located in the areas specified in Parts I.A.2., 3.,.and 4 are authorized to discharge in accordance with the conditions and requirements set forth herein.

Only operators of storm water discharges from small municipal separate storm sewer systems in the general permit area who submit a Notice of Intent and a storm water management program in accordance with Part I.E. of this permit and obtain written authorization from EPA are authorized under this general permit.

This permit becomes effective on May 1, 2003.

This permit and authorization to discharge expire at midnight five years from the effective date.

Signed this 18 day of April 2003

Linda M. Murphy, Director
Office of Ecosystem Protection
United States Environmental Protection Agency
One Congress Street - Suite 1100
Boston, Massachusetts 02114

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
GENERAL PERMIT FOR STORM WATER DISCHARGES
FROM SMALL MUNICIPAL SEPARATE STORM SEWER SYSTEMS

Authorization to discharge under the National Pollutant Discharge Elimination System

In accordance with the provisions of the Clean Water Act, as amended, (33 U.S.C. §1251 et. seq. (the Act) operators of small municipal separate storm sewer systems, located in the area specified in Part I.A.1, Commonwealth of Massachusetts, are authorized to discharge in accordance with the conditions and requirements set forth herein.

Only operators of storm water discharges from small municipal separate storm sewer systems in the general permit area who submit a Notice of Intent and a storm water management program in accordance with Part I.E. of this permit and obtain written authorization from EPA are authorized under this general permit.

This permit becomes effective on May 1, 2003.

This permit and authorization to discharge expire at midnight five years from the effective date.

Signed this 18 day of April 2003

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Linda M. Murphy, Director
Office of Ecosystem Protection
United States Environmental Protection Agency
One Congress Street - Suite 1100
Boston, Massachusetts 02114

____
Glenn Haas, Director
Division of Watershed Management
Bureau of Resource Protection
Massachusetts Department of Environmental Protection
One Winter Street
Boston, MA 02108

PART I

A. Area of Coverage: Small municipal separate storm sewer systems (MS4s) located within

1. Commonwealth of Massachusetts;
2. State of New Hampshire;
3. Indian Country lands within the States of Connecticut, Massachusetts, and Rhode Island; and
4. Federal Facilities within the State of Vermont.

B. Eligibility criteria:

1. This permit authorizes the discharge of storm water from small MS4s defined at 40 CFR §122.26(b)(16). This includes small MS4s designated under 40 CFR §122.32(a)(1) and 40 CFR §122.32(a)(2). The permittee is authorized to discharge under this permit if:

(a). The permittee is the operator of a small MS4 within the permit areas described in Part I.A;
(b). The permittee is not a large or medium MS4 defined in 40 CFR §§122.26(b)(4) or (7);
(c). The municipality is located fully or partially in an urbanized area as determined by the latest Decennial Census by the Bureau of Census; and
(d). The permittee submits a Notice of Intent in accordance with Part I.E. of this permit and obtains written authorization from EPA.

Small municipal separate storm sewer system means all separate storm sewers that are:

(a) owned or operated by the United States, a State, city town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity and Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States.
(b) not defined as large or medium municipal separate storm sewer systems pursuant to 40 CFR §122.26(b)(4) and (b)(7) or designated under 40 CFR §122.26(a)(1)(v).
(c) This term includes systems similar to separate storm sewer systems in municipalities, such as systems at military bases, large hospitals or prison complexes, and highways and other thoroughfares. The term does not include separate storm sewers in very discrete areas, such as individual buildings.

2. The following storm water discharges are not authorized by this permit:
(a) Discharges that are mixed with sources of non-storm water unless such non-storm water discharges are:
i. In compliance with a separate NPDES permit, or
ii. Determined by EPA not to be a substantial contributor of pollutants to waters of the U.S.
(b) Storm water discharges associated with industrial activity as defined in 40 CFR§122.26(b)(14)(i)-(ix) and (xi).
(c) Storm water discharges associated with construction activity as defined in 40 CFR§122.26(b)(14)(x) or 40 CFR §122.26(b)(15).
(d) Storm water discharges currently covered under another permit, including discharges covered under other regionally issued general permits.
(e) Discharges or discharge related activities that may adversely affect any species that are listed as endangered or threatened under the Endangered Species Act (ESA) or result in the adverse modification or destruction of habitat that is designated as critical under the ESA.

i. Coverage under this permit is available only if the storm water discharges, allowable non-storm water discharges, and discharge related activities do not adversely affect any species that are listed as endangered or threatened ("listed") under the ESA or result in the adverse modification or destruction of habitat that is designated as critical under the ESA ("critical habitat"). Submission of a signed NOI will be deemed to constitute certification of eligibility.

ii. "Discharge related activities" include: activities which cause, contribute to, or result in storm water point source pollutant discharges; and measures to control storm water discharges, including the siting, construction and operation of best management practices (BMPs) to control, reduce or prevent storm water pollution.

iii. In order to demonstrate eligibility, the permittee must use the guidance in Addendum A and the most recent Endangered and Threatened Species County-Species List available from EPA. Eligibility must be determined prior to submission of the NOI. The most current list is available at: http://www.epa.gov/npdes/. The permittee must meet one or more of the criteria described below for the entire term of the permit. The information used to determine eligibility must be maintained as part of the Storm Water Management Program.

- Criterion A: No endangered or threatened species or critical habitat are in proximity to the MS4 or the points where authorized discharges reach the receiving waters; or

- Criterion B: In the course of a separate federal action involving the MS4, formal or informal consultation with the U.S. Fish and Wildlife Service (FWS) and/or the National Marine Fisheries Service (NMFS) under Section 7 of the ESA has been concluded and that consultation:

-Addressed the effects of the MS4 storm water discharges, allowable non-storm water discharges, and discharge related activities on listed species and critical habitat; and

- The consultation resulted in either a no jeopardy opinion or a written concurrence by FWS and/or NMFS on a finding that the storm water discharges, allowable non-storm water discharges, and discharge related activities are not likely to adversely affect listed species or critical habitat; or

- Criterion C: The activities are authorized under Section 10 of the ESA and that authorization addresses the effects of the storm water discharges, allowable non-storm water discharges, and discharge related activities on listed species and critical habitat; or

- Criterion D: Using the best scientific and commercial data available, the effects of the storm water discharges, allowable non-storm water discharges, and discharge related activities on listed species and critical habitat have been evaluated. Based on those evaluations, a determination is made by the permittee and affirmed after review by EPA that the storm water discharges, allowable non-storm water discharges, and discharge related activities will not affect any federally threatened or endangered species or designated critical habitat.

- Criterion E: The storm water discharges, allowable non-storm water discharges, and discharge related activities were already addressed in another operator's certification of eligibility which includes the MS4 activities. If certification is under this criteria, the permittee agrees to comply with any measures or controls upon which the other operator's certification was based.

iv. The permitting authority may require any permittee or applicant to provide documentation of the determination of eligibility for this permit where the EPA or the FWS and/or NMFS determines that there is a potential impact on listed species or critical habitat.

v. A discharge is not authorized if the discharge or discharge related activities cause a prohibited "take" of endangered or threatened species (as defined under Section 3 of the ESA and 50 CFR 17.3), unless such actions are authorized by FWS or NMFS under sections 7 or 10 of the ESA.

vi. Discharges are not authorized where the discharge or discharge related activity are likely to jeopardize the continued existence of any species that are listed as endangered or threatened under the ESA or result in the adverse modification or destruction of habitat that is designated as critical under the ESA.

vii. Operators who conduct informal consultation to meet the eligibility requirements of Criterion

B are automatically designated as non-Federal representatives under this permit. See 50 CFR §402.08. Operators who choose to conduct informal consultation as a non-Federal representative must notify EPA and the appropriate service office in writing of that decision.

(f) Discharges whose direct or indirect impacts may adversely affect any Essential Fish Habitat.

(g) Discharges, or implementation of a storm water management program, which adversely effects properties listed or eligible to be listed on the National Register of Historic Places. The permittee must determine eligibility prior to submission of the Notice of Intent. The permittee should follow the guidance detailed in Addendum B. Discharges may be eligible for coverage under this permit if the permittee is in compliance with requirements of the National Historic Preservation Act and has coordinated any necessary activities to avoid or minimize impacts. These requirements must be coordinated with the State Historic Preservation Officer. Information used to determine eligibility must be maintained as part of the Storm Water Management Program.

(h) Discharges to territorial seas, the contiguous zone, and the oceans unless such discharges are in compliance with the ocean discharge criteria of 40 CFR 125 subpart M.

(i) Discharges prohibited under 40 CFR 122.4. This includes discharges not in compliance with the state's antidegradation policy.

(j) Discharges mixed with non-storm water except those discharges which are in compliance with another NPDES permit or are an allowable non-storm water discharge as discussed in Part I.F.

(k) Discharges that would cause or contribute to instream exceedance of water quality standards. The storm water management program must include a description of the BMPs that will be used to ensure that this will not occur. EPA, MA DEP , or NH DES may require corrective action or an application for an individual permit or alternative general permit if an MS4 is determined to cause an instream exceedance of water quality standards.

(l) Discharges of any pollutant into any water for which a Total Maximum Daily Load (TMDL) has been established or approved by the EPA unless the discharge is consistent with the TMDL. This eligibility condition applies at the time of submission of the NOI. If conditions change after submission of the NOI, coverage may continue provided the applicable requirements of Part 1.C. are met. In order to remain eligible for this permit, any limitations, conditions and requirements applicable to discharges authorized by this permit, must be incorporated into the storm water management program. This may include monitoring and reporting. Discharges not eligible for this permit, must apply for an individual or alternative NPDES general permit.

C. Discharges to Water Quality Impaired Waters

1. The permittee must determine whether storm water discharges from any part of the MS4 contribute, either directly or indirectly, to a 303(d) listed water body.

2. The storm water management program must include a section describing how the program will control the discharge of the pollutants of concern and ensure that the discharges will not cause an instream exceedance of the water quality standards. This discussion must specifically identify control measures and BMPs that will collectively control the discharge of the pollutant(s) of concern. Pollutant(s) of concern refer to the pollutant identified as causing the impairment.

D. Total Maximum Daily Load Allocations

If a TMDL has been approved for any water body into which the MS4 discharges, the permittee must:

1. Determine whether the approved TMDL is for a pollutant likely to be found in storm water discharges from the MS4.

2. Determine whether the TMDL includes a pollutant waste load allocation (WLA), BMP recommendations or other performance requirements for storm water discharges. This storm water WLA may be expressed in the TMDL as a gross allotment for the impaired water body. Or, provided no specific WLA for the MS4 exists, determine if a Performance Agreement or Memorandum of Understanding has been established between the MS4, EPA , and MA DEP or NH DES which modifies the BMPs or performance standards of the TMDL. Such Memoranda are posted on the TMDL websites. The Massachusetts site is: http://www.state.ma.us/dep/brp/wm/tmdl.htm The New Hampshire site is: http://www.des.state.nh.us/wmb/TMDL

3. If the MS4 is required to implement storm water waste load allocation provisions of the TMDL, the permittee must assess whether the WLA is being met through implementation of existing storm water control measures or if additional control measures are necessary. The permittee's assessment of whether the WLA is being met is expected to focus on the adequacy of the permittee's storm water controls (implementation and maintenance), not on the response of the receiving water.

4. Highlight in the storm water management program and annual reports all control measures currently being implemented or planned to be implemented to control pollutants of concern identified in approved TMDLs. Also include a schedule of implementation for all planned controls. Document the assessment which demonstrates that the WLA will be met including any calculations, maintenance log books, or other appropriate controls.

E. Obtaining Coverage

1. Small MS4s seeking coverage under this permit, must submit a Notice of Intent which contains the following information:

(a). Name of person responsible for overall coordination of the storm water management program, mailing address and phone number
(b). Name of municipality and state. For municipalities seeking coverage under Part V. of this permit, only identify the name of the agency, the city or town, and the state in which it is located.
(c). Identify the legal status of the operator of the MS4 as either, Federal, State, Tribal, county, or other Public Entity. If the municipality is a city or town, indicate if there are other MS4s within its boundaries such as state highways, universities, prisons.
(d). Identify the names of all known waters that receive a discharge from the MS4. If known, indicate the number of outfalls to each water.
(e). Using the guidance in Addendum A, describe how the eligibility criteria for listed species and critical habitat have been met.
(f). Using the guidance in Addendum B describe how the requirements to protect historic properties have been met.
(g). Identify best management practices for each minimum control measure described in Part II B (1-6); Part III B(1-6); Part IV. B(1-6) or Part V.B(1-6)., depending upon the type of MS4.
(h). Identify measurable goals for each best management practice described in paragraph (g) above including implementation time frames and contact person..
(i). The NOI must be signed by an appropriate official (see Part VI. G. of this permit). The NOI must contain the following 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, I certify that 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.

Print the name of the appropriate official, followed by signature, and date.

Municipalities in Massachusetts must use the form designated by the Massachusetts Department of Environmental Protection (MA DEP). The form is available at http://www.state.ma.us/dep/brp/stormwtr/strmfms.htm or by contacting MA DEP at 508/792-7470. The permit code for the form is BRP WM 08 A EPA does not require the use of this form, but will accept information submitted on this form. All signatures must be originals.

Municipalities in New Hampshire should use the form developed by the New Hampshire Department of Environmental Services. The form is available at: http://www.des.state.nh.us/StormWater/. EPA does not require the use of this form, but will accept information submitted on this form. All signatures must be originals.

2. The Notice of Intent must be submitted by March 10, 2003, if designated under 40 CFR 122.32(a)(1)- those MS4s located fully or partially in an urbanized area; or within 180 days of notice, if designated under 40 CFR 122.32(a)(2), unless granted a longer period of time by EPA;

3. Submission of Notice of Intent

(a) All permittees must submit the Notice of Intent to EPA-Region I at the following address:
United States Environmental Protection Agency
Municipal Assistance Unit (CMU)
One Congress Street – Suite 1100
Boston, Massachusetts 02114-2023

(b) MS4s located in Massachusetts, subject to Part II, Part IV, or Part V, except Indian lands, must also submit a copy of the NOI to the MA DEP at the following address:
Massachusetts Department of Environmental Protection
Division of Watershed Management
627 Main Street
Worcester, Massachusetts 01608

The appropriate fee must accompany the submission to MA DEP. The application fee is $60.00. A fee exemption applies to any Massachusetts city, town or state agency. The fee does apply to Massachusetts state authorities.

