



St. Mary's Soil Conservation District  
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St. Mary's County Government  
Department of Public Works &  
Transportation

## **ST. MARY'S SOIL CONSERVATION DISTRICT (SMSCD) AND DPW&T** **CONCEPT EROSION AND SEDIMENT CONTROL AND STORMWATER MANAGEMENT** **GUIDELINES AND CHECKLIST**

### **A. INTRODUCTION FOR CONCEPT EROSION AND SEDIMENT CONTROL AND STORMWATER MANAGEMENT PLANS**

- The following guidelines are to be considered in the preparation of Concept Erosion and Sediment Control and Stormwater Management (SWM) plans (hereinafter referred to as Concept Plan) submitted to the St. Mary's Soil Conservation District (SMSCD) and St. Mary's County Department of Public Works and Transportation (DPW&T) for review and approval. All Concept plans are to be in conformance with this document, the criteria established in the Code of Maryland Regulation Title 26, Subtitle 17, Chapters 01 and 02, the "2010 Maryland Standards and Specifications for Soil Erosion and Sediment Control", (Standards and Specifications), or later revisions, and the "2000 Maryland Stormwater Design Manual", as amended.
  - The plan must be a comprehensive design strategy for maintaining predevelopment runoff characteristics and protecting natural resources. This strategy, known as Environmental Site Design or "ESD," relies on integrating site design, natural hydrology, and small controls to capture and treat runoff.
  - The primary goal is to maintain predevelopment runoff characteristics to the maximum extent possible after development.
1. Designers must now ensure that plans are designed to:
    - a. Prevent soil erosion from development projects.
    - b. Prevent increases in nonpoint pollution.
    - c. Minimize pollutants in stormwater runoff from both new development and re-development.
    - d. Restore, enhance, and maintain chemical, physical, and biological integrity of receiving waters to protect public health and enhance domestic, municipal, recreational, industrial and other uses of water as specified by MDE.
    - e. Maintain 100% of the average annual pre-development groundwater recharge volume.
    - f. Capture and treat stormwater runoff to remove pollutants.
    - g. Implement a channel protection strategy to protect receiving streams.
    - h. Prevent increases in the frequency and magnitude of out-of-bank flooding from large, less frequent storms.
    - i. Protect public safety through the proper design and operation of stormwater management facilities.

2. Environmental Site Design (ESD) is defined as “...using small-scale stormwater management practices, nonstructural techniques, and better site planning to mimic natural hydrologic runoff characteristics and minimize the impact of land development on water resources.” This definition includes:
  - a. Optimizing conservation of natural features (e.g., drainage patterns, soil and vegetation).
  - b. Minimizing impervious surfaces (e.g., pavement, roofs).
  - c. Slowing down runoff to maintain discharge timing and to increase infiltration and evapotranspiration.
  - d. Using other nonstructural practices or innovative technologies approved by MDE.
3. ESD techniques involve protecting natural resources, integrating erosion and sediment controls with stormwater management practices, minimizing site imperviousness, and using natural conveyance and ESD practices throughout the site. Applying these techniques early in the design process will ensure that all available resources have been considered in order to protect streams and waterways from the impact of land development activities.
4. Developing a concept plan begins with gathering, mapping, and analyzing information about the physical characteristics of the site. Designers shall visit the proposed development site in order to clearly understand its topographic, vegetative, drainage and soil characteristics, and to verify the site resource mapping. Relying exclusively on topographic maps, soils maps, other materials found in the office without field verification is not an acceptable planning technique.

## **B. CONCEPT PLAN DESIGN CONSIDERATIONS**

1. Concept Plan and Resource Mapping
  - a. The Concept Plan will include site resource mapping and a strategy to minimize disturbed areas, protect and avoid natural resources, and protect and avoid steep slopes and highly erodible soils. Review of the Concept Plan will ensure that all important resources have been mapped, protected, and all opportunities to enhance natural areas have been explored early in the design process.
  - b. The resource mapping component will be used as a basis for all subsequent decisions during project design. During this step, the developer shall identify significant natural resources and demonstrate these areas will be protected and preserved. Additionally, options will be evaluated to enhance important hydrologic functions. The District, the Department of Land Use and Growth Management (LUGM) and/or DPW&T may require that other features be shown depending on site characteristics. This map shall be field verified by the project designer. Specific areas that shall be mapped are organized by government regulatory authority in Table 1 below.

