

Georgia Environmental Protection Division

Guidance Document

Notice of Intent & Storm Water
Management Program Preparation
For Military Facilities



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Chapter One **Background Information**

The Federal Phase II Stormwater regulations, 40 CFR Part 122.33, require an operator of a small municipal separate storm sewer system (MS4) or a facility with operation similar to a municipality (i.e. “look-alikes”) to apply for coverage under an NPDES permit for discharges from its storm sewer system. In Georgia, general NPDES permits will be used for all small MS4s. A general permit includes requirements that apply to all similar permittees, as opposed to an individual permit, which is tailored to a specific permittee. To apply for a general NPDES permit, a permittee must file a Notice of Intent (NOI) to be covered under the permit. The Georgia Environmental Protection Division (EPD) has developed a NOI form for use by small MS4s at military bases, called a Georgia Notice of Intent (GaNOI). This NOI will be due within 180 days after the NPDES Permit GAG480000 is issued.

The regulations require that you develop, implement and enforce a Storm Water Management Program (SWMP) designed to reduce the discharge of pollutants from your MS4 to the “Maximum Extent Practicable” to protect water quality. The MS4 will not be required to treat storm water to comply with numerical discharge standards. Instead, you will be required to implement best management practices (BMPs), which reduce pollutants prior to their discharge into the storm sewer system.

The SWMP will consist of 6 minimum control measures. These measures are as follows:

- Public education and outreach on storm water impacts;
- Public involvement/participation;
- Illicit discharge detection and elimination;
- Construction site storm water runoff control;
- Post-construction storm water management in new development and redevelopment; and
- Pollution prevention/good housekeeping for municipal operations.

For each of the 6 minimum control measures, you will need to select BMPs and set measurable goals. The steps the MS4 should undertake to select BMPs and set measurable goals will be discussed in future chapters. EPD has written the GaNOI form so that when the MS4 completes the form, it has also completed development of a SWMP.

Chapter Two **Identifying Water Quality Problems**

In order to develop a SWMP, the first step must be to identify water quality problems within your jurisdiction. For example, has the MS4 noted an increase of debris in the stream after a rain event? Have there been reports by the base community of an oil sheen on a local stream? Has the MS4 received complaints from a member of the base community of red mud in the streets after a rain event?

The potential problems in your area may be numerous and diverse. You may not be aware of all the problems. However, a starting point for identifying the problems is to look at any existing data. One data source is the EPD's 305(b)/303(d) list of impaired State waters. You should check the latest list to see if any stream segments within your jurisdiction are included (available www.gaepd.org/Documents/305b.html). Another method for identifying water quality problems is to talk to members of the base community (e.g. residents, employees) to gather information on any observed problems. Another approach is to identify possible sources of pollution within your jurisdiction. When developing your storm water management program, it may benefit you to address possible pollutants generated at these sources. For example, you may want to consider the following potential sources of pollution:

- Parking lots;
- Fueling stations;
- Vehicle maintenance areas;
- Car washes; and
- Residential housing areas.

Once you have identified the water quality problems or possible pollution sources within your jurisdiction, you are ready to begin selecting appropriate BMPs and setting attainable measurable goals.

Chapter Three **Best Management Practices (BMPs)**

A BMP can be structural or non-structural. Examples of structural BMPs are detention basins or vegetated swales. A non-structural BMP can consist of a program or procedure, such as a household hazardous waste recycling program, erosion control program, or a street cleaning program. Because structural BMPs can be costly and are not always a suitable solution to correcting a water quality problem, the facility should explore all the possible non-structural BMPs before deciding on a structural BMP.

EPA has created a “menu” of BMPs. This BMP menu list includes multiple BMPs for each of the 6 minimum control measures. The menu of BMPs can be found at www.epa.gov/npdes/stormwater/menuofbmps. EPA tried to fully evaluate each of the BMPs and provide information on the effectiveness of the BMP, the implementation cost and other useful information. After reviewing the list of BMPs, the MS4 may find that they are already implementing some of the BMPs. If not, the MS4 should be able to review the list and choose those BMPs which would appear to work for their situation. The MS4 should realize that the menu of BMPs is just a guidance document. The MS4 is free to be creative and develop their own BMPs.

In August 2001, a guidance document titled “Georgia Stormwater Management Manual (Volumes 1 and 2) was completed (www.georgiastormwater.com). If the MS4 determines that a structural BMP is required, then EPD recommends the use of this manual during the design of the structural control device. If a structural BMP will be constructed, then the MS4 should develop a schedule for maintaining the structure. By not maintaining a structure, the MS4 may appear to save money. However, the effectiveness of the BMP may be reduced. The MS4 would then need to implement additional BMPs to address the problem, which may result in the MS4 spending additional money. So, it is very important that the MS4 include a maintenance schedule during the development of any structural BMP. The schedule could require periodic inspection with maintenance as needed or periodic maintenance, whichever is appropriate. The MS4 should have a system in place which allows the inspection or maintenance schedule to be tracked, either manually or through a computer database.

The number of BMPs chosen for each of the 6 minimum control measures will vary. The MS4 may determine that only two BMPs are needed to address a water quality problem. However, the MS4 should not limit themselves to only two BMPs if they think a third or additional BMPs will prove effective. Also, the number of BMPs needed may depend on the size of a MS4 and activities at the military facility. Due to a larger population, an increased number of pollution sources, and increased impervious surface area, a larger facility may have more identified water quality problems. Therefore, a larger MS4 may need to implement more BMPs and develop a more complex SWMP.

The SWMP is meant to be flexible and constantly evolving. The MS4 can try a BMP, determine it is not effective or too costly, and replace it with a new BMP. The MS4 may identify a new water quality problem several years after the GaNOI was completed. Therefore, the MS4 might need to implement a new or additional BMP at that time. You may also find after you begin to implement a BMP that your measurable goals require revision.

You may share responsibility with another entity for implementing a minimum control measure or a component of a measure. You must have a written memorandum of agreement (MOA) with the other entity clearly stating that they will implement the control measure or a component of the measure on your behalf. You must submit a copy of the executed agreement to EPD. You will still have to submit a GaNOI form, all annual reports, and any other information that EPD requests. If the other entity does implement a control measure for you, then you will need to explain that in the annual report. In addition, you will need to either provide a summary of the other entity's activities on your behalf, or have the other entity prepare a summary of its activities and you submit a copy of their summary with your annual report.

You need to be aware that there is liability involved by allowing another entity to implement a control measure or component on your behalf. If the other entity agrees to implement the measure, but fails to perform the task, you may be liable for EPD enforcement action. Therefore, it is very important that you have a close working relationship with the other entity before entering into the agreement.

As previously explained, you may try a BMP, determine it is not suited to your needs and try another BMP. The only stipulation is that you notify EPD in writing at least 30 days prior to making a substantial change to the SWMP. The Permit does not require that you receive EPD approval for the SWMP revision or revised BMP. However, it is highly recommended that you request approval in writing and receive EPD's concurrence in writing.

You are expected to evaluate your chosen BMPs and begin implementing those BMPs that are not complex or time-consuming as soon as possible. Some BMPs, such as those requiring construction or development of a MS4 map or regulatory mechanism, may take longer to implement. However, within two (2) years of the issuance date of NPDES Permit No. GAG480000, the MS4 must have developed and begun implementing a complete SWMP that addresses all of the 6 minimum control measures. The SWMP may still be revised as needed; however, the revisions should happen less frequently than during the initial start-up of the program.

Chapter Four **Measurable Goals**

Once you determine which BMPs you will use to address the identified problems, then you must set a measurable goal for each BMP. Measurable goals allow you and EPD to track the effectiveness of each BMP and the overall progress of your SWMP. You should review any existing BMPs the MS4 may already be implementing. If you determine the BMP should be retained, then you need to set a measurable goal for that BMP. Also, each newly proposed BMP will need to have a corresponding measurable goal. Following is some general information on how to set measurable goals. In subsequent chapters dealing with each of the 6 minimum control measures, more specific information tailored to the possible goals for that control measure will be discussed.

When setting a measurable goal, the MS4 needs to establish an implementation schedule. The schedule can be written in one of two ways. The first method is for those BMPs that will take time to implement (e.g. construction of a control structure, mapping the storm sewer system). For this type of BMP, the implementation schedule needs to include a start date, interim milestone dates, and a date for completion.

