

NDDOT Erosion & Sediment Control – Construction Course

Module 4: Stormwater Pollution
Prevention Plan (SWPPP)

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What is a SWPPP?

Definition:

A document, a plan that describes who and what will control erosion and keep sediment from leaving the project site, and when, where and how this will be done. The plan is the common link between the owner, designer, contractor, and inspector.

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What is a SWPPP?

A SWPPP is a site-specific, written document.

- Identifies potential pollution
- Describes practices
- Identifies procedures

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Why is a SWPPP important?

1. Required by the permits
2. Powerful tool to assist erosion and sediment control

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Who is responsible for developing it?

Prime Contractor
Plan Designer

The diagram consists of three overlapping circles. The largest, outermost circle is grey and labeled 'Project Implementation'. Inside it, there are two smaller circles: an orange one labeled 'SWPPP' and a brown one labeled 'Design Plans'. The 'SWPPP' and 'Design Plans' circles overlap each other, and both are contained within the 'Project Implementation' circle.

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Overview of SWPPP Development Process

The diagram is a large arrow pointing to the right, divided into four sequential steps:

- Assess Site & Proposed Project
- Select ESC measures
- Select Good Housekeeping ESC measures
- Inspection, Maintain, and Record

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Initial Considerations

1. Existing conditions
2. Outfalls
3. Waterbodies
4. Project boundaries

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Initial Considerations

5. Environmentally sensitive areas
6. Permanent stormwater controls
7. Project phasing

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Existing Conditions

Soils

Hydrology

Topography



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Outfalls and Waterbodies

Considerations:

- Where does it drain to?
- How close will the disturbance be?
- What protections are required?
- Is it impaired? What for? Total Maximum Daily Load (TMDL)?

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Project Boundaries

Considerations:

- Slopes
- Proximity to right of way lines
- What is coming into the project?
- Points of egress – trackout
- Impacts to or from the outside

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Environmentally Sensitive Areas

Rivers, Lakes, Streams:

- Spawning times

Threatened and Endangered Species

Wetlands:

- Impacts
- Mitigation

Cultural sites and other avoidance areas

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Permanent Stormwater Controls

What permanent structures are required?

- MS4
- City
- Are there any existing?

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Permanent Stormwater Controls

Placement

Sizing

Maintenance

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Project Phasing

What will be done first?

What should be done first?

Environmental commitments

Should things be required due to the nature of the work?

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What are the main components of a SWPPP?

1. Illustrative:
 - a. Map/site plan
 - b. Details
 - c. Drawings
2. Narrative:
 - a. Contractors means and methods
 - b. Plan notes
 - c. Environmental commitments

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What are the parts of the illustrative section in the SWPPP?

1. Site map
2. Erosion and Sediment Control Measure (ESCM) installation drawings
 - a. Standard drawings
 - b. Plan details
 - c. Manufacturer's drawings/details
3. Other visual aids

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What are the parts of a map/site plan in the SWPPP?

1. Location of Project
2. Project Boundaries
3. Areas of ground disturbance per phase
4. Avoidance Areas (no disturbance)
5. Drainage Patterns w/ flow lines (on and off)
6. Discharge points and affected inlets

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What are the parts of a map/site plan in the SWPPP?

7. Location of temp and permanent ESCMs
8. Location of stormwater conveyances (ponds, ditches, pipes, swales, diversions, ditch blocks)
9. Location of potential pollution sources (dumpsters, toilets, etc.)
10. Location of soil stockpiles
11. Steep Slopes

What are the parts of a map/site plan in the SWPPP?

12. Surface waters including wetlands
13. Surface water crossings
14. Stormwater discharge points to surface waters
15. Dewatering discharge points
16. Chemical treatment locations and discharges

What are the parts of a map/site plan
in the SWPPP?

17.

- a) Fueling locations and storage
- b) Vehicle maintenance areas
- c) Wash water collection
- d) Lubricant and chemical storage
- e) Paint storage
- f) Material storage
- g) Staging areas
- h) Debris collection areas

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What are the parts of a map/site plan
in the SWPPP?

