

VILLAGE OF



MAMARONECK

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**Memorandum**

**To:** Mayor and Trustees  
**From:** Sanford Miller, Village Manager  
**Re:** Storm Water Phase II Plan - NOI  
**Date:** February 11, 2003

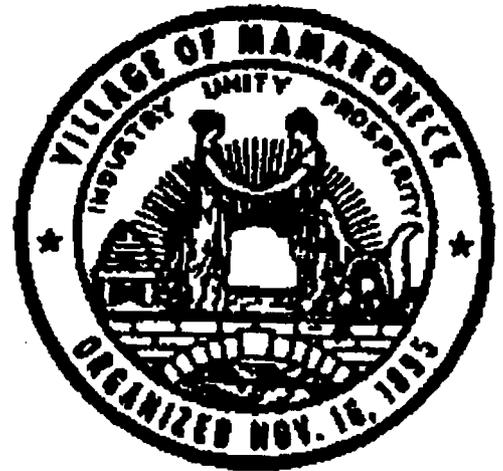
Attached is the draft Phase II Storm Water Management Plan prepared by Keith Furey that I received this afternoon. Please let me know as soon as possible to whom (which boards) you want to see a copy of the draft plan sent.

I have already sent copies for the Mayor's Water Quality Advisory Committee (with Trustee Derrico) in today's packet.

Thank you.

TECHNICAL DOCUMENT

# *USEPA Phase II Final Rule Storm Water Management Plan*



Mr. Sanford I. Miller  
Village Manager  
Village of Mamaroneck  
Mamaroneck, New York

March 2003

**KW Furey**  
Engineering, P.C.

# ***Executive Summary***

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***KW Furey Engineering, P.C.***  
*Engineering & Construction Management*

# **Executive Summary**

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## **I. Background**

### **A. Regulatory Impetus**

The Village of Mamaroneck (Village) has been designated as an operator of a small municipal separate storm sewer system (MS4) in an urbanized area, under the United States Environmental Protection Agency's (USEPA) Storm Water Phase II Final Rule (40CFR 122, 123 & 124). In order to meet the conditions of its State Pollutant Discharge Elimination (SPDES) Storm Water Permit, the Village has developed this Storm Water Management Plan (SWMP) in accordance with the requirements of the Phase II Final Rule.

### **B. Practical Impetus**

Due to the Village's proximity to the Long Island Sound, and the potential impacts of watershed pollution on the receiving waters of Mamaroneck Harbor, the implementation of this plan carries great significance for the residents of the Village. Past attempts at resolving water quality issues in the Village, by identifying and addressing specific contributing factors have met with only limited success. It is only through a policy that addresses water quality issues in general, that true improvements to the water quality in Mamaroneck Harbor can be made.

### **C. Development of the Plan**

It is important to note, that this plan represents a beginning point for storm water management. This document is intended to be a "dynamic" plan, which can, and will be modified and added to, in order to continue to address water quality issues attendant to stormwater management.

### **D. Program Components**

In accordance with the requirements of the Phase II Final Rule, this plan includes the following control measures:

- (1) Public Education & Outreach
- (2) Public Participation / Involvement
- (3) Illicit Discharge Detection & Elimination
- (4) Construction Site Runoff Control
- (5) Post-construction Runoff Control
- (6) Pollution Prevention / Good Housekeeping

***I. Public Education & Outreach***

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***KW Furey Engineering, P.C.***  
*Engineering & Construction Management*

# ***I. Public Education and Outreach***

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## **I. Introduction**

### **A. Regulatory Text**

"You must 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 water bodies and the steps that the public can take to reduce pollutants in storm water runoff."

### **B. Program Overview**

The public education program will inform individuals and households about the steps they can take to reduce storm water pollution, such as ensuring proper septic system maintenance, ensuring the proper use and disposal of landscape and garden chemicals including fertilizers and pesticides, protecting and restoring riparian vegetation, and properly disposing of used motor oil and household hazardous wastes. EPA recommends that the program inform individuals and groups how to become involved in local stream and beach restoration activities, as well as activities that are coordinated by youth service and conservation corps or other citizen groups. Some of the strategies to be employed by this plan include distributing brochures, sponsoring speaking engagements before community groups, implementing educational programs targeted at school age children, creation of a Village Storm Water Website and conducting community-based projects such as storm drain stenciling. The materials to be distributed by this outreach programs will be specifically tailored toward targeted groups of commercial, industrial, and institutional entities likely to have significant storm water impacts. For example, providing information to restaurants on the impact of grease clogging storm drains, and to garages on the impact of oil discharges. The Village will also implement a stormwater "hot-line" to provide community updates on storm water issues and access for citizen reporting of polluters.

## **II. Program Approach**

### **A. Best Management Practices**

The focus areas for the Public Education Measures will include the following Best Management Practices (BMP):

#### ***1. Lawn and Garden Activities***

Lawn and garden activities can result in contamination of storm water through pesticide, soil, and fertilizer runoff. Proper landscape management, however, can effectively reduce water use and contaminant runoff and enhance the aesthetics of a property. Environmentally friendly landscape management can protect the environment through careful planning and design, routine soil analysis, appropriate plant selection, use of practical turf areas, water use efficiency, use of mulches, and appropriate maintenance. Additional activities that benefit water resources include maintaining healthy plants and lawns and composting lawn wastes. Healthy plants are less susceptible to diseases and insects and therefore require minimal use of pest control measures. To promote healthy plants, it is often beneficial to till composted material into the soil. Recycling of garden wastes by composting is also effective at reducing waste, although compost bins and piles should not be located next to waterways or storm drains because leachate from compost materials can cause contamination. The Village will implement these BMP's for use on its own properties, and distribute educational materials outlining these practices for use of private property owners.

## **I. Public Education and Outreach**

### **a. Planning and Design**

It is important to emphasize that property owners develop a landscape plan that utilizes the natural conditions of the property. For example, the regional and climatic conditions of the site, existing vegetation, topography, intended uses of the property, and the grouping of plants by their water needs are all important considerations in designing a site that promotes natural vegetation growth while minimizing water loss and contamination.

### **b. Soil Analysis and Improvements**

Residents will be encouraged to test soils every three to four years to determine the amount of nutrients necessary to maintain a healthy lawn. Local home and garden centers will be encouraged to market and sell soil test kits so that property owners can perform such tests on their own and/or the Village will make them available for sale through the Village DPW.

### **c. Appropriate Plant Selection**

Property owners will be encouraged to choose local or regional plants when developing an environmentally friendly landscape. Indigenous plant species are generally more water efficient and disease resistant. Furthermore, exotic plants can potentially impact local waterways.

### **d. Practical Turf Areas**

Property owners will be encouraged to plant non-turf areas where possible, because lawns require more water and maintenance than wildflowers, shrubs, and trees. If turf is used, it is important to select a type of grass that can withstand drought and that becomes dormant in hot, dry seasons. Local nurseries can provide property owners and municipal crews with assistance when selecting grass types. In addition, when maintaining lawns, the grass should not be cut shorter than 3 to 4 inches in height, and mulched clippings should be left on the lawn as a natural fertilizer.