The second type of BMP will require an implementation schedule that either tracks how often a BMP is performed (e.g. conducting an annual workshop for construction site operators) or the total number of items completed (e.g. number of educational brochures distributed annually, number of storm drains stenciled annually).

The MS4 will need to establish a method to track the implementation schedule and determine when the goal is achieved. You may develop a database which allows tracking of milestone dates and/or activities, or choose some other tracking method. This information will be useful when the MS4 is compiling an annual report for submittal to EPD.

Once you have established the measurable goal and implementation schedule for each BMP, you will need to have procedures in place for evaluating the effectiveness of the BMP and if the goal is being achieved. In order to do this, you will need to establish a baseline condition and compare it against a quantifiable target. Establishing the baseline condition can consist of something as simple as photographing a stream segment, which shows the condition of the stream at a given time. Photographs are inexpensive, easy to do, and are easily understood. You may decide to document a baseline condition using another method, such as stream monitoring to establish a water quality baseline. You can set a baseline based on the number of BMPs in existence (e.g. the number of existing detention basins). Other methods of establishing baselines are also available and the MS4 should explore all possible options.

In order to determine if the BMP is being effective, the MS4 will need to establish a quantifiable target to compare against the baseline condition. For example, stream monitoring may show an improvement in water quality since the baseline monitoring was performed. The MS4 may have had 1 existing detention pond and now has completed construction of 2 additional ponds for a total of 3 ponds. The MS4 may have determined a control structure required modification in order to increase pollutant removal and the amount of increased pollutant removal efficiency can be quantified to show the BMP is being effective.

EPA has developed a guidance document for measurable goals that can be found at www.epa.gov/npdes/stormwater/measurablegoals. As part of this guidance, they list the following 26 indicators that can be used to evaluate the effectiveness of a BMP.

Category	Number	Indicator Name
Water Quality Indicators	1	Water quality pollutant constituent monitoring
	2	Toxicity testing
	3	Loadings
	4	Exceedance frequencies of water quality standards
	5	Sediment contamination
	6	Human health criteria
Physical and Hydrological Indicators	7	Stream widening/ downcutting
	8	Physical habitat monitoring
	9	Impacted dry weather flows
	10	Increased flooding frequency
	11	Stream temperature monitoring
Biological Indicators	12	Fish assemblage
	13	Macroinvertebrate assemblage
	14	Single species indicator
	15	Composite indicator
	16	Other biological indicators
Social Indicators	17	Public attitude surveys
	18	Industrial/commercial pollution prevention
	19	Public involvement and monitoring
	20	User perception
Programmatic Indicators	21	Number of illicit connections identified/corrected
	22	Number of BMPs installed, inspected, maintained
	23	Permitting and compliance
	24	Growth and development
Site Indicators	25	BMP performance monitoring
	26	Industrial site compliance monitoring

Each chapter for the 6 minimum control measures will include more specific information on setting measurable goals and evaluating their effectiveness.

Chapter Five
First Minimum Control Measure
Public Education and Outreach on Stormwater Impacts

Regulatory Requirement, 40 CFR Part 122.34(b)(1):

You must implement a public education program to distribute educational materials to the base community or conduct equivalent outreach activities about the impact of stormwater discharges on water bodies and the steps that the base community can take to reduce pollutants in stormwater runoff.

Guidance:

As explained in Chapter 2, the first step you need to take is to identify the water problem areas within your jurisdiction. You should develop your public education program by focusing on your “target audience”. For military facilities, your target audience will be both the residents and base employees within the facility fence line.

Example #1:

You have noticed incidents of red mud in the streets after rain events in area of the facility undergoing construction. You would want to develop and distribute educational materials to construction contractors and subcontractors about the proper use of erosion and sedimentation management practices.

Example #2:

You have received complaints from local residents of an oil sheen on a local stream. This could indicate the improper disposal of motor oil either from a resident or a vehicle maintenance facility. If the stream is located in the residential housing area, you will want to target your educational program towards the proper disposal of used oil by residents, including possibly providing an acceptable disposal location. If the stream is located in the area of the base where municipal-type operations are occurring, then you would want to develop educational materials more tailored to employees, such as proper pollution prevention.

During the development of your public education program, you will also need to determine the type of educational materials you will use. You should ensure you choose materials that will adequately convey your message to the largest available

audience. You want to try to use the most effective means for conveying your message at the least amount of cost (i.e. the most bang for your buck).

You can use print materials (e.g. brochures, newsletters) or the other types of media. You will need to determine the best method to disseminate your message depending on your budget. You may use existing educational materials from EPA (www.epa.gov) or other organizations or you may create your own. Several organizations have created educational materials, including the Center for Watershed Protection (www.cwp.org), Georgia's Clean Water Campaign (www.cleanwatercampaign.com) and Georgia's Pollution Prevention Assistance Division (www.p2ad.org).

After determining the water quality problems in your area and your target audience, then you need to select potential BMPs. EPA has provided numerous examples of BMPs in their "menu of BMPs". They have suggested BMPs for educating various types of communities. It is recommended that you review these potential BMPs to determine if any will work for your facility. You may also be creative and develop your own BMPs.

The final step is to establish a measurable goal for each BMP. The goal should be specific for each BMP. For example, to address the problem of oil sheens on a stream, you decided the appropriate BMP is to educate residents or employees on the proper disposal of used oil. You have decided to develop and distribute an informational brochure. Your measurable goal for this BMP will be to complete development of the brochure within 6 months and distribute 25 copies of the brochure annually.

EPA has developed a list of parameters the MS4 can use when establishing the measurable goals for the Public Outreach and Education minimum control measure (Measurable Goals Guidance for Phase II Small MS4s, pages 36-38). We have reiterated them in Table 1 for your convenience. Because these goals were written for municipal communities, you may not be able to use some of the goals and/or may need to revise them to be relevant to a military facility's educational program.

Table 1
Measurable Parameters
Public Education and Outreach

Classroom Education on Storm Water

- The number of educational materials distributed to schools.
- The number of classes, schools, or students that participate in municipal-sponsored storm water workshops or activities.
- The number of workshops held for teachers on storm water education.
- The number of certificates or other rewards given out for classes/students who participate in storm water education.
- The number of students receiving storm water education as a regular part of the school curriculum.
- The number of students receiving storm water education as part of after-school programs.

Education/Outreach for Commercial Activities

- The number of educational materials that were distributed to business owners and operators.
- The number of certified businesses that participated in training for a “green certification” program.
- The number of businesses trained under a training program.

Educational Displays, Pamphlets, Booklets, and Utility Stuffers

- List compiled of target audiences and possible activities for each.
- The number of materials created and distributed.
- The number of events attended with displays.
- The number of people at an event who saw the display (guest book) or took a pamphlet/booklet.

Lawn and Garden Activities

- The number of partnerships established with local lawn care businesses.
- The number of partnerships established with lawn care suppliers/retail stores.
- The number of municipal employees trained in proper lawn care practices.
- The number of homeowners that attend training workshops for lawn/garden care BMPs.
- A survey of homeowners about their lawn care behavior before and after message is delivered.
- Fertilizer and pesticide residues in runoff.
- The number of requests for soil testing.

Low Impact Development

- The number of meetings held to educate citizens and developers about low impact development.
- The percentage of land use codes reviewed to ensure consistency with low impact development principles and practices.
- The number of new site plans that incorporate low impact development principles & practices.
- The number of municipal-owned facilities that are retrofitted with low impact development practices.

Pet Waste Management

- Whether or not a pet waste ordinance was developed.
- The number of “clean up after your pet” signs posted in parks or neighborhoods.
- The number of dog-walking designated areas in parks.
- Nutrient and bacteria levels in runoff.
- The number of citations given under an enforcement program.
- The number of posters/brochures put up in pet supply stores.
- The number of educational materials given out to pet owners.

Promotional Giveaways

- The number of items given out.
- The number of events attended (to give out items).
- The number of partnerships with radio and TV stations for promotions.

Proper Disposal of Household Hazardous Wastes

- The pounds of household hazardous waste collected on amnesty days.
- The number of pickup days per year.
- The number of educational materials distributed to homeowners.
- The number of partnerships established with businesses.
- The number of curbside pickup days.
- Toxic chemical levels in receiving waters.

Tailoring Outreach Programs to Minority and Disadvantaged Communities and Children

- The number of brochures/posters created in non-English languages.
- The number of partnerships established with minority organizations.
- Attendance at workshops or public meetings held in low-income or minority neighborhoods.
- The number of educational materials distributed to low-income neighborhoods.

