Berkeley County
Stormwater Design Standards Manual

Berkeley County Engineering

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LIST OF ACRONYMS AND ABBREVIATIONS

BMP	Best Management Practices
CA	Construction Application
CAD	Computer Aided Design
CGP	Construction General Permit
CN	Curve Number
COA	Certificate of Authorization
C-SWPPP	Comprehensive Stormwater Pollution Prevention Plan
CWA	Clean Water Act
CZC	Coastal Zone Consistency
DO	Dissolved Oxygen
EPA	Environmental Protection Agency
EPSC	Erosion Prevention and Sediment Control
FEMA	Federal Emergency Management Agency
GRCP	Gasketed Reinforced Concrete Pipe
HSG	Hydrologic Soil Group
H:V	Ratio of Horizontal to Vertical slope
LCP	Larger Common Plan
LID	Low Impact Development
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer Systems
NAD	North American Datum
NAVD	North American Vertical Datum
NGVD	National Geodetic Vertical Datum
NOI	Notice of Intent
NOV	Notice of Violation
NPDES	National Pollutant Discharge Elimination System

NRCS	Natural Resources Conservation Service
BCM	Bureau of Coastal Management, formerly known as Ocean & Coastal Resource Management (OCRM)
OS-SWPPP	On-site Stormwater Pollution Prevention Plan
QPO	Peak Outflow
ROW	Right-of-Way
SCDES	South Carolina Department of Environmental Services, formerly known as South Carolina Department of Health and Environmental Control (SCDHEC)
SCDOT	South Carolina Department of Transportation
SWMP	Stormwater Management Program
SWPPP	Stormwater Pollution Prevention Plan
T_c	Time of Concentration
TMDL	Total Maximum Daily Load
TSS	Total Suspended Solids
USACE	United States Army Corps of Engineers
WoS	Waters of the State
WQMS	Water Quality Monitoring Station

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CHAPTER 1. GENERAL INFORMATION

1.1 PURPOSE

It is the purpose of this Manual and the Stormwater Management Ordinance to protect, maintain, and enhance water quality and the environment of Berkeley County. Furthermore, this Manual aims to protect the short-term and long-term public health, safety, and general welfare of the citizens of Berkeley County. This Manual is also designed to minimize property damage by establishing requirements and procedures to control the potential adverse effects of increased stormwater runoff and related pollutant loads associated with both future development and existing developed land. Proper management of stormwater runoff will further the purpose of this Manual and the Stormwater Management Ordinance to ensure a functional drainage system, reduce the effects of development on land and stream channel erosion, attain and maintain water quality standards, enhance the local environment associated with the drainage system, reduce local flooding, maintain where necessary pre-developed runoff characteristics of the area in terms of flow rate, volume and pollutant concentration, and facilitate economic development while mitigating associated pollutant, flooding, erosion, and drainage impacts.

This Manual describes the policies and procedures used by the County Engineer to implement the Stormwater Management Ordinance and elements of the County's Stormwater Management Program (SWMP). These standards and procedures will:

1. Clearly describe the Stormwater Management Plan and Construction Application (CA) requirements and approval process.
2. Convey the technical design standards to the engineering community, to include standards which address flow rates, runoff volume, and pollutant load/concentration, as well as specific standards for construction and long-term performance.
3. Provide information on approaches to improve water quality, prevent illicit discharges, and minimize stormwater runoff impacts due to development and redevelopment.
4. Convey other protection provisions related to stormwater discharges, wetlands, and watercourse conservation.

Every effort has been made throughout this Manual to cover the common conditions and information needed by those involved in development. However, these design standards and the County ordinances should be reviewed carefully to ensure that all requirements are being met. Development may also be impacted by State and federal requirements to include, but not be limited to, the National Pollutant Discharge Elimination System (NPDES) Phase II Construction General Permit for Stormwater Discharges from Large and Small Construction Activities (CGP). Those projects not subject to NPDES requirements must still comply with applicable County ordinances and standards.

1.2 SCOPE

The scope of this Manual is limited to the requirements related to stormwater management as reviewed and approved by the Berkeley County Engineer. This Manual is not intended as a textbook or a comprehensive engineering design reference. It was instead developed under the assumption that the user possesses a basic understanding of stormwater control design, construction, or land development. References to guidance documents from federal, State, and local agencies, as well as commercial products are given throughout this Manual to provide additional information to users. Three common examples are the Natural Resources Conservation Service's (NRCS) TR-55, South Carolina Department of Environmental Services (SCDES)

Best Management Practices (BMP) Handbook, and *Low Impact Development in Coastal South Carolina: A Planning and Design Guide*.

The design standards are not intended to restrain or inhibit engineering creativity, freedom of design, or the need for engineering judgment. When shown to be applicable, new methods, techniques, and innovative stormwater BMPs are encouraged to be submitted with supporting documentation for review. However, the use of such approaches should be substantiated with submitted documentation by design professionals showing that the proposed design is equal to, or exceeds the traditional procedures in terms of performance, longevity, and ease of maintenance.

For projects that require site-specific designs pertaining to stormwater management and water quality, site plans, details, calculations, construction specifications, and other technical documents must be signed and sealed by a licensed professional engineer registered in the State of South Carolina, with sufficient knowledge and experience to accomplish all design elements of the site plan. Users who are not justly qualified by education or experience in the fields of stormwater management design, construction, or land development should consult with a qualified professional in one or more of these areas prior to planning for construction activities.

1.3 MANUAL ORGANIZATION

The design standards are divided into five (5) chapters, organized to present recommended technical and engineering procedures along with criteria obtained from local, State, and federal regulations. The remainder of this chapter provides information on the County's authority to develop and enforce design requirements along with several legal matters, background information on stormwater management and its importance, and definitions for terms used throughout this Manual. **Chapter 2** describes the process for obtaining stormwater approval. **Chapter 3** contains specific design requirements and criteria. **Chapter 4** describes the inspection and enforcement process. **Chapter 5** contains references for designing components of the stormwater management system.

1.4 AUTHORIZATION

This Manual has been prepared under the direction of the County Engineer, who has been granted the authority to develop engineering design standards and enact programs and policies to ensure compliance with the NPDES Phase II General Permit for Stormwater Discharges from Regulated Small Municipal Separate Storm Sewer Systems (MS4s), SCR030000, and the County's pertinent ordinances.

1.4.1 NPDES MS4 GENERAL PERMIT SCR030000

Berkeley County, like many other counties and municipalities across the United States, is required to have an NPDES MS4 permit to discharge stormwater. Because construction activities contribute to the discharge of pollutants, the NPDES MS4 permit requires that Berkeley County encourage, promote, and implement certain practices, programs, and procedures for the purpose of reducing or limiting discharge of pollutants to waters of the State. The permit requires that Berkeley County develop and implement a SWMP to control the discharge of pollutants from its MS4 to the maximum extent practicable (MEP). The SWMP has several control measures that must be met. This Manual is in compliance with the MS4 permit and addresses the following control measures; public education, illicit discharge detection and elimination, active construction management, and post-construction management. The MS4 permit can be found at:

https://des.sc.gov/sites/des/files/docs/Environment/docs/Final_SMS4_Permit.pdf

1.4.2 BERKELEY COUNTY ORDINANCES, REGULATIONS, AND STANDARDS

Berkeley County has developed and adopted ordinances and standards, largely based on State and federal regulations, specifically to address concerns associated with uncontrolled stormwater runoff. The principal ordinances and standards for the County that affect the land development selection of stormwater control measures are:

1. Stormwater Management Ordinance: Established the engineering design standards and procedures for obtaining stormwater approval within Berkeley County. The County Engineer was authorized by this Ordinance to develop all necessary regulations, as detailed in this Manual for properly controlling stormwater runoff and mitigating existing and future impacts. The Berkeley County Stormwater Management Ordinance can be found at:

   https://library.municode.com/sc/berkeley_county/codes/code_of_ordinances?nodeId=COOR_CH65UT_ARTIVSTMA

2. Zoning and Land Development Regulations Ordinances: Issues that may be impacted by these Ordinances when designing stormwater management systems include, but are not limited to, limits on building density, buffer and setback requirements, parking lot islands, required parking spaces, tree protection, planting species selection, and screening requirements for ponds and other BMPs. Applicants should specifically check to make sure a desired development type is allowed in the planned location. The Berkeley County Zoning and Land Development Regulation Ordinances can be found at:

   https://library.municode.com/sc/berkeley_county/codes/code_of_ordinances?nodeId=COOR_CH59SULADE

   https://library.municode.com/sc/berkeley_county/codes/code_of_ordinances?nodeId=COOR_APXAZO

3. Building & Codes: Implements and enforces all applicable provisions of the building codes regulations. The Building & Codes Ordinance can be found at:

   https://library.municode.com/sc/berkeley_county/codes/code_of_ordinances?nodeId=COOR_CH11BUBURE

4. Floodplain Ordinances: Implements and enforces all applicable provisions of floodplain management regulations. The Floodplain Ordinance can be found at:

   https://library.municode.com/sc/berkeley_county/codes/code_of_ordinances?nodeId=COOR_CH26FLDAPR

1.5 UPDATES TO THE DESIGN STANDARDS

This Manual is subject to updates. As design technology and criteria evolve or change, or it becomes evident that additional measures are needed to ensure the public general welfare, the Manual will be updated as needed. Updates will be approved by the County Engineer. Users of this Manual are encouraged to provide comments on the content of this Manual at any time in writing to the County Engineer. The comments shall include proposed changes, reasoning, and justification (including any supporting technical documents supporting the changes). All comments will be considered during Manual updates. This Manual can also be found on the Berkeley County website at http://www.berkeleycountysc.gov/.

The previous version (2009) of this Manual has been updated with the following major changes and additions:

- The Construction Application (CA) process had the following changes:
  - Notice of Intent (NOI) forms have been replaced with the standard SCDES NOI forms (**Appendix A** and **Appendix B**)
  - Checklist has been replaced with the standard SCDES Checklist (**Appendix C)**
  - There are now three Application Types:
    - Minor Construction Activities (single-family residential construction disturbing less than one acre of land that is not part of an LCP)
    - Intermediate Construction Activities (all construction activities less than five acres unless it qualifies as a Minor Construction Activity)
    - Major Construction Activities (all projects disturbing five acres or more of land)
  - Minor Construction Activity Certification Form has been created for single-family residential construction that disturb less than one acre and are not part of an LCP (**Appendix D**).
- This Manual incorporates the Site Performance Standards (Section 4.2.5.2) in the current version of the State of South Carolina NPDES General Permit for Storm Water Discharges from Regulated Small Municipal Separate Storm Systems (SCR030000), which requires the management of the first inch of runoff. The Berkeley County Engineer now requires the management of the 85th percentile rainfall event (1.2 inches). This objective can be accomplished through the use of either one, a combination, or equivalent combination of design strategies, control measures, practices, or provisions, such as infiltration, evapotranspiration, rain harvesting, and stormwater reuse and recharge. More information can be found in **Section 3.8.1** in this Manual.
- The design storm for permanent BMPs will be the 25-year, 24-hour storm (**Section 3.4.3**).
- A spreadsheet has been developed to help determine if stormwater systems have been designed in compliance with this Manual. The Runoff Reduction Method will be used to determine if the 85th percentile storm and the peak discharge rate reduction have been managed successfully. Guidance for this spreadsheet can be found in **Appendix E**.
- Low Impact Development (LID) standards have been included. These can be used in conjunction with the new Berkeley County Stormwater Utility Fee Credit Manual.

1.6 STORMWATER MANAGEMENT

Development has the potential to alter the natural drainage patterns, quality, flow rates and volumes of the County's water resources. Traditional solutions have mitigated stormwater as efficiently as possible, while maintaining runoff quantity controls. The following sections discuss these impacts and the design considerations that are available and encouraged.

1.6.1 EFFECTS OF DEVELOPMENT ON WATERSHED HYDROLOGY

Development and urbanization have the following impacts on receiving waterbodies:

- Changes to Stream Flow
  - Increased runoff volumes
  - Increased peak runoff discharges
  - Greater runoff velocities
  - Increased flooding frequency
  - Lower dry weather flows (base flow)
  - Increase in floodplain elevation

- Changes to Stream Geometry
  - Stream channel enlargement
  - Stream down cutting
  - Changes in bed due to sedimentation
- Degradation of Aquatic Habitat
  - Degradation of habitat structure
  - Decline in stream biological functions
- Water Quality Impacts
  - Reduced oxygen in streams
  - Microbial contamination
  - Increases in hydrocarbons and toxic materials
  - Sedimentation
- Property damage and safety concerns
- Unsightly stream channel conditions and restricted use of recreational waters

1.6.2 STEPS TO SUCCESSFUL STORMWATER MANAGEMENT PLANS

Proper planning is necessary to ensure that stormwater management is considered and fully integrated at the various stages of the site-development process. This involves a comprehensive approach to site planning and a thorough understanding of the physical characteristics and resources associated with the project site. This planning includes addressing each of the following categories:

- Stormwater quantity controls
- Erosion and sediment controls
- Stormwater quality controls
- Stormwater conveyance controls
- Maintenance plans and schedules for construction and post-construction

The design of successful Stormwater Management Plans involves adhering to the following principles, where applicable:

- Pre-submittal site meeting/site visit
- Review of the site development requirements
- Detailed site analysis and supporting calculations
- A thorough knowledge of the impacts the stormwater system may have on the watershed
- Creation of a Stormwater Master Plan
- Design aspects of the Stormwater Management Plans
- Approval and completion of the CA

In **Chapter 2**, the procedure for including the necessary documentation for a complete Stormwater Management Plan and CA is provided.

1.6.3 INNOVATIVE DESIGN APPROACH

Innovative approaches to site design focus on source control for stormwater runoff that limit the amount of runoff generated for a BMP to control. When designing for land disturbance activities, the design must address the following four categories of control: water quantity (flood control), design storm control (rate and volume), Erosion Prevention and Sediment Control (EPSC), and pollution control (water quality standards). If an innovative stormwater design approach is to be used, the design professional should take the following considerations in mind, in addition to meeting these categories of control:

- Stormwater quantity and quality are best controlled at the source of the problem by reducing the potential maximum amount of runoff and pollutants. Source control will typically be more economical in order to treat the first flush of a storm event since a simple BMP for a large area will only treat the first flush from the closest portions of the site.
- BMPs address stormwater management by using simple structural and nonstructural methods along with or in place of traditional stormwater management structures when applicable.
- Equaling or exceeding traditional stormwater management designs in terms of performance (rate/volume attenuation, pollutant removal) and economic feasibility (long-term) are essential to a proposed concept's eventual approval.

1.6.4 BEST MANAGEMENT PRACTICES AND SITE PLANNING PROCESS

The first step in addressing stormwater management begins in the site planning and design strategy of the development project. The minimizing of adverse stormwater runoff impacts by the use of BMPs and site planning should be a major consideration for a design professional. By utilizing BMPs, LID practices, and natural site design at the beginning of the planning process, the amount of runoff, peak discharges, and pollutants generated from a site can be reduced. The reduction of runoff volumes, peak discharges, and stormwater pollutants decrease the total number and size of stormwater management controls that must be implemented under the guidelines set forth in this Manual.

1.6.4.1 MAINTAINING SITE RESOURCES AND NATURAL UNDISTURBED AREAS

The benefits provided by natural landscapes include the ability to improve and preserve water quality. For example, core habitats (biodiverse areas of undisturbed forest and wetlands) can filter pollutants, increase water storage capacity, reduce erosion, and provide shade that lowers the temperature and maintains dissolved oxygen (DO) concentrations in surface water. Conservation of natural site resources and undisturbed areas helps to reduce the post-development runoff volume and provides for natural stormwater management. Some ecologically important natural site resources that should be preserved and maintained include, but are not limited to:

- Existing soils
- Natural drainageways
- Riparian corridors or vegetated buffer areas along natural waterways
- Floodplains
- Areas of undisturbed vegetation
- Low areas within the site terrain
- Natural forested infiltration areas
- Wetlands

- Buffers

A series of geographic information system maps were developed for Berkeley County in 2014 to delineate a green space network. These maps of ecologically important undisturbed areas in Berkeley County can be found in *Conserving Green Infrastructure Across the Landscape* (Firehock, 2015). These maps emphasized the importance of preservation of land for water quality (e.g., habitat cores located within 328 feet of a lake, areas that had a stream running through them, or vegetated stream buffers within 492 feet of a named stream).

The planning processes surrounding the development of these maps also involved the establishment of several goals and policies. Berkeley County made the decision to adopt and apply land use principles and development practices which ensure development works in harmony with cultural and natural resources. The County will accomplish this by:

- Encouraging new development to locate in suitable locations in order to protect and preserve natural resources, environmentally sensitive areas, and valuable historic or cultural resources from encroachment.
- Adopting and implementing policies and standards that minimize impacts of site development, including land disturbance, infrastructure, and structures, on the quality of wetlands and other nonrenewable resources.

More information and strategies related to maintaining site resources and natural undisturbed areas can be found in *Low Impact Development in Coastal South Carolina: A Planning and Design Guide*.

1.6.4.2 SITE LAYOUT TECHNIQUES

Site layout techniques involve identifying and analyzing the location and configuration of structures on the site to be developed. Where applicable, the following options that create lower-impact layouts should be used:

- Preserve and maintain pervious open space. Large, continuous areas of open space reduce and slow runoff, filter out sediments, and uptake nutrients.
- Fit the design layout to follow the natural contours of the site to minimize clearing and grading and preserve natural drainage ways and patterns.
- Limit the amount of clearing and grading by identifying the smallest possible area on the site that would require land disturbance.
- Place development areas on the least sensitive areas of the site and avoid steeply sloped areas when possible.
- Locate development areas where the pre-development curve number (CN) is less sensitive (i.e., plan development on barren, poorly drained Hydrologic Soil Groups (HSG) C and D soils rather than developing forested, well-drained HSG A or B soils.
- Utilize nontraditional designs to reduce the overall imperviousness of the site by providing more undisturbed open space and minimizing clear-cutting.
- Design roads, sidewalks, and parking areas to minimize imperviousness. Examples of LID roadway and parking guidance can be found in *Low Impact Development in Coastal South Carolina: A Planning and Design Guide* (2014).
- Consider the utilization of cisterns and rain barrels to collect stormwater for reuse.

- Level spreaders or other energy dissipation devices should be used at all discharge points, including discharge points into ponds and other basin-type BMPs. More information on these devices is provided in **Chapter 3**.

1.6.4.3 MINIMIZATION OF IMPERVIOUS COVER

Between 2013 and 2024, Berkeley County's population increased by approximately 30 percent—roughly double the statewide growth rate of about 15 percent for South Carolina—based on U.S. Census Bureau population estimates. Such patterns are associated with disproportionate increases in impervious surface, stormwater runoff volumes, and downstream water-quality impacts relative to population growth. Based on U.S. Geological Survey analyses, impervious cover in urbanizing areas typically consists of roughly 30 percent building and roof surfaces, about 30 percent roadway surfaces, approximately 25 percent parking areas, and the remainder comprised of driveways, sidewalks, and other paved features, reflecting the diverse infrastructure contributions to sprawl-related imperviousness (USGS, 2007). In addition to impeding the natural infiltration of precipitation and reducing natural groundwater recharge, impervious surfaces have been linked with water quality problems for South Carolina tidal creeks. With as little as 10-20% impervious cover in a watershed, there are measurable physical and chemical changes in tidal creeks, such as altered hydrography, increased salinity variance, chemical contaminants, and fecal coliform loadings (Holland et al., 2004). Furthermore, measurable impacts to living resources (such as fish and crabs) were observed in watersheds when impervious cover exceeded 20-30% (Holland et al., 2004).

The minimization of total impervious area directly relates to a reduction in stormwater runoff volume and the associated pollutants from a development site. The amount of impervious cover on a site can be reduced by the following techniques, where applicable:

- Minimize disturbance to existing permeable soils and restore disturbed soils; post-development sites often have compacted soil that mimics impervious cover. Where disturbance occurs, soils should be decompacted and amended to restore infiltration capacity and biological function.
- Consider redevelopment and infill over conversion of natural lands to new development. Pursue development in areas with existing infrastructure. and/or already degraded watersheds, while incorporating retrofit measures that reduce existing stormwater impacts and support watershed recovery.
- Reduce building footprints by constructing some buildings as multi-story to limit land disturbance and impervious cover.
- Reduce parking lot areas and excess pavement. Use shared parking, right-sizing strategies, and porous or permeable pavement systems for overflow or low-traffic parking areas where site conditions are suitable.
- Design narrower streets, which can reduce impervious area by 5-20% in a typical residential subdivision (Schueler, 1995), while maintaining emergency access and safety requirements.
- Reduce cul-de-sac widths, include pervious islands, and consider alternative turnarounds.
- Increase the amount of vegetated parking lot "islands" that can also be utilized for stormwater management practices such as bioretention areas. Consider grading these islands as shallow depressions and removing curbs or installing curb cuts in order to facilitate routing of stormwater to these islands.
- Disconnect impervious surfaces to reduce runoff volume and improve water quality. When applicable, direct rooftop runoff to pervious or amended soil areas (e.g., managed turf areas, forest cover, preserved open space, or a compost-amended filter path) or other LID practices such as infiltration

wells, bioretention or other volume-reduction practices for water quality treatment and infiltration instead of directly connecting runoff to storm sewer systems.

Additional examples for how to minimize impervious cover can be found in *Low Impact Development in Coastal South Carolina: A Planning and Design Guide* (2014).

1.6.4.4 UTILIZATION OF NATURAL FEATURES FOR STORMWATER MANAGEMENT

Structural stormwater drainage controls are traditionally designed to quickly remove stormwater runoff from the site without utilizing any of the natural storage areas. These natural drainage areas should be considered as potential stormwater drainage systems. These natural areas can be utilized in the following ways where applicable:

- Vegetated buffers and undisturbed areas on the site are useful to control sheet flow (not concentrated flows) by providing infiltration, runoff velocity reduction, and pollutant removal. Site and lot vegetation can be used to promote natural stormwater retention and increase time of concentration (T_c).
- Various natural drainageways should be maintained and not disturbed to provide a natural stormwater drainage system to carry runoff to an existing outlet. The use of natural drainageways allows for more storage of stormwater runoff, lower peak flow rates, a reduction in erosive runoff velocities, and the capture and treatment of pollutants.
- Curb and gutter systems may be combined with vegetated swales at outfalls to provide added water quality benefits versus the traditional piped outfall designs.

1.6.4.5 LOW IMPACT DEVELOPMENT

The goal of LID is to create a post-development landscape that behaves with a similar hydrologic function as the pre-developed site through techniques that promote storage, infiltration, evaporation, and treatment of runoff. This is accomplished through an integrated, comprehensive approach to land development or redevelopment that works with nature to manage stormwater as close to its source as possible. LID practices and natural site design reduce the amount of total post-development impervious areas and maintain natural characteristics of the pre-development site conditions. Therefore, the post-development CNs and T_c are maintained more closely to pre-development conditions. This reduces the overall hydrologic and hydraulic impact of the development. Principles of and layout techniques to incorporate LID into design can be found in **Section 3.2.2**.

Guidance on LID design can be found in the *Low Impact Development in Coastal South Carolina: A Planning and Design Guide* (2014). A free Coastal South Carolina LID Compliance Calculator Spreadsheet, developed by the National Estuarine Research Reserve System, is available to assist property owners in calculating stormwater treatment requirements and runoff reductions based on statewide rules and regulations. The spreadsheet can be accessed using the link provided below:

https://nerrssciencecollaborative.org/resource/coastal-south-carolina-lid-compliance-calculator

1.6.5 CHARACTERIZATION OF URBAN STORMWATER RUNOFF QUALITY

This section provides some background information on the major sources of pollutants commonly found in stormwater flows and those that impact County waterbodies. In **Table 1-1**, these sources and the pollutants most commonly associated with them are presented. This is followed by a detailed discussion of the most common pollutants found in stormwater discharges.

Table 1-1. Typical Stormwater Pollutants and Sources

Pollutant Source	Pollutants of Concern
Erosion	Sediments and attached soil nutrients (numerous nitrogen and phosphorus forms), organic matter, and other adsorbed pollutants
Atmospheric Deposition	Hydrocarbons emitted from automobiles, dust, metals, nutrients, and other chemicals released from industrial and commercial activities
Roadways/Transportation related areas	Hydrocarbons emitted from automobiles, dust, metals, Tire and Road Wear Particles (TRWP) including microplastics and other contaminants
Construction Sites	Sediment, metals, paint, and wood preservatives
Manufactured Products (Industrial land uses)	Heavy metals, phenols, and oils from automobiles, Zinc and Cadmium from tire wear
Lawn and Landscape Maintenance	Fertilizer and pesticides
Plants and Animals	Plant debris, animal excrement
Septic Tanks	Coliform bacteria, nitrogen, nitrate
Non-Storm Water Connections	Sanitary sewage, industrial wastewater, commercial discharge, and construction activities
Accidental Spills	Pollutants of concern depend on the nature of the spill
Animal Waste Management	Coliform bacteria, nitrates, and phosphorus
Pesticide Applications	Pollutants of concern depend on the pesticide being used and the type of crop or pest being treated
Land Disturbance Agriculture	Sediment and attached soil nutrients, organic matter, and other adsorbed pollutants
Fertilizer Applications	Nitrogen and phosphorus

Source: U.S. Environmental Protection Agency, June 1992.

1.6.5.1 SUSPENDED SOLIDS

The most prevalent form of stormwater pollution is the presence of suspended matter that is either eroded by stormwater or washed off paved surfaces by stormwater. Suspended solids increase the turbidity of the receiving water, thereby reducing the penetration of light, resulting in decreased activity and growth of photosynthetic organisms. The increased turbidity also detracts from the aesthetics of natural waters. In addition, the clogging of fish gills has been attributed to the presence of suspended solids. Combined sewer overflows typically contain high suspended solids concentrations. The solids that settle in the receiving

water pose long-term threats resulting from their oxygen demand and gradual accumulation of toxic substances (Moffa, 1990), as well as reducing primary production. Sedimentation and other forms of physical separation are often an effective means of removing suspended solids from stormwater.

Sediment is derived from a variety of sources, including erosion from disturbed areas, washoff of sediment deposited on impervious areas, and detachment of sediment due to the increased stream power that comes from increased flow rates and flow durations with urbanization. A significant number of models are available to predict total suspended solids (TSS) contributions from "clean" sediment, but few of the models have parameters specific to urbanized areas. Most of the models were developed to deal with agricultural soils, and their application to urban areas is limited.

Models with demonstrated capability for estimating sediment loads in urban and urbanizing watersheds include SWMM for simulating urban runoff and sediment buildup and washoff processes, and watershed-scale models such as SWAT for mixed land-use sediment loading. Other models, including SEDPRO and the IDEAL model, have been applied historically for sediment estimation and BMP evaluation but are less commonly used in current practice. To effectively inform BMP sizing and performance evaluation, sediment predictions should consider time-varying sediment loads and particle size distributions, recognizing that many models approximate these distributions and that aggregated particle behavior, rather than primary particle size alone, governs sediment transport and removal in stormwater BMPs.

1.6.5.2 OXYGEN DEMANDING MATTER AND BACTERIA

Sufficient levels of DO in the water column are necessary to maintain aquatic life, growth, and reproductive activity, as well as to maintain aerobic conditions. The introduction of stormwater containing oxygen-demanding organic matter can impair the receiving water quality by reducing the DO levels such that it is unable to sustain certain forms of aquatic life and can further cause the water to become foul.

Bacteria enter the stormwater drainage systems typically from the runoff of animal feces and organic matter from the catchment surface, possibly even disturbed soil. Bacteria also may enter the stormwater system – and ultimately the natural receiving waterbodies – through leaking sewer systems (lateral connections, manholes, and industrial or commercial drains, etc.) and malfunctioning septic systems. All of these are termed illicit discharges and illegal by the Berkeley County Stormwater Management Ordinance. Organic matter, usually in the form of vegetation and detritus, is carried through the conveyance system by the stormwater. Pathogenic bacteria and viruses in stormwater discharges pose human health threats. The removal of pathogenic bacteria is achieved primarily through the process of biological decay and physical-chemical disinfection where practiced. Presence of such bacteria is assumed based on the detection of indicator bacteria such as fecal coliforms or E-coli. The reduction of bacteria in waters of the State has been the focus of total maximum daily load (TMDL) efforts by SCDES to date. Over 400 sites or stations are covered under a TMDL developed in South Carolina and approved by United States Environmental Protection Agency (EPA). Approximately 350 of these approved TMDLs are for fecal coliform bacteria (SCDES 2017).

