

GUIDANCE DOCUMENT:

12/06

LIGHT AND HEAVY INDUSTRY PERMITS PREPARING A STORMWATER MANAGEMENT PLAN

Colorado Department of Public Health and Environment

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Stormwater Management Plan (SWMP) Goal:

To provide a usable manual that describes the installation, implementation, and stormwater management that, when implemented at your facility, will improve water quality by reducing pollutants in stormwater discharges, and ensure compliance with the requirements of the stormwater permit.

In this document, the text in *bold italics* is quoted directly from the Heavy and Light Industry general permits. The text in straight type is provided as guidance in the preparation of your SWMP. (There are only slight variations between the Heavy and Light Industry SWMP requirements.)

The references (Part I.B.1.d, for example) correspond to the location of the item in the Heavy and Light Industry general permits.

Common Sense Approach: Your SWMP is intended to be a usable document, not a paper exercise. Therefore, do not include measures which may sound good, but are unreasonable or not feasible for your site. Failure to implement your SWMP, even if the BMPs listed do not make sense, puts you in automatic violation of the permit. Furthermore, if a particular BMP is listed in the SWMP, but then later turns out to be impractical or ineffective, the SWMP **must** be amended to reflect the changes/improvements made.

SWMP Items, Format: When preparing your plan, make sure to address each item included in this guidance. If it is not applicable to your site, briefly explain why. A simple "Not Applicable" is not enough. Failure to address each item is a violation of the permit.

You **must** be able to provide all required components of the SWMP to a State, EPA, or local agency inspector at your site, so the location and format of the information must be clear to the site personnel in charge of SWMP implementation.

Note that the SWMP must include any existing stormwater controls at your site, not just new or proposed ones. Take full credit for what you are already doing!

SWMP Availability: A copy of the SWMP must be kept on site, for ready availability to the operator, and so that Division or EPA representatives can review it during an inspection. City, county, and other local agencies may also request the SWMP as part of a local oversight program.

I.B. STORMWATER MANAGEMENT PLAN - CONTENTS AND REQUIREMENTS

A Stormwater Management Plan (SWMP) shall be developed for each facility covered by this permit. SWMPs shall include BMPs that are selected, installed, implemented and maintained in accordance with good engineering practices. (The plan need not be completed by a registered engineer.)

The plan shall identify potential sources of pollution which may reasonably be expected to affect the quality of stormwater discharges associated with industrial activity from the facility. In addition, the plan shall describe and ensure the implementation of practices which are to be used to reduce the pollutants in stormwater discharges associated with industrial activity at the facility and to assure compliance with the terms and conditions of this permit.

As a condition of this permit, facilities must implement the provisions of the SWMP required under this part. The Division reserves the right to review the plan, and to require additional measures to prevent and control pollution as needed.

Any SWMP prepared before June 30, 2006 (Light Industry) or December 31, 2006 (Heavy Industry) that does not meet all of the requirements listed herein (especially those items required for the site map) must be amended to conform with the SWMP requirements in this permit. Such amendments must be completed within 60 days of the certification effective date.

The SWMP shall include the following items, at a minimum:

1. **Industrial Activity Description.** *The plan shall provide a narrative description of the industrial activity taking place at the site.*

Describe the industrial activities which take place at the facility that may have an impact on stormwater. These may include manufacturing processes; equipment washing; materials storage; product assembly or disassembly; vehicle maintenance or fueling; incineration; power generation; waste treatment, storage or disposal; printing; shipping/loading/unloading, etc. You do not need to include industrial activities that only take place indoors, unless there is some part or aspect of the activity with which stormwater could come in contact. For example, if all vehicle maintenance is done indoors, but vehicle storage or fueling is outside, the vehicle storage or fueling area must be addressed.

It may be helpful to include some measure of the facility size, such as storage capacity, production capacity, number of units processed, etc. For sites that fall under the Heavy Industry permit, be sure to address those cases where the requirement to sample is based on some measure of facility capacity or production specialty (such as airports, fertilizer manufacturers, battery reclaimers, refineries, chemical and rubber/plastic product manufacturers).

2. **Site Map.** *The plan shall include a site map indicating the following:*
 - a. *the areas where industrial activities occur;*
 - b. *the locations of stormwater outfalls and an approximate outline of the areas draining to each outfall;*
 - c. *the locations of existing and new structural control measures to reduce pollutants in stormwater runoff;*
 - d. *the locations of all surface water bodies, including dry water courses, located in or next to the facility;*
 - e. *the locations of all potential pollutant sources identified under Part I.B.3.b; and*
 - f. *the location of each sampling point identified under Part I.B.3.c*

Each facility must develop a site map including the above listed items, which are explained below.

It is a good idea to start with a portion of the USGS (U.S. Geological Survey) quadrangle map showing the site. (See example, Appendix A.) These are available and easily obtainable for the entire state (call USGS, (303)202-4700); they provide a large amount of information for very little effort. You can use the USGS map as a guide for preparing your site map, which will be more detailed. (See example, Appendix B.)

Local municipalities may also have maps suitable a base to begin mapping procedures. Regardless of the source of the base map, the site map needs to be of a suitable scale to show the industrial portion of the facility and the features within it.

The map should show, at a minimum:

○ **2.a. – Areas where industrial activities occur:**

In general, areas where the industrial activities occur, as described in Item 1 of the SWMP, are the areas that generate stormwater affected by industrial activities. The drainage areas shown should include the portions of the site where the activities occur, as well as those portions contributing stormwater that mixes with runoff from the industrial area. Therefore, the entire drainage area where industrial activities occur must usually be included.

○ **2.b. – Locations of stormwater outfalls:**

If the site has a stormwater drainage system, the location of outfalls is a simple task. Indicate on the map where inlets to the storm sewer system are located and where any storm sewer pipes may outfall to adjacent waterways or open channels. If stormwater is conveyed over land without a developed storm drainage system, the points where runoff collects and leaves the site must be indicated. If there is no discrete single point of discharge for a drainage area (i.e., stormwater leaves the site as sheet flow), the map must clearly indicate this condition.

○ **2.b. – Drainage basins for each outfall:**

Field inspection can usually accomplish this task with acceptable accuracy. Look for high areas such as crests of parking lots, roads, etc. that would form the division between drainages. Gullies and swales are indicators of stormwater flow direction. Obviously, if runoff is observed during a storm, most uncertainties can be eliminated.