### **e. Efficient Irrigation**

Much of the water that is applied to lawns and gardens is not absorbed by the vegetation. When water is applied too quickly, it is lost as runoff along with the top layers of soil. To prevent this, property owners will be encouraged the use of low-volume watering approaches such as drip-type or sprinkler systems.

### **f. Use of Mulches**

Mulches help retain water, reduce weed growth, prevent erosion, and improve the soil for plant growth. Mulches are usually wood bark chips, wood grindings, pine straws, nut shells, small gravel, or shredded landscape clippings. Property owners will be encouraged to use mulches and will be informed of the benefits of these materials.

### **g. Fertilizers**

Property owners will be discouraged from using fertilizers, or if they are used, from over-applying them. The use of less-toxic alternatives to commercial fertilizers, such as composted organic material will be encouraged. Practices to reduce the amount of fertilizer entering runoff, such as, use of slow-release organic fertilizers, which are less likely to enter storm water, and application techniques, such as tilling fertilizers into moist soil to move the

## **I. Public Education and Outreach**

chemicals directly into the root zone, reduce the likelihood that the chemicals will be mobilized in storm water will be recommended. Timing is also important: Warm season grasses should be fertilized in the summer, in frequent and small doses, while cool season grasses should be fertilized in the fall. Also, fertilizer should not be applied on a windy day or immediately before a heavy rain. Excess fertilizer and containers will be disposed of as hazardous items, and not accepted with the general waste pickup.

### **h. Pesticides**

Like fertilizers, pesticides should be used on lawns and gardens only when absolutely necessary. Pesticide use can be avoided entirely by selecting hearty plants that are native to the area and by keeping them healthy. It is also important to identify any potential pests to determine if they are truly harmful to the plant. The pests should always be removed by hand if possible—chemical pest control should be used only if other approaches fail. If it is necessary to use chemical pesticides, the least toxic pesticide that targets the specific pest in question should be chosen (i.e., boric acid, garlic, insects, etc). If a pesticide is labeled with the word "caution," it is less toxic than one labeled "warning," which is, in turn, less toxic than one that is labeled "danger/poison."

### **2. *Water Conservation Measures***

Water use has soared in recent years. The recent drought conditions in Westchester County have limited the availability of drinking water and made water conservation practices mandatory. With water consumption at an all-time high, the costs of water and sewer services continue to climb. Widespread reduction in water consumption would limit the need for new or expanded water and sewage treatment plants. The Village will encourage good water use habits by making the public aware of daily activities that consume a large volume of water. Some water conservation practices that will be recommended include:

- (1) Run the dishwasher and laundry machines only with full loads. Use the shortest wash and rinse cycles and the lowest water level setting possible. Avoid the permanent press cycle, which uses an additional 10 to 20 gallons of water.
- (2) When hand-washing dishes, do not let the water run continuously.
- (3) Avoid using garbage disposal systems.
- (4) When buying a new washing machine, choose a suds-saver model.
- (5) In the bathrooms, place two half-gallon plastic bottles filled with water in the toilet tank to reduce the amount of flush water used.
- (6) Take shorter showers and use a water-conserving showerhead (less than 2.5 gallons per minute) rather than taking baths, which use 30 to 50 gallons of water.
- (7) When shaving, brushing teeth, or washing your face, do not let the water run continuously.
- (8) When washing your car, use a bucket, and wash and rinse sections individually. Use a high-pressure, low-volume hose with a nozzle.
- (9) Water the lawn only when absolutely necessary. More water is consumed using sprinkler and irrigation systems than if a hand-held hose is used (Trickle irrigation systems and soaker hoses are 20% more efficient than sprinklers.)
- (10) Water lawns only during the coolest time of day to avoid evaporation of the water.

## ***1. Public Education and Outreach***

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### ***3. Proper Disposal of Hazardous Wastes***

Many products found in homes contain chemical ingredients that are potentially harmful to people and to the environment. These products, if improperly stored or disposed of, can make their way into the storm water system, thereby adversely affecting water quality. Chemicals such as oven cleaners, paint removers, bug killers, solvents, and drain cleaners are just a few common hazardous products in the home. The Village already employs a Household Hazardous Waste Disposal Program. The importance of this program, and of the proper storage of hazardous household materials, will be tied to the storm water quality issues in the educational materials developed in this program measure. Hazardous products include the following:

- (1) Cleaning products: oven cleaner, floor wax, furniture polish, drain cleaner, and spot remover
- (2) Car care and maintenance: motor oil, battery acid, gasoline, car wax, engine cleaner, antifreeze, degreaser, radiator flush, and rust preventative
- (3) Home improvement products: paints, preservatives, strippers, brush cleaners, and solvents
- (4) Other products labeled toxic, flammable, or corrosive, or containing lye, phenols, petroleum distillates, or trichlorobenzene

### ***4. Pet Waste Management***

When pet waste is not properly disposed of, it can wash into nearby water bodies or can be carried by runoff into storm drains. Since storm drains do not connect to treatment facilities, but rather drain directly into the streams and rivers which flow directly to Mamaroneck Harbor, untreated animal feces can become a significant source of runoff pollution. As pet waste decays in a water body, it uses up oxygen, sometimes releasing ammonia. Low oxygen levels and ammonia combined with warm temperatures can be detrimental to the health of fish and other aquatic life. Pet waste also contains nutrients that promote weed and algae growth (eutrophication). Eutrophic water becomes cloudy and green, making it unattractive or even prohibitive for swimming and recreation. Pet waste also carries coliform bacteria, viruses, and parasites that can pose risks to human health and threaten wildlife.

### ***5. Trash Management***

Trash and floating debris in waterways are significant pollutants, especially in areas where a large volume of trash is generated in a concentrated area. Trash in water bodies contributes to visual pollution and detracts from the aesthetic qualities of the landscape. It also poses a threat to wildlife and human health (e.g., choking hazards to wildlife and bacteria to humans). The Village will take a two pronged approach to trash management.

#### ***a. Municipal & Commercial Trash Handling***

As has been well documented, a large potential contributor to water quality problems in the Village is the trash handling operations on Fayette Avenue. Although many BMP have already been implemented specific to this area (i.e., Street sweeping on a regular basis, etc.), it is apparent that BMP's alone can not adequately address this issue. The Village will identify specific treatment options for this section of the storm sewer system to reduce the pollutant load from this area, and implement these options.

## **I. Public Education and Outreach**

### **b. Public Education**

Public awareness is key to a successful trash management program. The public will be informed about the environmental consequences of littering. Community education, such as informing residents about their options for recycling and waste disposal, as well as the consequences of littering, can instill a sense of citizen responsibility. Flyers, door hangers, magnets, and bumper stickers will all be employed to educate the public. These materials will be distributed through the mail, at public places, in schools, and at local businesses.

### **6. Classroom Education**

Classroom education is an integral part of any storm water pollution outreach program. Providing storm water education through schools exposes the message not only to students but to their parents as well. The Village's storm water programs will partner with educators and experts to develop storm water-related curricula for the classroom.

