

**TOWN OF HAMDEN
2017 STORMWATER MANAGEMENT PLAN
ENGINEERING DEPARTMENT- JANUARY 2018
JOB 18002**

Table of Contents

Section A	Overview of Plan and Contact Information
Section B	Summary of Plan Contents
Section C	Details of Minimum Control Measures, BMPs and work performed
Section D	Responsible Party Assignments

Section A

For questions regarding this report contact:

Date Prepared: 01/18/18

Mark Austin, Town Engineer
Hamden Government Center, 2750 Dixwell Ave
Hamden, Connecticut 06518

Stormwater Program Permit Information

1. **Permitting Authority:** CT DEEP
2. **Permit Number:** GSM000102
3. **Permit Type:** General
4. **Permit Name:** Town of Hamden Stormwater Management Plan
5. **Date Issue:** 01/20/2016
6. **Date Expire:** 06/30/2022

General Information for MS4 Operator

1. **Operator Name:** Curt Balzano Leng
2. **Operator Title:** Mayor
3. **Represented Entity:** Town of Hamden
4. **Mailing Address:** Hamden Government Center, 2750 Dixwell Ave.
5. **Mail City, State, Zip:** Hamden, CT 06518
6. **Phone Number:** (203) 287-7100
7. **E-Mail Address:** cleng@hamden.com
8. **Co-Permitting With:** N/A
9. **Population:** 62,000 **Households:** 26,000 **Area (sq mi):** 33
10. **Official Website:** <http://www.hamden.com>

General Information for Primary Contact Person

1. **Name:** Mark Austin
2. **Title:** Town Engineer
3. **Phone Number:** (203) 287-7044
4. **E-Mail Address:** maustin@hamden.com

General Information for Secondary Contact Person

1. **Name:** Joseph Colello
2. **Title:** Superintendent of Storm Water and Transfer Station
3. **Phone Number:** 203-287-2600
4. **E-Mail Address:** jcoello@hamden.com

General Information for Receiving Waters

Receiving Water Lists: Listed below are all the identified receiving waterbodies to which identified outfalls discharge.

Receiving Streams (creek, stream, river, etc.)	Receiving Waterbodies (lake, wetland, ocean, etc.)	Receiving Watersheds
Mill River	Lake Whitney	Quinnipiac River Basin
Shepard Brook	Wetlands	West River Basin
Eaton Brook	Willow Brook Basin	
Brookdale Stream	Mill River Basin	
Jepp Brook	Wintergreen Brook Basin	
Willow Brook	South Central Shoreline Basin	
Farm Brook		
West Branch Farm Brook		
Belden Brook		
Quinnipiac River		
Wintergreen Brook		

Section B

Plan Contents Summary

The Stormwater Management Plan consists of the following Minimum Control Measures and BMPs:

Minimum Control Measures and BMPs

Public Education and Outreach	Earliest Start	End date
6.a.1.1 Distribute Literature at Town Offices	07/01/2017	06/30/2022
6.a.1.2 Educate Residents on Septic System Maintenance, Pet Waste, Fertilization, Herbicides and Pesticides, Illicit Discharge	07/01/2017	06/30/2022
6.a.1.3 Provide School Programs/Literature for Students	07/01/2017	06/30/2022
6.a.1.4 River Cleanups	07/01/2017	06/30/2022
6.a.1.5 Review Education Materials	07/01/2017	06/30/2022
6.a.1.6 Storm Drain Stenciling	07/01/2017	06/30/2022
6.a.1.7 Regional Outreach and Education	07/01/2017	06/30/2022
6.a.1.8 Website Modifications	07/01/2017	06/30/2022
Public Participation/Involvement		
6.a.2.1 Establish Stormwater Committee	07/01/2017	06/30/2022
6.a.2.2 Public Notice Requirements for Stormwater Management Plan	07/01/2017	06/30/2022
6.a.2.3 Develop Informational Strategies to Develop Partnerships With Other Governmental and Non-Governmental Entities	07/01/2017	06/30/2022
6.a.2.4 Service Request Tracking System	07/01/2017	06/30/2022
6.a.2.5 Hazardous Waste Collection	07/01/2017	06/30/2022
6.a.2.6 Adopt any Required Changes to the Ordinance to Address Illicit Discharges	07/01/2017	06/30/2022
Illicit Discharge Detection and Elimination (IDDE)		
6.a.3.1 Develop IDDE Program	07/01/2017	06/30/2022
6.a.3.10 Review Existing Town Ordinances	07/01/2017	06/30/2022
6.a.3.11 Investigate Outfalls	07/01/2017	06/30/2022
6.a.3.2 Outfall Sampling – Phase I	07/01/2017	06/30/2022
6.a.3.3 Outfall Sampling – Phase II	07/01/2017	06/30/2022

Construction Site Storm Water Management

6.a.4.1 Plan Review Procedures - Phase I	07/01/2017	06/30/2022
6.a.4.2 Interdepartmental Coordination	07/01/2017	06/30/2022
6.a.4.3 Construction Inspection	07/01/2017	06/30/2022
6.a.4.4 Public Involvement	07/01/2017	06/30/2022
6.a.4.5 Notification of Site Developers and Operators	07/01/2017	06/30/2022
6.a.4.6 Enforcement	07/01/2017	06/30/2022

Post-Construction Storm Water Management

6.a.5.1 Long-Term Post Construction Plan Phase - I	07/01/2017	06/30/2022
6.a.5.2 Regulations for Post Construction Runoff - Phase II	07/01/2017	06/30/2022
6.a.5.3 DCIA Mapping	07/01/2017	06/30/2022

Pollution Prevention/Good Housekeeping

6.a.6.1 Municipal Employee Training	07/01/2017	06/30/2022
6.a.6.10 Work Order Management System	07/01/2017	06/30/2022
6.a.6.11 Street Sweeping Activities-Phase I	07/01/2017	06/30/2022
6.a.6.2 Catch Basin Cleaning/Repairs-Phase I	07/01/2017	06/30/2022
6.a.6.3 Pest Management Plan	07/01/2017	06/30/2022
6.a.6.4 DCIA Disconnect Plan – Phase I	07/01/2017	06/30/2022
6.a.6.5 DCIA Disconnect Plan – Plan Phase II	07/01/2017	06/30/2022
6.a.6.6 Catch Basin Inspection	07/01/2017	06/30/2022
6.a.6.7 Snow Management	07/01/2017	06/30/2022
6a.6.8 Leaf Management	07/01/2017	06/30/2022

Section C

Public Education and Outreach

Descriptive Text:

To satisfy this minimum control measure, the operator of a regulated small MS4 needs to:

1. Implement a public education program to distribute educational materials to the community, or conduct equivalent outreach activities about the impacts of storm water discharges on local waterbodies and the steps that can be taken to reduce storm water pollution; and
2. Determine the appropriate best management practices (BMPs) and measurable goals for this minimum control measure.

An informed and knowledgeable community is crucial to the success of a storm water management program since it helps to ensure the following:

1. Greater support for the program as the public gains a greater understanding of the reasons why it is necessary and important. Public support is particularly beneficial when operators of small MS4s attempt to institute new funding initiatives for the program or seek volunteers to help implement the program; and
2. Greater compliance with the program as the public becomes aware of the personal responsibilities expected of them and others in the community, including the individual actions they can take to protect or improve the quality of area waters.