○ **2.c. – Locations of structural control measures:**

Show on the map the location of any structural stormwater pollution control measures, such as detention ponds, diversion ditches, covered material storage areas, fuel farm secondary containment structures, etc. These structural controls must also be described as required by Part I.B.3.b of the permit. Including the controls on the map alone is not adequate for compliance with the stormwater permit.

○ **2.d. – Surface water bodies (including dry water courses):**

Mark on the site map any surface water bodies, including lakes, streams, springs, wetlands, detention ponds, roadside or irrigation ditches, etc. These do not necessarily need to be within the industrial portion of the facility, but may be adjacent to it or impacted by stormwater runoff. Also include any existing storm sewers inlets.

○ **2.e. – Locations of potential pollutant sources**

Indicate on the map the locations of all potential pollutant sources identified under Part I.B.3.b. of the permit. Refer to the guidance in this document for Part I.B.3.b of the permit for direction on determining what materials and activities are defined as potential pollutant sources that must be identified. Activities and materials that are only occasionally present still must be included on the map, such as temporary storage areas and loading and unloading areas.

○ **2.f. – Locations of sampling points**

Unless specifically directed by the Division, this requirement only applies to permittees covered under the Heavy Industry permit. For those facilities with stormwater discharge sampling required under the Heavy Industry permit, the location of each sampling point identified under Part I.B.3.c of the permit must be identified on the map. These sampling points will typically be located at one or more of the outfalls identified in subsection 2.b. above.

In addition, there are several other features which could be included to make the SWMP a more comprehensive and usable plan. For example, later sections of the SWMP include requirements for spill prevention and response procedures, which should indicate where materials are stored. This information could be indicated on the site map. Also, indicating paved and unpaved areas for hydrologic assessments may be useful.

3. ***Stormwater Management Controls.*** Each facility covered by this permit shall develop a description of stormwater management controls appropriate for the facility, and implement such controls. The appropriateness and priorities of controls in a plan shall reflect identified potential sources of pollutants at the facility. The description of stormwater management controls shall address the following minimum components, including a schedule for implementing such controls. For newly-certified facilities, if existing controls are inadequate to achieve the general objective of controlling pollutants in stormwater discharges associated with industrial activity, any schedule to implement additional controls to meet this objective shall not exceed 60 days from when the facility begins operations, or from when the general permit certification is issued, whichever is later, unless permission for a later deadline is obtained from the Division. New controls that will replace or modify existing controls that are already adequately addressing a pollutant source are not required to meet this schedule (e.g., replacing a control with a less resource-intensive practice).
- a. ***SWMP Administrator -*** The SWMP shall identify a specific individual(s) within the plant organization who is responsible for developing the SWMP and assisting the plant manager in its implementation, maintenance, and revision. The activities and responsibilities of the administrator shall address all aspects of the facility's SWMP.

The SWMP Administrator is the contact for all SWMP-related issues, and the person responsible for its accuracy, completeness, and implementation. Therefore, the SWMP Administrator should be a person in an authoritative position. Larger facilities may want to develop a "SWMP team" in order to share the responsibilities and generate greater awareness and participation.

- b. ***Identification of Potential Pollutant Sources and Best Management Practices -*** The SWMP shall identify potential sources of pollutants at the site, and assess the potential of these sources to contribute pollutants to stormwater discharges associated with industrial activity. The SWMP must also describe appropriate Best Management Practices (BMPs) to reduce the potential of these sources to contribute pollutants to stormwater discharges.

At a minimum, each of the following shall be evaluated for the reasonable potential for contributing pollutants to runoff:

- Loading and unloading operations***
- Outdoor storage activities***
- Outdoor manufacturing or processing activities***
- Significant dust or particulate generating processes***
- On-site waste disposal practices***
- The presence of salt piles***
- Areas where significant spills and significant leaks of toxic or hazardous substances have occurred at the facility in the three years prior to the date the SWMP is developed or amended.***

Factors to consider include the toxicity of chemicals; quantity of chemicals used, produced, or discharged; the likelihood of contact with stormwater; and history of significant leaks or spills of toxic or hazardous substances.

This part of the SWMP identifies all industrial activities and materials at the site which have the potential to contaminate stormwater. This includes not only industrial processes, but also routine maintenance activities involving fertilizers, pesticides, detergents, solvents, oils, etc. It is a good idea to discuss each activity separately.

Judge the potential for the material to be found in stormwater, using the criteria listed above. Other potential factors to consider include the following:

- the intensity of the activity (i.e., does it occur every day, or just once a year, etc.)
- the size of the area over which the activity takes place, the surface type (pavement, gravel, vegetation, etc.), and other physical characteristics such as slope
- ability of product storage and loading/unloading facilities (fuel tanks, drum storage, etc.) to contain spills and leaks
- the concentration and toxicity of materials which can be expected to be found in the facility's stormwater runoff
- the contamination of storage facilities with the substances being stored (e.g., used oil drums or tanks coated with spilled oil)
- the visibility of any potential problems (e.g., how close is the storage tank to the operations building)

Where potential stormwater contamination sources are identified, appropriate preventive measures must be taken and documented. These should be discussed under the BMPs description, below. The purpose of the SWMP is to reduce or eliminate these sources; therefore, most of the remainder of the SWMP targets them.

"Significant" spills include, but are not limited to, releases of oil or hazardous substances in excess of reportable quantities under section 311 of the Clean Water Act (see 40 CFR 110.10 and CFR 117.21) or section 102 of CERCLA (see 40 CFR 302.4). Other significant spills would include those that could potentially add substantial amounts of pollutants to the environment. For instance, chronically repeated smaller spills can constitute significant spills if taken together. In addition, spills of materials besides hazardous substances and oil should be addressed if they pose a pollution potential to stormwater.

List the substance(s) spilled or leaked, the approximate quantities involved, where and when it occurred, and what was done in response. If there have not been any such events, make note of it.

(I.B.3.b. – Continued)

The description of the BMPs shall include:

- 1) Stormwater diversion: Describe how and where stormwater will be diverted away from industrial areas to prevent stormwater contamination.***
- 2) Materials handling and spill prevention: For materials that could impact stormwater runoff, all existing and planned BMPs that prevent the contamination of stormwater runoff at the site shall be included and described.***
- 3) Sediment and erosion prevention: The plan shall identify areas which, due to topography, activities, or other factors, have a high potential for significant soil erosion, and identify measures taken to limit erosion.***
- 4) Other pollution prevention measures: The plan shall identify any other structural and non-structural measures for stormwater quality control on-site.***

In each case where stormwater pollution potential exists, appropriate preventive measures must be taken and documented.