## **B. Implementation Timetable**

The Phase II Final Rule requires the use of measurable goals and allows five (5) years for full implementation of the SWMP. The following measurable goals are herein established for this purpose:

### **1. Year 1**

Brochures and educational materials developed and distributed, storm water "hot-line" in place, educators trained, completion of stenciling remaining storm drains in Village

### **2. Year 2**

A Storm Water Web Site Developed, school curricula developed and implemented

### **3. Year 3**

Outreach to all sectors of Village completed

## **II. Public Participation / Involvement**

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***KW Furey Engineering, P.C.***  
*Engineering & Construction Management*

## **II. Public Participation / Involvement**

### **I. Introduction**

#### **A. Regulatory Text**

"You must, at a minimum, comply with state, tribal, and local public notice requirements when implementing a public involvement/participation program.

#### **B. Program Overview**

USEPA recommends that the public be included in developing, implementing, and reviewing your storm water management program, and that the public participation process should make efforts to reach out and engage all economic and ethnic groups. The Village has Already formed a Water Quality Committee which participates in this process. In addition to their current input to the Mayor and the Board of Trustees concerning water quality issues and the development of this SWMP, the Committee will be asked to work as citizen volunteers to assist in educating other individuals about the program, assisting in program coordination with other pre-existing programs, and take the lead role in organizing community volunteer efforts.

### **II. Program Approach**

#### **A. Best Management Practices (BMP)**

The following BMP's will be included in this control measure:

##### **1. Storm Drain Stenciling**

Storm drain stenciling has already been implemented to some extent in the Village for the drains that deposit directly to Long Island Sound. As part of this control measure, the remaining storm drains in the Village will be marked to educate the public as to where they drain to (i.e.. Mamaroneck River, Sheldrake River, etc.).In order to get the public involved in this area the stenciling project will be conducted by volunteer groups in cooperation with the Village Community on Water Quality. In this arrangement, the volunteer groups will provide the labor and the Village will provide supplies, safety equipment, and a map and/or directions to the drains to be stenciled. The main benefit of using volunteers is the increased public awareness of storm water pollutants and their path to water bodies. Coordination activities will include providing

- (1) Stenciling kits containing all materials and tools needed to carry out a stenciling project
- (2) A map of the storm drains to be stenciled
- (3) Training for volunteers on safety procedures and on the technique for using stencils or affixing signs
- (4) Safety equipment (traffic cones, safety vests, masks and/or goggles for spray paint)
- (5) Incentives and rewards for volunteers (badges, T-shirts, certificates)

##### **2. Stream Clean-up and Monitoring**

An effective way to promote storm water awareness is to host a stream cleanup. Many people are

## **II. Public Participation / Involvement**

unaware that most storm drains discharge untreated waters directly into local water bodies. A stream cleanup allows concerned citizens to become directly involved in water pollution prevention. Participants volunteer to walk (or paddle) the length of the stream or river, collecting trash and recording information about the quantity and types of garbage that has been removed. Stream cleanups also educate members of the community about the importance of stream water quality through media coverage and publicity efforts. As a result, the river is cleaner, volunteers feel a sense of accomplishment, and the community at large is better informed. The Committee on Water Quality will be asked to schedule and organize the cleanup projects, recruit volunteers, coordinate trash disposal with DPW, and assign staff for supervision of the projects. Projects will be scheduled several months in advance to provide adequate time to organize volunteers and handle logistical issues. Stream reaches will be prioritized based on historical problem areas and potential contribution to Harbor Pollution. When the cleanup effort is complete, volunteers will be recognized for their work with participation certificates, T-shirts, cups, or other promotional items.

### ***3. Reforestation Programs***

Reforestation programs to preserve and restore vegetative buffers will be developed and implemented. The Village will determine which priority, candidate sites are appropriate for this activity. The Committee for Water Quality will be asked to assist in identifying candidates for these buffer zones with the Village Engineering Staff, and then to organize volunteers to work on creating the vegetative buffer. The Committee will be responsible for contacting local businesses, residences, or nursery farms to seek vegetative donations. The Village will offer matching purchases of these materials as a way of increasing the amount of buffer zones that can be established.

### ***4. Wetland Plantings***

Wetlands are unique ecosystems that are home to a great diversity of terrestrial and aquatic plants and animals and are beneficial in many ways. They have the ability to improve water quality by filtering and accumulating pollutants, thereby protecting adjacent rivers, lakes, and streams. The Village has several small wetland environments that are not either State Designated nor protected by other organizations. Over time, many of these wetland environments have become degraded by human-induced disturbances, such as the introduction of invasive, non-native plants. Such exotic vegetation can reduce habitat quality, contribute to an unkempt, weedy appearance, and obscure the water body from view. These disturbances have not only affected the natural functions of these systems by causing increased erosion, a decline in natural wetland vegetation, and degraded habitats, but they have also reduced the aesthetic value of the environment. Wetlands and water bodies are also disturbed by land development activities in adjacent areas and in upland areas within the watershed. These disturbances often result in sediment deposition, nutrient enrichment, and increased storm water flows into the wetlands. This causes a reduction in water clarity that ultimately limits the growth of wetland plant species and submerged aquatic vegetation, the smothering of streambeds, contamination of water quality, and alteration of natural hydrology.

#### **a. Implementation**

The first step in a wetland planting program is to determine the history of the site, including previous vegetation and typical conditions. Another important factor is the hydrology of a site. Hydrology defines such factors as average and maximum depth, duration of inundation,

## **II. Public Participation / Involvement**

and degree of soil saturation. Hydrology establishes the soil and plant conditions that distinguish between different wetland types and streambank and shoreline environments. Other factors that will be considered for wetland plantings are described below.

### **(1) Plant Species Selection**

Selection of plants for wetland and shore zones is closely tied to the hydrology of the site, particularly water depths and flood durations. Other factors such as shading, water clarity, and salinity should be taken into account as well. Planting in open water areas typically involves the use of tubers, plugs, and potted plants. Planting in non-ponded wetland zones often involves both seeds and live plants. Project planners must be familiar with different types of plants that can be used, depending on the site's characteristics. It is important to use a diverse mix of wetland plants and not just one type of plant such as Phragmites (reed grass) or cattails. These and other aggressive species are very easy to establish but should not be planted. They will out compete other valuable species and will eventually dominate less robust colonizers.

### **(2) Initial and Long-term Management and Maintenance**

Many wetlands become overgrown with non-native, invasive plant species following a disturbance. Noxious weeds can be controlled in a variety of ways. Invasive species can be removed by physically extracting them from the site. This process is often difficult because many non-native species grow in dense patches with extensive root systems. For species that are particularly difficult to eliminate using physical extraction approaches, chemical control of non-native species is sometimes warranted. Herbicide techniques are different from those used in upland sites, primarily because herbicides have to be licensed for use in or near water bodies, wetlands, and other aquatic systems. Chemical means of weed reduction should be used only when necessary, and product labels should be read and closely followed. Only a licensed herbicide applicator will be employed to conduct this work.