Trash Management

- The mass of trash removed from conveyance systems and receiving waters during cleanup campaigns.
- The number of structural trash controls installed.
- Floatables in receiving waters.
- Track the number of additional trash bins installed and signage posted.
- Whether or not a litter ordinance was established.

Using the Media

- The number of public service announcements made on radio and TV.
- The number of storm-water-related press releases.
- The number of storm-water-related articles published.

Water Conservation Practices for Homeowners

- The number of partnerships established with local water utilities.
- The number of water conservation utility inserts that are distributed with utility bills.
- A survey of homeowners about their water conservation behavior before and after the message is delivered.

Chapter Six
Second Minimum Control Measure
Public Involvement/Participation

Regulatory Requirement, 40 CFR Part 122.34(b)(2):

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

Guidance:

It is recommended that you involve citizens from your facility in both the development and the implementation of the SWMP. If possible, you should try to engage all economic and ethnic groups. By involving the citizens in the decision-making process, you have the potential to garner more support for various aspects of the program. Also, you may be able to use volunteer labor to implement some of your SWMP BMPs, as opposed to MS4 employees performing the tasks.

During the SWMP development, you might involve the base community by holding meetings with stakeholders from the facility. The meetings would serve as a forum where the stakeholders can express their concerns regarding stormwater issues. The citizens may be able to provide ideas on how to improve any existing stormwater BMPs. Also, after the program is drafted, you may want to hold meetings to educate the base community on the proposed program. The citizens will be able to provide feedback during the meetings and you may gain support for the proposed program.

After the SWMP development is complete, you need to involve the base community in the implementation of the program. The involvement may consist of periodic meetings with stakeholders to discuss the program's progress in addressing stormwater issues. The involvement may be more of a "hands-on" approach. Stakeholder groups may participate through such things as stream clean-ups, road clean-ups, or storm drain stenciling programs. Also, base community groups may participate in the SWMP implementation by performing periodic monitoring of a water body.

Example #1

You can involve the base community in implementation of the SWMP. An area stream contains a large amount of litter and the water quality is noticeably degraded. The MS4 forms a partnership with a group of citizens to perform an annual stream clean-up.

As discussed in Chapter 5, Public Education and Outreach, it is important to identify your “target audience”. This will allow you to determine which groups within the facility the MS4 can potentially involve in the development and implementation of the SWMP. If there are schools located on the base, then you may be able to enlist various school-age groups, such as scout troops, to assist in implementation of various BMPs. You may also want to consider the following stakeholder groups:

- Contractors and subcontractors;
- Facility employees; and
- Residents.

Once you have identified the target audience, you must select BMPs and set a measurable goal for each BMP. Suggested BMPs can be found in EPA’s “menu of BMPs” or you may develop your own. As previously explained, the measurable goal must be a quantifiable target. For example, you determine a BMP will be to involve the base community in an annual stream cleanup. Your measurable goal for the BMP can be the stream clean-up will occur annually, the number of miles of stream to be cleaned annually, or the minimum number of volunteers the will participate annually. It is recommended that the measurable goal be set based on an achievable target.

EPA has developed a list of parameters the MS4 can use when establishing the measurable goals for the Public Involvement/ Participation minimum control measure (Measurable Goals Guidance for Phase II Small MS4s, pages 39-40). We have reiterated these parameters in Table 2 for your convenience.

Table 2
Measurable Parameters
Public Involvement/Participation

Adopt-A-Stream Programs

- Track the number of participants in Adopt-A-Stream programs.
- Water quality at Adopt-A-Stream sites.
- The quantity of trash and debris removed by Adopt-A-Stream volunteers.

Attitude Surveys

- The number of citizens solicited to complete surveys.
- The number of completed surveys.
- A survey of citizens gauging change in attitude/behavior after storm water education activities are held.

Community Hotlines

- The number of hotlines established to handle stormwater related concerns.
- The number of calls received by hotlines.
- The number of problems/incidents remedied as a result of hotline calls.

Reforestation Programs

- The number of volunteer tree planters.
- The number of trees planted.
- The number of acres planted with trees.

Stakeholder Meetings

- The number of meetings held.
- The number of attendees.
- The number of actions taken as a result of stakeholder meetings.

Storm Drain Stenciling

- The number of drains or proportion of drains stenciled.
- The number of stenciling volunteers.
- Changes in water quality at outfalls of stenciled areas.

Stream Clean-up and Monitoring

- The number of stream clean-ups.

- The number of clean-up participants.
- The quantity of waste collected as a result of clean-up efforts.
- The number of stream miles cleaned.
- Water quality at the stream clean-up sites.

Volunteer Monitoring

- The number of volunteers participating in monitoring programs.
- The frequency of monitoring in the watershed.
- The number of volunteer monitoring stations established in the watershed.
- The number of volunteer monitoring training sessions held.
- The number of actions that were taken as a result of the monitoring data collected by volunteers.

Watershed Organization

- Whether or not a watershed organization was established.
- The number of participants in the watershed organization.
- The number of actions taken as a result of the watershed organization.

Wetland Plantings

- The acres of land planted.
- The number of volunteers that participated in planting.
- The number of planting events held.

Chapter Seven
Third Minimum Control Measure
Illicit Discharge Detection and Elimination

Regulatory Requirement, 40 CFR Part 122.34(b)(3):

You must develop, implement and enforce a program to detect and eliminate illicit discharges into your small MS4.

- A. You must develop, if not already completed, a storm sewer system map, showing the location of all outfalls and names and locations of all waters of the State that receive discharges from those outfalls.
- B. You must effectively prohibit through an appropriate regulatory mechanism, non-storm water discharges into your storm sewer system and implement appropriate enforcement procedures and actions.
- C. You must, develop and implement a plan to detect and address non-storm water discharges, including illegal dumping, to your system.
- D. You must inform the base community of hazards associated with illegal discharges or improper disposal of waste.

You need to 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;
- 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.

Guidance

The first requirement is that you develop a storm sewer system map, showing all outfalls and waters of the State that receive discharges from these outfalls. The complexity of your system will determine the type of map you develop. For military facilities, you need to delineate the area of the facility showing all boundaries (e.g. fence line). You can then add the receiving waters, the storm sewer system conveyances, and the outfalls to this map. Many military facilities will be subject to existing NPDES Permits. For example, some outfalls may be permitted under an Industrial NPDES Permit if they receive boiler blowdown or cooling tower wastewater. Other outfalls may be in areas of the facility where industrial activities occur. Outfalls in those areas may be subject to the General NPDES Permit No. GAR000000 for stormwater discharges associated with industrial activity. If either of these scenarios exist, then these outfalls should be identified as such on the map. You should be aware that the purpose of the map is to aid you in the future detection and elimination of illicit discharges to your MS4.

Once the storm sewer system is mapped, you should ensure procedures are in place to update the map. The MS4 should ensure that if the inventory of lines and outfalls is revised, then the map should be periodically updated.

After the mapping is completed, then you should identify high priority areas that are likely to have illicit discharges. The MS4 may want to concentrate on older sections of the facility, since these areas tend to have failing infrastructures. The MS4 may also be aware of an area of the system that has had numerous problems in the past. To detect illicit discharges in these problem areas, the MS4 might consider establishing a program to periodically walk the area streams within their jurisdiction and look for dry weather flows from storm sewer outfalls.

You might want to conduct field screening of any dry weather discharges to see if they are naturally occurring, (e.g. spring) or an illicit connection. The first step in the field screening process should be to note any unusual odor (e.g. sewage, petroleum, industrial), color, or the presence of an oil sheen. If unusual characteristics are noted, then you may want to proceed with field testing using a field test kit and/or meter. This field testing equipment is usually used to test for such parameters as chlorine or fluoride, surfactants, pH, and conductivity. If your field observation notes any unusual odor or color or the field testing shows unusual levels of any parameters, then you may determine additional testing is required. If you identify a strong odor, high conductivity level, or the presence of surfactants, then you may suspect a discharge of sewage. In this case, you may want to collect a sample to test for fecal coliform bacteria in the laboratory. If you note an oil sheen, then you may want to test for total petroleum hydrocarbons (TPH). The presence of chlorine or fluoride may indicate a potable water leak. You should use common sense when deciding if additional testing is warranted and what analyses to conduct.

Once you establish how you will identify the presence of any potential illicit discharges, then you need to have procedures in place for tracing the source. Your program may consist of walking the storm sewer line and looking for potential upstream sources. You may have to use more elaborate detection procedures, such as dye testing, smoke testing or videotaping the line.