Best Management Practices:

Best Management Practices (BMPs) can describe a wide range of structural treatment processes, pollution prevention practices, schedules of activities, prohibitions on practices, and other management practices.

"Nonstructural" BMPs are mainly definitions of operational or managerial techniques. In addition, there are a multitude of "structural" BMPs that should be considered, depending upon the industrial activity. Structural BMPs include physical processes ranging from diversion structures to oil/water separators to retention ponds.

Some BMPs may be listed under more than one section of the SWMP (for example, secondary containment may come under both BMPs and spill plans); these can be cross-referenced, instead of repeating the entire description.

BMP Selection:

When selecting BMPs, the most important ones to evaluate first are those which limit the source of the pollutant and prevent pollution of stormwater. It is much more efficient, from both a cost and environmental standpoint, to prevent the pollution in the first place than to clean up contaminated stormwater. For example, a BMP requiring that any vehicle maintenance that involves fluid exchange must take place indoors, results in the removal of a pollutant source (i.e., oil/hydraulic fluids) from possible contact with stormwater.

Once pollution prevention BMPs have been evaluated, then more costly options, such as mitigation of impacts or stormwater treatment, should be considered, if necessary. The BMPs selected are up to the judgment of the individual permittee. However, it is important to keep in mind that a fully implemented SWMP will constitute compliance with Best Available Technology (BAT) and Best Conventional Technology (BCT), as mandated under the Federal Clean Water Act. This means that in order to comply with your permit, the appropriate measures **must** be taken in keeping with the pollutant(s) involved and the risk potential at the facility.

Cover, Elevate, Divert!

Treatment of stormwater once it has already been polluted by stored materials is often ineffective. Therefore, preventing stormwater contact is usually essential to preventing impacts to receiving waters. This can be done by following one or more of these three simple practices, as needed, to adequately control the material being stored:

- 1. Cover the Material:** Store inside, under a shelter, in appropriate weather resistant containers, or using a weather resistant tarp.
- 2. Elevate off the Ground:** Store materials on pallets or racks so stormwater running along the ground does not contact it.
- 3. Divert Runoff:** Use berms, channels, or other methods to divert stormwater running on the ground around storage areas.

Stormwater Best Management Practices to prevent the discharge of pollutants typically include:

Prevention BMPs – These BMPs are your initial defense against stormwater pollution, and include practices to prevent pollutants from contaminating stormwater. This is the most effective and efficient method for controlling stormwater pollution. Examples:

- Source Reduction: reducing potential pollutant sources, good housekeeping, preventative maintenance, etc.
- Exposure Minimization: covering activities and materials, containment, diverting stormwater from pollutant sources.
- Spill Prevention

Treatment/Mitigation BMPs – These are typically your back-up BMPs to address pollution that can not be initially prevented, and include practices to remove pollution from runoff or otherwise control the discharge of polluted stormwater. Examples:

- Mitigation: cleaning drainage systems and ponds, drip pans, sumps.
- Treatment: ponds, vegetated swales, oil/water/grit separators, infiltrations, etc.

BMP Information Resources:

A list of common BMPs is provided in Appendix C, ranked in order from non-structural to structural, which is also, in most cases, least expensive to most expensive.

Various manuals, books, and web pages provide guidance on selection, installing, and/or implementing BMPs. The following resource is recommended by the Division and is utilized by several local government agencies in Colorado. In addition, your local city, county, and special district may have additional guidance or requirements appropriate for your area.

o **Urban Drainage and Flood Control District**

Urban Storm Drainage Criteria Manual Volume 3 – Best Management Practices

- o The manual includes discussion of stormwater quality management and BMPs for many activities, including industrial activities. This manual is a highly respected across the country and a great resource for professionally accepted design criteria for BMPs
- o Available free from the “download” section of the Urban Drainage and Flood Control District web page: <http://www.udfcd.org>
- o UDFCD, 2480 West 26th Avenue, Suite 156-B, Denver, CO 80211 (303-455-6277)

Document Selected BMPs in the SWMP:

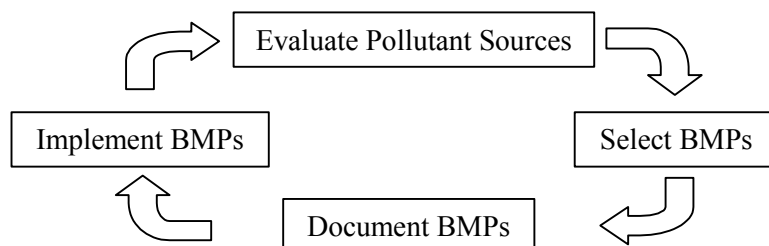
BMP descriptions in the SWMP must contain adequate detail to ensure proper implementation at the site. The following information must be addressed in the SWMP:

- **What** BMPs will be implemented?
- **Where** will the BMPs be implemented? The SWMP must clearly indicate the locations where BMPs will be implemented. For structural BMPs, this will usually require including the locations on the site map discussed in Section C.3 above.
- **How** will the BMPs be implemented? Details must be sufficient to ensure proper installation and implementation, including procedures for operation and maintenance of the BMP if necessary. For most BMPs at an industrial site, a narrative explanation will be sufficient. However, for structural treatment BMPs, in most cases this must include a technical drawing to provide adequate design details. For example, if a pond will be used at a site the SWMP must provide information such as sizing, outfall design, and maintenance needs.

Revising the BMPs and the SWMP:

For many sites, the BMPs implemented at the site will have to be modified to adapt to changing conditions or to ensure that potential pollutants are being properly managed. The pollutant sources and management practices at a site must be reviewed on an ongoing basis (and specifically during the two required comprehensive inspections). When BMPs or other site details discussed in the SWMP are modified in the field, the SWMP must be modified to accurately reflect the actual field conditions. Examples include, but are not limited to, removal of BMPs, addition of BMPs, modification of BMP design specifications, and changes in items included in the site map and/or description.

The SWMP should be viewed as a “living document” that is continuously being reviewed and modified as part of the overall process of assessing and managing stormwater quality issues at the site. The following illustration summarizes the process of evaluating, selecting, documenting, implementing, and revising BMPs.



- c. ***Sampling Information - The plan shall include a summary of any existing discharge sampling data describing pollutants in stormwater discharges...***

Many facilities will not have any existing data to include here. Facilities that have previously sampled their stormwater runoff should include any sampling data generated for their site.

and a description of each existing or proposed sampling point, if monitoring is required by the Division.