### **5. *Adopt-A-Stream Programs***

The Village will develop an Adopt-A-Stream Program in which participants "adopt" a stream, creek, or river to clean up, monitor, protect, and restore. Through these activities, the adopting group or organization becomes the primary caretaker of that stretch of stream in the watershed. The Adopt-A-Stream program will allow participation from any group or organization within a the Village. Adopting a stream is a great program for youth groups, including church groups, scouts, and school clubs, but it can also be a great activity for adult groups such as neighborhood associations, civic organizations, or businesses. Levels of involvement range from quarterly visual surveys and litter pick-ups to monthly testing to one-time habitat improvement projects. The objectives of the program are not only to remove litter, but also to improve the quality of the stream. Waste collected from stream banks and channels could spur local interest in maintaining and improving the water quality and aesthetics of all local water bodies. Many different activities can be implemented through Adopt-A-Stream programs, such as:

- (1) Implementing stream cleanups and monitoring stream insects and gauging water quality**
- (2) Executing streambank enhancement projects, such as tree planting, to help control erosion and stabilize streambanks**

The program will include signs designating the portion of the stream adopted and the organization responsible, documentation packages for the organization to document their activities to the

## **II. Public Participation / Involvement**

Village, and supply packets (i.e. Trash bags, small tools, gloves, etc) required to conduct activities.

### **B. Implementation Timetable**

The Phase II Final Rule requires the use of measurable goals and allows five (5) years for full implementation of the SWMP. The following measurable goals are herein established for this purpose:

1. *Year 1*

Development of detailed plans for Storm Drain Stenciling and other public participation projects, priority areas to be addressed identified. Hold Public Meetings to introduce programs and begin solicitation of volunteers and organizations to participate.

2. *Year 2*

Implementation of first Reforestation, Stream Clean-up and Adopt-A-Stream Programs.

3. *Year 3*

5% participation of public in above activities based on total Village population.

4. *Year 4*

Establishment of community watch groups to monitor status of streams and watersheds

### **III. Illicit Discharge Detection**

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***KW Furey Engineering, P.C.***  
*Engineering & Construction Management*

### **III. Illicit Discharge Detection and Elimination**

#### **I. Introduction**

##### **A. Regulatory Text**

- "• You must develop, implement and enforce a program to detect and eliminate illicit discharges (as defined at Sec. 122.26(b)(2)) into your small MS4.
- (ii) You must:
  - Develop, if not already completed, 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;
  - To the extent allowable under State, Tribal or local law, effectively prohibit, through ordinance, or other regulatory mechanism, non-storm water discharges into your storm sewer system and implement appropriate enforcement procedures and actions;
  - (C) Develop and implement a plan to detect and address non-storm water discharges, including illegal dumping, to your system; and
  - (D) Inform public employees, businesses, and the general public of hazards associated with illegal discharges and improper disposal of waste.
- (iii) You need address the following categories of non-storm water discharges or flows (i.e., illicit discharges) only if you identify them as significant contributors of pollutants to your small MS4: water line flushing, landscape irrigation, diverted stream flows, rising ground waters, uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20)), uncontaminated pumped ground water, discharges from potable water sources, foundation drains, air conditioning condensation, irrigation water, springs, water from crawl space pumps, footing drains, lawn watering, individual residential car washing, flows from riparian habitats and wetlands, dechlorinated swimming pool discharges, and street wash water (discharges or flows from fire fighting activities are excluded from the effective prohibition against non-storm water and need only be addressed where they are identified as significant sources of pollutants to waters of the United States)."

##### **B. Program Overview**

The Village plan to detect and address illicit discharges include the following four components:

- (1) Procedures for locating priority areas likely to have illicit discharges;
- (2) Procedures for tracing the source of an illicit discharge;
- (3) Procedures for removing the source of the discharge; and
- (4) Procedures for program evaluation and assessment.

#### **II. Program Approach**

##### **A. Best Management Practices (BMP)**

The following BMP's will be included in this control measure:

### **III. Illicit Discharge Detection and Elimination**

#### ***1. Development of Updated Storm Sewer Maps***

Using the existing Storm Sewer Maps (O'Brien & Gere, 1984) as a baseline, the Village will perform physical inspections to update the mapping database to reflect current storm sewer locations. Activities will include: compilation of existing construction drawings for projects including storm sewer work post-1984, physical inspection to identify all outfalls not shown, and survey work to annotate additional to the piping system and drainage structures

#### ***2. Addressing Failing Septic Systems***

While the major portion of the Village is served by the municipal sanitary sewer system, there are still some areas of the Village dependant upon on-site sewage treatment or septic systems. A failing septic system is considered to be one that discharges effluent with pollutant concentrations exceeding established water quality standards. Failure rates for septic systems typically range between 1 and 5 percent each year (De Walle, 1981) but can be much higher in some regions (Schueler, 1999). Failure of on-site disposal systems can be due to a number of causes, including unsuitable soil conditions, improper design and installation, or inadequate maintenance practices. Improperly functioning septic systems are recognized as a significant contributor of pollutants (especially nitrogen) and microbiological pathogens; these systems discharge more than one trillion gallons of waste each year to subsurface and surface waters (NSFC, 1995). Identifying and eliminating failing septic systems will help control contamination of ground and surface water supplies from untreated wastewater discharges. Measures will be taken to identify where these failures exist in order to correct them. In addition, engineering studies will be conducted to determine the feasibility and cost impacts of connecting these areas to the municipal sanitary sewer system. Two field screening techniques will be used to identify failing septic systems:

##### **a. The Brightener Test**

This test involves the use of specific phosphorus-based elements found in many laundry products, often called brighteners, as an indicator of the presence of failing on-site wastewater systems.

##### **b. Color Infrared (CIR) Aerial Photography**

This technique uses color infrared (CIR) aerial photography to characterize the performance of septic systems. This method has been found to be a quick and cost-effective method for assessing the potential impacts of failing systems and uses variations in vegetative growth or stress patterns over septic system field lines to identify those systems that may potentially be malfunctioning. Based on the results of these tests, the Westchester County Department of Health (WCDOH) will be notified to make a more detailed on-site visual and physical inspection which will confirm whether the system has truly failed and the extent of the repairs needed.

#### ***3. Industrial / Business Connections***

This management practice involves the identification and elimination of illegal or inappropriate connections of industrial and business wastewater sources to the storm drain system. Any industrial discharge not composed entirely of storm water that is conveyed to the storm drainage system or a water body is considered to be an illicit discharge. These discharges may contain a variety of pollutants that can affect both public safety and the aquatic environment. Many of these discharges are a result of connections to the storm drain that are unknown to the business owner and may not be evident in architectural plans. Illicit industrial connections can arise in a number

### **III. Illicit Discharge Detection and Elimination**

of ways, including cross connections with sanitary sewers and floor drains improperly attached to storm drainage pipes. These connections may be accidental or planned, and may occur in new developments as well as in existing developments. For new businesses, preventative practices such as thorough inspection and verification during the entire construction phase can avoid the need for more extensive detection techniques and disconnection. For existing industries, improper connections are located by using field screening procedures, source testing protocols, and visual inspection. The following methods will be used for identifying improper industrial discharges to the storm drain system:

**a. Field Testing of Dry Weather Discharges**

Storm drain outfalls are monitored to identify those areas where discharges are occurring that exceed water quality standards. This monitoring includes both visual inspection and chemical analysis to aid in identifying potential discharge sources. Visual Inspection. A physical examination of piping connections or analysis by closed circuit camera is used to identify possible illicit connection sites.

