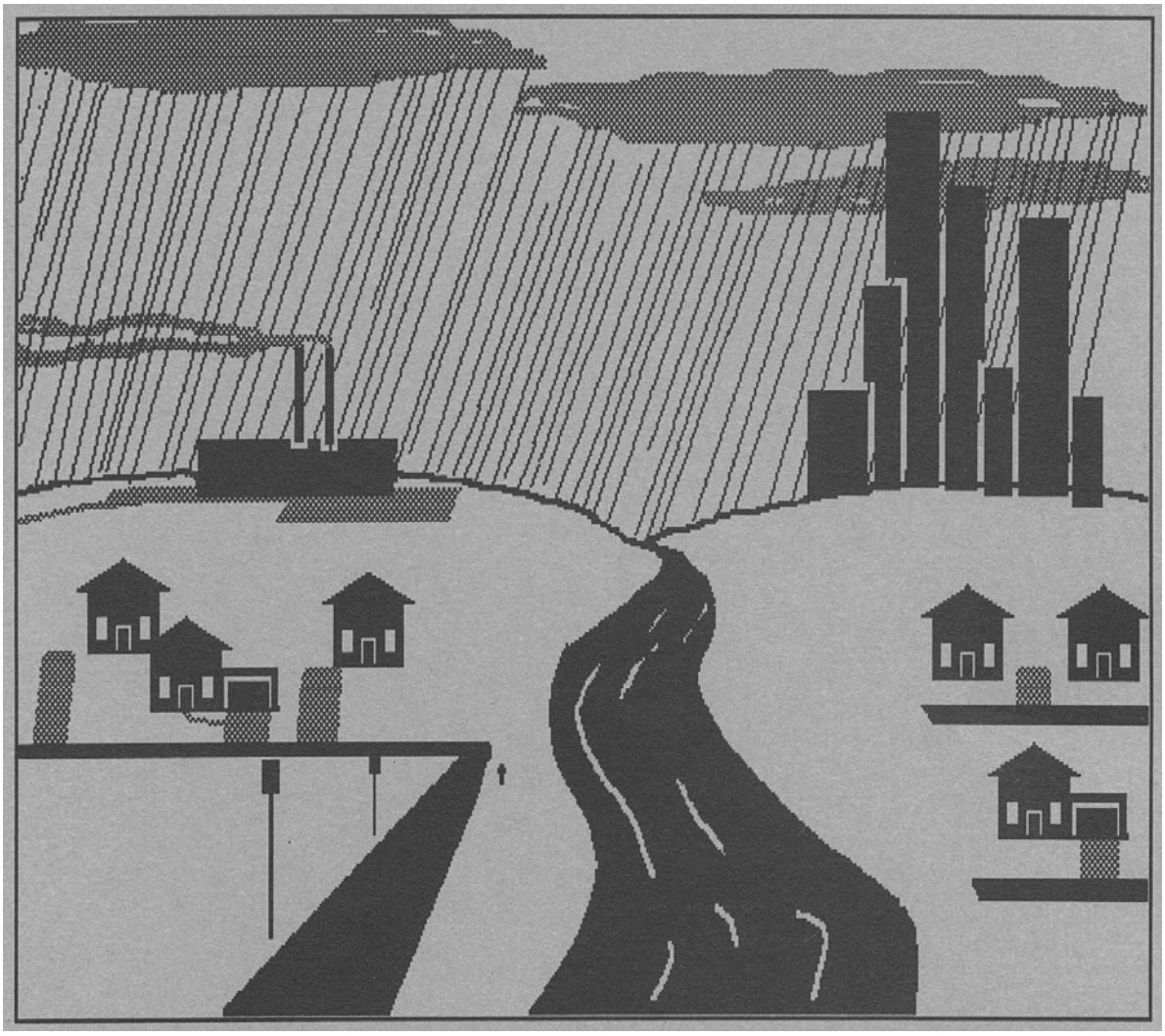
Industrial Storm Water Pollution Prevention Planning Guidance



Wisconsin Department of Natural Resources
Bureau of Wastewater Management
Municipal Wastewater Section – Storm Water Unit
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The Wisconsin Department of Natural Resources based this document on the Environmental Protection Agency's "Storm Water Management For Industrial Activities: Developing Pollution Prevention Plans and Best Management Practices" guidance document and modified it to meet additional provisions in s. NR 216 Wis. Admin. Code, Subchapter II (Permits for Industrial Storm Water Discharge).

September 1994

INDUSTRIAL STORM WATER POLLUTION PREVENTION PLANNING

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About the Manual

This manual reflects the requirements for preparing a Storm Water Pollution Prevention Plan in s. NR 216.27, Wis. Admin. Code, covering storm water discharge from industrial activity. This document is based on EPA's guidance document entitled Storm Water Management For Industrial Activities: Developing Pollution Prevention Plans and Best Management Practices, but contains information that reflects some basic differences between Wisconsin's rules and that of the federal government. This document illustrates the Department's expectations.

The provisions in ch. NR 216, Wis. Admin. Code, require that most industries covered by ch. NR 216, Wis. Admin. Code, develop and implement a Storm Water Pollution Prevention Plan. This should be a comprehensive plan ranging from the identification of a storm water pollution prevention team to the planning and implementation of Best Management Practices (BMPs) for storm water protection. The ultimate goal of your plan should be to prevent contaminants from polluting waters of the state through discharge in storm water.

This document is a guide to help you develop a Storm Water Pollution Prevention Plan for your facility. There are four phases discussed with various tasks required under each phase. These are:

- Planning and Organization Phase
- Assessment Phase
- Plan Design Phase
- Evaluation and Monitoring Phase

Each task under the phases is summarized in an information box, followed by a more detailed explanation. In addition, you are provided with worksheets and tables in the Appendices to help with the planning and development process. Although the use of these worksheets and tables may not be required, it will help .us in reviewing any of the information that you submit.

It is important to understand that the focus of the storm water program is to stress the use of source control instead of storm water treatment to prevent the contamination of storm water. Source control consists of practices ranging from non-structural (good housekeeping or personnel training) to structural (covering of stored materials). These practices should reduce the chance of polluting storm water. Storm water treatment consists of structural practices which remove pollutants from contaminated storm water. This guidance will focus on source control ideas to aid in improving storm water quality.

SECTION 1: PLANNING AND ORGANIZATION PHASE

Before you start to put your Storm Water Pollution Prevention Plan together, there are three tasks that will make developing the plan easier. These tasks are designed to help you organize your staff and make preliminary decisions:

. Decide who is responsible for developing your Storm Water pollution Prevention Plan

· Examine other existing schematic, environmental, and safety plans for your facility

· Briefly survey your site to get an initial understanding of the extent to which there is a potential to contaminate storm water.

TASK 1: Developing a Pollution Prevention Team

Identify an Individual or a Team

In cases where your facility is small, or a single individual is responsible for handling environmental quality and regulatory issues, you may want ***to:***

· *Designate a specific individual to develop, implement, maintain, and revise your Storm Water Pollution Prevention Plan*

lf your facility is large or complex, you may want ***to:***

· *Designate a team to be responsible for developing, implementing, maintaining, and revising the Storm Water Pollution Prevention Plan*

· *Describe each team member's role and responsibilities with respect to storm water management activities*

What is the Purpose of Designating an **Individual or a** Team?

Assigning a specific individual or a team to develop and implement your plan serves several purposes. Naming an individual or team makes it clear that part of each identified person's job is to prevent storm water pollution. This also provides a contact for people outside the facility who may need to discuss aspects of your pollution prevention plan. Make sure to designate one person to act as the DNR contact.

If the team approach is appropriate, it is important to identify key people on-site with sufficient knowledge of the facility and its operations. These individuals will be able to provide structure and direction to the facility's storm water management program.

Effective organization of the Pollution Prevention Team is important to accomplish the task of developing and implementing a comprehensive Storm Water Pollution prevention Plan. In organizing the team, always

consider what contribution each individual can make to planning and how to enhance good channels of communication between team members.

What are the Roles and Responsibilities of the Pollution Prevention Team or Individual?

The team or individual will be the driving force behind the development, implementation and maintenance of **the** facility's Storm Water Pollution Prevention Plan. An initial task is to define and agree upon a clear and reasonable set of goals for the facility's storm water management program. For a team, the responsibilities or duties of specific team members should be defined'.

Types of responsibilities include assessment, management recommendations, implementation, evaluation, and reporting. You can find these procedures described in detail in Sections 2-4 of this document. It is important to note that teams may need to be revised as they develop the Storm Water Pollution Prevention Plan because management actions may require new or different team members.

Those responsible for maintaining the pollution prevention plan must be aware of any changes in plant operation. Such changes may require revisions to the plan to ensure that it remains effective.

While a designated individual can be assigned the job of developing and implementing a Storm Water Pollution Prevention Plan, the management is responsible for the effective implementation of the plan and for compliance with storm water requirements. Therefore, the designated individual or team must have a clear line of communication with management to ensure the ability to function in a cooperative partnership.

Who Should be on a Storm Water Pollution Prevention Team?

Any team, by definition, involves decision making and planning in a group environment. This allows for people with different areas of expertise to share knowledge and collectively decide what will work best for a particular facility. To broaden the base of involvement in the facility's storm water program, team members should represent all parts of the facility's operations.

For example, at a large facility, a team may be comprised of representatives from plant management, plant maintenance, grounds maintenance, all aspects of production operations (including union representatives, engineering, waste handling and treatment), and, if applicable, research and development. Not all facilities will **have** or require these "team" positions. As mentioned above, team membership depends on the type of operations occurring at a facility. For example, a small trucking operation may find it more appropriate to assign a single individual with experience in key types of facility operations, such as vehicle maintenance, vehicle washing, fueling, and materials handling.

If a facility has an existing Spill Prevention and Response Team, some personnel from that team may be used for the Storm Water Pollution Prevention Team. However, the roles and responsibilities of the pollution prevention team should reach beyond the activities of a spill prevention and response team. Therefore, it may not be appropriate for a facility to substitute the Spill Response Team for the Pollution Prevention Team. Make sure to examine the roles and requirements related to storm water management before making a decision.

Worksheet #1 (located in Appendix A) is an example of an appropriate form for listing the team members, by **name,** facility position (title), phone number, and including a brief description of each member's specific responsibilities. This list can be directly incorporated into the Storm Water Pollution Prevention Plan, but it also should be posted within the facility so other plant employees are aware of whom is responsible for storm water management.

TASK 2: Building on Previously Developed Management Plans

Building on Other Environmental Management Plans

You may be able to incorporate relevant provisions of other Environmental Management Programs or Spill Prevention Control and Countermeasure Plans into your Storm Water Pollution Prevention Plan by reference.

Many industrial facilities may already be subject to similar requirements under several other regulations. The following examples are some different plans: the Preparedness, Prevention and Contingency Plan (40 Code of Federal Regulations [CFR] 264 and 256); the Spill Control and Countermeasures requirement (40 CFR 112); the National Pollutant Discharge Elimination System (NPDES) Toxic Organic Management Plan (40 CFR 413, 433, 469); and the Occupational Safety and Health Administration (OSHA) Emergency Action Plan (29 CFR 1910). It is the responsibility of the pollution prevention team to decide requirements of the Storm Water Pollution Prevention Plan that overlap with other plans or requirements.

Where such plans exist, they should be incorporated into your Storm Water Pollution Prevention Plan by reference. Sometimes, it may be possible to build on elements of these plans that relate to storm water pollution prevention. For example, if your facility already has an effective Spill Prevention and Response Plan in place, elements may be used for your storm water pollution prevention approach. More specifically, lists of potential pollutants or constituents of concern may provide a starting point for your list of potential storm water pollutants. Besides referencing other plans, you should keep relevant portions of these plans filed with your Storm Water Pollution Prevention Plan.

If your facility is subject to regulation of storm water discharges through other WPDES permits or through another program, you may have already met the requirements of the storm water program. If you suspect this is the case, please contact the DNR storm water program at 608-267-7694.

SECTION 2: ASSESSMENT PHASE

After identifying who is responsible for developing your plan and organizing your planning process, you should go to the next step: a pollutant source assessment. This is where you look at your whole facility to find what materials or practices are, or may be, sources of storm water contaminants.