This applies only to Heavy Industry permittees with sampling requirements, and any other permittees specifically designated by the Division as required to sample. Describe the basics of the drainage system (underground with inlets, surface runoff to swale, etc.), and where the sampling will take place and why. Keep in mind that sampling requirements for most of the industries only apply to runoff from industrial areas, and so **segregated** runoff from non-industrial areas (such as employee parking lots), does not need to be sampled.

Choosing a Sampling Point – Avoiding Errors:

1. Sample a stormwater discharge: Your sample should be taken at a location where the stormwater leaves your facility. Sampling puddles or flow prior to the discharge may not accurately reflect your discharge quality.

2. Avoid contaminating the sample: Take the sample at a location, and in a way, to avoid stirring up additional sediment that could get into your sampling vial.

3. Obtain a representative sample: If the site has more than one discharge point, the possibility of sampling from representative points should be evaluated. (See Part I.D.1.e of the Heavy Industry permit.)

Refer to the Division’s sampling guidance for additional information:

www.cdphe.state.co.us/wq/PermitsUnit/stormwater/SWSamplingGuidance.pdf

- d. ***Preventive Maintenance - A preventive maintenance program is required, and shall involve inspection and maintenance of stormwater management devices (cleaning oil/water separators, catch basins, etc.) as well as inspecting and testing plant equipment and systems to uncover conditions that could cause breakdowns or failures resulting in discharges of pollutants to surface waters. These periodic inspections are different from the comprehensive facility inspection (see Part I.C.5), although the former may be incorporated into the latter. Equipment, area, or other inspections are typically visual and are normally conducted on a regular basis (e.g., daily inspections of loading areas).***

This part of the SWMP should also include maintenance of the BMPs that are discussed as required in Part I.B.3. of the Permit. Set up a schedule appropriate to the activity and the BMP. Preventive maintenance should be coupled with periodic inspections. If there are already inspections/preventive maintenance programs or practices or equipment in place, include them here.

Preventive maintenance involves the regular inspection and testing of plant equipment and operational systems. These inspections should uncover conditions, such as cracks or slow leaks, which could cause breakdowns or failures that result in discharge of pollutants to storm sewers and surface waters. The program should prevent breakdowns and failures by adjustment, repair or replacement of equipment. An effective preventive maintenance program should include the following elements, at a minimum:

- identification of equipment, systems, and facility areas that should be inspected
- schedule for periodic inspection or testing of this equipment and systems.
- appropriate and timely adjustment, repair or replacement of equipment and systems.
- maintenance of complete records on inspections, equipment, and systems
- a program for stocking spare parts critical to the operation of equipment (e.g., fuel pumps, etc.)

In order to adequately define a preventive maintenance program, review the information gathered so far in terms of materials handling, risk assessment, etc., to determine where equipment failure could result in spills or leaks of contaminants. This section will be highly specific to each facility. However, as appropriate, the following items should be included in the program:

- pipes
- pumps
- structural stormwater BMPs
- vehicles
- oil/water separators
- storage tanks and bins
- pressure vessels
- pressure release valves
- material handling equipment

- e. Good Housekeeping - Good housekeeping requires the maintenance of a clean, orderly facility. This part of the SWMP shall address cleaning and maintenance schedules, trash disposal and collection practices, grounds maintenance, etc.*

Most facilities already adhere to some form of "Good Housekeeping" routine, whether they realize it or not. Industries must now put these practices down in writing and ensure that they are adequate to meet the needs of the facility. To prepare this section, begin by summarizing any activities which already take place, such as trash removal, sweeping, oil recycling, etc.

Most good housekeeping practices involve simple common sense. The basic pollution prevention concept is that a clean site will have less potential for stormwater contamination. The following checklist can serve as a starting point for the assessment of existing good housekeeping practices:

- are outside areas kept in a neat and orderly condition?
- is there evidence of drips or leaks from equipment or machinery at the site?
- is garbage removed regularly?
- are proper clean-up procedures used for spilled materials?
- are there abandoned machinery, parts, etc. around the site that can be removed?
- is every effort made to order only materials that are required, thus minimizing the amounts of materials stored?
- what other practices routinely performed constitute good housekeeping? (For example, are maintenance and emergency response vehicles usually stored indoors?)

Set up a general Good Housekeeping plan with as many of the following items as possible, plus any additional items pertinent to the site, or new ideas which are not included in the list. The Good Housekeeping plan can then be referred to later in the discussion on BMPs.

The following items are typical *examples* of information to include in a Good Housekeeping plan:

Operation and Maintenance Techniques:

- garbage and waste materials must be picked up and disposed of regularly.
- signs are posted at appropriate locations indicating where to dispose of waste oils and refuse.
- locations where spill clean-up equipment and materials are stored are appropriately marked
- inlets to the storm drainage system are marked with warning signs (e.g., "Dump No Waste - Drains to Sand Creek"). They will be repainted as needed.
- bulletin boards with updated Good Housekeeping procedures, tips, and reminders are posted.
- pollution prevention concepts will be provided through training posters, newsletters, mailings, workshops, etc.
- fertilizers applied to landscaped areas shall be judiciously applied, using only that quantity required.

The following examples of good housekeeping BMPs are recommended methods for the storage of materials including lubricants, hydraulic fluids, grounds maintenance materials (fertilizers, pesticides, herbicides, etc.), refuse, etc.:

Material Storage and Inventory:

- the centralized used oil tank shall be emptied frequently enough to ensure it never reaches capacity (e.g., at least once per month). This area will be kept free of trash and spilled oil.
- where practical, refuse and waste storage shall take place indoors, in a safe and sanitary fashion.
- all refuse dumpsters and receptacles shall be equipped with functional lids to prevent precipitation from entering.
- storage containers, drums, and bags shall be stored away from direct traffic routes to prevent accidental spills.
- empty drums shall be covered to prevent collection of precipitation.
- containers shall be stored on pallets or similar devices to prevent corrosion of the containers, which can result when containers come in contact with moisture on the ground.
- all chemical substances present at the facility shall be identified. (Walk through the facility and review the purchase orders for the previous year.)
- all of the chemical substances used in the workplace shall be listed, and the Material Safety Data Sheet (MSDS) obtained for each. The MSDSs will be readily available for use; i.e., posted at the locations where the materials are stored and handled.
- all containers shall be labeled to show the name and type of substance, stock number, expiration date, health hazards, including reactivity, corrosivity, ignitability and toxicity, suggestions for handling, and first aid information. (This information can usually be found on the MSDS. Unlabeled chemicals and chemicals with deteriorated labels are often disposed of unnecessarily or improperly.)

f. Spill Prevention and Response Procedures - Areas where potential spills can occur, and their accompanying drainage points, shall be identified clearly in the SWMP. Where appropriate, specifying material handling procedures and storage requirements in the plan shall be considered. Procedures for cleaning up spills shall be identified in the plan and made available to the appropriate personnel. The necessary equipment to implement a clean up shall be available to personnel.