**b. Piping Schematic Review**

Architectural plans and plumbing details are examined for potential sites where improper connections have occurred.

**c. Smoke Testing**

Smoke testing is used to locate connections by injecting a non-toxic vapor (smoke) into the system and following its path of travel.

**d. Dye Testing**

Colored dye is added to the drain water in suspect piping. Dyed water appearing in the storm drain system indicates an illegal connection, possibly between the sanitary sewer system and the storm drain.

**4. Recreational Sewage**

Based on the large volume of recreational boating in the Mamaroneck Harbor, the Village is highly susceptible to problems from recreational sewage discharge. Under federal law, it is illegal to discharge marine sewage from boats in navigable U.S. waters, including coastal waters up to 3 miles offshore. Boats with installed toilets must have an operable Coast Guard approved marine sanitation device (MSD) that either holds sewage for pumpout ashore or for discharge in the ocean beyond the 3-mile limit, or that treats the sewage to Federal standards prior to discharge. Marina and recreational boat sewage can have substantial impact on water quality by introducing bacteria, nutrients, and hazardous chemicals into waterways. It has been reported that a single overboard discharge of human waste can be detected in up to a 1-square-mile area of shallow enclosed water (FL DEP, no date). These human wastes can include Streptococci, fecal coliform, and other bacteria. "Boats can be a significant source of fecal coliform bacteria in areas with high boating densities and low hydrologic flushing," [a near perfect description of Mamaroneck Harbor] "and fecal coliform levels become elevated near boats during periods of high occupancy and usage (USEPA, 1993)". Holding tanks on boats also concentrate pollutants and use increased levels of oxygen during decomposition. Table 1 shows a comparison of the biological oxygen demand required to break down sewage held by MSD's versus untreated and treated municipal sewage (FL DEP, no date).

### **III. Illicit Discharge Detection and Elimination**

**Table 1. BOD concentrations according to sewage type**

Sewage	BOD concentration
Boat Sewage	1,700-3,500 mg/l
Raw Municipal Sewage	110-400 mg/l
Treated Municipal Sewage	5-100 mg/l

The Village provides services for removal of recreational wastes which alleviates the effects that this source of pollutants has on water quality. However, pumpout facilities are of little use if boaters do not use the service. This can be addressed in two ways:

**a. Education**

Many boaters are unaware of state and federal regulations requiring the use of marine sanitation devices, or of the location of pumpout services. Like most forms of educational outreach, the use of pamphlets, newsletters, bill inserts, and meetings are often used to inform users of available pumpout services. The Village will also implement a free inspections of customer MSD's through the Coast Guard Auxiliary Boating Safety Program.

**b. Enforcement**

A strict laws will be developed granting the Harbor Master the authority to enforce MSD requirements and fine violators, and the enforcement authority will allow for the inspection and identification of MSD'S that are not operating properly. As part of this ordinance to enforce illegal discharge controls, all vessels entering and/or docking in Mamaroneck Harbor will be required to place dye tablets in holding tanks to discourage illegal disposal. Upon a vessel entering the harbor, a harbor patrol officer will board and place dye tablets in all sanitary devices. The devices are then flushed to ensure that the holding tanks do not leak. One tablet in approximately 60 gallons of water will give a visible dye concentration of one part per million.

**5. *Sanitary Sewer Overflows***

Sanitary sewer overflows (SOS's) involve the release of raw sewage from a separate sanitary sewer system prior to reaching a treatment facility. The raw sewage from these overflows contains bacteria and nutrients that affect both human and environmental health. These overflows occur when the flow into the system exceeds the design capacity of the conveyance system, resulting in discharges into basements, streets, and streams. A common SSO is overflowing sewage manholes that send untreated sewage into a stream. Identification of SSO's within the Village is being addressed separately by the development of a Capacity, Management, Operation and Maintenance (CMOM) Program for the entire Village sanitary sewer collection and conveyance system.

**B. Implementation Timetable**

The Phase II Final Rule requires the use of measurable goals and allows five (5) years for full implementation of the SWMP. The following measurable goals are herein established for this purpose:

### **III. Illicit Discharge Detection and Elimination**

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**1. Year 1**

Storm Sewer Mapping in-place; Areas using septic systems identified and addressed, ordinance in place for dye testing of all boats in Harbor; concurrent development and implementation of CMOM in accordance with timetable developed in CMOM Program

**2. Year 2**

Identification of potential industrial areas with illicit storm water connections, action plan in place and begin implementation of investigation work

**3. Year 3**

Completion of illicit Business/Industrial illicit connection identification, removal of 25% of connections identified

**4. Year 4**

Removal of 95% of identified industrial illicit connections, CMOM in full implementation

## ***IV. Construction Runoff Control***

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***KW Furey Engineering, P.C.***  
*Engineering & Construction Management*

## **IV. Construction Site Runoff Control**

### **I. Introduction**

#### **A. Regulatory Text**

- "• You must develop, implement, and enforce a program to reduce pollutants in any storm water runoff to your small MS4 from construction activities that result in a land disturbance of greater than or equal to one acre. Reduction of storm water discharges from construction activity disturbing less than one acre must be included in your program if that construction activity is part of a larger common plan of development or sale that would disturb one acre or more. If the NPDES permitting authority waives requirements for storm water discharges associated with small construction activity in accordance with Sec. 122.26(b)(15)(i), you are not required to develop, implement, and/or enforce a program to reduce pollutant discharges from such sites.
- Your program must include the development and implementation of, at a minimum:
  - (A) An ordinance or other regulatory mechanism to require erosion and sediment controls, as well as sanctions to ensure compliance, to the extent allowable under State, Tribal, or local law;
  - (B) Requirements for construction site operators to implement appropriate erosion and sediment control (ESC) best management practices;
  - (C) Requirements for construction site operators to control waste such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste at the construction site that may cause adverse impacts to water quality;
  - (D) Procedures for site plan review which incorporate consideration of potential water quality impacts;
  - (E) Procedures for receipt and consideration of information submitted by the public, and
  - (F) Procedures for site inspection and enforcement of control measures."