The detection procedures may be effective for locating an illicit connection; however, they will not help the MS4 in identifying illegal dumping into the storm sewer system. If you have evaluated all potential illicit connections and determined the only source of the pollutant can be from illegal dumping, then you will need to handle this situation differently. The dumping may be occurring as a result of a lack of understanding, and the MS4 may want to escalate their educational activities (e.g. residents dumping yard wastes, used oil, or antifreeze down the storm drain). In some cases, the MS4 may have to use its enforcement capabilities to stop the dumping.

The MS4 will need a regulatory mechanism which prohibits illicit discharges, gives the MS4 the right to enter the property, the authority to require the illicit connections to be removed, and allows enforcement against a violator. Once the authority exists, then the MS4 will need procedures in place for ensuring illicit discharges are eliminated. The procedures should clarify whose responsibility it is to ensure the discharge ceases. For example, if you conduct field testing and determine the discharge is composed of sanitary sewage, then the procedure may be that you notify the municipal water and sewer department. If it is your responsibility to ensure the discharge is eliminated, then the procedures need to specify what steps you will take to ensure the discharge ceases, the time frame for completing the task, the corrective action to be taken, any follow-up inspection, etc.

Example #1

During a stream walk, you notice flow coming from an outfall. You visually observe foam in the discharge. You follow the storm sewer line upstream and find a housing area. An inspection of the area reveals a resident is washing their vehicle, which is resulting in the washwater flowing into the storm drain. You inform the resident of the illicit discharge requirements and potential enforcement action if the practice does not cease.

Example #2

During a stream clean-up event, one of the base residents notices flow coming from an outfall. Knowing that it hasn't rained in several weeks, the resident notifies the MS4 representative. You notice the discharge has a strong sewage odor and is gray in color. You proceed to conduct a field test of the discharge for pH, conductivity, chlorine and surfactants. When the conductivity reading is high, you decide to take a sample for fecal coliform bacteria analysis. The laboratory results indicate a high fecal coliform bacteria count. Following your written procedures, you notify the municipal water and sewer department. They locate and repair a sanitary sewer line which has been leaking into your storm sewer system. You re-visit the outfall in a month to ensure the problem has been fully corrected.

Finally, the regulations require that the MS4 have a program in place to educate the base community of problems caused by illicit connections and illegal dumping. The program can include the development and distribution of educational literature. You can establish a program for informing the base community how to report any observed dumping, including the establishment of a hotline. You can stencil storm drains to inform residents that anything they pour down the drain flows to the stream. These are just a few examples and the MS4 should consider all possible options.

Once you determine the BMPs you will use to detect and eliminate illicit discharges, then you will need to set a measurable goal for each BMP. EPA has developed a list of parameters the MS4 can use when establishing the measurable goals for the Illicit Discharge Detection and Elimination minimum control measure (Measurable Goal Guidance for Phase II Small MS4s, pages 41-42). We have reiterated these parameters in Table 3 for your convenience.

Table 3
Measurable Parameters
Illicit Discharge Detection and Elimination

Failing Septic Systems

- The number of regular maintenance and inspection reminders issued to tank owners.
- The number of partnerships formed with private pumping companies.
- Whether or not an inventory of tanks and when they were last serviced was completed.
- The number of field tests and screening conducted.
- The number of post construction inspections conducted to insure proper installation.
- The number of scheduled pump-outs and routine maintenance work conducted.

Identifying Illicit Connections

- Inventory conducted and sites prioritized for inspection.
- The number of field tests conducted in high-risk areas.
- Whether or not an ordinance was developed to allow entrance into private buildings for the purpose of conducting tests.
- The number of illicit connections reported by business employees.
- The number of survey responses indicating a possible illicit connection.
- The number of illicit connections repaired/replaced.
- Whether or not an ordinance was developed for mandatory inspection of new buildings.
- The number of new buildings inspected.

Illegal Dumping

- The number of flyers, posters, or other public education tools distributed.
- The number of illegal dumps reported by citizens.
- The number of penalties enforced upon the participants of illegal dumps.
- Whether or not an inventory of prime areas for illegal dumping was completed.
- The number of rewards distributed to citizens who reported an illegal dump.
- The number of illegal dump clean-ups completed.

Industrial/Business Connections

- The number of dry weather tests completed.
- The number of high-risk connections prioritized.
- The number of codes developed to prohibit connections.
- The number of illicit connections reported by business employees.

- The number of survey responses indicating a possible illicit connection.
- The number of illicit connections found.
- The number of illicit connections repaired/replaced.
- The number of new buildings inspected.
- Whether or not an ordinance was developed for mandatory inspection of new buildings.

Recreational Sewage

- Whether or not an inventory of high-risk areas was completed.
- The number of pump-out stations installed.
- The amount of wastewater that pump-out stations collect.
- The number of no-discharge areas created.
- The number of new signs added to remind citizens of dumping policies and alternatives.
- The number of enforced cases of recreational dumping.
- The number of citizen complaints made reporting illegal action.
- The change in water quality at marinas.

Sanitary Sewer Overflows

- The frequency of routine maintenance and cleaning activities.
- The number of overflows reported.
- The number of overflow causes that were identified during inspection.
- The number of sites repaired.
- The number of rainfall gauges installed.
- Whether or not an ordinance was developed to prohibit new and illicit connections.

Wastewater Connections to the Storm Drain System

- The number of rerouted connections.
- The number of dry weather monitoring activities performed.
- Whether or not an inventory and prioritization of potential connection sites was completed.
- The number of field tests conducted in high-risk areas.
- The number of unwarranted connections reported.
- The number of unwarranted connections found.
- The number of unwarranted connections repaired/replaced.
- Whether or not an ordinance was developed for mandatory inspections of new buildings.
- The number of new buildings inspected.
- Changes in water quality at re-routed outfalls and high risk areas.

Chapter Eight
Fourth Minimum Control Measure
Construction Site Stormwater Runoff Control

Regulatory Requirement, 40 CFR Part 122.34(b)(4):

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. 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 that would disturb one acre or more.

Your program must include the development and implementation of, at a minimum:

- A. An appropriate regulatory mechanism to require erosion and sediment controls, as well as sanctions to ensure compliance, to the extent allowable under State or local law;
- B. Requirements for construction site operators to implement appropriate erosion and sediment control best management practices;
- C. Requirements for construction site operators to control waste such as discharged 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 base community; and
- F. Procedures for site inspection and enforcement of control measures.

Guidance

Stormwater discharges from construction activities in Georgia are authorized through General NPDES Permit numbers GAR100001, GAR100002, and GAR100003. The type of construction activity occurring at your facility will determine whether you are subject to GAR100001 (stand alone construction projects), GAR100002 (infrastructure construction projects) or GAR100003 (common development construction projects). Many of the requirements with which you must comply are detailed in these Construction Activity General NPDES Permits.

The Phase II regulations require that you have a regulatory mechanism in place to control erosion and sedimentation and pollution at construction sites. The Georgia regulations specify that only municipalities can qualify for Local Issuing Authority status. Therefore, military facilities in Georgia cannot be considered Issuing Authorities and do not have the authority to adopt an erosion and sedimentation and pollution control ordinance. In most cases, construction at military facilities will be performed by contractors and subcontractors. The facility must have some method that will allow the regulation of these contractors. One method might be to develop policies with which the contractors must comply. These policies could be referenced in the contract executed between the facility and contractor. The requirements of the policy document should be equivalent in stringency to the requirements of General NPDES Permits GAR100001, GAR100002, or GAR100003, whichever one is relevant.

As explained above, stormwater discharges from construction sites are authorized by one of three Construction Activity General NPDES Permits. Military construction activities can receive this authorization through submittal of a Notice of Intent (NOI) by either the owner (military facility) or the operator (military facility or contractor). The original NOI is to be submitted to the appropriate EPD District office and a copy to the municipality where the base is located (if they are a Local Issuing Authority). The Construction Activity General NPDES Permits specify where the NOI is to be submitted. In addition to the NOI, the permittee (owner or operator) must submit any applicable fees and a copy of an Erosion, Sedimentation and Pollution Control Plan (ES&PC Plan).