Spills and leaks are one of the largest industrial sources of stormwater pollutants, and in most cases, are avoidable. Establishing standard operating procedures such as safety and spill prevention procedures, along with proper employee training, can reduce these accidental releases. Avoiding spills and leaks is preferable to cleaning them up after they occur, not only from an environmental standpoint, but also because spills cause increased operating costs, lower productivity, and concern for personnel safety.

Many industries are required by Federal law to have a Spill Prevention Control and Countermeasures Plan (SPCC). Therefore, many facilities may already have a start on this item. It can be included in the SWMP by reference, as long as the SPCC is readily available, along with a statement that the SPCC as required by other laws will be adhered to.

Even if your facility is not required to have an SPCC under some other regulation, you **must** have a spill plan under this part of the SWMP. In general, spill plans developed as part of the SWMP should contain the following:

- a site plan showing where materials are stored and handled, and where associated activities occur. (By including this information on the comprehensive site map required in Item B.2, a separate map can be avoided.)
- notification procedures to be used in the event of an accident. At the very least, the SWMP Administrator needs to be notified. Depending on the nature of the spill and the material involved, the Colorado Department of Public Health & Environment, local sewer authority, downstream water users, or other agencies may also need to be notified. (The CDPHE 24-hour spill reporting line is 1(877) 518-5608.)
- instructions for clean-up procedures
- a designated person with spill response and clean-up authority. For clarity, this could be the SWMP Administrator.
- training of key personnel in the use of plan and clean-up procedures.
- signs posted at critical locations providing a summary of SPCC plan information, phone numbers, contacts, equipment locations, etc.
- provisions requiring spills to be cleaned up, corrective actions taken, or countermeasures implemented immediately.
- provisions for absorbents to be made available for use in fuel areas, and for containers to be available for used absorbents.
- prohibition on the washing of absorbents into the storm drainage system or into the sanitary sewer system, via floor drains.
- provision for emergency spill containment and clean-up kits to be made available and stored in accessible and convenient locations. Kits should contain the appropriate clean-up materials applicable to the materials stored at the site.

Spill Reporting and Documentation:

Additionally, records of spills, leaks, or overflows that result in the discharge of pollutants must be documented and maintained. You may also want to record other spills that are responded to and do not result in a discharge of pollutants. Information that should be recorded for all occurrences includes the time and date, weather conditions, reasons for the spill, type and amount of material spilled, etc. Some spills may need to be reported to the Division immediately. Specifically, a release of any chemical, oil, petroleum product, sewage, etc., which may enter waters of the State of Colorado (which include surface water, ground water and dry gullies or storm sewers leading to surface water) must be reported. More guidance is available on the web at www.cdphe.state.co.us/emp/spillsandreleases.htm. The Division's toll-free 24-hour environmental emergency spill reporting line is 1(877) 518-5608.

- g. Employee Training - Employee training programs shall inform personnel at all levels of responsibility (who are involved in industrial activities that may impact stormwater runoff) of the components and goals of the SWMP. Training shall address topics such as spill response, good housekeeping and material management practices. The SWMP shall identify periodic dates for such training. Contractor or temporary personnel shall be informed of plant operation and design features in order to prevent discharges or spills from occurring.***

In order to make the SWMP an effective management tool, personnel must be informed of the procedures and how they are to be implemented. The permit regulations require that facility personnel be trained periodically. Any training session should include actual field observations of the BMPs being discussed.

As a guide, at average-sized facilities, staff training should take place at least twice a year. If the facility is subject to seasonal shifts in workload, training should take place immediately prior to the onset of the heaviest critical activities.

The length of time required for the training sessions is a function of the size and complexity of the facility, and the level of intensity of industrial activities.

The following is a *sample* SWMP training program outline:

- I. Introduction to NPDES Stormwater Permits**
 - A. Background information
 - B. Status of the permit
- II. Pertinent components of the permit**
 - A. SWMP
 1. Spill response and clean-up procedures
 2. Good Housekeeping procedures
 3. Best Management Practices
 - a) What they are and where they apply
 - b) Implementation
 - c) Maintenance
 4. Inspections
 - B. Monitoring and sampling (if required)
- III. Reporting and Recordkeeping**
- IV. Enforcement**

The training sessions should be attended by critical staff involved in any of the activities discussed in the BMP section. This would include all levels of personnel involved in operations and maintenance.

New or temporary personnel and contractors working at the facility also need to be trained in the SWMP procedures as soon as possible. Contractors should be provided with a copy, as well as being informed that they are also liable for conditions set forth within it.

- h. Identification of Discharges other than Stormwater - The stormwater conveyance system on the site shall be evaluated for the presence of discharges other than stormwater. The SWMP shall include a description of the results of any evaluation for the presence of discharges other than stormwater, the method used, the date of the evaluation, and the on-site drainage points that were directly observed during the evaluation.*

A number of discharges other than stormwater may not require a CDPS Industrial Wastewater Discharge permit and are considered Allowable Non-Stormwater Discharges. Any of these discharges that exist at the site must be identified in the SWMP. See Part I.C.3.b of the permit for a list of such allowable discharges.

In other words, **only stormwater** can be conveyed by the stormwater drainage system. A very limited number of allowable non-stormwater discharges are allowed for in the permit. They require appropriate control measures to be implemented as needed to minimize the impacts. The source must be listed in the SWMP. Allowable sources will typically only include discharges from emergency fire fighting activities (discharges from maintenance of fire suppression systems and training exercises are not allowed), uncontaminated compressor condensate, irrigation drainage, lawn watering, air conditioner condensate, uncontaminated springs, and foundation or footing drain where flows are not contaminated. Before assuming groundwater is uncontaminated, contact the Division at 303-692-3500 to determine if you are required to assess the existence of contamination. A separate permit may be required for these discharges initially to demonstrate the water is uncontaminated.