#### **B. Program Overview**

The Village will develop and implement an Ordinance to provide for control of pollutant runoff on construction sites with a land disturbance greater than one (1) acre. The Ordinance will incorporate Construction Site Erosion and Sediment Control BMP's and will be accompanied by the development of a BMP Manual for use in the VILLAGE. The implementation of this measure will include three key aspects

- (1) Adoption of a Local Ordinance meeting the requirements of the Phase II Final Rule
- (2) Inclusion of the requirements of the ordinance in the Site Plan Review Process
- (3) Enforcement of the Ordinance through Building Department Inspections and the issuance of fines/penalties for violation

### **II. Program Approach**

#### **A. Best Management Practices (BMP)**

The following BMP's will be included in this control measure:

## **IV. Construction Site Runoff Control**

### **1. Land Grading**

Plans for land grading will address the steepness of cut-and-fill slopes and how the slopes will be:

- (1) Protected from runoff
- (2) Stabilized
- (3) Maintained

A grading plan will be required to be prepared that establishes which areas of the site will be graded, how drainage patterns will be directed, and how runoff velocities will affect receiving waters. The grading plan will also include information regarding when earthwork will start and stop, establishes the degree and length of finished slopes, and dictates where and how excess material will be disposed of (or where borrow materials will be obtained if needed). Berms, diversions, and other storm water practices that require excavation and filling will also be incorporated into the grading plan. Site fingerprinting, which involves clearing and grading only those areas necessary for building activities and equipment traffic, will be required for all grading plans. Maintaining undisturbed temporary and/or permanent buffer zones in the grading operation will also be required. The lowest elevation of the site will remain undisturbed to provide a protected storm water outlet before storm drains or other construction outlets are installed.

### **2. Permanent Diversions**

Diversions will be required to be constructed, in areas where runoff from areas of higher elevation poses a threat of property damage or erosion, by creating channels across slopes with supporting earthen ridges on the bottom sides of the slopes. The ridges reduce slope length, collect storm water runoff, and deflect the runoff to acceptable outlets that convey it without erosion. Diversions will include the following siting and design considerations:

#### **a. Ridge**

A cross section of the earthen ridge must have side slopes no steeper than 2:1; a width at the design water elevation of at least 4 feet; a minimum freeboard of 0.3 feet; and a 10-percent settlement factor included in the design.

#### **b. Outlet**

Four acceptable outlets for the conveyance of runoff and their construction specifications include:

- (1) Storm water conveyance channel. A permanent designed waterway, containing appropriate vegetation, that is appropriately shaped and sized to carry storm water runoff away from developing areas without any damage from erosion.
- (2) Level spreader. A device used to prevent erosion and to improve infiltration by spreading storm water runoff evenly over the ground as shallow flow instead of through channels. It usually involves a depression in the soil surface that disperses flow onto a flatter area across a slight slope and then releases the flow onto level vegetated areas. This reduces flow speed and increases infiltration.
- (3) Outlet protection. This involves placing structurally lined aprons or other appropriate energy-dissipating devices at the outlets of pipes to reduce the velocity of storm water flows and thereby prevent scouring at storm water outlets, protect the outlet structure, and minimize potential for erosion downstream.

## ***IV. Construction Site Runoff Control***

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- (4) Paved flume. A permanent paved channel that is constructed on a slope through which storm water runoff can be diverted down the face of the slope without causing erosion problems on or below the slope. Paved flumes are not recommended unless very high flows with excessive erosive power are expected, because increased runoff velocity might magnify erosion at the flume's outfall. Outfall protection must be provided to prevent damage from high-velocity flows. The paved flume also prevents infiltration of surface runoff, exacerbating offsite runoff problems. Where possible, vegetated channels should be used - additional stabilization can be provided with rip-rap, gabions, or turf reinforcement mats.

### ***c. Stabilization***

Immediately after the ridge and channel are constructed, they must be seeded and mulched along with any disturbed areas that drain into the diversion. Sediment-trapping measures must remain in place in case the upslope area is not stabilized, to prevent soil from moving into the diversion. All obstructions and unsuitable material, such as trees, brush, and stumps, must be removed from the channel area and disposed of so the diversion may function properly. The channel must meet grade and cross-section specifications, and any fill that is used must be free from excessive organic debris, rocks, or other unsuitable material and must be compacted to ensure equal settlement. Disturbed areas will be permanently stabilized.

### ***3. Preserving Natural Vegetation***

The principal advantage of preserving natural vegetation is the protection of desirable trees, vines, bushes, and grasses from damage during project development. Vegetation provides erosion control, storm water detention, biofiltration, and aesthetic values to a site during and after construction activities. Other benefits from preserving natural areas are because natural vegetation

- (1) Can process higher quantities of storm water runoff than newly seeded areas
- (2) Does not require time to establish
- (3) Has a higher filtering capacity than newly planted vegetation because aboveground and root structures are typically denser
- (4) Reduces storm water runoff by intercepting rainfall, promoting infiltration, and lowering the water table through transpiration
- (5) Provides buffers and screens against noise and visual disturbance
- (6) Provides a fully developed habitat for wildlife
- (7) Usually requires less maintenance (e.g., irrigation, fertilizer) than planting new vegetation
- (8) Enhances aesthetics.

### ***4. Construction Entrances***

Stabilizing the entrances to a construction site will be required to minimize the amount of sediment leaving the area as mud and sediment attached to motorized vehicles. Included in this requirement will be:

- (1) Installing a pad of gravel over filter cloth where construction traffic leaves a site can help stabilize a construction entrance. As a vehicle drives over the gravel pad, mud and sediment are removed from the vehicle's wheels and offsite transport of soil is reduced. The gravel pad also reduces erosion and rutting on the soil beneath the stabilization

## **IV. Construction Site Runoff Control**

structure. The filter fabric separates the gravel from the soil below, preventing the gravel from being ground into the soil. The fabric also reduces the amount of rutting caused by vehicle tires by spreading the vehicle's weight over a larger soil area than just the tire width.

- (2) In addition to removal of sediment by simple friction of vehicle tires on the gravel pad, a vehicle washing station will be established at the site entrance. Wash stations, remove a substantial amount of sediment from vehicles before they leave the site. Runoff from vehicle washing stations will be diverted into a sediment traps to ensure that sediment removed from vehicles is kept on-site and disposed of properly.

### **5. *Check Dams***

Check dams are small, temporary dams constructed across a swale or channel. Check dams will be constructed using gravel, rock, sandbags, logs, or straw bales and are used to slow the velocity of concentrated flow in a channel. By reducing the velocity of the water flowing through a swale or channel, check dams reduce the erosion in the swale or channel. Check dams will be used in swales or channels that will be used for a short period of time where it is not practical to line the channel or implement other flow control practices. In addition, check dams are appropriate where temporary seeding has been recently implemented but has not had time to take root and fully develop. Check dams are usually used in small open channels with a contributing drainage area of 2 to 10 acres. For a given swale or channel, multiple check dams, spaced at appropriate intervals, will increase overall effectiveness. If dams are used in a series, they should be spaced such that the base of the upstream dam is at the same elevation as the top of the next downstream dam.

### **6. *Filter Berms***

A gravel or stone filter berm is a temporary ridge made up of loose gravel, stone, or crushed rock that slows, filters, and diverts flow from an open traffic area and acts as an efficient form of sediment control. Gravel or stone filter berms will be required in areas where vehicular traffic needs to be rerouted because roads are under construction, or in traffic areas within a construction site.