(c) MS4s located in New Hampshire subject to Part III, Part IV or Part V, must also submit a copy of the NOI to the New Hampshire Department of Environmental Services (NH DES) at the following address:
New Hampshire Department Environmental Services
Water Division
Wastewater Engineering Bureau
P.O. Box 95
Concord, New Hampshire 03302-0095

New Hampshire may also adopt this permit as a state permit pursuant to RSA 485-A:13,I.(a).

4. Effective date of coverage. The authorization to discharge begins on the date of receipt of EPA's written authorization. The initial written receipt will detail the completeness of the submission. The permittee may be contacted by either EPA or MA DEP/NHDES at a later date requesting additional or updated information concerning the storm water management program. The initial response will not provide detailed comments on the submission.

5. A municipality is not prohibited from submitting a Notice of Intent after the dates provided in paragraph E.2. However, if a late NOI is submitted, authorization is only for discharges that occur after permit coverage is granted. The permitting authority reserves the right to take appropriate enforcement actions for any unpermitted discharges.

F. Allowable Non-Storm Water Discharges

The following non-storm water discharges are authorized provided it has been determined by the permittee that they are not significant contributors of pollutants to the MS4. If these discharges are identified as significant contributors to the MS4, they must be addressed in the Illicit Discharge Detection and Elimination minimum control measure described in Parts II, III, IV and V.

1. water line flushing,
2. landscape irrigation,
3. diverted stream flows,
4. rising ground waters,
5. uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20)),
6. uncontaminated pumped ground water,
7. discharge from potable water sources,
8. foundation drains,
9. air conditioning condensation,
10. irrigation water, springs,
11. water from crawl space pumps,
12. footing drains,
13. lawn watering,
14. individual resident car washing,
15. flows from riparian habitats and wetlands,
16. dechlorinated swimming pool discharges,
17. street wash water, and
18. Residential building wash waters, without detergents.

Discharges or flows from fire fighting activities occur during emergency situations. The permittee is not expected to evaluate fire fighting discharges with regard to pollutant contributions. Therefore, these discharges are authorized as allowable non-storm water discharges, unless identified, by EPA, as significant sources of pollutants to Waters of the U.S..

PART II
MASSACHUSETTS SMALL MS4 STORM WATER MANAGEMENT PROGRAM

A. Storm Water Management Program

The permittee must develop, implement and enforce a program to reduce the discharge of pollutants from the MS4 to the maximum extent practicable; protect water quality, and satisfy the water quality requirements of the Clean Water Act and Massachusetts Water Quality Standards.

1. The permittee must develop a storm water management program implementing the minimum measures described in Paragraph II.B.

2. All elements of the storm water management program must be implemented by the expiration date of this permit.

3. Implementation of one or more of the minimum measures may be shared with another entity, or the entity may fully implement the measure(s). When another entity fully implements a minimum control measure for the permittee, the following applies:

(a.) the other entity, in fact, implements the control measure;
(b.) the particular control measure, or component of that measure is at least as stringent as the corresponding permit requirement.
(c.) The other entity agrees to implement the control measure on the permittee's behalf. A legally binding written acceptance of this obligation is expected. This obligation must be maintained as part of the storm water management program. If the other entity agrees to report on the minimum measure, the permittee must supply the other entity with the reporting requirements contained in this permit under Part II.E.
(d) The permittee remains responsible for permit compliance and implementation of the minimum measure if the other entity fails to do it.

4. Permittee may use the following state program to implement some of the requirements of Part II.B.4 and Part II.B.5: The Massachusetts Department of Environmental Protection, Wetland Protection Act (MGL Chapter 131, Section 40) Storm Water Management Policy
(a) Standard 8 of the Policy may be used for the minimum control measure regarding construction site storm water runoff control, Part II.B.4(c). Standards 2, 3, 4, and 7 of the Policy may be used for the minimum control measure regarding post construction storm water management in development and redevelopment, Part II.B.5. The permittee may not apply this criterion outside of the jurisdiction of the Wetlands Protection Act unless the municipality has specifically provided for such in local by-laws.
(b) Additional information available at: http://www.state.ma.us/dep/brp/stormwtr/stormpub.htm

5. For each minimum measure, the permittee must:
(a.) identify the person(s) or department responsible for the measure;
(b.) identify all Best Management Practices (BMPs) for the measure;
(c.) identify measurable goals for each BMP. Identify time lines and milestones for implementation.

6. EPA's BMP menu found at http://www.epa.gov/npdes/menuofbmps/menu.htm and EPA's guidance on measurable goals, found at http://www.epa.gov/npdes/stormwater/measurablegoals/index.htm, may be used in the development of the storm water management program.

B. Minimum Control Measures

1. Public education and outreach. The permittee must implement a public education program to distribute educational material to the community. The public education program must provide information concerning the impact of storm water discharges on water bodies. It must address steps and/or activities that the public can take to reduce the pollutants in storm water runoff.

The following should be included in the education and outreach efforts:

(a.) information regarding both industrial and residential activities including illegal dumping into storm drains.
(b.) coordination with local groups (i.e. watershed associations, or schools)
(c.) materials for outreach/education may include, but are not limited to, pamphlets; fact sheets; brochures; public service announcements; storm drain stenciling and newspaper advertisements.
(d.) topics may include, but are not limited to, litter disposal, pet waste, household hazardous waste disposal, proper use of fertilizer and pesticides, and effects of impervious areas on water bodies. (This list is intended to provide examples, the permittee is encouraged to use a variety of activities for public education.)

2. Public involvement and participation. All public involvement activities must comply with state public notice requirements at MGL Chapter 39 Section 23B and local public notice requirements.

(a.) The permittee must provide opportunity for the public to participate in the implementation and review of the storm water management program.
(b.) Activities may also include volunteer stream monitoring or formation of a storm water management committee. (These are examples of public involvement activities, the permittee is encouraged to use a wide range of activities to maximize public involvement.)

3. Illicit discharge detection and elimination. The permittee must develop, implement and enforce a program to detect and eliminate illicit discharges. An illicit discharge is any discharge to a municipal separate storm sewer that is not composed entirely of storm water. Exceptions are discharges pursuant to a NPDES permit (other that the NPDES permit for discharges from the municipal sewer system), allowable non storm water discharges described at Part I.F. and discharges resulting from fire fighting activities.

(a.) If not already existing, the permittee must develop a storm sewer system map. At a minimum, the map must show the location of all outfalls and the names of all waters that receive discharges from those outfalls. Additional elements may be included on the map, such as, location of catch basins, location of manholes, and location of pipes within the system. Initial mapping should be based on all existing information available to the permittee including city records and drainage maps. Field surveys may be necessary to verify existing records and locate all outfalls.

(b.) To the extent allowable under state or local law, the permittee must effectively prohibit, through an ordinance or other regulatory mechanism, non storm water discharges into the system and implement appropriate enforcement procedures and actions. If a regulatory mechanism does not exist, development and adoption of such a mechanism must be included as part of the storm water management program.

(c.) The permittee must develop and implement a plan to detect and address non -storm water discharges, including illegal dumping, into the system.

The illicit discharge plan must contain the following elements:
i. Procedures to identify priority areas. This includes areas suspected of having illicit discharges, for example: older areas of the city, areas of high public complaints and areas of high recreational value or high environmental value such as beaches and drinking water sources.
ii. Procedures for locating illicit discharges (i.e. visual screening of outfalls for dry weather discharges, dye or smoke testing)
iii. Procedures for locating the source of the discharge and procedures for the removal of the source.

iv. Procedures for documenting actions and evaluating impacts on the storm sewer system subsequent to the removal.

(d.) The permittee must inform public employees, businesses, and the general public of hazards associated with illegal discharges and improper waste disposal.

(e.) The non-storm water discharges listed in Part I.F. must be addressed if they are identified as being significant contributors of pollutants to the small MS4.

4. Construction site storm water runoff control. The permittee must develop, implement, and enforce a program to reduce pollutants in any storm water runoff to the MS4 from construction activities that result in a land disturbance of greater than or equal to one acre. The permittee must include disturbances less than one acre if part of a larger common plan.

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

At a minimum, the program must include:

(a.) To the extent allowable under state or local law, an ordinance or other regulatory mechanism to require sediment and erosion control at construction sites. If such an ordinance does not exist, development and adoption of an ordinance must be part of the program.

(b.) Sanctions to ensure compliance with the program. To the extent allowable under state or local law sanctions may include both monetary or non-monetary penalties.

(c.) Requirements for construction site operators to implement a sediment and erosion control program which includes BMPs that are appropriate for the conditions at the construction site, including efforts to minimize the area of the land disturbance.

(d.) Requirements for the control of wastes, including but not limited to, discarded building materials, concrete truck wash out, chemicals, litter, and sanitary wastes.

(e.) Procedures for site plan review including procedures which incorporate consideration of potential water quality impacts. The site plan review should include procedures for preconstruction review.

(f.) Procedures for receipt and consideration of information submitted by the public.

(g.) Procedures for inspections and enforcement of control measures at construction sites.

5. Post construction storm water management in new development and redevelopment.

The permittee must develop, implement and enforce a program to address storm water runoff from new development and redevelopment projects that disturb greater than one acre and discharge into the municipal system.

The program must include projects less than one acre if the project is part of a larger common plan of development which disturbs greater than one acre.

The post construction program must include:

(a.) To the extent allowable under state or local law, an ordinance or other regulatory mechanism to address post construction runoff from new development and redevelopment. If such an ordinance does not exist, development and adoption of an ordinance must be part of the program.

(b.) Procedures to ensure adequate long term operation and maintenance of best management practices.

(c.) Procedure to ensure that any controls that are put in place will prevent or minimize impacts to water quality.

6. <u>Pollution prevention and good housekeeping in municipal operations</u>.

The permittee must

(a.) Develop and implement a program with a goal of preventing and/or reducing pollutant runoff from municipal operations. The program must include an employee training component.

(b.) Include, at a minimum, maintenance activities for the following : parks and open space (areas such as public golf course and playing fields); fleet maintenance, building maintenance; new construction and land disturbance; and road way drainage system maintenance and storm water system maintenance.

(c.) Develop schedules for municipal maintenance activities described in paragraph (b) above.

(d) Develop inspection procedures and schedules for long term structural controls.

7. Cooperation between interconnected municipal separate storm sewer systems is encouraged. The permittee should identify interconnections within the system. The permittee should attempt to work cooperatively with an interconnected municipality in instances of discharges impacting a system.

8. The permittee must evaluate physical conditions, site design, and best management practices to promote groundwater recharge and infiltration where feasible in the implementation of the control measures described above. During the implementation of the storm water management program, the permittee must address recharge and infiltration for the minimum control measures, as well as any reasons for electing not to implement recharge and infiltration. Loss of annual recharge to ground water should be minimized through the use of infiltration measures to the maximum extent practicable. Permittees in areas identified as “high” or “medium” in the most recent Massachusetts Water Resources Commission’s *Stressed Basins in Massachusetts* report in effect at the time the permittee submits a Notice of Intent and accompanying storm water management program, must minimize the loss of annual recharge to ground water from new development and redevelopment, including but not limited to drainage improvements done in conjunction with road improvements, street drain improvement projects and flood mitigation projects, consistent with Standard 3 of the Storm Water Management Policy in areas both within and outside of the jurisdiction of the Massachusetts Wetlands Protection Act.
(See http://www.state.ma.us/dem/programs/intbasin/stressed_basin)

9. MS4s which discharge to coastal waters with public swimming beaches should consider these waters a priority in implementation of the storm water management program. Refer to Part IX , State 401 Certification Requirements, for additional requirements.

C. Public Drinking Water Supply Requirements

1. MS4s which discharge to public drinking water sources and their protection areas (Class A and B surface waters used for drinking water and wellhead protection areas) should consider these waters a priority in implementation of the storm water management program.

2. Discharges to public drinking water supply sources and their protection areas (Zones I, II, Wellhead Protection Areas, Zone A, B, and C as defined in 310 CMR 22.00) should provide pretreatment and spill control capabilities to the extent feasible.

3. Direct discharges to Class A waters and Zone I wellhead protection areas (as defined in 310 CMR 22.02) should be avoided to the extent feasible.

D. Program Evaluation

1. The permittee must annually evaluate the compliance of the storm water management program with the conditions of this permit.

2. The permittee must evaluate the appropriateness of the selected BMPs in efforts towards achieving the defined measurable goals. The storm water management program may be changed in accordance with the following provisions:

(a). Changes adding (but not subtracting or replacing) components, controls or requirements to the SWMP may be made at any time upon written notification to EPA and MA DEP

(b). Changes replacing an ineffective or infeasible BMP specifically identified in the SWMP with an alternative BMP may be requested in writing to EPA and MA DEP at any time. Unless denied, changes proposed in accordance with the criteria below shall be deemed approved and may be implemented 60 days from submittal of the request. If the request is denied, EPA or MA DEP, as applicable, will send you a written explanation of the denial.

(c). Modification requests, must include the following information:
i. an analysis of why the BMP is ineffective or infeasible (including cost prohibitive)
ii. expectations on the effectiveness of the replacement BMP, and
iii. an analysis of why the replacement BMP is expected to achieve the goals of the BMP to be replaced.
iv. Change requests or notifications must be in writing and signed in accordance with the signatory requirements of Part VI.

3. EPA or MA DEP may require changes to the SWMP as needed to:

(a). Address impacts on receiving water quality caused or contributed to by discharges from the MS4;

(b). To include more stringent requirements necessary to comply with new Federal statutory or regulatory requirement; or

(c). To include such other conditions deemed necessary to comply with the goals and requirements of the CWA.

(d). Any changes requested by EPA or MA DEP will be in writing and will set forth the schedule for the permittee to develop the changes and offer the opportunity to propose alternative program changes to meet the objective of the requested modification.

E. Record Keeping

1. All records required by this permit must be kept for a period of at least five years. Records include information used in the development of the storm water management program, any monitoring, copies of reports, and all data used in the development of the notice of intent.

2. Records need to be submitted only when specifically requested by the permitting authority.

3. The permittee must make the records relating to this permit available to the public, including the storm water management program. The public may view the records during normal business hours. The permittee may charge a reasonable fee for copying requests.