1.6.5.3 NUTRIENTS

Nitrogen and phosphorus are essential plant nutrients that, when present in excess, stimulate algal growth and contribute to eutrophication. Recent assessments by the U.S. Environmental Protection Agency indicate that nutrient pollution is among the most widespread stressors affecting the biological condition of U.S. rivers, streams, and lakes (EPA, 2022). Such nutrient enrichment contributes to eutrophication of water bodies, which can result in excessive algal growth, reduced dissolved oxygen (hypoxia), alteration of aquatic communities, and diminished recreational and water supply value (U.S. EPA, 2023).

Nutrients are typically derived from agricultural runoff as well as runoff from chemicals applied to lawns in urbanized areas, runoff from industrial sites, municipal wastewaters (of more concern for combined sewer overflows), or atmospheric deposition onto impervious surfaces that is later washed into stormwater. Model studies indicate that the increase in nutrient loading due to increased imperviousness is dramatic. Nutrients can be removed from stormwater prior to discharge through biological uptake such as by plantings in stormwater quality control ponds.

Nutrient loading from construction and post-construction stormwater runoff is commonly estimated using urban stormwater models such as SWMM, which simulate runoff generation and sediment-associated pollutant buildup and washoff processes. The IDEAL model has historically been referenced in Berkeley County and other South Carolina guidance for estimating nutrient loading and BMP performance using simplified equilibrium partitioning concepts to approximate dissolved and particle-associated nutrient fractions; however, its use has declined in current practice. Contemporary stormwater design more commonly relies on empirical BMP performance data, sediment-associated nutrient assumptions, and time-varying load estimates, recognizing that nutrient fate and removal are strongly influenced by particle size distributions and the behavior of aggregated sediments within stormwater BMPs (EPA, 2016).

1.7 ENGINEERING DESIGN ACCOUNTABILITY

This Manual will assist engineers, plan reviewers, inspectors, and contractors in the design and layout of most land disturbance projects. However, this Manual does not replace or otherwise excuse the need for professional engineering judgment and knowledge. The user of this Manual is hereby cautioned that many aspects of engineering design must be considered, including but not limited to:

- Public health and safety
- Site-specific conditions or unusual features of a project site that warrant special designs
- Current versions of design texts, manuals, technical documents, and research

The design engineer (with assistance from other design professionals as needed) is expected to thoroughly investigate field conditions and coordinate all design efforts with Berkeley County. For applicable projects, construction plans must be stamped and signed by a licensed professional engineer registered in the State of South Carolina, unless otherwise stated in this Manual. The design professional must have sufficient education and experience to perform a complete and thorough design of each element shown on the construction plans and must also have complete control to change or alter plans during the design phase. The professional's stamp is a public guarantee that his design has the highest regard for health and safety, protects the environment (air, soil, water) to the maximum degree possible, and serves the interests of the general public within Berkeley County. A Certificate of Authorization (COA) is required on the construction plans and Stormwater Pollution Prevention Plan in addition to the design professional’s certification.

Berkeley County requires a certain level of design expertise for stormwater calculations and flooding analyses. Stormwater design criteria are based upon current scientific knowledge and engineering judgment. It should be realized by engineering designers that floods and flooding may occur at any time due to any number of factors beyond the reasonable control of Berkeley County, such as greater amounts of precipitation or different rainfall patterns than used in design storms, wet soil conditions, debris or blockage of key stormwater channels, high groundwater tables, etc.

1.8 LEGAL ASPECTS

If any portion of this Manual is ruled to be invalid or unconstitutional by any court with adequate jurisdiction over Berkeley County, then such portion shall be considered to have been selectively removed

from the design standards without affecting this Manual's overall applicability and legal standing to the land disturbance process. This Manual will be revised on a periodic basis to reflect known changes to laws and regulations. All local, State, and federal laws and regulations shall be considered in regard to this Manual. In each instance, the more restrictive requirement shall govern unless sound engineering judgment can determine and prove that the more restrictive requirement would be otherwise unnecessary. In most instances, laws and regulations that are phrased more explicitly shall apply over those items that are described in general terms.

1.9 CONTACT INFORMATION

The following Berkeley County personnel should be contacted for any questions, clarifications, or other information related to stormwater management and this Manual. Primary contact for stormwater issues:

Berkeley County Engineer's Office

1003 US Highway 52, Suite 120

P.O. Box 6122

Moncks Corner, S.C. 29461-6120

(843) 719-4195

webswmp@berkeleycountysc.gov

1.10 DEFINITIONS

Words used in this Manual shall have their customary meanings as determined by the standard dictionary definition except for the following specific words and terms which are herein defined or are otherwise defined in the Berkeley County Stormwater Management Ordinance. In any case, the County Engineer shall have the right to define or interpret any other word or term contained within this Manual. The rules of verbal construction found in the Stormwater Management Ordinance apply to this Manual.

1. Applicant: a person, firm, governmental agency, partnership, or any other entity who seeks to obtain approval under the requirements of this Manual and Berkeley County Stormwater Management Ordinance and who will be responsible for the land disturbing activity and related maintenance thereof.
2. As-Built: See Record Drawing.
3. Best Management Practices (BMPs): any structural or non-structural measure or facility used for the control of stormwater runoff, be it for quantity or quality control. BMPs also include schedules of activities, prohibition of practices, maintenance procedures, treatment requirements, operating procedures, and other management practices to control site runoff, spillage or leaks, sludge or waste disposal, drainage from raw material storage, or otherwise prevent or reduce the pollution of waters of the State.
4. Building: (1) a relatively permanent enclosed structure over a plot of land, having a roof and usually walls and windows and often more than one level, used for any of a wide variety of activities, as living, entertaining, or manufacturing; (2) anything built or constructed; (3) the act, business, or practice of constructing houses, office buildings, etc.
5. Construction Activity: a land-disturbing activity involving clearing, grading, excavating, transporting, filling, or any other activity which results in a change in the natural cover or topography that may cause erosion and contribute to sediment and alter the quality and quantity of stormwater runoff.

6. Construction Application: means the set of drawings, specifications, design calculations, and other documents necessary to demonstrate compliance with the County's Stormwater Management Ordinance.
7. Contour: an imaginary line, or its representation on a topographic map, joining points of equal elevation.
8. Culvert: any structure not classified as a bridge which provides an opening under any roadway, including pipe culverts, and any structure so named in the plans.
9. Datum: a quantity, or a set of quantities, that serves as a basis for the calculation of other quantities; in surveying and mapping, a datum is a point, line, or surface used as a reference in measuring locations or elevations. The horizontal and vertical datum required for plan set submittal in Berkeley County is North American Datum (NAD) 83 and North American Vertical Datum (NAVD) 88, respectively.
10. Detention: the collection and storage of stormwater runoff in a surface or sub-surface facility for subsequent controlled discharge to a watercourse or water body.
11. Developer: any person, or others who act in his own behalf, that is required to submit an application for approval of construction activities to disturb land or encroachment and is thereafter responsible for maintaining compliance with the Berkeley County Stormwater Management Ordinance, this Manual, and conditions of the approved application.
12. Ditch: a drainage channel in earth created by natural or artificial means to convey surface and/or subsurface water, flowing continuously or intermittently.
13. Drainage: a general term applied to the removal of surface or subsurface water from a given area either by gravity via natural means or by systems constructed so as to remove water, and is commonly applied herein to surface water.
14. Early Site Plan (Mass Grading): A preliminary plan involving clearing, grading, and initial site work with subsequent plans for one or more phases of intended development to follow.
15. Easement: an authorization by a property owner to the general public, a corporation, or a certain person or persons for the use of any designated part of his property for a specific purpose.
16. Elevation: height in feet above a given known datum, such as mean sea level.
17. Embankment or Fill: a deposit of soil, rock or other material placed by man.
18. Engineered Device: a structural device that is designed to improve stormwater quality and/or quantity by controlling runoff volumes, rates, or pollutants, etc.
19. Erosion: the wearing away of the land surface by the action of wind, water, gravity, ice, or any combination of those forces.
20. Erosion Prevention: measures employed to protect the soil surface and prevent soil particles from being detached by wind, water, gravity, ice, or any combination of these forces.
21. Final Stabilization: all land-disturbing activities at the construction site have been completed and that on all areas not covered by permanent structures, either (1) a uniform (e.g., evenly distributed, without large bare areas) vegetative cover with a density of 70 percent of the natural background vegetative cover has been established excluding areas where no natural background vegetative cover is possible (e.g., on a beach), or (2) equivalent permanent stabilization measures (such as the use of landscaping mulch, riprap, pavement, and gravel) have been implemented to provide effective cover for exposed portions of the construction site not stabilized with vegetation.
22. Flood/flooding: a temporary rise in the level of water which results in the inundation of areas not ordinarily covered by water.

23. Grading: any displacement of soil by stripping, excavating, filling, stockpiling, or any combination thereof, including the land in its excavated or filled state.

24. Illicit Discharge: defined in South Carolina Water Pollution Control Permits Regulation 61-9 122.26(b)(2) and refers to any discharge to a Berkeley County stormwater management system or facility or waters of the State that is not composed entirely of stormwater except (a) discharge pursuant to an NPDES permit (other than the NPDES MS4 Permit for Berkeley County) and discharges resulting from the fire-fighting activities.

25. Impervious surface: a surface which has been compacted or covered with a layer of material so that it is highly resistant to infiltration by water. The term includes most conventionally surfaced streets, roofs, sidewalks, parking lots, and other similar structures.

26. Intergovernmental Agreement: an agreement between the County and participating municipalities allowing the County to charge utility fees and complete stormwater-related work within the municipalities.

27. Invasive Plants: introduced species of mosses, ferns, grasses, herbaceous perennials, shrubs, vines, and trees that have the ability to thrive and spread aggressively outside their native range.

28. Larger Common Plan for Development or Sale (LCP) is broadly defined as any announcement or piece of documentation (including a sign, public notice or hearing, sales pitch, advertisement, drawing, permit application, zoning request, computer design, etc.) or physical demarcation (including boundary signs, lot stakes, surveyor markings, etc.) indicating construction activities may occur on a specific plot. [63 Federal Register No. 128, July 6, 1998, p. 36491].

    A common plan for development or sale identifies a site where multiple separate and distinct construction activities (areas of disturbance) are occurring on contiguous areas. Such sites may have one operator or owner or several operators and owners. Construction activities may take place at different times on different schedules, in separate stages, and/or in separate phases, and/or in combination with other construction activities. Each Developer, Operator or Owner for each Site or Project determined to be a part of an LCP are subject to permitting requirements as defined by this permit.

    Projects and sites identified as part of an LCP for development or sale are linked through permitting by the Department as part of one plan, referred to as the larger common plan. Stormwater management and sediment control plans for LCP projects must demonstrate that adequate stormwater management facilities are designed for the Project(s) or Site(s) to control pollution and protect water quality during all stages or phases of development. These plans must also provide engineering designs that address the post-construction water quantity and quality control requirements established in South Carolina Regulation 72-300, Standards for Stormwater Management and Sediment Reduction which are authorized by the South Carolina Stormwater Management and Sediment Reduction Act. These engineering designs must account for the cumulative changes of land development to ensure adequate controls are constructed on site as development progresses. Projects or Sites added as part of an LCP may be required to expand existing or provide additional stormwater management facilities to control pollution from land disturbance activities from other contiguous areas or proposed additional phases as required by this permit. Stormwater management facility expansions or additions may also be necessary to address post-construction water quantity and quality requirements.

    LCP projects are typically identified by the documentation that identifies the scope of the project including such things as plats, blueprints, marketing plans, contracts, building permits, public notice or hearing, and zoning requests. If master calculations have been prepared and/or submitted for an entire site, then all phases and parcels at that site would be considered part of an LCP. (Ref. 2026 SCDES CGP)

29. Low Impact Development (LID): an approach to land development (or redevelopment) that works with nature to manage stormwater as close to its source as possible.
30. Maximum Extent Practicable (MEP): the technology-based discharge standard for MS4s to reduce pollutants in stormwater discharges that was established by the Clean Water Act (CWA).
31. Mean Sea Level: the average (mean) height of the sea or ocean, in reference to NAVD 88.
32. Municipal Separate Storm Sewer Systems (MS4s): conveyances or system of conveyances (including, but are not limited to, catch basins, curbs, gutters, ditches, man-made channels, pipes, tunnels, and/or storm drains) that receives, transports, stores, or treats stormwater runoff and that is:
    a. Owned or operated by Berkeley County.
    b. Designed or used for collecting or conveying stormwater.
    c. Not a combined sewer system.
    d. Not part of a Publicly Owned Treatment Works.
33. National Pollutant Discharge Elimination System (NPDES): addresses water pollution by regulating point sources that discharge pollutants to waters of the United States.
34. National Pollutant Discharge Elimination System (NPDES) Permit: permit for stormwater discharges issued by SCDES pursuant to the CWA and the federal stormwater discharge regulations (40 CFR 122.26) that allows for restriction of pollutant loads as necessary to meet water quality standards.
35. Native Plants: species that have an evolutionary history with the biological and physical factors specific to a region, and typically require less irrigation, fertilizers, and maintenance than non-native or exotic species.
36. New Development: any of the following actions undertaken by any person, including, without limitation, any public or private individual or entity:
    a. division of a lot, tract, parcels or other divisions by plat or deed.
    b. the construction, installation, or alteration of land, a structure, impervious surface, or drainage facility.
    c. clearing, scraping, grubbing, or otherwise significantly disturbing the soil, vegetation, mud, sand, or rock of a site.
    d. adding, removing, exposing, excavating, leveling, grading, digging, burrowing, dumping, piling, dredging, or otherwise disturbing the soil, vegetation, mud, sand, or rock of a site.
37. Notice of Intent (NOI): the mechanism used to request and obtain coverage under a general permit.
38. Operator: the person who has operational control of the property, including an operator or person who is in charge of any activity related to land disturbance, construction or post construction stormwater quality or quantity.
39. Outfall: a point source as defined by section 122.2 of SC Regulation 61-9 at the point where a stormwater management system or facility discharges to waters of the State and does not include any conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the State.
40. Outlet Control Structure: a stormwater management facility designed to regulate the elevation, rate, and volume of stormwater discharge from detention facilities.

41. Owner: the property owner or authorized agent that submits an application for approval to disturb land or vegetation or encroachment, and the person, if so designated by default or on legal documents, as the responsible party for maintenance of a stormwater management system(s) and facility(s).
42. Pollutant: defined in Section 122.2 of South Carolina regulation 61-9 as dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal, and agricultural waste discharged into water. Typical construction site pollutants include sediment, oil and grease, pesticides and fertilizers, pollutants from construction wastes, and pollutants from construction materials.
43. Post-Development Conditions: those conditions which are expected to exist, or do exist, after alteration, of the natural topography, vegetation, and rate, volume, or direction of stormwater runoff, (resulting from development activity).
44. Pre-Development Conditions: those conditions, in terms of the existing topography, vegetation and rate, volume or direction of stormwater runoff, which exist at the time the applicant submits an application form for a construction activity or variance.
45. Project: improvements and structures proposed by the applicant to be constructed on a defined site.
46. Rate: volume of water passing a point per unit of time, generally expressed in cubic feet per second.
47. Receiving Water(s) or Receiving Waterbody: refers to any lakes, bays, sounds, ponds, impounding reservoirs, springs, wells, rivers, streams, creeks, estuaries, marshes, inlets, canals, and the Atlantic Ocean within the territorial limits of the State of South Carolina and all other bodies of surface or underground water, natural or artificial, public or private, inland or coastal, fresh or salt.
48. Re-Development: a project that proposes to modify an existing built upon site.
49. Regulated Area: any portion of the County that is so designated by Berkeley County Council, consistent with State and Federal regulations. The Council may amend the Regulated Area from time to time.
50. Retention: the collection and storage of stormwater runoff without subsequent discharge to surface waters.
51. Retrofit: the process of altering an existing drainage system to function properly or more efficiently than currently exists. Retrofitting will be a common method used by the County to address TMDLs to include installation of water quality/runoff treatment devices.
52. Runoff: that part of rainfall that is not absorbed into the sites but flows over the site as surface waters.
53. Sediment: fine, particulate material, whether mineral or organic, that is in suspension and is being transported, or has been transported, from its site of origin by water or air.
54. Sediment Control: measures employed to prevent eroded soil particles from leaving the site.
55. Sedimentation: the process which operates at or near the surface of the ground, or deposits soils, debris, and other materials either on other ground surfaces or in the waterbody.
56. Sedimentation Facility: any structure or area which is designed to retain suspended sediments from collected stormwater runoff, to include sediment basins.
57. Shallow Concentrated Flow: stormwater flow after approximately 100 feet of sheet flow that collects in swales, small rills, and gullies. It is assumed that shallow concentrated flow does not have a well-defined channel and has flow depths of 0.1 to 0.5 feet.
58. Sheet Flow: flow over plane surfaces, usually within the headwaters of streams near the ridge of the watershed boundary Typically occurs for no more than 100 feet before transitioning to shallow concentrated flow.

59. Single-Family Residential: a single noncommercial dwelling that is occupied exclusively by one family and not part of a residential or subdivision development. This classification includes mobile home and factory-built housing.

60. Site: any tract, lot, or parcel of land or combination of tracts, lots, or parcels of land which are in common ownership, or are contiguous and in diverse ownership where development is to be performed as part of a unit, subdivision, or project.

61. Site Construction: the act or process of altering the natural cover or topography and alters the quality or quantity of stormwater runoff.

62. Special Protection Areas: designated areas within the County within which more stringent design standards have been established to address an existing problem, such as flooding or water quality. Construction activities occurring within these areas will be required to comply with the additional or more stringent design criteria.

63. Stormwater Discharge Point: the location where collected and concentrated stormwater flows are discharged from the construction site.

64. Storm Frequency: rate of likely recurrence of a rainstorm over a period of specified time.

65. Stormwater Management Plan: the plan to manage stormwater in terms of collection, conveyance, storage, treatment, and disposal of stormwater runoff in a manner to meet the objectives of the County Stormwater Management Ordinance, the Manual and their terms, including, but not limited to, measures that control the increased volume and rate of stormwater runoff and water quality impacts caused by man-made changes to the land. This plan is approved as detailed in this document and includes the engineering calculations and construction drawings.

66. Stormwater Management Program (SWMP): control measures used by Berkeley County to address stormwater discharges, flooding, and water quality standards within Berkeley County.

67. Stormwater Pollution Prevention Plan (SWPPP): a site-specific document that identifies potential sources of pollution, describes stormwater control measures to reduce or eliminate pollutants in stormwater discharges, and identifies procedures the operator shall implement to comply with the terms and conditions of a permit. The SWPPP includes site map(s), drawings and plans, other documents, and supporting calculations, identification of activities that could cause pollutants in the stormwater, and description of measures or practices to control these pollutants. A SWPPP may be prepared for construction sites, municipal facilities, or industrial facilities. A SWPPP is divided into two (2) subcategories: Comprehensive SWPPP and On-Site SWPPP

    a. Comprehensive SWPPP (C-SWPPP): defined in the 2026 NPDES CGP Section 3.1.1.G. A C-SWPPP must be designed, approved, and implemented to meet all applicable requirements outlined by the NPDES CGP. It accompanies the NOI when the permittee is seeking coverage under the permit. Construction site plans are referenced as part of the contents of a C-SWPPP but do not have to be bound to the C-SWPPP and should be submitted as a separate document.

    b. On-Site SWPPP (OS-SWPPP): defined in the 2026 NPDES CGP Section 3.1.1.H. An OS-SWPPP is a derivative of the C-SWPPP and is created after the C-SWPPP has been submitted and approved by SCDES and Berkeley County. It is to be stored at the construction site as required by Section 3.1.6 of the NPDES CGP.

68. Structures: anything constructed or erected, the use of which requires a location on the ground or attached to something having a location on the ground, including, but not limited to, tennis courts, swimming pools, fences, and buildings.

69. Subdivision: all divisions of a tract or parcel of land into two or more lots, building sites, or other divisions for the purpose, whether immediate or future, of sale, lease, or building development, and

includes all division of land involving a new street or change in existing streets, and includes re-subdivision which would involve the further division or relocation of lot lines of any lot or lots within a subdivision previously made and approved or recorded according to law; or, the alteration of any streets or the establishment of any new streets within any subdivision previously made and approved or recorded according to law, and includes combination of lots of record. A site that is part of a subdivision is part of a Larger Common Plan.

70. Temporary Stabilization: a condition where exposed soils or disturbed areas are provided a temporary vegetative and/or non-vegetative protective cover to prevent erosion and sediment loss. Temporary stabilization may include temporary seeding, geotextiles, mulches, and other techniques to reduce or eliminate erosion until either final stabilization can be achieved or until further construction activities resume disturbance in the area. Temporary controls must be installed, maintained, and removed according to specifications in the BMP Manual.
71. Total Maximum Daily Load (TMDL): A regulatory value developed to represent the amount of a pollutant that a waterbody can incorporate while meeting water quality standards. It is further defined as the legal document developed by EPA and SCDES designating the pollutant load a permitted discharge is allowed to input into a waterbody. It is a calculation of the maximum amount of a specific pollutant that a waterbody can receive and still meet water quality standards. It is the sum of the allowable loads or allocations of a given pollutant from all contributing point (wasteload allocation (WLA)) and nonpoint (load allocation (LA)) sources. It also incorporates a margin of safety and consideration of seasonal variation. For an impaired waterbody, the document specifies the level of pollutant reductions needed for waterbody use attainment. It can be expressed in terms of either mass per time, toxicity, or other appropriate measure.
72. Undisturbed Area: property not altered from its natural state by construction or installation of improvements such as roads, drainage improvements, building, structures, or other impervious surfaces.
73. Undisturbed Buffer: an area left undisturbed between neighboring property lines, along natural waterways and/or wetlands.
74. Variance: the modification of the minimum stormwater management requirements contained in the Berkeley County Stormwater Management Ordinance, this manual, and the SWMP for specific circumstances where strict adherence to the requirements would result in unnecessary hardship and not fulfill the intent of the Berkeley County Stormwater Management Ordinance.
75. Vegetation: all plant growth, especially trees, shrubs, mosses, and grasses.
76. Vegetated Buffer: small areas or strips of land in permanent vegetation, designed to intercept pollutants, slow runoff, trap sediment, and provide opportunity for stormwater to infiltrate into underlying soils.
77. Vegetated Filter Strips: zones of vegetation where pollutant-laden runoff is introduced as sheet flow. Vegetated Filter Strips may consist of grass filters, grass filter strips, buffer strips, vegetated buffer zones, riparian vegetated buffer strips, and constructed filter strips.
78. Water Quality: characteristics of stormwater runoff that relate to the physical, chemical, biological, or radiological composition of water.
79. Water Quantity: characteristics of stormwater runoff that relate to the rate, duration, and volume of the stormwater runoff.
80. Watercourse: any natural or man-made conveyance used to transport water, including stormwater runoff, from one location to the next, whether continuous or intermittent.
81. Waters of the State: lakes, bays, sounds, ponds, impounding reservoirs, springs, wells, rivers, streams, creeks, estuaries, marshes, inlets, canals, the Atlantic Ocean within the territorial limits of the State,

and all other bodies of surface or underground water, natural or artificial, public or private, inland or coastal, fresh or salt, which are wholly or partially within or bordering the State or within its jurisdiction and all waters of the United States within the political boundaries of the State of South Carolina. Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA are not waters of South Carolina. This exclusion applies only to manmade bodies of water which neither were originally created in waters of South Carolina (such as disposal areas in wetlands) nor resulted from the impound of waters of South Carolina.

82. Waters of the United States:
    a. All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide.
    b. All interstate waters, including interstate "wetlands."
    c. All other waters such as interstate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, wet meadows, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters:
        i. Which are or could be used by interstate or foreign travelers for recreational or other purposes.
        ii. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
        iii. Which are used or could be used for industrial purposes by industries in interstate commerce.
    d. All impoundments of waters otherwise defined as waters of South Carolina under this definition.
    e. Tributaries of waters identified in paragraphs (a) through (d) of this definition.
    f. The territorial sea.
    g. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition.
83. Watershed: a drainage area or drainage basin contributing stormwater runoff to a single point.
84. Wetlands: those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

CHAPTER 2. STORMWATER APPROVAL PROCEDURES

This chapter provides applicants (including, but not limited to, developers, owners, engineers, and contractors) with the information needed to obtain approval of a CA from the County Engineer as required for certain construction, development, and redevelopment activities within the Berkeley County Regulated Area and encompassed municipalities as authorized under intergovernmental agreements. This section describes conditions when County approval is required, the types of CA that apply based on the construction activity, application package and submittal requirements, and when and if waivers or variances of such requirements are applicable for certain activities.

2.1 DUTY TO COMPLY

Unless otherwise allowed by the Stormwater Management Ordinance or this Manual, the surface of land in Berkeley County shall not be disturbed or altered for any purpose whatsoever, nor any major drainage channel or component of the stormwater system impeded or encroached upon without approval from the County Engineer. Construction, development, and redevelopment activities shall not begin prior to approval from the County Engineer.

2.2 STORMWATER CONSTRUCTION APPLICATION

A party wanting to construct, develop, or redevelop in the Regulated Area of Berkeley County is subject to requirements determined by the application type.

2.2.1 APPLICATION PROCEDURES

The Construction Application (CA) must be submitted electronically to the Berkeley County Engineering Department through the online development review application. Once a CA has been submitted, information regarding the CA can be queried. The website to submit documents and track the status of project review and approval can be found at:

https://berkeleycountysc.gov/energovinfo/index.php

Construction activities that require other permit/certification coverage (such as, but not limited to, Coastal Zone Consistency (CZC) Determination, 401 Water Quality Certification, and Navigable Waters Permit) from any State or federal agency can be processed simultaneously during the County Stormwater Management Plan review.

CAs shall be considered complete only if they are submitted in the required format, include all applicable information, and are accompanied by the established fee(s). Any CA that is determined to be incomplete shall be returned to the applicant along with an explanation of the application's deficiencies. Fees shall not be refunded. No further processing of the CA shall occur until the deficiencies are corrected. Once the deficiencies are corrected, the CA may be resubmitted without the payment of additional fees, provided that it is resubmitted within six (6) months of the date that the CA was returned to the applicant. Applications that have been inactive by the applicant for more than six (6) months shall expire, and any further submittal shall require a new application and payment of applicable fees at that time.

Whenever the procedures of the County expressly state that the CA is to be submitted after a "pre-application conference," applicants shall be responsible for scheduling and attending such meetings. When pre-application conferences are required, a CA shall not be accepted until the pre-application conference has been conducted.

The approval process for a Construction Application can be found in **Appendix F**.

2.2.2 APPLICATION TYPES

This section of the manual describes application requirements for a complete submittal package to the County Engineer. The County Engineer's permitting requirements will mirror the land disturbance thresholds and submittal requirements established below:

The County Engineer has established three (3) categories of Construction Activity:

- Minor Construction Activity for single-family residential construction disturbing less than one acre that are not part of an LCP (**Section 2.2.2.1**).
- Intermediate Construction Activity for all construction activities less than five acres, unless it qualifies as a Minor Construction Activity (**Section 2.2.2.2**).
- Major Construction Activity for sites disturbing five or more acres (**Section 2.2.2.3**).

2.2.2.1 MINOR CONSTRUCTION ACTIVITY REQUIREMENTS

Single-family residential construction activities, not part of an LCP, and disturbing less than one acre are considered minor construction activities. An application package must be submitted to the Berkeley County Engineering Department. Construction shall not commence until the County approves the Construction Application.