> In this section you will develop a map of current conditions at your facility. It is also helpful to make an additional map showing the new conditions if your site changes drastically after implementation of "source area" control BMPs (berming an area or moving storage inside). If nothing will be moved, just add all the new practices to the initial **map.**

TASK 1: Facility Site Description and Drainage Base Map

As part of your permit application the DNR required you to develop a site map, which may be a useful place to begin developing your base map.

The Facility Site Map Should Include:

. The facility property boundaries

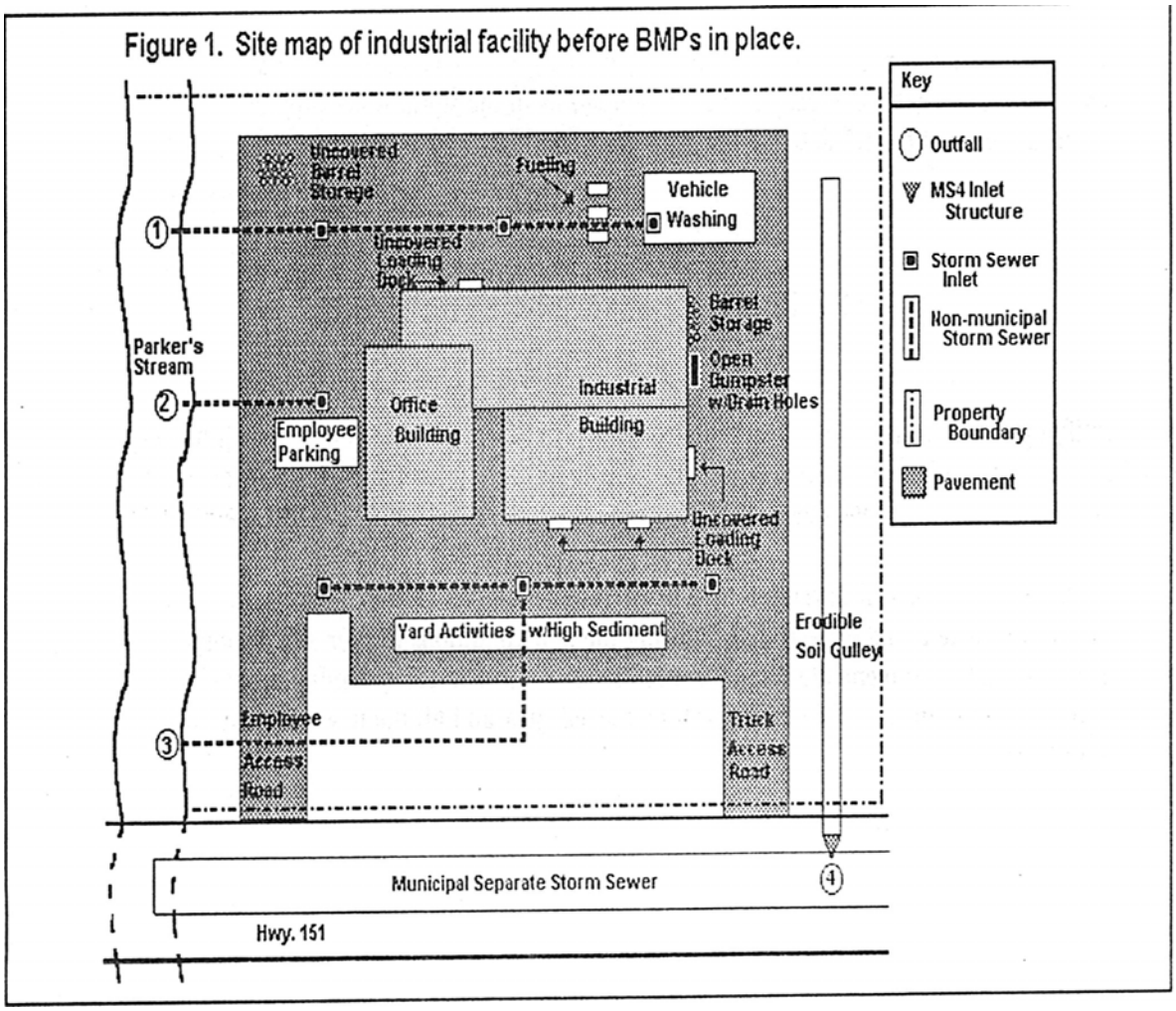
· *The storm drainage collection system including all known surface and subsurface conveyances including the location of all storm water outfalls (numbered for reference)*

· *An outline of the drainage area of each storm water outfall*

· *The surface area (in acres) draining to each outfall including % pervious and impervious*

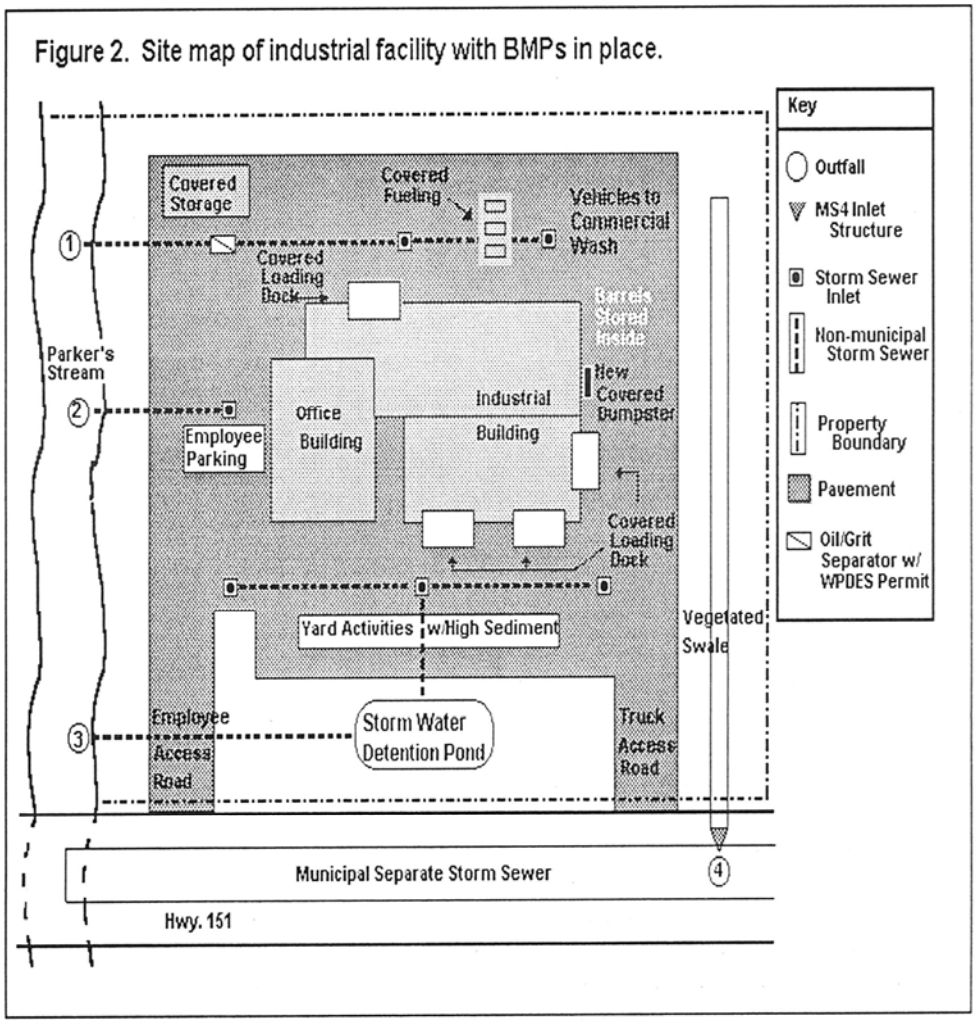
. *Location of any structural control measures used to reduce pollutants in storm water runoff*

· *Water bodies that receive storm water runoff-surface water, ground water, or wetlands*



Section 2 - Assessment Phase

The facility site map is an illustration of the complete site location, and should show property boundaries, buildings and operation or process areas. Figure 1 depicts an industrial facility prior to the implementation of the BMPs in a SWPPP. Locating these features on the map will help you when it comes time to assess where potential storm water pollutants exist on your site, where they mix with storm water, and where storm water **leaves** your site. Also, the map should provide information on storm water control structures, and receiving **water** bodies such as would be present after the implementation of your SWPPP (Figure 2). Use worksheet #2 (located in Appendix A) to help develop an appropriate base map. The worksheet has two parts: Part 1 tells you which features should be identified on your map from Section 2, Task 1, and Part 2 will be discussed in Section 2, Task 4 of this document.

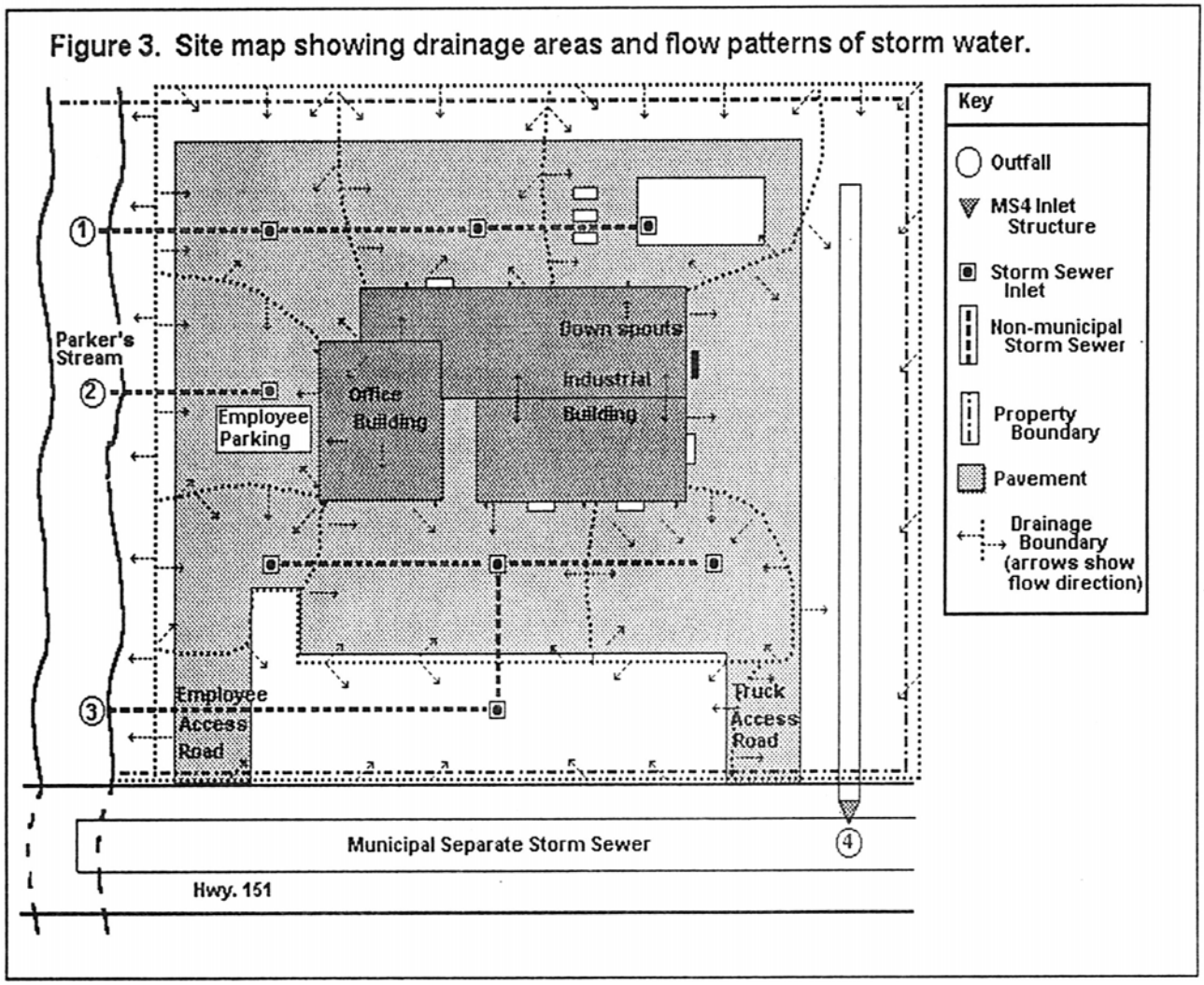


Outfalls and Drainage Areas

Once you show all boundaries and facility structures on your site map, identify all of the storm water outfalls **(also** called "discharge points") on your site. For the purposes of mapping, a storm water outfall can be considered to be the point where storm water leaves your property, whether it enters a municipal storm sewer, surface water, wetlands, or soaks into the ground. If your facility has a storm sewer system it should be easy to find where the pipes discharge. However, at many sites you simply collect storm water in ditches, or

discharge it by sheetflow. In these instances, the discharge points may not be so obvious, particularly when it is not raining. In these cases, it may be necessary to inspect your site during several rain storms to identify your discharge points. Clearly label each outfall with numbers (1, 2, 3, etc.) so that you can easily reference these discharge points in other sections of your Storm Water Pollution Prevention Plan.