18. Final impervious surface

19. Offsite locations (if applicable)

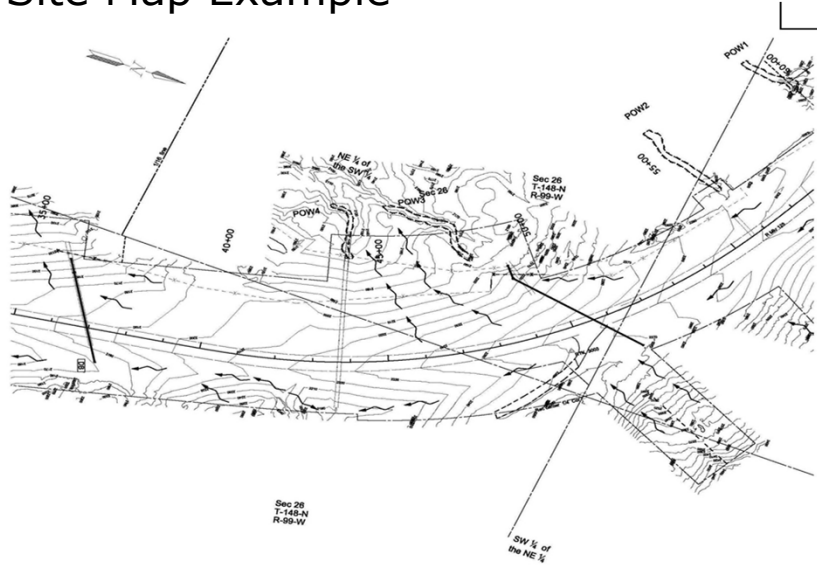
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Plan Sections

- Section 75 – Wetlands
- Section 76 – Temporary ESCMs
- Section 77 – Permanent ESCMs



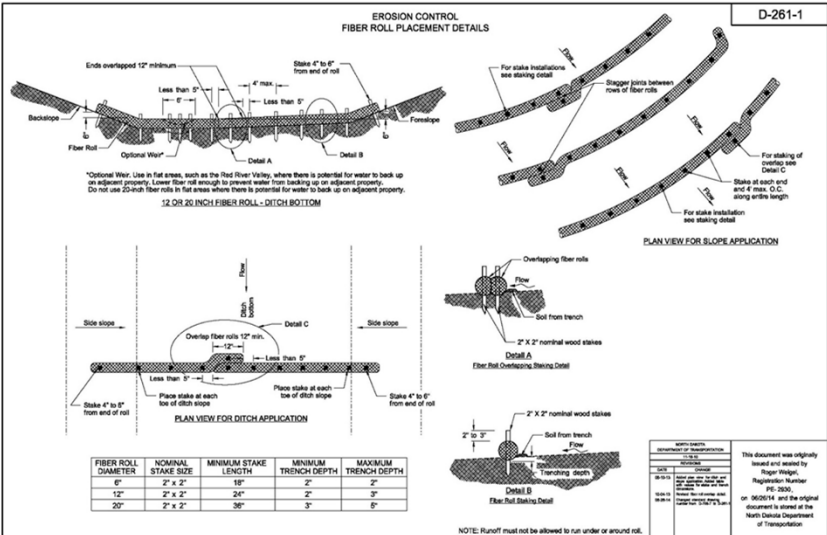
Site Map Example





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ESCM Installation Drawings



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What are the parts of the narrative section in a SWPPP?

1. Site description
2. Operational controls
3. Erosion and sediment control measures
4. Stormwater management
5. Maintenance

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What are the parts of the narrative section in a SWPPP?

6. Inspections
7. Plan review and revisions
8. Signatory requirements
9. Local requirements
10. Final stabilization

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Site Description

- 1. Project description
- 2. Existing site conditions
- 3. Adjacent areas
- 4. Estimates of areas
- 5. Proposed timetable
- 6. Soils
- 7. Critical areas
- 8. Surface waters
- 9. 303(d) list information



Project Description, Existing Site Conditions, Adjacent & Estimated Areas

- Who
- What
- Existing issues
- Land uses



A proposed timetable of activities that disturb soils for major portions of the site



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Example Erosion and Sediment Control Staging Chart

