



Stormwater Pollution Prevention Plans (SWPPP) for NPDES Construction Sites

An Online Continuing Education Course for Engineers

Course Number: C-5011

Credit: 5 Hours / 5 PDH / 5 CPD

DEVELOPING YOUR STORMWATER POLLUTION PREVENTION PLAN

A GUIDE FOR CONSTRUCTION SITES

Who?

Construction site operators (the person who has operational control over construction plans and/or the person who has day-to-day supervision and control of activities occurring at the construction site)

Where?

Construction sites required to comply with stormwater discharge requirements

What?

A guide to help you develop a good Stormwater Pollution Prevention Plan (SWPPP)

Why?

Stormwater runoff from construction sites can cause significant harm to our rivers, lakes, and coastal waters

A SWPPP is required (by your construction general permit) and will help you prevent stormwater pollution

A SWPPP is more than just a sediment and erosion control plan. It describes all the construction site operator's activities to prevent stormwater contamination, control sedimentation and erosion, and comply with the requirements of the Clean Water Act

What is a Stormwater Pollution Prevention Plan (SWPPP)?

A SWPPP may be called many things. Your state may use terms like:

- Construction Best Practices Plan
- Sediment and Stormwater Plan
- Erosion, Sediment, and Pollution Prevention Plan
- Construction Site Best Management Practices Plan
- Erosion Control Plan and Best Management Practices
- Best Management Practices Plan
- Erosion and Sediment Control Plan

Regardless of the title used in your state, these documents—and the stormwater permits that require them—have many common elements. This guide is intended to help you develop a better one for your construction site.



Example drawing identifying major issues to address in SWPPP.

INTRODUCTION

A. WHY DO YOU NEED THIS COURSE?

If you are responsible for erosion and sediment control and stormwater management at a permitted construction site, then this course may be useful to you. This course is designed to walk you through the steps necessary to develop and implement an effective stormwater pollution prevention plan (SWPPP). The basic outline of the course is presented below:

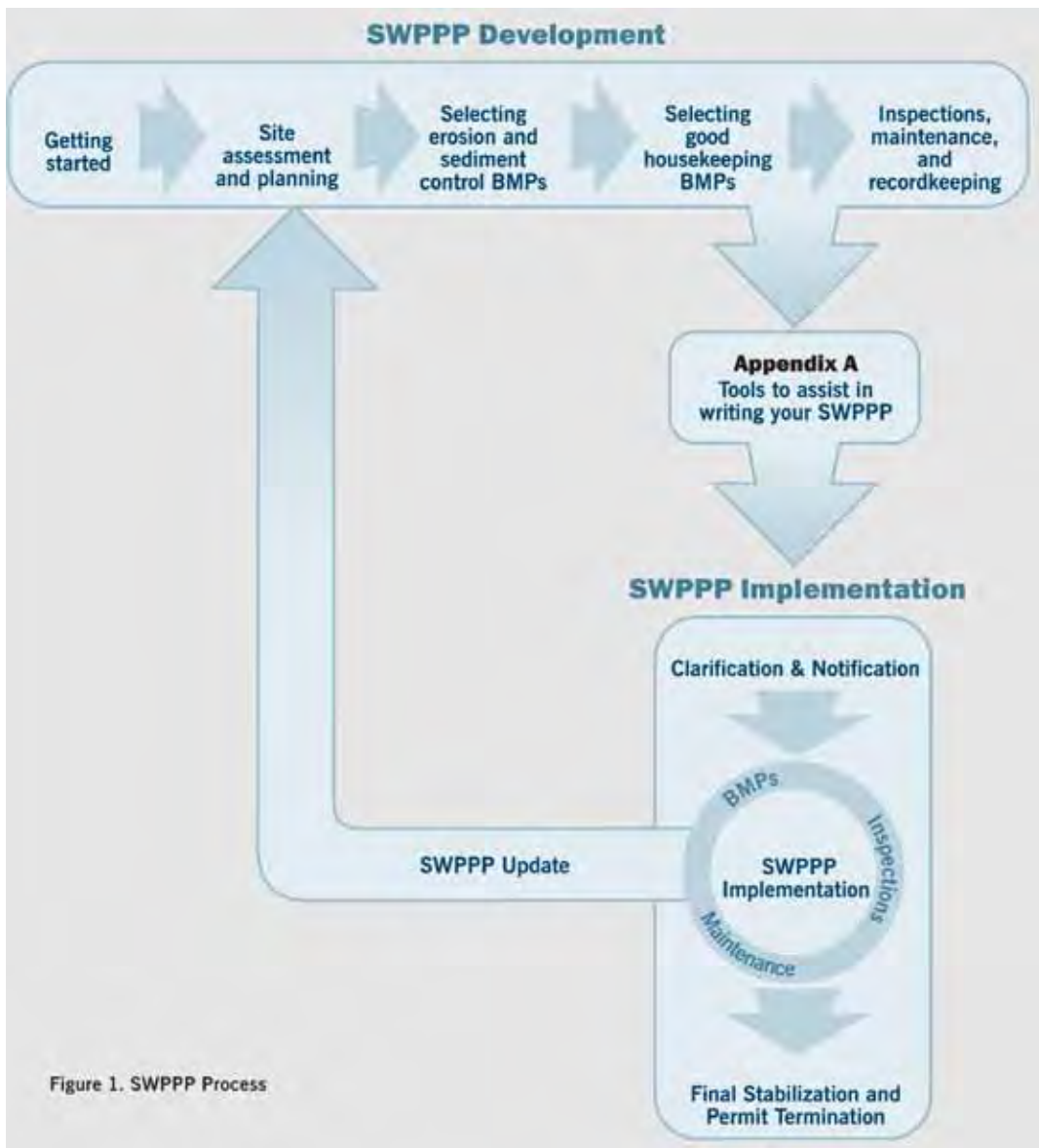


Figure 1. SWPPP Process

TAKE A CLOSER LOOK...

What is a SWPPP?

A SWPPP is a site-specific, written document that:

- Identifies potential sources of stormwater pollution at the construction site
- Describes practices to reduce pollutants and the volume of stormwater discharges from the construction site
- Identifies procedures the operator will implement to comply with the terms and conditions of a construction general permit

What does this mean to me?

Failure to implement your SWPPP could result in significant fines from EPA or a state environmental agency. Therefore, it is important that you develop your SWPPP to address the specific conditions at your site, fully implement it, and keep it up-to-date to reflect changes at your site.

B. What Is Stormwater Runoff and What Are Its Impacts?

Stormwater runoff is rain or snowmelt that flows over land and does not percolate into the soil. Stormwater runoff occurs naturally, in small amounts, from almost any type of land surface, especially during larger storm events. Impervious surfaces, such as buildings, homes, roads, sidewalks, and parking lots, can significantly alter the natural hydrology of the land by increasing the volume, velocity, and temperature of runoff and by decreasing its infiltration capacity. Increasing the volume and velocity of stormwater runoff can cause severe stream bank erosion, flooding, and degrade the biological habitat of these streams. Reducing infiltration can lower ground water levels and affect drinking water supplies.

In addition, as stormwater runoff moves across surfaces, it picks up trash, debris, and pollutants such as sediment, oil and grease, pesticides and other toxics. Changes in ambient water temperature, sediment, and pollutants from stormwater runoff can be detrimental to aquatic life, wildlife, habitat, and human

health. Soil exposed by construction activities is especially vulnerable to erosion. Runoff from an unstabilized construction site can result in the loss of approximately 35-45 tons of sediment per acre each year (ASCE and WFF, 1992). Even during a short period of time, construction sites can contribute more sediment to streams than would be deposited naturally over several decades. Excess sediment can cloud the water reducing the amount of sunlight reaching aquatic plants, clog fish gills, smother aquatic habitat and spawning areas, and impede navigation in our waterways.

The primary stormwater pollutant at a construction site is sediment. To control erosion at a construction site, it is important to understand the different types of erosion that can occur. Erosion begins when raindrops break down the soil structure and dislodge soil particles. Runoff carrying the soil particles becomes sheet erosion which eventually forms smaller rills and larger gullies. The best way to stop erosion is to keep the soil in place through vegetation, erosion control blankets, or other methods that prevent the soil from becoming dislodged during rain events.