The Plan must be prepared by a design professional who has completed a Level II certification course approved by the State Soil and Water Conservation Commission. During development of the Plan, it is recommended that the construction activity permittee use the EPA document "Developing Your Stormwater Pollution Prevention Plan: A Guide for Construction Sites" (EPA 833-R-060-04, May 2007). The document may be found on EPA's website at www.epa.gov/npdes/pubs/swppp_guide.pdf. At a minimum, the Plan must include:

- ES&PC Plan checklist;
- Certification statement(s) and signature(s) in accordance with the Construction Activity General NPDES Permit(s);
- Site description;
- The identification of sources of pollution and practices to reduce pollution and a description of appropriate controls and measures that will be implemented at the construction site;
- Best management practices (BMPs) for minimizing erosion and sedimentation. These BMPs must be at least as stringent as those found in the "Manual for

Erosion & Sedimentation Control for Georgia” (Manual), published by the State Soil and Water Conservation Commission; and

- Other requirements are specified in the Construction Activity General NPDES Permit(s).

The permittee must determine if any biota impaired waters, listed on the State’s 305(b)/303(d) list are located within your jurisdiction. The list of impaired waters can be found on EPD’s website at www.gaepd.org/Documents/305b.html. If the construction activities will result in discharges to an impaired water or within one (1) linear mile of an impaired stream segment and within the same watershed, then the permittee must comply with additional requirements found in Part III.C of the Construction Activity General NPDES Permits.

Once construction on a site begins, the permittee must have procedures in place for inspecting the construction activity. The permittee must have at least one Level IA certified person on site at all times, who is responsible for overseeing construction activities. As with plan design, this certification course must have been approved by the State Soil and Water Conservation Commission. EPD recommends that the facility ensure they have at least two Level IA certified people. If one Level 1A person must leave the site for any reason, then the second certified person can take over and construction on the site will not need to stop.

The frequency at which inspections must occur is described in each of the Construction Activity General NPDES Permits. Erosion and sedimentation inspectors must be Level IA certified. The permittee should ensure that each inspection is documented and the reports are retained until construction on the site has ceased.

The permittee is required to conduct sampling of either the receiving stream and/or outfalls to those streams. The parameter to be sampled for is nephelometric turbidity. The nephelometric turbidity unit value will vary depending on the classification of the receiving stream (e.g. warm water fishing, cold water trout). Sample types, frequency and preferred techniques may be found in each Construction Activity General NPDES Permit.

The regulations require that you have procedures in place for taking enforcement in the event that inspections of the construction site identify a violation. Because the military facility does not have the authority to adopt an ordinance with penalties, its enforcement authority will be reduced. It is recommended that the MS4 consider possible enforcement actions during the negotiation of the contract between the facility and its construction contractors. If the contractor fails to comply with the State Construction Activity General NPDES Permit, then the contract would contain penalties to address this noncompliance event.

Once construction on a site has stopped, final stabilization has occurred, and all storm water discharges associated with construction activity have ceased, then the permittee must submit a Notice of Termination (NOT). The Construction Activity

General NPDES Permit specifies what must be included in a NOT. The NOT must be submitted to the appropriate EPD office, and to the local government if they are a Local Issuing Authority.

The regulations also require that the MS4 have procedures in place for receiving and considering information from the public. For a military base, it was determined that the public would be considered the base community, both residents and employees. The MS4 should make public reporting of problems as easy as possible, whether it is through publication of a telephone number, use of a web site, etc. Once a complaint is received, procedures need to be in place to ensure the MS4 responds to the complaint. The MS4 may conduct a site visit to verify if a problem exists. The MS4 should document any site inspections, findings and requested corrective actions. Also, the MS4 may have to conduct a follow-up to ensure the complaint is resolved and this follow-up action should be documented. Because the military facility is not an Issuing Authority, the MS4 may need to seek assistance from either EPD or the Local Issuing Authority in order to resolve the complaint. For good public relations, it is highly recommended that after the complaint has been resolved, the MS4 notify the complainant of the results of the investigation and any corrective actions taken.

During development of the Phase II NOI, the MS4 will need to include a BMP for each of the regulation requirements (e.g. regulatory mechanism, site plan review procedures, procedures for handling complaints, procedures for site inspection, procedures for enforcement). Because a military facility is a unique entity and does not have the same authority as a municipality, in many cases, the BMP will need to clarify that a Local Issuing Authority or EPD is responsible for implementing the BMP (e.g. the storm water management plan BMP, not the erosion and sedimentation BMP). Once you determine the BMPs to be included in the Phase II NOI, you need to set a measurable goal for each BMP. EPA has developed a list of parameters the MS4 can use when establishing the measurable goals for the Construction Site Storm Water Runoff Control minimum control measure (Measurable Goal Guidance for Phase II Small MS4s, pages 43-47). We have reiterated these parameters in Table 4 for your convenience.

Table 4
Measurable Parameters
Construction Site Storm Water Runoff Control

BMP Inspection and Maintenance

- The frequency of inspection and maintenance of BMPs.
- The number of failed storm water BMPs.
- The number of BMPs reported to be in need of repair.
- Whether or not an inventory of inspection and maintenance activities was created and is regularly maintained.

Brush Barrier

- The number of brush barriers installed.
- The number of construction sites with brush barriers.
- The amount of sediment collected brush barriers.
- The frequency of inspection and maintenance of brush barrier installations.
- Suspended solids levels at the site outfall.

Check Dams

- The number of check dams installed.
- The number of construction sites that have check dams.
- The reduction in runoff quantity.
- The frequency of inspection and maintenance of check dam installations.
- The amount of sediment collected.
- Suspended solids levels at the site outfall.

Chemical Stabilization

- The number of personnel trained to apply chemicals.
- Suspended solids levels at the site outfall.
- The frequency of chemical reapplication.
- The number of construction sites that use chemical stabilization.

Construction Entrances

- The frequency of inspection and maintenance of construction entrances.
- The amount of sediment collected at construction entrances.
- Suspended solids levels at the site outfall.
- Whether or not an ordinance was developed that requires special construction entrances.

Construction Reviewer

- The number of trained inspectors.
- Whether or not an ordinance was developed requiring that sites be inspected.
- The number of inadequate sites/plans reported by inspectors.
- The number on non-compliant permits reported.

Construction Sequencing

- Whether or not an ordinance was developed that requires construction sequencing.
- The number of construction sites that practice sequencing.
- Suspended solids levels at the site outfall.

Contractor Certification and Inspector Training

- The number of certified contractors.
- The number of training and certification programs offered.
- Whether or not an ordinance requiring certification was developed.
- Whether or not an incentives program for certified contractors and inspectors was developed.
- The number of certified inspectors.
- The number of sites inspected.
- Changes in water quality at inspected sites.

Dust Control

- Suspended solids levels at the site outfall or in nearby receiving waters.

Filter Berms

- The number of filter berms installed.
- The number of construction sites with filter berms.
- The frequency of inspections and maintenance activities.

Geotextiles

- The number of geotextile installations at construction sites.
- The number of construction sites that use geotextiles.
- The frequency of inspection and maintenance of geotextile installations.
- Suspended solids levels at the site outfall.

Gradient Terraces

- The number of gradient terrace installations at construction sites.

- The number of construction sites that use gradient terraces.
- The frequency of inspection and maintenance of gradient terraces.
- Suspended solids levels at the site outfall.

Grass-lined Channels

- The number of grass-lined channels installed.
- The number of construction sites that use grass-lined channels.
- The frequency of inspection and maintenance of grass-lined channels.
- The reduction in runoff quantity.
- Water quality at the site outfall.

Land Grading

- The number of construction sites that use better land grading practices.
- Suspended solids levels at the site outfall.

Model Ordinances

- Whether or not an ordinance was developed to address construction site runoff control.
- The number of enforcement actions taken.
- The number of stop work orders given.
- The number of bonding requirements set.

Mulching

- The amount of exposed soils protected with mulch.
- The number of construction sites that use mulching.
- Suspended solids levels at the site outfall.

Permanent Diversions

- The number of permanent diversions installed.
- The number of construction sites that use permanent diversions.
- The amount of runoff reduced.
- The frequency of inspection and maintenance of permanent diversions.
- Water quality at the site outfall.

Permanent Seeding

- The amount of seeded area.
- The number of construction sites that use permanent seeding.
- The frequency of inspection and maintenance of seeded areas.
- Suspended solids levels at the site outfall.

Preserving Natural Vegetation

- The amount of naturally vegetated land area preserved.
- The number of construction sites that preserve natural vegetation.
- Whether or not an ordinance was developed that requires that some natural vegetation be preserved at construction sites.
- Water quality at the site outfall.