F. Reporting

1. The permittee must submit an annual report. The initial report is due one year from the effective date of this permit and annually thereafter. The reports should contain information regarding activities of the previous calendar year. Reports should be submitted to both EPA and MA DEP at the following addresses:

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

and

Massachusetts Department of Environmental Protection
Division of Watershed Management
627 Main Street
Worcester, Massachusetts 01608

2. The following information must be contained in the annual report:

(a) A self assessment review of compliance with the permit conditions.

(b) An assessment of the appropriateness of the selected BMPs.

(c) An assessment of the progress towards achieving the measurable goals.

(d) A summary of results of any information that has been collected and analyzed. This includes any type of data.

(e) A discussion of activities for the next reporting cycle.

(f) A discussion of any changes in identified BMPs or measurable goals.

(g) Reference any reliance on another entity for achieving any measurable goal.

G. State Permit Conditions

This permit is issued jointly by the U.S. Environmental Protection Agency and the Massachusetts Department of Environmental Protection under federal and state law, respectively. As such, all the terms and conditions of this permit are hereby incorporated into and constitute a discharge permit issued by the Commissioner of the MA DEP pursuant to M.G.L. Chap. 21, §43 and under regulations found at 314 CMR 3.00. Regulations found at 314 CMR 3.19 (Standard Permit Conditions) are incorporated into this permit by reference.

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

PART III
NEW HAMPSHIRE SMALL MS4
STORM WATER MANAGEMENT PROGRAM
(This part also applies to Indian Lands in MA, CT, and RI .)

A. Storm Water Management Program

The permittee must develop, implement and enforce a program to reduce the discharge of pollutants from the MS4 to the maximum extent practicable; protect water quality, and satisfy the water quality requirements of the Clean Water Act and state water quality standards

1. The permittee must develop a storm water management program implementing the minimum measures described in Paragraph III.B.

2. All elements of the storm water management program must be implemented by the expiration date of this permit.

3. Implementation of one or more of the minimum measures may be shared with another entity, or the entity may fully implement the measure. When another entity fully implements a minimum control measure for the permittee, the following applies:

   (a.) the other entity, in fact, implements the control measure;
   (b.) the particular control measure, or component of that measure is at least as stringent as the corresponding permit requirement.
   (c.) The other entity agrees to implement the control measure on the permittee behalf. A legally binding written acceptance of this obligation is expected. This obligation must be maintained as part of the storm water management program. If the other entity agrees to report on the minimum measure, the permittee must supply the other entity with the reporting requirements contained in this permit under Part III.E.
   (d) The permittee remains responsible for permit compliance and implementation of the minimum measure if the other entity fails to do it.

4. For each minimum measure, the permittee must:

   (a.) identify the person(s) or department responsible for the measure;
   (b.) identify Best Management Practices (BMPs) for the measure;
   (c.) identify measurable goals for each BMP. Identify time lines and milestones for implementation.

5. EPA's BMP menu found at:
http://www.epa.gov/npdes/menuofbmps/menu.htm and EPA's guidance on measurable goals, found at: http://www.epa.gov/npdes/stormwater/measurablegoals/index.htm, may be used in the development of the storm water management program.

B. Minimum Control Measures

1. Public education and outreach. The permittee must implement a public education program to distribute educational material to the community. The public education program must provide information concerning the impact of storm water discharges on water bodies. It must address steps and/or activities that the public can take to reduce the pollutants in storm water runoff.

The following should be included in education and outreach efforts:

   (a.) information regarding industrial, commercial, and residential activities including illegal dumping into storm drains.
   (b.) coordinate activities with local groups (i.e. watershed associations, or schools)

(c.) materials for outreach/education may include, but are not limited to, pamphlets; fact sheets; brochures; public service announcements; storm drain stenciling and newspaper advertisements.
(d.) topics may include, but are not limited to, litter disposal, pet waste, household hazardous waste disposal, proper use of fertilizer and pesticides. (This list is intended to provide examples of education topics, the permittee is encouraged to use a variety of methods for public education.)

2. Public Involvement and participation. All public involvement activities in the State of New Hampshire must comply with state public notice requirements, RSA-91A. Activities must also comply with local and Tribal requirements, as appropriate.

(a.) The permittee must provide opportunity for the public to participate in the development, implementation and review of the storm water management program.
(b) Activities may also include volunteer stream monitoring or formation of a storm water management committee. (These are examples of public involvement activities, the permittee is encouraged to use a wide range of activities to maximize public involvement.)

3. Illicit discharge detection and elimination. The permittee must develop, implement and enforce a program to detect and eliminate illicit discharges. An illicit discharge is any discharge to a municipal separate storm sewer that is not composed entirely of storm water. Exceptions are discharges pursuant to a NPDES permit (other that the NPDES permit for discharges from the municipal sewer system), allowable non storm water discharges described at Part I.F. and discharges resulting from fire fighting activities.

(a.) If not already existing, the permittee must develop a storm sewer system map. At a minimum, the map must show the location of all outfalls and the names of all waters that receive discharges from those outfalls. Additional elements may be included on the map, such as, location of catch basins, location of manholes, and location of pipes within the system. Initial mapping should be based on all existing information available to the permittee including city records and drainage maps. Field surveys may be necessary to verify existing records and locate all outfalls.

(b.) To the extent allowable under state, Tribal or local law, the permittee must effectively prohibit, through an ordinance or other regulatory mechanism, non-storm water discharges into the system and implement appropriate enforcement procedures and actions. If a regulatory mechanism does not exist, development and adoption of such a mechanism must be included as part of the storm water management program.

(c.) The permittee must develop and implement a plan to detect and address non storm water discharges, including illegal dumping, into the system.

The illicit discharge plan must contain the following elements:
i. Procedures to identify priority areas. This includes areas suspected of having illicit discharges, for example: older areas of the city, areas of high public complaints and areas of high recreational value or high environmental value such as beaches and drinking water sources.
ii. Procedures for locating illicit discharges (i.e. visual screening of outfalls for dry weather discharges, dye or smoke testing)
iii. Procedures for locating the source of the discharge and procedures for the removal of the source.
iv. Procedures for documenting actions and evaluating impact on the storm sewer system subsequent to the removal.

(d.) The permittee must inform public employees, businesses, and the general public of hazards associated with illegal discharges and improper waste disposal.

(e.) The non-storm water discharges listed in Part I.F. must be addressed if they are identified as being significant contributors of pollutants to the MS4.

4. Construction site storm water runoff control. The permittee must develop, implement, and enforce a program to reduce pollutants in any storm water runoff to the MS4 from construction activities that result in a land disturbance of greater than or equal to one acre. The permittee must include disturbances less than one acre if part of a larger common plan.

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

At a minimum, the program must include:

(a.) To the extent allowable under state, Tribal or local law, an ordinance or other regulatory mechanism to require sediment and erosion control at construction sites. If such an ordinance does not exist, development and adoption of an ordinance must be part of the program.

(b.) Sanctions to ensure compliance with the program. To the extent allowable under state, Tribal or local laws, sanctions may include both monetary or non-monetary penalties.

(c.) Requirements for construction site operators to implement a sediment and erosion control program which includes BMPs that are appropriate for the conditions at the construction site.

(d.) Requirements for the control of wastes, including but not limited to, discarded building materials, concrete truck wash out, chemicals, litter, and sanitary wastes.

(e.) Procedures for site plan review including procedures which incorporate consideration of potential water quality impacts. The site plan review should include procedures for preconstruction review.

(f.) Procedures for receipt and consideration of information submitted by the public.

(g.) Procedures for inspections and enforcement of control measures at construction sites.

5. Post construction storm water management in new development and redevelopment.

The permittee must develop, implement and enforce a program to address storm water runoff from new development and redevelopment projects that disturb greater than one acre and discharge into the municipal system.

The program must include projects less than one acre if the project is part of a larger common plan of development.

The post construction program must include:

(a.) To the extent allowable under state, Tribal or local law, an ordinance or other regulatory mechanism to address post construction runoff from new development and redevelopment. If such an ordinance does not exist, development and adoption of an ordinance must be part of the program.

(b.) Procedures to ensure adequate long term operation and maintenance of best management practices.

(c.) Procedure to ensure that any controls that are in place will prevent or minimize impacts to water quality.

6. Pollution prevention and good house keeping in municipal operations.
The permittee must

(a.) Develop and implement a program with a goal of preventing and/or reducing pollutant runoff from municipal operations. The program must include an employee training component.

(b.) Include, at a minimum, maintenance activities for the following : parks and open space (area such as public golf courses and athletic fields); fleet maintenance, building maintenance; new construction and land disturbance; roadway drainage system maintenance and storm water system maintenance.

(c.) Develop schedules for municipal maintenance activities described in paragraph (b) above.

(d) Develop inspection procedures and schedules for long term structural controls.

7. Cooperation between interconnected municipal separate storm sewer systems is encouraged. The permittee should identify interconnections within the system. The permittee should attempt to work cooperatively with an interconnected municipality in instances of discharges impacting a system.

8. MS4s which discharge to coastal waters with public swimming beaches should consider these waters a priority in implementation of the storm water management program.

9. The permittee must evaluate physical conditions, site design, and best management practices to promote groundwater recharge an infiltration where feasible in the implementation of the control measures described above. During the implementation of the storm water management program, the permittee must address recharge and infiltration for the minimum control measures, as well as any reasons for electing not to implement recharge and infiltration. Loss of annual recharge to ground water should be minimized through the use of infiltration measures to the maximum extent practicable.

C. Public Drinking Water Supply Requirements

1. MS4s which discharge to public drinking water sources and their protected areas (Class A and B surface waters used for drinking water and wellhead protection areas) should consider these waters a priority in implementation of the storm water management program.

2. Discharges to public drinking water supply sources and their protection areas (wellhead protection areas, Class A and B waters) should provide pretreatment and spill control capabilities to the extent feasible.

3. Direct discharges to Class A waters and the sanitary radius to supply wells (defined in EnV-Ws 378.06, EnV-Ws 372.13) should be avoided to the extent feasible.

D. Program Evaluation

1. The permittee must annually evaluate the compliance of the storm water management program with the conditions of this permit.

2. The permittee must evaluate the appropriateness of the selected Best Management Practices in efforts towards achieving the defined Measurable Goals. The SWMP may be changed in accordance with the following provisions:

(a). Changes adding (but not subtracting or replacing) components, controls or requirements to the SWMP may be made at any time upon written notification to EPA.

(b.) Changes replacing an ineffective or infeasible BMP specifically identified in the SWMP with an alternative BMP may be requested at any time. Unless denied, changes proposed in accordance with the criteria below shall be deemed approved and may be implemented 60 days from submittal of the request. If the request is denied, EPA will send a written explanation of the denial.

(c.) Modification requests, must include the following information:

i. an analysis of why the BMP is ineffective or infeasible (including cost prohibitive)

ii. expectations on the effectiveness of the replacement BMP, and

iii. an analysis of why the replacement BMP is expected to achieve the goals of the BMP to be replaced.

iv. Change requests or notifications must be in writing and signed in accordance with the signatory requirements of Part VI.

3. EPA or NHDES may require changes to the SWMP as needed to:

(a.) Address impacts on receiving water quality caused or contributed to by discharges from the MS4;

(b.) To include more stringent requirements necessary to comply with new Federal statutory or regulatory requirement; or

(c.) To include such other conditions deemed necessary to comply with the goals and requirements of the CWA.

(d.) Any changes requested by EPA or NHDESwill be in writing and will set forth the schedule for the permittee to develop the changes and offer the opportunity to propose alternative program changes to meet the objective of the requested modification.

E. Record Keeping

1. All records required by this permit must be kept for a period of at least five years. Records include information used in the development of the storm water management program, any monitoring, copies of reports, and all data used in the development of the notice of intent.

2. Records need to be submitted only when specifically requested by the permitting authority.

3. The permittee must make the records relating to this permit available to the public, including the storm water management program. The public may view the records during normal business hours. The permittee may charge a reasonable fee for copying requests.

F. Reporting

1. The permittee must submit an annual report. The initial report is due one year from the effective date of this permit and annually thereafter. The reports should contain information regarding activities of the previous calendar year. Reports must be submitted to EPA at the following address:

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

Municipalities located in the State of New Hampshire, must also submit reports to the New Hampshire Department of Environmental Services at the following address:

New Hampshire Department of Environmental Services
Water Division
Wastewater Engineering Bureau
P.O. Box 95
Concord, New Hampshire 03302-0095

2. The following information must be contained in the annual report:

(a) A self assessment review of compliance with the permit conditions.

(b) An assessment of the appropriateness of the selected BMPs.

(c) An assessment of the progress towards achieving the measurable goals.

(d) A summary of results of any information that has been collected and analyzed. This includes any type of data.

(e) A discussion of activities for the next reporting cycle.

(f) A discussion of any changes in identified BMPs or measurable goals.

(g) Reference any reliance on another entity for achieving any measurable goal.

PART IV
NON-TRADITIONAL SMALL MS4 -STORM WATER MANAGEMENT PROGRAM
(This covers federal, county, or state owned small MS4s located in any of the areas described in Part I.A. of this permit)

A. Storm Water Management Program

The permittee must develop, implement and enforce a program to reduce the discharge of pollutants from the MS4 to the maximum extent practicable; protect water quality, and satisfy the water quality requirements of the Clean Water Act and state water quality standards.

1. The permittee must develop a storm water management program implementing the minimum measures described in Paragraph IV.B.

2. All elements of the storm water management program must be implemented by the expiration date of this permit.

3. Implementation of one or more of the minimum measures may be shared with another entity, or the entity may fully implement the measure. When another entity fully implements a minimum measure for the permittee, the following applies:

(a.) the other entity, in fact, implements the control measure,
(b.) the particular control measure, or component of that measure is at least as stringent as the corresponding permit requirement.
(c.) The other entity agrees to implement the control measure on the permittee behalf. A legally binding written acceptance of this obligation is expected. This obligation must be maintained as part of the storm water management program. If the other entity agrees to report on the minimum measure, the permittee must supply the other entity with the reporting requirements contained in this permit under Part IV.E.
(d) The permittee remains responsible for permit compliance and implementation of the minimum measure if the other entity fails to do it.

4. For each minimum measure, the permittee must:

(a.) identify the person(s) or department responsible for the measure;
(b.) identify Best Management Practices (BMPs) for the measure;
(c.) identify measurable goals for the BMP. The permittee may also identify an overall goal for the measure. Time lines and milestones for implementation of BMPs should be identified.