The erosion process is typically influenced by climate, topography, soils, and vegetative cover. Understanding how these factors influence erosion will help you select and design appropriate controls to minimize erosion from your construction site.

Climate. The frequency, intensity, and duration of rainfall are the principle factors influencing erosion from a construction site. Know the weather patterns in your area and, if possible, plan your soil disturbance activities for periods of historically lower rainfall.

Topography. The longer and steeper a slope, the greater the potential there is for erosion from that slope. Use practices such as diversions or fiber rolls to break up long slopes. Consider minimizing soil disturbance activities on steeper slopes.

SWPPP Tip!

A SWPPP can have different names

A SWPPP may also be called a "construction best practices plan," "sediment and stormwater plan," "erosion, sedimentation, and pollution prevention plan," or similar term. The SWPPP (or similarly named plan) is the plan required to comply with EPA's or the state's stormwater construction general permit.

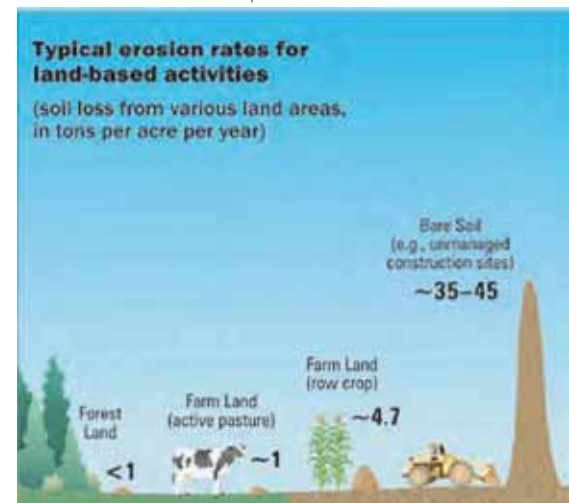


Figure 2 Typical erosion rates from land-based activities. (Dunne, T. and L. Leopold, 1978; NRCS, 2000; NRCS, 2006; ASCE and WFF, 1992)

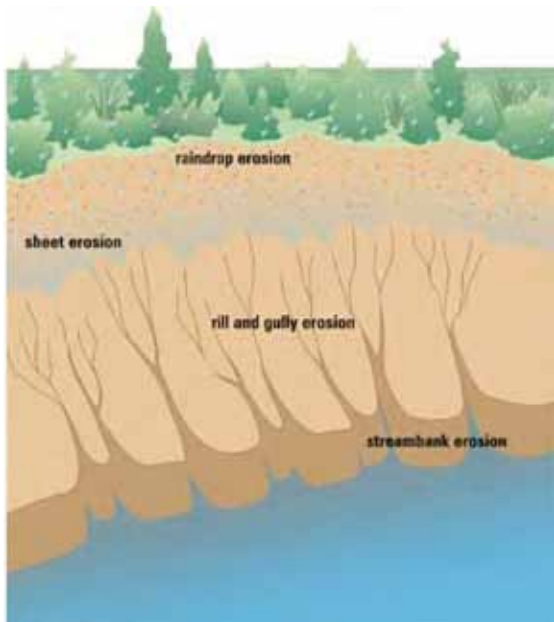


Figure 3 Types of erosion.

Raindrop erosion

Dislodging of soil particles by raindrops

Sheet erosion

The uniform removal of soil without the development of visible water channels

Rill erosion

Soil removal through the formation of concentrated runoff that creates many small channels

Gully erosion

The result of highly concentrated runoff that cuts down into the soil along the line of flow

Streambank erosion

Flowing water that erodes unstable streambanks

Soils. Soil type can also impact erosion. Soil texture, structure, organic matter content, compaction, and permeability can all influence erosion rates.

Vegetative cover. Vegetative cover provides a number of critical benefits in preventing erosion—it absorbs the energy of raindrops, slows velocity of runoff, increases infiltration, and helps bind the soil. Soil erosion can be greatly reduced by maximizing vegetative cover at a construction site.