A Construction Application for Minor Construction Activities must provide the following:

1. Minor Construction Activity Certification Form (**Appendix D**).

Single-family residential construction, not part of an LCP, that includes modification of an existing watercourse or creation of a new watercourse, must provide a Construction Application for Minor Construction Activities that includes item 1 above and the following:

   a. Technical Report: One (1) copy of a technical report should be prepared and submitted as part of the application package, prepared by a licensed engineer. This report shall consist of documentation clearly substantiating that changes made on-site will not adversely impact upstream or downstream properties.

2.2.2.2 INTERMEDIATE AND MAJOR CONSTRUCTION ACTIVITY REQUIREMENTS

All residential construction activities disturbing equal to or more than one acre, all non-single-family residential sites, all sites that are an LCP or part thereof (even if the land disturbance is less than one acre), and all non-residential sites must submit a SWPPP to the Berkeley County Engineering Department. Construction shall not commence until the County approves the CA. The submittal requirements for a CA for Intermediate Construction Activity include the following items. Any project that will disturb equal to or greater than five (5) acres must submit a CA for Major Construction Activity, which includes the following items and additional requirements as described in **Section 2.2.2.3**:

1. The SCDES NOI Form D-2671. (**Appendix B**).
2. Technical Report: One (1) copy of the technical report should be prepared and submitted as part of the application package, prepared by a licensed professional engineer. This report shall consist of the items listed below:
   a. Project Area Map:

i. Site location drawing of the proposed project showing project location in relation to roadways, jurisdictional boundaries, streams, rivers, and lakes, and the boundary lines of the site to be developed.

ii. Topographic information showing runoff patterns.

iii. Soil types.

iv. Wetlands (fresh and saltwater).

v. Identification of all areas within the site that will be included in the construction activities, along with the calculated total disturbed area.

vi. Location of temporary and permanent stormwater management controls.

b. Site Narrative: The narrative should identify the roles and responsibilities of all involved in the construction project and include the following:

i. General description of the site.

ii. Adjacent properties and owners.

iii. Topographic and soil information.

iv. Waterbodies receiving stormwater runoff (existing and proposed).

v. Water quality and flooding issues, and anticipated potential impacts (quality, downstream structures, etc.) and benefits (open space, treatment, maintenance, etc.).

vi. Purpose of the construction activity.

vii. Justification for selection of site-specific BMPs proposed.

viii. Summary table(s) of existing and proposed runoff flows, volumes, and pollutant loads.

ix. Anticipated starting and completion dates of the various stages of the construction activities and the expected date of final stabilization.

x. If applicable, the narrative should also contain justification for variances, waivers, or other special conditions of the site.

xi. Also, if applicable, wetland and water body disturbance issues should be discussed along with details on the status of necessary permit application to the USACE.

xii. If a TMDL(s) is in place for the receiving waterbody, the narrative must describe how the project will comply with the TMDL(s).

c. Hydrologic Analysis: The stormwater plan must demonstrate control of runoff quantity and quality in accordance with design criteria provided in **Chapter 3**. The natural or historic condition will be the standard by which the stormwater plan for a construction project is evaluated.

d. Hydraulic Design Analysis: Design calculations for all conveyances showing the ability to handle anticipated flows and volumes shall be provided.

i. PDFs of the model input and output must be included in the submittal.

ii. Provide calculations showing that the project does not cause or increase any negative impact on downstream structures, and the upstream and downstream stormwater drainage system. The following computations should be included as necessary: hydrographs, routing of hydrographs through system components, pipe and open channel capacity, velocity calculations, and water surface elevations.

iii. Calculations and discussion shall be provided for energy dissipation and inlet/outlet protection devices.

iv. All system components should have standard details and specifications.

e. Special Protection Area: If a project is located in a special protection area, a comprehensive evaluation of engineering calculations and analysis should be included that demonstrate that the project will not negatively impact current drainage conditions and/or comply with State and federal regulations on stormwater discharges. More information is provided in **Section 3.10**.

3. Stormwater Management Plan:

   a. A description of the erosion and sediment control facilities selected.

   b. Plan showing the location of all erosion and sediment control facilities.

   c. Design calculations of each measure, including trapping efficiencies. Each measure should also have a standard detail and specification.

   d. Explanation/discussion of models used in the design.

   e. Downstream analysis calculations showing the effect of post-development design flows on downstream stormwater conveyance systems and channels. More details on this analysis and where it is applicable is covered in **Chapter 3.**

   f. Watershed delineation maps with consistent sequential notations.

   g. Location map showing topography and waters of the state in relation to proposed project. Map extents must show the nearest Receiving Waterbody.

   h. Discussion and calculation of any wetlands issues.

   i. Map showing type and classification of all soils expected to be encountered or used at the development site.

   j. Presentation of existing and proposed contours at the development site.

   k. General description of the adjacent property and description of existing structures, buildings, and other fixed improvements located on surrounding properties.

   l. All recorded easement documents and discussion of site access issues.

4. Construction Plans: One (1) electronic copy of certified and signed construction plans are to be included for stamping. At a minimum, the following items listed below and in the checklist (**Appendix C**) for Construction Plans are required by the County Engineer, and other items may be requested on a case-by-case basis. In the case of any conflicting information between **Appendix C** and the information below, the stricter requirements will supersede.

   a. North arrow and scale.

   b. Property lines, bearings and distances, adjacent landowners' names, and land use conditions.

   c. Legend.

   d. South Carolina Licensed Professional Engineer's seal and signature.

   e. COA seal, as appropriate.

   f. Existing and proposed contours (one-foot contours).

   g. Limits of disturbed area.

   h. Delineation of wetlands and/or waters of the State.

i. Location, type, and base flood elevations of any and all Federal Emergency Management Agency (FEMA) floodplains and floodways.

j. Easements.

k. Stormwater system profiles with existing and proposed ground elevations and design storm hydraulic grade line starting at the design storm water surface elevation.

l. Construction sequence (include implementation of all stormwater and sediment controls in the first phase of construction).

m. Locations of all temporary and permanent control measures.

n. Details for all temporary and permanent control measures.

    i. Outlet control structure details shall be drawn to scale and include an isometric drawing, plan view, elevation view, and side views that clearly show key components and critical elevations.

o. Grassing and stabilization specifications and schedule.

p. Maintenance requirements (for temporary and permanent controls, grassing, etc.).

q. Construction entrance/exit.

r. Tree protection, preservation, and overall landscaping plan with appropriate species selection and screening for ponds and other components required by the Zoning Ordinance.

s. Details and specifications of all necessary construction components.

t. Location map.

u. The cover sheet shall contain, at a minimum, the following items:

    i. Project name.

    ii. Engineer's contact information (name, mailing address, telephone, email).

    iii. Contact information (name, mailing, address, telephone, fax) of the owner, operator, or designated party.

    iv. Vicinity map.

    v. Table of contents.

v. All drawing elevations shall be based on the NAVD 88 and projected in the state plane coordinate system.

w. The following standard notes shall be shown on the plans. This list is not meant to be exhaustive and other notes should be included as necessary:

    i. If necessary, slopes which exceed eight (8) vertical feet should be stabilized with synthetic or vegetative mats, in addition to hydroseeding. It may be necessary to install temporary slope drains during construction. Temporary berms may be needed until the slope is brought to grade.

    ii. Stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than fourteen (14) days after work has ceased, except as stated below:

        1. Where stabilization by the 14th day is precluded by snow cover or frozen ground conditions, stabilization measures must be initiated as soon as practicable.

2. Where construction activity on a portion of the Site is temporarily ceased, and earth-disturbing activities will be resumed within 14 days, temporary stabilization measures do not have to be initiated on that portion of the site.

iii. All sediment and erosion control devices shall be inspected once every calendar week and recorded as part of a weekly inspection report to be kept with the OS-SWPPP. If periodic inspection or other information indicates that a BMP has been used inappropriately or incorrectly, the Permittee must address the necessary replacement or modification required to correct the BMP within 48 hours of identification.

iv. Provide silt fence and/or other control devices, as may be required, to control soil erosion during utility construction. All disturbed areas shall be cleaned, graded, and stabilized with grassing immediately after the utility installation. Fill, cover, and temporary seeding at the end of each day are recommended. If water is encountered while trenching, the water should be filtered to remove sediment before being pumped back into any waters of the State.

v. All erosion control devices shall be properly maintained during all phases of construction until the completion of all construction activities and all disturbed areas have been stabilized. Additional control devices may be required during construction in order to control erosion and/or offsite sedimentation. All temporary control devices shall be removed once construction is complete, and the site is stabilized.

vi. The contractor must take necessary action to minimize the tracking of mud onto paved roadways from construction areas and the generation of dust. The contractor shall remove mud/soil from pavement daily, or more frequently, as may be necessary and determined by Berkeley County.

vii. Residential subdivisions require erosion control features for infrastructure as well as for individual lot construction. Individual property owners shall follow these plans during construction or obtain approval of an individual plan in accordance with S.C. Reg. 72-300 et seq. and SCR100000.

viii. Temporary diversion berms and/or ditches will be provided as needed during construction to protect work areas from upslope runoff and/or to divert sediment-laden water to appropriate traps or stable outlets.

ix. All waters of the State (WoS), including wetlands, are to be flagged or otherwise clearly marked in the field. A double row of silt fence is to be installed in all areas where a 50-foot buffer can't be maintained between the disturbed area and all WoS. A 10-foot buffer should be maintained between the last row of silt fence and all WoS.

x. Litter, construction debris, oils, fuels, and building products with significant potential for impact (such as stockpiles of freshly treated lumber) and construction chemicals that could be exposed to storm water must be prevented from becoming a pollutant source in storm water discharges. Litter and construction debris must be collected, contained, and disposed of properly. Any chemicals, fuels, oils, or hazardous materials must be stored in secondary containment when not in use.

xi. A copy of the SWPPP, inspection records, and rainfall data must be retained at the construction site or a nearby location easily accessible during normal business hours, from the date of commencement of construction activities to the date that final stabilization is reached.

xii. Initiate stabilization measures on any exposed steep slope (3H:1V or greater) where land-disturbing activities have permanently or temporarily ceased and will not resume for a period of seven calendar days.

xiii. Minimize soil compaction and, unless infeasible, preserve topsoil.

xiv. Minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other wash waters. Wash waters must be treated in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge.

xv. Minimize the discharge of pollutants from dewatering of trenches and excavated areas. These discharges are to be routed through appropriate BMPs (sediment basin, filter bag, etc.).

xvi. The following discharges from sites are prohibited:

1. Wastewater from washout of concrete, unless managed by an appropriate control,
2. Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds, and other construction materials,
3. Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance, and
4. Soaps or solvents used in vehicle and equipment washing.

xvii. After construction activities begin, inspections must be conducted at a minimum of at least once every calendar week with no more than nine (9) days between inspections and must be conducted until final stabilization is reached on all areas of the construction site.

xviii. If existing BMPs need to be modified or if additional BMPs are necessary to comply with the requirements of this permit and/or SC's Water Quality Standards, implementation must be completed before the next storm event whenever practicable. If implementation before the next storm event is impracticable, the situation must be documented in the SWPPP and alternative BMPs must be implemented as soon as reasonably possible.

xix. Pre-Construction Conference must be held for each construction site with an approved On-Site SWPPP prior to the implementation of construction activities. For non-linear projects that disturb 10 acres or more this conference must be held on-site unless the Department has approved otherwise.

5. Erosion Prevention and Sediment Control (EPSC) plan set shall have the following information contained in a cohesive, organized, and easy to follow format:

a. Location of all EPSC structures on construction documents.

b. Delineation of all sensitive features (wetlands, streams, ponds, existing stormwater structures, etc.) and potential sediment sources.

c. Drainage area map outlining the area draining to each sediment basin/trap.

d. Installation sequencing and maintenance plan and schedules for all EPSC BMPs during and after construction (**Appendix G**). The sequence and phasing shall consider exposing the smallest practical areas for the shortest period of time and retain as much natural vegetation as possible to prevent erosion.

e. Design computations and applicable assumptions for all structural measures for sediment and erosion control:

i. Volume and velocity must be given for all surface water conveyance measures and piped outfalls.

ii. For Major Construction Activities only (sites that disturb more than five (5) acres), calculations of required sediment storage volumes for all EPSC BMPs if applicable.

iii. For Major Construction Activity only (sites that disturb more than five (5) acres), a list or calculation of the trapping efficiency for all EPSC BMPs, if applicable.

iv. Copies of figures used to determine V15 (SV-1) and trapping efficiency (ST-1, SB-1, SB-2), if Design Aids from SCDES BMP Manual (2005) are used to determine trapping efficiencies.

v. Explanation of any computer models or software used with highlights of and/or notes on the output data.

f. All components of a SWPPP as outlined by SCDES (**Appendix H**) and the most current NPDES CGP.

g. Sediment control practices shall be used around the perimeter of the site to prevent off-site sediment damage.

h. Methods for controlling dust during construction.

i. Provisions to preserve topsoil and limit the amount of total disturbed area.

j. Details of site grading.

k. Protection of all storm drain inlets and outlets.

l. Locate temporary and permanent soil disposal areas, haul roads, and construction staging areas to minimize erosion, sediment transport, and disturbance to existing vegetation.

m. All necessary certifications by the person responsible for the activity. This includes the Stormwater Management Plan, permit, and Covenants. Proper preparation of the EPSC plan set and SWPPP if necessary, by a licensed engineer, landscape architect, or Tier B land surveyor.

n. A site-specific EPSC construction sequence must be shown on the plans and include, at a minimum, the following information:

i. Construction sequence must accurately reflect the nature and timing of construction activities for the site.

ii. The sequence must begin with the installation of perimeter controls and end with the removal of sediment prevention and erosion control measures once the site has been finally stabilized.

iii. Address the timing of conversion of any temporary EPSC structures to permanent measures (i.e., conversion of a sediment basin to a permanent detention basin).

iv. The sequence should reflect implementation and transition between each phased plan. A sample sequence can be found in **Appendix G**.

6. Subdivision projects must have a complete set of plans and specifications to include, but not be limited to, the following items, as appropriate: lot layout/site plan and staking, acreage, limits of disturbance, road plan/profiles, storm drainage plan/profile, pre and post development drainage areas (both on and off-site), sediment and erosion control plans and details, construction waste management, utilities (water and sanitary sewer), post-construction stormwater management facilities, and traffic patterns with temporary (construction) and permanent traffic signage. Plans shall provide existing and proposed contours with intervals of not more than one (1) foot. Where possible and as needed, contour lines should be extended beyond the site boundary lines. While some of these items lend themselves to combining information on a single sheet/drawing, care should be taken to ensure that plans are not overcrowded/cluttered. The lot layout sheet should show a tie distance from the primary entrance of the proposed project to the nearest existing intersection.

a. All available or used benchmarks shall be shown on this or other applicable sheet. At least one benchmark shall be available or established on/near (within survey instrument sight distance) the site. The benchmark shall be referenced to NAVD 88.

7. The applicant will provide a tentative Construction Time Schedule: The applicant shall provide a schedule of construction activities starting with sediment and erosion control measures through final stabilization and close out. The schedule will also provide for coordination with the responsibilities of all parties, including those installing utilities.
8. Specifications: Specifications are required for all components of construction activities related to grading, utilities, sediment and erosion control, temporary and permanent vegetation, water quality BMPs, etc.
9. Fees: Plan review and inspection fees are required per Resolution 10-39 adopted by the County on the 27th day of September 2010. Plan review and inspection fees are subject to change per amendment to the Resolution.
10. Stormwater Pollution Prevention Plan: A SWPPP is a stand-alone document (not included in engineering drawings) that provides guidance to owners, contractors, and subcontractors on the activities that shall be done during construction to reduce the risk of pollution. Construction projects are considered an industrial category and are required to prepare and implement a SWPPP to be submitted with the CA package to Berkeley County. The SWPPP requirement applies to both development and redevelopment sites. Refer to **Appendix H** for the SCDES SWPPP template and written guidance.
11. Covenants for Permanent Maintenance of Stormwater Systems and Maintenance Plans and Schedules: When stormwater management facilities and system components are to be maintained by an owner, operator, or other designated party, Berkeley County must be given assurance that such activities will be conducted. This is to be established using Berkeley County Covenants for Permanent Maintenance of Stormwater Systems (Covenants) to ensure that the stormwater management facilities are constructed, operated, and maintained by the owner, its successors, and assigns, in accordance with the approved Stormwater Management Plan and specifications identified in the Stormwater Management Plan. The Covenants must be recorded prior to the approval of the CA in the Office of the Berkeley County Register of Deeds. The maintenance plan and schedules must be included in the Stormwater Management Plan for all the activities to be conducted during and after construction for all stormwater system components. The Covenants for Permanent Maintenance of Stormwater Systems is in **Appendix I**.

2.2.2.3 ADDITIONAL MAJOR CONSTRUCTION ACTIVITY REQUIREMENTS

Any new or redevelopment project that will disturb equal to or more than five (5) acres must submit a CA for Major Construction Activity. A complete application is accomplished by submitting the items listed for Intermediate and Major Construction Activity Requirements (**Section 2.2.2.2**), plus the following additional requirements:

1. Pre-Application Meeting: This meeting is intended to coordinate stormwater management submittal requirements with the County Engineer. Design professionals are encouraged to inspect the site prior to this meeting to understand the existing runoff patterns and identify areas on the site that may require greater attention to meet the intent of the requirements.

   The pre-application meeting is required if the Major Construction Activity is located within a special protection area. A pre-application meeting with the County is optional for Major Construction Activities located outside of the designated special protection areas. It is up to the designer to contact the County Engineer to determine if the project is located in a special protection area.
2. Stormwater Master Plan: If the project is located in a special protection area, a Stormwater Master Plan is required to be submitted prior to the submittal of the complete package as detailed below. A Stormwater Master Plan is to be created to give the design professional the opportunity to propose a

site layout and proposed stormwater controls to the County Engineer. The Stormwater Master Plan should be submitted online or through email and can be incorporated for discussion at the pre-submittal meeting. The County Engineer may waive the requirement for a Stormwater Master Plan for some permit applicants on a case-by-case basis.

The Stormwater Master Plan can be a preliminary sketch of the site and shall contain the following items:

a. Site layout showing buildings, roads, parking areas, utilities, and grassed or landscaped areas.

b. Vicinity map.

c. Pre- and post-development primary runoff patterns and discharge points.

d. Location and distance to Waters of the State and all other existing natural features such as wetlands, ponds, lakes, floodplains, and stream buffers.

Additionally, the applicant should be prepared to discuss the following items, when applicable:

a. All modeling methodologies to be used.

b. Methods to show compliance with any adopted TMDLs or other waterbody impairments that may limit the allowable pollutant load that can be discharged.

c. Preliminary waiver or variance requests.

d. Others as requested by the County Engineer.

Upon submittal and discussion of the Stormwater Master Plan and related concerns, the applicant can create and submit a complete CA.

3. Phased Plan Requirement: The phased plan identifies all BMPs and grading work implemented during a specific portion of a site's construction sequence (e.g., initial grading and perimeter controls, interim land disturbances through final grading, post-construction and final stabilization). One sheet showing all BMPs and grading work for the entire course of the construction project will not be considered a phased plan.

The County Engineer reserves the right to require additional information and/or BMPs for major clearing and grubbing activities that are phased.

2.2.3 PROVISIONAL APPROVAL

When stormwater approval is needed in order to secure permits or other required items for a complete CA, applicants may submit a preliminary application. The preliminary application includes the Technical Report, Construction Plans, and EPSC Plans (as described in **Section 2.2.2.2**) and the items listed for Major Construction Activity (**Section 2.2.2.3**), if applicable. Berkeley County may issue Provisional Approval for the applicant to obtain other necessary permits before issuing Final Approval.

2.2.4 FINAL CONSTRUCTION APPLICATION APPROVAL

Once the Stormwater Management Plan and CA are deemed complete, the County's review shall be accomplished and an approval, denial, review comments, or request for further information shall be transmitted to the applicant.

SCDES may request additional information from the applicant for NPDES permit compliance, which may result in changes to the Stormwater Management Plan or CA. Any such changes shall be provided to the County Engineer as well. The County Engineer reserves the right to deny approval if a submittal fails to conform to the provisions of the Stormwater Management Ordinance and this Manual.

2.3 DURING CONSTRUCTION ACTIVITY

Site construction shall not commence until the Stormwater Management Plan and CA are approved and a permit is granted by the County Engineer. Construction activities must adhere to the provisions and requirements of the Stormwater Management Plan and permit. Any substantial revisions to the approved Stormwater Management Plan or permit should be submitted in writing to Berkeley County Engineering along with any subsequent fees for review. Such changes shall not be implemented until approval is given. Substantial revisions for stormwater management issues may include, but are not limited to, pipe size and grade alterations that affect hydraulic capacity, changes to easement boundary due to changes in the stormwater system components, or changes to the general grading plan of the site that affect the flow direction, rate, volume, or quality of stormwater runoff.

The owner is required to maintain at least one copy of the approved SWPPP on site (OS-SWPPP). During construction, the owner or an authorized representative must conduct inspections of all temporary erosion and sediment controls, construction waste control, and permanent stabilization on site in accordance with the submitted and approved plans and maintenance schedule, and if applicable, the NPDES permit from SCDES-BCM.

2.4 MODIFICATIONS DURING CONSTRUCTION ACTIVITY

The construction process may be subject to changing climatic conditions and unforeseen site conditions. Parties involved (County, Permittee, or Inspector) may determine that the SWPPP is ineffective in either eliminating or significantly minimizing pollutants in stormwater discharges. The SWPPP must be modified as necessary to include additional or modified BMPs, which are designed to correct any deficiencies identified. The Permittee has seven calendar days following the inspection to make the required modifications to revise the SWPPP.

2.4.1 MINOR MODIFICATIONS

If minor modifications are necessary, the construction plans must be updated, the modification must be recorded in the OS-SWPPP, and the information regarding the minor modification must be made available upon request. No changes to the existing approved application are necessary.

Minor modifications include:

- Addition of silt fence, slope drains, inlet protection, outlet protection, construction entrance, that does not involve additional wetland impacts, or check dams to improve the overall stormwater management and sediment control at the construction site
- Relocation of construction entrance, pond inlet pipes (within a pond), and any other proposed BMP to improve the overall stormwater management and sediment control at the construction site
- Removal of the disturbed area as long as the removal does not remove any BMPs (ponds, traps, etc.) that are required to meet South Carolina's Water Quality or Quantity Standards. Removal of disturbed area only qualifies for disturbed area that was included in the initial coverage approval and that was never disturbed (i.e., cleared, grubbed, or graded)
- Modifying individual lot drainage unless the changes affect the inflow to a detention structure or analysis point, to which the lot drains, that was not previously approved

2.4.2 MAJOR MODIFICATIONS

If major modifications are necessary, the construction plans and SWPPP must be updated and submitted for review and approval by the County Engineer. A modification is considered a major modification whenever there is a significant change in design, construction, operation, or maintenance at the construction site resulting in discharges that will cause, have reasonable potential to cause, or contribute to violations of South Carolina's Water Quality Standards.

Major modifications include:

- Modifications that will affect the hydrology or trapping efficiency calculations including:
  - Resizing sediment or detention basins that either reduce the stormwater volume capacity and/or are resized to handle an increase/decrease in incoming peak flows or runoff volumes due to revised site development plans.
  - Relocation of sediment or detention basins resulting in increases/decreases in receiving drainage area and/or resulting in a new/relocated basin outlet location, which is directed towards an outfall that was not approved within the C-SWPPP
  - Addition/Removal of sediment or detention basin or sediment trap.
  - Modification of sediment or detention basin outlet structure.
  - Changes in grading that alter drainage patterns that may result in increased or decreased flow to a sediment or detention basin.
  - Amending the construction sequence in a fashion that the detention basin is not installed before grubbing operations begin.
- Point discharge or outfall location changes.
- Any modification to regulated water quality structural control measures.
- Adding a new point discharge.
- Addition of impervious area due to revised site development plans.
- Addition of disturbed area.
- Changes to navigable water crossing.
- Addition of sediment trap(s) when required to obtain 80% trapping efficiencies for disturbed areas not previously permitted or redirected away from an approved water quality BMP.
- Site layout changes that require redesigning the stormwater management system.
- Any additional modification as determined by the County Engineer or SCDES.
- Some major modifications require that an updated NOI, along with any supporting documentation, be submitted to SCDES for review and approval. This occurs in the cases that involve:
- Changes that include impacts to Waters of the State/Waters of the U.S.
- Changes to the site design that may impact the project's CZC (in which case a new CZC determination must also be submitted along with the C-SWPPP).
- Other changes as deemed appropriate by the County Engineer and/or SCDES that may affect the site's authorization to discharge under the permit.

2.5 CONSTRUCTION ACTIVITY CLOSEOUT

At the conclusion of construction, the owner is responsible for making sure a site is permanently stabilized with vegetation established, paved areas and stormwater conveyances clean of debris, temporary erosion and sediment controls are removed, and permanent (post-construction) sediment/stormwater controls are working properly. Additionally, the owner is responsible for notifying the County, in writing, at least 30-days prior to final inspection, that the previous conditions have been met. Proof of these will be determined by a County inspector, and any problems found must be corrected by the owner prior to closing out a construction activity. As-built/record drawings must be submitted in Computer Aided Design (CAD) software (DWG), electronic file (PDF), and paper copy (Full Size) prior to the final inspection to aid the County in the final inspection process. All drawing elevations shall be based on the NAVD 88 and projected in the state plane coordinate system. All as-built/record drawings must stipulate if construction plan data was collected in National Geodetic Vertical Datum (NGVD) 29. The County Engineer may require additional items on a case-by-case basis in order to closeout a construction activity.

2.6 TRANSFER OF OWNERSHIP

In certain cases, and as requested by an applicant, the permit may be transferred from one applicant to another. The most obvious example of this is when a developer prepares a piece of property for a new neighborhood by performing grading activities, utility installation, the building of roads, and then turns the property over to a homebuilder(s). In such cases, the applicant must make Berkeley County and SCDES aware of plans to transfer ownership of the permit and associated stormwater management issues through completion of the Transfer of Ownership Application in **Appendix J** within five (5) business days. A transfer of ownership is also allowed for phases within a project. If a permit transfer is not requested using the appropriate form, the current owner will continue to be held responsible for stormwater management issues at the site. A transfer of ownership will result in an amended permit issued by Berkeley County.

2.7 EXEMPTIONS

The provisions of this Manual shall not apply to land disturbing activities that are conducted under another State or federal environmental permitting, licensing, or certification program where the State or federal environmental permit, license, or certification is conditioned on compliance with the minimum standards and criteria developed under the Stormwater Management and Sediment Reduction Act.

Per the Stormwater Management Ordinance, the provisions of this Manual shall not apply to:

- Land disturbing activities undertaken on forestland for the production and harvesting of timber and timber products and conducted in accordance with BMPs and minimum erosion protection measures established by the South Carolina Forestry Commission pursuant to Section 48-18-70 of the 1976 Code of Laws of South Carolina, as amended.
- Land disturbing activities on agricultural land for production of plants and animals useful to man, including but not limited to: forages and sod crops, grains and feed crops, tobacco, cotton, and peanuts; dairy animals and dairy products; poultry and poultry products; livestock, including beef cattle, sheep, swine, horses, ponies, mules, or goats, including the breeding and grazing of these animals; bees and dairy products, fur animals, and aquaculture, except that the construction of an agricultural structure of one or more acres, such as, but not limited to, broiler houses, machine sheds, repair shops, coops, barns, and other major buildings and which shall require the submittal and approval of necessary application materials as outlined in this Manual prior to the start of the land disturbing activity.

- Linear utility installation activities that are covered under their own SCDES-approved utility general permit, requiring associated assurance of proper stormwater management.
- Activities undertaken by persons who are otherwise regulated by the provisions of Chapter 20 Title 48, the South Carolina Mining Act.
- Discharges of dredged or fill material into waters of the United States which are regulated under Section 404 of the CWA.

Additional exemptions are listed in Section 48-14-40 of the Code of Laws of South Carolina:

- Any of the following land disturbing activities undertaken by any person who provides gas, electrification, or communications services, subject to the jurisdiction of the South Carolina Public Service Commission, or corporations organized and operating pursuant to Section 33-49-10 et seq. of the Code of Laws of South Carolina.