Working back from the storm water outfalls, find the drainage areas for each outfall by examining the contours of your site. Drainage patterns may be obvious, such as drainage down a hill on the site. In areas where the site is fiat, a rough study of storm water flow during a rain event may provide you with a sufficient understanding of the flow patterns. If you have problems defining your drainage patterns, you may want to get a professional survey of your site. Figure 3 shows an example of a drainage basin map for an industrial site. The map includes the various drainage areas and flow patterns.



Structural Storm Water Controls

Other features to include on the site map are the locations and type of any existing structural control measures that you use to control or direct storm water runoff. Examples of structural controls include: retention/detention ponds, flow diversion structures (including ditches and culverts), vegetative swales, porous pavement, sediment traps, and any soil stabilization or erosion control practices. (See Chapter 4 of EPA's

"Storm Water Management For Industrial Activities: Developing Pollution Prevention Plans and Best Management Practices" manual for a complete description and illustrations of these structures. You can obtain a copy of this document by calling National Technical Information Sales (NTIS) at (703) 487-4650. The Document number is #PB 922 359 69.)

Surface Waters

You should label all surface water bodies on the site map. This includes any stream, river, lake, or wetland located on or next to the site (see Figure 1 as an example). Each water body should be identified by name. To find the names of water bodies, you may want to use a 7 % minute series map from the United States Geological Survey (USGS).

Maps may be purchased from local commercial dealers or directly from USGS information offices. Check your local yellow pages for commercial dealers. Topographic maps also may be purchased by mail. Standard 71/2 topographic quadrangles maps may be purchased for a nominal fee. You can order maps from the following location:

Wisconsin Geological and Natural History Survey
3817 Mineral Point Road
Madison, WI 53706

If your storm water runoff flows into a small, unnamed tributary, the name of the first downstream water body will be sufficient. Also, you should specify if the water body (for a stream, creek, etc.) is constant or intermittent (seasonal flow).

TASK 2: Summary of Existing Sampling Data or Observations

Sampling Data

If available, you should summarize and interpret any results of past storm water sampling or observations that could be useful in identifying pollutant sources and management actions. You
are not required to perform new sampling, but it may be helpful in preparing your plan.and
locating your sources of pollution.

Previously collected storm water monitoring data or data from sufficiently similar outfalls may be very useful in identifying types and areas of potential pollutants. In your summary of this data, describe your sample collection procedures. Be sure to cross-reference the particular storm water outfall sampled to an outfall designated on your site

TASK 3: Potential Sources of Storm Water Contamination

Your plan should include a list of all activities and materials that are potential sources of storm water contamination to surface water, ground water, or wetlands. When looking at your site, be certain to consider the following areas as sources of pollution (Keep in mind that this list may not include all of the industrial source areas that you should address in your plan).'

- outdoor manufacturing areas
- industrialplant yards
- immediate access roads and rail lines
- material handling sites (storage, loading, unloading, transportation, or conveyance of any raw material, finished product, intermediate product, by-product or waste)
- refuse sites
- disposal or application of wastewater as defined in 40 CFR, Part 401
- vehicle maintenance and cleaning areas
- areas of significant soil erosion
- routine chemical mixing and transfer areas
- rooftops contaminated by industrial activity
- storage and maintenance areas for material handling equipment
- shipping and receiving areas
- manufacturing buildings
- residual treatment, storage, and disposal sites
- storage areas (including tank farms) for raw materials, finished and intermediate products
- areas containing residual pollutants from pastindustrial activity, including spills and leaks of toxic and hazardous materials
- storage, processing, or handling of SARA Title III, Section 313, "water priority chemicals" (chemicals in Appendix B)

Your plan should include:

- *A list of any existing "source area control" BMPs or "storm water treatment" BMPs currently used at your facility. Also label these BMPs on your base map.*

- *Use the unshadedportion of Table I., Appendix C to check the chemicals you expect to be present in your storm water discharges before implementing any new "source area control" BMPs.*

The next step in the Assessment Phase is to conduct a material inventory on your site. Include those materials that you store outside, and measures you have taken to prevent the contact of these materials with storm water. **Maintaining** up-to-date management of material inventory is an efficient way to identify what materials your facility handles on-site that contribute to storm water contamination problems. These potential pollutant sources should be identified on your facility's site map. Part 2 of Worksheet//2 lists areas and activities that are **possible** sources of pollutants that you should include on your base map. Make sure to consider past storage of equipment piles and raw materials. Although these items are no longer stored outside, the area where the piles **were may still** be contaminated.

Materials Exposed to Storm Water

Many **materials are** potential sources of pollutants in storm water such as: raw materials; fuels; manufacturing by-products; solvents, detergents, plastic pellets and related materials; finished materials; hazardous substances; SARA Title III, Section 313 chemicals; fertilizers; pesticides; and waste products. When you expose these substances to storm water, they may be carried in the runoff to a receiving stream or the ground water. Therefore, identification of these materials helps to learn where a potential for contamination exists and is the **first** step in identifying appropriate BMPs.

Monitoring for pesticides and fertilizers will not be required for their routine application. However, if your facility stores these materials outside or storage could contact storm water you will be required to monitor for these products. As a part of every Storm Water Pollution Prevention Plan you should look at ways to reduce your use of pesticides and fertilizers. In addition, your industry should try to reduce their runoff to the environment by applying less product and looking at the application time. (For instance, never apply pesticides on days with a chance of rain, instead you should reschedule application for a dryer period.)

Worksheet//3 (located in Appendix A) will help guide you through the process of conducting a material inventory for your Storm Water Pollution Prevention Plan. If any of the significant materials on your site have been exposed to storm water in the three years before the effective date of your permit, fill out Worksheet and include it in your plan.

Other Source Areas

Roof, lawn and parking lot runoff can be a source of pollutants in storm water. However, if these areas are not exposed to industrial activity, such as process vents or truck traffic, the storm water discharged from these areas is not regulated under your permit. For example, outfall/#2 in Figure 1 and 2 would not be considered as relating to industrial activity because it only handles water from employee parking and the office roof. Although not regulated, these areas should still be considered for source control through pollution prevention. For example:

- Inform your employees not to change their oil etc. in the parking lot and to watch for these fluids leaking from their vehicles

- Have a minimization/application plan for pesticides and fertilizers

- If you replace a roof, use new roofing materials/gutters that won't be a source of zinc (galvanized), copper, or other pollutants.

These additional considerations are voluntary. However, they will be addressed at some future date in your community's storm water plan. Therefore, any effort now will be beneficial in the future.

Be certain to do a complete and careful inspection of your site for materials and conditions that can be' sources of storm water contamination. You may wish to use Figure 4 in Section 2 in your materials inventory, to help you identify exposed materials. Focus on areas where you store, process, transport, or transfer any material used or produced in your industrial processes. Check storage tanks, pipes or pumping areas and note any leaks or spills. Look for areas of possible contaminant concentration such as low spots near buildings' or manholes where residue can build up and then be carried off in a storm event. Observe your loading or unloading activities and decide if material exposure to storm water occurs during these processes. Also, pay attention to material handling equipment, including everything from vehicles to pallets, for exposure of residue from your industrial activities. Look at any unsealed dumpsters or disposal units/areas where you deposit waste from your industrial activities, for storm water exposure and signs of contaminant movement. Finally, check the roof for areas where particles or chemicals vented from manufacturing processes are likely to fall within your drainage areas.

Identifying Past Spills and Leaks

Part of the material inventory should be a list of significant spills and leaks of toxic or hazardous materials that have occurred at your facility. The list provides information on potential sources of storm water contamination.

SARA Title III, Section 313 facilities should describe releases of "water priority chemicals" (see list in Appendix B) to land or water that have occurred during the three years before permit issuance.

Worksheet//4 (located in Appendix A) can help you organize this list of leaks and spills. The locations of significant leaks or spills are areas to focus when selecting "source area" control or "storm water treatment" **BMPs.**

Existing Management and Storm Water Treatment

Once you have listed the potential sources of storm water pollutants on your site, and labeled them on your map, describe management practices you currently use such as "source area control" BMPs and "storm water treatment" BMPs. You should design "source area" control practices to prevent storm water from becoming contaminated. This can be done by reducing material exposure, directing storm water away from contaminated areas, or reducing the volume of potentially polluting materials on the site. They can be simple such as **sweeping** a work area or more complex such as building a dike around a tank. "Storm water treatment" management practices reduce the pollutants in contaminated storm water before discharge. Some examples are detention ponds or grassed swales. Section 3 of this document explains in detail information about "source area control" BMPs and "storm water treatment" BMPs. Also, make sure to draw these practices on your facility base map.

Probable Storm Water Pollutants

Table I in Appendix C is a list of conventional and nonconventional pollutant parameters, toxic inorganics, volatile organic compounds (VOC's), semi-volatile organic compounds, base/neutrals, pesticides and PCB's, and hazardous substances. Use this list to determine which chemicals would be present in the storm water outfalls of your site. If you have more than 4 outfalls, make sure to photocopy these sheets before assessment. Take the time to evaluate each "source area" so you know what will be in the outfall runoff.

TASK 4: Status of Non-Storm Water Discharges

Identify Other Types of Discharges that are Combined with Your Storm Water Discharges

You should include a certification that you tested all storm water outfalls or conveyance systems for the presence of non-storm water discharges. The certification should include:

- *Identification of potential non-storm water discharges*
- *Description of the test results for the presence of non-storm water discharges*
- *Test method used*
- *Test date of testing*
- *The on-site drainage points directly observed during the test.*

A summary of illicit discharge information should be filled out. Use Table I1., Appendix C.

This certification should be signed according to the example certification form, Worksheet #5 (located in Appendix A), and included in your Storm Water Pollution Prevention Plan. If this certification is impracticable because of the inaccessibility of an outfall, you should describe why in your Storm Water Pollution Prevention Plan. This certification must be signed according to the example Failure to Certify form, Worksheet #6 (located in Appendix A).

Examples of contaminated non-storm water discharges are:

- contact cooling water
- process wastewater
- sewage
- spills
- leaks from storage tanks
- outside vehicle washwater

Examples of non-contaminated non-storm water discharges are:

- non-contact cooling water
- fire fighting
- lawn watering
- springs
- foundation footing drains

To check for non-storm water discharges, you may elect to use one of four common dry weather tests:

(1) end of pipe screening
(2) dye testing
(3) smoke testing
(4) video camera observation

Certain types of discharges may be covered by a separate WPDES general permit, including:

- fire hydrant flushing
- potable water sources including water line flushing
- uncontaminated ground water pumping
- air conditioning condensate
- non-contact cooling water
- vehicle washwaters

Although non-contaminated discharges of non-storm water may be allowed with a separate WPDES permit, ' listing these discharge sources in your Storm Water Pollution Prevention Plan will allow you to select the most appropriate BMPs for your site. This is because you will know where all discharges are going.

The EPA has produced a user's guide called Investigation of Inappropriate Pollutant Entries into Storm Drainage Systems. Although this document was prepared for municipalities as a whole, it may be very useful if you are having trouble identifying your non-storm water flows. (EPA/600/R-92/238 January 1993)

Figure 4.
Outdoor Site Assessment Checklist

I'l *Does your facility show signs of poor housekeeping (cluttered walkways, unswept floors, uncovered materials, etc.)?*

[] *Do you see spots, pools, puddles, or other traces of oils, grease, or other chemical on the ground?*

[] *Can you find discoloration, residue, or corrosion on the roof or around vents or pipes that ventilate or drain work areas?*

[] *Do you see leaking equipment, pipes or containers?*

Are absorbent materials (kitty litter, sand, saw dust, etc.) regularly used in certain areas to absorb spills?