	Project Stage	BMP Plan Ref No.	BMP Description	Remove after Stage:	Notes:	
Phase I	A - Prior to Land Disturbance/Sanitary Sewer Installation	1	Construction Entrance and Staging Area	D		
		2	Construction Fencing	D	Place at edge of designated stream corridor.	
		3	Curb Inlet Protection	E	Install filter bags on existing curb inlets.	
		4	Perimeter Sediment Fence	E		
		5	Temporary Diversion Dike	E	Remove only when graded areas south of berm have permanent stabilization established.	
Phase II	B - Mass Grading	6	Temp Sediment Basin	E	To be installed prior to disturbing entire site.	
		7	Stockpile Topsoil	D	Install sediment fence a minimum of 5' beyond toe of slope for all stockpile areas.	
		8	Sediment Fence	D	Install on contour for intermediate sediment control.	
		9	Check Dams	D		
		10	Concrete Washout	D	To be installed prior to pouring any concrete.	
	C - Storm Sewer Installation	11	Phase I Area Inlet Protection	D	Install excavated area and sediment fence around all area inlets and open junction boxes.	
		12	Phase I Curb Inlet Protection	D	Install excavated area and throat protection on all curb inlets.	
		13	Stabilize Borrow Area with Perennial Vegetation	NA	Seed and mulch future development area. Temporarily stabilize with hydromulch if out of seeding season.	
	Phase III	D - Construction of Streets and Buildings	14	Phase II Area Inlet Protection	E	At time of final grading, concurrent with stabilization of site, install stabilized buffer and filter bag.
			15	Phase II Curb Inlet Protection	E	Following installation of curb and gutter, install inlet filter bag.
16			Sediment Log/Wattle	E	Where indicated adjacent to street - place at back of curb. Install per manufacturer's instructions.	
E - Final Stabilization		17	Erosion Control Blanket (Curlex II)	NA	To be installed in swale per manufacturer's instructions.	
		18	Establish Perennial Vegetation	NA	Redistribute topsoil and seed and mulch all disturbed areas. Sod right-of-way. Stabilization complete when 100% of disturbed area is established with perennial vegetation with a density of 70%.	

Soils

What types of soil?

Soil properties

Specific ESCMs due to soils



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Critical Areas

Environmentally sensitive – Not only within ROW

Highly erosive

High flow

Time sensitive



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Surface Waters and 303(d) list

Where does the site drain?

Multiple receiving waters

Impaired waters list (NDDEQ/EPA)

TMDLs (NDDEQ/EPA)

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Operational Controls

1. Chain of responsibility
2. Good housekeeping practices
3. Preventative measure practices
4. Spill prevention and response procedures

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Operational Controls

5. Training
6. Concrete waste control
7. Dewatering

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Chain of Responsibility

Identify who will oversee:

- SWPPP
- ESCM installation, inspection, maintenance and removal

Develop a Chain of Responsibility:

- NOT JUST DOT and PRIME CONTRACTOR

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Good Housekeeping Practices

- Litter
- Construction debris
- Chemicals
- Human waste
- Vehicle fueling/maintenance
- Vehicle washing




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Trackout and Dust Control

- Soils
- Particular ESCMs
- Practices
- Locations
- Plan for cleaning



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Preventative Measure Practices

Stormwater control devices

- Operation
- Inspection
- Maintenance

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Preventative Measure Practices

Equipment and vehicles

- Operation
- Inspection
- Maintenance

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Spill Prevention and Response Procedures

Specific handling procedures

Storage requirements

Spill containment

Cleanup procedures

Use Spill Prevention, Control and Countermeasure (SPCC) Plans

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Training

Site specific annual training

As new employees are hired

Erosion and sediment control practices

Spill response

Good housekeeping

The SWPPP

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Training Subcontractors

Train subcontractors to implement stormwater controls as specified in the SWPPP




Concrete Waste Control

- Concrete wash water**
- Grindings**
- Slurries**



Dewatering

- Only stormwater or groundwater
- Cannot discharge sediment
- Inspected daily
- Includes stream diversions



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Erosion and Sediment Control Measures



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Erosion Control (keeping the dirt in place)

1. Minimize disturbed area and protect natural features and soil
2. Phase construction activity
3. Control stormwater flowing onto and through the project
4. Stabilize soils promptly
5. Protect slopes