Number of BMPs associated with control measure: 8

Important Dates:

Earliest Start Date: 07/01/2017

End Date: 06/30/2022

Details of BMPs and Work Performed for Them

6.a.1.1 Distribute Literature at Town Offices

Responsible Party: Dan Kops, Town Planner

Start Date: 07/01/2017

End Date: 06/30/2022

Permits Years during which activities are scheduled:

Year 1 **X** Year 2 **X** Year 3 **X** Year 4 **X** Year 5 **X**

Name of Separate Implementing Entity:

Not Applicable

BMP Description:

Provide literature in the office of Planning and Zoning and the Library.

2017:

Literature is available in the office of Planning & Zoning and the Library.

Has Goal Been Accomplished: Continuously ongoing program

Work Performed

6.a.1.2 Educate Residents on Septic System Maintenance, Pet Waste, Fertilization, Herbicide and Pesticide, Illicit Discharges.

Responsible Party: Dan Kops, Town Planner

Start Date: 07/01/2017

End Date: 06/30/2022

Permits Years during which activities are scheduled:

Year 1 X Year 2 X Year 3 X Year 4 X Year 5 X

Name of Separate Implementing Entity: Quininiack Valley Health District (QVHD)

BMP Description:

Refer to QVHD literature and assistance. Distribute this and additional information as deemed appropriate by the Stormwater Committee.

2017:

Has Goal Been Accomplished: Continuously ongoing program

Work Performed

6.a.1.3 Provide School Programs/Literature for Students

Responsible Party: Jody Goeler, Superintendent of Schools

Start Date: 07/01/2017

End Date: 06/30/2022

Permits Years during which activities are scheduled:

Year 1 X Year 2 X Year 3 X Year 4 X Year 5 X

Name of Separate Implementing Entity:

Not Applicable

BMP Description:

Consider programs/literature that could be incorporated in environmental, biology and earth science classes.

2017:

The Hamden Public Schools science curriculum addresses watersheds and both river and storm water runoff. These topics are reflected in the Next Generation Science Standards (NGSS), adopted by the CSDE in 2015. In grade 4, the following performance is expected of students: "Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation. [Clarification Statement: Examples of variables to test could include angle of slope in the downhill movement of water, amount of vegetation, speed of wind, relative rate of deposition, cycles of freezing and thawing of water, cycles of heating and cooling, and volume of water flow.]" This standard is addressed during an in-depth unit on Land and Water, where, through investigation of a landslide, students explore erosion, runoff, weathering and permeability. At the high school level, the following performance is expected: "Plan and conduct an investigation of the properties of water and its effects on Earth materials and surface processes. (Emphasis is on mechanical and chemical investigations with water and a variety of solid materials to provide the evidence for connections between the hydrologic cycle and system interactions commonly known as the rock cycle. Examples of mechanical investigations include stream transportation and deposition using a stream table, erosion using variations in soil moisture content, or frost wedging by the expansion of water as it freezes.)" This standard is addressed in the high school Earth Science curriculum, which includes an in-depth study of watersheds. In AP Environmental Science, the curriculum includes runoff into local bodies of water, point and non-point solution, and salinity and density fluctuations through fresh water incursion.

Has Goal Been Accomplished: Continuously ongoing program

Work Performed

6.a.1.4 River Cleanups

Responsible Party: Haley Starvaggi; Recycling Coordinator

Start Date: 07/01/2017

End Date: 06/30/2022

Permits Years during which activities are scheduled:

Year 1 X Year 2 X Year 3 X Year 4 X Year 5 X

Name of Separate Implementing Entity:

Not Applicable

BMP Description:

List annually all cleanup operations - Mill River, Quininiac River, Earth Day, etc.

2017:

Project 365 is an extension of the Town’s annual National Night Out event, in which local volunteers join together to focus on areas of Hamden which are in need of pro-active community support. Volunteers performed such actions as litter removal, cutting down overgrown branches, and replacing top soil, along with other revitalization efforts. These efforts help protect the receiving streams, waterbodies, and watersheds of Hamden.

Has Goal Been Accomplished: Continuously ongoing program

Work Performed

6.a.1.5 Review Education Materials

Responsible Mark Austin, Town Engineer

Start Date: 07/01/2017

End Date: 06/30/2022

Permits Years during which activities are scheduled:

Year 1 **X** Year 2 **X** Year 3 **X** Year 4 **X** Year 5 **X**

Name of Separate Implementing Entity:

Not Applicable

BMP Description:

Review educational materials from DEEP, NEMO, EPA, etc.

2017:

Source material from EPA, Nemo and DEP reviewed and archived -

http://www.epa.gov/npdes/menuofbmeps/pub_ed.htm

<http://www.nemo.uconn.edu/links.htm>

<http://www.deep.state.ct.us/>

Has Goal Been Accomplished: YES, the website for the Engineering Department was updated in 2017.

Work Performed

6.a.1.6 Storm Drain Stenciling

Responsible Party: Craig Cesare, Director of Public Works & Parks

Start Date: 07/01/2018

End Date: 06/30/2022

Permits Years during which activities are scheduled:

Year 1 Year 2 **X** Year 3 **X** Year 4 **X** Year 5 **X**

Name of Separate Implementing Entity:

Not Applicable

BMP Description:

Stencil up to 500 catch basins per year.

Has Goal Been Accomplished: Continuously ongoing program

Work Performed

6.a.1.7 Regional Outreach and Education

Responsible Party: Haley Starvaggi, Recycling Coordinator

Start Date: 07/01/2017

End Date: 06/30/2022

Permits Years during which activities are scheduled:

Year 1**X** Year 2 **X** Year 3 **X** Year 4 **X** Year 5 **X**

Name of Separate Implementing Entity:

Not Applicable

BMP Description:

1. To raise awareness that polluted stormwater runoff is the most significant source of water quality problems.
2. To motivate residents to use Best Management Practices (BMP's) which reduce polluted stormwater runoff.
3. To reduce polluted stormwater runoff as a result of increased awareness and utilization of BMP's.

2017:

Water Seminar

Hamden's Clean & Green Commission hosted a free public seminar on Water Management. Speakers from Regional Water Authority and Save the Sound spoke about the drought in our area and what Hamden residents could do to protect our water sources. Handouts obtained from the New Haven Garden Club were also presented.

Hamden Earth Day Celebration

The 11th Annual Earth Day Celebration was held in April at the Hamden Middle School. This celebration draws 3500+ people each year. The 2017 family oriented celebration featured food, over 100 exhibitors promoting earth friendly services and products, organizations, and school exhibits. Sponsors of Hamden's Earth Day Celebration were: FRAMED, Covanta, DEXSIL, Hope Depot, Take 2, Inc. Paradise Nursery, Specialty Wire, Grove Street Financial, CT Humanities, Hindinger Farm, Dunbar United Church of Christ, and Stop and Shop.

The Regional Water Authority (RWA) continued to provide educational materials relating to HazWaste and Earth Day (April 2017) events. Additional support was provided by the Solid Waste and Recycling Commission and the Clean and Green Commission.

Has Goal Been Accomplished: Continuously ongoing program

Work Performed

6.a.1.8 Website Modifications

Responsible Party: Patrick Donnelly, Information and Research Officer

Start Date: 07/01/2017

End Date: 06/30/2022

Permits Years during which activities are scheduled:

Year 1 X	Year 2 X	Year 3 X	Year 4 X	Year 5 X
-----------------	-----------------	-----------------	-----------------	-----------------

Name of Separate Implementing Entity:

Not Applicable

BMP Description:

Include information about, and provide links to stormwater management on the Town web site. Review annually.