**TABLE 1**  
**Natural Resources and the Corresponding Regulatory Authorities:**

Federal	State	Local
<ul style="list-style-type: none"> <li>- Wetland</li> <li>- Major Waterways</li> <li>- Floodplains</li> </ul>	<ul style="list-style-type: none"> <li>- Tidal and Non-tidal Wetland</li> <li>- Wetlands of Special State Concern</li> <li>- Wetland Buffers</li> <li>- Stream Buffers</li> <li>- Perennial Streams</li> <li>- Floodplains</li> <li>- Forests</li> <li>- Forest Buffers</li> <li>- Critical Areas</li> </ul>	<ul style="list-style-type: none"> <li>- Steep Slopes</li> <li>- Highly Erodible Soils</li> <li>- Enhanced Stream Buffers</li> <li>- Topography/Slopes</li> <li>- Springs</li> <li>- Seeps</li> <li>- Intermittent Streams</li> <li>- Vegetative Cover</li> <li>- Soils</li> <li>- Bedrock/Geology</li> <li>- Existing Drainage Areas</li> <li>- Ponds</li> </ul>

- c. The mapping process will identify important natural resources, as well as areas that are highly susceptible to erosion caused by construction activities. Identifying these important resources and high risk locations and protecting them from disturbance is the first step in the planning process. When steep slopes and highly erodible soils are found, measures need to be taken to limit disturbance and minimize impacts. For the purpose of project planning, steep slopes are considered to be any mapping unit with a slope class of 15% or greater. While it may not be practicable to eliminate earth disturbing activities exclusively on the basis of soil erodibility or slope alone, constraints are warranted when both steep slopes and highly erodible soils occupy the same area within the development footprint. Areas with slopes equal to or greater than 25% shall be incorporated into adjacent buffers, remain undisturbed, protected during the construction process, and/or preserved as open space. See Chapter 71 of the Zoning Ordinance for specific resource protection standards and buffer establishment.
- d. Concept plans shall include the existing topography of the site, mapped at suitable contour intervals, which will allow for the identification of drainage patterns, slopes, and natural resources such as wetlands, seeps, streams, forests, critical areas, and buffers. Mapping the flow of water onto, through, and off the site enables the delineation of drainage areas and flow patterns. Downstream wetlands, lakes, streams, structures, or other areas particularly sensitive to damage from erosion and sedimentation should also be investigated, mapped, and incorporated into the design to afford additional protection to these areas. The design shall never allow sediment to flow through a sensitive area.
- e. Investigating the site soil characteristics by geotechnical testing and referring to local soil surveys enables the designer to identify highly erodible soil areas, which are to remain undisturbed. Long or steep slopes (steeper than 15%), highly erodible soils, and vegetative buffer strips along water bodies shall be mapped and designated to remain undisturbed whenever possible.

**2. Strategies to protect steep slopes and highly erodible soil include:**

- a. Identify and map all highly erodible soils and steep slopes.
- b. Protect areas with slopes equal to or greater than 25% from earth disturbing activities.
- c. Divert water flow away from steep slopes and highly erodible soils where possible.
- d. In addition to preserving sensitive areas during disturbance, the environmental benefits of other existing natural resources should be maximized by incorporating protection strategies into the overall goals of the project. Protecting these resources up front in the planning process will allow their many functions to be utilized for infiltration, flow attenuation, groundwater recharge, flood storage, runoff reduction, nutrient cycling, air and water pollution reduction, habitat diversity, and thermal impact reduction.

**3. Natural resources protection and enhancement strategies include:**

- a. Protecting large tracts of contiguous open space, forested areas, and other important resources through conservation easements.
- b. Identifying afforestation opportunities in open space areas and setting aside land for natural regeneration.
- c. Identifying important resources areas that may be expanded such as stream buffers and floodplains.
- d. Minimize disturbance to highly permeable soils.

**4. Site Layout**

- a. After conserving and protecting sensitive resources, the next step in the planning process involves determining the approximate location of buildings, roadways, parking lots, and other impervious areas. These site improvements should be placed at a sufficient distance to protect the conservation areas. Protecting these resources will involve enhancing or expanding forested and stream buffers of adequate widths based on site characteristics.
- b. Minimum buffer widths may be expanded based on receiving stream characteristics, stream order, adjacent land slopes, 100-year floodplain, wetlands, mature forest, vegetative cover, depth of the groundwater table, and the presence of spring seeps and other sensitive areas. Several studies have suggested that minimum buffer widths could be based on site specific functions including: bank stability and water temperature moderation (50 feet), nitrogen removal (100 feet), sediment removal (150 feet) or floodplain mitigation (200 feet). The SMSCD may enhance existing buffer requirements depending upon resource protection goals identified.

- c. After the development footprint has been established, consideration should be given to natural drainage areas and how runoff will travel over and through the site. Sheetflow and existing drainage patterns shall be maintained and discharges from the site shall occur at the natural location wherever possible. New drainage patterns result in concentrated flow that can leave the site at inappropriate or unstable locations, as well as creating erosion, sediment transport, and stream channel stability problems. The use of storm drains and engineered conveyance systems should be minimized by using vegetated swales and other natural systems so that forest, buffers, and overland flow characteristics remain intact. Planning for on-site and off-site drainage patterns must be done early in the design process to establish a stable outfall for downstream discharges. Some of the strategies listed below can be used to establish nonstructural practices such as sheetflow to natural areas. These protection and enhancement tools can then double as important strategies for meeting on-site stormwater requirements.

**5. Strategies for site layout and connecting landscape features include:**

- a. Plan the building footprint and layout to protect conservation areas.
- b. Evaluate opportunities to enhance/expand forested, wetland, and stream buffers.
- c. Grade the site so that runoff will flow from impervious areas directly to pervious areas or other natural conveyance systems.
- d. Maintain natural flow paths between the site and upstream and downstream systems.
- e. Maintain sheet flow and natural overland flow processes wherever feasible.
- f. Provide stable conveyance of runoff off-site.