Do you find manholes or piping that could act as routes for pollutants or catch areas for pollutants that could then be scoured in a large storm event?

[] *Do you smell strange odors, or experience eye, nose, or throat' irritation when you first enter the work area? These are indications of equipment leaks that could lead to storm water contamination.*

[] *Do you see open containers, stacked drums, shelving too small to handle inventory, or other indications of poor storage procedures ?*

[] *Are containers properly labeled to maintain material inventory of these items ?*

[]Do drips, spills, or leaks occur when materials are being transferred from one source to another?

SECTION 3: PLAN DESIGN PHASE

Once you have identified and assessed your potential sources of storm water contamination, the next step is to select the proper Best Management Practices (BMPs) that will eliminate or reduce pollution potential. BMPs should prevent, mitigate, or treat pollution from any type of activity. They may include processes, procedures, schedules of activities, and other management practices to prevent or reduce water pollution. They can be anything a plant manager, department supervisor, environmental engineer, consultant or employee identifies as a method to reduce the amount of pollutants leaving an industrial site in storm water runoff.

NOTE: Reduction or elimination of contaminates in storm water discharge through "source area" control should be the ultimate goal of your Storm Water Pollution Prevention Plan.

Reduce, Reuse, Recycle

When selecting a BMP for your storm water program, the DNR recommends that you choose practices that eliminate or reduce the amount of pollutants generated on your site (source reduction). When this is impracticable, try to select options that recycle or reuse the storm water in your industrial processes. The next option is treating storm water to remove any pollutants before it leaves the site. However, this is a less desirable method due to cost and it often only transfers from being a storm water problem to being a solid waste problem. Table 1 provides examples that represent different BMP options.

Table 1. Classification of Storm Water BMPs

Storm Water Management		Example BMPs
"Source Area" Control		
Source Reduction	·	Preventive maintenance
	·	Spill prevention
	·	Chemical substitution
	,,	Housekeeping
	·	Training
	·	Materials management practices
	·	Covering the activity
Structural Containment/Diversion	·	Segregating the source of concern
	·	Covering the source area
	,,	Berming the source area
Recycling	,.	Recycling washwaters
"Storm Water Treatment"	·	Sand/Peat filter with pretreatment
	·	Diverting flow to grassed area*
	·	Oil/water separator
	·	Vegetated swale
	,.	Storm water detention pond

*
his BMP should be used for clean water. (refer to discussion 27.)
For protection of ground water quality,only on page

TASK 1: "Source Area" Control Best Management Practices

"Source Area" control BMPs

Your plan should include a description of storm water management controls appropriate for the facility, and their implementation schedule. Facilities must rely on pollution prevention and "source area" control BMPs for most of their work. If possible, try to label these BMPs on your Facility Site Map. If the base map changes too significantly after implementation of your chosen BMPs, make a pre and post BMP map,. and label them accordingly.

You should plan "source *area"* BMPs to prevent storm water contamination. These BMPs are usually inexpensive, simple, and applicable to many industries and activities. Most industrial facilities already have some of these in place for material loss prevention, accident and fire prevention, worker health and safety, or to comply with other environmental regulations. The purpose of this section is to highlight how these common practices can be improved and maintained to prevent storm water pollution. The DNR's Storm Water Program is emphasizing these measures because they are efficient and cost-effective, and they promote pollution prevention over treatment.

(See Chapter 4 of EPA's "Storm Water Management For Industrial Activities: Developing Pollution Prevention Plans and BMPs" for more detailed information on "source area" control BMPs. This can be ordered by calling National Technical Information Sales (NTIS) at (703) 487-4650, order document #PB 922 359 69.)
At a minimum, industrial facilities should look into implementing the following eight "source area" BMPs:

Minimum Required "source area" control BMPs

- *Erosion Repair*
- *Good Housekeeping*
- *Preventive Maintenance*

  Visual Inspections
- *Spill Prevention and Response*
- *Employee Training and Awareness*
- *Management of Salt Storage Areas*
- *Management of "Water Priority Chemicals" Identified Under SARA Title III, Section 313 (see list of chemicals in Appendix B)*

This section describes how each of these BMPs can prevent storm water pollution.

Erosion Repair

Identify areas that, due to topography, activities, or other factors, have a high potential for significant soil erosion, and identify measures to limit erosion.

There may be areas on your site that are prone to erosion due to steep slopes, sandy soils and additional areas that may not be able to hold plant life. The dirt and sand particles in these situations are easily picked up by wind and/or washed away by runoff. This process is erosion and can be controlled or prevented with the use of BMPs such as silt fences or straw bales. Reconstructing slopes and seeding open areas with grass are also effective, inexpensive ways to reduce erosion. Diversion of runoff around steep slopes also will help to maintain slope stability.

Good Housekeeping

Good housekeeping requires the maintenance of a dean, orderly facility.

Often the most effective first step toward preventing industrial pollution in storm water involves using common **sense** improvements to the facility's housekeeping routine.

There are some simple procedures to promote good housekeeping: improved operation and maintenance of industrial machinery and processes; good material storage practices and inventory controls; routine .clean-up schedules; and well organized work areas. The following sections describe good housekeeping procedures and provide a checklist (Figure 5.) that you can use to evaluate and improve your facility's storm water pollution prevention program.

Operation and Maintenance

These practices ensure that processes and equipment are functioning correctly. Here are a few examples of easy-to-implement operation and maintenance BMPs that should be incorporated into your housekeeping program:

,, Clearly explain spill cleanup procedures to employees

Maintain dry and clean floors by using brooms, shovels, vacuum cleaners, or cleaning machines

Regularly pickup and dispose of garbage and waste material

,. Make sure equipment is working properly

,. Routinely inspect for leaks or conditions that could lead to the discharge of chemicals or contact of storm water with raw materials, intermediate materials, waste materials, or products

Material Storage Practices

Improper storage results in the release of materials that can cause the contamination of storm water runoff pollution. Proper storage techniques include:

- Providing adequate aisle space to simplify material transfer and provide easier, safer **access** for inspection
- Storing containers, drums, and bags away from direct traffic routes to prevent accidental spills
- Stacking containers according to manufacturers' instructions to avoid collapsing or damaging the containers from improper weight distribution
- Storing containers on pallets or similar devices to prevent corrosion of the containers resulting from containers coming in contact with moisture on the ground
- Assigning the responsibility of hazardous material inventory to a few people whom you have trained to handle hazardous materials

Material Inventory Procedures

Maintaining an up-to-date inventory of all materials (hazardous and non-hazardous) onsite may help reduce the material costs caused by overstocking. It may also help to track material storage and handling on-site, and to identify materials and activities that pose the most risk to the environment. Worksheets #3 and 3A provide examples of the types of information you should collect while conducting the inventory. The following instructions explain the basic steps to completing a material inventory:

- Identify all chemical substances present in the workplace. After reviewing the purchase orders for the previous year, walk through the facility. List all of the chemical substances used in the workplace and obtain the Material Safety Data Sheet (MSDS) for each.
- Label all containers to show the name and type of substance, stock number, expiration date, health hazards, suggestions for handling, and first aid information. This information can usually be found on the MSDS. Proper labeling will limit the improper disposal of chemicals.

  Hazardous materials should be clearly marked on your inventory as requiring special handling, storage, use, and disposal considerations.

Figure 5.
Good Housekeeping Checklist

[] Are outside areas kept in a neat and orderly condition?

[] Are drips or leaks from equipment or machinery being controlled?

[] Is the facility orderly and neat? Is adequate space provided in the work areas?

[] Is garbage removed regularly?

[] Are walkway passageways easily accessible, safe, and free of protruding objects, materials or equipment?

[] Is dust on the ground from industrial operations or processes being controlled?

[] Are cleanup procedures used for spilled solids ?

[] Is good housekeeping included in the employee program ?

[] Are good housekeeping procedures and reminders posted in appropriate locations around the workplace ? Are regular housekeeping inspections made?

Preventive Maintenance

Your preventive maintenance program should include:

- *Inspection and maintenance of storm water management devices (cleaning oil/water separators, catch basins)*
- *Inspection and testing of plant equipment and systems to uncover conditions that could cause breakdowns or failures resulting in discharges of pollutants to surface waters*
- *Proper maintenance of plant equipment and systems*

The goal of a preventive maintenance program is to detect problems in equipment before they have an opportunity to pollute storm water. Most facilities already have preventive maintenance programs that can serve as a basis for developing a program for the Storm Water Pollution Prevention Plan. The Pollution Prevention Team should evaluate the existing program and recommend changes.

The following lists identify some types of equipment and plant areas to include in your preventive maintenance program.

Equipment to Inspect

- *Pipes, Hoses*
- *Pumps*
- *Storage tanks and bins*
- *Pressure vessels*
- *Pressure relief valves*
- *Process and material handling equipment*
- *Storm water management devices (oil/water separators, catch basins, or other structural or treatment BMPs)*

Areas to Inspect

- *Areas around all of equipment listed above*
- *Areas where spills and leaks have occurred in the past*
- *Material storage areas (tank farms, drum storage)*
- *Outdoor material processing areas*

- *Material handling areas (e.g., loading, unloading, transfer)*
- *Waste generation, storage, treatment and disposal areas*

Preventive Maintenance Records

Include a suitable record keeping system for scheduling inspections of items in the preventive maintenance program. Record inspection results and correct any problems you find. Make sure records are complete and kept with regular visual inspection records.

Visual Inspections

- *identify qualified personnel who will inspect equipment and areas at appropriate intervals in the plan*
- *Track results of inspections to ensure you take corrective actions*
- *Maintain records o fall inspections.*

Preventing the pollution of your facility's storm water runoff requires both good housekeeping and preventive maintenance in areas where you handle, store or transfer materials. Once you have outlined these methods in your Storm Water Pollution Prevention Plan, regular visual inspections must be made to ensure the plan is working properly. Figure 6 provides a visual inspection checklist to help in your inspections.

Your routine visual inspections should not be a comprehensive evaluation of the entire storm water program that is the function of the Annual Facility Site Compliance Inspection, which is part of the Facility Monitoring Plan. Instead, it should be a routine inspection of how well the preventive maintenance and good housekeeping activities are working. The frequency of visual inspections should be determined by the type and amount of materials handled at the facility, existing facility BMPs, and any other relevant factors such as the age of the facility (in general, older facilities should be inspected more frequently than new facilities).

Inspections Records

It is important to document each inspection, noting when you performed, it, what problems you saw, and. all steps taken to correct the problems, including the name of personnel .notified. Many industrial facilities already have an inspection procedure in place that may be incorporated into the Storm Water Pollution Prevention Plan.

Figure 6.
Visual Inspection Checklist

Do you see:

Corroded drums or drums without plugs or covers

[] Corroded or damaged tanks, tank supports, and tank drain valves

[] Torn bags or bags exposed to rain water

[] Corroded or leaking pipes

[] Leaking or improperly closed valves and valve fittings

[] Leaking pumps and/or hose connections

[] Broken or cracked dikes, walls or other physical barriers designed to prevent storm water from reaching stored materials

[] Windblown dry chemicals

[] Improperly maintained or overloaded dry chemical transport systems

If you have checked any of these areas on your inspection, you should reevaluate your Storm Water Pollution Prevention Plan and make appropriate changes to correct these problems.

Spill Prevention and .Response

- *Identify areas where spills can occur and their drainage points*
- *Specify material handling procedures, storage requirements, and use of spill prevention equipment such as diversion valves*
- *·ldentify procedures for spill clean-up and teach personnel about these procedures*
- *Provide the appropriate spill dean-up equipment*

Spills and leaks of industrial materials are a significant source of storm water pollutants and are generally caused by operator error. Establishing standard operating procedures (SOP's) such as safety and spill **prevention** along with proper employee training, can reduce accidental releases.