Illicit discharges typically involve short-term discharges associated with an intermittent industrial activity or more permanent discharges. Intermittent discharges, such as dumping or outdoors equipment or vehicle washing, are typically controlled through proper training and implementing adequate procedures prohibiting such activities. Examples of more permanent potential illicit connections include the floor drains and toilets in maintenance buildings, chemical storage buildings, or waste lines incorrectly connected to stormwater drainage systems. These types of illicit discharges often involve older buildings which were constructed when such connections may not have been prohibited. Therefore, management or tenants may have no knowledge of them. Cross-connections via broken lines or stoppages are also possible.

Evaluating Site For Illicit Discharges

The permittee must evaluate their site to determine if illicit discharges are occurring and record the evaluation in the SWMP. The goal of such an evaluation is to identify the more permanent illicit discharges discussed above. There are several methods of determining whether or not illicit connections exist. Acceptable procedures include dry weather observations of outfalls or other appropriate locations, analysis and validation of accurate piping schematics, dye tests, etc.

For your facility, describe the method(s) used, how and when it was applied, and the results of the investigation. Depending upon the complexity of the storm drainage system, this process may include a combination of more than one of the methods. Your SWMP **must** include a certification statement on this item.

Note - if illicit connections are discovered, corrective measures must be taken.

Method 1 - Dry Weather Observations

During dry weather conditions, observe storm drain outlets during normal operating hours when an illicit discharge would be expected to be present. If flows are visible, there may be such connections. Make note of all observed flows, stains, sludges, oil films, or abnormal conditions. When such flows are found, additional tests will be required to determine the source(s). At industrial sites with large drainage areas, observed flows could be a result of groundwater seepage.

This method is best suited for small sites without well-developed storm drainage systems. If there are no storm inlets and all discharge is conveyed above ground, this process is a simple observation to verify that there are no exposed outlets from floor drains, etc.

Start at the outlet of the drainage system if it is accessible. If not, start at the farthest point downstream that the system is visible. If discharge is observed, possible sources can be determined by viewing upstream inlets and grates. Copies of the drainage system schematics are very useful.

Method 2 - Review and Inspection of Schematics

Obtain any "as built" available on the storm drainage system and buildings. Review them carefully to determine where flow from floor drains and toilets goes. This review should be accompanied by field inspection to verify that the "as built" are accurate and to determine whether any unrecorded pipe connections exist.

Method 3 - Dye Tests

Dye tests are a very effective means of determining where flow from a certain location goes. Environmentally safe dyes are available which turn fluorescent green or orange in water. Release a quantity of dye into a suspected source and run water into it from a hose or tap long enough to determine where it flows. View downstream outlets or inlets where the flow would be visible. Viewing sanitary sewers at manholes will provide verification that the inlet is connected to the sanitary system. Many storm drainage systems can have a significant amount of internal storage capacity, which needs to be overcome before flow from a dye test would be visible. Therefore, it may be more practical to conduct dye tests during or soon after wet weather to help overcome this problem. Two people are usually required for this test: one to apply the dye at the source, and the other to view the system downstream.

Method 4 - TV Line Surveys

This method is the most costly and would therefore most likely be a last resort, used when all other methods are exhausted. A mobile closed-circuit television system consisting of a monitor, camera, drag lines, and reels and cables is guided through the system. This allows visual inspection of the system as well as documentation of conditions. Pipes as small as 4 inches can be surveyed in this manner. This method will still usually need to be combined with other methods. The EPA estimates that this method would cost between \$1 to \$3 per foot of survey. Small surveys could vary from \$125 to \$200 per hour, including labor and equipment rental. However, the cost would be highly variable depending upon the complexity and condition of the system (e.g., is it free of debris?).

- 4. Comprehensive Inspections. The SWMP shall identify qualified personnel that shall inspect designated equipment and plant areas. The procedures and intervals of the comprehensive inspection shall also be specified in the plan and shall be consistent with Part I.C.5. Except as provided in paragraphs (d) and (e) of that part, comprehensive inspections shall in no case be completed less than twice a year (in the spring and fall). The operator shall keep a record of such inspections. This record shall be made available to the Division upon request and shall be summarized in the Annual Report.***

(The following three paragraphs are from Part I.C.5 of the permit.)

In addition to the inspections necessary to comply with the preventive maintenance program requirements in Part I.B.3.d, qualified personnel identified by the permittee shall make a comprehensive inspection of their stormwater management system, at least twice per year (in the spring and fall), except as provided in paragraphs d and e, below. These comprehensive inspections must be documented and summarized in the Annual Report (see Part I.D.1 of the permit). Qualified personnel are those who possess the knowledge and skills to assess conditions and activities that could impact stormwater quality at the facility, and who can also evaluate the effectiveness of BMPs selected.