2017:

Links to EPA, DEEP and NEMO are available on the Town Web Site

Has Goal Been Accomplished: YES

Public Participation/Involvement

Descriptive Text:

To satisfy this minimum control measure, the operator of a regulated small MS4 must:

1. Comply with applicable State, Tribal, and local public notice requirements; and
2. Determine the appropriate best management practices (BMPs) and measurable goals for this minimum control measure.

EPA believes that the public can provide valuable input and assistance to a regulated small MS4's municipal storm water management program and, therefore, suggests that the public be given opportunities to play an active role in both the development and implementation of the program. An active and involved community is crucial to the success of a storm water management program because it allows for:

1. Broader public support since citizens who participate in the development and decision making process are partially responsible for the program and, therefore, may be less likely to raise legal challenges to the program and more likely to take an active role in its implementation;
2. Shorter implementation schedules due to fewer obstacles in the form of public and legal challenges and increased sources in the form of citizen volunteers;
3. A broader base of expertise and economic benefits since the community can be a valuable, and free, intellectual resource; and
4. A conduit to other programs as citizens involved in the storm water program development process provide important cross-connections and relationships with other community and government programs. This benefit is particularly valuable when trying to implement a storm water program on a watershed basis, as encouraged by EPA.

Number of BMPs associated with control measure: 6

Important Dates:

Earliest Start Date: 07/01/2017

End Date: 06/30/2022

Details of BMPs and Work Performed for Them

6.a.2.1 Establish Stormwater Committee

Responsible Party: David Garretson, Chief Administrative Officer

Start Date: 07/01/2017 End Date: 06/30/2022

Permits Years during which activities are scheduled:

Year 1 **X** Year 2 **X** Year 3 **X** Year 4 **X** Year 5 **X**

Name of Separate Implementing Entity:

Not Applicable

BMP Description:

Stormwater Committee consists of representatives from Engineering, Department of Public Works, Board of Education, Inland Wetlands, Mayor's Office, Planning & Zoning, Parks and Recreation and the Library.

Meetings will be held annually, at a minimum.

2017:

Has Goal Been Accomplished: NO

Work Performed

6.a.2.2 Public Notice Requirements for Stormwater Management Plan

Responsible Party: Mark Austin, Town Engineer

Start Date: 04/01/2017 End Date: 04/01/2018

Permits Years during which activities are scheduled:

Year 1 **X** Year 2 Year 3 Year 4 Year 5

Name of Separate Implementing Entity:

Not Applicable

BMP Description:

1. Public notices are made available for solicitation of comments on the draft SWMP. The notices are available on the town website, www.hamden.com, in the Town Engineer Office and the Town Libraries. A minimum of 30 days to solicit and receive public comments will be required.

Has Goal Been Accomplished: YES

Work Performed

6.a.2.3 Develop Informational Strategies to Develop Partnerships With Other Governmental and Non-Governmental Entities.

Responsible Party: Dan Kops, Town Planner

Start Date: 07/01/2017

End Date: 06/30/2022

Permits Years during which activities are scheduled:

Year 1 **X** Year 2 **X** Year 3 **X** Year 4 **X** Year 5 **X**

Name of Separate Implementing Entity:

Not Applicable

BMP Description:

Document meetings held with such entities as: Soil & Water Conservation District, RWA, and QVHD and communicate with on an as needed basis.

2017:

Conducts monthly development meetings for new potential applications before the land use boards.

Has Goal Been Accomplished: YES

Work Performed

6.a.2.4 Service Request Tracking System

Responsible Party: David Garretson, Chief Administrative Officer

Start Date: 07/01/2017

End Date: 06/30/2022

Permits Years during which activities are scheduled:

Year 1 **X** Year 2 **X** Year 3 **X** Year 4 **X** Year 5 **X**

Name of Separate Implementing Entity:

Not Applicable

BMP Description:

Town has switched from the Q-alert system to the SeeClickFix platform to track town wide storm water service requests.

Has Goal Been Accomplished: YES

Work Performed

6.a.2.5 Hazardous Waste Collection

Responsible Party: Haley Starvaggi, Recycling Coordinator

Start Date: 07/01/2017

End Date: 06/30/2022

Permits Years during which activities are scheduled:

Year 1 **X** Year 2 **X** Year 3 **X** Year 4 **X** Year 5 **X**

Name of Separate Implementing Entity:

Not Applicable

BMP Description:

1. Identify the number of annual waste collection events
2. Quantify the collection in some manner.

2017:

Hamden Residents have access to HazWaste Central on Saturdays 9 a.m. to noon, from mid-May through October (closed major holiday weekends) for proper disposal of their household hazardous waste chemicals and products, i.e. oil-based paint, paint thinners/strippers, cleaners/polishes, pesticides, fertilizers, kerosene, gasoline, batteries, waste oil, mercury, etc. During FY16/17, 661 Hamden households participated in HazWaste Central, amounting to more than 9,000 lbs. of hazardous waste collected.

Electronics Recycling

During FY16/17, in accordance with state regulations, Take2 Inc. collected 112 tons of electronics from the electronics recycling container at Hamden's Transfer Station at no charge to the Town of Hamden.

Has Goal Been Accomplished: Continuously ongoing program

Work Performed

6.a.2.6 Adopt any Required Changes to the Ordinance to Address Illicit Discharges

Responsible Party: Mark Austin, Town Engineer

Start Date: 07/01/2019 End Date: 06/30/2019

Permits Years during which activities are scheduled:

Year 1	Year 2	Year 3 X	Year 4	Year 5
--------	--------	-----------------	--------	--------

Name of Separate Implementing Entity:

Not Applicable

BMP Description:

2017:

Has Goal Been Accomplished: NO

Illicit Discharge Detection and Elimination

Descriptive Text:

Recognizing the adverse effects illicit discharges can have on receiving waters, the final rule requires an operator of a regulated small MS4 to develop, implement and enforce an illicit discharge detection and elimination program. This program must include the following:

1. A storm sewer system map, showing the location of all outfalls and the names and location of all waters of the United States that receive discharges from those outfalls;
2. Through an ordinance, or other regulatory mechanism, a prohibition (to the extent allowable under State, Tribal, or local law) on non-storm water discharges into the MS4, and appropriate enforcement procedures and actions;
3. A plan to detect and address non-storm water discharges, including illegal dumping, into the MS4;
4. The education of public employees, businesses, and the general public about the hazards associated with illegal discharges and improper disposal of waste;
5. The determination of appropriate best management practices (BMPs) and measurable goals for this minimum

control measure. Discharges from MS4s often include wastes and wastewater from non-storm water sources. A study conducted in 1987 in Sacramento, California, found that almost one-half of the water discharged from a local MS4 was not directly attributable to precipitation runoff. A significant portion of these dry weather flows were from illicit and/or inappropriate discharges and connections to the MS4. Illicit discharges enter the system through either direct connections (e.g., waste water piping either mistakenly or deliberately connected to the storm drains) or indirect connections (e.g., infiltration into the MS4 from cracked sanitary systems, spills collected by drain outlets, or paint or used oil dumped directly into a drain). The result is untreated discharges that contribute high levels of pollutants, including heavy metals, toxics, oil and grease, solvents, nutrients, viruses, and bacteria to receiving waterbodies. Pollutant levels from these illicit discharges have been shown in EPA studies to be high enough to significantly degrade receiving water quality and threaten aquatic, wildlife, and human health.