5. The following EPA websites may be used in the development of BMPs and measurable goals. EPA's BMP menu: http://www.epa.gov/npdes/menuofbmps/menu.htm EPA's guidance on measurable goals: http://www.epa.gov/npdes/stormwater/measurablegoals/index.htm

B. Minimum Control Measures

1.. Public education and outreach. The permittee must implement a public education program to distribute educational material to the community. For the purposes of this permit, a community consists of the people who use the facility. For example, at a university it would be the faculty, other staff, students, and visitors. The public education program must provide information concerning the impact of storm water discharges on water bodies. It must address steps and/or activities that the community can take to reduce the pollutants in storm water runoff.

The following should be included in education and outreach efforts:

(a.) information regarding activities that occur at the facility, including illegal dumping into storm drains.
(b.) activities may be coordinated with local groups (i.e. watershed associations, or schools).

(c.) materials for outreach/education may include, but are not limited to, pamphlets; fact sheets; brochures; public service announcements; storm drain stenciling and newspaper advertisements.
(d.) encourage cooperative efforts with neighboring municipalities, watershed associations and others.

2. Public Involvement and participation. All public involvement activities must comply with state public notice requirement. In Massachusetts the public notice requirements are at MGL Chapter 39, Section 23B. In New Hampshire, the public notice requirements are at RSA 91A.

(a.) The permittee must provide opportunity for the public to participate in the implementation and review of the storm water management program.

3. Illicit discharge detection and elimination. The permittee must develop, implement and enforce a program to detect and eliminate illicit discharges. An illicit discharge is any discharge to a municipal separate storm sewer that is not composed entirely of storm water. Exceptions are discharges pursuant to a NPDES permit (other than the NPDES permit for discharges from the municipal sewer system), allowable non-storm water discharges described at Part I.F. and discharges resulting from fire fighting activities.

(a.) If not already existing, the permittee must develop a storm sewer system map. At a minimum, the map must show the location of all outfalls and the names of all waters that receive discharges from those outfalls. Additional elements may be included on the map, such as, location of catch basins, location of manholes, and location of pipes within the system. Initial mapping should be based on all existing information available to the permittee including facility records, city records, and drainage maps. Field surveys may be necessary to verify existing records and locate all outfalls.

(b.) To the extent allowable under state law, the permittee must effectively prohibit, through regulatory mechanisms available to the permittee, non storm water discharges into the system and implement appropriate enforcement procedures and actions. If a regulatory mechanism does not exist, development and adoption of such a mechanism must be included as part of the storm water management program. The permittee should evaluate existing procedures, policies, and authorities pertaining to connections to its separate storm sewer system. These may be used to assist in the development of the required regulatory mechanism.

If an illicit discharger fails to comply with procedures or policies established at the facility, the permittee may seek assistance from EPA or the state agency in enforcing this provision of the permit.

(c.) The permittee must develop and implement a plan to detect and address non -storm water discharges, including illegal dumping, into the system.

The illicit discharge plan must contain the following elements:
i. Procedures to identify priority areas. This includes areas suspected of having illicit discharges, for example: older areas of the city, areas of high public complaints and areas of high recreational value or high environmental value such as beaches and drinking water sources.
ii. Procedures for locating illicit discharges (i.e. visual screening of outfalls for dry weather discharges, dye or smoke testing).
iii. Procedures for locating the source of the discharge and procedures for the removal of the source.
iv. Procedures for documenting actions and evaluating the impact on the storm sewer system subsequent to the removal.

(d.) The permittee must inform users of system and the general public of hazards associated with illegal discharges and improper waste disposal.

(e.) The non-storm water discharges listed in Part I.F. must be addressed if they are identified as being significant contributors of pollutants to the MS4.

4. Construction site storm water runoff control. The permittee must develop, implement, and enforce a program to reduce pollutants in any storm water runoff to the MS4 from construction activities that result in a land disturbance of greater than or equal to one acre. The permittee must include disturbances less than one acre if part of a larger common plan.

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

At a minimum, the program must include:

(a.) To the extent allowable under state law, a regulatory mechanism to require sediment and erosion control at construction sites. If such a mechanism does not exist, development and adoption of a mechanism must be part of the program. The permittee should evaluate existing procedures, policies, and authorities pertaining to activities occurring on its property, these may be used to assist in the development of the required regulatory mechanism. If attempts to enforce this part of their program are ineffective, the permittee may seek assistance from EPA or the state agency for enforcement of this provision .

(b.) Sanctions to ensure compliance with the program. To the extent allowable under state law sanctions may include both monetary or non-monetary penalties.

(c.) Requirements for construction site operators to implement a sediment and erosion control program which includes best management practices that are appropriate for the conditions at the construction site. The overall goal of a sediment and erosion control plan is to retain sediment on site, to the extent practicable. A sediment and erosion control plan should, at a minimum, include provisions to address maintenance and inspection of BMPs, and long and short term stabilization practices.

(d.) Require control of wastes, including but not limited to, discarded building materials, concrete truck wash out, chemicals, litter, and sanitary wastes.

(e.) Procedures for site plan review including procedures which incorporate consideration of potential water quality impacts. The site plan review should include procedures for preconstruction review.

(f.) Procedures for receipt and consideration of information submitted by the public.

(g.) Procedures for inspections and enforcement of control measures at construction sites.

5. Post construction storm water management in new development and redevelopment.

The permittee must develop, implement and enforce a program to address storm water runoff from new development and redevelopment projects that disturb greater than one acre and discharge into the MS4.

The program must include projects less than one acre if the project is part of a larger common plan of development.

The post construction program must include:

(a.) To the extent allowable under state law, a regulatory mechanism to address post construction runoff from new development and redevelopment. If such a mechanism does not exist, development and adoption of a mechanism must be part of the program. The permittee should evaluate existing procedures and policies concerning activities occurring on its property. These may be used to assist in development of the required regulatory mechanism. If attempts to enforce this provision of the program are ineffective, the permittee may seek assistance from EPA or the state agency in enforcing this provision.

(b.) Procedures to ensure adequate long term operation and maintenance of best management practices.

(c.) Procedure to ensure that any controls that are put in place will prevent or minimize impacts to water quality.

6. <u>Pollution prevention and good housekeeping in community/facility operations</u>.

The permittee must

(a.) Develop and implement a program with a goal of preventing and/or reducing pollutant runoff from community/facility operations. The program must include an employee training component.

(b.) Include, at a minimum, maintenance activities for the following : parks and open space; fleet maintenance, building maintenance; new construction and land disturbance; road way drainage system maintenance, and storm water system maintenance.

(c.) Develop schedules for maintenance activities described in paragraph (b) above.

(d) Develop inspection procedures and schedules for long term structural controls.

7. Cooperation with interconnected municipal separate storm sewer systems is encouraged. The permittee should identify interconnections within the system. These interconnections include both those leaving the system and those entering the system. The permittee should attempt to work cooperatively with an interconnected municipality in instances of discharges impacting either system.

8. MS4s which discharge to coastal waters with public swimming beaches should consider these waters a priority in implementation of the storm water management program.

9. The permittee should consider opportunities for ground water recharge and infiltration in implementation of the control measures described above.
The permittee must evaluate physical conditions, site design, and best management practices to promote groundwater recharge and infiltration where feasible in the implementation of the control measures described above. During the implementation of the storm water management program, the permittee must address recharge and infiltration for the minimum control measures as well as any reasons for electing not to implement recharge and infiltration. Loss of annual recharge to ground water should be minimized through the use of infiltration measures to the maximum extent practicable.
Massachusetts Only: Permittee in areas identified as “high” or “medium” in the most recent Massachusetts Water Resources Commission’s *Stressed Basins in Massachusetts* report in effect at the time the permittee submits a Notice of Intent and accompanying storm water management program, must minimize the loss of annual recharge to ground water from new development and redevelopment, including but not limited to drainage improvements done in conjunction with road improvements, street drain improvement projects and flood mitigation projects, consistent with Standard 3 of the Storm Water Management Policy in areas both within and outside of the jurisdiction of the Massachusetts Wetlands Protection Act.

(See http://www.state.ma.us/dem/programs/intbasin/stressed_basin)

C. Public Drinking Water Supply Requirements

1. MS4s which discharge to public drinking water sources and their protection areas (Class A and B surface waters used for drinking water and wellhead protection areas) should consider these waters a priority in implementation of the storm water management program.

2. Discharges to public drinking water supply sources and their protection areas (wellhead protection areas, Class A and Class B waters) should provide pretreatment and spill control capabilities to the extent feasible.

3. Direct discharges to Class A waters and the sanitary radius to public supply wells should be avoided the extent feasible.

D. Program Evaluation

1.The permittee must annually evaluate the compliance of the storm water management program with the conditions of this permit.

2.The permittee must evaluate the appropriateness of the selected Best Management Practices in efforts towards achieving the defined Measurable Goals. The SWMP may be changed in accordance with the following provisions:

(a.) Changes adding (but not subtracting or replacing) components, controls or requirements to the SWMP may be made at any time upon written notification to EPA and MA DEP.

(b.) Changes replacing an ineffective or infeasible BMP specifically identified in the SWMP with an alternative BMP may be requested in writing to EPA and MA DEP at any time. Unless denied, changes proposed in accordance with the criteria below shall be deemed approved and may be implemented 60 days from submittal of the request. If the request is denied, EPA or MA DEP, as applicable, will send you a written explanation of the denial.

(c.) Modification requests, must include the following information:

i. an analysis of why the BMP is ineffective or infeasible (including cost prohibitive)

ii. expectations on the effectiveness of the replacement BMP, and

iii. an analysis of why the replacement BMP is expected to achieve the goals of the BMP to be replaced.

iv. Change requests or notifications must be in writing and signed in accordance with the signatory requirements of Part VI.

3. EPA or the state agency may require changes to the SWMP as needed to:

(a.) Address impacts on receiving water quality caused or contributed to by discharges from the MS4,

(b.) To include more stringent requirements necessary to comply with a new Federal statutory or regulatory requirement; or

(c.) To include such other conditions deemed necessary to comply with the goals and requirements of the CWA.

(d.) Any changes requested by EPA or MA DEP/ NH DES will be in writing and will set forth the time schedule for the permittee to develop the changes and offer the opportunity to propose alternative program changes to meet the objective of the requested modification.

E. Record Keeping

1. All records required by this permit must be kept for a period of five years. Records include information used in the development of the storm water management program, any monitoring, copies of reports, and all data used in the development of the notice of intent.

2.Records need to be submitted only when specifically requested by the permitting authority.

3. The permittee must make the records relating to this permit available to the public, including the storm water management program. The public may view the records during normal business hours. The permittee may charge a reasonable fee for copying requests.

F. Reporting

1.The permittee must submit an annual report. The initial report is due one year from the effective date of this permit and annually thereafter. The reports should contain information regarding activities of the previous calendar year. Reports should be submitted to EPA. At the following address:

United States Environmental Protection Agency
Water Technical Unit
P.O. Box 8127
Boston, Massachusetts, 02114

Massachusetts MS4s must also submit reports to:

Massachusetts Department of Environmental Protection
Division of Watershed Management
627 Main Street
Worcester, Massachusetts 01608

New Hampshire MS4s must submit reports to:

New Hampshire Department of Environmental Services
Water Division
Wastewater Engineering Bureau
P.O. Box 95
Concord, New Hampshire 03302-0095

2. The following information must be contained in the annual report:

(a) A self assessment review of compliance with the permit conditions

(b) An assessment of the appropriateness of the selected BMPs.

(c) An assessment of the progress towards achieving the measurable goals

(d) A summary of results of any information that has been collected and analyzed. This includes any type of data.

(e) A discussion of activities for the next reporting cycle.

(f) A discussion of any changes in identified BMPs or measurable goals.

(g) Reference any reliance on another entity for achieving any measurable goal.

G. Massachusetts State Permit Conditions

This permit is issued jointly by the U.S. Environmental Protection Agency and the Massachusetts Department of Environmental Protection under federal and state law, respectively. As such, all the terms and conditions of this permit are hereby incorporated into and constitute a discharge permit issued by the Commissioner of the MA DEP pursuant to M.G.L. Chap. 21, §43 and under regulations found at 314 CMR 3.00. Regulations found at 314 CMR 3.19 (Standard Permit Conditions) are incorporated into this permit by reference.

To the extent allowable by their respective laws and regulations, each agency shall have the independent right to enforce the terms and conditions of this permit. Any modification, suspension or revocation of this permit shall be effective only with respect to the agency taking such action, and shall not affect the validity or status of this permit as issued by the other agency, unless and until each agency has concurred in writing with such modification, suspension or revocation. In the event any portion of this permit is declared invalid, illegal or otherwise issued in violation of the state law such permit shall remain in force and effect under federal law as a NPDES permit issued by the U.S. Environmental Protection Agency. In the event this permit is declared invalid, illegal or otherwise issued in violation of federal law, this permit shall remain in full force and effect under state law as a permit issued by the Commonwealth of Massachusetts. Refer to Part IX for 401 Certification Requirements.

PART V
TRANSPORTATION MS4 - STORM WATER MANAGEMENT PROGRAM
(This part applies to state and county agencies who maintain roadways, highways and other thoroughfares in the state including but not limited to Massachusetts Highway Department and New Hampshire Department of Transportation)

A. Storm Water Management Program

The permittee must develop, implement and enforce a program to reduce the discharge of pollutants from the MS4 to the maximum extent practicable; protect water quality, and satisfythe water quality requirements of the Clean Water Act and state water quality standards

1. The permittee must develop a storm water management program implementing the minimum measures described in Paragraph V.B.

2. All elements of the storm water management program must be implemented by the expiration date of this permit.

3. Implementation of one or more of the minimum measures may be shared with another entity, or the entity may fully implement the measure. When another entity fully implements a minimum measure for the permittee, the following applies
   (a.) the other entity, in fact, implements the control measure;
   (b.) the particular control measure, or component of that measure is at least as stringent as the corresponding permit requirement.
   (c.) The other entity agrees to implement the control measure on the permittee behalf. A legally binding written acceptance of this obligation is expected. This obligation must be maintained as part of the storm water management program. If the other entity agrees to report on the minimum measure, the permittee must supply the other entity with the reporting requirements contained in this permit under Paragraph V.E.
   (d) The permittee remains responsible for permit compliance and implementation of the minimum measure if the other entity fails to do it.