    1. Land disturbing activities conducted pursuant to a certificate of environmental compatibility and public convenience and necessity issued pursuant to Title 58, Chapter 33 of the Code of Laws of South Carolina or land disturbing activities conducted pursuant to any other certification or authorization issued by the Public Service Commission.
    2. Land disturbing activities conducted pursuant to a federal environmental permit, including Section 404 of the federal CWA, and including permits issued by the Federal Energy Regulatory Commission.
    3. Land disturbing activities associated with emergency maintenance or construction of electric, gas, or communications facilities, when necessary to restore service or when the Governor declares the area to have sustained a disaster and the actions are undertaken to protect the public from a threat to health or safety.
    4. Land disturbing activities associated with routine maintenance and/or repair of electric, gas, or communications lines.
    5. Land disturbing activities associated with the placement of poles for overhead distribution or transmission of electric energy or of communications services.
    6. Land disturbing activities associated with placement of underground lines for distribution or transmission of electric energy or of gas or communications services.
    7. Land disturbing activities conducted by a person filing environmental reports, assessments, or impact statements with the United States Department of Agriculture, Rural Electrification Administration in regard to a project.

    Any person, other than a person identified in subparagraph (7), who undertakes land disturbing activities described in subparagraphs (4), (5), and (6) of this subsection must file with the South Carolina Public Service Commission, in a Policy and Procedures Manual, the procedures it will follow in conducting such activities. Any person, other than a person identified in subparagraph (7), who conducts land disturbing activities described in subparagraph (2) of this subsection, must address the procedures it will follow in conducting the activities in the Policy and Procedures Manual filed with the South Carolina Public Service Commission to the extent that the land disturbing activities are not specifically addressed in the federal permit or permitting process. If any person, other than a person identified in subparagraph (7), does not have a Policy and Procedures Manual on file with the Public Service Commission, such manual must be filed with the Public Service Commission not later than six months after May 27, 1992.

    Any person who undertakes land disturbing activities described in subparagraph (7) of this subsection shall give the same written notice to the department as given to agencies whose permits are required

for project approval by the regulations of the United States Department of Agriculture, Rural Electrification Administration.

- Activities relating to the routine maintenance and/or repair or rebuilding of the tracks, rights-of-way, bridges, communication facilities, and other related structures and facilities of a railroad company.
- Activities undertaken on State-owned or managed lands that are otherwise regulated by the provisions of Chapter 18 of this title, the Erosion and Sediment Reduction Act.
- Activities undertaken by local governments or special purpose or public service districts relating to the repair and maintenance of existing facilities and structures.

2.8 EXPIRATION OF STORMWATER APPROVAL

Stormwater Management Plan approval and CA approval will remain valid for up to five (5) years from the date of approval, provided that the project is in compliance with the Stormwater Management Ordinance and this Manual and is not inactive for a period of twelve consecutive months. Construction activity must be initiated within twelve (12) months of Stormwater Management Plan approval. Failure to initiate construction will render all approvals invalid at the end of the twelfth month.

2.9 RESPONSIBILITY OF OWNER/OPERATOR

During any construction operation, the owner/operator shall be responsible for carrying out the proposed work in accordance with the approved plan, specifications, time schedule, and all requirements of the Stormwater Management Ordinance and this Manual.

2.10 VARIANCE

The County Engineer may grant variances from the requirements of the Stormwater Management Ordinance and this Manual for construction activities if there are exceptional circumstances applicable to the site such that strict adherence to these provisions will result in unnecessary hardship and not fulfill the intent of this Manual and the Berkeley County Stormwater Management Ordinance.

A written request for variance must be provided to the County Engineer stating the specific variance(s) sought and the reason(s) with supporting data, including descriptions, drawings, and any other information that is necessary to evaluate the proposed variance.

A separate written variance request shall be required if there are subsequent additions, extensions, or modifications which would alter a previously approved variance. A project may be eligible for a variance if the applicant can demonstrate the following:

1. The variance will not conflict with the purpose of this Manual, all pertinent Berkeley County ordinances or local, State, or federal requirements.
2. The proposed project will have no significant adverse impact on the receiving natural waterway or upstream, downstream, or adjacent properties.
3. The imposition of peak or volume control requirements of stormwater runoff would aggravate downstream flooding. An example of this situation would be when an overall analysis has indicated that imposing restrictions in the upstream watershed of the proposed project would cause the timing of the peak of the routed hydrograph to coincide with the peak flow from another contributing watershed downstream.

4. Attenuation of the runoff within the subject basin will alter the release rate such that downstream systems will be adversely impacted by storing the regulated storm event (i.e., it can be shown that the T_c of the basins will coincide, leading to an increase of the peak at an already vulnerable point downstream).

2.11 ENCROACHMENT PERMITS

All applicable encroachment permit(s) must be obtained from the SCDOT and/or the Berkeley County Roads & Bridges Department before construction begins. Applicants should be aware of Berkeley County requirements which may differ from SCDOT's.

It is the applicant's responsibility to comply with all SCDOT and Berkeley County Encroachment Permit application requirements. Approved encroachment permits are required prior to stormwater approval from the County Engineer.

2.12 STORMWATER FACILITY OWNERSHIP AND MAINTENANCE

Post-construction maintenance of stormwater facilities is important for the proper function of the stormwater system. This section describes the ownership designation and maintenance requirements for these stormwater facilities.

2.12.1 OWNERSHIP

The owner of a portion or the entire stormwater system, as the case may be, shall be clearly designated before stormwater approval will be issued. Ownership shall also be recorded on the final plat. Ownership shall imply responsibility for maintaining the stormwater system, including all ponds and other BMPs used for controlling runoff quantity and quality. Ownership does not imply that the owner(s) may in any way alter the size or function of any component of the stormwater system. Alterations can only be made with consent from the County Engineer. Owners found altering such components without County approval will be required to remove any alterations.

2.12.2 MAINTENANCE

Each component of the stormwater management system (pipes, inlets, BMPs) shall have a maintenance plan (activities and associated schedule) as part of Stormwater Management Plan and CA package. Suggested maintenance activities and recurrence intervals for water quality BMPs are discussed and referenced in **Chapter 3**. In addition, Covenants for Permanent Maintenance of Stormwater Systems must be recorded in the permanent land records with the Berkeley County Register of Deeds. The Covenants is provided in **Appendix I**. The Covenants must be signed and executed prior to the issuance of County approval.

The owners of all stormwater management facilities/BMPs shall annually have the facilities inspected by a certified Post-Construction BMP inspector and perform any maintenance recommended. Additionally, the inspection report and maintenance checklist shall be provided to the County as requested. Inspection checklists are provided in **Appendix K**.

County maintained stormwater conveyances located on private property and outside of the County right-of-way shall be located in an easement to allow access for maintenance and inspection.

CHAPTER 3. DESIGN REQUIREMENTS

This chapter provides engineers, designers, developers, and others with the necessary information needed to design adequate stormwater systems that will manage the stormwater rate, volume, and pollutant loads released from a new or redevelopment project where the County Engineer has been authorized by law or agreement to enforce engineering standards. These design requirements have been developed based on common engineering practice and reference State and Federal requirements, engineering publications, and other municipal and academic guidance.

It is the goal of this Chapter to provide a minimum set of design standards that will result in effective stormwater management to mitigate the impact of land development on existing/natural hydrologic and hydraulic processes, as well as attempt to prevent further degradation of the water resources in Berkeley County through proper planning, design, installation, and maintenance. All land shall be developed in a manner consistent with all County ordinances and this Manual. Specific methods and applications not covered in this Manual can and should be discussed with the County Engineer for applicability prior to the submission of the CA package. The following sections detail the criteria that shall be followed in the absence of designated specific watershed master plan criteria.

3.1 DETERMINATION OF CONSTRUCTION ACTIVITY

Construction, development, or redevelopment within the County's Regulated Area is subject to the design requirements as determined by application type. The application types determine the construction activity and design parameters. Specifics can be found in **Section 2.2**.

3.2 DESIGN APPROACH

Proper planning is necessary to ensure that stormwater management is considered and fully integrated at the various stages of construction, development/redevelopment, and post-construction. This involves a comprehensive approach to site planning and a thorough understanding of the physical and environmental characteristics and resources associated with the project site. Planning includes addressing stormwater quantity and quality controls, EPSC, stormwater conveyance controls, and maintenance schedules for temporary and permanent stormwater BMPs.

3.2.1 GENERAL PRINCIPLES AND TECHNIQUES

The design of successful stormwater infrastructure on a construction project involves adhering to the following principles:

- Pre-submittal site meeting/site visit.
- Review of site development requirements.
- Detailed site analysis and supporting calculations.
- Creation of a Stormwater Concept Plan.
- Design aspects of the SWPPP.
- Completion and approval of the CA (**Chapter 2**).

Site designers shall minimize the generation of stormwater and maximize pervious areas by:

- Selecting portions of the site where the drainage pattern, topography, environmental features, and soils are favorable for the intended use.
- Exposing the smallest practical area of land for the least possible time during construction. This includes maintaining or creating buffers and preserving natural areas.
- Limiting the drainage area to all BMPs.
- Retaining and protecting natural vegetation and saving topsoil for replacement on graded areas, when feasible.
- Using plant cover, mulching, hydroseeding, or other stabilization methods to control runoff and protect areas subject to erosion during and after construction.
- Use vegetated swales where appropriate. Vegetated or grassed open swales should be the primary means of conveying surface runoff between lots.
- Use a pipe system along the roadway as the primary means of conveying surface runoff. Refer to the SCDOT Roadway Design Manual.

3.2.2 LID PRINCIPLES AND LAYOUT TECHNIQUES

LID site layout techniques involve identifying and analyzing the location and configuration of structures on the site to be developed. LID techniques are efficient and cost-effective when considered from the site planning stage. When using an LID approach, these additional considerations should be followed:

- Stormwater quantity and quality are best controlled at the source by reducing the potential maximum volume of runoff and pollutants. Source control will typically be more economical to treat the first flush of a storm event.
- Implement stormwater management by using simple structural and non-structural methods which are reasonably maintained.
- Equaling or exceeding traditional stormwater management designs in terms of performance (rate/volume) attenuation, pollutant removal and economic feasibility (long-term) are essential to a proposed concept's eventual approval.

Where applicable, the following techniques aid in creating LID site layouts:

- Preserve and maintain open space. Large, continuous areas of open space reduce and slow runoff, filter out sediments, and uptake nutrients.
- Fit the design layout to follow the natural contours of the site to minimize clearing and grading and preserve natural drainage ways and patterns.
- Limit the amount of clearing and grading by identifying the smallest possible area on the site that would require land disturbance.
- Place development areas on the least sensitive areas of the site and avoid steeply sloped areas when possible and cluster development by concentrating development away from environmentally sensitive areas such as streams, wetlands, mature wooded areas, and steep slopes. This can be accomplished by using higher-density developments at the site level to reduce impervious cover (and thus improve water quality) at the watershed level. An EPA report on this Smart Growth strategy can be found at:
- https://www.epa.gov/sites/production/files/2014-03/documents/protect_water_higher_density1.pdf

- Locate development areas where the pre-development CN is less sensitive (i.e., plan development on barren, poorly drained HSG C and D soils rather than developing forested, well-drained HSG A or B soils).
- Utilize nontraditional designs to reduce the overall imperviousness of the site by providing more undisturbed open space and minimizing clear-cutting.
- Design roads, sidewalks, and parking areas to minimize imperviousness while maintaining the roadway standards required by the Berkeley County roadway standards. Examples of LID roadway and parking guidance can be found in *Low Impact Development in Coastal South Carolina: A Planning and Design Guide* (2014).
- Consider the utilization of cisterns and rain barrels to collect stormwater for reuse.
- Level spreaders or other energy dissipation devices should be used at all discharge points including discharge points into ponds and other basin-type BMPs. More information on these devices is provided later in this chapter.

3.3 GENERAL DESIGN STANDARDS

General requirements for all stormwater systems and facilities will include, but not be limited to, the following:

1. Annual groundwater recharge rates shall be maintained to the maximum extent practical by promoting infiltration through the use of structural and non-structural methods.
2. Stormwater runoff generated from new development shall be controlled to predevelopment rates and/or natural rates. Stormwater runoff generated from a redevelopment shall be controlled to previous development rates. The method for computing adequate control shall be based on several design storms. Greater detail is provided in this chapter.
3. Stormwater runoff generated from development shall be treated through the use of structural and/or non-structural practices. It is presumed that sufficient treatment is provided by the proposed BMPs if they are designed according to the specific performance criteria outlined in this Manual or other approved design guidance, constructed properly, and maintained regularly according to the maintenance plans and schedules found in the SWPPP and Covenants for Permanent Stormwater Systems.
4. Stormwater discharges to Special Protection Areas with sensitive resources or that have existing flooding or water quality problems [e.g., cold water fisheries, recharge areas, water supply reservoirs, TMDLs, and 303(d) listings] are subject to additional performance criteria. **Section 3.10** contains more specific information and design requirements on the areas that will receive this additional set of protection criteria.
5. All BMPs shall have an enforceable operation and maintenance plan and schedule to ensure the system functions as designed.
6. Sediment basins and other BMPs shall be used during construction to remove heavy sediment loads from runoff waters leaving the disturbed area. Design criteria are provided in this chapter.
7. Permanent vegetative cover and the long-term erosion protection structures shall be installed as soon as practical in the development process.
8. If wetlands are suspected to exist on the property, they should be investigated and delineated by a qualified professional. The USACE must make a determination as to whether or not the wetlands fall under their jurisdiction. All efforts should be made to reduce or eliminate impacts such as using a

buffer and/or installing a silt fence around wetlands. If the wetlands fall under the jurisdiction of the USACE, a Section 404 permit is required before any disturbance of the wetlands is allowed. In addition, the SCDES-BCM CZC determination will address any proposed wetland impacts. Berkeley County will accept certified delineations from qualified consultants if the USACE is unable to issue a verification on the jurisdictional determination.

9. Where existing wetlands receive runoff from an overall stormwater management system, the approved plan for stormwater management shall not be implemented until all necessary State and federal permits have been obtained.

10. All stormwater management and sediment control practices shall be designed, constructed, and maintained with consideration for the proper control of mosquitoes and other vectors.

11. For the purposes of hydraulic design, capacity of a system to transport stormwater runoff shall be based on the size of the contributing drainage basin or subwatershed, as outlined below:

    a. Major Drainage Channels: All channels which drain an accumulation of primary and/or secondary drainage channels. These channels shall be the natural drainage channels of the watershed or man-made channels draining an area of one square mile or more.

    b. Primary Drainage Channels: All drainage channels which drain an area of two hundred (200) acres or more.

    c. Secondary Drainage Channels: All drainage channels which drain an area of less than two hundred (200) acres and the primary benefit is to the development.

12. All development sites disturbing one acre or more shall have an analysis performed of the drainage system to ascertain the function of the system during the 100-year storm event (precipitation only) or more specifically, determine that the project will not:

    a. Increase the likelihood of dwelling flooding and property damage.

    b. Increase water surface elevations or reduce system capacity in the stormwater system and facilities upstream or downstream of the project.

    c. Impose any new or additional increase in stormwater runoff velocity on adjacent properties, discharge points, or downstream areas.

    d. Impose any new or additional increase in erosion and pollutant loads that would adversely impact waters of the State.

13. If a master plan exists for the area/watershed which encompasses the project, criteria set by that plan shall be used for determining the extent of this analysis. Without a master plan, analysis shall extend up to the top of the watershed and down to a Water of the State or to a point in which the project comprises 10% of the total contributing area, whichever occurs first. In these cases, the analysis criteria may include, but is not limited to:

    a. Utilization of existing land use CNs for all areas.

    b. Routing the flows using an accepted hydrologic and hydraulic method.

    c. Providing hydraulic step-backwater calculations using USACE's HEC-2 or HEC-RAS models or equivalent. Other calculations may be required by the County Engineer based on severity of potential impact and location of the project.

    d. If the downstream analysis determines that the development of a particular site does contribute to flooding, pollution, or erosion problems, then the system design shall be changed or additional controls shall be included, until there is no contribution to flooding, pollution, or erosion problems.

14. Watersheds that have documented water quantity problems are an example of a Special Protection Area and may have more stringent or modified design criteria as determined from Berkeley County studies or as dictated by State and federal regulations. Examples of potential additional design requirements the County Engineer may impose in such areas are provided in **Section 3.10** of this manual.
15. For outlets and conveyances influenced by receiving waterbody backwater, the design shall prevent reverse flow into the storm drain system and demonstrate that the storm drain network, roadway ponding, and pond stages remain within adopted performance criteria during the coincident occurrence of (a) the 25-year runoff event and (b) the receiving water 25-year tailwater elevation at the outfall. Tailwater elevations shall be established using an accepted hydraulic method (e.g., HEC-RAS) and applied as a downstream boundary condition in outlet and conveyance modeling. Where tailwater submerges the outlet, backflow prevention devices and maintainable appurtenances shall be provided. Emergency spillways and overland relief paths shall be designed to safely convey exceedance flows without impacts to structures.

3.4 STORMWATER HYDROLOGY AND ROUTING

This section discusses the hydrologic criteria that a designer should use when designing stormwater infrastructure.

3.4.1 HYDROLOGICAL COMPUTATION METHODS

All hydrologic computations shall be completed using volume-based hydrograph methods acceptable to the County Engineer. The design storm duration for these computations shall be the 25-year, 24-hour storm event utilizing a SCS Type III distribution with a 0.1-hour duration time increment with peak rate factor (PRF) varying depending on the type of project. PRF is based on the impervious area for both the pre-development and post-development scenarios; values can be found in **Table 3-1**.

Table 3-1. Peak Rate Factors by Impervious Area

Impervious Area (%)	PRF*
0 – 10	256
<10 – 20	300
<20 – 30	350
<30 – 40	375
<40 – 65	400
<65 – 80	475
<80 – 100	550

*Values are based off of Meadows (2020)

Typical hydrologic inputs include, but are not limited to the following:

- Rainfall depth or intensity.
- NRCS soil classification and HSG.
- Land use.

- T_c.
- Initial abstraction/surface storage.

The remainder of this section will provide basic information for the hydrologic calculations. As discussed, the intent of the Manual is not to provide detail on every aspect of hydrologic computations, their limitations, assumptions, and appropriateness of use, but rather general guidance on generally accepted standards. This Manual does, however, reference suggested materials as necessary for detailed discussion of related topics.

3.4.2 COMPUTER MODELING METHODOLOGIES

Designers may select an appropriate modeling program to calculate the pre-development and post-development site conditions. In circumstances where backwater and tailwater conditions are not present, and for storm drainage systems with less than five connections, Manning's Equation shall be acceptable. For sizing the capacity of pipes in non-submerged conditions where the free water surface elevation is below the crown of the pipes, programs that incorporate Saint-Venant equations (full dynamic wave) shall be selected to better represent the hydrodynamic environment. Acceptable models for design include, but are not limited to, the following:

- ICPR.
- HY8.
- Pond Pack.
- HEC-RAS.
- Flow Master.
- HydroCAD.
- Culvertmaster.
- XPSWMM.
- Autodesk Storm and Sanitary Analysis.
- Hydraflow.

3.4.3 RAINFALL AND DESIGN STORMS

The design storm for Berkeley County shall be the 25-year, 24-hour storm. Some designs will also require the management of the 100-year, 24-hour storm and will be noted where applicable in this Manual. The 24-hour duration precipitation depths corresponding to various return periods to be used for projects in Berkeley County are shown in **Table 3-2**.

Table 3-2. Design Storm Precipitation Data for Berkeley County

24 Hour Storm Event	1-yr	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
Precipitation (inches)	3.42	4.16	5.38	6.36	7.75	8.88	10.1

Source: NOAA Atlas 14, Vol. 2, Ver. 3

3.4.4 STORMWATER MANAGEMENT METHODOLOGIES

Berkeley County recommended methods and corresponding design circumstances are listed in **Table 3-3** and **Table 3-4** below. If other methods are used, approval must first be given by the County Engineer. Complete source documentation must be submitted for approval.

Table 3-3. Recommended Methodologies Based on Land Disturbance Area

Method	Size Limitations*	Comments
(Modified) Rational Method	0 – < 1 Acres	Acceptable for sizing individual culverts or storm drains that are not part of a pipe network or system. Not to be used for storage design.
NRCS Method (TR-55)	0 – 2000 Acres	Used for estimating peak flows from urban areas.

*Size limitations refer to the subwatershed size to the point where a stormwater system component (i.e., culvert, inlet, BMP) is located.

Details of Rational Method and Modified Rational Method can be found in Chow (1988), ASCE (1996), USDA (1996), and Mays (2001). Documentation on the commonly used NRCS Method can be found in the US Department of Agriculture Technical Release 55 (TR-55), "Urban Hydrology for Small Watersheds" (USDA 1986).

The USGS regression equations for South Carolina can be obtained from the US Geological Survey website: https://water.usgs.gov/software/NFF/manual/sc

Haan, C. T., Barfield, B. J., and Hayes, J. C. (1995) and USDT (1996, 2001) can also be referenced for greater detail on hydrology calculations and assumptions.

Table 3-4. Recommended Hydrologic Methods for Designing Various Stormwater Management Systems and Controls

Method	Rational Method	SCS Method
Extreme Flood Protection		+
Storage/Sedimentation Facilities		+
Outlet Structures		+
Gutter Flow and Inlets	+	
Storm Drain Pipes	+	+
Culverts	+	+
Small Ditches		+
Open Channels		+
Energy Dissipation		+

3.4.5 CURVE NUMBER

Curve Numbers range from 1 to 100, with lower CNs representing land cover and soils with a lower potential for runoff, such as those with more forested cover and HSG A. Watersheds with high CNs represent watersheds with relatively high impervious land cover and soils with a higher potential for runoff (such as HSG D). Site designs that conserve natural areas and reduce impervious cover will produce designs that emulate the runoff characteristics of the pre-developed condition, resulting in a lower CN and reduced runoff volume. Documentation and guidance to determine the CN can be found in the US Department of Agriculture Technical Release 55 (TR-55), "Urban Hydrology for Small Watersheds" (USDA 1986). Open water, including BMPs, should be considered impervious for hydrologic calculations.

3.4.6 TIME OF CONCENTRATION

Time of Concentration (T_c) is the time for runoff to travel from the most hydraulically remote point of the watershed to a point of interest. Methods for calculating Tc and abstraction are numerous. The most common method to calculate T_c for surface flow is using the NRCS TR-55 methodology (USDA 1986), which divides T_c into three components: (1) sheet flow, (2) shallow concentrated flow, and (3) open/closed channel flow. For purposes of calculating T_c in the County, the maximum sheet flow distance shall be 100 feet, and the maximum shallow concentrated flow length shall be 1,200 feet. From there, it is considered open/closed channel flow until the ultimate outlet. Each component has a travel time (T_t) associated with it and will be added together to become the T_c. A minimum T_c of six minutes shall be used for all hydrologic calculations.

A long T_c that mimics pre-development conditions can be achieved by maximizing sheet flow, lengthening the flow path, flattening slopes, increasing the surface roughness through the use of vegetation, and reducing the length of conveyance systems (e.g., pipes) in favor of open swales. A longer flow path or travel distance will increase the T_c and allow more time for infiltration. This will simultaneously reduce the peak flow rate and the total volume of runoff. Rooftop and driveway runoff can be directed to infiltration trenches or stored in cisterns to capture the runoff prior to it reaching the lawn. Strategic lot grading can increase both surface roughness and the travel length of the runoff, which in turn will increase the T_c along that particular flow path.

3.4.7 HYDROGRAPHS

Hydrographs shall be used to evaluate entire systems by routing storm events through pipe or storage systems. The use of a hydrograph will provide better insight into system performance than simply using the peak discharge. The County Engineer will accept computer models commonly used in the industry as well as newer models with appropriate documentation.

3.5 COLLECTION AND CONVEYANCE DESIGN STANDARDS

This section provides the design requirements for various storm sewer drainage/collection system components, including design storms, velocities, and pipe and inlet sizes. Storm drainage systems shall include all storm drainage structures and pipes that convey runoff. The standards in the following sections are required for all publicly maintained drainage systems and are recommended for privately maintained systems, as well.

Surface water collected on roadways shall be diverted to a drainage facility at satisfactory intervals to prevent overtopping the centerline of the road during a 25-year 24-hour storm event for minor residential roadways and collector roadways. Design frequency may vary with the classification of street, highway, or land use in the area. Drainage areas allowed for surface flow on streets at the point of diversion shall not exceed twenty (20) acres, regardless of flow.

3.5.1 STORM DRAIN PIPES

1. The minimum size storm drainage pipe allowable shall be 15 inches in nominal inner diameter. The minimum size pipe allowed under a public roadway, within the public right-of-way (ROW), and/or downstream of public ROW shall be 18 inches in nominal inner diameter, with the exception of driveway pipes. The minimum size driveway pipe allowable shall be 15 inches in nominal inner diameter.
2. Within ROW, only gasketed reinforced concrete pipes (GRCP), minimum Class III, are allowed. Outside the ROW, High Density Polyethylene pipes (HDPE) are also permitted in pipe systems to be accepted for County maintenance. All pipe joints shall be wrapped in non-woven geotextile fabric.
3. The minimum allowable slope for storm drainage pipe shall be 0.3 percent [0.003 ft/ft], if feasible. Regardless of slope, the minimum flow velocity shall be three feet per second when pipe is flowing at half capacity or greater. Maximum allowable slope for storm drainage pipe is 20 percent. The maximum allowable flow velocity shall be 15 feet per second.
4. For very flat flow lines, flow velocities shall increase progressively throughout the system. Upper reaches of the pipe system may have flatter slopes than the lower end of the system to facilitate the increasing flow velocities.
5. Roof drains may be made of PVC and shall be no smaller than 6 inches in diameter. Roof drains may be a maximum of 40 feet, comprised of a maximum 10 foot long pipe sections. Roof drains must drain to private property, stormwater conveyance, or drainage structure approved by the County Engineer and/or his designee.
6. Drainage system installation must be such that stormwater discharge is not concentrated on adjacent property owners and that the velocity is less than erosive limits for the site soils. At pipe outfalls, this normally requires the use of a rip-rap apron placed on filter fabric and lightly grouted or articulating concrete blocks for a minimum distance equal to or greater than six pipe diameters. To use an alternative measure, the design engineer shall submit supporting documentation that the proposed measure shall perform at least equivalent to the currently approved erosion prevention measure contained in this Manual.
7. Type and class of storm drainage pipe and the installation of pipes shall be in accordance with Sections 714 (Permanent Pipe Culverts) and 715 (Temporary Pipe and Pipe Arch) of the latest SCDOT specifications.
8. A minimum of one foot of cover must be provided for all storm drainage pipes unless otherwise granted by the County Engineer. GRCP Class IV or V pipe may be requested by the County Engineer in special conditions (deep installations, excessive surface loads, etc.).
9. Storm drainage pipe shall be placed to minimize length running under pavement. Where it is necessary for a pipe to cross the roadway, it preferably shall be placed at a 90-degree angle, and in no case at less than 45 degrees. All cross lines in the roadway shall have backfill compacted in six-to-eight-inch lifts to 95 percent Modified Proctor maximum density.
10. Any "open" storm drainage cross line pipe shall extend out to the toe of the roadway embankment. In no case will the end of the pipe be within roadway shoulder of approved road section. Beveled pipe ends are recommended.
11. Storm drainage pipe discharging into a drainage channel shall intersect the channel in a manner such that the interior angles measured from their centerlines of flow, is greater than, or at least equal to minimum 90 degrees. Riprap, or other suitable protection, is required from the top of the pipe at the outlet point to the bottom of the channel and on the opposite channel bank to prevent scour and erosion.