The development of spill prevention and response procedures is a very important element of an effective Storm Water Pollution Prevention Plan. A Spill Prevention and Response Plan may currently exist for other environmental regulatory requirements. If so, it should be evaluated and revised to address the objectives of the Storm Water Pollution Prevention Plan. This section outlines how to identify and characterize potential spills, to eliminate or reduce spill potential, and how to respond when spills occur.

Identify Potential Spill Areas **and Drainage Points**

Spill potential depends on your current material handling procedures, the types and volumes of materials handled, and the storage of materials. You must describe these factors in your plan.

The activities and areas where spills are likely to occur are described below:

Loading and unloading areas have a high spill potential. Evaluate the spill potential from all loading and unloading equipment, such as barges, railroad cars, tank trucks, and front end loaders, and vehicle wash areas.

Storage areas, both indoor and outdoor, are also potential spill areas. Outdoor storage areas exposed to storm water runoff may provide direct contact between potential pollutants and storm water. Indoor storage areas may contaminate storm water if the drains in the storage area connect to the storm sewer or if you use improper spill clean up procedures. This evaluation should consider the type, age, and condition of storage containers and structures (including tanks, drums, bags, bottles). Also, evaluation of the spill potential of storage areas should focus on how employees handle materials.

All process areas.., including waste disposal, are potential sources of storm water contamination if their floor drains are connected to the storm sewer. If these drains cannot be sealed, the process area should be evaluated for the adequacy of spill control structures. Also consider normal housekeeping procedures. Some process areas are hosed down periodically and the resulting wash water contains pollutants. Outdoor process activities may contaminate storm water if you divert spills to the storm sewer.

Specify Material Handling Procedures and Storage Requirements

Ideas for eliminating or minimizing spill potential or its impact will emerge through the process of developing various spill scenarios. You should Set priorities and adopt BMPs according to conditions of effectiveness, cost, feasibility, and ease of implementation. The following is a list of some suggested activities or alterations that may be made to reduce the potential for spills to occur and affect storm water quality:

- Develop ways to recycle, reclaim and/or reuse process materials to reduce material movement in and out of the facility

- Install leak detection devices, overflow controls with alarms, and diversion berms

- Plug drains in the processing areas that lead to the storm sewer (be sure that any such action would not create a health or safety hazard within your facility). Sometimes it may be possible to connect the drain to the sanitary sewer. If this is your choice, you may need permission from the sewerage district prior to connection.

- Fit all floor drains with removable covers to prevent accidental spills and sweepings from entering the drain.

- Adopt effective housekeeping practices

- Adopt a material flow/plant layout (i.e. avoiding the storage of easily punctured bags in high-traffic areas where they may be routinely damaged)

  Perform regular visual inspections to identify signs of wear on tanks, drums, containers, storage shelves, berms, containment and poor housekeeping or other clues that could lead to potential spills

  Perform preventive maintenance on storage tanks and shelves, valves, pumps, pipes, and other equipment

- Perform integrity testing on tanks, cleaning, and periodic sampling

- Use procedures for filling tanks and other equipment that minimize spills

- Use material transfer procedures that reduce the chance of leaks or spills Ensure appropriate security

Identify Spill Response Procedures and Equipment

If spill prevention measures fail, a swiftly executed response may prevent contamination of storm water. Many programs require spill response plans. However, this may be the first time that your spill response plan needs to address storm water quality.

The greatest obstacle to an effective spill response plan is in its prompt implementation. Therefore develop a plan that is easy to implement and don't keep it a secret.

The spill response plan should include:

, Identification of the spill response "team" that is responsible for implementing the spill response plan

, Safety measures to take both before and during spill cleanup

Procedures to notify the appropriate authorities to Provide assistance [police, fire, hospital, Publicly Owned Treatment Works (POTW), etc.]

· Spill containment, diversion, isolation, and cleanup procedures

· Spill response equipment including

Safety equipment such as respirators, safety glasses, protective clothing, fire extinguisher, and two-way radios
Cleanup equipment such as booms, barriers, sweeps, adsorbents, containers, etc.

Proper disposal or treatment of collected materials.

Following any spills, evaluate if the prevention plan response team was successful or how it can be improved. Be certain to incorporate the finds of this evaluation into any further employee training.

Employee Training

Employee training programs should inform all personnel of responsibility of the components and goals of the Storm Water Pollution Prevention Plan. Training should address each component of your pollution prevention plan, including how and why each task is to be implemented.
Topics are likely to include (discussed previously):

· *Spill prevention and response*

· *Good housekeeping*

· *Material management practices*

The pollution prevention plan should specify how often to conduct training.

Employee training is essential to implement the Storm Water Pollution Prevention Plan. The goal of your training program should be to teach your personnel the components and goals of your pollution prevention plan'. When properly trained, your personnel can recognize situations that could lead to storm water contamination and respond safely and effectively to an accident.

Tools For a Successful Training Program

Here are some suggestions of tools that you can include in your training program: · Employee handbooks

· Films and slide presentations

- Drills
- Routine employee meetings
- Bulletin boards
- Suggestion boxes
- Newsletters
- Environmental excellence awards or other employee incentive programs

Frequency of Training

Training should be done at least once a year for all employees. You should examine your plan to decide if training exercises should be conducted more frequently. Consider the complexity of your management practices and the nature of your staff, including staff turnover and changes in job assignments, when scheduling training. Also, you should plan to evaluate the effectiveness of your training efforts. Usually this may only involve speaking with your employees to verify that information has been communicated effectively.

Salt Storage Piles

*Salt storage piles should be covered or enclosed so that neither precipitation nor storm water **run-on** can come into contact with the stored salt.*

Covering or enclosing salt storage piles is the only way to ensure that storm water does not come into contact with the salt. This also keeps the chemical composition of the salt from changing so it is the right consistency when applied. Also, understand that if your stored salt is to be spread on public or private roads it is considered highway salt and you must also comply with DOT's TRANS 277 regulations (not covered here).

Management of "Water Priority Chemicals" Identified Under SARA Title III, Section 313

Extra precautions are needed for facilities managing SARA Title III, Section 313 "water priority chemicals" to prevent the discharge of these materials into storm water. These include:

Drainage control such as: roofs, covers or other means to prevent exposure of chemicals to precipitation; or curbs, culverts, gutters, sewers, or other means to reduce exposure of materials to storm water runoff.

- *Containers and piping compatible with chemicals stored to minimize chemical discharges.*
- *Proper operation of chemical storage areas to minimize accidents and spills*
- *Periodic site inspections to detect existing leaks or conditions that could lead to a potential discharge*

A list of the "water priority chemicals" can be found in Appendix B.

The following practices should be considered when implementing "source area" control BMPs. They are required in special cases such as salt storage piles or oil and grease separators.

Suggested "Source Area" Control Best Management Practices

Consider BMPs that divert storm water away from pollutant sources by covering or berming, or contain pollutant leaks that can be collected and treated.

Many BMPs discussed in Section 3 are measures to reduce pollutants at the source before they pollute storm water runoff. These *suggested* "Source area" BMPs can be used to prevent storm water contamination by directing storm water away from areas of exposed materials or potential pollutants. Some practices that should be considered include:

- Containing and covering materials in a building or frame structure
- Containment of material by berming or diking
- Diversion of clear water runoff away from material storage
- Water reuse/recycle systems (ex: vehicle wash water)

For open or exposed containment, try to minimize the volume of water that will be collected and then must be treated. Many POTW's do not have the type of treatment to remove many of these storm water contaminants and therefore will not accept hook up to the sanitary system. You may minimize volume by clear water diversion (such as diversion berms that change the flow direction of water), or enclosing the source area. (Chapter 4 of EPA's "Storm Water Management For Industrial Activities: Developing Pollution Prevention Plans and BMPs" provides descriptions and pictures of most of these practices and is available by calling National Technical Information Services (NTIS) at (703) 487-4650 and ordering document #PB 922 359 69)

TASK 2: Residual Pollutants Expected to Remain in Storm Water

Residual Pollutants

After your facility has implemented the "source area" control BMPs, you should consider what pollutants may remain in your storm water. These would be pollutants that did not benefit from "source area" controls and therefore remain in the storm water runoff. Some ideas for looking at residual pollutants are the following: any pollutant contained in any discharge permit; any pollutant contained in a categorical effluent limitation or pretreatment standard; any SARA Title III Section 313 "Water Priority Chemical" which the facility uses; any other toxic or hazardous pollutants from present or past activity that remain in contact with storm water; any pollutants in significant concentrations such as oil & grease, pH, total suspended solids, 5-day biochemical oxygen demand, and chemical oxygen demand. Also, perform the following steps:

Consult the list of chemicals you checked in Section 2, Task 3 using Appendix ***C. Table I.***

Fill out the shaded portion of Table I.'

- *First list by outfall the "source area' controls you have used that will affect each outfall. (For example: If chemical storage in the drainage area of Outfall 1 was moved indoors, then these chemicals will not be in the storm water discharge of Outfall 1. Therefore, the "source area" control affected Outfall I.)*
- *Second, identify those chemicals that you feel did not benefit from any "source area" control BMPs and are likely to remain ht the storm water discharges.*

The chemicals you identify in Table I will be the basis for identifying chemical monitoring needs and "storm water treatment" BMPs to reduce further storm water contamination. Generally, the more "source area" control BMPs you use to prevent pollution, the less time and money will be spent monitoring and treating your storm water.

3: "Storm Water Treatment" Best Management Practices

"Treatment" BMPs

Where "source area" controls can not be used or do not prevent pollution, "storm water treatment" BMPs should be used to reduce the residual pollutants in contaminated storm water before discharge. These BMPs include:

Vegetative grassed swales (see groundwater discussion below)

- *Infiltration devices (see groundwater discussion below)*
- *Filtration devices (see groundwater discussion below)*
- *Wet or dry detention ponds*
- *Chemical treatment devices*
- *Discharge to existing waste water treatment system*

In selecting "treatment" BMPs, you may wish to consider the following factors:

,. The potential for pollutant load reduction

,, Capital and Operation & Maintenance costs

,, Cost-effectiveness

BMP **Cost and** Effectiveness

The costs of implementing "treatment" BMPs vary depending upon many factors and site-specific conditions.
In general, "treatment" BMPs are more expensive than "source-area" BMPs; Costs may vary depending upon the size of the facility, the types of materials, and the nature of plant operations. Because BMP effectiveness is also site specific, this guidance does not attempt to provide details of the BMPs listed above. (You may reference Chapter 4 and Appendix A of EPA's "Storm Water Management For Industrial Activities: Developing Pollution Prevention Plans and BMPs" for specific guidance and references. This can be ordered by calling National Technical Information Services at (703) 487-4650 and ordering document #PB 922 359 69..) If you design storm water treatment BMPs for use, the DNR will require Plans and Specifications for review and approval.

Protection of Groundwater Quality

The DNR only allows land application of wastes tie: infiltration devices) including storm water, for clean wastes (such as non-contact cooling water) or wastes that have beneficial properties to the !and for agricultural purposes (ex: contain nitrogen as a nutrient). NR140 sets preventive action limits for chemical discharges. Discharges of toxic or hazardous substances are prohibited. Therefore, before deciding to infiltrate your storm water, make certain it is clean and will not require a land application permit. To protect groundwater, you should only be infiltrating water with low to moderate levels of contamination such as storm water from lawn areas, rooftops, or separate employee parking areas.

TASK 4: Compliance With Federal, State and Local Regulations

Compliance

All storm water discharges and pollution prevention plans need to comply with established regulations. These include, but are not limited to: local sewer ordinances, local fire codes, state hazardous waste handling laws, Spill Prevention Control and Countermeasure (SPCC) Plans, air and groundwater quality requirements.

Use the following sample matrix to gain an understanding as to how to fill out your own compliance matrix (see Appendix C, Table II for a working blank). Regulations you need to comply with are listed on the left side of the matrix, along with blanks for you to fill in any additional regulations that may apply to your industry. Across the top you should list all BMPs that you plan to implement. You should use this matrix to verify that each BMP complies with all regulations applicable to your facility. If you find a BMP that doesn't comply, you will need either to alter it so that it will comply, or use a different BMP.