4. For each minimum measure, the permittee must:
   (a.) identify the person(s) or department responsible for the measure;
   (b.) identify Best Management Practices (BMPs) for the measure;
   (c.) identify measurable goals for each best management practice. The permittee may also identify an overall goal for each measure. Time lines and milestones for implementation of BMPs should be identified.

5. The following EPA websites may be used in the development of BMPs and measurable goals. EPA's BMP menu: http://www.epa.gov/npdes/menuofbmps/menu.htm EPA's guidance on Measurable goals: http://www.epa.gov/npdes/stormwater/measurablegoals/index.htm

Minimum Control Measures

1. Public education and outreach. The permittee must implement a public education program to distribute educational material to the community. For the purposes of this permit, a community consists of the people who use the facility. For a transportation agency, this would include employees, contractors, and general public. The public education program must provide information concerning the impact of storm water discharges on water bodies. It must address steps and/or activities that the community can take to reduce the pollutants in storm water runoff.

The following should be included in education and outreach efforts:

(a.) information regarding activities that occur within the facility, including illegal dumping into storm drains.

(b.) coordinate activities with local groups (i.e. watershed associations, or schools)

(c.) materials for outreach/education may include, but are not limited to, pamphlets; fact sheets; brochures; public service announcements; storm drain stenciling and newspaper advertisements.

(d.) encourage cooperative efforts with neighboring municipalities, watershed associations and others.

2. Public involvement and participation. All public involvement activities must comply with state public notice requirement.

(a.) The permittee must provide opportunity for the public to participate in the development, implementation and review of the storm water management program. In Massachusetts, the public notice requirements are at Chapter 39, Section 23B. In New Hampshire, the public notice requirements are at RSA-91A.

3. Illicit discharge detection and elimination. The permittee must develop, implement and enforce a program to detect and eliminate illicit discharges. An illicit discharge is any discharge to a municipal separate storm sewer that is not composed entirely of storm water. Exceptions are discharges pursuant to a NPDES permit (other that the NPDES permit for discharges from the municipal sewer system), allowable non-storm water discharges described at Part I.F. and discharges resulting from fire fighting activities.

(a.) If not already existing, the permittee must develop a storm sewer system map. At a minimum, the map must show the location of all outfalls and the names of all waters that receive discharges from those outfalls. Due to the magnitude of a transportation agency's drainage system, identification of outfalls may be done on a district basis, and as part of construction and redevelopment projects.

Additional elements may be included on the map, such as, location of catch basins, location of manholes, and location of pipes within the system. Initial mapping should be based on all existing information available to the permittee including project plans, agency records, city records and drainage maps. Field surveys may be necessary to verify existing records and locate all outfalls.

(b.) To the extent allowable under state law, the permittee must effectively prohibit, through a regulatory mechanism, non storm water discharges into the system and implement appropriate enforcement procedures and actions. If a regulatory mechanism does not exist, development and adoption of such a mechanism must be included as part of the storm water management program. The permittee should evaluate existing procedures, policies and authorities pertaining to connections to its separate storm sewer system.

If an illicit discharger fails to comply with procedures or policies established by the agency, the permittee seek assistance from EPA or the state environmental agency in enforcing this provision of the permit.

(c.) The permittee must develop and implement a plan to detect and address non-storm water discharges, including illegal dumping, into the system.

The illicit discharge plan must contain the following elements:

i. Procedures to identify priority areas. This includes areas suspected of having illicit discharges, for example: older areas of a city, areas of high public complaints, and areas of high recreational value or high environmental value such as beaches and drinking water sources.

ii. Procedures for locating illicit discharges (i.e. visual screening of outfalls for dry weather discharges, dye or smoke testing).

iii. Procedures for locating the source of the discharge and procedures for the removal of the source.
iv. Procedures for documenting actions and evaluating the impact on the storm sewer system subsequent to the removal.

(d.) The permittee must inform users of the system and the general public of hazards associated with illegal discharges and improper waste disposal. The permittee must train field inspectors to recognize illicit discharges.

(e.) The non storm water discharges listed in Part I.F. must be addressed if they are identified as being significant contributors of pollutants.

4. Construction site storm water runoff control. The permittee must develop, implement, and enforce a program to reduce pollutants in any storm water runoff to the MS4 from construction activities that result in a land disturbance of greater than or equal to one acre. The permittee must include disturbances less than one acre if part of a larger common plan.

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

At a minimum, the program must include:

(a.) To the extent allowable under state law,a regulatory mechanism to require sediment and erosion control at construction sites. If such a mechanism does not exist, development and adoption of a mechanism must be part of the program. If attempts to enforce this part of their program are ineffective, the permittee may seek assistance from EPA or the state agency for enforcement of this provision.

(b.) Sanctions to ensure compliance with the program. To the extent allowable under state law, sanctions may include both monetary or non-monetary penalties. The transportation agency can consider with-holding payment to contractors who fail to implement appropriate sediment and erosion control plans.

(c.) Requirements for construction site operators to implement a sediment and erosion control program which includes best management practices that are appropriate for the conditions at the construction site. The Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas may be used as a tool to implement this provision. The New Hampshire Department of Transportation may use the Storm Water Management Sediment and Erosion Control Handbook as a tool to implement this provision.

(d.) Require control of wastes, including but not limited to, discarded building materials, concrete truck wash out, chemicals, litter, and sanitary wastes.

(e.) Procedures for site plan review including procedures which incorporate consideration of potential water quality impacts. The site plan review should include procedures for preconstruction review.

(f.) Procedures for receipt and consideration of information submitted by the public. This may include the opportunities for public comment during the project development process.

(g.) Procedures for inspections and enforcement of control measures at construction sites.

5. Post construction storm water management in new development and redevelopment.
The permittee must develop, implement and enforce a program to address storm water runoff from new development and redevelopment projects that disturb greater than one acre and discharge into the MS4.

The program must include projects less than one acre if the project is part of a larger common plan of development.

The post construction program must include:

(a.) To the extent allowable under state law, a regulatory mechanism to address post construction runoff from new development and redevelopment. If such a mechanism does not exist, development and adoption of a mechanism must be part of the program. If attempts to enforce this provision of the program are ineffective, the permittee may seek assistance from EPA of the state agency in enforcing this provision.

(b.) Procedures to ensure adequate long term operation and maintenance of best management practices.

(c.) Procedure to ensure that any controls that are in place will prevent or minimize impacts to water quality.

(d) The Massachusetts Highway Department may use the approved Storm Water Management Handbook as a tool to implement this provision.

6. <u>Pollution prevention and good housekeeping in community/facility operations.</u>
The permittee must

(a.) Develop and implement a program with a goal of preventing and/or reducing pollutant runoff from transportation facility operations. The program must include an employee training component.

(b.) Include, at a minimum, maintenance activities for the following : rest areas along interstates; weigh stations; material storage yards; new construction and land disturbance; roadway drainage system maintenance, and storm water system maintenance.

(c.) Develop schedules for maintenance activities described in paragraph (b) above.

(d) Develop inspection procedures and schedules for long term structural controls.

7. Cooperation between interconnected municipal separate storm sewer systems is encouraged. The permittee should identify interconnections within the system. These interconnections include both those leaving the system and those entering the system. The permittee should attempt to work cooperatively with an interconnected municipality in instances of discharges impacting either system.

8. MS4s which discharge to coastal waters with public swimming beaches should consider these waters a priority in implementation of the storm water management program.

9. The permittee should consider opportunities for ground water recharge and infiltration in the implementation of the minimum measures described above.

The permittee must evaluate physical conditions, site design, and best management practices to promote groundwater recharge and infiltration where feasible in the implementation of the control measures described above. During the implementation of the storm water management program, the permittee must address recharge and infiltration for the minimum control measures as well as any reasons for electing not to implement recharge and infiltration. Loss of annual recharge to ground water should be minimized through the use of infiltration measures to the maximum extent practicable.
Massachusetts Only: Permittees in areas identified as "high" or "medium" in the most recent Massachusetts Water Resources Commission's *Stressed Basins in Massachusetts* report in effect at the time the permittee submits a Notice of Intent and accompanying storm water management program, must minimize the loss of annual recharge to ground water from new development and redevelopment, including but not limited to drainage improvements done in conjunction with road improvements, street drain

improvement projects and flood mitigation projects, consistent with Standard 3 of the Storm Water Management Policy in areas both within and outside of the jurisdiction of the Massachusetts Wetlands Protection Act.
(See http://www.state.ma.us/dem/programs/intbasin/stressed_basin)

C. Public Drinking Water Supply Requirements

1. MS4s which discharge to public drinking water sources and their protection areas (Class A and B surface waters used for drinking water and well head protection areas) should consider these waters a priority in implementation of the storm water management program.

2. Discharges to public drinking water supply sources and their protection areas (wellhead protection areas, Class A and Class B waters) should provide pretreatment and spill control capabilities to the extent practicable.

3. Discharges to Class A waters, Zone 1 wellhead protection areas, and the sanitary radius to supply wells should be avoided to the extent feasible.

D. Program Evaluation

1. The permittee must annually evaluate the compliance of the storm water management program with the conditions of this permit.

2. The permittee must evaluate the appropriateness of the selected Best Management Practices in efforts towards achieving the defined Measurable Goals. The SWMP may be changed in accordance with the following provisions:

(a.) Changes adding (but not subtracting or replacing) components, controls or requirements to the SWMP may be made at any time upon written notification to EPA and MADEP.
(b.) Changes replacing an ineffective or unfeasible BMP specifically identified in the SWMP with an alternative BMP may be requested in writing to EPA and MA DEP at any time. Unless denied, changes proposed in accordance with the criteria below shall be deemed approved and may be implemented 60 days from submittal of the request. If the request is denied, EPA or MA DEP, as applicable, will send a written explanation of the denial.
(c.) Modification requests, must include the following information:
i. an analysis of why the BMP is ineffective or infeasible (including cost prohibitive)
ii. expectations on the effectiveness of the replacement BMP, and
iii. an analysis of why the replacement BMP is expected to achieve the goals of the BMP to be replaced.
iv. Change requests or notifications must be in writing and signed in accordance with the signatory requirements of Part VI.

3. EPA or MADEP/NHDES may require changes to the SWMP as needed to:

(a.) Address impacts on receiving water quality caused or contributed to by discharges from the MS4;
(b.) To include more stringent requirements necessary to comply with a new Federal statutory or regulatory requirement; or
(c.) To include such other conditions deemed necessary to comply with the goals and requirements of the CWA.
(d.) Any changes requested by EPA or MADEP/NHDES will be in writing and will set forth the time schedule for the permittee to develop the changes and offer the opportunity to propose alternative program changes to meet the objective of the requested modification

E. Record Keeping

1. All records required by this permit must be kept for a period of at least five years. Records include information used in the development of the storm water management program, any monitoring, copies of reports, and all data used in the development of the notice of intent.

2. Records need to be submitted only when specifically requested by the permitting authority.

3. The permittee should make the records relating to this permit available to the public, including the storm water management program. The public may view the records during normal business hours. The permittee may charge a reasonable fee for copying requests.

F. Reporting

1. The permittee must submit an annual report. The initial report is due one year from the effective date of this permit and annually thereafter. The reports should contain information regarding activities of the previous calendar year. Reports should be submitted to EPA. At the following address:
United States Environmental Protection Agency
Water Technical Unit
P.O. Box 8127
Boston, MA 02114

Massachusetts transportation MS4s must also submit reports to:

Department of Environmental Protection
Division of Watershed Management
627 Main Street
Worcester, Massachusetts 01608

New Hampshire transportation MS4s must also submit reports to:

New Hampshire Department of Environmental Services
Water Division
Wastewater Engineering Bureau
P.O. Box 95
Concord, NH 03302-0095

2. The following information must be contained in the annual report:

(a) A self assessment review of compliance with the permit conditions.

(b) An assessment of the appropriateness of the selected BMPs.

(c) An assessment of the progress towards achieving the measurable goals.

(d) A summary of results of any information that has been collected and analyzed. This includes any type of data.

(e) A discussion of activities for the next reporting cycle.

(f) A discussion of any changes in identified BMPs or measurable goals.

(g) Reference any reliance on another entity for achieving any measurable goal.

G. Massachusetts State Permit Conditions

This permit is issued jointly by the U.S. Environmental Protection Agency and the Massachusetts Department of Environmental Protection under federal and state law, respectively. As such, all the terms and conditions of this permit are hereby incorporated into and constitute a discharge permit issued by the Commissioner of the MA DEP pursuant to M.G.L. Chap. 21, §43 and under regulations found at 314 CMR 3.00. Regulations found at 314 CMR 3.19 (Standard Permit Conditions) are incorporated into this permit by reference.

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

Refer to Part IX for 401 Certification Requirements.

PART VI - STANDARD PERMIT CONDITIONS

H. Duty to Comply

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

2. Penalties for Violations of Permit Conditions

The Director will adjust the civil and administrative penalties listed below in accordance with Civil Monetary Penalty Inflation Adjustment Rule (Federal Register: December 31, 1996, Volume 61, Number 252, pages 69359-69366, as corrected, March 20, 1997, Volume 62, Number 54, pages 13514-13517) as mandated by the Debt Collection Improvement Act of 1996 for inflation on a periodic basis. This rule allows EPA's penalties to keep pace with inflation. The Agency is required to review its penalties at least once every four years thereafter and to adjust them as necessary for inflation according to a specialized formula. The civil and administrative penalties listed below were adjusted for inflation starting in 1996

(a) Criminal

i. Negligent Violations. The CWA provides that any person who negligently violates permit conditions implementing sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a fine of not less than $2,500 nor more than $25,000 per day of violation or by imprisonment for not more than 1 year or both.

ii. Knowing Violations. The CWA provides that any person who knowingly violates permit conditions implementing sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a fine of not less than $ 5,000 not more than $50,000 per day of violation, or by imprisonment for not more than 3 years, or both.

iii. Knowing Endangerment. The CWA provides that any person who knowingly violates permit conditions implementing sections 301, 302, 306, 307, 308, 318, or 405 of the Act and who knows at that time that he is placing another person in imminent danger of death or serious bodily injury is subject to a fine of not more than $250,000 or by imprisonment for not more than 15 years, or both.

iv. False statement. The CWA provides that any person who knowingly makes any false material statement, representation, or certification in any application, record, report, plan or other document filed or required to be maintained under the Act or who knowingly falsifies, tampers with, or renders inaccurate, any monitoring device or method required to be maintained under the Act, shall upon conviction, be punished by a fine or not more than $10,000 or by imprisonment for not more that two years, or by both. If a conviction is for a violation committed after a first conviction of such person under this paragraph, punishment shall be by a fine of not more than $20,000 per day of violation, or by imprisonment of not more than four years, or by both.

b. Civil penalties- The CWA provides that any person who violates a permit condition implementing sections 301, 302, 306, 306, 307, 318 or 405 of the Act is subject to a civil penalty not to exceed $ 27,500 per day for each violation.

c. Administrative Penalties

The CWA provides that any person who violates a permit condition implementing sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to an administrative penalty, as follows:

i. Class I penalty. Not to exceed $11,000 per violation nor shall the maximum amount exceed $ 27,500.

ii. Class II penalty. Not to exceed $11,000 per day for each day during which the violation continues nor shall the maximum amount exceed $137,500.