Riprap

- The number of riprap installations.
- The number of construction sites that use riprap.
- Suspended solids levels at the site outfall.
- The frequency of inspection and maintenance of riprap installations.
- The reduction in runoff velocity.

Sediment Filters and Sediment Chambers

- The number of sediment filters and chambers installed.
- The number of construction sites that use sediment filters and chambers
- The frequency of inspection and maintenance of sediment filters and chambers.
- Water quality at the site outfall.
- The acreage of disturbed land that drains to sediment filters and chambers.
- The amount of sediment collected in filters and chambers.

Sediment Traps

- The number of sediment traps installed.
- The number of construction sites that use sediment traps.
- The amount of sediment collected in sediment traps.
- Suspended solids levels at the site outfall.
- The frequency of inspection and maintenance of sediment traps.

Sediment Basins and Rock Dams

- The number of sediment basins and rock drains installed.
- The number of construction sites that use sediment basins and rock dams.
- The amount of sediment collected in sediment basins.
- Suspended solids levels at the site outfall.
- The frequency of inspection and maintenance of sediment basins and rock drains.

Silt Fence

- The amount of silt fence installed.
- The number of construction sites that use silt fences.
- The amount of sediment collected by silt fences.
- The frequency of inspection and maintenance of silt fences.
- Suspended solids levels at the site outfall.

Sodding

- The amount of disturbed land protected by sod installations.
- The number of construction sites that use sodding.
- The frequency of inspection and maintenance of sod installations.
- Suspended solids levels at the site outfall.

Soil Roughing

- The amount of disturbed land protected by soil roughing.
- The number of construction sites that use soil roughing.
- Suspended solids levels at the site outfall.

Soil Retention

- The number of soil retaining structures installed.
- The number of construction sites with soil retaining structures.
- Suspended solids levels at the site outfall.
- The frequency of inspections to ensure that no erosion is occurring.

Spill Prevention and Control Plan

- The number of reported spills.
- Whether or not an ordinance for storage of high-risk chemicals was developed.
- The number of personnel trained in spill response.

Storm Drain Inlet Protection

- The number of storm drain inlets protected.
- The number of construction sites that use storm drain inlet protection.
- The amount of sediment collected.
- Suspended solids levels at the site outfall.
- The frequency of inspection and maintenance of storm drain inlets.

Temporary Diversion Dikes

- The number of temporary diversion dikes installed.

- The number of construction sites that use temporary diversion dikes.
- The reduction in runoff quality at the site outfall.
- Suspended solids levels at the site outfall.
- The amount of sediment collected by temporary diversion dikes outfall.

Temporary Slope Drain

- The number of temporary slope drains installed.
- The number of construction sites that have temporary slope drains.
- Suspended solids levels at the site outfall.
- The frequency of inspection and maintenance of temporary slope drains.

Temporary Stream Crossings

- The number of temporary stream crossings installed.
- The frequency of inspection and maintenance of temporary stream crossings.
- Suspended solids levels at the site.

Vegetated Buffer

- The number of vegetated buffers installed.
- The number of construction sites with vegetated buffers.
- Changes in water quality of runoff leaving buffer areas.
- The reduction in runoff quantity.
- The frequency of inspection and maintenance of vegetated buffers.

Vehicle Maintenance and Washing Areas

- Water quality at the site outfall.
- Whether or not construction vehicles are regularly inspected.
- The number of vehicle wash areas on-site.
- The number of construction sites with designated vehicle maintenance and washing areas.

Wind Fences and Sand Fences

- The number of fences installed.
- The number of construction sites that use fences.
- The frequency of inspection and maintenance of wind and sand fences.
- Suspended solids levels at the site outfall.

Chapter Nine
Fifth Minimum Control Measure
Post-Construction Storm Water Management
in New Development and Redevelopment

Regulatory Requirement, 40 CFR Part 122.34(b)(5):

You must develop, implement, and enforce a program to address storm water runoff into your small MS4 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. Your program must ensure that controls are in place that would prevent or minimize water quality impacts.

You must:

- A. Develop and implement strategies which include a combination of structural and/or non-structural best management practices (BMPs) appropriate for your facility, including the use of the Georgia Stormwater Management Manual or an equivalent stormwater management design manual;
- B. Use an appropriate regulatory mechanism to address post-construction runoff from new development and redevelopment projects to the extent allowable under State or local law; and
- C. Ensure adequate long-term operation and maintenance of BMPs.

Guidance

The purpose of post-construction storm water management is to minimize water quality impacts and attempt to maintain pre-development conditions. In order to do this, the MS4 should consider post-construction conditions even before construction begins on the site. By considering the impacts at the beginning of a project, the MS4 has greater opportunity to include the practices and/or control structures needed to protect water quality. EPD highly recommends the use of low impact development techniques (e.g. green infrastructure) during the design of construction projects. After construction is completed, these projects will result in minimal environmental impact for years to come. Information on low impact development practices can be found in the Georgia Stormwater Management Manual, on EPA's website (www.epa.gov) or on the Center for Watershed Protection's website (www.cwp.org). For example, the MS4 may consider reducing the size of a parking lot or include bioretention structures in the parking areas during the design of a facility building. As another example, the site design can include more pervious areas (e.g. areas with vegetative cover), which will reduce runoff and allow for groundwater recharge.

The first step should be to evaluate either an existing regulatory mechanism or develop a new regulatory mechanism, if needed. You want to ensure that runoff is required to be controlled after construction is completed. You also want to make sure that it addresses both new developments and redevelopment of sites. If an existing mechanism does not address these issues, then the MS4 will need to create a comprehensive regulatory mechanism. An example ordinance can be found at EPA's website: www.epa.gov/owow/nps/ordinance. You may be able to use text from this model ordinance to develop your regulatory mechanism. You may want to include requirements in your mechanism for maintaining specified buffers, minimizing impervious surfaces, and minimizing the disturbance of soils and vegetation. You might also want to require structural BMPs under certain conditions.

Structural BMPs include such things as detention ponds, grassed swales, and infiltration basins. The Atlanta Regional Commission (ARC), in conjunction with several metro communities, has developed the Georgia Stormwater Management Manual (a stormwater design manual), which the MS4 may use. The MS4's regulatory mechanism can either refer to this design manual, an equivalent design manual, or include other specific design criteria for structural controls.

You can also use non-structural BMPs to control post-construction runoff. Non-structural BMPs include such things as policies, procedures, and practices. For example, the MS4 may direct growth towards less sensitive areas of its jurisdiction (e.g. away from wetland areas) or increase open spaces. A non-structural BMP can include educational programs for various groups, such as contractors, on project designs that minimize water quality impacts. The MS4 can also require a reduction in impervious area in order to allow rain filtration and recharge of the groundwater supply.

Once you have determined which BMPs to use, either structural or non-structural, then you need to set a measurable goal for each BMP. EPA has developed a list of parameters the MS4 can use when establishing the measurable goals for the Post-Construction Storm Water Management in New Development and Redevelopment minimum control measure (Measurable Goals Guidance for Phase II Small MS4s, pages 48-52). We have reiterated these parameters in Table 5 for your convenience.

Table 5
Measurable Parameters
Post-Construction Stormwater Management
In New Development and Redevelopment

Alternative Turnarounds

- The reduction in impervious cover.
- The number of turnarounds modified.
- Whether or not development codes were changed to allow alternative turnarounds.
- The reduction in runoff quantity.
- Changes in the physical characteristics of streams downstream from modified areas.

Alternative Pavers

- Whether or not development codes were changed to allow for alternative pavers.
- The amount of new alternative paver installations added or replaced.
- The number of new development sites that use alternative pavers.
- The reduction in runoff quantity.
- Changes in the physical characteristics of streams downstream from areas with alternative paver installations.

Alum Injection

- Whether or not an inventory of sites where alum injection was used was completed.
- Changes in water quality.
- Changes in biological populations.

Bioretention

- The reduction in impervious cover.
- The reduction in runoff quantity.
- Changes in runoff water quality (nutrients, sediments, metals, organics, etc.)
- The number of new bioretention cells installed (both commercial and residential).
- The number of acres that are drained by bioretention cells.

BMP Inspection and Maintenance

- The frequency of inspection and maintenance activities.
- The number of problems that were identified and remedied.

- The change in the proportion of BMPs that are well-maintained as a result of inspection and maintenance.
- Whether or not an inventory of BMPs requiring maintenance was completed and is regularly updated.
- Changes in water quality of effluent from BMPs.