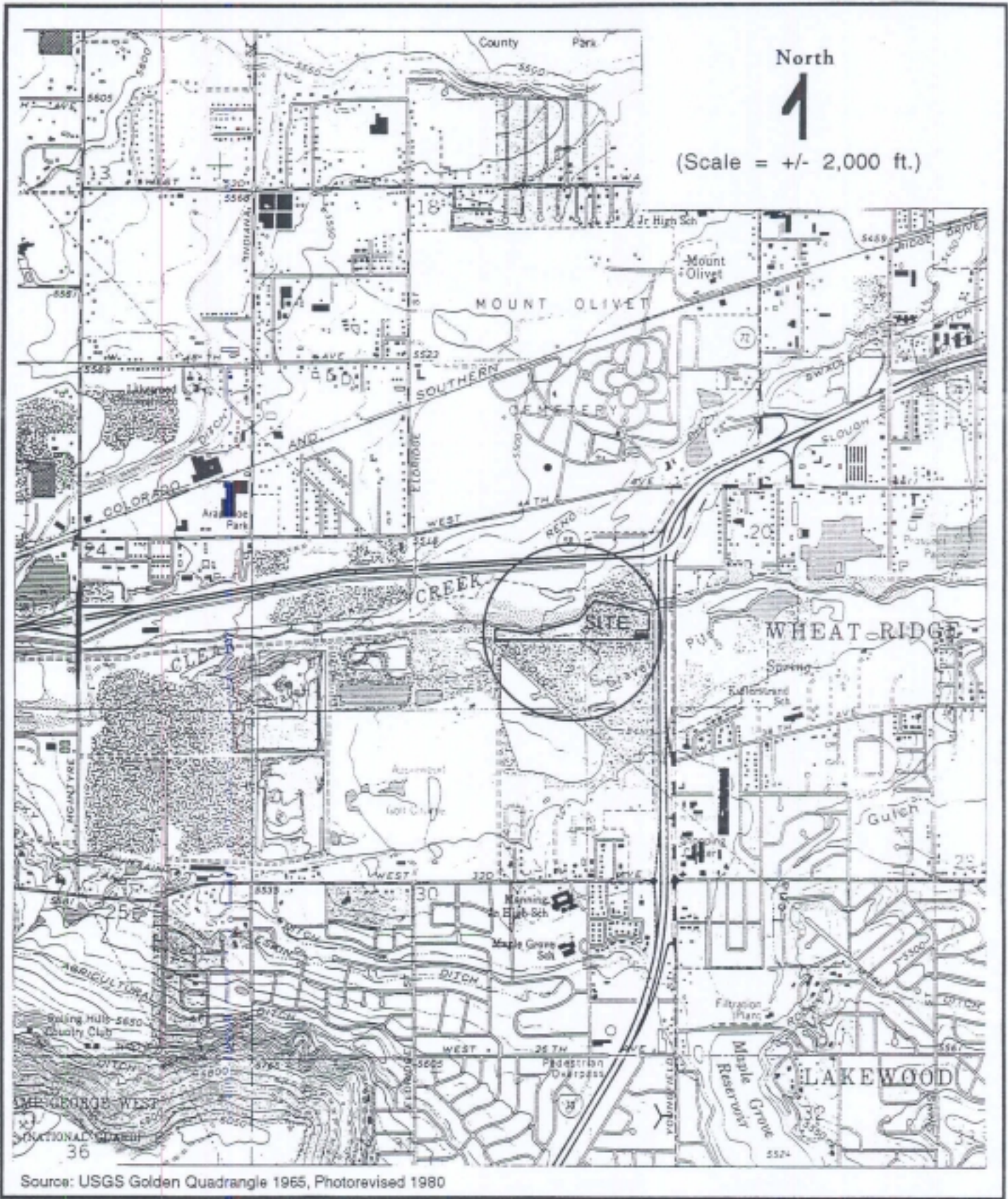
- a. ***Material handling areas, disturbed areas, areas used for material storage that are exposed to precipitation, and other potential sources of pollution identified in the SWMP in accordance with Part I.B.3.b of this permit shall be inspected for evidence of, or the potential for, pollutants entering the drainage system. Structural stormwater management measures, sediment and control measures, and other structural pollution prevention measures identified in the plan shall be observed to ensure that they are operating correctly. A visual inspection of equipment needed to implement the plan, such as spill response equipment, shall be made to confirm that it is readily available and in proper working order.***
- b. ***Any repairs or maintenance needs identified by the inspection shall be completed immediately. Based on the results of the inspection, if revisions to the description of potential pollutant sources and pollution prevention measures identified in the plan are needed, the plan shall be revised as appropriate, and shall provide for implementation of any changes to the plan in a timely manner, and in compliance with the requirements of Part I.C.2.c.2.***
- c. ***A report summarizing the scope of the inspection, personnel making the inspection, the date(s) of the inspection, significant observations relating to the implementation of the SWMP, and actions taken in accordance with paragraph (b), above, shall be made and retained for at least three years after the date of the inspection. Significant observations include such things as the locations of discharges of pollutants from the site; locations of previously unidentified sources of pollutants; locations of BMPs needing maintenance or repair; locations of failed BMPs that need replacement; and locations where additional BMPs are needed. The report must also document any incidents of noncompliance observed.***

List in the SWMP the items to be inspected (manufacturing areas, fuel storage and transmission facilities, materials storage areas, structural BMPs, SPCC effectiveness, good housekeeping practices, etc.). Sites with limited industrial activity will have a correspondingly low level of required inspection activity. An inspection report must be developed from each comprehensive inspection including all the information listed in subsection c, above. The permittee may want to develop an inspection form that requires this information, to simplify the process and help ensure inspections are conducted in compliance with the permit.

5. ***Consistency with Other Plans. SWMPs may reflect requirements for Spill Prevention Control and Countermeasure (SPCC) plans under section 311 of the CWA, or Best Management Practices (BMPs) Programs otherwise required by a CDPS permit, and may incorporate any part of such plans into the SWMP by reference, provided that the relevant sections of such plans are available as part of the SWMP consistent with Section I.C.2.b.***

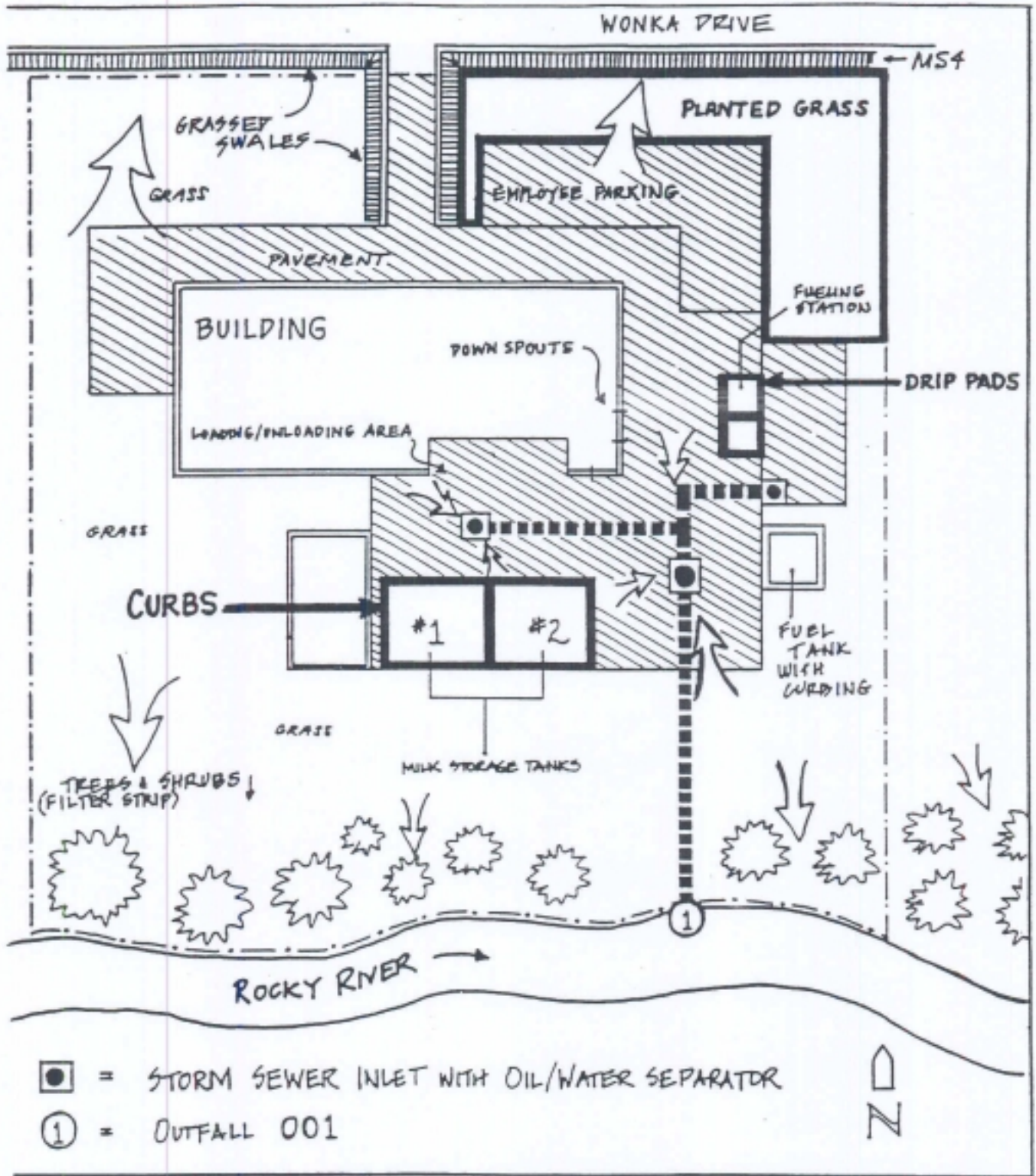
If the facility, or a portion of it, is already regulated through another program which requires such things as SPCC plans or good housekeeping measures, these can be included by reference.