BEST MANAGEMENT PRACTICE

REGULATION	AUTHORITY
Local Sewer	Treatment
Local Fire Codes	Fire Dept.
Solid/Hazardous Waste Regulations	DNR
SPCC plans	DNR
Underground Storage Tanks	DNR
Air Quality	DNR
Groundwater Quality	DNR
Water Regulation and Zoning	DNR
Other Codes/Reg.	

SECTION 4: EVALUATION AND MONITORING

As part of your Storm Water Pollution Prevention Plan, you should evaluate and monitor the controls that you specified in the PLAN DESIGN PHASE. You need to:

· conduct site evaluations
· perform chemical monitoring (if required) · keep records of all inspections and reports · revise your plan as needed

TASK 1: Facility monitoring Plan

Facility monitoring consists of an Annual Facility Site Compliance Inspection, a Regular Visual Inspection of Storm Water Discharge Quality, and Annual Chemical Storm Water Monitoring (if required). Procedures should be developed so these monitoring efforts can effectively evaluate your facility's pollution prevention activities.

Comprehensive Annual Facility Site Compliance Inspection

A comprehensive annual facility site compliance inspection is required for all industries covered under either a Tier 1 or 2 type general permit. The inspection should center on verifying site drainage conditions and any new potential for pollution. Note any changes that have occurred from the conditions discussed in your plan. All best management practices should be checked to make sure they are being properly operated and maintained.

The scope of the annual inspection will depend on various factors, including the details of the Storm Water Pollution Prevention Plan and the size and nature of the activities undertaken at the facility. Typically, the process for conducting the inspection would follow these steps:

Review the Storm Water Pollution: Prevention Plan and create a list of those items that are part of material handling, storage, and transfer areas

· List all area equipment and containment.

· Review facility operations for the past year to decide if more areas should be included in the plan and inspection

· Conduct the site inspection and BMP evaluation

· Document findings and make recommendations

· Modify Storm Water Pollution Prevention Plan as necessary

You should keep the following records of your inspection:

Inspection date
Inspection personnel

Scope of the inspection
Major observations
Revisions needed in your Storm Water Pollution Prevention Plan

Regular Visual Inspection of Storm Water Discharge Quality
Quarterly inspections at each storm water discharge outfall on your site can be a valuable assessment tool and **are** required. This inspection should be performed when sufficient runoff occurs during daylight hours. Try to make observations within the first 30 minutes of the storm event and look for color, odor, turbidity, floating solids, foam, oil sheen or any other visual indicators of storm water pollution. If you find visible pollution, **not**[e] the probable source and list any possible BMPs that could be used to reduce or eliminate the problem. Make any necessary changes to your Storm Water Pollution Prevention Plan as needed.

Compile the following information for inspection:

Inspection date
Inspection personnel (name)
- Visual quality of the storm water discharge
- Probable sources of any observed storm water contamination

Inspections for Non-storm Water Discharges

s. NR 216 Wis. Admin. Code requires that industrial permittees all certify that outfalls discharging storm water associated with industrial activity have been tested or evaluated for the presence of non-storm discharges. Applicants do not have to test for the presence of discharges already subject to a WPDES permit. Acceptable testing procedures include: dry weather observations of outfalls; the analysis and validation of accurate piping **schematics;** dye-tests; smoke tests; and video camera observation.

Dry Weather Observations of Outfall
A visual inspection that is conducted during dry weather, can be an effective method of locating illicit **connections** to the storm drain system. The observation should be made during normal business hours when **sources** of non-storm water are typically operating. Keep a record of all observed .flows and any stains, sludge's, or other abnormal conditions observed. Where flows are observed, additional analysis, such as dye testing may be necessary to identify its source.

Applicability: This method is applicable to any industrial site with a storm drain system where an outfall or other location (e.g. manhole) down gradient from potential non-storm discharges can be observed.

Resources: No special equipment is required:

Review and Validation of Piping Schematics Description.
A careful review of piping schematic drawings for industrial sites can identify the intended routing of flows from particular areas or drains. This review should be accompanied by visual inspection to compare the "as built" condition to the plans and to determine whether any unrecorded piping modifications have been made.

Applicability: This method is most applicable for industrial sites which have large or elaborate piping arrangements, usually recorded on schematic piping drawings. It is most applicable in conjunction with use of the other techniques described below.

Resources: No special equipment is required, though dye tests may be useful in specific situations to clarify discrepancies which cannot be resolved visually.

Dye Tests Description

Dye tests are used to determine whether a particular inlet or fixture discharges non-storm water to the storm water drain. A quantity of dye is released at the selected location while an observer watches for the dye at a downstream location. If the inlet is discharging to the storm drain, the dye will be detected at the downstream location. Dye doses should be sufficiently large enough so that the dye at the downstream location is visible to the naked eye.

Applicability: Dye tests are most effective for determining if an identified drain or catchbasin is connected to the storm sewer where the outfall of the storm sewer is submerged, but the receiving water can be observed. (Where the outfall or other point can be observed and is not submerged, dry weather observation can be made or water can be used instead of dye). Dye tests can also be used where dry weather flows have been observed, but the source of the flow has not yet been observed. It is best used when there are only a limited number of possible sources of non-storm water to the storm drain that need to be investigated.

Resources: No special equipment is necessary to conduct a dye test. Dye is the only material required. Effective dyes that are safe and harmless are available in powder, tablet, or liquid form. A 20% solution of Rhodamine (liquid) costs about $15/1b. Dye can be purchased in 2 1/2 gallon containers which weigh 25 pounds and cost about $400. This can be diluted before each test by an approximate ratio of 10 to 1. A minimum field crew of two is needed, the other to observe the storm drain.

TV Line Surveys Description

TV surveys are conducted with a mobile closed-circuit television system consisting of a monitor screen, camera, drag line, and reels and cables that allow the camera to be guided through a section of pipeline. The TV picture allows a visual inspection of the interior of the drain pipe and can be used for pipelines with diameters that range from 4 inches to approximately 48 inches. Television inspection of a storm drain provides positive information (and a documented record) of the interiors of the pipelines. All inlets to the line can be identified and located. Systems for conducting TV surveys can be purchased, leased, or rented. An alternative is to hire a firm which specializes in this work.

Applicability: TV surveys may serve as useful tools where an initial survey identifies a non-storm water discharge and the operator is having difficulty in finding the source. A TV survey can locate entry points to the storm drain system, determine whether or not there is flow in them, and allows for estimates of the flow. However, in many cases, these observations will need to be supplemented by other methods to identify the specific sources (above ground) of the connection. This may be accomplished by inspection of drain maps, dye tests, or, possibly, smoke tests.

Resources: Resources required for a TV survey of storm data include the following:

TV camera
TV monitor and VCR to record survey

- Rig consisting of video cables, tow lines, and related equipment for properly guiding the camera in the line at a controlled rate, recording distance moved, and withdrawing the camera from the pipeline.

The cost to conduct a TV survey can range from $1 to $3 per foot of storm sewer. For small surveys, costs could vary from $125 to $200 per hour, including labor and rental of necessary equipment. However, this cost can increase significantly if the storm sewer must be cleaned of debris prior to conducting the survey. On the average, approximately 1000 feet of sewer can be inspected in a day. In a clean sewer, up to 2000 feet can be inspected.

Smoke Tests Description.

Smoke tests can also be used to determine whether a particular inlet or fixture discharges non-storm to the storm water drain. This method should be applied to the sanitary sewer to see if smoke appears in the storm sewer. Be certain to inform any local personnel of this procedure to avoid anyone contacting the fire department due to the smoke.

Applicability: Smoke should not be applied to sewer sections that are flowing full or containing water traps or sags because these conditions may significantly reduce the ability for smoke to move through cross connections. In addition, smoke tests are more reliable if performed on dry days when there is very little wind to blow the smoke away.

Resources: The following equipment is usually needed to conduct smoke testing:

-smoke bombs
- air blower (1500 CFM minimum)
- camera and film
- sand bags and/or plugs

The smoke bombs should be used to produce smoke that is nontoxic, odorless and non-staining. An air blower is used to force the smoke into the sewer pipes. The sand bags are to be used to block the ends. of the sewer .section to prevent the smoke from escaping through the manholes and adjacent sewer pipes. After the smoke bomb is lit and the smoke introduced into the sanitary system with the blower, you should investigate the storm sewer for the presence of smoke.

Chemical Storm Water Monitoring

At facilities covered by Tier l general permit language, chemical monitoring is required for pollutants that remain after you have. implemented your plan. Therefore, the better job you do at pollution prevention (i.e.: "source control") will pay off with less monitoring required. Storm water sampling should follow the procedures in s. NR 216.28 (4)¢):

(e) Storm water samples shall be representative ((either:

1. The 'first flush' of storm water runoff from the outfall: Composite samples are required for all pollutants except those for which analytic techniques require grab samples. The composite sample shall be collected during the first 30 minutes of runoff. At least three separate samples shall be collected for compositing, and the collection of samples should be evenly spaced throughout the sampling period, or

2. The storm water discharged from a detention pond that has greater than a 24 hour holding time for a representative storm. A grab sample is required for all pollutants. The grab sample shall be representative of the storm water discharged from the pond outfall.

A storm event must fulfill minimum criteria to produce a sample that will adequately represent the movement of contaminants from an industrial site. Requirements in s. NR 216.28(4)(d) state that an acceptable storm must:

o occur during the period of March through November,

° produce greater than 0.1 inch of rainfall,

o occur at least 72 hours after a previous rainfall of. 1 inch.

Storms that do not fit these criteria are not acceptable for sample collection, so collect a sample from a different storm. Remember, you only need to sample once per year, so be patient and collect a good sample from an acceptable storm.

TASK 2: Schedule for Implementation of BMPs, Monitoring and Reporting

Included in your plan should be schedules for:

· *Implementing "source area" control and "treatment" best management practices*

· *Implementing storm water monitoring regularly*

Implementing your plan will involve several steps:

,. Develop a schedule for implementation. For example, your schedule might include a deadline for putting improved housekeeping measures into practice and training employees. Should implementation involve modifications to your site, such as construction, you will need to account for the time required to secure any necessary local or state permits.

,, Assign specific individuals with responsibility for setting up aspects of the plan and/or monitoring requirements.

Ensure that management approves of your implementation schedule and strategy. Also schedule regular times for reporting progress of implementation to management.

Schedule for Monitoring

Your plan should contain a schedule for the Annual Facility Site Compliance Inspection, .Regular Visual Inspection of Storm Water Discharge Quality, and Annual Chemical Storm Water Monitoring. The procedure is to develop your Storm Water Pollution Prevention Plan, provide time to implement the best management practices, determine what residual pollutants remain, and follow-up with monitoring of those residual pollutants.

Record keeping

Keeping accurate records is an effective way to track the progress of your pollution prevention efforts and can be a source of information for determining future development of BMPs. In addition, keeping records of spills and leaks can help your facility minimize the recurrence of these incidences.

Document Retention '

All records, reports, inspections and maintenance activities related to your Storm Water Pollution Prevention Plan should be kept in a central location and maintained for five years from the effective date of permit coverage,

Signatures

All reports required by your general permit shall be signed (in accordance with Part VI Section M) as follows:

In the case of a corporation, by a principal executive officer of at least the level of vice-president, or by an authorized representative responsible for the overall operation of the site for which a permit is sought;

For a limited liability company, by a member or manager;

In the case of a partnership, by a general partner;

In the case of a sole proprietorship, by the proprietor.

Amending your SWPPP

· Under s. NR 216.27(4) Wis. Admin. Code, you will need to amend your SWPPP under the 'following circumstances:

When expansion, production increases; process modifications, changes in material handling or storage, or other activities are planned which will result in significant increases in the exposure of pollutants to storm Water. discharged either to waters of the state or to storm water treatment devices. The amendment shall contain a description of the new activities that contribute to the increased pollutant loading, planned source control activities that will be used to control pollutant loads, an estimate of the new or increased discharge of pollutants following treatment and, when appropriate, a description of the effect of the new or increased discharge on existing storm water treatment facilities.

. The facility finds through its annual facility site compliance inspection, quarterly visual inspection of storm water quality, or other means that the provisions of the SWPPP are ineffective in controlling storm water pollutants discharged to waters of the state.

. Upon written notice that the department finds the SWPPP is ineffective in achieving the conditions of the storm water permit coverage.