12. Storm drainage pipe discharging into a wet pond or lake should have the discharge invert above the permanent pool elevation and riprap or other energy dissipation structures shall be placed from the outlet point to two feet below pool level. Submerged systems should be avoided where feasible.
13. A maintenance access point shall be available within every 200 feet for 15–18-inch diameter pipe and every 400 feet for 24-inch and larger pipe.
    a. No section of pipe, including outfalls, shall be more than 400 feet from a roadway, driveway, or parking lot.
    b. All pipes must have at least one access point available for cleaning purposes, and all access points must be above the 25-year hydraulic grade line.
14. Hydraulic grade line and head loss calculations for determining water surface elevations shall be performed for all system connections.
15. Calculations should be performed for the appropriate design storm event as prescribed in **Section 3.3**.
16. Storm drainage systems shall be designed to convey stormwater runoff by gravity flow unless otherwise approved.

3.5.2 CULVERTS

1. The minimum allowable size for any roadway culvert shall be 18 inches. The minimum allowable size for any driveway culvert shall be 15 inches.
2. All culverts shall be GRCP Class III as a minimum beneath traffic-bearing areas such as roadways and driveways or inside a right-of-way.
3. Proper consideration of inlet and outlet control shall be given in the design of culverts and outlets.
4. The pipe, appurtenant entrance and outlet structure should properly account for water, bedload, sedimentation, and floating debris at all stages of flow.
5. The outlet must be designed to resist undermining and washout.
6. Culvert design shall include all cross-drainage facilities that transport stormwater runoff under roadways. Culvert selection techniques can range from solving empirical formulas, to using nomographs and charts, to comprehensive mathematical analysis for specific hydraulic conditions. The models used for these calculations are listed in **Section 3.4.2**. Other widely accepted models may be used but must be approved by the County Engineer. Designs shall be based upon SCDOT requirements where applicable.
7. Culverts under roadways shall be designed using the 25-year storm event as a minimum, but critical roadways shall be designed using a higher storm event as follows:
    a. A critical roadway is a roadway that is a sole-access route that must remain passable throughout the 100-year 24-hour storm event. At least one critical roadway must be designated for each applicable development. All critical roadways must connect to a County- or State-maintained road.
    b. Ponding on the upstream end of the culvert is acceptable as long as the roadway is not overtopped during the precipitation event. Ponding or backwater effects shall not impact any new or existing structures and recede after the storm event in a time period acceptable to the County Engineer.
8. Additional hydraulic capacity shall be required as necessary to prevent backwater effects that may adversely impact upstream property or structures.

3.5.3 EXFILTRATION SYSTEMS.

All materials used in the construction of exfiltration systems shall conform to the latest edition of the SCDOT Standard Specifications for Highway Construction. The following is a list of exfiltration materials acceptable for use in the County:

1. Exfiltration pipe:
    a. Aluminum pipe perforated 360 degrees, meeting the requirements of AASHTO M-196.
    b. Perforated Class III RCP (minimum) with perforations meeting the requirements of ASTM C-444.
    c. Polyvinyl chloride pipe perforated 360 degrees, meeting the requirements of ASTM D-3033.
2. Coarse aggregate: Clean stone containing no friable materials and a gradation equivalent to size number 56 or 57.

3.5.4 HEADWALLS AND OUTLETS

1. All exposed ends of pipes shall be protected by one of the following approaches:
    a. A flared end section (limited to pipes 36 inches or less in diameter).
    b. A concrete or brick plastered with grout, headwall is preferred and is required on culverts located in major defined drainage channels.
    c. A rip-rap headwall is acceptable for pipes 24 inches or less in a number of situations. If used, it must conform to the standard details. Note that this technique requires the use of both non-woven geotextile fabric and grout.
2. Storm drainage or pond outfalls must be carried to an existing drainage conveyance system.
3. New point discharges onto adjacent properties shall not be allowed without the property owner's written consent.
4. Discharge points created by construction, development, and redevelopment shall connect to an existing drainage system, whether natural or man-made. The new outlet may not cause flooding or in any way degrade the existing drainage system and proof of such shall be provided. In some cases, conveyance must be constructed from the new development to a point of discharge into the existing system and shall be done at the owner's expense. In these cases, the owner is responsible for obtaining all necessary easements and agreements to construct such drainage improvements.
5. Outlets will not be allowed to discharge onto fill slopes.

3.5.5 ENERGY DISSIPATION

1. All outlets should be sufficiently stabilized. Calculations shall be provided justifying the design and material used (e.g., riprap aprons geometry and diameter). SCDOT methodologies are acceptable.
2. If riprap aprons are used, non-woven geotextile fabric is to be installed beneath all riprap, lightly grouted, and the length must be at least six times the diameter of the pipe, unless otherwise justified by provided calculations.
3. If level spreaders, plunge pools, etc. are used, then they shall be properly designed and installed at the proposed outlet(s).

3.5.6 STORM DRAINAGE STRUCTURES

Storm drainage structures include catch basins, inlets, manholes, junction boxes, outlet control structures, etc.

1. Structures, materials, and construction shall be as specified in Section 719 of the latest SCDOT specifications and details.
2. Maintenance access points (manholes) are required on all structures in the County maintained system.
3. All designs shall include catchments to ensure that water will not cross a street or entrance way.
4. Catch basins shall be spaced so that the spread in the street for the 25-year 24-hour design flow shall not exceed one half lane width plus the width of the gutter. At least one full travel lane width must be available during the storm event for all roads. Inlets up-gradient of a road intersection, sag inlets, or the last inlet for a given system must be designed with sufficient capacity to handle the entire flow, such that there is no flow through/bypass.
5. When the depth of a storm drainage structure exceeds four and one-half feet, rungs/steps shall be provided for ascent and descent. (Steps are to be ASTM-C-478, or equivalent.)
6. The minimum inside dimension of all storm drainage structures shall be three feet by three feet. Masonry sides shall be plastered with grout.
7. Pipes entering or leaving shall not protrude more than four inches into the box.
8. Catch basins and yard inlets shall be designed to accommodate a given flow such that ponded water is removed within 24 hours and does not cause flooding to adjacent buildings or other structures.
9. Inlets placed in collector roadway gutter lines must be spaced to prevent flow from entering road intersections and to not exceed a maximum spread of 6-feet, or one-half of a travel lane, whichever is greater, and based on maximum inlet capacity.
10. Storm drainage structures will be located outside curve radii.
11. Storm drainage structures within ROW shall have a minimum of a one-foot sump.
12. Storm drainage structures shall contain a minimum drop of 0.1 feet from invert in to invert out.
13. Within a catch basin or storm drainage structure, the elevation at the crown of any inlet pipe shall be equal to or greater than the crown of the outlet pipe.
14. Area around all catch basins shall be backfilled in six-inch to eight-inch lifts, compacted to ninety-five (95) percent Modified Proctor maximum density.
15. Inlet protection shall be provided at all inlets into the stormwater system during construction and until project closure procedures have been completed or notification from the County Engineer has been given stating that an acceptable level of stabilization has been achieved. Guidance on design, installation and maintenance of inlet protection can be found in SCDOT Standard Specifications for Highway Construction (2007).
16. The maximum depth in which the water may pond above or around an inlet must not threaten surrounding permanent structures or facilities including vehicular or pedestrian traffic.
17. All manhole lids and catch basins shall contain the Berkeley County water quality logo or an alternate design approved by the County Engineer. Contact the County Engineer for information on how to obtain logos.

3.5.7 OPEN CHANNELS

Open channels shall include all permanent storm drainage channels, including swales, ditches, and diversions.

3.5.7.1 GENERAL OPEN CHANNEL CRITERIA

These storm drainage systems shall be designed based upon the following general criteria:

1. The design of open channels shall be based on Manning's Formula. Where backwater effects from obstructions and/or tailwater are present, the design of open channels shall be based on the Saint-Venant Equations. Flow velocities for the 10-year storm event must be less than five ft/sec (two and one-half ft/sec in bare sandy soils) or the channel surfaces must be adequately lined, e.g., riprap, concrete.
    a. The minimum channel grade shall be 0.005 ft/ft, unless supporting calculations show that there will be no pools or standing water areas formed in the channels at smaller slopes.
    b. Design conditions shall be assumed to be steady, uniform flow.
    c. Except for roadside ditches, side slopes of grassed lined channels without Erosion Control Blankets or Turf Reinforcement Matting shall be no steeper than 3H to 1V.
    d. Channels may be designed with multiple stage levels with a low flow section to carry the 2-year 24-hour storm event and a high flow section to carry storms of lower frequencies. In the two-stage ditch option, the benches above the 2-year storm event should have between a 0% and 3% side slope. In addition, the width of each bench should, at a minimum, be equal to the top width of the lower conveyance channel.
    e. Additional hydraulic capacity shall be required as necessary to prevent backwater effects that may adversely impact upstream property or structures.
2. Open channels should be designed with a trapezoidal, V-shaped, or parabolic cross-section.
3. Generally, open channels should be aligned adjacent to and the same length as the contributing drainage area identified for treatment.
4. All open channels shall be uniform and shall be stabilized to prevent erosion in a manner approved by the County Engineer. Some acceptable techniques are shown in the current version of the SCDES BMP Handbook (2005).
5. A cross-section should be obtained at each location where there are significant changes in channel width, shape, or vegetal patterns. Usually, sections should be no more than 4 to 5 channel widths apart or 100 feet apart for ditches or streams and 500 feet apart for flood plains, unless the channel is very regular.
6. For vegetative channels, design stability should be determined using low vegetative retardance conditions (Class D) and for design capacity higher vegetation retardance conditions (Class C) should be used. If permanent vegetation cannot be established immediately, then an Erosion Control Blanket (ECB) or Turf Reinforcement Mat (TRM) shall be installed and designed to handle the maximum velocities for the channel. Maximum permissible velocities are located in **Table 3-5**.

Table 3-5. Maximum Permissible Velocities for Vegetated Channels

Cover	Permissible Velocity (ft/sec)*					
	Erosion Resistant Soils % Slope			Easily Eroded Soils % Slope		
	0-5	5-10	> 10	0-5	5-10	> 10
Bermuda Grass	8	7	6	6	5	4
Buffalo Grass Blue Grama Centipede Grass	7	6	5	5	4	3
Grass-legume Mixture	5	4	NR	4	3	NR
Alfalfa Small Grains Temporary Vegetation	3.5	NR	NR	2.5	NR	NR

*Allow velocities over 5 ft/sec only where good cover and maintenance will be provided. If poor vegetation exists due to shade, climate, soils or other factors, the permissible velocity shall be reduced by 50 percent.
NR = Not Recommended
Sources: Elementary Soil and Water Engineering, Shwab et. al. and Hann et. al. (1995)

7. Open channel drainage systems shall be sized to handle a 25-year design storm. The 100-year design storm shall be routed through the channel system to determine if the 100-year plus applicable building elevation restrictions are exceeded, structures are flooded, or flood damages increased. The open channel system shall be designed so that the 100-year event does not overtop the banks. Calculations shall be provided in the stormwater report.
8. Design of drainage channels must avoid erosion problems. Wide channels with flat slopes lined with grass or other vegetation should be used where practical. Where channel gradients are steep, concrete linings or grade control structures, such as check dams, may be required. Every effort should be made to preserve natural channels.
9. General guidance on open channel design can be found in USDT (1996, 2001) *and Low Impact Development in Coastal South Carolina: A Planning and Design Guide* (2014).

Additional criteria for specific types of open channels (primary channels, ditches, and swales) can be found in the following sections.

3.5.7.2 PRIMARY AND MAJOR CHANNELS

All natural primary and/or major drainage channels which are located within, or along the property line of an improvement, development or subdivision shall be protected by the developer as follows:

1. The bottom width of the channel should be four to eight feet wide to ensure that adequate surface area exists along the bottom of the channel for filtering.
    a. If a channel will be wider than eight feet, the designer should incorporate benches, check dams, level spreaders, or multi-level cross-sections to prevent braiding and erosion along the channel bottom.
    b. Channel bottoms with widths greater than ten feet shall be designed with a minimum bottom cross-slope of 12:1.

2. If relocation of a stream channel is unavoidable, the cross-sectional shape, meander pattern, roughness, sediment transport, and slope should conform to the existing conditions as much as practicable. Some means of energy dissipation may be necessary when existing conditions cannot be duplicated.
3. Stream bank stabilization must be provided, when appropriate, as a result of any stream disturbance, such as encroachment, and should include both upstream and downstream banks as well as the local site.
4. The existing channel lying within or along the property line of a subdivision or parcel of land proposed for development or redevelopment shall be straightened, widened, and improved to the extent required to prevent overflow, resulting from a 50-year frequency rainfall.
5. Site improvement shall provide for the grading of all building pads to an elevation where all building pads will not be subject to flooding from the 100-year frequency flood and in a manner that will provide for a rapid runoff of stormwater.
6. Whenever channel improvements are carried out, sodding, back sloping, cribbing, and other bank protection practices shall be designed and constructed to control erosion from the anticipated conditions and flow resulting from a 50-year frequency rainfall.
7. An existing natural drainage channel shall not be located in a street easement unless it is placed in an enclosed storm sewer, except under the following conditions:
    a. Where a paved street surface at least two lanes wide is provided on both sides of a paved or stabilized bank channel so as to provide access to abutting properties.
    b. When a condition exists as outlined above, adequate space shall be dedicated as right-of- way to provide for maintenance of the paved drainage channel.
8. Culverts, bridges, and other drainage structures shall be constructed in accordance with the specifications and design criteria of Berkeley County when the County shall have present or future maintenance responsibility.
9. No open natural storm drainage course shall be permitted within 75 feet of the rear or side of a building to the top of the edge of the drainage facility or vice versa, or 35 feet from impervious parking areas unless exceptional site planning opportunity is afforded, and the improvement will not be jeopardized by flooding or erosion.

3.5.7.3 SECONDARY CHANNELS (DITCHES AND SWALES)

All secondary drainage channels which are within, or immediately adjacent to, an improvement or subdivision shall be protected and improved by the developer as follows:

1. Ditches
    a. Depths up to and including five feet – Side slope ratio of 2H:1V.
    b. Depths greater than five feet but no more than seven feet – Side slope ratio of 3H:1V.
    c. At the option of the developer any open ditch may be piped in lieu of these requirements. As a minimum the drainage system must be piped from the right-of-way to the rear property line on residential lots.
    d. No drainage ditch shall exceed a maximum depth of seven feet.
2. Swales shall have side slopes between 4H:1V to 10H:1V and a depth of 6 – 18 inches measured at the flow line to the top of the swale. Swales must reside entirely within the drainage easement.

3.6 SOILS AND GEOTECHNICAL INFORMATION

Soil types in Berkeley County range from sands to sandy clays. Existing land use and corresponding runoff potential factors should be obtained from the site visit and other appropriate sources, such as the NRCS Web Soil Survey at the following website:

https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx

The best way to understand the types of soils that are on a site is to conduct a soil analysis by a licensed professional engineer, geologist, or soil scientist. A soil analysis can provide critical information such as soil types, depth to relatively impenetrable soil types, and depth to groundwater and infiltration ability. These are key considerations when performing calculations for stormwater runoff and determining the ability to implement LID infrastructure.

3.7 WATER QUANTITY CONTROL STANDARDS

Water quantity control is an integral component of overall stormwater management. Quantity control is effectively flood control, reducing potential damage and health risks, but because uncontrolled runoff can cause erosion, water quantity control can also be a form of water quality control. The following design criteria are established for water quantity control. All designs of storage facilities utilized for stormwater quantity control and the associated required downstream analyses shall be submitted as part of the engineering calculations to obtain Berkeley County stormwater approval.

3.7.1 GENERAL WATER QUANTITY CRITERIA

1. Post-development peak discharge rates shall not exceed pre-development discharge rates for the 2-, 10-, and 25-year, 24-hour duration storm event.
2. Discharge velocities shall be reduced to provide a nonerosive velocity flow from a structure, channel, or other control measure or the velocity of the 25-year, 24-hour storm runoff in the receiving waterway prior to the land disturbing activity, whichever is greater.
3. Dry detention practices must store one inch of runoff from the site, whereas infiltration practices must capture one inch of runoff from only the impervious cover on a site.
4. Watersheds that have well-documented water quantity problems (Special Protection Area) may have more stringent, or modified, design criteria. See **Section 3.10.1** for any additional requirements.

3.7.2 STANDARD WATER QUANTITY DESIGN PROCEDURES

This section provides the general procedures for the design of stormwater quantity structures. The following items shall be required for the design of these structures and routing flows through them:

1. Controls shall be designed by traditional reservoir routing procedures.
2. Compute the inflow hydrograph for the structure for the 2-year, 10-year, 25-year, 50-year, and 100-year 24-hour storm events for both the existing and proposed conditions. From this, determine peak flow rates for each storm.
3. Compute a stage-storage relationship for the proposed structure. A stage storage-curve defines the relationship between the depth of water and storage volume within the detention facility.
4. Compute stage-discharge relationship of the outlet control structure(s). A stage-discharge curve defines the flow capacity of a structure at a given stage or elevation.

5. Perform routing calculations for the 2-year, 10-year, and 25-year 24-hour storm events. Calculations may be done by hand or may be done by using a storage routing computer model.
6. Determine the cumulative volume at the 24-hour point released from the facility.
7. Compare the pre- and post-development volumes and peak discharges for the routed storm events.
    a. The volume released from the pond within 24 hours should be at or below that for pre-development conditions.
    b. The peak discharge rate from the pond should be at or below the peak discharge rate for the pre-development condition for the 2-year, 10-year, and 25-year storm events.
    c. Verify the peak water surface elevation for the 100-year storm event does not exceed freeboard requirements established in subsequent sections.
8. Evaluate the control structure outlet flow velocity and provide velocity control and channel stabilization if needed. Drawings and details should be provided for outlet structures and basins.
9. Repeat Steps 1-7 for post-development condition until peak, volume, and velocity criteria are met.
10. Provide all calculations in the submittal package in a cohesive, organized, and easy to follow SCDES submittal package format.
11. Stage-storage and stage-discharge calculations should be included in the engineering calculations. Common methodologies for stage-storage curves include the double end area method and the pyramid frustum method. Other methods may be accepted upon justification.
12. All models/methodologies used must be approved by Berkeley County. A list of accepted models can be found in **Section 3.4.2.**

3.7.3 ACCEPTED WATER QUANTITY CONTROLS

Detention structural controls are used for providing water quantity control and are typically used downstream of other minor structural controls. These structures are designed to provide channel protection, overbank flood protection, and protection against adverse downstream impacts that are related to the increase in peak flow rates and flow volumes from a land disturbing activity development. Structural detention stormwater controls accepted by Berkeley County are shown in **Table 3-6**.

Table 3-6. Accepted Water Quantity Controls (BMPs)

General Structural Control	Description*
Dry Detention/Dry Extended Basins	Dry detention basins and dry extended detention basins are surface storage facilities intended to provide temporary storage of stormwater runoff and releasing it at a designed flow rate to reduce downstream water quantity impacts. These structures are designed to completely drain to a dry condition within 72 hours.
Wet Storm Water Detention Basins Wet Pond Wet Extended Detention Pond Micropool Extended Detention Pond Multiple Pond System	Wet detention basins are constructed stormwater basins that have a permanent pool or micropool of water. Runoff from each rain event is detained above the permanent pool and released at a designed flow rate to reduce downstream water quantity impacts. Permanent pool depths must be at least 4 feet.
Multi-purpose Detention Areas	Multi-purpose detention areas are used for one or more specific activities such as parking areas and rooftops. These areas are used to provide temporary storage of runoff. Some of the multi-purpose areas such as infiltration trenches or bio-retention cells may also be used for water quality purposes.
Underground Detention	Underground detention systems are used as an alternative to surface dry- detention basins. They are used in areas that are space-limited where there is not enough adequate land to provide the required detention volume. Underground storage utilizes tanks, vaults, and buried pipes to supply the required storage volume.
Infiltration Basins	Infiltration basins are used to remove runoff from the flow path into the ground. They are used in areas that currently do not discharge stormwater or create runoff only during large storm events.
Rainwater Harvesting	Rainwater harvesting systems store precipitation for future use, such as landscape irrigation, toilet flushing, or exterior washing. Rainwater harvesting can be combined with secondary stormwater practices to enhance stormwater retention and/or provide treatment of overflow.
Pervious Pavement Pervious Concrete Porous Asphalt Permeable Pavers Concrete Grid Pavers Plastic Grid Pavers	Pervious pavement systems capture and temporarily store the design volume by filtering runoff through voids in the pavement surface into an underlying stone reservoir. Filtered runoff may be collected and returned to the conveyance system or allowed to partially infiltrate into the soil. These systems can provide reductions in post-construction stormwater runoff rates, volumes, and pollutant loads.

*See LID Manual for an alternative detailed design and maintenance criteria

3.8 WATER QUALITY CONTROL STANDARDS

Water quality control is an integral and required component of overall stormwater management systems. New development and redevelopment projects must include controls that treat or otherwise limit the discharge of pollutants. These requirements were added due to State and federal requirements, and are needed to improve and preserve the water resources in Berkeley County.

3.8.1 GENERAL WATER QUALITY CRITERIA

The following design criteria are established for water quality control and must be incorporated in one or more BMPs for a given sub-basin unless a specific quality variance is granted by the County Engineer. Incorporation of these requirements shall constitute adequate control of the discharge of pollutants.

1. For water quality purposes, the 85th percentile storm shall be managed on-site. The 85th percentile storm refers to the storm event which is bigger than 85 percent of all storms during a typical year. For Berkeley County, this corresponds to a 1.2-inch rainfall event. This requirement mandates the implementation of practices to manage rainfall events at or below the 85th percentile storm, using methods such as infiltration, evapotranspiration, harvesting, or other approaches approved by the County Engineer or their designee.
2. All sites which disturb one (1) acre or greater shall have permanent BMPs installed.
3. Permanent water quality requirements (all projects or LCP that disturb one or more acres):
    a. All permanent water quality ponds, whether having a permanent pool or not, shall be designed to capture the water quality volume (WQV), defined as the runoff from the 85th percentile storm (1.2 inches of rainfall) for the entire area draining to the pond, and release it over at least a 24-hour period.
    b. For areas not draining to a pond, show how permanent water quality requirements were addressed.
4. Projects within one-half mile of a receiving water body in the Coastal Zone must meet Section III.C.3.XIII.A of the Coastal Zone Management Program Refinements. Designs must show that the first one-half inch of runoff from the entire site or the first one inch of runoff from the built-upon area, whichever is greater, can be stored onsite.
5. Waters of the U.S./State must not be used for permanent water quality control (alternative means of treatment must be used if an existing pond is to be used for water quantity control).
6. A variance of the WQV requirement may be approved if treatment is instead provided by engineered devices. Applicability of such waivers will be based on submitted information showing that the device(s) has a design pollutant removal efficiency equivalent to the requirement found in Section 3.8.1.3.
7. If the project is located within 1000 feet of shellfish beds, the pollutant removal equivalency must match a WQV of the first one and one-half inches of runoff from the built-upon portion of the site.
8. BMPs used for water quality that will be capturing one or more acres shall have a pretreatment device as part of the BMP or treatment system, such as a forebay or vault, to remove debris and coarser sediments.
    a. Forebays shall be placed upstream of the main pond storage area. Further forebay design guidance can be found in Section 3.9.1.2.
    b. Unless a separate vault is to be used for the forebay, the forebay shall be separated from the larger detention area by barriers or baffles that may be constructed of earth, stones, riprap, gabions, or

geo-textiles. The barrier and/or baffles act as a trap for coarse sediments and minimize their movement into the main pond.

c. Maintenance of forebays will be needed more frequently than the main storage area and all designs should consider this need.

9. All BMPs must have a maintenance plan and schedule for construction site and post construction. The maintenance plan and schedule must be included with the submitted Stormwater Maintenance Covenants. Suggested schedules and routine activities are provided in the SCDES BMP Manual (2005).

10. Projects that discharge either directly or indirectly into an impaired waterbody as determined by the existence of an adopted TMDL by SCDES or through SCDES's listing of the waterbody on the most current 303(d) list shall be required to reduce pollutant loads to meet applicable water quality standards. More background information is covered in **Section 3.10.2** that discusses criteria for Special Protection Areas. This will require the installation and implementation of measures (structural or non-structural BMPs) to adequately reduce pollutant loads to levels required by the TMDL (currently expressed as % reductions) or to prevent further impairment. A list of approved water quality devices was provided in the previous section.

11. The County Engineer reserves the right to require specific effluent limits for any pollutant from a site, if necessary, to ensure the water quality standards and other State and federal water quality regulations are met.

12. When ponds are used for water quality protection, the ponds shall be designed as both quantity and quality control structures. Sediment storage volume shall be calculated considering the clean out and maintenance schedules specified by the designer during the land disturbing activity. Sediment storage volumes may be predicted by the Universal Soil Loss Equation or methods deemed acceptable by the County Engineer.

3.8.2 TYPICAL WATER QUALITY DESIGN PROCEDURES

1. Determine appropriate, accepted BMPs needed for the site. Consider the land use, pollutants of concern, soils, maintenance requirements, and location in relation to waters of the State and any impairments that may exist.

2. If the receiving water of the project is impaired or has an adopted TMDL, the applicant must show that water quality standards are being met and designated uses are not impacted. This proof must be quantitative and qualitative for sites which disturb greater than 25 acres (see **Section 3.10**). The appropriate steps include:

   a. Calculate the estimated load for the pollutant(s) of concern. The SWMM or IDEAL models may be used for all water quality calculations. Another, less preferred option is the Simple Method (Schueler 1987). This method is based on an extensive database obtained in Washington, D.C. for the National Urban Runoff Program (NURP). The Simple Method estimates pollutant loads from urban development by **Equation 3-1**:

Equation 3-1. Estimated Load for Pollutant of Concern

$$L = 0.227(Q \times P_j \times R_v \times C \times A)$$

Where:
L = Pollutant load in pounds per desired time interval
Q = Runoff depth
P_j = Fraction of rainfall events over the time intervals that produce runoff
Pj = 1 for a single event
Pj = 0.9 for larger time intervals (months, years)
R_v = Volumetric runoff coefficient expressing fraction of rainfall converted to runoff
C = Event mean pollutant concentration in mg/l (See applicable TMDL)
A = Total area of site in acres (areas < 640 acres are recommended for this method)

The most important factor affecting the volumetric runoff coefficient (R_v) is the imperviousness of the watershed, *I*, in percent. An empirical relationship relates R_v and *I* in **Equation 3-2**.

Equation 3-2. Volumetric Runoff Coefficient

$$R_v = 0.05 + 0.09(I)$$

The rainfall depth, *P*, was chosen such that a large percentage of storm events will be captured, with larger events only partially captured or bypassed. Greater than 85% of the average annual rainfall amount in Berkeley County occurs from storm events with a total depth equal to or greater than 1.2-inches. The 1.2-inches of runoff from pervious areas is the result of approximately 4.5-inches of total rainfall, but it only takes a rainfall of 1.2 inches on impervious surfaces.

Other loading modules, such as in SEDPRO and SEDCAD for eroded particles or common buildup and washoff equations may be used.

b. Select appropriate BMPs from **Table 3-6**, **Table 3-7**, **Table 3-8**, and the additional BMP tables in **Appendix L**. The use of an engineered device would require documentation to demonstrate its equivalency in meeting water quality criteria.

c. Compute BMP effectiveness for removing pollutants of concern, showing at a minimum that the concentration of the pollutants of concern from the last BMP meets applicable water quality standards.

3. If the BMP is to capture runoff from 5 or more acres, design a forebay or vault. Guidance on this aspect can be found in SCDES (2005) and ARC (2001).

4. Calculate the water quality volume using **Equation 3-3**.

Equation 3-3. Water Quality Volume

$$WQV = \frac{Q \times DA}{12}$$

Where:
WQV = Water quality volume (acre-feet);
Q = Runoff depth (inches);
DA = Drainage area to water quality BMP (acres).

If the project is located within 1,000 ft of shellfish beds, calculate WQV as defined by Section 3.8.1.7.