B. Continuation of the Expired General Permit

If this permit is not reissued prior to the expiration date, it will be administratively continued in accordance with the Administrative Procedures Act and remain in force and in effect as to any particular permittee as long as the permittee submits a new Notice of Intent two (2) months prior to the expiration of this permit. However, once this permit expires, EPA cannot provide written notification of coverage under this general permit to any permittee who submits a Notice of Intent to EPA after the permit's expiration date. Any permittee who was granted permit coverage prior to the expiration date will automatically remain covered by the continued permit until the earlier of :

(1) Reissuance of this permit, at which time the permittee must comply with the Notice of Intent conditions of the new permit to maintain authorization to discharge; or
(2) The permittee's submittal of a Notice of Termination; or
(3) Issuance of an individual permit for the permittee's discharges; or
(4) A formal permit decision by the Director not to reissue this general permit, at which time the permittee must seek coverage under an alternative general permit or an individual permit.

C. Need to Halt or Reduce Activity not a Defense

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

D. Duty to Mitigate

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

F. Duty to Provide Information

The permittee must furnish to the Director or an authorized representative of the Director any information which is requested to determine compliance with this permit. The permittee shall also furnish to the Director upon request, copies of records required to be kept by this permit.

G. Signatory Requirement

i. All applications, reports, or information submitted to the Director shall be signed and certified. (See 40 CFR 122.22)

ii. The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation or both.

H. Oil and Hazardous Substance Liability

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

I. Property Rights

The issuance of this permit does not convey any property rights of any sort, nor any exclusive privileges nor does it authorize any injury to private property nor any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

J. Severability

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to the circumstances, and the remainder of this permit shall not be affected thereby.

K. Requiring an Individual Permit or an Alternative General Permit

i. The Director may require any person authorized by this permit to apply for and/or obtain either an individual NPDES permit or an alternative NPDES general permit. Any interested person may petition the Director to take action under this paragraph. Where the Director requires the permittee to apply for an individual NPDES permit, the Director will notify the permittee in writing that a permit application is required. This notification shall include a brief statement of the reasons for this decision, an application form, a statement setting a deadline for the permittee to file the application, and a statement that on the effective date of issuance or denial of the individual NPDES permit or the alternative general permit as it applies to the individual permittee, coverage under this general permit shall automatically terminate. Applications must be submitted to the Regional Office. The Director may grant additional time to submit the application upon request of the applicant. If the permittee fails to submit in a timely manner an individual NPDES permit application as required by the Director under this paragraph, then the applicability of this permit to the permittee is automatically terminated at the end of the day specified by the Director for application submittal.

ii. Any discharger authorized by this permit may request to be excluded from the coverage of this permit by applying for an individual permit. In such cases, the permittee must submit an individual application in accordance with the requirements of 40 CFR 122.26(c)(1)(ii), with reasons supporting the request, to the Director at the following address: Office of Ecosystem Protection, United States Environmental Protection Agency, One Congress Street- Suite 1100, Boston, Massachusetts 02114. The request may be granted by issuance of any individual permit or an alternative general permit if the reasons cited by the permittee are adequate to support the request.

iii. When an individual NPDES permit is issued to a discharger otherwise subject to this permit, or the discharger is authorized to discharge under an alternative NPDES general permit, the applicability of this permit to the individual NPDES permittee is automatically terminated on the effective date of the individual permit or the date of authorization of coverage under the alternative general permit, whichever the case may be. When an individual NPDES permit is denied to an operator otherwise subject to this permit, or the operator is denied for coverage under an alternative NPDES general permit, the applicability of this permit to the individual NPDES permittee is automatically terminated on the date of such denial, unless otherwise specified by the Director.

L. State/Tribal Environmental Laws

i. Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State/Tribal law or regulation under authority preserved by section 510 of the Act.

ii. No condition of this permit releases the permittee from any responsibility or requirements under other environmental statutes or regulations.

M. Proper Operation and Maintenance

The permittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. Proper operation and maintenance requires the operation of backup or auxiliary facilities or similar systems, installed by a permittee only when necessary to achieve compliance with the conditions of the permit.

N. Inspection and Entry

The permittee must allow the Director or an authorized representative of EPA or the State/Tribe, upon the presentation of credentials and other documents as may be required by law, to:

i Enter the permittee premises where a regulated facility or activity is located or conducted or where records must be kept under the conditions of this permit;

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

iii Inspect at reasonable times any facilities or equipment (including monitoring and control equipment).

PART VII - DEFINITIONS

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

Commencement of Construction means the initial disturbance of soils associated with clearing, grading or excavating activities or other construction activities.

Control Measure as used in this permit, refers to any BMP or other method, used to prevent or reduce the discharge of pollutants to waters of the United States.
CWA means the Clean Water Act, or the Federal Water Pollution Control Act, 33 U.S.C 1251 *et seq.*

Director means the Regional Administrator of the Environmental Protection Agency or an authorized representative.

Discharge when used without qualification means the "discharge of a pollutant."

Discharge of Storm Water Associated with Construction Activity as used in this permit, refers to a discharge of pollutants in storm water runoff from areas where soil disturbing activities (e.g. clearing, grading, or excavation), construction materials or equipment storage or maintenance (e.g. fill piles, borrow areas, concrete truck washout, fueling) or other industrial storm water directly related to the construction process are located. (See 40 CFR 122.26(b)(14)(x) and 40 CFR 122.26(b)(15) for the two regulatory definition of storm water associated with construction sites).

Discharge of Storm Water Associated with Industrial Activity is defined at 40 CFR 122.26(b)(14).

EPA means the United States Environmental Protection Agency

Facility or Activity means any NPDES "point source" or any other facility or activity (including land or appurtenances thereto) that is subject to regulation under the NPDES program.

General Permit means an NPDES permit issued under §122.28 authorizing a category of discharges under the CWA within a geographical area.

Indian Country, as defined in 18 U.S.C. 1151, means : (a) All lands within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and including rights-of-way running through the reservation; (b) all dependent Indian communities with the borders of the United States whether within the original or subsequently acquired territory thereof, and whether within or without the limits of a state; and (c) all Indian allotments, the Indian titles to which have not been extinguished, including rights-of-way running through the same. This definition includes all land held in trust for an Indian tribe.

Industrial Activity as used in this permit refers to the eleven categories of industrial activities included in the definition of discharges of storm water associated with industrial activity.

Industrial Storm Water as used in this permit refers to storm water runoff associated with the definition of discharges of storm water associated with industrial activity.

Large municipal separate storm sewer system means all municipal separate storm sewer systems that are either: (i) Located in an incorporated place with a population of 250,000 or mor as determined by the 1990 Decennial Census by the Bureau of the Census; or (ii.) Located in counties listed in Appendix H of 40 CFR 122, except municipal separate storm sewers that are located in the incorporated places, townships or towns within such counties; or (iii.) Owned or operated by a municipality other than those described in paragraph (b)(4)(i) or (ii) of this section and that are designated by the Director as part of the large or medium municipal separate storm sewer system due to the interrelationship between the discharges of the designated storm sewer and the discharges from municipal separate storm sewers described under paragraph (b)(4)(i) or (ii) of this section.(Complete definition found at 40 CFR 122.26(b)(4) and incorporated here by reference).

MADEP means Massachusetts Department of Environmental Protection.

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

Medium Municipal Separate Storm Sewer System means all municipal separate storm sewers that are either: (i) Located in an incorporated place with a population of 100,000 or more but less than 250,000, as determined by the 1990 Decennial Census by the Bureau of the Census (Appendix G of this part); or (ii.) Located in the counties listed in Appendix I, except municipal separate storm sewers that are located in the incorporated places, townships or towns within such counties; or (iii.) Owned or operated by a municipality other than those described in paragraph (b)(4)(i) or (ii) of this section and that are designated by the Director as part of the large or medium municipal separate storm sewer system due to the interrelationship between the discharges of the designated storm sewer and the discharges from municipal separate storm sewers described under paragraph (b)(7)(i) or (ii) of this section.(Complete definition found at 40 CFR 122.26(b)(7) and incorporated here by reference).

Municipal Separate Storm Sewer System means a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains); (i.) Owned or operated by a State, city, town, borough, county, parish, district, association or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district, or drainage district, or similar entity or an Indian tribe or an authorized tribal organization or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; and (iv) Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.

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

NHDES means New Hampshire Department of Environmental Services.

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

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

Pollutant is defined at 40 CFR 122.2. A partial listing from this definition includes: dredged spoil, solid waste, sewage, garbage, sewage sludge, chemical wastes, biological materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial or municipal waste.

Runoff Coefficient means the fraction of total rainfall that will appear at the conveyance as runoff.

State means any of the 50 States, the District of Columbia, Guam, the Commonwealth of Puerto Rico, the Virgin Islands, American Samoa, the Commonwealth of the Northern Mariana Islands, the Trust Territory of the Pacific Islands, or an Indian Tribe meeting the requirements of 40 CFR 123.31.

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

Storm Water Associated with Industrial Activity refers to storm water, that if allowed to discharge, would constitute a "discharge of storm water associated with industrial activity" as defined at 40 CFR 122.26(b)(14) and incorporated here by reference.

Waters of the United States means:

1. All waters which are currently used, were used in the past or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide.
2. All interstate waters, including interstate wetlands;
3. All other waters such as interstate lakes, rivers, streams, (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes or natural ponds the use, designation or destruction of which would affect or could affect interstate or foreign commerce including any such waters;
    a. Which are or could be used by interstate or foreign travelers for recreational or other purposes.
    b. From which fish or shell fish are or could be taken and sold in interstate or foreign or;
    c. Which are used or could be used for industrial purposes by industries in interstate commerce.
4. All impoundments of waters otherwise defined as waters of the United States under this definition;
5. Tributaries of waters identified in paragraphs (1) through (4) of this definition;
6. The territorial sea; and
7. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs 1 through 6 of this definition.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the CWA (other than cooling ponds as defined in 40 CFR 423.11(m) which also meet the criteria of this definition) are not waters of the United States. This exclusion applies only to manmade bodies of water which neither were originally created in waters of the United States (such as disposal areas in wetlands) nor resulted from the impoundment of waters of the United States. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by other federal agency for the purposes of the Clean Water Act jurisdiction remains with EPA.

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

PART VIII - REOPENER

If there is evidence indicating that the storm water discharges authorized by this permit cause, have the reasonable potential to cause, or contribute to a violation of a water quality standard, the permittee may be required to obtain an individual permit or an alternative general permit in accordance with Part VI.K of this permit, or the permit may be modified to include different limitations and/or requirements.
Permit modification or revocation will be conducted according to 40 CFR 122.62, 122.63, 122.64 and 124.5.

PART IX - 401 WATER QUALITY CERTIFICATION REQUIREMENTS

Massachusetts:

The Massachusetts Department of Environmental Protection in accordance with the provisions of MGL Ch. 21, s. 26-53, 314 CMR 4.00, 314. CMR 3.00, 314 CMR 9.00 and Section 401 of the Federal Clean Water Act (Public Law 92-500 as amended) issues this Section 401 Water Quality Certification for the *General Permit for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems* in Massachusetts. The Department has determined that compliance with the conditions of this permit will result in compliance with applicable water quality standards, as required by the Massachusetts Surface Water Quality Standards regulations (314 CMR 4.00) and with 314 CMR 9.04 and that the permittee will be in compliance with Sections 301, 302, 303, 306 and 307 of the Federal Clean Water Act. The Department issues this Water Quality Certification subject to the following conditions, which are to be added to the final permit as state water quality certification requirements. The conditions outlined below will be presented in the following order:

A. state statutes and regulations relating to water quality and surface water discharges;
B. adherence to the Massachusetts Storm Water Management Policy, March 1997;
C. other state laws, regulations, and policies
D. environmental priority resource areas designated for protection;
E. other Department Directives, and
F. permit compliance

A. State Water Quality Statutes, Regulations and Policies:

1. The permittee shall comply with the Massachusetts Clean Waters Act (Ch. 21 s. 26-53).

2. The permittee shall comply with the conditions in 314 CMR 4.00- Surface Water Quality Standards.

3. The permittee shall comply with the conditions in 314 CMR 3.00- Surface Water Discharge Permit Program.

4. The permittee shall comply with the Wetlands Protection Act, Ch. 131 s. 40 and its regulations, 310 CMR 10.00 and any Order of Conditions issued by a Conservation Commission or Superseding Order of Conditions issued by the Massachusetts Department of Environmental Protection.

B. Department of Environmental Protection Storm Water Management Policy:

1. The permittee shall comply with the Massachusetts Storm Water Management Policy, March 1997 and applicable Storm Water Performance Standards, as prescribed by state regulations promulgated under the authority of the Massachusetts Clean Waters Act, MGL c. 21, ss 23-56 and the Wetlands Protection Act, MGL c. 131 s. 40.

C. Other State Environmental Laws, Regulations, Policies:

1. The permittee shall comply with the Massachusetts Endangered Species Act (MESA)(MGL c. 131A and regulations at 321 CMR 10.00) and any actions undertaken to comply with this storm water permit, shall not result in non-compliance with the MESA.

2. The permittee shall not conduct activities under this permit that will interfere with implementation of mosquito control work conducted in accordance with Chapter 252 including, s. 5A thereunder and DEP Guideline Number BRP G01-02, West Nile Virus Application of Pesticides to Wetland Resource Areas and Buffer Zones, and Public Water Systems.