Number of BMPs associated with control measure: 5

Important Dates:

Earliest Start Date: 07/01/2018 End Date: 06/30/2022

Details of BMPs and Work Performed for Them

6.a.3.1 Develop IDDE Program

Responsible Party: Mark Austin, Town Engineer

Start Date: 07/01/2018 End Date: 06/30/2022

Permits Years during which activities are scheduled:

Year 1	Year 2 X	Year 3 X	Year 4 X	Year 5 X
--------	-----------------	-----------------	-----------------	-----------------

Name of Separate Implementing Entity:

Not Applicable

BMP Description:

Establish legal authority to eliminate illicit discharges

Has Goal Been Accomplished: NO

Work Performed

6.a.3.10 Review Existing Town Ordinances

Responsible Party: Mark Austin, Town Engineer

Start Date: 07/01/2018 End Date: 06/30/2019

Permits Years during which activities are scheduled:

Year 1	Year 2 X	Year 3	Year 4	Year 5
--------	-----------------	--------	--------	--------

Name of Separate Implementing Entity:

Not Applicable

BMP Description:

Review existing Town Ordinances and Land Use Regulations to determine if revisions are necessary.

Has Goal Been Accomplished: NO

Work Performed

6.a.3.11 Investigate Outfalls

Responsible Party: Mark Austin, Town Engineer

Start Date: 07/01/2018 End Date: 06/30/2022

Permits Years during which activities are scheduled:

Year 1 Year 2 **X** Year 3 **X** Year 4 **X** Year 5 **X**

Name of Separate Implementing Entity:

Not Applicable

BMP Description:

Develop list and maps of all MS4 outfall. Determine highest priority discharges.

Has Goal Been Accomplished: NO

Work Performed

6.a.3.2 Outfall Sampling – Phase I

Responsible Party: Mark Austin, Town Engineer

Start Date: 07/01/2019

End Date: 06/30/2022

Permits Years during which activities are scheduled:

Year 1 Year 2 Year 3 **X** Year 4 **X** Year 5 **X**

Name of Separate Implementing Entity:

Not Applicable

BMP Description:

Complete dry weather screening and sampling. Complete 80% of investigations for problem catchments.

Has Goal Been Accomplished: NO

Work Performed

6.a.3.3 Outfall Sampling – Phase II

Responsible Party: Mark Austin, Town Engineer

Start Date: 07/01/2021

End Date: 06/30/2022

Permits Years during which activities are scheduled:

Year 1 Year 2 Year 3 Year 4 Year 5 **X**

Name of Separate Implementing Entity:

Not Applicable

BMP Description:

Complete 100% of investigations for problem catchments of 40% of all catchments.

Has Goal Been Accomplished: NO

Construction Site Storm Water Management

Descriptive Text:

The four minimum control measure Phase II requires an operator of a regulated small MS4 to develop, implement, and enforce a program to reduce pollutants in storm water runoff to their MS4 from construction activities

that result in a land disturbance.

The small MS4 operator is required to:

1. Have an ordinance or other regulatory mechanism requiring the implementation of proper erosion and sediment controls, and controls for other wastes, on applicable construction sites, which are consistent with the 2002 guidelines for soil erosion and sedimentation control;
2. Have procedures for site plan review of construction plans that consider potential water quality impacts;
3. Have procedures for site inspection and enforcement of control measures;
4. Have sanctions to ensure compliance (established in the ordinance or other regulatory mechanism);
5. Establish procedures for the receipt and consideration of information submitted by the public; and
6. Determine the appropriate best management practices (BMPs) and measurable goals for this minimum control measure.

Polluted storm water runoff from construction sites often flows to MS4s and ultimately is discharged into local rivers and streams. Of the pollutants listed in Table 1, sediment is usually the main pollutant of concern. 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 forest lands. During 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 contribution of other pollutants from construction sites, can cause physical, chemical, and biological harm to our nation's waters. For example, excess sediment can quickly fill rivers and lakes, requiring dredging and destroying aquatic habitats.

Table 1
Pollutants Commonly Discharged From Construction Sites

- Sediment
- Solid and sanitary wastes
- Phosphorous (fertilizer)
- Nitrogen (fertilizer)
- Pesticides
- Oil and grease
- Concrete truck washout

Number of BMPs associated with control measure: 6

Important Dates:

Earliest Start Date: 07/01/2017

End Date: 06/30/2022

Details of BMPs and Work Performed for Them

6.a.4.1 Plan Review Procedures - Phase I

Responsible Party: Mark Austin, Town Engineer

Start Date: 07/01/2017 End Date: 06/30/2018

Permits Years during which activities are scheduled:

Year 1 X	Year 2	Year 3	Year 4	Year 5
-----------------	--------	--------	--------	--------

Name of Separate Implementing Entity:

Regional Water Authority

BMP Description:

Develop procedures for plan reviews that incorporate consideration of potential water quality impacts and storm water management plans.
Town Department reviews will be supplemented by review by the Regional Water Authority.

Has Goal Been Accomplished: YES

Work Performed

6.a.4.2 Interdepartmental Coordination

Responsible Party: Dan Kops, Town Planner
Start Date: 07/01/2017 End Date: 06/30/2018
Permits Years during which activities are scheduled:

Year 1 **X** Year 2 Year 3 Year 4 Year 5

Name of Separate Implementing Entity:
Not Applicable
BMP Description:
Develop and implement coordination between town departments.

Has Goal Been Accomplished: Ongoing Program

Work Performed

6.a.4.3 Construction Inspection

Responsible Party: Dan Kops, Town Planner
Start Date: 07/01/2017 End Date: 06/30/2022
Permits Years during which activities are scheduled:

Year 1 **X** Year 2 **X** Year 3 **X** Year 4 **X** Year 5 **X**

Name of Separate Implementing Entity:
Not Applicable
BMP Description:
Perform site inspections.

Has Goal Been Accomplished: Ongoing Program

Work Performed

6.a.4.4 Public Involvement

Responsible Party: Dan Kops, Town Planner
Start Date: 07/01/2017 End Date: 06/30/2022
Permits Years during which activities are scheduled:

Year 1 **X** Year 2 **X** Year 3 **X** Year 4 **X** Year 5 **X**

Name of Separate Implementing Entity:
Not Applicable
BMP Description:
Establish format to involve public.

Has Goal Been Accomplished: Ongoing Program

Work Performed

6.a.4.5 Notification of Site Developers and Operators

Responsible Party: Dan Kops, Town Planner

Start Date: 07/01/2017

End Date: 06/30/2018

Permits Years during which activities are scheduled:

Year 1 **X** Year 2 Year 3 Year 4 Year 5

Name of Separate Implementing Entity:

Not Applicable

BMP Description:

Fact sheets from the CT DEP and the New England Chapter of the EPA for builders and construction personnel are now available in the Office of Planning and Zoning. All applicants are encouraged to take the forms. We continue to refer builders and construction personnel to the Connecticut Stormwater Quality manual for guidelines to follow and encourage them to maintain a copy on site during the construction process.

Has Goal Been Accomplished: YES

Work Performed

6.a.4.6 Enforcement

Responsible Party: Dan Kops, Town Planner

Start Date: 07/01/2019

End Date: 06/30/2020

Permits Years during which activities are scheduled:

Year 1 Year 2 Year 3 **X** Year 4 Year 5

Name of Separate Implementing Entity:

Not Applicable

BMP Description:

Implement, upgrade and enforce legal authority regarding land disturbance and development.