5. Runoff from the entire site must be captured in a water quality BMP, unless otherwise allowed by the County Engineer.
6. Compute the inflow hydrograph for the structure for the proposed condition.
7. Unless already known from the quantity calculations detailed in **Section 3.7.2**, compute stage-storage and stage-discharge relationships of the outlet control structure(s).
8. Perform routing calculations for the storm event through the BMP. These may be done by hand or may be done by using a storage routing computer model.
9. Determine if the entire volume from the design storm event was released before the 24-hour point. If it does, the outlet is too large. Resize outlet structure.
10. Repeat steps 4-8 until entire volume is not released prior to 24-hours. This procedure is commonly accomplished using a low-flow orifice and the two-year discharge level is not reached.
11. For engineered devices, alternative calculations other than detailed here should be provided. SCDES has accepted some such devices as providing adequate treatment as compared to capturing and detaining the first one inch of runoff from a storm event (per section 4.2.5.2.2 of SCR030000). Berkeley County requires managing the runoff from the 1.2-inch storm event.
12. Provide all calculations in the submittal package in a cohesive, organized, and easy to follow format. A compliance calculator spreadsheet is available on the Berkeley County website. The spreadsheet was developed by the Center for Watershed Protection and uses the runoff reduction method to determine if BMPs have successfully managed the runoff from the 1.2-inch storm event.

3.8.3 ACCEPTED WATER QUALITY CONTROLS

In selecting BMPs, it is most important to know what pollutants need to be removed, how to remove them, and what degree of removal is needed to meet water quality goals. There are many other project- specific considerations, however, with the proper planning, installation, and maintenance, BMPs are expected to reduce pollutant loads to receiving waters, reduce erosion, provide health and safety benefits, and be cost effective.

The varieties of water quality BMPs are numerous and are typically considered either structural or non-structural. Berkeley County's current approved list of stormwater quality BMPs, listed in **Table 3-7**, are based on literature reviews and experience. Some references to BMP selection, effectiveness, and design can be found in the SCDES BMP Handbook (2005), Agricultural Resource Council (2001), Schueler (1987), and Water Environment Foundation (WEF) & American Society of Civil Engineers (ASCE) (1998). Guidance on applying BMPs into LID approaches can be found in Prince George County (1999a and b) and *Low Impact Development in Coastal South Carolina: A Planning and Design Guide* (2014).

Table 3-7. Accepted Water Quality Controls (BMPs)

General Structural Control	Description	Expected Annual Pollutant Removal[2] (%)				
		TSS	TP	TN	Metals	Pathogens
Wet Ponds	Wet stormwater ponds are constructed stormwater basins that have a permanent pool or micropool of water. Runoff from each rain event is detained and treated in the pool and released at a designed rate.	85	75	40	40	70
Stormwater Wetlands	Stormwater wetlands are natural or constructed systems used for stormwater management. Stormwater wetlands consist of a combination of shallow marsh areas, open water, and semi-wet areas above the permanent water surface.	80	50	30	50	70
Rainwater Harvesting	Rainwater harvesting is the accumulation of rainwater for reuse on-site, rather than allowing it to run off.	*varies*	*varies*	*varies*	*varies*	N/A
Bioretention Areas[1]	Bioretention areas are shallow stormwater basins or landscaped areas that utilize engineered soils and vegetation to capture and treat stormwater runoff. Runoff may be returned to the conveyance system or partially exfiltrate into the soil.	80-90	55-90	65-90	N/A	55-90
Green Roofs	A green roof is a layered practice that captures and stores rainfall in an engineered growing media that is designed to support plant growth, while simultaneously protecting the roof structure. A portion of the rainfall evaporates or is taken up by the plants.	80	45-60	45-60	N/A	45-60
Sand Filters[1]	Sand filters are multi-chamber structures designed to treat stormwater runoff through filtration, using a sand bed as its primary filter media. Filtered runoff may be returned to the conveyance system or partially exfiltrated into the soil.	90	65	45	50	80
Infiltration Trenches[1]	An infiltration trench is an excavated trench filled with stone aggregate used to capture and allow infiltration of stormwater runoff into the surrounding soils from the bottom and sides of the trench.	80-95	65-95	55-90	N/A	65-95
Enhanced Grassed Swales[1]	Enhanced swales are vegetated open channels that are explicitly designed and constructed to capture and treat stormwater runoff within dry or wet cells formed by check dams or other structures.	40	40-45	20-35	30	N/A
Pervious Pavement	Pervious pavement systems capture and temporarily store the design volume by filtering runoff through voids in the pavement surface into an underlying stone reservoir. Filtered runoff may be collected and returned to the conveyance system or allowed to partially infiltrate into the soil. These systems can provide reductions in post-construction stormwater runoff rates, volumes, and pollutant loads.	80	60-80	60-80	N/A	45-75

1 This is an infiltration design and must meet infiltration standard requirements.
2 Based on information from Low Impact Development in Coastal South Carolina: A Planning and Design Guide (2014).

Additionally, water quality controls may include engineered devices, such as a vortex separator, baffles cartridges, skimmers, gravity oil-grit separator, filter material, and inlet inserts. Prefabricated controls use the movement of stormwater runoff through a specially designed structure to remove target pollutants. They are typically used on smaller commercial sites and urban high priority areas. Numerous proprietary stormwater treatment devices are commercially available. Inclusion of any such device in a design does not constitute endorsement by the County. Proprietary devices will be evaluated on a case-by-case basis, and approval is contingent upon submittal of device-specific documentation demonstrating applicability to site conditions and independent, third-party verification of performance using recognized testing protocols.

Some structural BMPs have limited applications and are recommended to be used in conjunction with other BMPs. Limited application controls may be used within a system of water quality controls and are very effective pre-treatment structures for the controls listed in **Table 3-7**. Limited application structural controls should be designed and used only in development situations where regular maintenance is guaranteed. Some popular limited stormwater controls are shown in **Table 3-8**.

Table 3-8. Limited Structural Controls

General Structural Control	Description
Vegetated Filters • Filter Strip • Grassed Channels and Swales	Both filter strips and grassed channels provide filtering of stormwater runoff as it flows across the vegetation. However, by themselves these controls do not consistently obtain adequate sediment and pollutant removal. Both filter strips and vegetated channels shall be used as pretreatment measures or part of a treatment system approach.
Submerged Gravel Wetland Systems	Submerged gravel wetlands use wetland plants in a submerged gravel or crushed rock media to remove stormwater runoff pollutants. These systems should only be used in mid- to high-density environments where other structural controls will be utilized.
Small Sand Filters • Surface Sand Filter • Perimeter Sand Filter	Sand filters are multi-chamber structures designed to treat stormwater runoff through filtration, using a sand bed as its primary filter media. Filtered runoff may be returned to the conveyance system or partially exfiltrated into the soil.
Porous Paver Systems	Porous paver systems consist of open void paver units laid on gravel subgrade to promote stormwater infiltration. Porous pavers provide water quality and quantity benefits.

Regardless of the type of control, maintenance plan and schedules must be included for each BMP proposed with the submitted Stormwater Maintenance Agreement.

3.9 BEST MANAGEMENT PRACTICES

Permanent BMPs are those practices that remain after the project has been constructed and the permit closed out. Permanent structural BMPs typically fall into two categories:

- Water quantity practices that provide runoff retention for a design rainfall depth (**Section 3.7.3**).
- Water quality practices that reduce potential pollutants from leaving the site (**Section 3.8.3**).

Some BMPs can be used for both water quantity and water quality and must be designed to the requirements listed in both **Sections 3.7.1** and **Section 3.8.1** and the individual criteria listed in the following sections. If any criteria/standards conflict, the more stringent criteria set shall be used.

3.9.1 DETENTION PONDS/RESERVOIRS

Detention Ponds are surface storage facilities intended to provide temporary storage of stormwater runoff and to release it at a designed flow rate to reduce downstream impacts.

3.9.1.1 GENERAL DETENTION POND CRITERIA

1. Vegetated pond embankments shall be less than 15-feet in height and shall have side slopes no steeper than 3H:1V. Alternate stabilized embankment methods, as permitted at the discretion of the County Engineer or designee, shall be no steeper than 2H:1V. The embankment shall have a minimum top width of 15 ft.
2. Access inside a pond shall be provided with at least one side slope at 3H:1V or flatter. Geotechnical slope stability analysis is required for embankments greater than 10-feet in height and/or have steeper slope than those indicated above.
3. The flow path between the pond inlet and outlet must be maximized to ensure sufficient time to allow for sedimentation as well as chemical and/or biological transformation of pollutants.
4. The primary spillway should be designed with acceptable anti-flotation, anti-vortex, and trash rack devices. The spillway should be accessible by dry land.
5. All ponds must have a minimum freeboard of one foot from the 100-year, 24-hour design storm WSE to the top of the embankment and a minimum of six inches from the 25-year, 24-hour design storm WSE to the bottom of the emergency spillway.
6. All ponds shall have an emergency spillway designed to safely pass the 100-year storm event if the storage capacity is exceeded.
7. The emergency spillway shall be designed to pass runoff from the basin's entire drainage area without damage to the impoundment structure. The design storm shall be the 100-year storm, unless otherwise specified by the County Engineer. Spillways located within a pond embankment should be a trapezoidal cross-section designed for non-erosive velocities and shall direct discharge away from the toe of the dam or principal embankment structure.
8. The following criteria apply to the design of outlet control structures:
    a. All designs shall include a defined outlet and have minimum size openings of three inches and must be protected by trash racks.
    b. Designs shall not be placed within a right-of-way.
    c. If contained within a detention/retention pond, outlet control structures must be accessible for maintenance.

d. Designs must provide for ease of maintenance and incorporate techniques to prevent clogging (such as 3-dimensional trash racks).

e. A riprap weir or earthen dam is not permitted to be utilized as the only outlet control structure.

f. All orifices shall have the minimum size of three inches and must be protected by trash racks.

9. All ponds located within a LCP must be situated on a dedicated lot, separate from other proposed features. The dedicated lot shall be clearly labeled and identified on the final recorded plat.

3.9.1.2 WET DETENTION PONDS

The following is the design criteria for wet detention ponds in addition to the general criteria in **Section 3.9.1.1**:

1. A sediment forebay (or equivalent pretreatment) must be provided, where feasible, upstream of all wet ponds. The forebay storage capacity should be 10% of the permanent pool storage volume.
2. Sediment removal is an important maintenance activity to ensure the ponds operate as designed on a long-term basis. Sediment removal in the pre-treatment forebay should occur every five to seven years or after 50% of the total forebay storage capacity has been lost. Sediment removal should occur if more than 25% of the permanent pool volume is filled.
3. The maximum depth of permanent storage facilities with a permanent pool shall be determined by site conditions, design constraints, and environmental needs, but shall never be less than four feet. The facility should provide a permanent pool of water with a depth sufficient to discourage weed growth without creating undue potential for anaerobic bottom conditions. In addition, the pond bottom shall be a minimum of two feet below an inflow invert and 50' radially from the inflow invert to allow for sediment build-up. A mean depth of four to seven feet should maintain an acceptable environment within the permanent pool for the storage volume and associated hydraulic residence time. The maximum depth of the permanent pool shall be no greater than 12 feet to minimize thermal stratification.
4. Ponds shall have 3H:1V side slopes or flatter above the normal pool water surface elevation. Slopes below the normal pool water surface elevation must be no steeper than 2H:1V.
5. The littoral zone or aquatic bench is a shallow area just inside the area of the permanent pool that promotes growth of aquatic plants along the shoreline. If provided, the aquatic bench shall have side slopes of no more than 10H:1V and a maximum depth of 18 inches below the normal pool water surface elevation. Generally, the aquatic bench extends up to 10 feet inward from the normal shoreline and has an irregular configuration. When provided, the littoral shelf must be sized to 220 square feet per acre or 660 square feet per impervious acre, whichever is greater. Aeration (preferably through bottom bubblers) or other means is required to prevent anaerobic conditions for ponds less than one-half (½) acre in size.
6. Length to width ratio should be at least 2:1, and a ratio of 3:1 is preferred where feasible for the permanent pool to enhance sedimentation, minimize short-circuiting, and help prevent vertical stratification. The outlet shall be located as far as practicable from the inlets, but no closer than half the longest dimension of the pond.
7. Pond slopes within five (5) feet of each other must be armored.
8. Additional design, installation, inspection, and maintenance guidance can be found in *Low Impact Development in Coastal South Carolina: A Planning and Design Guide* (2014).

3.9.1.3 DRY DETENTION PONDS

The following is the design criteria for dry detention ponds in addition to the general criteria in **Section 3.9.1.1**:

1. Dry ponds are not allowed if the seasonally high-water table will be within one (1) foot of the bottom of the pond. Separation from seasonal high-water table must be demonstrated via site specific seasonal high-water table testing and depicted in the design considerations.
2. Dry detention practices must store and release the first 1.2 inch of runoff over 24 hours.
3. Dry detention ponds must drain areas less than ten acres.
4. The bottom of dry detention structures must be graded towards the outlet structure(s) to prevent standing water conditions with a minimum 1.0% bottom slope. The surface of the pond must be as flat as possible to allow runoff to spread out evenly across the entire pond surface.
5. Side slopes must have a gradient of 3H:1V to 4H:1V to promote better establishment and growth of vegetation and allow for easier maintenance.
6. Pond slopes and bottom must be grassed according to the seeding schedule in **Section 3.11.1.5**.
7. The outlet of a dry detention practice must be above the tidal mean high–water elevation.
8. Inflow points into a dry detention pond must be stabilized to ensure that non-erosive conditions exist during storm events up to and including the 25-year storm event.
9. A forebay must be located at each major inlet to a dry pond to trap sediment and preserve the capacity of the main treatment cell. The forebay shall be sized to capture 10% of the WQV of the dry detention pond's drainage area.
10. A 5H:1V slope and 15-foot-wide entrance ramp is recommended for maintenance access to dry ponds.
11. Additional design, installation, inspection, and maintenance guidance can be found in *Low Impact Development in Coastal South Carolina: A Planning and Design Guide* (2014).

3.9.2 UNDERGROUND DETENTION DEVICES

Underground detention tanks and vaults are used to attenuate peak storm water flows through detention or extended detention of stormwater runoff. They are constructed out of GRCP, corrugated metal pipe (CMP), High Density Polyethylene Pipe (HDPE) or concrete vaults. These systems are normally used when space is limited and there are no other practical alternatives. They can be expensive, but often allow for greater uses of a development site.

1. Underground detention systems shall be located downstream of other stormwater controls providing treatment of the WQV.
2. The maximum contributing drainage area to be served by a single underground detention vault or tank is five acres.
3. A pretreatment structure (sediment sump or vault chamber), sized to capture 0.1 inches of runoff from the impervious area draining to the underground detention system should be provided at the inlet.
4. All systems shall be designed and located to facilitate maintenance. Systems must be cleaned out (sediment removal) as directed by the approved maintenance plan, but more frequently if necessary. Access must be provided over the inlet pipe and outflow structure. Intermediate access openings should be added as needed for cleaning and maintenance. Access openings can consist of a standard frame, grate, and solid cover, or preferably a removable panel.
5. The minimum pipe diameter to be utilized as underground detention is 36 inches or equivalent.

6. Underground detention systems must meet structural requirements for overburden support and traffic loading if appropriate.
7. All underground detention systems must accommodate at least six inches in addition to the WQV for sediment storage in the volume calculations.
8. The feasibility of these devices for a given situation shall be evaluated by a soil scientist, geotechnical engineer, or other qualified individual certified by the State of South Carolina.
9. An anti-flotation analysis must be performed to check for buoyancy problems in high water table areas.
10. An internal or external high flow bypass or overflow should be included in the underground detention designs.
11. Any development that uses a parking area or other feature for detention storage capacity shall clearly identify the limits and depths of the proposed detention pool.
12. Basin configurations which create stagnant water conditions must be avoided.
13. Post-development discharge rates shall not exceed pre-development discharge rates for the 2-year, 10-year, and 25-year (and in some cases 50-year) frequency 24-hour duration storm events. The same hydrologic procedures shall be used in determining both the pre-development and post-development peak flow rates.
14. Post-development discharge velocities shall be reduced to provide non-erosive flow velocities from structures, channels, or other control measures, or equal the pre-development 10-year 24-hour storm event flow velocities, whichever is less.
15. The volume within any structure used for water quantity control shall be drained from the structure within 72 hours.

3.9.3 INFILTRATION PRACTICES

Infiltration practices are shallow excavations, typically filled with stone or engineered soil mix. They intercept and temporarily store stormwater runoff until it infiltrates into the underlying soils. Typically, infiltration practices receive stormwater runoff from relatively small drainage areas up to five (5) acres, and they should not receive inputs of stormwater with high sediment loads. Ideally, infiltration practices are best suited for impervious areas where there are low levels of fine particulates in the runoff.

Infiltration practices shall be required on those sites which do not currently discharge stormwater runoff or have no existing outlet. In such cases, in the post-development condition, devices shall be designed to infiltrate the runoff volume equivalent to the 85^{th} percentile storm event (1.2 inches). For evaluating the 10-year and 25-year storm events, the discharge rate from the site shall be limited to (not exceed) that of a site of equivalent size and slope with a NRCS CN equal to 39. As with detention ponds, an emergency spillway shall be designed to pass the 100-year storm event if the storage capacity is exceeded. The system must be analyzed, but only to the extent that no structure flooding or damage results. The following other criteria, based primarily on SC Code of Regulation Section 72-307.C requirements, shall be followed in the design of infiltration systems:

1. Infiltration practices shall be designed to accept WQV equal to one inch of runoff from the impervious surface in the contributing drainage area.
2. Infiltration may not be utilized at sites designated as stormwater high priority areas.
3. Infiltration practices must be designed to drain completely in 72 hours.
4. Infiltration device design shall be based on soils characteristics of the first 18 inches below the proposed bottom of the device (not necessarily the first 18 inches below ground surface).

5. Soils must have adequate permeability to allow water to infiltrate. Infiltration practices are limited to soils having an infiltration rate of at least 0.30 inches per hour. If the infiltration rate is greater than 0.3 but less than 2.0 inches/hour, then an underdrain system with a discharge point must be installed. Initial consideration will be based on a review of the appropriate soil survey, and proposed depths of excavation. The survey may serve as a basis for rejection. On-site soil borings and textural classifications must be accomplished to verify the actual site and seasonal high-water table conditions when infiltration is to be utilized.

   If an underdrain system is required, clean outs will be provided at a minimum, every 100 feet along the infiltration practice to allow for access and maintenance.

6. The design infiltration rate should be equal to one-half the infiltration rate found from the soil testing (i, in ft/day). This acts as a factor of safety to account for potential compaction during construction and to approximate the possible long-term infiltration rates. The maximum water depth for an infiltration practice (d_{max}, in feet) that can be infiltrated over the minimum drawdown time (t_d = 3 days) is given by the equation:

Equation 3-4. Maximum Water Depth for Infiltration Practice

$$\boldsymbol{d_{max} = \frac{i}{2} \times t_d}$$

7. The maximum vertical depth to which runoff may be ponded over an infiltration basin is 24 inches. Taking into account the ponding depth (d_{pond}, in feet) and the depth and porosity of the stone reservoir (η_r = 0.35), The maximum infiltration practice depth, when a stone reservoir is used, is given by the following equation:

Equation 3-5. Infiltration Practice Depth

$$d_{max} = \frac{d_{gravel}}{\eta_r} + d_{pond}$$

   The ponding and stone reservoir depths may be adjusted to meet the design goal. For example, in an infiltration trench the ponding area may be very small or zero. Similarly, an infiltration basin may be installed without a stone reservoir. Ensure that d_{max} is not exceeded.

8. The surface area of the infiltration practice SA (ft^2) can be found using the following equation, where Sv is the storage volume (ft^3) and t_f is the time to fill the infiltration facility in days (usually 2 hours or 0.083 days):

Equation 3-6. Infiltration Practice Surface Area

$$\boldsymbol{SA = \frac{Sv}{d_{max} + \left(\frac{i}{2} \times t_f\right)}}$$

   Pretreatment must be provided upstream of all infiltration practices to remove sediment and organic material before it reaches the infiltration practice. Areas draining to these practices must be stabilized and pervious areas must be stabilized with dense and healthy vegetation prior to runoff entering the system. Infiltration practices shall not be used if a suspended solids filter system does not accompany the practice.

   a. If vegetation is the intended filter, there shall be, at least a 20-foot length of vegetative filter strip prior to stormwater runoff entering the infiltration practice.

   b. A forebay should be designed to accommodate a minimum 15% of the design storm volume (if the infiltration rate of the underlying soils is greater than 2 inches per hour then the forebay volume shall be a minimum of 50% of the design storm volume).

c. Other engineered devices may be used with approval from the County Engineer.

9. Each system shall be designed to prevent clogging by fine material and for ease of maintenance.
10. The bottom of the infiltration practice shall be at least 0.75 feet (9 inches) above the "zone of seasonal saturation" and infiltration interface.
11. The infiltration practice shall be designed to be wider or longer than its depth to avoid classification as a Class V injection well.
12. Infiltration practices greater than three feet deep shall be located at least 25 feet from basement walls.
13. Infiltration practices designed to handle runoff from areas with a high runoff potential shall be a minimum of 150 feet from any public or private water supply well.
14. The design of an infiltration practice shall have a properly sized overflow or bypass for larger storm events. Measures to provide a non-erosive velocity of flow along its length and at the outfall shall also be included as necessary. Additional control devices will typically be necessary prior to a release to a watercourse to meet water quality requirements.
15. The slope of the bottom of the infiltration practice shall not exceed five percent. Also, the practice shall not be installed in fill material as piping along the fill/natural ground interface may cause slope failure.
16. Do not install geotextile fabric on the bottom of infiltration practices due to the possibility of clogging. The use of geotextile and geogrid materials on the side wall of the infiltration practice shall be determined by the designer based on site specific criteria.
17. An infiltration practice shall not be installed on or atop a slope whose natural or existing angle of incline exceeds (20) percent.
18. Infiltration practices shall include a clean out and observation well to facilitate periodic inspection and maintenance. The observation well shall be made of perforated 6-inch diameter PVC pipe with a tamper-proof lockable cap.
19. In cases where such criteria or limitations make the use of infiltration devices inappropriate, but no discharge currently leaves a given site, runoff control must be provided by some other measure. The County Engineer shall be contacted for guidance on the appropriate controls to employ or other mutually accepted BMPs.
20. Additional design, installation, inspection, and maintenance guidance can be found in *Low Impact Development in Coastal South Carolina: A Planning and Design Guide* (2014).

3.9.4 ADDITIONAL RUNOFF REDUCTION MEASURES

3.9.4.1 BUFFERS

Buffers are areas along a shoreline, wetland, or stream where development is restricted or prohibited. The primary function of the buffer is to physically protect and separate a stream, lake, or wetland from future disturbance or encroachment. The general function of a buffer is to:

- Protect the overall stream quality by providing shade for the stream and provide wildlife habitat.
- Remove pollutants, sediments, bacteria, and excess nutrients from stormwater runoff through infiltration and filtering.
- Help detain and slow down flow rates from developed areas.
- Provide a setback from the shoreline, wetland, or stream to prevent damage to structures or improved property due to flooding or changes in the stream channel.

More information about buffers can be found in the SCDES BMP Handbook (2005) or *Low Impact Development in Coastal South Carolina: A Planning and Design Guide* (2014).

3.9.4.2 IMPERVIOUS SURFACE DISCONNECTION

Impervious surface disconnection directs stormwater runoff from rooftops towards pervious areas where it is allowed to filter through vegetation and other landscaped material and infiltrate into the soil. More information about the feasibility, design, and maintenance of impervious surface disconnection can be found in *Low Impact Development in Coastal South Carolina: A Planning and Design Guide* (2014).

3.9.4.3 GRASS/POROUS PAVEMENTS

Grass/Porous pavements allow for the reduction of paved areas by incorporating these practices into areas that are infrequently used, providing water quality benefits through increased infiltration. These practices should be avoided in high traffic areas. More information about the feasibility, design, and maintenance of grass/porous pavement can be found in *Low Impact Development in Coastal South Carolina: A Planning and Design Guide* (2014).

3.9.4.4 ENGINEERED/PROPRIETARY DEVICES

Berkeley County is aware of the potential benefit in using a number of stormwater engineered devices currently available on the market, such as baffle boxes, cartridge filters, bioretention, and sock and tube erosion control devices. The County Engineer will evaluate any and all such devices specified for a given project and require appropriate drawings, specifications, and discussions as to the applicability of the product, expected performance, and required maintenance. The County Engineer reserves the right to require that certain devices be installed and maintained.

The SCDOT has developed Supplemental Technical Specifications for Stormwater Manufactured Treatment Devices (MTDs) and a Qualified Products List that can serve as a reference of types of devices the County Engineer may approve.

3.10 SPECIAL PROTECTION AREAS

To address some of the most critical water resource problems that exist in the County, Special Protection Areas have been established. Any development or redevelopment within or discharging to these protected areas are required to comply with the minimum standards listed in the preceding sections as well as a more stringent set of design criteria detailed below. For any conflicting design criteria, the more stringent set of requirements will supersede the minimum standards for special protection areas.

The County Engineer or establishment of specific local, State, or federal requirements (TMDL, 303(d) Impaired Waterbodies List, etc.) can designate any area as a special protection area on a case-by-case basis. Watershed areas identified in the Green Infrastructure Network maps (Firehock, 2015) will be evaluated as guidance on special protection status as well. The permittee has the responsibility to contact the County Engineer to determine whether the proposed project site is within or discharging to a special protection area and is required to comply with additional design criteria listed in the following sections.

3.10.1 WATER QUANTITY CRITERIA

Flooding problem areas exist in many locations around the County to the point that stormwater controls have become overwhelmed, or where controls were never adequately designed or installed to control runoff. The ability to maintain a system is also suspected to be contributing to some of the frequent flooding. In an effort to relieve existing flooding problems, the following list of design criteria will be required in designated areas:

1. The post-development, peak discharge rates are restricted to half the pre-development rates for the 2-, 10-, and 25-year 24-hour storm event or to the downstream system capacity, whichever is less.
2. The post-development runoff volumes for the 2-year, 24-hour duration storm event above the pre-development level shall be stored for a period of 24-hours on average before release.
3. Stormwater management facilities must be designed to reduce the 50- and 100-year, 24-hour developed peak discharge rate by a minimum of 20 percent from the existing peak discharge rates.
4. Redevelopment projects in flood-prone areas must reduce post-development runoff volume by ten percent from pre-development levels.
5. Impervious area on a redevelopment site must be reduced by 20 percent.
6. The 100-year, 24-hour storm event peak water surface shall not overtop the emergency spillway.

Additional criteria may be established on a case-by-case basis.

3.10.2 WATER QUALITY CRITERIA

In conjunction with the NPDES permitting program, SCDES, through delegated responsibility from EPA, must identify and mitigate impaired waterbodies. Impaired waterbodies are identified through a monitoring program, the results of which are compared against water quality standards developed to protect designated uses of individual waterbodies. Impaired waterbodies are those that do not meet these standards for their designated purposes, such as fishing, swimming, recreation, and/or support of aquatic life. In accordance with Section 303 of the CWA, states must release a bi-annual report of the impaired waterbodies. Waters listed on the 303(d) list may eventually have a TMDL developed, which represents the daily amount of a particular pollutant that a waterbody can receive and still meet the water quality standard for its designated use(s). A list of the 303(d) waterbodies can be found at

https://des.sc.gov/sites/des/files/media/document/South%20Carolina%202020-2022%20303%28d%29%20List_1.pdf

The following list of water quality design criteria is required in Special Protection Areas:

1. List the nearest SCDES Water Quality Monitoring Station (WQMS) that the site's stormwater discharges drain to and the waterbody on which it is located.
2. If the nearest WQMS is listed on the most current 303(d) List of Impaired Waters for a sediment-related parameter (i.e., BIO (macroinvertebrate), turbidity, Total Phosphorus, Total Nitrogen, Chlorophyll-a), the site's stormwater construction discharges contain the pollutant of impairment, the site drains directly to the impaired waterbody, and the site disturbance is 25 acres or more, a written qualitative and quantitative assessment (described in Section 3.2.12 of SCR100000) must be provided and include at a minimum, calculations that show:
    a. Site's pollutant load for all pollutants of concern.
    b. Trapping effectiveness of the chosen BMPs.
    c. Runoff discharged through the last water quality BMP will neither cause nor contribute to a violation of water quality standards.
3. Evaluation of selected BMPs if the nearest WQMS is listed on the most current 303(d) List of Impaired Waters, the site's stormwater construction discharges contain the pollutant of impairment, and the site disturbance is less than 25 acres. Such evaluations may reference published values on BMP effectiveness.