D. ***Resource Areas Required for priority consideration in Storm Water Management Program***

1. The permittee shall identify discharges to the following resource areas as a priority and indicate in their storm water management program how storm water controls will be implemented. Identified priority areas include:

a. public water supplies

b. public swimming beaches
c. Outstanding Resource Waters (as designated in 314 CMR 4.00)
d. shell fishing areas (open versus closed areas)
e. rivers, ponds, lakes and coastal waters which are on the Department's 303d list of impaired waters
f. cold water fishery river segments as identified in 314 CMR 4.00

E. Other Department Directives:

1. The Department may require the permittee to perform water quality monitoring during the permit term if monitoring is necessary for the protection of public health or the environment as designated under the authority at 314 CMR 3.00.

2. The Department may require one or more permittees covered under this general permit to provide measurable verification of the effectiveness of BMPs and other control measures in the permittee's management program, including water quality monitoring.

3. The Department has determined that compliance with this permit does not protect the permittee from enforcement actions deemed necessary by the Department under its associated regulations to address an imminent threat to the public health, or a significant adverse environmental impact which results in a violation of the Massachusetts Clean Waters Act. Ch. 21 ss 26-53.

4. The Department reserves the right to modify this 401 Water Quality Certification if any changes, modifications or deletions are made to the general permit. In addition, the Department reserves the right to add and/or alter the terms and conditions of its Section 401 Water Quality Certification to carry out its responsibilities during the term of this permit with respect to water quality.

F. Permit Compliance:

1. Should any violation of the Massachusetts Surface Water Quality Standards (314 CMR 4.00) or the conditions of this certification occur, the Department will direct the permittee to correct the violation(s). The Department has the right to take any action as authorized by the General Laws of the Commonwealth to address the violation of this permit or the MA Clean Waters Act and the regulations promulgated thereunder. Substantial civil and criminal penalties are authorized under MGL Ch. 21, Section 42 for discharging into Massachusetts's waters in violation of an order or permit issued by this Department. This certification does not relieve the permittee of the duty to comply with other applicable Massachusetts statues and regulations.

New Hampshire
No additional conditions added.

Addendum A
Endangered Species Guidance

A. Background

In order to meet its obligations under the Clean Water Act and the Endangered Species Act (ESA), and to promote the goals of those Acts, the Environmental Protection Agency (EPA) is seeking to ensure the activities regulated by this small MS4 general permit do not adversely affect endangered and threatened species and critical habitat. Small MS4 operators applying for permit coverage must assess the impacts of their storm water discharges, allowable non-storm water discharges, and discharge-related activities on Federally listed endangered and threatened species ("listed species") and designated critical habitat ("critical habitat"), to ensure that those goals are met. Prior to obtaining general permit coverage, applicants must meet the ESA eligibility provisions of this permit. EPA strongly recommends that applicants follow the guidance in this addendum at the earliest possible stage to ensure that measures to protect listed species and critical habitat are incorporated early in the storm water management program development.

Applicants also have an independent ESA obligation to ensure that their activities do not result in any prohibited "takes" of listed species[1]. Many of the measures required in this general permit and in these instructions to protect species may also assist in ensuring that the applicants activities do not result in a prohibited take of species in violation of section 9 of the ESA. If the MS4 operator has plans or activities in areas where endangered and threatened species are located, they may wish to ensure that they are protected from potential takings liability under ESA section 9 by obtaining an ESA section 10 permit or by requesting formal consultation under ESA section 7. Applicants that are unsure whether to pursue a section 10 permit or a section 7 consultation for takings protection, should confer with the appropriate U.S. Fish and Wildlife Service (FWS)[2] office or the National Marine Fisheries Service (NMFS).

The FWS and NMFS have identified two species of concern, the short nosed sturgeon and the dwarf wedge mussel. These species are found in the Merrimack River and the Connecticut River. Specifically, the sturgeon is in the Connecticut River (main stem) down stream of Turners Falls, Massachusetts. It is in the Merrimack River (main stem) below the Lawrence Dam.

The dwarf wedge mussel is located in the following areas:

1. The Connecticut River, North from Nothumberland, NH south to Dalton, NH
2. Historic location in North Thetford, NH
3. Connecticut River, south and Black River: 16 -18 miles along the CT river form North Hartland, NH to Aschutney, VT as well as 1 mile along the Black River, from the river mouth to Springfield, VT
4. Ashuelt River form below Surry Mt. Dam, 6 -7 miles south to Keane, NH
5. South Branch of Ashuelot River, 0.5 miles in East Swanzey, NH
6. Mill River; approximately 5 miles in Whatley, MA and Hatfield, MA as well as 1-2 miles along Mill River Diversion in Northampton, MA
7. Farmington River, Muddy Brook, Philo Brook and Podunk River; Philo Brook and Muddy Brook in Suffield, CT; Farmington River in North Bloomfield, CT and the Podunk River in South Windsor, CT

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[1] Section 9 of the ESA prohibits any person from "taking" a listed species (e.g., harassing or harming it) unless: (1) the taking is authorized through a "incidental take statement" as part of completion of formal consultation according to ESA section 7; (2) where an incidental take permit is obtained under ESA section 10 (which requires the development of a habitat conservation plan); or (3) where otherwise authorized or exempted under the ESA. This prohibition applies to all entities including private individuals, businesses, and governments.

[2] Discharges to marine waters may require consultation with the National Marine Fisheries Service instead.

Any small MS4 which discharges to these rivers must consult with the Services. EPA may designate the applicants as non-Federal representatives for the small MS4 general permit for the purpose of carrying out informal consultation with NMFS and FWS. By terms of this MS4 permit, EPA has automatically designated operators as non-Federal representatives for the purpose of conducting informal consultations. (See 50 CFR §402.08 and §402.13 and Part I.B.2.(e) of the permit) Permit coverage is only available if the applicant contacts the Services to determine that discharges are not likely to adversely affect listed species or critical habitat and informal consultation with the Services has been concluded and results in a written concurrence by the Services that the discharge is not likely to adversely affect an endangered or threatened species.

B. The ESA Eligibility Process

Before submitting a notice of intent (NOI) for coverage by this permit, applicants must determine whether they meet the ESA eligibility criteria by following the steps in Section "D" of this Addendum. Applicants that cannot meet any of the eligibility criteria, must apply for an individual permit.

C. The ESA Eligibility Criteria

The ESA eligibility requirements of this permit, may be satisfied by documenting that one or more of the following criteria has been met. Upon notification, EPA may direct an applicant to pursue eligibility under Criterion B.

Criterion A: No endangered or threatened species or critical habitat are in proximity to the MS4 or the points where authorized discharges reach the receiving waters.

Criterion B: In the course of a separate federal action involving the MS4, formal or informal consultation with the Fish and Wildlife Service and/or the National Marine Fisheries Service under Section 7 of the ESA has been concluded and that consultation
- Addressed the effects of the MS4 storm water discharges, allowable non-storm water discharges and discharge related activities on listed species and critical habitat; and
The consultation resulted in either a no jeopardy opinion or a written concurrence by FWS and/or NMFS on a finding that the storm water discharges, allowable non-storm water discharges, and discharge related activities are not likely to adversely affect listed species or critical habitat.

Criterion C: The activities are authorized under Section 10 of the ESA and that authorization addresses the effects of the storm water discharges, allowable non-storm water discharges, and discharge related activities on listed species and critical habitat. (Eligibility under this criterion is not likely. This criterion involves an MS4s activities being authorized through the issuance of a permit under section 10 of the ESA and that authorization addresses the effect of the MS4's storm water discharges and discharge related activities on listed species and designated critical habitat. MS4s must follow FWS and/or NMFS procedures when applying for an ESA Section 10 permit (see 50 CFR §17.22(b)(1) for FWS and §222.22 for NMFS). Application instructions for section 10 permits can be obtained by assessing the appropriate websites (www.fws.gov and www.nmfs.noaa.gov) or by contacting the appropriate regional office.)

Criterion D: Using the best scientific and commercial data available, the effects of the storm water discharges, allowable non-storm water discharges, and discharge related activities on listed species and critical habitat have been evaluated. Based on those evaluations, a determination is made by the permittee and affirmed after review by EPA that the storm water discharges, allowable non-storm water discharges, and discharge related activity will not affect any federally threatened or endangered species or designated critical habitat.

Criterion E: The storm water discharges, allowable non-storm water discharges, and discharge related activities where already addressed in another operator's certification of eligibility which includes the MS4 activities.

D. The Steps To Determine if the ESA Eligibility Criteria Can Be Met

To determine eligibility, you must assess (or have previously assessed) the potential effects of your known storm water discharges, allowable non-storm water discharges and discharge-related activities on listed species and critical habitat, PRIOR to completing and submitting a Notice of Intent (NOI). You must follow the steps outlined below and document the results of your eligibility determination.

Step1. Determine if You Can Meet Eligibility Criterion "A"

Criterion A. You can certify eligibility, according to Criterion A, for coverage by this permit if you can answer "No" to all of the following questions:

- Are there any Endangered Species in your county? Are there any Critical Habitats in your county?

- Are there any Endangered Species or Critical Habitat in proximity to your MS4 or discharge locations?

Use the guidance below to answer these questions, and to: "*Check for Listed Endangered Species in Your County,*" "*Check for Critical Habitat in Your County,*" and "*Check for Proximity to Your MS4 or MS4 Discharge Locations*."

If you answered "No" to the questions above, you have met ESA eligibility Criterion A. Skip to Step 4.

If you answered "Yes" to either of the questions above, Go to Step 2.

Check for Listed Endangered Species in Your County.

Look at the latest county species list to see if any listed species are found in your county. If you are located close to the border of a county or your MS4 is located in one county and your discharge points are located in another, you must look under both counties. Since species are listed and de-listed periodically, you will need the most current list at the time you are conducting your endangered species assessment.

Check for Critical Habitat in Your County.

Some (but not all) listed species have designated critical habitat. Exact locations of such habitat is provided in the endangered species regulations at 50 CFR part 17 and part 226. To determine if MS4 or discharge locations are within designated critical habitat, you should either:

- Review those regulations (50 CFR Parts 17 and 226) that specific critical habitat. These regulations can be found in many larger libraries or via the Government Printing Office website, www.access.gpo.gov ; or

- Contact the nearest Fish and Wildlife Service (FWS) office or National Marine Fisheries Service (NMFS) office. A list of FWS and NMFS offices for the areas of permit coverage is found in sections "F" and "G", respectively, of this Addendum; or

- Contact the Natural Heritage Program for your state. Heritage programs gather, manage, and distribute detailed information about the biological diversity found within their jurisdictions. They frequently have the most current information on listed species and critical habitat. Contact information for the Heritage program is provided in section "H" of this Addendum.

Check for Proximity to Your MS4 or MS4 Discharge Locations.

You must determine whether listed species or critical habitat are in proximity to your MS4 storm water discharges or allowable non-storm water discharges. Listed species and critical habitat are in proximity when they are:

- Located in the path or immediate area through which or over which point source storm water or allowable non-storm water flows to the point of discharge into the receiving water. This may also include areas where storm water from your MS4 enters groundwater that has a direct hydrological connection to a receiving water (e.g., groundwater infiltrates at your MS4 and re-emerges to enter a surface waterbody within a short period of time.)

- Located in the immediate vicinity of, or nearby, the point of discharge into receiving waters.

- Located in the area of an MS4 where storm water BMPs are planned or are to be constructed.

The area in proximity to be searched/surveyed for listed species will vary with the size of the MS4, the nature and quantity of the storm water discharges, and the type of receiving waters. You should use the method(s) which allow you to determine, to the best of your knowledge, whether listed species are in proximity to your particular MS4. These methods may include:

- Conducting visual inspections. This method may be particularly suitable for MS4s that are smaller in size or MS4s located in non-natural settings such as highly urbanized areas where there is little or no natural habitat. For other MS4s, a visual survey may not be sufficient to determine whether listed species are in proximity.

- Contacting the nearest State Wildlife Agency or U.S. FWS offices. Many endangered and threatened species are found in well-defined areas or habitats. That information is frequently known to state or federal wildlife agencies.

- Contacting local/regional conservation groups such as natural heritage programs (see section H below). These groups inventory species and their locations and maintain lists of sightings and habitats.

- Conducting a formal biological survey. MS4s with extensive storm water discharges may choose to conduct biological surveys as the most effective way to assess whether listed species are located in proximity and whether there are likely adverse effects.

Step 2. Determine If You Can Meet Eligibility Criteria "B", "C", or "E"

Criterion B. You can certify eligibility, according to Criterion B, for coverage by this permit if you can answer "Yes" to all of the following questions:

- Has consultation, under ESA Section 7, already been completed for discharges from your MS4[3]?

- Did the previously completed ESA Section 7 consultation consider all currently listed species and critical habitat and address your storm water, allowable non-storm water, and discharge-related activities?

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[3] A formal or informal ESA Section 7 consultation on this or another federal action (e.g., New source review under NEPA, application for a dredge and fill permit under CWA Sec. 404, application for an individual NPDES permit, etc.) addressed the effects of your MS4 discharges and discharge-related activities on listed species and critical habitat. (See 50 CFR 402.13).

■ Did the ESA Section 7 consultation result in either a "no jeopardy" opinion by the Service (for formal consultations) or a concurrence by the Service that your activities would be "unlikely to adversely affect" listed species or critical habitat?

■ Do you agree to implement all measures upon which the consultation was conditioned?

If you answered "Yes" to all four questions above, you have met ESA eligibility Criteria B. Skip to Step 4.

If you answered "No" to any of the four questions above, check to see if you can meet Criteria C or E, or Go to Step 3.

Criterion C. You can certify eligibility, according to Criterion C, for coverage by this permit if you can answer "Yes" to all of the following questions:

■ Has an ESA Section 10 permit already been issued for discharges from your MS4[4]?

■ Does your ESA Section 10 Permit consider all currently listed species and critical habitat, and address your storm water, allowable non-storm water, and discharge related activities, for discharges from your MS4?

If you answered "Yes" to the two questions above, you have met ESA eligibility Criterion

C. Skip to Step 4.

If you answered "No" to either of the two questions above, check to see if you can meet Criterion E, or Go to Step 3.