C. How Can Construction Site Operators Prevent Stormwater Pollution?

An effective SWPPP is the key! If sediment and erosion controls and good housekeeping practices are not followed, construction activity can result in the discharge of significant amounts of sediment and other pollutants. The term *Best Management Practices* or BMPs is often used to describe the controls and activities used to prevent stormwater pollution.

BMPs can be divided into two categories—structural and non-structural BMPs. Structural BMPs include silt fences, sedimentation ponds, erosion control blankets, and temporary or permanent seeding, while non-structural BMPs include picking up trash and debris, sweeping up nearby sidewalks and streets,

maintaining equipment, and training site staff on erosion and sediment control practices. In this document, the term “BMPs” is used broadly and includes both structural and non-structural controls and practices.

A SWPPP is more than just a sediment and erosion control plan. It is a comprehensive, written document that describes the pollution prevention practices and activities that will be used during each phase of construction. It includes descriptions of the site and of each major phase of the planned activity, the roles and responsibilities of contractors and subcontractors, and the inspection schedules and logs. It is also a place to document changes and modifications to the construction plans and associated stormwater pollution prevention activities.

GETTING STARTED

A. What Are the Federal Requirements for Stormwater Runoff from Construction Sites?

The Clean Water Act and associated federal regulations (Title 40 of the *Code of Federal Regulations* [CFR] 123.25(a)(9), 122.26(b)(14)(x) and 122.26(b)(15)) require nearly all construction site operators engaged in

SWPPP Tip!

Erosion versus Sedimentation

Erosion is the process by which the land surface is worn away by the action of water or wind. Sedimentation is the movement and settling out of suspension of soil particles. It is usually easier and less expensive to prevent erosion than it is to control sediment from leaving a construction site.

clearing, grading, and excavating activities that **disturb one acre or more, including smaller sites in a common plan of development or sale**, to obtain coverage under a National Pollutant Discharge Elimination System (NPDES) permit for their stormwater discharges. Under the NPDES program, the U.S. Environmental Protection Agency (EPA) can authorize states to implement the federal requirements and issue stormwater permits. Today, most states are authorized to implement the NPDES program and issue stormwater permits for construction activities.

Each state (or EPA, in states that are not authorized) issues stormwater construction general permits. These permits generally, can be thought of as permits that cover all construction activities in a given state for a designated period of 5 years. Operators of industrial sites then apply for coverage. *Before applying for permits, read and understand all the appropriate construction general permits to develop a SWPPP.*

Because authorized states have their own NPDES requirements, you must read your state's construction permit and follow the specific requirements it contains.

Most construction general permits contain similar elements:

- **Applicability**—describes the geographic area covered and who is eligible to apply

SWPPP Tip!

Don't forget about "common plans of development or sale"

A *common plan of development or sale* includes larger-scale plans for land development to be carried out by one or more entities. Examples include housing developments and subdivisions, industrial parks, and commercial developments.

EPA has defined this term in its Construction General Permit to include: any announcement or piece of documentation (including

TAKE A CLOSER LOOK. . .

EPA Permits vs. State-Issued Permits

At the time of publication, EPA was the NPDES permitting authority in Massachusetts, New Hampshire, New Mexico, Idaho, Alaska, the District of Columbia, Puerto Rico, the U.S. territories (except the Virgin Islands), most Indian country, and federal facilities. For a complete list of NPDES permitting authorities, visit www.epa.gov/npdes, or www.epa.gov/npdes.

To view the remainder of the course material and to take the quiz for PDH credit, you must purchase the course.

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Permits can be issued by you read and understand all the appropriate construction general permits. The first step is to obtain a NPDES permit. This process will occur.

Examples of

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be addressed to

to prevent the contamination of stormwater runoff leaving the construction site

- **Application**—includes instructions for obtaining permit coverage, usually by filing an application or Notice of Intent (NOI) form
- **Implementation**—BMP installation, inspection, and maintenance requirements

This section describes some of the basic things you'll want to determine (Do you need permit coverage? What permit applies to you?), as well as some of the materials and information you may need to develop your SWPPP. Collecting this information before you start will help you develop your SWPPP more efficiently. Keep in mind that you may also need to gather this information and develop your SWPPP before you complete your Notice of Intent (NOI) and file for permit coverage (filing an NOI is discussed later in the course).