4. If a TMDL has been developed for the nearest WQMS and if the site's stormwater construction discharges contain the pollutant of impairment, show that measures and controls meet assumptions and requirements of TMDL (may need to contact SCDES Watershed Manager for assistance).
5. Buffers are required along perennial and intermittent streams adjacent to the project within a watershed where there is an established TMDL. Buffers shall be required on other waters as dictated by the County Engineer. Within buffer areas, all significant sources of aquatic contamination and degradation shall be excluded, including construction resulting in land disturbance, impervious surfaces, logging roads, mining, septic tank drain fields, agricultural fields, waste disposal sites, stormwater BMPs (except those designed as wetlands), access of livestock, clear cutting, and application of pesticides and fertilizers. The width of buffers shall be as follows:
    a. Base width is 50 feet plus two feet per one percent slope of the stream valley.
    b. Existing impervious surfaces in the riparian zone as well as wetlands, do not count toward the buffer width (i.e., the width is extended by the width of the impervious surface, just as for wetlands).
    c. Slopes over 25 percent do not count toward the width.
6. The 95th percentile storm (1.96 inches) must be retained on site.
7. In areas with soils that are HSG A and B, the development shall control and infiltrate the first one inch of stormwater runoff from the entire development or maintain the pre-development hydrology for the 95th percentile storm, whichever is more restrictive.

3.11 EROSION PREVENTION AND SEDIMENT CONTROL

Berkeley County requires that an EPSC plan set and SWPPP be submitted and approved for construction activities that result in land disturbance of one acre or more. This plan shall describe the practices and controls that will be used during construction to meet the following goals:

1. Minimization of the extent and duration of disturbed soil exposure.
2. Prompt stabilization of disturbed areas.
3. Protection of off-site and downstream locations, drainage systems and natural waterways from the impacts of erosion and sedimentation.
4. Limitation of the exit velocities of the flow leaving the site to non-erosive or pre-development conditions.
5. Design and implementation of an ongoing inspection and maintenance plan.

Information regarding EPSC BMPs can be found in *Low Impact Development in Coastal South Carolina: A Planning and Design Guide* (2014).

3.11.1 ACCEPTED EROSION PREVENTION AND SEDIMENT CONTROL BMPS

The various types of EPSC BMPs that are acceptable for use in Berkeley County at permitted construction sites are presented below. These generally fall into three categories: erosion prevention measures, temporary sediment controls, and runoff control and conveyance measures. The SCDES BMP Handbook (2005) can be referenced for additional details on acceptable EPSC BMPs at:

https://des.sc.gov/programs/bureau-water/stormwater/best-management-practices-bmps/bmp-handbook

3.11.1.1 EROSION PREVENTION MEASURES

Erosion prevention measures shall be used during and after construction site preparation to avert the discharge of runoff highly concentrated with sediment and other associated pollutants. One or more measures are typically needed on a given site. Measures that fall into this category along with their preferred application are provided in **Table 3-9**. Details on each of these measures are not discussed in this Manual. Guidance documents that should be referenced as necessary include: SCDES (2005), Haan, C. T., Barfield, B. J., and Hayes, J. C. (1995) and Shwab, Glenn O. and Richard K. Frevert (1985). Other practices, such as engineered devices, will be allowed as long as sufficient evidence is presented as to their effectiveness in meeting the County's requirements.

Standard details can be found at:

https://des.sc.gov/programs/bureau-water/stormwater/best-management-practices-bmps/bmp-handbook

Table 3-9. Erosion Prevention BMP Suggested Uses

BMP	Slope Protection	Waterway Protection	Surface Protection	Enclosed Drainage	Large Flat Areas	Borrow Areas	Adjacent Properties
Surface Roughening	X		X				
Bench Terracing	X		X				
Temporary Seeding	X		X		X	X	X
Mulching	X				X	X	
Erosion Control Blankets (ECB) and Turf Reinforcement Mats (TRM)	X	X	X			X	
Topsoiling			X		X		
Permanent Seeding and Planting of Grasses	X		X		X		X
Permanent Ground Cover Plants	X		X				X
Sodding	X		X		X		X
Riprap or Aggregate	X	X	X				
Outlet Protection		X		X			X
Dust Control					X	X	X
Polyacrylamide (PAMs)	X		X	X	X	X	X

3.11.1.2 TEMPORARY SEDIMENT CONTROL MEASURES

Berkeley County emphasizes preventative measures as the main control to protect against erosion, both during and following construction. However, there are typically instances where erosion prevention measures alone do not provide sufficient control. For these situations, temporary sediment controls shall be implemented to control the migration of eroded sediment off site. These temporary sediment control

measures are typically only applicable as practices for use during construction. One or more of the measures should be utilized as appropriate during the project's construction phase. **Table 3-10** lists some of the suggested controls of this type along with their intended use. Details on these and other measures are not discussed in detail in this Manual. However, an excellent reference is Haan, Barfield, and Hayes (1995) and SCDES's BMP Manual. Other practices, such as engineered devices, will be allowed as long as sufficient evidence is presented as to their effectiveness in meeting the County's requirements. Standard details can be found at:

https://des.sc.gov/programs/bureau-water/stormwater/best-management-practices-bmps/bmp-handbook

Table 3-10. Temporary Sediment Control BMP Suggested Uses

BMP	Slope Protection	Waterway Protection	Surface Protection	Enclosed Drainage	Large Flat Areas	Borrow Areas	Adjacent Properties
Storage Volumes and Maintenance Schedules		X		X			X
Temporary Sediment Basin		X	X	X			X
Multipurpose Basin		X	X	X			X
Temporary Sediment Trap		X	X				X
Silt Fence	X	X	X			X	X
Rock Ditch Check		X	X				X
Stabilized Construction Entrance					X		X
Storm Drain Inlet Protection		X		X			X
Vegetated Filter Strips		X	X				X
Rock Sediment Dike		X	X				X

3.11.1.3 RUNOFF CONTROL AND CONVEYANCE MEASURES

This category of EPSC BMPs should be used as necessary during and following construction. Suggested varieties and their corresponding uses are provided in **Table 3-11**.

Table 3-11. Runoff Control and Conveyance Measure BMP Suggested Uses

BMP	Slope Protection	Waterway Protection	Surface Protection	Enclosed Drainage	Large Flat Areas	Borrow Areas	Adjacent Properties
Pipe Slope Drains	X		X				
Temporary Stream Crossing		X	X				X
Runoff Conveyance Measures	X					X	X
Construction De-watering		X		X	X	X	
Level Spreader			X		X		X
Subsurface Drains			X		X		

3.11.1.4 TEMPORARY VEGETATION AND SEEDING

The purpose of temporary seeding is to reduce erosion and sedimentation by stabilizing disturbed areas that would otherwise lay bare for long periods of time before they are worked or stabilized. Temporary seeding is also used where permanent vegetation growth is not necessary or appropriate. More information regarding temporary vegetation and seeding can be found in the SCDES BMP Handbook at:

https://des.sc.gov/programs/bureau-water/stormwater/best-management-practices-bmps/bmp-handbook

Plant seed selection should be based on the type of soil and the season of the year in which the planting is to be done. Soil shall be prepared for planting before seeding takes place. **Table 3-12** should be used if conventional tillage methods (plowing, seedbed preparation, hydroseeding, etc.) are being used. If a fast-growing crop is needed to nurse permanent species, then use the mix rate. Failure to carefully follow agronomic recommendations often results in an inadequate stand of temporary vegetation that provides little or no erosion control.

Native plant species should be specified over non-native and/or invasive plant species. Invasive plants are detrimental to the ecological health of an area because they outcompete native vegetation for resources and disrupt the natural food chain. Seed and hydroseed mixtures shall not include invasive species. A current list of Exotic Invasive Plant Species of South Carolina can be found at:

https://www.se-eppc.org/southcarolina/Publications/InvasivePlantsBooklet.pdf.

Table 3-12. Temporary Vegetation Schedule

Species	Rates (lbs/acre)	Optimum Dates to Plant	Slopes?	Remarks
Crimson Clover (Trifolium incarnatum)	20	September – March	Y	Quick cover for erosion control, stabilization, and nitrogen fixation
Browntop Millet (Urochloa ramosa)	50	March – August	Y	Fast-growing cover for erosion control
Foxtail Millet (Setaria italica)	40	April – August	Y	Fast-growing, high salinity tolerance
Hairy Vetch (Vicia villosa)	50	September – April	Y	Used for erosion control and nitrogen fixation
Oats (Avena sativa)	110	September – November	Y	Suppresses weeds, prevents erosion
Pearl Millet (Pennisetum glaucum)	50	March – August	Y	Fast-growing, deep roots, drought-resistant
Sudangrass (Sorghum bicolor)	60	March – August	Y	Fast-growing, drought-tolerant, extensive root systems, provides weed suppression
Barley (Hordeum vulgare)	110	August – November	Y	Fast-growing, deep root system, provides weed suppression
Wheat (Triticum sp.)	110	July – December	Y	Prevents erosion, suppresses weeds, scavenges excess nutrients
Rye Grain (Secale cereale)	110	August – March	Y	Prevents erosion, suppresses weeds, scavenges excess nutrients

Information adapted from SCDOT Supplemental Specification for Seeding (SC-M-810-2, April 2011)
* For details on mixes consult Clemson University Home and Garden Information Center at (888) 656-9988 or hgic@clemson.edu

3.11.1.5 FINAL STABILIZATION - PERMANENT VEGETATION AND SEEDING

Prior to the County conducting a final site inspection and close-out of a construction project, the site must meet final stabilization requirements. Final stabilization means that all land-disturbing activities at the construction site have been completed, all temporary BMPs have been removed, and all areas not covered by permanent structures will have either:

1. A uniform (e.g., evenly distributed, without large bare areas) permanent vegetative cover with a density of seventy percent (70%).

2. Equivalent permanent stabilization measures (such as the use of landscaping mulch, riprap, pavement, and gravel) have been implemented to provide effective cover for exposed portions of the construction site not stabilized with vegetation.

More information regarding permanent vegetation and seeding can be found in the SCDES BMP Handbook at:

https://des.sc.gov/programs/bureau-water/stormwater/best-management-practices-bmps/bmp-handbook

Plant seed selection should be based on the type of soil, the season of the year in which the planting is to be done, and the needs and desires of the permanent land user. **Table 3-13** should be used to select the desired species to be planted. Failure to carefully follow agronomic recommendations often results in an inadequate stand of permanent vegetation that provides little or no erosion control. The rates in **Table 3-13** are based on purity and germination standards required for certification.

Native plant species should be specified over non-native and/or invasive plant species. Invasive plants are detrimental to the ecological health of an area because they outcompete native vegetation for resources and disrupt the natural food chain. Seed and hydroseed mixtures shall not include invasive species. A current list of Exotic Invasive Plant Species of South Carolina can be found at:

https://www.se-eppc.org/southcarolina/Publications/InvasivePlantsBooklet.pdf.

Sod is required for final grass stabilization over permanent stormwater ponds and drainage swales before the project can be closed out or placed under warranty. Dry Ponds are required to be sodded over all portions of the pond area, including the maintenance shelf to the pond bottom. Wet ponds are required to be sodded on the maintenance shelf and side slopes to the normal water surface elevation. In subdivisions, all common areas not permanently stabilized by the end of the warranty period shall also be sodded.

The following notes apply to **Table 3-13**.

1. In mixtures with temporary cover, the full seeding rate of permanent cover shall be used.
2. Mix means 2 or more long term species plus short-term species. For dates other than optimum, call the Soil and Water Conservation District, (843) 719-4146.
3. A legume, such as a clover or crown vetch should be used where it is possible.
4. The appropriate inoculants should be used.

Table 3-13. Permanent (Perennial) Vegetation Schedule

Species	Rates (lbs/acre)	Optimum Dates to Plant	Slopes?	Remarks
Bermuda Grass (Hulled) (Cynodon dactylon)	25	March – August	Y	Quick cover, Sod forming, partial winter kill, can be used in grassed waterways and pond banks
Bermuda Grass (Unhulled) (Cynodon dactylon)	30	September – March	Y	Quick cover, Sod forming, partial winter kill, can be used in grassed waterways and pond banks
Centipede Grass (Eremochloa ophiuroides)	10	March – June	N	Slow-growing, forms dense turf, low-maintenance (infrequent mowing and fertilization)
Indian Grass (Sorghastrum nutans)	10	October – June	Y	Native, clump-forming, ornamental value, designated as SC State grass
Little Bluestem (Schizachyrium scoparium)	10	October – June	Y	Native, ornamental bunchgrass, adaptable to wide range of soils, drought-tolerant
Coastal Panic Grass (Panicum amarum)	20	February – June	Y	Native, good at stabilizing dry, sterile areas; salt tolerant
Switch Grass (Panicum virgatum)	10	October – June	Y	Native, clump-forming grass, tolerates wide range of soils
Perennial Rye Grass (Lolium perenne)	15	January, August & December	Y	Quick cover for erosion control plantings, bunchgrass, can withstand wet soils
Virginia Wild Rye (Elymus virginicus)	6	Feb – March, Sept – Oct	Y	Native bunchgrass, shade tolerant,
White Clover (Trifolium repens)	5	February – April, August – November	Y	Beneficial to mix with other grasses (nitrogen fixation); form solid stands in moist soil

Information adapted from SCDOT Supplemental Specification for Seeding (SC-M-810-2, April 2011) and USDA Plants Database (2017)

* For details on mixes consult Clemson University Home and Garden Information Center at (888) 656-9988 or hgic@clemson.edu

3.11.2 EROSION PREVENTION AND SEDIMENT CONTROL DESIGN STANDARDS

1. NRCS procedures should be used to determine runoff amounts. It is important to note that when a BMP is designed for the 10-year, 24-hour storm event, the BMP will have a greater trapping efficiency for more frequent events such as the 2-year, 24-hour storm event.
2. Sites shall not have more than 30 acres of disturbed, unstabilized area at any time during construction.
3. BMPs should be properly placed (silt fence, inlet protection, construction entrance, riprap at outfalls, check dams etc.).

4. EPSC plan set and SWPPP shall be developed to achieve an 80 percent design sediment removal efficiency goal, if more than five (5) disturbed acres drain to a common point (stream, lake, etc.). Simply applied, when a site is completely denuded of vegetation, a sediment basin shall be designed to trap 80 percent of the TSS that are generated by the site. The design storm event associated with this level of control is the 10-year, 24-hour NRCS Type III storm event. Calculations using models, such as SEDPRO or SEDCAD, or SCDES design aids shall be provided to show adherence to these criteria.
    a. Sediment basins must be provided for storage for the 10-year, 24-hour storm event for disturbed conditions or 3,600 ft^3/ acre draining to the basin, if more than ten disturbed acres drain to a common point (stream, lake, property line, etc.).
    b. Sediment basins should be constructed with a positive outfall to discharge stormwater while retaining sediment loads. Sediment basins may be temporary or permanent as required by the County Stormwater Department.
5. Activities that disturb between one and ten acres of land area that do not drain to a single outlet point may incorporate practices other than a sediment basin to achieve an equivalent removal efficiency.
6. Sediment traps shall only be used for drainage areas of less than five acres.
7. Sediment trap storage calculations, showing that 1,800 ft^3/ acre draining to each trap is provided below the spillway.
8. Trapping efficiency calculations are required for sediment traps. Provide peak outflow (qpo), calculations; the 10-year, 24-hour storm event for construction conditions cannot overtop the trap's spillway.
9. Sediment basins and traps must be designed for total area draining to them.
10. Detention basins may also be used to trap sediment during and after development. When used for this purpose, the basin shall continue to detain stormwater in accordance with the hydraulic design criteria but allow for the settlement and retention of sediment in the basin. Calculations shall be provided whenever detention basins are used to trap sediment. Added storage volume for stormwater shall be required to account for the volume lost to sedimentation. Sediment must be removed periodically to ensure the intended performance of the basin.
11. Silt fencing shall be placed on a flat area adjacent to the toe of all fill slopes and soil berms and below disturbed areas where the size of the area is no more than ¼-acre per 100 feet of silt fence length. The maximum slope length uphill of the fence is 100 feet, and the maximum gradient uphill of the fence is 2H:1V.
12. The following nonstructural site management practices shall be utilized on the plans where applicable:
    a. Minimize site disturbance to preserve and maintain existing vegetative cover.
    b. Limit the number of temporary access points to the site for land disturbing activities to no more than two.
    c. Protect off-site and downstream locations, drainage systems and natural waterways from the impacts of erosion and sedimentation.
    d. Phase and sequence construction activities to minimize the extent and duration of disturbed soil exposure.
    e. Implement an ongoing inspection and maintenance plan. Suggested maintenance schedules are given in SCDES BMP Handbook (2005).
13. Sediment storage volumes shall be calculated for all sediment controls to determine the required clean-out frequencies and maintenance schedules. The Universal Soil Loss Equation (USLE) and subsequent

modifications or other acceptable methods that determine sediment yield may be used to predict the required sediment storage volumes for specific sediment control structures.

14. To encourage the development and testing of innovative alternative EPSC BMPs, alternative management practices that are not included in the Manual may be allowed upon review and approval by the County Engineer. The use of alternative BMPs will be allowed as long as sufficient evidence is presented as to their effectiveness in meeting the County's requirements. Evidence may include, but is not limited to:
    a. Supporting hydraulic and trapping efficiency calculations.
    b. Peer review by a panel of professional engineers.
    c. Research results as reported in professional journals.
    d. Manufacturer's literature.
15. Detailed EPSC plan set and SWPPP shall comply to the MEP with the following specific standards and review criteria:
    a. Sediment tracking control shall be implemented using stabilized construction entrances that are to be located and utilized at all points of ingress/egress on a construction site. The contractor must take necessary action to minimize the tracking of mud onto the paved roadway construction areas. The contractor shall daily remove mud/soil from pavement, as may be required.
    b. If surface roughening is to be performed along a sloped area, the tracks should always be perpendicular to the slope/flow path to interrupt runoff.
    c. Crossings of waterways during construction should be minimized and must be approved by the County Engineer and possibly the USACE. Encroachment into stream buffers, riparian areas, and wetlands must be avoided when possible.
    d. Topsoil shall be stockpiled and preserved from erosion or dispersal both during and after site grading operations when applicable.
    e. Stockpile locations must be clearly shown and labeled on the EPSC plans with necessary details provided.
    f. Stabilization measures must be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than 14 days after work has ceased. Hydroseeding as often as possible is encouraged. Stabilization of disturbed areas is one of the best approaches for EPSC.
    g. All slopes must be stabilized though grassing, hydroseeding, synthetic or vegetative matting, diversion berms, temporary slope drains, etc. and must be performed within two working days after the necessary grading (temporary or permanent) has been achieved.
    h. A site is considered stabilized once the entire disturbed area has a vegetative cover with a uniform density of 70%. Seeding should be accompanied with erosion control mats as necessary to achieve this density. Final or permanent stabilization is considered achieved once the entire disturbed area has a permanent vegetative cover with a uniform density of 70%. Final stabilization shall be implemented within 14 days of completion of all construction activities. After final stabilization is achieved, all temporary control measures shall be removed from the site.
    i. Temporary structural controls installed during construction shall be designed to accomplish maximum stabilization and control of erosion and sedimentation, and shall be installed, maintained, and removed according to the specifications set forth in the Manual and project specifics developed as part of the Stormwater Management Plan. All temporary structural controls shall be designed to control the peak runoff resulting from the 10-year, 24-hour storm event.

j. All permanent structural controls, including drainage facilities such as channels, storm sewer inlets, and detention basins, are required to be cleaned out to their designed conditions as part of the project closeout process.

k. Linear projects (utility lines, road construction) over, under, or along a water body shall include measures and controls which adequately protect the water body from undue impact. Such work shall not be performed without approval from USACE and should be coordinated with the installation of EPSC measures so that disruption is minimized. Every effort should be made to install utilities during the initial construction phases. Trench sharing is encouraged to the extent practicable.

3.11.3 TYPICAL EPSC DESIGN PROCEDURES

The design procedures will vary depending on the EPSC BMP. Many of the BMPs listed in **Table 3-9, Table 3-10**, and **Table 3-11** do not need to be "designed" using calculations, such as surface roughening or dust control. Others require the use of equations or design aids to properly design. SCDES has two handbooks, the BMP Handbook (SCDES 2005) and the Stormwater Management and Sediment Control Handbook (SCDES 2003) that provide the procedures and equations needed to design some of the EPSC BMPs listed in Tables 3.9 – 3.15. Example problems are given for most types. As with the design of any BMP, engineering judgment will be needed on most applications. Proper design must be complemented with proper installation and routine maintenance for BMPs to be effective and to adhere to the provisions of this section.

3.11.4 CONSTRUCTION DE-WATERING REQUIREMENTS

Construction de-watering involves removing stormwater or groundwater from bore pits, trenches, and other excavations on a construction site. Typically, this removal of water involves the pumping of the water to an appropriate receiving area. Direct pumping to lakes, rivers, and streams is illegal and must be avoided.

The following is design criteria for de-watering practices:

1. Size the pump(s) utilized for de-watering purposes properly. Each pump has its own unique rating curve. Calculate the pump design flows based on head loss through the pump system.
2. Sediment laden water must be pumped to a sediment control structure or device (sediment basin, sediment trap manufactured de-watering device, or infiltration trench).
3. Ensure that the influx of water does not cause the sediment control structure to fail.
4. Ensure erosion does not occur at the outlet of the hose from the pump due to high concentrated flows.
5. When discharging from sediment basins and similar impoundments, utilize outlet structures that only withdraw water from near the surface of the basin or impoundment, unless infeasible. This outlet structure should be capable of conveying the flow for the 10-year, 24-hour storm event.

The SCDES BMP Handbook (2005) can be referenced for additional details on acceptable construction de-watering practices at:

https://des.sc.gov/programs/bureau-water/stormwater/best-management-practices-bmps/bmp-handbook

3.12 GRADING STANDARDS AND CRITERIA

The grading plan should include the following general measures at a minimum:

1. The finished cut and fill slopes to be vegetated should not be steeper than 3H:1V. The finished grades of cut and fill slopes to be vegetated with vines and/or groundcovers should not be steeper than 1H:1V.

2. Cuts or fills should not be so close to property lines as to endanger adjoining property without adequately protecting such properties against erosion, sedimentation, slippage, settlement, subsidence, or other damages.
3. Subsurface drainage should be provided in areas having a high-water table to intercept seepage that would affect slope stability, bearing strength or create undesirable wetness.
4. No fill shall be placed where it can slide or wash onto another property.
5. Fill shall not be placed adjacent to channel banks where it can create bank failure, reduce the capacity of the stream, or result in downstream sediment deposition.
6. Adequate channels and floodways should be provided to safely convey increased runoff from the developed area to an adequate outlet without causing significant channel degradation or increased off-site flooding.
7. The site should be graded to direct flows to appropriate controls.
8. The site should be graded to maximize overland sheet flow distance and minimize the disturbance of woodlands along the flow path. Where graded areas flow to natural drainageways, velocities should not exceed one ft/s to the extent practicable; faster velocities may provide insufficient contact time for the settlement of suspended solids. The installation of a stable, level spreader along the upland edge of the natural drainageway buffer, or flat grassy area about 30 feet wide upland of the buffer will allow the runoff to spread out.
9. Increase infiltration and travel time by flattening lot slopes to one percent or less. While codes may require a positive drainage perimeter around the building, lot areas outside the pad should contain at least one (1) percent positive slope. Maximize infiltration by avoiding compaction of original soils (not fill) in the lot.
10. Developments:
    a. Lot grading shall be established on plans.
    b. In single-family residential, duplex or apartment-townhouse-condominium development, site grading shall be carried out in such a manner that surface water from each dwelling lot will flow directly to a storm sewer, sodded swale, or paved street without crossing more than four adjacent lots in overland flow and with no adverse effects to adjacent property.
    c. In commercial, industrial, and institutional development, roofs, paved area, yards, courts, and courtyards shall be drained into a storm drainage facility.

3.13 EASEMENTS

The following section provides the required easement widths for various components of the stormwater management system(s). This section applies to easements that are publicly and privately dedicated and or accepted by Berkeley County. All easements shall be calculated the same whether they are private or public. In all cases, there will be an allowance for offset easements, in which the pipe, channel, or other stormwater system component does not necessarily have to be in the middle of the easement width but may be offset to allow for certain construction or maintenance needs. Proposed offset easements will be identified and additional width may be required as prescribed by the County Engineer.

In interpreting and applying the requirements of this section, the easement requirements shall be held to the minimum requirements necessary to uphold the purpose of this section. It is not intended by this section to interfere with, abrogate, or annul any easements, covenants, or other agreements between parties, provided, however, where this section imposes greater restrictions on subdivision and/or use of buildings or land, or requirements more stringent development standards than required by other resolutions, ordinances, rules, or regulations, or by easements, covenants or agreements, the requirements of this section shall govern.

When the provisions of any other statute requirement more restrictive standards than are required by the requirements of this section, the provisions of such statute shall govern.

3.13.1 STORM DRAIN PIPE

Equation 3-7 provides required minimum drainage easement widths for storm drain pipes.

Equation 3-7. Storm Drain Pipe Easement Width Requirement

$$Easement\ Width = (Depth\ x\ 3) + Diameter$$

Where Easement Width = Total easement width, feet
Depth = Pipe depth measure from the bottom of the pipe to the finished grade, feet
Diameter = Pipe diameter, feet

The calculated pipe drainage easement shall always be rounded up to the next five-foot increment. The minimum width for any piped drainage easements shall be 20 feet.

For multiple pipes, box culverts, or multiple box culverts, the easement width shall be the outside diameter or width of the system plus ten feet on one side and 15 feet on the other side of the system. The minimum total width shall not be less than 30 feet.

Pipe designs that require shoring to access the storm drain for maintenance, repair, or replacement shall not be accepted.

3.13.2 OPEN CHANNELS

Channel easements vary depending on the top width of the channel. For instances when the top width is equal to or less than 15 feet, use **Equation 3-8**. For instances when the top width is greater than 15 feet, use **Equation 3-9**.

Equation 3-8. Channel Easement Width Requirement (Top width ≤ 15 feet)

$$Easement\ Width = Top\ Width + 25\ (offset\ on\ one\ side) + 5\ (offset\ on\ other\ side)$$

Where Easement Width = Total easement width, feet
Top Width = Top width of the channel, feet

Equation 3-9. Channel Easement Width Requirement (Top width > 15 feet)

$$Easement\ Width = Top\ Width + 25\ (offset\ on\ one\ side) + 10\ (offset\ on\ other\ side)$$

Where Easement Width = Total easement width, feet
Top Width = Top width of the channel, feet

For minor swales along rear lot lines where the side slopes are equal to or flatter than 5H:1V and the depth does not exceed 1.5 feet, a minimum drainage easement of 20 feet must be provided.

Drainage of minor swales, across three or more lots must have easements that the homeowner or homeowner's association, if applicable, is required to maintain.

3.13.3 DETENTION/RETENTION PONDS

A minimum access easement of 20 feet shall be provided to all detention/retention ponds from the access point of the pond. The drainage easement for the detention/retention pond shall incorporate and include the

pond area plus a minimum 15 feet around the perimeter of the pond beyond the top of the pond bank for maintenance access. The perimeter easement around the top of the bank of the pond shall have a maximum cross slope of 10H:1V. While the County shall not accept responsibility for pond maintenance, unless agreed to in writing, the County may utilize the easement for necessary emergency repairs.

3.13.4 OTHER STORMWATER FACILITIES & BMPS

All other structures used for the control of stormwater runoff (quantity or quality) not otherwise covered above, shall have an easement for access and maintenance that is a minimum of 20 feet beyond the boundary of any such structure. The County Engineer may request or allow other easement widths on a case-by-case basis given site constraints or special conditions. While the County shall not accept responsibility for stormwater facility maintenance, unless agreed to in writing, the County may utilize the easement for necessary emergency repairs.