Has Goal Been Accomplished: NO

Post-Construction Storm Water Management

Descriptive Text:

The Phase II Final Rule requires an operator of a regulated small MS4 to develop, implement, and enforce a program to reduce pollutants in post-construction runoff to their MS4 from new development and redevelopment projects that result in the land disturbance of greater than or equal to 1 acre. The small MS4 operator is required to:

1. Develop and implement strategies, which include a combination of structural and/or non-structural best management practices (BMPs);
2. Have an ordinance or other regulatory mechanism requiring the implementation of post-construction runoff controls to the extent allowable under State, Tribal or local law,
3. Ensure adequate long-term operation and maintenance of controls;
4. Determine the appropriate best management practices (BMPs) and measurable goals for this minimum control measure.

Post-construction storm water management in areas undergoing new development or redevelopment is necessary because runoff from these areas has been shown to significantly effect receiving waterbodies. Many studies indicate that prior planning and design for the minimization of pollutants in post-construction storm water discharges is the most cost-effective approach to storm water quality management.

There are generally two forms of substantial impacts of post-construction runoff. The first is caused by an increase in the type and quantity of pollutants in storm water runoff. As runoff flows over areas altered by development, it picks up harmful sediment and chemicals such as oil and grease, pesticides, heavy metals, and nutrients (e.g., nitrogen and phosphorus). These pollutants often become suspended in runoff and are carried to receiving waters, such as lakes, ponds, and streams. Once deposited, these pollutants can enter the food chain through small aquatic life, eventually entering the tissues of fish and humans. The second kind of post-construction runoff impact occurs by increasing the quantity of water delivered to the waterbody during storms. Increased impervious surfaces interrupt the natural cycle of gradual percolation of water through vegetation and soil. Instead, water is collected from surfaces such as asphalt and concrete and routed to drainage systems where large volumes of runoff quickly flow to the nearest receiving water. The effects of this process include stream bank scouring and downstream flooding, which often lead to a loss of aquatic life and damage to property.

Number of BMPs associated with control measure: 3

Important Dates:

Earliest Start Date: 07/01/2019

End Date: 06/30/2020

Details of BMPs and Work Performed for Them

6.a.5.1 Long-Term Post Construction Plan – Phase I

Responsible Party: Dan Kops, Town Planner

Start Date: 07/01/2019

End Date: 06/30/2020

Permits Years during which activities are scheduled:

Year 1 Year 2 Year 3 **X** Year 4 Year 5

Name of Separate Implementing Entity:

Not Applicable

BMP Description:

Establish/implement long term construction and maintenance plan for retention/detention basins and storm water treatment structure.

Has Goal Been Accomplished: NO

Work Performed

6.a.5.2 Regulations for Post Construction Runoff - Phase II

Responsible Party: Dan Kops, Town Planner

Start Date: 07/01/2019

End Date: 06/20/2020

Permits Years during which activities are scheduled:

Year 1 Year 2 Year 3 **X** Year 4 Year 5

Name of Separate Implementing Entity:

Not Applicable

BMP Description:

Develop and adopt language in the land use regulations relative to Post-Construction Runoff Controls to include low impact development, post-construction and storm water retention.

Use Regulations and Engineering Standards.

2017:

Has Goal Been Accomplished: NO

Work Performed

6.a.5.3 DCIA Mapping

Responsible Party: Mark Austin, Town Engineer

Start Date: 07/01/2019

End Date: 06/30/2022

Permits Years during which activities are scheduled:

Year 1 Year 2 Year 3 **X** Year 4 **X** Year 5 **X**

Name of Separate Implementing Entity:

Not Applicable

BMP Description:

Establish plan for mapping DCIA

Has Goal Been Accomplished: NO

Pollution Prevention and Good Housekeeping

Descriptive Text:

Recognizing the benefits of pollution prevention practices, the rule requires an operator of a regulated small MS4 to:

1. Develop and implement an operation and maintenance program with the ultimate goal of preventing or reducing pollutant runoff from municipal operations into the storm sewer system;
2. Include employee training on how to incorporate pollution prevention/good housekeeping techniques into municipal operations such as park and open space maintenance, fleet and building maintenance, new construction and land disturbances, and storm water system maintenance. To minimize duplication of effort and conserve resources, the MS4 operator can use training materials that are available from EPA, their State or Tribe, or relevant organizations;
3. Determine the appropriate best management practices (BMPs) and measurable goals for this minimum control measure.

The Pollution Prevention/Good Housekeeping for municipal operations minimum control measure is a

key element of the small MS4 storm water management program. This measure requires the small MS4 operator to examine and subsequently alter their own actions to help ensure a reduction in the amount and type of pollution that: (1) collects on streets, parking lots, open spaces, and storage and vehicle maintenance areas and is discharged into local waterways; and (2) results from actions such as environmentally damaging land development and flood management practices or poor maintenance of storm sewer systems. While this measure is meant primarily to improve or protect receiving water quality by altering municipal or facility operations, it also can result in a cost savings for the small MS4 operator, since proper and timely maintenance of storm sewer systems can help avoid repair costs from damage caused by age and neglect.

Number of BMPs associated with control measure: 16

Important Dates:

Earliest Start Date: 07/01/2017

End Date: 06/30/2022

Details of BMPs and Work Performed for Them

6.a.6.1 Municipal Employee Training

Responsible Party: Craig Cesare, Director of Public Works & Parks

Start Date: 07/01/2017

End Date: 06/30/2018

Permits Years during which activities are scheduled:

Year 1 **X** Year 2 Year 3 Year 4 Year 5

Name of Separate Implementing Entity:

Not Applicable

BMP Description:

Continue storm water compliance training program.

Has Goal Been Accomplished: YES

Work Performed

6.a.6.10 Work Order Management System

Responsible Party: Craig Cesare, Director of Public Works & Parks

Start Date: 07/01/2019

End Date: 06/30/2022

Permits Years during which activities are scheduled:

Year 1 Year 2 Year 3 **X** Year 4 Year 5

Name of Separate Implementing Entity:

Not Applicable

BMP Description:

Develop a work order management system for required storm water maintenance activities.

Has Goal Been Accomplished: In Process

Work Performed

6.a.6.11 Street Sweeping Activities-Phase I

Responsible Party: Craig Cesare, Director of Public Works & Parks
Start Date: 07/01/2018 End Date: 06/30/2022
Permits Years during which activities are scheduled:

Year 1 Year 2 **X** Year 3 **X** Year 4 **X** Year 5 **X**

Name of Separate Implementing Entity:
Not Applicable

BMP Description: Sweep all Town accepted roadways and off road areas once per year in the spring.

Has Goal Been Accomplished: Yes – Ongoing Program

Work Performed

6.a.6.2 Catch Basin Cleaning/Repairs-Phase I

Responsible Party: Craig Cesare, Director of Public Works & Parks
Start Date: 07/01/2018 End Date: 06/30/2022
Permits Years during which activities are scheduled:

Year 1 Year 2 **X** Year 3 **X** Year 4 **X** Year 5 **X**

Name of Separate Implementing Entity:
Not Applicable

BMP Description:
Clean at least 20% of catch basins per year. Note and report any odors or flow and any other observations for the purposes of determining whether illicit discharges to these structures should be investigated.