3: Pollution Prevention Plan Summary

The Pollution Prevention Plan Summary should include the following:

· *A listing of source areas of pollutants*

· *Proposed BMPs to prevent theses pollutants from contacting storm water*

· *Your monitoring schedule by outfall*

· *A summary of illicit discharge information*

Summary Table II, Appendix C

Use the information you have gathered on sources of pollutants, "source area" controls, and chemical monitoring to fill out the summary sheet of your Storm Water Pollution Prevention Plan, Appendix C, Table II. (Make as many copies of the sheet as you need to list all outfalls and sources of pollutants.)

For each outfall, list in the summary table:

,, Sources of pollutants located in that outfall's drainage area. All of this information should be on your facility site map, so it is easy to get the information,

,. Proposed or implemented BMPs for each source,

,, Date of planned BMP implementation,

Chemicals you plan to monitor and the monitoring date (see previous section for monitoring dates),

,. Illicit discharges associated with each outfall if applicable, and what action you are taking to remedy the situation if these discharges do exist.

Appendix A

POLLUTION PREVENTION TEAM MEMBER ROSTER	Worksheet #1 Completed by: Title: Date:
Leader:	Title:
	Office Phone:
Responsibilities:	
Members: (1)	Title:
	Office Phone:
Responsibilities:	
(2)	Title:
	Office Phone:
Responsibilities:	
O)	Title:
	Office Phone:
Responsibilities:	
(4)	Title:
	Office Phone:
Responsibilities:	

DEVELOPING A SITE MAP	Worksheet #2: Completed by: Title: Date

Instructions: Draw a map of your site. Part 2 should be completed after sources of storm water contaminants have been identified.

Part 1

Indicate the following features on your site map:

· Facility property

·Storm drainage collection system, including all known surface and subsurface conveyances

· Drainage areas of each storm water outfall

· Location of each storm water outfall numbered

· Structural storm water pollution control measures, such as:
- Dikes, berms
- Flow diversion structures
- Retention/detention ponds
= Vegetative swales
- Sediment traps

· Named waters or if to Municipal Storm Sewer

Part 2

The following and any additional source areas should be located on your map.

· Locations of exposed significant materials

· Locations of past spills and leaks

· Locations of high-risk, waste-generating areas and activities common to industrial sites such as:

- Fueling stations
- Vehicle/equipment washing and maintenance areas
. Area for unloading/loading materials
- Above-ground tanks for liquid storage
. Industrial waste management areas (Landfills, waste piles, treatment plants, disposal areas.)
- Outside storage areas for raw materials, by-products, and finished products
Outside manufacturing areas
- Outside electrical areas
- Salt storage locations
- Other areas of concern

MATERIAL INVENTORY	Worksheet #3 Completed by: Title: Date:

Instructions: List all materials used, stored, or produced onsite. Assess and evaluate these materials for their potential to contribute to pollution. Also complete Worksheet 3A if the material has been exposed during the last three years

Material	Purpose/Location	Quantity Exposed in Last 3Years (if known)	Likelihood of contact with storm water. If yes, describe reason	Past significant spill or Leak	
				Yes	**No**

DESCRIPTION OF EXPOSED SIGNIFICANT MATERIAL	Worksheet #3A Completed by: Title: Date:		
Instructions: Based on your material inventory, describe the significant materials that are currently or were exposed to storm water during the past three years.			
Description of Exposed Significant Material	**Location (as indicated on the site map)**	**Method of Storage or Disposal(e.g., pile, drum, tank)**	**Description of material Management Practice (e.g., pile covered, drum sealed)**

LIST OF SIGNIFICANT SPILLS AND LEAKS	Worksheet #4 Completed by: Title: Date:

Directions: Record below all significant spills and significant leaks of toxic or hazardous pollutants that have occurred at the facility within the last three years.

Definitions: Significant spills include, but are not limited to, releases of oil or hazardous substances in excess of reportable quantities .

1st Year Prior									
Date *(month/day/year)*	Spill	Leak	Location (as indicated on site map)	Description				Spill Response Procedure	Preventive Measures Taken
				Type of Material	Quantity	Source, If Known	Reason		
2nd Year Prior									
Date *(month/day/year)*	Spill	Leak	Location (as indicated on site map)	Description				Spill Response Procedure	Preventive Measures Taken
				Type of Material	Quantity	Source, If Known	Reason		
3rd Year Prior									
Date *(month/day/year)*	Spill	Leak	Location (as indicated on site map)	Description				Spill Response Procedure	Preventive Measures Taken
				Type of Material	Quantity	Source, If Known	Reason		

NON_STORM WATER DISCHARGE ASSESSMENT AND CERTIFICATION :	Worksheet #5 Completeed by Title: Date:

Date of Test or Evaluation	Outfall Directly Observed During the Test (identify as indicated on the site map)	Method Used to Test or Evaluate Discharge	Describe Results from Test for the Presence of Non-Storm Water Discharge	Identity Potential Significant Sources	Name of Person Who Conducted the Test or Evaluation

CERTIFICATION

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

Name and Official Title (type or print)	Area code and telephone No.
Signature	Date Signed

NON-STORM WATER DISCHARGE ASSESSMENT AND FAILURE TO CERTIFY NOTIFICATION	Worksheet #6 Completed by: Title: Date:

Directions: If you cannot feasibly test or evaluate an outfall due to one of the following reasons, fill in the table below with the appropriate information and sign this form to certify the accuracy of the included information.

List all outfalls not tested or evaluated, describe any potential sources of non--storm water pollution from listed outfalls, and state the reason(s) why certification is not possible. Use the key from your site map to identify each outfall.

Important Notice: A copy of this notification must be signed and submitted with the stormwater Pollution Prevention Plan.

Identify Outfall Not Tested/Evaluated	Description of Why Certification Is Infeasible	Description of Potential Sources of Non—Storm Water Pollution

CERTIFICATION

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

Name and Official title (type or print)	Area code and Telephone No.
Signature	Date signed

Appendix B

SECTION 313 WATER PRIORITY CHEMICALS

Cas Number	Common Name
75-07-0	Acetaldehyde
75865	Acetane cynohydrin
107-02-8	Acrolein
107-13-1	Acrylonitrile
309-00-2	Aldrin[1,4:5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a hexahydro-(1.alpha,n.alpha,na.beta,5.alpha 8.alpha,8a.beta)-]
107-05-1	Allyl Chloride
7429-90-5	Aluminum (fume or dust)
7664-41-7	Ammonia
62-53-3	Aniline
120-12-7	Anthracene
7440-36-0	Antimony
7647189	Antimony pentachloride
28300745	Antimony potassium tartrate
7789619	Antimony tribromide
10025919	Antimony trichloride
7783564	Antimony trifluoride
1309644	Antimony trioxide
7440-38-2	Arsenic
1303328	Arsenic disulfide
1303282	Arsenic pentoxide
7784341	Arsenic trichloride
1327533	Arsenic trioxide
1303339	Arsonic trisulfide
1332-21-4	Asbestos (friable)
542621	Barium cyanide
7143-2	Benzene
92-87-5	Benzedine
100470	Benzonitrile
98-88-4	Benzoyl chloride
· 100-44-7	Benzyl chloride
7440-41-7	Beryllium
7787475	Beryllium chloride
7787497	Beryllium fluoride
7787555	Beryllium nitrate
111444	Bis(2-chloroethyl) ether
75-25-2	Bromoform
74-83-9	Bromomethane (Methyl bromide)
85-68-7	Butyl benzyl phthalate
7440-43-9	Cadmium
543908	Cadmium acetate
7789426	Cadmium bromide
10108642	Cadmium chloride
7778441	Calcium arsenate
52740166	Calcium arsenite
13765190	Calcium chromate
592018	Calcium cyanide
133-06-2	Captan [1H-Isoindole-l,3(2H) dione,3a,4, 7,7a-tetrahydro-2-[(trichloromethyl)thio]-]
63-25-2	Carbaryl [1-Napththalenol, methylcarbamate]
75-15-0	Carbon disulfide
56-23-5	Carbon tetrachloride
57-74-9	Chlordane [4,7-Methanoindan, l,2,4,5,6,7,8, 8-octachloro-2,3,31,4,7,7a-hexahydro-]
7782-50-5	Chlorine
59-50-7	Chloro-n-methyl-3-phenol p-Chloro-m-cresol
108-90-7	Chlorobenzene
75-00-3	Chloroethane (Ethyl chloride)
67-66-3	Chloroform
74-87-3	Chloromethane (Methyl chloride)
95-57-8	2-Chlorophenol
106-48-9	4-Chlorophenol
1066304	Chromic acetate
11115745	Chromic acid
10101538	Chromic sulfate
7440-47-3	Chromium
1308-14-1	Chromium (Tri)
10049055	Chromous chloride
7789437	Cobaltous bromide
544183	Cobaltous formate
14017415	Cobaltous sulfamate
7440-50-8	Copper
108-39-4	m-Cresol
9548-7	o-Cresol
106-44-5	p-Cresol
1319-77-3	Cresol (mixed isomers)
142712	Cupric acetate
12002038	Cupric acetoarsenite
7447394	Cupric chloride
3251238	Cupric nitrate
5893663	Cupric oxalate
7758987	Cupric sulfate
10380297	Cupric sulfate, ammoniated
815827	Cupric tartrate
57-12-5	Cyanide
506774	Cyanogen chloride
110-82-7	Cyclohexane
94-75-7	2,4-D [Acetic acid, (2,4-dichlorophenoxy)-]

SECTION 313 WATER PRIORITY CHEMICALS

Cas Number	Common Name
106-93-4	1,2-Dibromoethane (Ethylene dibromide)
84-74-2	Dibutyl phthalate
25321-22-6	Dichlorobenzene (mixed isomers)
95-50-1	1,2-Dichlorobenzene
541-73-1	1,3-Dichlorobenzene
106-46-7	1,4-Dichlorobenzene
91-94-1	3,Y-Dichlorobenzidine
75-27-4	Dichlorobromomethane
107-06-2	1,2-Dichloroethane (Ethylene dichloride)
540-59-0	1,2-Dichloroethylene
120-83-2	2,4-Dichlorophenol
78-87-5	1,2-Dichloropropane
542-75-6	1,3-Dichloropropylene
62-73-7	Dichlorvos [Phosphoric acid, 2,2 dichloroethenyl dimethyl ester]
115-32-2	Dicofol [Benzenemethanol, 4-chloro-.alpha.-(4-chlorophenyl)-.alpha.-(trichloromethyl)-]
177-81-7	Di-(2-ethylhexyl phthalate (DEHP)
84-66-2	Diethyl phthalate
105-67-9	2,4-Dimethylphenol
131-11-3	Dimethyl phthalate
534-52-1	4,6-Dinitro-o-cresol
51-28-5	2,4-Dinitrophenol
121-14-2	2,4-Dinitrotoluene
606-20-2	2,6-Dinitrotoluene
117-84-0	n-Dioctyt phthalate
122-66-7	1,2-Diphenylhydrazine (Hydrazobenzene)
106-89-8	Epichlorohydrin
100414	Ethylbenzene
106934	Ethylene dibromide
50-00-0	Formaldehyde
76-44-8	Heptachlor [1,4,5,6,7,8,8-Heptachloro3a,4,7,7a-tetrahydro-4,7-methano-IH-indene]
118-74-1	Hexachlorobenzene
87-68-3	Hexachloro-l,3-butadiene
77-47-4	Hexachlorocyclopentadiene
67-72-1	Hexachloroethane
7647-01-0	Hydrochloric acid
74-90-8	Hydrogen cyanide
7664-39-3	Hydrogen fluoride
7439-92-1	Lead
301042	Lead acetate
7784409	Lead arsenate
7645252	Lead arsenate
10102484	Lead arsenate
7758954	Lead chloride
13814965	Lead fluoborate
7783462	Lead fluoride
10101630	Lead iodide
10099748	Lead nitrate
7428480	Lead stearate
1072351	Lead stearate
52652592	Lead stearate
7446142	Lead sulfate
1314870	Lead sulfide
592870	Lead thiocyanate
58-89-9	Lindane [Cyclohexane, 1,2,3,4,5,6-hexachloro-(1.alpha.,3.beta.,4.alpha ,5.alpha.,6.beta.)-]
14307358	Lithium chromate
108-31-6	Maleic anhydride
592041	Mercuric cyanide
10045940	Mercuric nitrate
7783359	Mercuric sulfate
592858	Mercuric thiocyanate
7782867	Mercurous nitrate
7439-97-6	Mercury
72-43-5	Methoxychlor [Benzene, 1,1'-2,2,2-trichloroethylidene)bis[4-methoxy-]
80-62-6	methyl methacrylate
91-20-3	Naphthalene
7440-02-0	Nickel
15699180	Nickel ammonium sulfate
37211055	Nickel chloride
7718549	Nickel chloride
12054487	Nickel hydroxide
14216752	Nickel nitrate
7786814	Nickel sulfate
7697-37-2	Nitric Acid
98-95-3	Nitrobenzene
88-75-5	2-Nitrophenol
100-02-7	4-Nitrophenol
62-75-9	N-Nitrosodimethylamine
86-30-6	N-Nitrosodiphenylamine
62 !-64-7	N-Nitrosodi-n-propylamine
56-38-2	Parathion [Phosphorothioic acid,0,0-diethyl-0-(4-nitrophenyl)ester]