### **7. *Grass Lined Channels***

Grass-lined channels convey storm water runoff through a stable conduit. Vegetation lining the channel reduces the flow velocity of concentrated runoff. Grassed channels are not designed to control peak runoff loads by themselves and are to be used in combination with other BMP's, such as subsurface drains and rip-rap stabilization. Where moderately steep slopes require drainage, grassed channels can include excavated depressions or check dams to enhance runoff storage, decrease flow rates, and enhance pollutant removal. Peak discharges can be reduced through temporary detention in the channel. Pollutants are removed from storm water by filtration through vegetation, by deposition, or in some cases by infiltration of soluble nutrients into the soil. Grassed channels are to be used in areas where erosion-resistant conveyances are needed, including areas with highly erodible soils and moderately steep slopes (although less than 5 percent). They should only be installed where space is available for a relatively large cross section. Grassed channels have a limited ability to control runoff from large storms and will not be used in areas where flow rates exceed 5 feet per second.

## ***IV. Construction Site Runoff Control***

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### ***8. Rip-Rap***

Rip-rap is a permanent, erosion-resistant layer made of stones. It is intended to protect soil from erosion in areas of concentrated runoff. Rip-rap will also be used to stabilize slopes that are unstable because of seepage problems. Rip-rap is to be used to stabilize cut-and-fill slopes; channel side slopes and bottoms; inlets and outlets for culverts, bridges, slope drains, grade stabilization structures, and storm drains; and streambanks and grades.

### ***9. Erosion Control***

Erosion Control Measures will be implemented to stabilized exposed solids. These measures will include as appropriate:

- (1) Chemical Stabilization
- (2) Mulching
- (3) Permanent Seeding
- (4) Sodding
- (5) Soil Roughening
- (6) Geotextile Slope Stabilization
- (7) Construction of Gradient Terraces
- (8) Slope Reinforcement
- (9) Pipe Slope Drains

### ***10. Protection of Waterways***

Waterways adjacent to construction sites shall be adequately protected at all times. Protection measures will include as appropriate:

- (1) Temporary Stream Crossings
- (2) Vegetated Buffer Zones

### ***11. Sediment Control***

Site perimeter controls will be employed to contain any potential sediment runoff on the construction site. These measures will include as appropriate:

- (1) Temporary Diversion Dikes, Earth Dikes, and Interceptor Dikes
- (2) Wind and Sand Fences
- (3) Brush Barriers
- (4) Silt Fencing
- (5) Sediment Basins and Rock Dams
- (6) Sediment Filters and Chambers
- (7) Sediment Traps

### ***12. Storm Sewer System Inlet Protection***

Storm drain inlet protection measures are controls that help prevent soil and debris from site erosion from entering storm drain drop inlets. These measures are temporary controls that are implemented prior to large-scale disturbance of the surrounding site. These controls are

## **IV. Construction Site Runoff Control**

advantageous because their implementation allows storm drains to be used during even the early stages of construction activities. The early use of storm drains during project development significantly reduces the potential occurrence of future erosion problems. Three temporary control measures to protect storm drain drop inlets are

**a. Excavation around the perimeter of the drop inlet**

Excavation around a storm drain inlet creates a settling pool to remove sediments. Weep holes protected by gravel are used to drain the shallow pool of water that accumulates around the inlet.

**b. Fabric barriers around inlet entrances**

A fabric barrier made of porous material erected around an inlet can create an effective shield to erosion sediment while allowing water flow into the storm drain. This type of barrier can slow runoff velocity while catching soil and other debris at the drain inlet.

**c. Block and gravel protection.**

Block and gravel inlet protection uses standard concrete blocks and gravel to form a barrier to sediments while permitting water runoff through select blocks laid sideways.

For permanent storm drain drop inlet protection after the surrounding area has been stabilized, sod will be installed as a barrier to slow storm water entry to storm drain inlets and capture erosion sediments. All temporary controls will have a drainage area no greater than 1 acre per inlet. Temporary controls must be constructed prior to disturbance of the surrounding landscape.

### **13. *Good Housekeeping***

Good construction site housekeeping is essential to the prevention of other pollutants from entering site runoff. The housekeeping procedures to be employed include:

- (1) General Construction Site Waste Management
- (2) Implementation of a Spill Prevention & Control Plan
- (3) Use of a Vehicle Maintenance Washing Area

### **B. *Implementation Timetable***

The Phase II Final Rule requires the use of measurable goals and allows five (5) years for full implementation of the SWMP. The following measurable goals are herein established for this purpose:

**1. *Year 1***

Ordinance in place, Village Construction Site Erosion and Sediment Control BMP Manual completed, begin incorporating in Planning Board Reviews

**2. *Year 2***

Full implementation of Ordinance in Site Plan Reviews, inspections and enforcement on 100% of new construction sites.

## ***V. Post-Construction Runoff***

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***KW Furey Engineering, P.C.***  
*Engineering & Construction Management*

## **V. Post-Construction Runoff Control**

### **I. Introduction**

#### **A. Regulatory Text**

- "• You must develop, implement, and enforce a program to address storm water runoff from new development and redevelopment projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, that discharge into your small MS4. Your program must ensure that controls are in place that would prevent or minimize water quality impacts.
- You must:
  - Develop and implement strategies which include a combination of structural and/or non-structural best management practices (BMP'S) appropriate for your community;
  - Use an ordinance or other regulatory mechanism to address post-construction runoff from new development and redevelopment projects to the extent allowable under State, Tribal or local law;
  - Ensure adequate long-term operation and maintenance of BMP'S."

#### **B. Program Overview**

If water quality impacts are considered from the beginning stages of a project, new development and potentially redevelopment provide more opportunities for water quality protection. EPA recommends that the BMP'S chosen: be appropriate for the local community; minimize water quality impacts; and attempt to maintain pre-development runoff conditions. The process will include both Structural and Non-Structural BMP's to ensure that development projects include the best long-term storm water runoff measures possible.

### **II. Program Approach**

#### **A. Best Management Practices (BMP)**

The following BMP's will be included in this control measure:

##### **1. Village Storm Water Design Manual**

The structural BMP's will be included in a Village Storm Water Design Manual. This manual will include those storm water measures the Village feels are appropriate for inclusion in proposed development projects. The basic design concepts included in the manual will be taken from existing USEPA, New York State Department of Environmental Conservation (NYSDEC), and Water Environment Federation (WEF) publications, and tailored to the specific concerns of the Village. A preliminary list of the BMP's to be included in the manual includes:

- (1) Dry Extended Detention Ponds
- (2) Infiltration Trenches
- (3) Sand and Organic Filters
- (4) Grassed Swales

## **V. Post-Construction Runoff Control**

- (5) Grassed Filter Strips
- (6) Catch Basins

### **2. Zoning Ordinances**

The Non-Structural BMP's will include additions to the Zoning Ordinances requiring certain BMP's be incorporated in both strategic planning and overall design of development projects. Included in these BMP's is:

#### **a. Buffer Zones**

An aquatic buffer is an area along a shoreline, wetland, or stream where development is restricted or prohibited. The primary function of aquatic buffers is to physically protect and separate a stream, lake, or wetland from future disturbance or encroachment. If properly designed, a buffer can provide storm water management and act as a right-of-way during floods, sustaining the integrity of stream ecosystems and habitats. Technically, aquatic buffers are one type of conservation area that function as an integral part of the aquatic ecosystem and can also function as part of an urban forest. The three types of buffers are:

##### **(1) Water Pollution Hazard Setbacks**

Water pollution hazard setbacks are areas that separate a potential pollution hazard from a waterway. By providing setbacks from these areas in the form of a buffer, the potential for pollution can be reduced

##### **(2) Vegetated Buffers**

Vegetated buffers are any number of natural areas that exist to divide land uses or provide landscape relief.