Has Goal Been Accomplished: In Process

Work Performed

6.a.6.3 Pest Management Plan

Responsible Party: Craig Cesare, Director of Public Works & Parks
Start Date: 07/01/2017 End Date: 06/30/2019
Permits Years during which activities are scheduled:

Year 1 **X** Year 2 **X** Year 3 Year 4 Year 5

Name of Separate Implementing Entity:
Not Applicable

BMP Description:
Continue Integrated Pest Management Plan and distribute to all applicable Departments - coordination is necessary between Parks and Recreation, Public Works, Board of Education, Planning and Zoning, and the Mayor's Office.

Has Goal Been Accomplished: Yes – Ongoing Program

Work Performed

6.a.6.4 DCIA Disconnect Plan – Phase I

Responsible Party: Craig Cesare, Director of Public Works & Parks

Start Date: 07/01/2019 End Date: 06/30/2020

Permits Years during which activities are scheduled:

Year 1 Year 2 Year 3 **X** Year 4 Year 5

Name of Separate Implementing Entity:

Not Applicable

BMP Description:

Develop a plan to identify/prioritize retrofit projects to disconnect DCIA.

Has Goal Been Accomplished: NO

Work Performed

6.a.6.5 DCIA Disconnect Plan – Phase II

Responsible Party: Craig Cesare, Director of Public Works & Parks

Start Date: 07/01/2020 End Date: 06/30/2022

Permits Years during which activities are scheduled:

Year 1 Year 2 Year 3 Year 4 **X** Year 5 **X**

Name of Separate Implementing Entity:

Not Applicable

BMP Description:

Begin implementing 1% annual DCIA disconnection

Has Goal Been Accomplished: NO

Work Performed

6.a.6.6 Catch Basin Inspection

Responsible Party: Craig Cesare, Director of Public Works & Parks

Start Date: 07/01/2020 End Date: 06/30/2021

Permits Years during which activities are scheduled:

Year 1 Year 2 Year 3 Year 4 **X** Year 5

Name of Separate Implementing Entity:

Not Applicable

BMP Description:

Complete catch basin inspections of full MS4

Has Goal Been Accomplished: NO

Work Performed

6.a.6.7 Snow Management

Responsible Party: Craig Cesare, Director of Public Works & Parks

Start Date: 07/01/2020 End Date: 06/30/2022

Permits Years during which activities are scheduled:

Year 1 Year 2 Year 3 Year 4 **X** Year 5 **X**

Name of Separate Implementing Entity:

Not Applicable

BMP Description:

Develop a plan to accommodate snowfall significant enough to be plowed. Address impact on storm water system.

Has Goal Been Accomplished: NO

6.a.6.8 Leaf Management

Responsible Party: Craig Cesare, Director of Public Works & Parks

Start Date: 07/01/2017 End Date: 06/30/2022

Year 1 **X** Year 2 **X** Year 3 **X** Year 4 **X** Year 5 **X**

Name of Separate Implementing Entity:

Not Applicable

BMP Description:

Develop and implement a plan for the collection, storage and composting leaves

Has Goal Been Accomplished: Yes – Ongoing Plan

Section D

BMP Assignments by Responsible Party

Public Education and Outreach

Dan Kops

6.a.1.1 Distribute Literature at Town Offices 07/01/2017 06/30/2022

6.a.1.2 Educate Residents on Septic System Maintenance,pet waste, fertilization,
Herbicide and pesticide, illicit discharges 07/01/2017 06/30/2022

Jody Goeler

6.a.1.3 Provide School Programs/Literature for Students 07/01/2017 06/30/2022

Haley Starvaggi

6.a.1.4 River Cleanups 07/01/2017 06/30/2022

Mark Austin

6.a.1.5 Review Education Materials 07/01/2017 06/30/2022

Craig Cesare

6.a.1.6 Storm Drain Stenciling 07/01/2017 06/30/2022

Haley Starvaggi

6.a.1.7 Regional Outreach and Education 07/01/2017 06/30/2022

Mark Austin.

6.a.1.8 Website Modifications 07/01/2017 06/30/2022

Public Participation/Involvement

David Garretson

6.a.2.1 Establish Stormwater Committee 07/01/2017 06/30/2022

Mark Austin

6.a.2.2 Public Notice Requirements for Stormwater Management Plan 07/01/2017 06/30/2022

Dan Kops

6.a.2.3 Develop Informational Strategies to Develop Partnerships
With Other Governmental and Non-Governmental Entities. 07/01/2017 06/30/2022

David Garretson

6.a.2.4 Service Request Tracking System 07/01/2017 06/30/2022

Haley Starvaggi

6.a.2.5 Hazardous Waste Collection 07/01/2017 06/30/2022

Mark Austin

6.a.2.6 Adopt any Required Changes to the Ordinance to Address Illicit Discharges 07/01/2017 06/30/2022

Illicit Discharge Detection and Elimination

Mark Austin

6.a.3.1 Develop IDDE Program	07/01/2017	06/30/2022
6.a.3.10 Review Existing Town Ordinances	07/01/2017	06/30/2022
6.a.3.11 Investigate Outfalls	07/01/2017	06/30/2022
6.a.3.2 Outfall Sampling – Phase I	07/01/2017	06/30/2022
6.a.3.3 Outfall Sampling – Phase II	07/01/2017	06/30/2022

Construction Site Storm Water Management

Mark Austin

6.a.4.1 Plan Review Procedures - Phase I	07/01/2017	06/30/2022
--	------------	------------

Dan Kops

6.a.4.2 Interdepartmental Coordination	07/01/2017	06/30/2022
6.a.4.3 Construction Inspection	07/01/2017	06/30/2022
6.a.4.4 Public Involvement	07/01/2017	06/30/2022
6.a.4.5 Notification of Site Developers and Operators	07/01/2017	06/30/2022
6.a.4.6 Enforcement	07/01/2017	06/30/2022

Post-Construction Storm Water Management

Dan Kops

6.a.5.1 Long-Term Post Construction Plan – Phase I	07/01/2017	06/30/2022
6.a.5.2 Regulations for Post Construction Runoff - Phase II	07/01/2017	06/30/2022

Mark Austin

6.a.5.3 DCIA Mapping	07/01/2017	06/30/2022
----------------------	------------	------------

Pollution Prevention/Good Housekeeping

Craig Cesare

6.a.6.1 Municipal Employee Training	07/01/2017	06/30/2022
6.a.6.10 Work Order Management System - Phase I	07/01/2017	06/30/2022
6.a.6.11 Street Sweeping Activities-Phase I	07/01/2017	06/30/2022
6.a.6.2 Catch Basin Cleaning/Repairs-Phase I	07/01/2017	06/30/2022
6.a.6.3 Pest Management Plan	07/01/2017	06/30/2022
6.a.6.4 DCIA Disconnect Plan – Phase I	07/01/2017	06/30/2022
6.a.6.5 DCIA Disconnect Plan – Phase II	07/01/2017	06/30/2022
6.a.6.6 Catch Basin Inspection	07/01/2017	06/30/2022
6.a.6.7 Snow Management	07/01/2017	06/30/2022
6.a.6.8 Leaf Management	07/01/2017	06/30/2022

TOWN OF HAMDEN
 ORNAMENTAL AND TURF
 INTEGRATED PEST MANAGEMENT PLAN

March 2017

Prepared For:
 State of Connecticut DEP

Prepared by:
 Town of Hamden
 Engineering Department
 2750 Dixwell Avenue
 Hamden, CT 06518