SECTION 313 WATER PRIORITY CHEMICALS

Cas Number	Common Name
87-86-5	Pentachlorophenol (PCP)
108-95-2	Phenol
7544-5	Phosgene
7664-38-2	Phosphoric acid
7723-14-0	Phosphorus (yellow or white)
1336-36-3	Polychlorinated biphenyls (PCBs)
7784410	Potassium arsenate
10124502	Potassium arsenite
7778509	Potassium bichromate
7789006	Potassium chromate
151508	Potassium cyanide
75-56-9	Propylene oxide
91-22-5	Quinoline
7782-49-2	Selenium
7446084	Selenium oxide
7440-22-4	Silver
7761888	Sliver nitrate
7631892	Sodium arsenate
7784465	Sodium arsenite
10588019	Sodium bichromate
7775113	Sodium chromate
143339	Sodium cyanide
10102188	Sodium selenite
7782823	Sodium selenite
7789062	Strontium chromate
1310-73-2	Sodium hydroxide (solution)
10042-5	Styrene
7664-93-9	Sulfuric acid
79-34-5	1,1,2,2-Tetrachloroethane
127-18-4	Tetrachloroethylene (Perchloroethylene)
935-95-5	2,3,5,6-Tetrachlorophenol
78002	Tetraethyl lead
7440-28-0	Thallium
10031591	Thallium sulfate
108-88-3	Toluene
8001-35-2	Toxaphene
52-68-6	Trichlorfon [Phosphonic acid, (2,2,2-trichloro-l-hydroxyethyl)-dimethylester]
120-82-1	1,2,4-Trichlorobenzene
71-55-6	1,1, l-Trichloroethane (Methyl chloroform)
79-00-5	1,1,2-Trichloroethane
79-01-6	Trichloroethylene
95-954	2,4,5-Trichlorophenol
88-06-2	2,4,6-Trichlorophenol
7440-62-2	Vanadium (fume or dust)
108-054	Vinyl acetate
75-01-4	Vinyl chloride
75-35-4	Vinylidene chloride
108-38-3	m-Xylene
95-47-6	o-Xylene
106-42-3	p-Xylene
1330-20-7	×ylene (mixed isomers)
7440-66-6	Zinc (fume or dust)
557346	Zinc acetate
14639975	Zinc ammonium chloride
14639986	Zinc ammonium chloride
52628258	Zinc ammonium chloride
1332076	Zinc borate
7699458	Zinc bromide
3486359	Zinc carbonate
7646857	Zinc chloride
557211	Zinc cyanide
7783495	Zinc fluoride
557415	Zinc formate
7779864	Zinc hydrosulfite
7779886	Zinc nitrate
127822	Zinc phenolsulfonate
1314847	Zinc phosphide
16871719	Zinc siliconfluoride
7733020	Zinc sulfate

Appendix C

DESCRIPTION OF SOURCE AREA CONTROLS

OUTFALL # _____

OUTFALL # _____

OUTFALL # _____

Parameter	OUTFALL # _____		OUTFALL # _____		OUTFALL # _____		OUTFALL # _____	
	PRESENT BRFORE	PRESENT AFTER	PRESENT BRFORE	PRESENT AFTER	PRESENT BRFORE	PRESENT AFTER	PRESENT BRFORE	PRESENT AFTER
Common Pollutants								
Biochemical Oxygen Demand (BOD5)								
Chemical Oxygen Demand (COD)								
Chlorine, Total Residual								
Chlorides, Total								
Nitrogen, Ammonia								
Oil and Grease								
pH								
Phosphorus, Total								
Suspended Solids, Total								
Temperature								
TOXIC INORGANIC PLUS PHENOL								
Antimony, Total Recoverable								
Arsenic, Total Recoverable								
Beryllium, Total Recoverable								
Cadmium, Total Recoverable								
Chromium, Hexavalent								
Chromium, Total Recoverable								
Copper, Total Recoverable								
Cyanide, Total								
Cyanide, Amenable to Chlorination								
Lead, Total Recoverable								
Mercury, Total Recoverable								
Nickel, Total Recoverable								
Selenium, Total Recoverable								
Silver, Total Recoverable								
Thallium, Total Recoverable								
Zinc, Total Recoverable								
Hardness (Total as CaCO3)								
Phenols, Total								
VOLATILE ORGANICS								
Acrolein								
Acrylonitrile								
Benzene								
Bromodichloromethane (dichlorobromo-methane)								
Bromoform								
Carbon tetrachloride								
Chlorobenzene								
Chlorodibromo-methane (dibromochloromethane)								
Chloroethane								
Chloroform								
Chloromethane (methyl chloride)								
1,2-Dichlorobenzene								
1,3-Dichlorobenzene								
1,4-Dichlorobenzene								
1,1-Dichloroethane								
1,2-Dichloroethane								
1,1-Dichloroethylene								
cis-1,2 Dichloroethylene								
trans-1,2-Dichloroethylene								
1,2-Dichloropropane								
1,3-Dichloropropane								
1,1-Dichloropropylene								
cis-1,3-Dichloropropylene								
trans-1,3-Dichloropropylene								
2,3-Dichloropropylene								
Ethylbenzene								
Methyl bromide (bromomethane)								
Methylene chloride (dichloromethane)								

1,1,2,2-Tetrachloroethane								
Tetrachloroethylene								
Toluene								
1,1,1-Trichloroethane								
1,1,2-Trichloroethane								
Trichloroethylene								
SEMI VOLATILE ORGANIC COMPOUNDS								
Vinyl Chloride								
2-Chlorophenol								
3-Chlorophenol								
4-Chlorophenol								
2,3-Dichlorophenol								
2,4-Dichlorophenol								
2,5-Dichlorophenol								
2,6-Dichlorophenol								
3,4-Dichlorophenol								
2,4-Dimethylphenol								
2,3-Dinitrophenol								
2,4-Dinitrophenol								
2,5-Dinitrophenol								
2-Methyl-4-chlorophenol								
3-Methyl-4-chlorophenol (para-chloro-meta--cresol)								
3-Methyl-6-chlorophenol								
2-Methyl-4,6-dinitrophenol (4,6-dinitro-ortho-cresol)								
2-Nitrophenol								
4-Nitrophenol								
Pentachlorophenol								
Phenol								
2,3,4,6-Tetrachlorophenol								
2,4,5-Trichlorophenol								
2,4,6-Trichlorophenol								
BASE/NEUTRAL COMPOUNDS								
Acenaphthene								
Acenaphthylene								
Benzidine								
Bis(2-chloroethoxy) methane								
Bis(2-chloroethyl) ether								
Bis(2-chloroisopropyl) ether								
Bis(2-ethylhexyl) phthalate								
4-Bromophenyl-phenyl ether								
Butyl benzyl phthalate								
2-Chloronaphthalene								
4-Chlorophenyl-phenyl ether								
3,3'-Dichlorobenzidine								
Diethyl phthalate								
Dimethyl phthalate								
Di-n-butyl phthalate								
2,4-Dinitrotoluene								
2,6-Dinitrotoluene								
Di-n-octyl phthalate								
1,2-Diphenylhydrazine								
Hexachloroethane								
Isophorone								
N-Nitrosodi-n-butylamine								
N-Nitrosodiethylamine								
N-Nitrosodimethylamine								
N-Nitrosodiphenylamine								
N-Nitrosodi-n-propylamine								
N-Nitrosopyrrolidine								
Naphthalene								
Nitrobenzene								
1,2,4-Trichlorobenzene								
Chlorinated Hydrocarbons Requiring Specialized Testing								
Hexachlorobenzene								
Hexachlorobutadiene								
Hexachlorocyclopentadiene								
Pentachlorobenzene								
1,2,4,5-Tetrachlorobenzene								
Polynuclear Aromatic Hydrocarbons Requiring Specialized Testing								
Anthracene								
Benzo(a)anthracene								

Benzo(a)pyrene								
Benzo(b)fluoranthene								
Benzo(ghi)perylene								
Benzo(k)fluoranthene								
Chrysene								
Dibenzo(a,h)anthracene								
Fluoranthene								
Fluorene								
Indeno(1,2,3-cd)pyrene								
Phenanthrene								
Pyrene								
PESTICIDES								
Aldrin								
alpha-BHC (-hexachlorocyclohexane)								
beta-BHC (-hexachlorocyclohexane)								
delta-BHC (-hexachlorocyclohexane)								
gamma-BHC (-hexachlorocyclohexane, Lindane)								
Chlordane								
4,4'-DDT								
4,4'-DDE								
4,4'-DDD								
Dieldrin								
alpha-Endosulfan								
beta-Endosulfan								
Endosulfan sulfate								
Endrin								
Endrin aldehyde								
Heptachlor								
Heptachlor epoxide								
Toxaphene								
Chlorpyrifos								
Parathion, (ethyl)								
Parathion, (methyl)								
PCB-1016								
PCB-1221								
PCB-1232								
PCB-1242								
PCB-1248								
PCB-1254								
PCB-1260								
DIOXIN AND FURAN								
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)								
2,3,7,8-Tetrachlorodibenzofuran (TCDF)								
HAZARDOUS SUBSTANCES								
2,4-Dichloroproprionic acid								
2,4,5-T(2,4,5 trichlorphenoxyacetic acid)								
2,4,5-T(2,4,5 trichlorphenoxyproprionic acid)								
2,4,D(2,4 dichlorphenoxyacetic acid)								
Acetylaldehyde								
Allyl allcohol								
Allyl chloride								
Amyl acetate								
Analine								
Benzonitrile								
Benzyl chloride								
Butyl acetate								
Butylamine								
Carbaryl								
Carbofuran								
Carbon disulfide								
Chloropyrifos								
Coumaphos								
Cresol								

Crotonaldehyde								
Cyclohexane								
Diazinon								
Dicamba								
Dichlobenil								
Dichlone								
Dichlorvos								
Diethyl Amine								
Dimethyl Amine								
Dinitrobenzene								
Diquat dibromide								
Disulfoton								
Diuron								
Epichlorohydrin								
Etion								
Ethylene diamine								
Ethylene dibromide								
Formaldehyde								
Furfural								
Guthion								
Isoprene								
Isopropranolamine								
Kelthane								
Kepone								
Malathion								
Mercaptodimethur								
Methoxychlor								
Methyl mercaptan								
Methyl methylacrylate								
Methyl parathion								
Mevinphos								
Monoethyl amine								
Monomethyl amine								
Naled								
Naphthemic acid								
Nitrotolulene								
Parathion								
Phenolsulfonate								
Phenoxyacetic acid								
Phogene								
Propargite								
Propylene oxide								
Pyrethrins								
Quinoline								
Resorcinol								
Strontium								
Strychnine								
Stryene								
TDE (Tetrachlorodiphenyl)								
Trichlorofan								
Triethylamine								

Trimethylamine								
Uranium								
Vanadium								
Vinyl-acetate								
Xylene								
Xylenol								
Zirconium								

This document is intended solely as guidance and does not contain any mandatory requirements except where requirements found in statute or administrative rule are referenced. Any regulatory decisions made by the Department of Natural Resources in any matter addressed by this guidance will be made by applying the governing statutes and administrative rules to the relevant facts.