Criterion E. You can certify eligibility, according to Criterion E, for coverage by this permit if you can answer "Yes" to all of the following questions:

■ Did another MS4 operator previously certify ESA eligibility for your MS4 area[5]?

■ Did the other operator's certification of eligibility consider all currently listed species and critical habitat and address your storm water, allowable non-storm water, and discharge related activities?

■ Do you agree to implement all measures upon which the other operator's certification was based?

Before you rely on another operator's certification, you should carefully review that certification along with any supporting information. You also need to confirm that no additional species have been listed or critical habitat designated in the area of your MS4 since the other operator's endangered species assessment was done. If you do not believe that the other operator's certification provides adequate coverage for your MS4, you should provide your own independent endangered species assessment and certification.

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[4] You have a permit under section 10 of the ESA and that authorization addresses the effects of your storm water discharges and discharge-related activities on listed species and critical habitat. You must follow FWS procedures when applying for an ESA section 10 permit (see 50 CFR 17.22(b)(1)).

[5] In order to meet the permit eligibility requirements by relying on another operator's certification of eligibility, the other operator's certification must apply to the location of your MS4 and must address the effects from your storm water discharges, allowable non-storm water discharges, and discharge-related activities on listed species and critical habitat.

If you answered "Yes" to all three questions above, you have met ESA eligibility Criteria

E. Skip to Step 4.

If you answered "No" to any of the three questions above, Go to Step 3.

Step 3. Determine If You Can Meet Eligibility Criterion "D"

Criterion D. You can certify eligibility, according to Criterion D, for coverage by this permit if you can answer "Yes" to all of the following questions:

- Have you determined that your MS4's storm water discharges, allowable non-storm water discharges, and discharge-related activities are "not likely to adversely affect" listed species or critical habitat, and/or have you reached agreement with the U.S. FWS or NMFS on measures to avoid, eliminate, or minimize adverse affects?

- Do you agree to implement all measures upon which the determination was conditioned?

Use the guidance below to understand adverse effect determinations, and to answer these questions.

If you answered "Yes" to the both questions above, you have met ESA eligibility Criterion D. Go to Step 4.

If you answered "No" to either of the questions above you are not eligible for coverage by this permit. You must submit an individual application for your discharges to EPA. (See 40 CFR 122.33(b)(2))

If you are unable to certify eligibility under Criterion A, B, C, or E, you must assess whether your storm water discharges, allowable non-storm water discharges, and discharge-related activities are likely to adversely affect listed species or critical habitat. "Storm water discharge-related activities" include: activities which cause, contribute to, or result in point source storm water pollutant discharges; and measures to control storm water discharges and allowable non-storm water discharges including the siting, construction, operation of best management practices (BMPs) to control, reduce or prevent water pollution. Please be aware that no protection from incidental takings liability is provided under this criterion.

The scope of effects to consider will vary with each MS4. If you are having difficulty in determining whether your MS4 is likely to cause adverse effects to a listed species or critical habitat, you should contact the appropriate office of the FWS, NMFS, or Natural Heritage Program for assistance. In order to complete the determination of effects it may be necessary to follow the consultation procedures in section 7 of the ESA. (See Criterion B information above, and section 7 consultation web link in section F below).

Upon completion of your assessment, document the results of your effects determination. If adverse effects are not likely, you are eligible under criterion "D" - proceed to Step 4 of this Addendum. Your determination may be based on measures that you implement to avoid, eliminate, or minimize adverse affects.

If the determination is "May Adversely Affect." You must contact the FWS and/or NMFS to discuss your findings and measures you could implement to avoid, eliminate, or minimize adverse affects. If you and the Service(s) reach agreement on measures to avoid adverse effects, you are eligible under criteria "D". Any terms and/or conditions to protect listed species and critical habitat that you relied on in order to complete an adverse effects determination, must be incorporated into your Storm Water Management Program (required by the permit) and implemented in order to maintain permit eligibility.

If endangered species issues cannot be resolved. If you cannot reach agreement with the Services on measures to avoid, eliminate, or reduce adverse effects, and the likely adverse effects cannot be otherwise addressed through meeting the other criteria , then you are not eligible for coverage under this general permit. You must seek coverage under an individual permit.

Effects from storm water discharges, allowable non-storm water discharges, and discharge-related activities which could pose an adverse effect include:

■ *Hydrological*. Storm water discharges may cause siltation, sedimentation or induce other changes in receiving waters such as temperature, salinity or pH. These effects will vary with the amount of storm water discharged and the volume and condition of the receiving water. Where a discharge constitutes a minute portion of the total volume of the receiving water, adverse hydrological effects are less likely.

■ *Habitat*. Excavation, site development, grading, and other surface disturbance activities, including the installation or placement of storm water ponds or BMPs, may adversely affect listed species or their habitat. Storm water associated with MS4 operation may drain or inundate listed species habitat.

■ *Toxicity*. In some cases, pollutants in storm water may have toxic effects on listed species.

Step 4. Submit Notice of Intent and Document Results of the Eligibility Determination.

Once the ESA eligibility requirements have been met, and you have determined NHPA eligibility (see Addendum B), you may submit the Notice of Intent (NOI). Signature and submittal of the NOI constitutes your certification, under penalty of law, of your eligibility for permit coverage.

You must include documentation of ESA eligibility in the storm water management program required for the MS4. Documentation required for the various ESA eligibility criteria are as follows:

Criterion A: A copy of the most current county species list pages for the county(ies) where your MS4 and discharges are located. You must also include a statement on how you determined that no listed species or critical habitat are in proximity to your MS4 or MS4 discharge locations.

Criterion B: A copy of the Service's biological opinion or concurrence on a finding of "unlikely to adversely effect" regarding the ESA Section 7 consultation.

Criterion C: A copy of the Service's letter transmitting the ESA Section 10 authorization.

Criterion D: Documentation on how you determined adverse effects on listed species and critical habitat were unlikely.

Criterion E: A copy of the documents originally used by the other operator of your MS4 (or area including your MS4) to satisfy the documentation requirement of Criteria A, B, C or D.

E. Duty To Implement Terms and Conditions Upon Which Eligibility Was Determined

You must comply with any terms and conditions imposed under the ESA eligibility requirements to ensure that your storm water discharges, allowable non-storm water discharges, and discharge-related activities do not pose adverse effects or jeopardy to listed species and/or critical habitat. You must incorporate such terms and conditions into your MS4's Storm Water Management Program as required by the permit. If the ESA eligibility requirements of Part I.E cannot be met, then you may not receive coverage under this permit, and must apply for an individual permit.

F. U.S. Fish and Wildlife Service Offices

National Websites For Endangered Species Information.
Endangered Species Home page: http://endangered.fws.gov/
ESA Section 7 Consultations: http://endangered.fws.gov/consultations/index.html

U.S. FWS Region 5
Division Chief, Endangered Species
U.S. Fish and Wildlife Service
ARD Ecological Services
300 Westgate Center Drive
Hadley, MA 01035-9589

Regional, State, Field and Project Offices
Project Leader, USFWS
Rhode Island Field Office
Shoreline Plaza, Rt 1A
P.O. Box 307
Charlestown, RI 02813

Project Leader, USFWS
Maine Field Office
1033 South Main Street
Old Town, ME 04468

Project Leader, USFWS
New England Field Office
22 Bridge Street, Unit #1
Concord, NH 03301-4986

Project Leader, USFWS
Vermont Field Office
11 Lincoln Street
Winston Prouty Federal Building
Essex Junction, VT 05452

G. National Marine Fisheries Services

Website: http://www.nmfs.gov

Regional Office
Protected Resource Program
National Marine Fisheries Service
Northeast Region
One Blackburn Drive
Gloucester, MA 01930

Field Offices
Milford Field Office
National Marine Fisheries Service
212 Rogers Avenue
Milford, CT 06460

Protected Species Branch
NMFS
Northeast Fisheries Science Center
166 Water Street
Woods Hole, MA 02543

H. Natural Heritage Network

The Natural Heritage Network comprises 75 independent heritage program organizations located in all 50 states, 10 Canadian provinces, and 12 countries and territories located throughout Latin America and the Caribbean. These programs gather, manage, and distribute detailed information about the biological diversity found within their jurisdictions. Developers, businesses, and public agencies use natural heritage information to comply with environmental laws and to improve the environmental sensitivity of economic development projects. Local governments use the information to aid in land use planning.

The Natural Heritage Network is overseen by NatureServe, the Network's parent organization, and is accessable on-line at: http://www.natureserve.org/nhp/us_programs.htm, which provides website and other access to a large number of specific biodiversity centers.

Connecticut Natural Diversity Database
Natural Resources Center
Department of Environmental Protection

79 Elm Street, Store Level
Hartford, CT 06106

Maine Natural Areas Program
Department of Conservation
93 State House Station
Augusta, ME 04333
http://www.state.me.us/doc/mnap/home.htm

Massachusetts Natural Heritage & Endangered Species Program
Division of Fisheries and Wildlife
Route 135
Westborough, MA 01581
508/792-7270

New Hampshire Natural Heritage Inventory
Department of Resources & Economic Development
172 Pembroke Street, P.O. Box 30370
Concord, NH 03302
603/271-3623

Rhode Island Natural Heritage Program
Department of Environmental Management
Division of Planning & Development
83 Park Street
Providence, RI 02903
401/277-2776

Vermont Non-game & Natural Heritage Program
Vermont Fish & Wildlife Department
103 South Main Street, 10 South
Waterbury, VT 05671-0501
802/241-3700

Addendum B
Historic Properties Guidance

Applicants must determine whether their MS4's storm water discharges, allowable non-storm water discharges, or construction of best management practices (BMPs) to control such discharges, has potential to affect a property that is either listed or eligible for listing on the National Register of Historic Places.

For existing dischargers who do not need to construct BMPs for permit coverage, a simple visual inspection may be sufficient to determine whether historic properties are affected. However, for MS4s which are new storm water dischargers and for existing MS4s which are planning to construct BMPs for permit eligibility, applicants should conduct further inquiry to determine whether historic properties may be affected by the storm water discharge or BMPs to control the discharge. In such instances, applicants should first determine whether there are any historic properties or places listed on the National Register or if any are eligible for listing on the register (e.g., they are "eligible for listing").

EPA suggests that applicants first access the "National Register of Historic Places" information listed on the National Park Service's web page: http://www.cr.nps.gov/nr. The addresses for State Historic Preservation Officers are listed in Part II of this addendum. Applicants may also contact city, county or other local historical societies for assistance, especially when determining if a place or property is eligible for listing on the register.

The following three scenarios describe how applicants can meet the permit eligibility criteria for protection of historic properties under this permit:

(1) If historic properties are not identified in the path of an MS4's storm water and allowable non-storm water discharges or where construction activities are planned to install BMPs to control such discharges (e.g., diversion channels or retention ponds), then the applicant has met the NHPA eligibility criteria of this permit.

(2) If historic properties are identified but it is determined that they will not be affected by the discharges or construction of BMPs to control the discharge, the applicant has met the NHPA eligibility criteria of this permit.

(3) If historic properties are identified in the path of an MS4's storm water and/or allowable non-storm water discharges or where construction activities are planned to install BMPs to control such discharges, and it is determined that there is the potential to adversely affect the property, the applicant can still meet the NHPA eligibility criteria under of this permit, if he/she obtains and complies with a written agreement with the appropriate State or Tribal Historic Preservation Officer which outlines measures the applicant will follow to mitigate or prevent those adverse effects. The contents of such a written agreement must be included in the MS4's Storm Water Management Program.
In situations where an agreement cannot be reached between an applicant and the State Historic Preservation Officer, applicants should contact the Advisory Council on Historic Preservation listed in Part III of this Addendum for assistance.

The term "adverse effects" includes but is not limited to damage, deterioration, alteration or destruction of the historic property or place. EPA encourages applicants to contact the appropriate State or Tribal Historic Preservation Officer as soon as possible in the event of a potential adverse effect to a historic property. Applicants are reminded that they must comply with applicable State, Tribal and local laws concerning the protection of historic properties and places.

A. Internet Information on the National Register of Historic Places

The National Register of Historic Places is the Nation's official list of cultural resources worthy of preservation. Authorized under the National Historic Preservation Act of 1966, the National Register is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect our historic and archeological resources. Properties listed in the Register include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archeology, engineering, and culture. The National Register is administered by the National Park Service, which is part of the U.S. Department of the Interior.

An electronic listing of the ``National Register of Historic Places," as maintained by the National Park Service, can be accessed on the Internet at: http://www.cr.nps.gov/nr

B. State Historic Preservation Officers (SHPO)

Connecticut Historical Commission
59 South Prospect Street
Hartford, CT 06106
860/566-3005

Maine Historic Preservation Commission
55 Capital Street, Station 65
Augusta, ME 04333
207/287-2132

Massachusetts Historical Commission
220 Morrissey Boulevard

Boston, MA 02125
617/727-8470
TTD: 1-800-392-6090

New Hampshire Division of Historic Resources
P.O. Box 2043
Concord, NH 03302-2043
603/271-6435
TDD: 1-800-735-2964
Rhode Island Historic Preservation & Heritage Commission
Old State House
150 Benefit Street
Providence, RI 02903
401/222-2678

Vermont Division for Historic Preservation
National Life Building, Drawer 20
Montpelier, VT 05620-0501
802/828-3211

C. Advisory Council on Historic Preservation

The Advisory Council on Historic Preservation (ACHP) is an independent Federal agency that promotes the preservation, enhancement, and productive use of our Nation's historic resources, and advises the President and Congress on national historic preservation policy.

The goal of the National Historic Preservation Act (NHPA), which established ACHP in 1966, is to have Federal agencies act as responsible stewards of our Nation's resources when their actions affect historic properties. ACHP is the only entity with the legal responsibility to encourage Federal agencies to factor historic preservation into Federal project requirements.

As directed by NHPA, ACHP serves as the primary Federal policy advisor to the President and Congress; recommends administrative and legislative improvements for protecting our Nation's heritage; advocates full consideration of historic values in Federal decision making; and reviews Federal programs and policies to promote effectiveness, coordination, and consistency with national preservation policies.

Main Office

Advisory Council on Historic Preservation
Old Post Office Building
1100 Pennsylvania Avenue, NW, Suite 809
Washington, DC 20004
Phone: (202) 606-8503
Fax: (202) 606-8647/8672
E-mail: achp@achp.gov
Internet: http://www.achp.gov/