TABLE OF CONTENTS

Section	Page
I. INTRODUCTION	1
II. FACILITY IDENTIFICATION	2
2.1 Facility	2
III. ROLES AND RESPONSIBILITIES	2
3.1 Landscape Control Entity	2
3.1.1 Landscape Control Representatives	3
IV. TURF MANAGEMENT	6
4.1 Turf Maintenance	6
4.2 Turf Insect Control	7
4.3 Turf Weed Control	8
Section (cont)	Page (cont)
4.4 Turf Disease Management	8
V. ORNAMENTALS AND LANDSCAPING MANAGEMENT	9
5.1 Ornamental/landscaping Maintenance	9
5.2 Ornamental/landscaping Insect Control	9
5.3 Ornamental/landscaping Weed Control	10
5.4 Ornamental/landscaping Disease Management	10
VI. PESTICIDE/HERBICIDE PLAN	11
6.1 First Choice Products	11
6.2 Second Choice Products	11
6.3 Third Choice Products	12
VII. WATERSHED EVALUATION	13
7.1 Groundwater Quality	13
7.2 Surface Water Quality	13
7.3 Public Water Supply	14
I. INTRODUCTION	

This plan follows Connecticut General Statutes Section 22a-661 for the development of a comprehensive integrated pest management program to maintain a pest population at or below an acceptable level while decreasing the unnecessary use of pesticides and herbicides.

This IPM has been designed to reduce the amounts of pesticides/herbicides applied by using alternative methods of control including; use of biological agents, targeting application areas, time

specific application, water use allocation and mechanical control methods. Implementation of these methods will help to limit conditions that favor pest infestation and undesirable vegetation growth resulting in a reduction in the use of chemical agents for control.

II. FACILITY IDENTIFICATION

2.1 Facility

Town of Hamden
Engineering Department
Hamden, Connecticut 06518
Phone: (203) 287-7040

This IPM will cover all grounds maintained by the above facility including all Town park areas, golf courses, public buildings and schools and all other areas where pesticides/herbicides may be applied.

III. ROLES AND RESPONSIBILITIES

3.1 Landscape Control Entity

Town of Hamden
Public Works & Park Dept.
1125 Shepard Avenue
Hamden, Connecticut 06518
Phone: (203) 287-2600

The Landscape Control Entity (LCE) will be responsible to implement this IPM for all covered areas. The LCE shall monitor the grounds for pest populations and use effective pesticide/herbicide reducing methods including biological and mechanical means for control. If possible, pesticides/herbicides will not be applied on a periodic basis and only applied as needed when pest infestations and undesired vegetation are identified.

Pesticide/herbicides used should be selected following a preference for least toxic and/or biodegradable agents with more toxic agents used only as an alternative if less toxic agents do not provide adequate control. (See Section VI) Biological agents for control such as predatory insects, microbe enhancement and use of beneficial nematodes should be considered and implemented where practical.

Mechanical methods such as pruning diseased vegetation, clearing deadfall, cutting back overgrowth and improving drainage to reduce standing water and runoff should also be considered and implemented where practical.

3.1.1 Landscape Control Representatives

Town of Hamden Public Works & Parks Department.

Director of Public Works & Parks- Craig Cesare
P&R- Pest Control Supervisor – John Torgerson
(registration #S-4618)

Contact Phone #
203-287-2600
203-287-2600

Upon implementation of this IPM the LCE representatives shall conduct an initial meeting to review this IPM and develop strategies for the reduction pesticide/herbicide use. LCE representatives shall make six weekly inspections of the Facility pesticide/herbicide potential application areas.

These inspection areas shall include:

Information for inspection areas to be supplied by Town of Hamden found in back of manual.

Records of each inspection shall be completed using the Ornamental and Turf Application Record/IPM Monitoring Form (Attachment B) and filed with the Director of Public Works & Parks.

The LCE representatives shall evaluate all facility areas where pesticides/herbicides may be applied and identify areas which may be particularly susceptible to infestation or undesired vegetation (e.g. high traffic areas, overgrown areas, wet areas and/or shady areas). LCE representatives should also identify runoff areas and areas where pesticides/herbicide agents may contact individuals using the facility grounds and determine strategies to prevent runoff and contact.

The LCE representatives shall submit recommendations in writing using the Ornamental and Turf Application Record/IPM Monitoring Form to the Director of Public Works & Parks indicating problems encountered and actions to be taken. The Director of Public Works & Parks is responsible for scheduling control measures as soon as possible. The Director should report in writing if no actions are taken and state reasons for doing so.

Pesticide/herbicide control services will be supervised by the Town of Hamden Public Works & Parks Department (Custom Ground Pest Control license #S-4618). The pesticide/herbicide control supervisor will perform a monthly inspection of all of the Facility's application areas from April - September to monitor for infestations, disease and overgrowth of undesired vegetation. Off season monitoring should be performed on an "as needed" basis. The Director shall act as liaison for LCE representatives and pesticide/herbicide control supervisor and be responsible to implement corrective actions. Records of monthly inspections and control services herbicide/pesticide applications shall be recorded using the Ornamental and Turf Application Record/IPM Monitoring Form and filed with the Director of Public Works & Parks. A diagram of pesticide/herbicide applications showing the areas and rates of control agents applied shall be completed with the form.

Additional records to be maintain by the Public Works & Parks Director shall be a copy of this IPM, copies of labels and Material Safety Data Sheets (MSDS) for all pesticide/herbicide control agents, diagrams showing the placement of pest monitoring devices, and soil/water analysis reports.

Pest sightings by LCE representatives shall be recorded on the Ornamental and Turf Application Record/IPM Monitoring Form. The pest sighting information should include specific information detailing the location and type of pest if known. A sample of the pest should be collected for identification purposes. For severe infestations or undesired vegetation overgrowth over large areas, the Pest Control Supervisor shall conduct a follow up inspection to confirm the presence of a severe infestation before widespread pesticide/herbicide application.

IV. TURF MANAGEMENT

4.1 Turf Maintenance

Best management and horticultural practices for the turf types sown for the Facility areas shall be implemented at all times to maintain turf health and minimize disease and infestation susceptibility.

Lawn and grounds turf should be mowed to a 2"-3" cut height or as high as possible with mowing on a weekly/bi-weekly basis. Golf course turf shall be maintained using best management practice for the turf type sown. Mowing should be done when grass is dry to minimize disease spread. Mower blades should be maintained with sharp edges to avoid a tearing and damaging cut.

For lawn and grounds turf, grass clippings should be allowed to remain with grass mowing preferentially performed using a self-mulching type mower. Allowing grass clippings to remain will increase organic nutrients and earthworm activity and return up to 50% of available nitrogen back to the turf allowing for a reduction in fertilizer use.

A thatch layer of up to ¾" thick is beneficial. If the thatch reaches a greater thickness, fertilizers and pesticides may be blocked from reaching the turf root system. If necessary, de-thatching should be done by mechanical means during spring or late summer when the turf can recover faster.

Annually, during early spring a landscape/pest technician to assess should collect soil samples soil mineral and nutrient content and pH. Fertilizer and pH adjustments should be made based upon soil analytical results and best application for turf type.

Organic fertilizers shall be used preferentially otherwise fertilizer with 50% slow release nitrogen should be applied. Fertilizer should be applied no later in the year than October 15. Late fall applications of lime should not be conducted to minimize the promotion of snow mold. Fertilizers should be applied cautiously as over-fertilization will lead to increased runoff, an increase in some diseases and a thatch build-up due to excessive cuttings.

Fertilizers should be applied during late spring and early summer when grass is most actively growing. Fertilizer applications should not exceed 2.5 pounds of nitrogen per 1,000 square feet unless soil analytical results indicate an unusual nitrogen deficiency.