Buffer Zones

- Whether or not development codes were changed to require buffer zones.
- The acreage of land conserved as buffers.
- The acreage of land converted to buffers.
- Changes in water quality of runoff leaving buffer areas.
- Changes in the physical characteristics of streams downstream from areas with buffer zones.
- The frequency of inspections and maintenance activities in buffer zones.
- The acreage that drains to buffer zones.

Catch Basin

- Whether or not an inventory of catch basins was completed.
- The number of catch basins retrofitted with filtering devices.
- The quantity of sediment removed from catch basins.

Conservation Easements

- The acreage of land conserved under easements.
- Whether or not an inventory of lands that could be conserved with conservation easements was completed.

Dry Extended Detention Ponds

- The reduction in runoff quantity.
- Changes in water quality of effluent from the dry pond outlet.
- The number of new dry ponds installed.
- The acreage of land drained by dry ponds.

Eliminating Curbs and Gutters

- Whether or not development codes were changed.
- The reduction in runoff quantity.
- The number of new developments without curbs and gutters.
- The number of curb cuts made in existing developments.
- The number of miles of gutterless streets.

Grassed Swales

- The number of new grassed swales installed.
- The miles of streets with grassed swales.
- The reduction in runoff quantity.
- The reduction in runoff velocity.
- Change in water quality of runoff from areas with grassed swales.
- The number of acres drained by grassed swales.

Grassed Filter Strip

- The number of new grassed filter strips installed.
- The miles of streets with grassed filter strips.
- The reduction in runoff quantity.
- The reduction in runoff velocity.
- Changes in water quality of runoff from areas with grassed filter strips.
- The number of acres drained by grassed filter strips.

Green Parking

- Whether or not development codes were changed to allow green parking.
- The number of new green parking lots installed.
- The reduction in runoff quantity.
- The number of impervious acres served by green parking lots.
- The number of impervious lots converted to green lots.

In-line Storage

- The reduction in peak flow of runoff.
- The number of basins retrofitted with flow regulators.
- The acreage drained by in-line storage systems.

Infiltration Basin

- The reduction in runoff quantity.
- Changes in water quality.
- The number of new infiltration basins installed.
- The acreage drained by infiltration basins.

Infiltration Trench

- The reduction in runoff quantity.
- Changes in water quality.
- The number of new infiltration trenches installed.
- The acreage drained by infiltration trenches.

Infrastructure Planning

- Whether or not development codes were modified.
- The number of new developments using storm water BMPs.
- The reduction in impervious surface area and infrastructure.

Manufactured Products for Storm Water Inlets

- Whether or not an inventory of areas where installation of manufactured products would be appropriate was completed.
- Whether or not a review was conducted to identify which products would be best for each inlet.
- The number of manufactured products installed in storm water inlets.
- Changes in water quality.

Narrower Residential Streets

- Whether or not development codes were modified.
- The reduction in impervious surface area.
- The number of new developments that use narrow streets.
- Changes in water quality.

On-lot Treatment

- The reduction in runoff quantity.
- The reduction in runoff peak flow.
- The number of lots that use on-lot treatment.
- The acreage of impervious surfaces that drain to on-lot treatment BMPs.
- The number of manufactured products sold to store runoff on-site (i.e. rain barrels).
- Changes in water quality downstream from areas that use on-lot treatment.

Open Space Design

- Whether or not development codes were modified to accommodate open space developments.
- The number of new developments that use open space design principles.
- The number of acres of open space preserved with open space design.

Ordinances for Post-Construction Runoff

- Whether or not an ordinance was developed to address post-construction runoff.
- The projected amount of impervious cover reduced under the new ordinance.
- The number of enforcement actions that occur as a result of the new ordinance.

Porous Pavement

- Whether or not development codes were modified to allow for porous pavement.
- The amount of new porous pavement added or replaced.
- The number of new development sites that use porous pavement.
- The reduction in runoff quantity.
- Changes in the physical characteristics of streams downstream from areas with porous pavement installations.

Sand and Organic Filters

- Changes in water quality.
- The reduction in runoff quantity.
- The number of new sand and organic filters installed.
- The acreage of impervious surface that drains to sand and organic filters.

Storm Water Wetland

- Changes in water quality.
- The reduction in runoff quantity.
- The number of storm water wetlands created.
- The acreage of impervious surface that drains to storm water wetlands.

Urban Forestry

- Whether or not development codes were modified to promote urban forestry.
- Whether or not an ordinance was developed to promote urban forestry.
- The number of trees planted as a result of urban forestry initiatives.
- The acreage of treed land.
- The reduction in runoff quantity.
- Changes in water quality.
- The acreage of forest habitat created.
- Aesthetic and shade benefits.

Wet Ponds

- Changes in water quality.
- The reduction in runoff quantity.
- The number of wet ponds installed.
- The acreage of impervious surface that drains to wet ponds.

Zoning

- Whether or not development codes were modified.
- The amount of open space protected with new zoning codes.

- The projected number of new storm water treatment areas expected under the new zoning codes.
- The projected number of upgrades to existing storm water facilities expected as a result of changes in expected development density.

Chapter Ten
Sixth Minimum Control Measure
Pollution Prevention/Good Housekeeping for Municipal Operations

Regulatory Requirement, 40 CFR Part 122.34(b)(6):

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, 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.

Guidance:

The regulations require that you develop an operation and maintenance program for municipal-type operations. The first logical step is to inventory all potential municipal-type operations. You will need to consider both actual facilities and the activities performed there and also, practices throughout the MS4's jurisdiction. Some of the things to consider include:

- Fleet or maintenance shops;
- Maintenance and storage yards;
- Streets and parking lots;
- Vehicle washing;
- Waste transfer stations;
- Parks and public areas; and
- Storm sewer system (cleaning and maintenance).

One of the most important aspects of pollution prevention and good housekeeping is the education of base employees. This is important because once they become aware of the potential water quality impacts their facilities or actions may cause, they can take steps to prevent these impacts. Educating employees can be accomplished through something as simple as placing posters in their work areas or holding formal training sessions. It is highly recommended that the facility perform at least annual training of its employees in pollution prevention and good housekeeping techniques.

For each municipal-type facility, you need to evaluate all operations that occur at that location. For example, you need to determine if chemicals, such as fertilizers, paints, solvents or automotive products are properly stored and inventoried. When reviewing proper storage practices, the MS4 should ensure procedures exist to store chemicals in areas not exposed to precipitation or storm water. Procedures should also be in place to ensure containers are sound, or if they have the potential to leak, are

stored in a retaining (diked) area. The MS4 should take steps to minimize the amounts of chemical used. Finally, procedures should be in place to properly dispose of spent chemicals and containers.

You will also need to review maintenance practices. For example, during street maintenance, do you limit paving to periods of dry weather? Are procedures in place to limit the amount of vegetative area disturbed when street maintenance is performed? The MS4 should consider such things as procedures to ensure proper disposal of debris after the storm drain systems or streets are cleaned. Use of herbicides, pesticides, and fertilizers on landscaped areas (e.g. parks, roadway shoulders) should be minimized and properly controlled. Washing of vehicles should be performed in a manner which limits the amount of runoff (e.g. use of a car wash with an grit/oil/water separator discharging to a sanitary sewer). In short, the MS4 will need to look at every aspect of operating the facility and determine if procedures need to be developed to improve pollution prevention.

Another aspect of pollution prevention is having spill response procedures in place. These procedures should detail who will respond to a spill, how the spill will be contained or diverted, and steps that will be taken to clean up the spill. All employees who have the potential to cause or encounter a spill should be trained in the proper procedures, even if they are just made aware of whom to contact in the event of a spill.

Example #1

There have been numerous complaints of algal blooms during warm weather on the lake located within the facility's jurisdiction. Because algal blooms are caused by increased nutrients, you investigate and find that MS4 grounds crews are applying large quantities of fertilizer to the landscaped areas. You develop a workshop to train MS4 employees to limit the amount of fertilizer used and to provide information about the use of native vegetation.

Example #2

A large amount of debris and sediment has been noted in a nearby stream. The MS4 has a street sweeping program and catch basins are periodically cleaned. Upon investigation, it is determined that the MS4 crews have only been removing debris from grate openings, and not fully cleaning the catch basins. You develop a program for periodic inspection and cleaning of the catch basins, including educating MS4 employees on proper cleaning of the storm sewer system and disposal of debris.