##### **(3) Engineered Buffers**

Engineered buffers are areas specifically designed to treat storm water before it enters into a stream, lake, or wetland.

#### **b. Open Space Design**

Open space design, also known as conservation development or cluster development, is a better site design technique that concentrates dwelling units in a compact area in one portion of the development site in exchange for providing open space and natural areas elsewhere on the site. The minimum lot sizes, setbacks and frontage distances for the residential zone are relaxed in order to create the open space at the site. Open space designs have many benefits in comparison to the conventional subdivisions that they replace: they can reduce impervious cover, storm water pollutants, construction costs, grading, and the loss of natural areas. Zoning ordinances will need to be developed to permit open space development to achieve greater water quality and environmental benefits.

### **B. Implementation Timetable**

The Phase II Final Rule requires the use of measurable goals and allows five (5) years for full implementation of the SWMP. The following measurable goals are herein established for this purpose:

## **V. Post-Construction Runoff Control**

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*1. Year 1*

Village Storm Water Design Manual Developed, public education to local developers, engineers and contractors about required long-term storm water approaches completed

*2. Year 2*

Zoning changes made to allow open space development and designation of Buffer Zones completed. Combination of structural and non-structural BMP's fully integrated in development approval process.

## ***VI. Good Housekeeping***

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***KW Furey Engineering, P.C.***  
*Engineering & Construction Management*

## **VI. Pollution Prevention / Good Housekeeping**

### **I. Introduction**

#### **A. Regulatory Text**

"You must develop and implement an operation and maintenance program that includes a training component and has the ultimate goal of preventing or reducing pollutant runoff from municipal operations. Using training materials that are available from EPA, your State, Tribe, or other organizations, your program must include employee training to prevent and reduce storm water pollution from activities such as park and open space maintenance, fleet and building maintenance, new construction and land disturbances, and storm water system maintenance."

#### **B. Program Overview**

This program will include maintenance activities, maintenance schedules, and long-term inspection procedures for structural and non-structural storm water controls to reduce floatables and other pollutants discharged from the storm sewers; controls for reducing or eliminating the discharge of pollutants from streets, roads, highways, municipal parking lots, maintenance and storage yards, fleet or maintenance shops with outdoor storage areas, salt/sand storage locations and snow disposal areas, and waste transfer stations; and procedures for properly disposing of waste removed from the storm sewers. Operation and maintenance is an integral component of all storm water management programs. This measure is intended to improve the efficiency of these programs. The BMP's discussed in this section are in addition to those enumerated in Section I, which will be implemented by the Village as well as included in the Public Education Materials developed under that Control Measure.

### **II. Program Approach**

#### **A. Best Management Practices (BMP)**

The following BMP's will be included in this control measure:

##### ***1. Automobile Maintenance***

This pollution prevention measure involves creating a program of targeted outreach and training for businesses and the Village's municipal fleet (DPW, school buses, fire, and police) involved in automobile maintenance about practices that control pollutants and reduce storm water impacts. Automotive maintenance facilities are considered to be storm water "hot spots" where significant loads of hydrocarbons, trace metals, and other pollutants can be produced that can affect the quality of storm water runoff. Some of the waste types generated at automobile maintenance facilities and at homes of residents performing their own car maintenance include the following:

- (1) Solvents (paints and paint thinners)
- (2) Antifreeze
- (3) Brake fluid and brake lining
- (4) Batteries
- (5) Motor oils
- (6) Fuels (gasoline, diesel, kerosene)

## **VI. Pollution Prevention / Good Housekeeping**

(7) Lubricating grease.

### **2. *Vehicle Washing***

This management measure involves educating the general public, businesses, and the Village fleet on the water quality impacts of the outdoor washing of automobiles and how to avoid allowing polluted runoff to enter the storm drain system. Outdoor car washing has the potential to result in a high loads of nutrients, metals, and hydrocarbons during dry weather conditions in many watersheds, as the detergent-rich water used to wash the grime off our cars flows down the street and into the storm drain. Commercial car wash facilities will be required to recycle their water and to treat their wash water discharge prior to release to the sanitary sewer system., Storm water impacts from car washing charity car wash fundraisers will be required to obtain a permit, outlining BMP's for preventing discharge of polluted wash water to the storm drain system. Business operations that maintain fleets and car dealerships, will be required to install containment systems to retain and treat wash water prior to discharge.

### **3. *Parking Lot & Street Sweeping***

This management measure involves employing pavement cleaning practices such as street sweeping on a regular basis to minimize pollutant export to receiving waters. These cleaning practices are designed to remove from road and parking lot surfaces sediment debris and other pollutants that are a potential source of pollution impacting urban waterways. A street sweeping schedule will be developed, targeting those areas with the greatest impact on water quality as a priority.

### **4. *Storm Drain System Cleaning***

The storm drain system need to be cleaned regularly. Routine cleaning reduces the amount of pollutants, trash, and debris both in the storm drain system and in receiving waters. Clogged drains and storm drain inlets can also cause the drains to overflow, leading to increased erosion and further adverse impacts on water quality. The benefits of cleaning include increased dissolved oxygen, reduced levels of bacteria, and support of instream habitat. Areas with relatively flat grades or low flows (as determined in the mapping of the system) will be given special attention because they rarely achieve high enough flows to flush themselves. A regular maintenance schedule will be developed to systematically flush all the storm sewers, and clean out the catch basins, in the Village on a rotating basis.

### **5. *Roadway Salt Storage***

The application and storage of deicing materials, most commonly salts such as sodium chloride, can lead to water quality problems for surrounding areas. Salts, gravel, sand, and other materials are applied to the Village roads to reduce the amount of ice during winter storm events. Covering stored road salts may be costly; however, the benefits are greater than the perceived costs. Storing road salts correctly prevents the salt from lumping together, which makes it easier to load and apply. In addition, covering salt storage piles reduces salt loss from storm water runoff and potential contamination to streams, aquifers, and estuarine areas. Salt storage piles will be located outside the 100-year flood plain for further protection against surface water contamination. BMP's will be implemented during salt application. The amount of road salt applied will be regulated to prevent over-salting of roads and increasing runoff concentrations. Calibration devices will be

## **VI. Pollution Prevention / Good Housekeeping**

installed for spreaders in trucks for the proper application of road salts. Alternative materials, such as sand or gravel, will be used in areas immediately adjacent to the Harbor.

### **B. Implementation Timetable**

The Phase II Final Rule requires the use of measurable goals and allows five (5) years for full implementation of the SWMP. The following measurable goals are herein established for this purpose:

*1. Year 1*

Implementation of Housekeeping BMP's by Village Departments, development of maintenance schedule for storm sewer system

*2. Year 2*

Training Program for Village employees implemented, roadway salt reduction measures implemented

*3. Year 3*

Inspection process in-place to observe if local business are practicing housekeeping BMP's, and enforcement vehicle for offenders in -place