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## **CONCEPT EROSION AND SEDIMENT CONTROL AND STORMWATER MANAGEMENT PLAN PREPARATION CHECKLIST**

The Concept Erosion and Sediment Control and Stormwater Management plan shall be submitted to the St. Mary's County Department of Land Use and Growth Management for distribution to the review agencies through the Technical Evaluation Committee (TEC), and shall include natural resources mapping, erosion and sediment control locations, ESD locations, concept narrative, and where applicable, geotechnical testing. SMSCD and/or DPW&T may require additional information at this phase; however, at a minimum, the Concept Plan shall include the following:

- \_\_\_ 1. Plan location of all site resources shown in Table 1 of Concept E&S Guidelines.
- \_\_\_ 2. Field verification from the project engineer of the natural resource map.
- \_\_\_ 3. Include appropriate photographs of the natural resources.
- \_\_\_ 4. Proposed limits of clearing and grading.
- \_\_\_ 5. Existing and proposed drainage area maps with drainage area sizes listed.
- \_\_\_ 6. Location and dimensions of proposed impervious areas (buildings, roadways, parking, and sidewalks).
- \_\_\_ 7. Location of existing and proposed utilities.
- \_\_\_ 8. Preliminary locations of erosion and sediment control practices.
- \_\_\_ 9. Preliminary location of ESD practices, and sizing calculations based on each drainage area as well as the overall site area.
- \_\_\_ 10. Suitability factors for each ESD practice chosen.
- \_\_\_ 11. Include stable conveyance of stormwater at potential outfall locations.
- \_\_\_ 12. A narrative that supports the concept and describes how the design will achieve the following:
  - \_\_\_ a. Natural resources protection, enhancement, and preservation.
  - \_\_\_ b. Maintenance of natural flow patterns.
  - \_\_\_ c. Reduction of impervious areas through better site design, alternative surfaces, and nonstructural practices.
  - \_\_\_ d. Integration of erosion and sediment controls into the stormwater strategy.
  - \_\_\_ e. Implementation of ESD planning techniques and practices to the MEP.
- \_\_\_ 13. Geotechnical testing of site soils to identifying highly erodible soils. (If appropriate)
- \_\_\_ 14. Delineation of vegetative buffer strips along water bodies.
- \_\_\_ 15. Delineation of long or steep slopes (steeper than 15%).
- \_\_\_ 16. Discharges to Chesapeake Bay, to impaired waters or to waters with an established Total Maximum Daily Load (TMDL)
  - \_\_\_ a. Protection measures for discharges.
  - \_\_\_ b. Time limits of discharges.
- \_\_\_ 17. Evaluation and designation of stabilization requirements.

- \_\_\_18. The scope of the Concept Erosion and Sediment Control plan is to be clearly defined and fully identified in the title block. All Concept Plan sheets are to be numbered chronologically with a Concept SWM E&S#.
  
- \_\_\_19. Plans are to be legible and shall include: scale (1"=50' maximum), two foot contour intervals, legends, north arrow. All plan sheets must be the same size with a maximum size of 24"x36". Include a site specific vicinity map to scale. Include road name(s), nearest intersections and distance to. Include enough detail on the vicinity map so that someone unfamiliar with the site can quickly locate it in the field.
  
- \_\_\_20. All Concept Plans submitted for review shall contain one (1) set of folded prints for each review agency. The narrative and any accompanying data including this completed checklist should be included on the concept plan sheets, but optionally can be included on a separate 8 ½"x11" document.
  
- \_\_\_21. If the Concept Plan is presented on three or more sheets, provide a composite-overall drawing showing how the individual sheets tie together.  
Match lines and matching sheet numbers are to be included on each sheet.
  
- \_\_\_22. Show property lines and names of all adjacent property owners.
  
- \_\_\_23. Plans must include topographic data sufficiently adequate to show existing conditions adjacent to the site and downstream of all concept sediment controls. This shall be a **minimum** 50 foot adjacent strip upstream, and a **minimum** 100 foot downstream, or as otherwise needed to clearly reflect existing conditions.
  
- \_\_\_24. **The following certification shall be included on all Concept Erosion and Sediment Control Plans and shall be signed at time of plan submittal. Include on the first sheet (lower right hand corner) and do not alter the wording.**

<b><u>CONSULTANTS CERTIFICATION</u></b>	
<i>"I certify that this Concept Erosion and Sediment Control and Stormwater Management Plan represents all significant natural resources based on my personal knowledge of the site, and that this plan was prepared in accordance with the requirements of the review agencies. I have reviewed this Concept Plan with the owner/developer".</i>	
Signature _____	MD License # _____
Print Name _____	Date _____

\*(Include seal, company name, address and phone number if not included elsewhere on plan).

- \_\_\_25. With concept stormwater management and erosion and sediment control approval from all applicable review and approval agencies, the project may proceed to the site development phase.