APPENDIX A



EXAMPLE OF FACILITY LOCATION MAP

APPENDIX B



- = STORM SEWER INLET WITH OIL/WATER SEPARATOR
- ① = OUTFALL 001

EXAMPLE OF FACILITY SITE MAP

Appendix C - Classification of Industrial BMPs

The following is a list of some of the most commonly used BMPs. The question is, how do you select the right BMPs for your site when there are so many options and various criteria for selection? Here are three suggestions:

- Identify practices that control the problem at the source or prevent pollutants from getting into your storm water runoff. Source control practices are the best defenses against pollution. Also, source control BMPs are more cost effective than treatment BMPs.
- Identify specific activities that have high potential for generating wastes that could come in contact with stormwater, and identify BMPs for these areas. Focus most of your attention on these areas first.
- Integrate requirements of other facility environmental program elements into your SWMP. The SPCC plan, the NPDES toxic organic management plan, the hazardous materials clean-up plan, and the SWMP are all related. By incorporating these programs into your SWMP, you will be integrating various environmental programs, which will lead to cost savings in the long run.

POLLUTANT DISCHARGE CONTROL APPROACH	HOW THEY WORK	BMP EXAMPLES
Source Reduction (prevention)	Practices that prevent, eliminate or reduce the amount of pollutants generated on the site.	<p><u>Good housekeeping</u></p> <ul style="list-style-type: none"> -routine operations -scheduled maintenance -signs and labels -security system <p><u>Visual inspections</u></p> <ul style="list-style-type: none"> -regular inspections and testing -identify illegal dumping activities <p><u>Preventive maintenance</u></p> <ul style="list-style-type: none"> -non-scheduled maintenance <p><u>Spill prevention</u></p> <ul style="list-style-type: none"> -material handling procedures -material storage practices -loading/unloading by air pressure or vacuum -preventive monitoring of materials -vehicle positioning for materials transfer <p><u>Employee training</u></p> <p><u>Record keeping and Reporting</u></p> <ul style="list-style-type: none"> -inspections -maintenance -inventory of materials <p><u>Sediment and erosion prevention</u></p> <ul style="list-style-type: none"> -vegetative practices (sodding, seeding of areas and swales) -minimize bare soil exposure -slope protection (surface roughening, gradient terraces) -divert flow around exposed areas (interceptor dikes, swales) -mulching, matting, netting and chemical soil stabilization -reduce surface runoff velocity (channel slope, check dams) -preserve natural vegetation -stream bank protection -pipe slope drains -sub-surface drains -sewer outlet protection <p><u>Chemical substitution</u></p> <p><u>Air emissions control</u></p> <p><u>Dust control</u></p> <ul style="list-style-type: none"> -chemical soil treatment -irrigation -minimize denuded areas -wind breaks -tillage

POLLUTANT DISCHARGE CONTROL APPROACH	HOW THEY WORK	BMP EXAMPLES
Exposure Minimization	Practices that eliminate or minimize the chances of stormwater runoff coming into contact with pollutants.	<u>Covering activity</u> <u>Containment</u> -berming, curbing or diking around activity <u>Segregating or diverting flow around activity</u> -channels (grass, concrete, rock lined) -..dikes and berms -surface grading and paving <u>Recycling vehicle/equipment wash water</u>
Mitigation	Practices that involve cleaning up or recovering a substance after it has been released or spilled.	<u>Spill response</u> -identify procedures and equipment -manual clean-up (sweeping, shoveling, etc.) -removal of contaminated materials by excavation -removal of contaminated materials by vacuum or pump systems -sorbents -gelling agents <u>Drip pans</u> <u>Collection basins</u> <u>Sumps</u> <u>Vehicle / equipment washing</u> <u>Clean storm drains, grates and inlets</u>
Treatment	Practices that remove pollutants from stormwater prior to leaving the site.	<u>Traditional stormwater management practices</u> -vegetated swale -stormwater detention or retention pond -constructed wetlands -snow removal/storage activities -catch basin design -oil/water/ grit separators -buffer zones -infiltration (trenches, swales, basins, porous pavement) -level spreaders <u>Sediment removal from runoff</u> -filter (silt) fence -straw bale barrier -brush barrier -gravel/stone filter berm -storm drain inlet protection -sediment trap basin <u>Advanced treatment</u> -liquid-solids separation -volatilization -coagulation/precipitation -neutralization -chemical oxidation -biological treatment -thermal oxidation
Waste Disposal	Practices that collect and dispose of stormwater.	<u>Discharge to a POTW (via a sanitary sewer)</u> <u>Discharge to an industrial waste treatment plant</u> <u>Landfill or land disposal</u> <u>Deep well injection</u>

Table and introductory text are from " A Guide to Industrial Stormwater BMPs," by William Ruzzo, Brown and Caldwell, 1992.