The NPDES Permit specifies what must be included in the facility's operation and maintenance program. During development of the NOI, you should ensure BMPs are included for each of these items, including:

- An employee training program;
- A program for inspecting and maintaining the storm sewer system;
- A program for pollution prevention at municipal-type operations and facilities; and
- Procedures for the proper disposal of waste, both from the storm sewer system and from the municipal-type operations and facilities.

Once you have selected the BMPs to be implemented, either from EPA's "menu of BMPs" or through creating your own, you must establish measurable goals. EPA has developed a list of parameters the MS4 can use when establishing the measurable goals for the Pollution Prevention/ Good Housekeeping for Municipal Operations minimum control measure (Measurable Goals Guidance for Phase II Small MS4s, pages 53-55). We have reiterated these parameters in Table 6 for your convenience.

Table 6
Measurable Parameters
Pollution Prevention/Good Housekeeping for Municipal Operations

Alternative Products

- The number of educational materials distributed.
- The number of consumers surveyed who have increased their use of alternative products.

Alternative Discharge Options for Chlorinated Water

- Whether or not an ordinance was developed to prevent direct discharge of chlorinated water.
- The number of pool owners informed of the options for discharging chlorinated water.
- Chlorine levels in receiving waters.
- The number of enforcement actions pertaining to pool discharges.

Automobile Maintenance

- The number of employees trained in preventing pollution from automobile maintenance activities.
- The number of sites rewarded as being a “clean site” under a rewards program.
- The number of spills reported.
- The number of educational materials distributed at garages, auto shops, and other automobile-related businesses.

Hazardous Materials Storage

- The number of regularly inspected storage units.
- The number of employees trained in hazardous material storage and maintenance.
- The total number of storage facilities equipped to store hazardous materials.
- The level of toxic pollutants in receiving waters.
- The number of materials distributed educating citizens on home storage of hazardous materials.

Illegal Dumping Control

- Whether or not areas where illegal dumping is common were identified.
- The number of “no dumping” signs posted.
- The number of educational materials distributed.
- The number of reports of illegal dumping received.

- The number of dumps sites cleaned up.
- The number of sites improved to eliminate them as target dumping spots.
- The number of enforcement actions pertaining to illegal dumping.
- Whether or not a partnership with the community was established to promote reporting and to educate citizens.

Landscaping and Lawn Care

- The number of stores/gardens participating in education program.
- The number of people trained in safe landscaping, lawn care, and pest management techniques.
- The number of classes/seminars offered in landscaping and lawn care.
- Whether or not a survey of lawn and landscaping methods used by the community was conducted.

Materials Management

- The number of facilities storing hazardous materials.
- The frequency of inspection and maintenance visits to storage facilities.
- The number of personnel trained in hazardous material handling and storage.
- The amount of waste generated by municipal operations.
- Whether or not an inventory of hazardous materials was created for each storage facility.

Parking Lot and Street Cleaning

- Whether or not roads and parking lots were inventoried and prioritized for cleaning.
- The number of scheduled road cleanings.
- The suspended solids levels in runoff.
- The pounds of debris collected from street sweeping.

Pest Control

- The number of businesses participating in education at the point of purchase.
- The number of municipal employees trained in integrated pest management.
- Pesticide levels in runoff and receiving waters.
- The number of educational materials distributed.

Pet Waste Collection

- The number of dog parks.
- The number of signs posted stating regulations.
- The number of educational materials distributed.
- The number of “pooper-scooper” stations installed.

- Whether or not an ordinance was created to address pet waste.

Road Salt Application and Storage

- The number of storage facilities included in a regular inspection and maintenance program.
- The number of storage facilities repaired.
- The number of employees trained in road salt application.
- The quantity of salt applied to roadways.
- The quantity of alternative products used.
- The water quality at outfalls near downstream of storage facilities.

Roadway and Bridge Maintenance

- Whether or not a current list of roadway and bridge construction is maintained.
- The quantity of debris removed from construction sites.
- The number of employees trained in pollution prevention techniques.
- The amount of deicing salts used.
- The number of catch basins at construction sites that are cleaned regularly.

Septic Systems Controls

- The number and location of septic systems.
- The number of systems that are inspected and maintained regularly.
- The number of reminder and educational flyers distributed.
- The number of people trained in inspection and installation of septic systems.
- The number of failed septic systems.

Spill Response and Prevention

- Whether or not an inventory of municipal facilities at risk for spills was created.
- The number of leak detection devices at municipal facilities.
- The number of preventative maintenance procedures performed on tanks, valves, pumps, pipes, and other equipment.
- Whether or not a spill response plan was developed for municipal facilities.
- The number of personnel trained on spill response.
- The number of regularly inspected high-risk facilities.
- The number of educational materials distributed to municipal employees.

Storm Drain System Cleaning

- Whether or not areas with high pollutant loadings were inventoried and prioritized for cleaning.
- The length of storm drain pipe cleaned regularly.
- The number of outfalls cleaned regularly.

- The amount of trash, sediment, and other pollutants removed during cleaning.
- Water quality at storm drain system outfalls.

Used Oil Recycling

- The number of gallons of used oil collected from municipal operations.
- The number of recycling facilities that collect oil from municipal operations.
- The number of educational materials distributed to municipal employees.

Vehicle Washing

- The number of educational materials distributed to municipal employees.
- The number of designated municipal vehicle washing areas.

Chapter Eleven Data Management and Reporting

Although this guidance document focused mainly on the completion of the GaNOI form and development of the stormwater management program (SWMP), there is one more item that needs to be addressed. The General NPDES Permit will require submittal of a report which summarizes the status of the program on an annual basis (Annual Report). The Annual Report will require the MS4 to provide information on the steps taken each year to implement the SWMP. The report will require the MS4 to report such things as the following:

- What BMPs were implemented during the reporting year;
- The status of BMPs already in place;
- Revisions to any BMPs (you tried a BMP, found it to be ineffective, and implemented a new BMP);
- Stormwater activities performed during the reporting year, including the results of any information collected (e.g. monitoring results, completed inspections, enforcement actions); and
- Planned activities for the next reporting year.

For some of the items you will be required to report on, narrative text may suffice. For example, during the year in which a BMP is implemented, you will probably be reporting the steps taken to get the BMP going and not be able to report actual data or results of activities performed. However, in subsequent years, after a BMP has been implemented, you will be expected to provide more specific information.

Example #1

As part of the NOI/SWMP development, you determine a component of your Public Involvement/Participation minimum control measure will be stenciling of storm drains. In the first annual report, you will probably only be able to discuss details on the storm drain stenciling program implementation. You explain that during the first year, you organized volunteers to perform the task, obtained the necessary materials, and prioritized the drains to be stenciled.

Example #2

This is the second year that you are required to submit an Annual Report. You implemented a storm drain stenciling program during the first year of your SWMP. In this Annual Report, you discuss that during the reporting year, volunteers stenciled 25 drains in the residential area of the base.

In order to provide specific information on the tasks performed during a reporting year by the MS4 (e.g. number of catch basins inspected, number of brochures distributed, number of outfalls screened for illicit connections), the MS4 will need to develop tracking procedures. The first step will be to ensure all tasks are documented. If an inspection is performed, then an inspection form should be completed. If enforcement is taken, then documentation of the enforcement action (e.g. letter, form) should be retained. For every item reported to EPD as having been completed, there should be some type of documentation to support this statement. If you state in the Annual Report that you inspected 3 municipal-type operations, but are unable to provide documentation to EPD upon request, then it will be assumed that the inspections were not performed. Therefore, it is extremely important to document each action.

Once you have developed procedures for ensuring tasks are documented, then you need to determine how the information will be compiled and the status tracked. You may be able to do this using hard copies and manually tabulating results. You may find that you need to develop some type of database. In some cases, the MS4 will only have to track the number of items completed (e.g. number of miles of streets swept, pounds of debris removed from stream, number of storm drains stenciled). In other cases, the MS4 may need to track when something is due (e.g. inspections of the Old North Church detention basin are due 2 times per year), when the task was performed (e.g. the Old North Church detention basin was inspected in April and October 2010), or additional information (e.g. the Old North Church detention basin outlet structure was repaired on November 15, 2010).

In summary, the MS4 will need to submit an Annual Report to EPD which provides the status of implementation of the SWMP. The MS4 should ensure all tasks performed are documented in some manner. The MS4 will need to tailor their data management program to their own needs and ensure it allows the MS4 to compile and report all the necessary information to EPD in the Annual Report.