Watering should be done on a weekly basis in accordance with turf type requirements to supplement and balance natural rainfall. Use of "timer" type sprinklers should be avoided as unnecessary watering and over-watering may result. Best time for watering is between the hours of 5:00 am and 8:00 am. Watering on hot humid nights is not recommended as it may result in the promotion of diseases.

4.2 Turf Insect Control

Inspection of turf areas by the Pest Control Supervisor for insect population monitoring shall be on a monthly basis during April through September. Sample collection should be performed as outlined in Section III to confirm the presence and extent of pest populations.

Application of pesticide should be limited so that beneficial species populations such as nematodes and ladybugs be preserved.

Pesticide application should be considered only if it is anticipated that 20% or greater of the established turf would be damaged from the following pest populations:

Pest Type	Pesticide to be Applied When
White Grubs	10 larvae/sq. ft.
Chinch Bugs	30-50 nymphs & adults/sq. ft. (if damage is evident)
Sod Webworms/Cutworms	20% damage is evident
Hyperodes weevil	"
Black turfgrass ataenius "	"
Ticks	Consult State and Local Health Authority

See Section VI for recommended pesticide agents.

4.3 Turf Weed Control

A properly established healthy dense turf in itself can prevent or decrease the potential invasion of undesired weed species. Some weed growth should be anticipated and tolerated if non damaging or over-invasive to the turf area. Widespread application of herbicides should not be performed unless greater 25% of the entire turf has been invaded. Spot or targeted applications are preferred for weed control.

Over seeding the turf area and allowing for higher grass growth in late summer/early fall should be performed as a crabgrass control alternative to herbicide application. Herbicide may be applied as a post emergent only when cultural practices have failed and providing that the area is not widespread. Re-establishment of turf areas by turning soil, loaming and re-seeding should be considered for widespread areas of crabgrass.

A complete re-evaluation of areas prior to widespread application of herbicides must performed by the Control Supervisor.

See Section VI for recommended pesticide agents.

4.4 Turf Disease Management

Application of chemical agents for disease control will be performed only if evidence of disease has been found and areas of greater than 10% - 15% of damage can be anticipated. The Pest Control Supervisor will discuss disease control options with the Director of Public Works & Parks to determine the appropriate course of action.

Refer to Attachment C for Turf grass Pest Management Guidelines

V. ORNAMENTAL/LANDSCAPING MANAGEMENT

5.1 Ornamental/landscaping Maintenance

Best management and horticultural practices for the ornamental/landscaping plant types for the Facility areas shall be implemented at all times to maintain health and minimize disease and infestation susceptibility. Plantings should be selected for disease and pest resistance whenever possible. Landscape Control Representatives should inspect all ornamental plantings for signs of disease and infestation on regular basis.

Mulch should be placed in and around ornamental plantings to reduce weed growth and retain moisture. Mulch should also be placed around plantings to provide a buffer area to prevent from accidental mowing or cutting by edgers and trimmers.

Plants should be kept at least 12" away from all buildings and structures to reduce rodent habitat and insect encroachment. Dead and dying plants should be culled from plant beds on a monthly basis. Leaves and debris should be cleared from planting areas to prevent shading and rodent hiding areas

5.2 Ornamental/landscaping Insect Control

Inspection of ornamental/landscaping areas for insect population monitoring shall be done during routine maintenance and use of pest monitoring traps shall be used where appropriate. If pest activity is found trimming and removing of infested branches or plant washings where tolerable should be employed before pesticide application.

Pesticide application should be considered only if it is anticipated that 15% or greater of the established ornamental/landscaping would be damaged. Pesticide application should be limited only to infested areas. Use of biodegradable insecticides and insecticidal soaps, predatory insects, dormant oil or summer oil should be used prior to more toxic pesticides. When using pesticides, the pest life cycle and vulnerability to the pesticide should be considered.

Preventive application of pesticide agents should only be considered if previous inspections has that pests are over-wintering in ornamental/landscaping plants.

See Section VI for recommended pesticide agents.

5.3 Ornamental/landscaping Weed Control

If previous history indicates an established weed growth, re-emergent weed control in flower beds may be used where pesticide labeling allows. Where practical taking into account labor expenses, hand weeding shall be performed in areas of ornamental plantings. Borders and walkways will be trimmed using mechanical methods.

See Section VI for recommended pesticide agents.

5.4 Ornamental/landscaping Disease Management

Application of chemical agents for disease control will be performed only if evidence of disease has been found and areas of greater than 15% of damage can be anticipated all cultural practices have

been employed.

Preventive applications can only be used if previous years monitoring indicates the likelihood of emergent disease. Preventive applications should only be to specific problem areas.

The Pest Control Supervisor will discuss disease control options with the Director of Public Works & Parks to determine the appropriate course of action.

VI. PESTICIDE/HERBICIDE PLAN

Pesticides/herbicides may be applied if pest populations and undesired vegetation exceed the tolerances outlined by Sections IV and V of this IPM. Applications should be performed after regular business hours or on weekends or during periods when areas are least likely to be occupied.

Biological controls, predatory insects, beneficial nematodes or mechanical controls should be employed or considered prior to chemical agent applications. If chemical agents are to be used priority is given to those pesticides/herbicides having the lowest toxicity as outlined below:

The information below will be completed pending an evaluation and approval of pesticides and herbicide alternatives to be used by the Town of Hamden.

6.1 First Choice Products (lowest toxicity and/or least risk of exposure)

Turf Herbicides

- a) Round Up Reg #524-445
- b) Finale Reg #45639-187
- c) 2,4-D Bentgrass Selective Reg # 10404-44

Turf Insecticides

- a) Dursbans 50W Reg# 62719-72
- b) Merit 75WSP Reg# 3125-439

Ornamental Insecticides

- a) Not Used
- b) Not Used
- c) Not Used

6.2 Second Choice Products (moderate toxicity and/or risk of exposure)

Turf Herbicides

- a) See Attachments
- b) See Attachments
- c) See Attachments

Turf Insecticides

- a) See Attachments
- b) See Attachments

Ornamental Insecticides

- a) See Attachments
- b) See Attachments
- c) See Attachments

6.3 Third Choice Products (moderate or high toxicity and/or risk of exposure)

Turf Herbicides

- a) See Attachments

Turf Insecticides

- a) See Attachments

Turf Fungicides

- a) Daconil 2787 Reg # 5053434-195

b) Chipco 26019 Reg # 264-480

Ornamental Insecticides

- a) See Attachments
- b) See Attachments

Ornamental Fungicides

- a) See Attachments
- b) See Attachments

VII. WATERSHED EVALUATION

7.1 Groundwater Quality

The groundwater at the subject site is classified by the Connecticut Department of Environmental & Energy Protection (CTDEEP) as GB/GAA.

A GB/GAA classification indicates groundwater in an area of public water supply wells that has been degraded due to industrial impact(s). The CTDEEP goal is for restoration of GB/GAA areas to GAA quality groundwater.

7.2 Surface Water Quality

A listing of all Town of Hamden turf and ornamental landscape management areas will be reviewed to correlate the locations of surface water bodies to potential pesticide/herbicide application areas. See attachment for location.

7.3 Public Water Supply

A listing of all Town of Hamden turf and ornamental landscape management areas will be reviewed to correlate the locations of public water supply watersheds to potential pesticide/herbicide application areas. See attachment for location. (2009-A copy of the attachments are available upon request).