Sediment Controls (the second line of defense)

6. Protect storm drain inlets
7. Establish perimeter controls
8. Retain sediment on-site and control dewatering practices
9. Establish stabilized construction exits
10. Inspect and maintain controls

Erosion and Sediment Control Measures

Perimeter control

Temporary or permanent cover

Required maintenance

Off-site accumulations removed

Withstand a 2yr, 24-hour rain event

TMDL requirements

Appendix 1

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Perimeter Control

All down slope boundaries

Side slope boundaries




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Temporary or Permanent Cover

Where activities have been completed or temporarily ceased

Include graded slopes, pond embankments, ditches, berms and soil stockpiles



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Required Maintenance

All control measures must be properly selected, installed, and **maintained**

Required maintenance must be outlined for each device

Justification required if against guidelines



Off-site Accumulations

- Must be removed
- Minimize off-site impacts
- Plan must be modified
- Have a plan in place for this

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2 Year, 24 Hour Rain Event

Controls are expected to withstand and function properly

Visible erosion should be minimal

Ranges from about 1.76 inches in the west to 2.5 inches in the east

Rain Gauge



Must Comply with TMDL Requirements

Patterson Lake

WLA = 0
Tons/year



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**Appendix 1
Specific Requirements for ESCMs**



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Permanent Stormwater Management

SWPPP must identify:

- Ponds
- Flow reduction devices
- Infiltration areas
- Energy dissipation at discharge locations
- Erosion protection for outfalls and ditches

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What are the environmental considerations?

Wetland impacts

Mitigation

404 Permit

Temporary/permanent impacts

What are the environmental considerations?

Wildlife

Threatened and Endangered

Fish passage

Spawning seasons



What are the environmental considerations?

Environmental documents

Environmental commitments

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SWPPP must indicate the maintenance intervals for all ESCMs



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Inspections

Must provide for site inspections

May have to revise SWPPP based upon findings of the inspections

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Plan Review and Revisions

Must amend the SWPPP when there is a change in Design, Construction, Operation, Maintenance, or if found to be ineffective

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Signatory Requirements

SWPPP must be signed

Signed by a responsible corporate officer, a
general partner, or a principal executive officer

Can be someone authorized by the above

Permit contains certification language

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Local Requirements

Some Cities and Counties have their own
requirements

Must comply with the most stringent requirement

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Final Stabilization

SWPPP must show how the site will be stabilized.

Three methods:

1. 70% Vegetation
2. Farmland
3. Arid exemption (3-year rule)



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Common SWPPP Mistakes and Violations

Not developing a SWPPP

Missing required sections

Inadequate maps/illustrations

ESCMS not designed to 2-year, 24-hour storm

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Common SWPPP Mistakes and Violations

Weak chain of responsibility section

No signature/certification

No Inspection Report

Cookie cutter SWPPP

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Art of Writing A SWPPP

Clear and concise

Avoid “as needed” or “when required”

Be specific, but not too specific

Example – “Trackout will be cleaned up everyday using a scoop shovel and a bucket”

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Example – “Trackout will be cleaned up everyday using a scoop shovel and a bucket”

What are some improvements we can make?

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More writing does not always improve quality in a SWPPP

EPA Example

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The exits will be inspected weekly and after storm events or heavy use. The exits will be maintained in a condition that will prevent tracking or flowing of sediment onto Sixth Avenue. This could require adding additional crushed stone to the exit. All sediment tracked, spilled, dropped, or washed onto Sixth Avenue will be swept up immediately and hauled off-site for disposal at Middletown Landfill. Sediment will be swept from the anti-tracking pad at least weekly, or more often if necessary. If excess sediment has clogged the pad, the exit will be topdressed with new crushed stone.

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Replacement of the entire pad might be necessary when the pad becomes completely filled with sediment. The pad will be reshaped as needed for drainage and runoff control. Broken road pavement as a result of construction activities on roadways immediately adjacent to the project site will be repaired immediately. The stone anti-tracking pad will be removed before the subgrade of pavement is applied to the parking lot. The removed stone and sediment from the pad will be hauled off-site and disposed of at Middletown Landfill.

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Questions?

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