3.13.5 OFFSITE EASEMENTS

Any required off-site easements should be obtained prior to stormwater approval which would impact upon that area. Any work done without a proper and adequate easement(s) shall be at the owner's own risk. Non-subdivision projects shall provide validation of necessary easements before a Stormwater Management Plan and application is approved.

CHAPTER 4. INSPECTION & ENFORCEMENT

This chapter establishes inspection and enforcement guidelines to be followed by the permittee and County.

4.1 PERMITTEE INSPECTION RESPONSIBILITIES

In accordance with any applicable local, State, and federal stormwater requirements including, but not limited to, the NPDES CGP and approved SWPPP, owner/operators are responsible for conducting during construction and post-construction site inspections. Records of such inspections should be kept for a minimum of three (3) years and must be made available to Berkeley County upon request.

4.2 BERKELEY COUNTY STORMWATER MANAGEMENT INSPECTIONS

The County will inspect applicable construction sites from initial land clearing to final stabilization, as well as post-construction. The purpose of these inspections will be to check for compliance with the SWPPP approved by the County Engineer. These construction site inspections shall address terms and conditions of the NPDES CGP, this manual, and the County Stormwater Management Ordinance. Maintenance inspections will also be performed on post-construction stormwater management systems and facilities throughout their useful life. For each system or facility installed or retrofitted during an approved construction project, the applicant must have submitted a maintenance schedule and plan. County Inspector will be checking for adherence to this plan and any necessary changes that may arise after installation. County inspections are not to be construed as a relaxation of the requirements on owners/operators to conduct self-inspection in accordance with any applicable local, State, or federal stormwater requirements.

4.2.1 STORMWATER MANAGEMENT INSPECTOR DUTIES/RESPONSIBILITIES

Berkeley County Inspectors shall inspect and enforce the requirements of the Berkeley County Stormwater Management Ordinance. The job duties/responsibilities of a County Inspector shall include, but not be limited to, the following:

1. Conduct and document site inspections during construction to ensure compliance with the approved SWPPP. Frequency of inspections will be determined by County staff on an as needed basis.
2. Ensure that the approved SWPPP, owner/operator inspection reports, and the construction plans are on the project site and are properly being followed and implemented.
3. Issue enforcement orders, as necessary, to the owner/operator when any portion of the work does not comply with the approved SWPPP or work is occurring without appropriate approval or permitting. The enforcement process and types of orders is detailed in **Section 4.3**.
4. Perform a final inspection upon the completion of the stormwater system to determine if the system is constructed in accordance with the approved Stormwater Management Plan.
5. Take immediate action if the owner/operator fails to comply with the approved SWPPP and an imminent hazard exists as a result. The County Inspector should address the situation and notify any applicable local, State, and federal agencies.
6. Conduct post-construction inspections to ensure that permanent maintenance is being performed in accordance with the maintenance schedules and Covenants of Permanent Maintenance of Stormwater Systems (Covenants) for the various stormwater management facilities in the approved SWPPP at the final inspection for closeout and at all other subsequent dates to ensure continued conformance with permanent maintenance requirements.

7. Maintain accurate and comprehensive project inspection files ensuring all relevant information is entered in the files to be maintained in the County Engineering Department.

4.2.2 INSPECTION PROCESS AND PROCEDURES

As per Berkeley County's Stormwater Management Ordinance, the County Engineer, or an authorized representative/designee (County Inspector) may enter upon all properties for regular inspections, periodic investigations, enforcement and to effectuate the provisions of the Ordinance. Upon refusal by any owner/operator to permit a County Inspector to enter upon the property or continue an inspection, the County Inspector shall terminate the inspection or confine the inspection to portions of the property to which no objection is raised. The County Engineer or his designee shall document the refusal and the grounds for such and promptly seek appropriate compulsory process.

Upon completion of a during construction site inspection, the County Inspector should, at a minimum, include the following in their inspection report:

1. Date, time, and location of the site inspection.
2. Whether the approved SWPPP, and construction plans have been properly implemented and maintained.
3. Identification of any approved plan or BMP deficiencies.
4. Any corrective actions needed.

Upon completion of a post-construction maintenance inspection, the County Inspector should, at a minimum, include the following in their inspection report:

1. Date, time, and location of the site inspection.
2. Whether the activities identified in the approved maintenance plan and schedule and Covenants have been properly implemented, completed, and maintained.
3. Identification of any maintenance deficiencies.
4. Any corrective actions needed.

4.3 ENFORCEMENT

If the County determines that a project is in non-compliance with the County's Stormwater Management Ordinance, then the County Inspector may direct conformity by proceeding with the appropriate enforcement action. The types of enforcement tools available to the County include a Correction Order, Notice of Violation (NOV), Stop Work Order and Civil/Criminal Penalties. The enforcement mechanism to be utilized will depend on the circumstances as described in the following sections.

4.3.1 CORRECTION ORDERS

The County Engineer typically issues a Correction Order for first offenses of non-compliance with the County Stormwater Management Ordinance and the approved SWPPP. The purpose of the Correction Order is to give notice of the deficiencies, identify expected corrective results and provide a reasonable timeframe to the contractor prior to the County taking further action to get a problem resolved. Correction Orders shall be submitted in writing, but a verbal notice may be given if the deficiency needs immediate correction to prevent offsite or downstream impacts. The County Engineer shall issue Correction Orders within five (5) working days of an inspection. All Correction Orders, verbal or written, shall be noted in the project file.

Correction Orders may be issued in such cases, but not be limited to, when there is:

1. Failure to comply with the approved SWPPP to include failure to have properly installed and/or maintained BMP measures.
2. Failure to properly maintain permanent stormwater management structures.
3. Failure to notify the County Engineer before beginning work on a phase of an approved project.
4. Failure to call for a final site inspection.

A Correction Order should at a minimum include, but not be limited to, the following:

1. Nature of the violation(s).
2. Proposed penalty.
3. Required corrective actions.
4. The time period for correcting the violation(s).

4.3.2 NOTICES OF VIOLATION

If a Correction Order has been previously issued and there are either subsequent non-compliance issues or failure to complete the items on the Correction Order within a specified time period, then a NOV may be issued. A NOV may be issued for violations that involve a safety issue, or an imminent threat of serious damage to the environment and/or public or private property. A NOV may be issued without a Correction order having previously been issued based on the nature, severity, and frequency of the violation(s) at the discretion of the County Engineer or his designee. Additionally, a NOV may be issued for, but is not limited to, the following:

1. If construction activities have been initiated and no BMP measures are in place or are not working to prevent sediment from leaving the site.
2. Failure to obtain a permit before initiating land disturbance activities.
3. Unpermitted work and/or not following the approved sequence of construction.
4. Site conditions that pose an environmental risk to discharge pollutants.
5. Failure to have work inspected and approved before restarting construction activities after a stoppage of work.
6. Failure to conduct inspections of BMPs, complete inspection reports, or make OS-SWPPP accessible to County Inspectors.

A NOV should at a minimum include, but not be limited to, the following:

1. Nature of the violation(s).
2. Proposed penalty.
3. Notification that a Stop Work Order may be issued or that permits for the site may be suspended or revoked if there is continued non-compliance.
4. Required corrective actions.
5. The time period for correcting the violation(s).

4.3.3 STOP WORK ORDER

A Stop Work Order may be issued for, but are not limited to, the following:

1. Construction activities are occurring without an approved SWPPP.
2. Past enforcement actions taken by the County (Correction Orders, NOVs) to remedy a situation(s) have not been properly addressed with appropriate and prompt action to the satisfaction of the County Engineer.
3. Non-compliance with the plans has resulted in a health, environmental, or safety issue.
4. Offsite sedimentation resulting from non-compliance with the approved SWPPP has eliminated or severely degraded a use in a downstream waterbody or that such degradation is imminent.
5. Offsite sedimentation resulting from non-compliance with the approved SWPPP has caused severe damage to adjacent, downstream, or upstream property.

A Stop Work Order may allow or require correction of violations, but no other work, other than leading to compliance, as directed by the County Engineer or his designee (County Inspector), may occur. The Stop Work Order shall state that failure to comply may result in the suspension or revocation of any remaining permits issued for the site and/or civil penalties being issued. The Stop Work Order shall remain in effect until the County Engineer or his designee (County Inspector) inspects the site, approves of the completed correction actions, and issues formal correspondence lifting the Stop Work Order.

4.3.4 CIVIL PENALTIES

The County may issue a Civil Penalty as a result of non-compliance with a NOV and/or Stop Work Order or there has not been substantial progress in complying with the NOV and/or Stop Work Order. In addition, a Civil Penalty may be issued when there are repeated, recurring violations at the same site or when there are repeated, recurring violations by the same responsible party. Violations may subject the owner/operator to Civil Penalties of not more than $1,000 for each violation. Each separate day of a violation constitutes a new and separate violation.

4.3.5 CRIMINAL PENALTIES

In addition to any applicable civil penalties, any person who negligently, willfully, or intentionally violates any provision of the Stormwater Management Ordinance shall be guilty of a misdemeanor and shall be punished within the jurisdictional limits of the magistrate's court. The County may issue a uniform summons citation for a violation of this Ordinance. Fines imposed under the NOV may not exceed $500.00 per violation and/or 30 days in jail. Each day of a violation shall constitute a new and separate violation.

CHAPTER 5. REFERENCES

This chapter lists the various references used in the manual and if available, websites where they can be retrieved.

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APPENDICES

Appendix A. South Carolina Department of Environmental Services Control Notice of Intent Form D-0451

PRINT | SUBMIT BY EMAIL

SC DEPARTMENT of ENVIRONMENTAL SERVICES

Notification Form for Sites Disturbing Less Than 1-Acre, Not Located within 0.5 Miles of a Coastal Receiving Water and Automatic Permit Coverage (Not Part of a Larger Common Plan, Coastal County)

Notification #: _____ (For Official Use Only)

Note: This form is for use on projects LOCATED WITHIN THE EIGHT COASTAL COUNTIES (Beaufort, Berkeley, Charleston, Colleton, Dorchester, Georgetown, Horry, and Jasper) and that are NOT part of a larger common plan for development or sale.

Date: _____

Project/ Site Name: _____ **County:** _____

I. Project Information

A. Is any portion of this Project's boundary located within an Urbanized Area or MS4? ☐ Yes ☐ No
If yes, list the MS4 Operator or Urbanized Area Name. _____

B. Project Owner/ Operator (Company or person): _____
Company EIN: __ __ - __ __ __ __ __ __ __ Phone: _____ Fax: _____
Mailing Address: _____ City: _____ State: ____ Zip: _____
Email address: _____

C. Permit Contact (If Owner Is Company): _____
Phone: (Day) _____ Email Address: _____

II. Property Information

A. Site Location (street address, nearest intersection, etc.): _____
Is the Property located Within City Limits? ☐ Yes ☐ No Nearest City/Town: _____
Latitude: ____°____'____" N Longitude: -____°____'____" W Tax Map # (List All): _____
Tax Map # (Continued): _____

B. Property Owner (if different from section **I. B** above): _____
Mailing Address: _____ City: _____ State: ____ Zip: _____
Phone: (Day) _____ Email address: _____

III. Site Information

A. Disturbed Area (to the nearest tenth of an acre): _____ Total Area (to the nearest tenth of an acre): _____

B. Start Date (MM/DD/YYYY): ____/____/_____ Completion Date (MM/DD/YYYY): ____/____/_____

C. Are there any Flooding Problems Downstream of or Adjacent to this Site? ☐ Yes ☐ No

D. Has SCDES or MS4 issued a *Notice to Comply, Notice of Violation or a Warning Notice* for this site or LCP? ☐ Yes ☐ No

E. Type of Activity (check all that apply):
☐ Commercial ☐ Industrial ☐ Institutional
☐ Residential: Single-family ☐ Residential: Multi-family ☐ Linear ☐ Other: _____
☐ Multi-use (Commercial & Residential) ☐ Site Preparation (No new impervious)

IV. Waterbody Information

A. Nearest Receiving Waterbody(s) [RWB]: _____ Distance to Nearest RWB (feet): _____

B. Drains to Coastal Receiving Water? ☐ Yes ☐ No Distance to Coastal Receiving Water [CRW] (feet): _____

C. 1. Are there any Waters of the United States/ Waters of the State, jurisdictional or non-jurisdictional wetlands, or any other waters located on site? ☐ Yes ☐ No
2. Are there any impacts to any of the on-site Waters of the U.S./State, jurisdictional or non-jurisdictional wetlands, or any other waters? ☐ Yes ☐ No

D. If checked yes for impacts in item C.2, describe each impact and activity, and list all permits (e.g., USACOE Nationwide Permit, SCDES General Permit) and certifications that have been applied for or obtained for each impact.

_____

_____

V. Signatures and Certifications: DO NOT SIGN IN BLACK INK!

A. Per my signature below, I hereby certify that this project is not part of a Larger Common Plan (LCP) for Development or Sale. I understand that additional construction activities at this site may require permit coverage and I am responsible for obtaining any federal, state, or local permits that may be required for this project. In the case that the site associated with this project is located within an Urbanized Area (UA) or MS4, I certify that the respective UA or MS4 has been informed about the scope of all land-disturbing construction and associated activity pertaining to this site, and that all additional requirements mandated by the UA or MS4 have been addressed. I certify that all land-disturbing construction and associated activity pertaining to this site shall be accomplished pursuant to and in keeping with the terms and conditions of all relevant laws and regulations, including the Storm Water Management and Sediment Reduction Act of 1991 and the Federal Clean Water Act. Failure to do so may result in penalties. I hereby grant authorization to the Department of Environmental Services and/or the local implementing agency the right of access to the site at all times for the purpose of on site inspections during the course of construction and to perform maintenance inspections following the completion of the land-disturbing activity. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Printed name of Project Owner/Operator	Signature of Project Owner/Operator	Date

Less Than 1-Acre, Not Located within 0.5 Miles of a Coastal Receiving Water and Automatic Permit Coverage Not Part of a Larger Common Plan, Coastal County

Application Instructions

This form is for use on projects that will disturb less than 1 acre, are not located within 0.5 miles of a coastal receiving water, and are **not** a part of Larger Common Plan (LCP) for development or sale. This form is also for use on projects that qualify for Automatic Permit Coverage under the NPDES General Permit for Stormwater Discharges from Construction Activities by disturbing 0.5 acres or less on sites that are located within 0.5 miles of a Coastal Receiving Water (not part of an LCP). Coastal Receiving Waters are *receiving water bodies as defined in* **South Carolina's Coastal Zone Management Program Refinements** *including all regularly tidally influenced salt and fresh water marsh areas, all lakes or ponds which are used primarily for public recreation or a public drinking water supply, and other water bodies within the coastal zone, excluding wetlands, swamps, ditches and stormwater management ponds which are not contiguous via an outfall or similar structure with a tidal water body.*

This form is only for use on projects located within one of the eight counties comprising the S.C. Coastal Zone (Beaufort, Berkeley, Charleston, Colleton, Dorchester, Georgetown, Horry, and Jasper counties). **If this project is part of a LCP for sale or development OR if this project includes more than 0.5 acres of disturbance located within 0.5 miles of a coastal receiving water, this form may not be used. Please see DES Form d-2617 for the aforementioned scenarios.**

Completing the Application:
You must type or print legibly. You must include the original, signed notification form and one (1) copy of a sketched plan outlining the anticipated activities and the location of all proposed sediment and erosion control devices. **See Details on Pages 3-4 for additional information.**

Project/ Site Name:
The Project/Site Name should be a unique or distinguishing name (e.g., not Proposed Subdivision).

I. Project Information

- **A.** If any of the property is located inside an urbanized area (UA) or MS4, then list the entity and contact the respective MS4 or UA to identify applicable project requirements. See the following website for information about MS4s: SCDES MS4 Link. Urbanized area boundary maps are available at the following EPA Link: EPA Urbanized Area Maps Link Please verify boundaries with the MS4 entity as some boundaries may have changed since the urbanized area maps were published.
- **B.** The official or legal name of the Project Owner/Operator (PO/O) should be listed under section B. The Company EIN is the Employer Identification Number as established by the U.S. Internal Revenue Service; the EIN is commonly referred to as the taxpayer ID. If the PO/O is not a company, then do not list a Company EIN. Please provide all requested information including email addresses.
- **C.** If the Project Owner/ Operator is a company, then a Permit Contact person must be listed under section C. This can be someone other than the person that has signatory authority for the company. Please provide all requested information including email addresses.

II. Property Information

- **A.** Provide all requested information, including Nearest City/Town even if project is located outside of City Limits. Latitude (from 32° to 35°) and longitude (78° to 83°) should be for the center of the site to the nearest 15". Minutes (') should be from 0 to 59, and seconds (") should be 0, 15, 30, or 45. List all Tax Map Numbers associated with the property.
- **B.** If the Project Owner/ Operator does not own the project site, then list the official or legal name of the current Property Owner of the site. Exemption Notification will be issued to the Project Owner/Operator (Section I), not the Property Owner, unless same entity.

III. Site Information

- **A.** The disturbed area and total site area should be rounded to the nearest tenth of an acre.
- **B.** List the estimated start and completion dates of the construction activity.
- **C.** If there are any downstream or adjacent flooding problems, then mark Yes. Otherwise mark No.
- **D.** If SCDES or an MS4 has issued a Notice to Comply, Notice of Violation or Warning Notice for this site please check yes. Otherwise check No.
- **E.** Identify the type of activity on this site by checking all that apply. Institutional includes schools and other publicly owned projects, except Linear projects. Site Preparation includes clearing, grubbing, and grading only; no new impervious areas should be proposed if this activity type is checked.

IV. Water Body Information

- **A.** The nearest receiving water body is the nearest Waters of the State (WOS)(see definition in S.C. Regulation 61-9) to which the site's stormwater will discharge. If this water body is unnamed, then provide a description that references the nearest, named water body (e.g., tributary to Grove Creek). If the site's stormwater discharges to multiple water bodies, then list all such water bodies and attach additional sheets, if necessary.
- **B.** If your site drains to a Coastal Receiving Water as defined above, then mark Yes. Otherwise mark No. If YES, provide the distance.
- **C.** If there are other waters of the U.S./State on the site not listed in item A (e.g., lake, pond), then mark Yes under item C.1. If there are proposed impacts to these or any WoS, then mark Yes under item C.2. It is also advised that you contact USACOE (866-329-8187), SCDES Water Quality Certification & Wetlands Section (803-898-4300), and SCDES Office of Ocean and Coastal Resource Management (843-953-0200) as applicable about these impacts.
- **D.** If items C.1 and C.2 were marked Yes, then describe the scope of all impacts to the referenced Waters of the State and list all permits and certifications that have been applied for or obtained which address each impact.

V. Signatures and Certifications

A. If the Project Owner / Operator is a company, print the name of the person who is signing the NOI for the Project Owner / Operator. A person with signatory authority for the Project Owner / Operator must sign the application. Certified Digital Signatures through Adobe Reader are accepted.

Where to File: (For projects that are located **within the Coastal Zone** and are **not** part of a LCP.) **For projects located within an Urbanized Area or MS4, you must first contact the respective UA or MS4 to identify applicable project requirements.**

Via Email

coastalstormwaternotification@des.sc.gov
(All files must be submitted as PDFs.)

Via Mail

SCDES—Coastal Stormwater Permitting Section
1362 McMillan Avenue, Suite 400
Charleston, SC 29405

Project Requirements

The following paragraphs provide guidance for projects located within the Coastal Zone that disturb less than one (1) acre, are not located within 0.5 miles of a CRW, and are not part of a larger common plan for development or sale (LCP). The following paragraphs also provide guidance for coastal projects that qualify for Automatic Permit Coverage under the NPDES General Permit for Stormwater Discharges from Construction Activities (NPDES CGP) by disturbing 0.5 acres or less on sites that are located within 0.5 miles of a Coastal Receiving Water (not part of an LCP.) **If your project is to be constructed in a MS4 or Urbanized Area, the respective MS4 or UA must be consulted to identify additional project requirements.** The **Where To Apply** guidance may also be consulted for MS4/UA contact information.

Regulatory Basis: The S.C. Stormwater Management and Sediment Reduction Regulations (R.72-300) require that for land disturbing activities involving two (2) acres or less of actual land disturbance which are not part of a larger common plan of development or sale, the person responsible for the land disturbing activity shall submit a simplified stormwater management and sediment control plan meeting the requirements of R.72-307H. In addition to R.72-300, all projects that disturb 1 acre or more are subject to the requirements of the NPDES General Permit for Storm Water Discharges from Construction Activities (NPDES CGP). Additionally, projects may be subject to requirements of local governments through local ordinances, in particular, those areas that are considered Municipal Separate Storm Sewer Systems (MS4s) under the NPDES program. Please see SCDES's MS4 website for more information.

Heightened Coastal Stormwater Requirements – Sites Located Within 0.5 Miles of Coastal Receiving Waters
The South Carolina Coastal Zone Management Program Refinements (Program Refinements) call for regulatory approval of small sites that are located within 0.5 miles of a receiving water body as defined in Chapter III, Section XIII of the Program Refinements (See definition of receiving water body located in the instructions for this form). This type of receiving water body is also known as a coastal receiving water for the purposes of permitting requirements. Regulation 61-9, used in developing NPDES permits, defines any construction activity located within 0.5 miles of a coastal receiving water as a " Small Construction Activity", and therefore subject to coverage under the NPDES CGP. In the NPDES CGP, sites that are located within 0.5 miles of a coastal receiving water and disturb 0.5 acres or less (not part of an LCP) qualify for automatic permit coverage with the use of appropriate best management practices.

For construction activities that include less than one (1) acre of disturbance, are not part of an LCP, where the site is located within 0.5 miles of a coastal receiving water, the following applies:

Submittal Type	Size of Construction Activity	DES Form 0451
Automatic Permit Coverage* (Notification)	0.1 – 0.5 acres	0451
Individual Permit Coverage*	0.6 – 0.9 acres	2617

Definition LCP: The plan in LCP is "broadly defined as any announcement or piece of documentation (including a sign, public notice or hearing, sales pitch, advertisement, drawing, permit application, zoning request, computer design, etc.) or physical demarcation (including boundary signs, lot stakes, surveyor markings, etc.) indicating construction activities may occur on a specific plot." [63 Federal Register No. 128, July 6, 1998, p. 36491] For example, if master calculations have been prepared and/or submitted for an entire site, then all phases and parcels at that site would be considered part of an LCP. If the site is part of a subdivision, industrial park, commercial park, etc., then it is considered to be part of an LCP. If there have been land-disturbing activities, including clearing, grading or excavating, that resulted in one (1) disturbed acre or more since 1992, then any future land-disturbing activities at the site are considered to be part of an LCP. If you are unable to determine if a plan is part of a LCP, you may contact the Department or the respective MS4/UA (when applicable) for assistance.

Submittal Requirements: *Projects Less Than One (1) Acre, Not Located Within 0.5 Miles of a Coastal Receiving Water AND Automatic Permit Coverage that are not part of an LCP*

Following is a summary of SCDES's submittal requirements for coastal projects that disturb less than one (1) acre and are not located within 0.5 miles of a coastal receiving water OR projects that qualify for Automatic Permit Coverage when either project type is not part of an LCP:

1. Provide **one** (**1) complete (signed and dated) Notification Form** for coastal counties (DES Form 0451 or other form provided by SCDES. *Note: The Notification form must be signed and dated by the Project Owner/Operator*.
2. Provide **one** (**1) copy of the plan/sketch.** *Note***: Plan is not required to be prepared by an engineer, Tier B surveyor, or landscape architect; however, if an individual with one of these licenses prepares the plan, then they must sign and seal the plans.** *The sketched plan should include:*
   (a) A site location drawing of the proposed project, indicating the location of the proposed project in relation to roadways, jurisdictional boundaries, streams and rivers; **(b)** The boundary lines of the site on which the work is to be performed; **(c)** The location of vegetative (temporary and permanent) and structural stormwater management and sediment control measures; and **(d)** A topographic map of the site (if required by the implementing agency).
3. A **narrative description** of the stormwater management and sediment control plan to be used during land disturbing activities. *Note:* **This may be included on the plans instead of in a written narrative**. Include a general description of topographic and soil conditions of the property. Include a general description of adjacent property and a description of existing structures, buildings, and other fixed improvements located on surrounding properties.
4. Automatic Permit Coverage Only: A Coastal Zone Consistency determination is required for any site that is located within 0.5 miles of a coastal receiving water due to the permit coverage requirement. Contact **SCDES's Office of Ocean and Coastal Resource Management (SCDES-OCRM)** for any submittal requirements. Submit CZC submittal directly to SCDES-OCRM.

Once completed, the notification package (form, plans, and narrative) may be e-mailed (as pdf) to coastalstormwaternotification@des.sc.gov for electronic processing by the Bureau of Water. A notice of receipt will be e-mailed to the applicant upon successful receipt of the notification package. Once the notification package has been screened for completeness and applicability, a letter requesting additional information or an approval letter will be e-mailed to the project owner/operator at the e-mail address provided on the notification form. A copy of the Notification letter will also be e-mailed to SCDES Regional inspectors**. If electronic submittal is not possible or desired, Less Than One Acre/Automatic Permit Coverage notifications may be mailed to SCDES - Bureau of Water, Coastal Stormwater Section, 1362 McMillan Avenue, Suite 400, Charleston, S.C. 29405.**

If the project is to be constructed inside a MS4 or Urbanized Area, you must first contact the respective MS4 or UA to identify applicable project requirements. Please note that these projects are required to provide adequate sediment and erosion controls in order to insure no off-site sedimentation into Waters of the State, adjacent properties, and public right-of-ways. Please also note that the Department does not regulate the placement of fill in floodplains. You must contact your local city or county official for such approval.

Appendix B. South Carolina Department of Environmental Services Control Notice of Intent Form D-2617

SC DEPARTMENT *of* **ENVIRONMENTAL SERVICES**

NOTICE OF INTENT (NOI)
For Coverage(s) of Primary Permittees Under South Carolina NPDES General Permit For Stormwater Discharges From Construction Activities SCR100000
(Maintain As Part of On-Site SWPPP)

For Official Use Only
File Number: _____
Permit Number: SCR10_____
Submittal Package Complete: _____

Submission of this Notice of Intent constitutes notice that the Applicant identified in Section II intends to be authorized as a Primary Permittee in the state of South Carolina under NPDES General Permit SCR1000000. ***Fees required for review and NPDES coverage of each application type are as listed on page 2 of the Instructions.***

Date: _____ **Check if project is receiving SCIIP Funding** ☐ **Grant #:**
Project/Site Name: _____ **County:** _____
(Modification or Change of Information Only) **Prior Approved NPDES Permit or File Number:** _____

Do you want this project to be considered for the Expedited Review Program (ERP)? ☐**Yes or** ☐**No (See instructions)**

I. Notice of Intent (NOI) Application Type(s)

A. **Project (Application/Review) Type(s)** (Select **ALL** that apply):
☐ New Project (Initial Notification) Ongoing Project: ☐ Permitted or ☐ Un-Permitted
☐ Late Notification ☐ Low Impact Development (LID) or Project Design Above Regulatory Requirements
☐ New Owner/Operator or Company Name Change **(see instructions, attach Form A (Transfer of Ownership))**
☐ Major Modification: **(see instructions, attach Form B (Major Modifications))**
☐ MS4 Project Review
☐ Bureau of Coastal Management (BCM) Review
☐ Change of Information/Other (Specify): _____

B. If Applicable, identify the entity designated as **MS4 Reviewer and MS4 Operator** (i.e., Lexington County, City of Greer, etc.): **MS4 Reviewer**_____ **MS4 Operator** _____

II. Primary Permittee Information ☐ Change of Information

☐ Person or ☐ Company	If a Company, are you a ☐ Lending Institution or ☐ Government Entity? Company EIN **(If applicable):** EIN: _____

A. **Primary Permittee Name:** _____
Mailing Address: _____ City: _____ State: _____ Zip: _____
Phone: _____ Fax: _____ Email Address: _____

B. **Contact /ODSA Name** (If different from above OR if owner is a company): _____
Mailing Address: _____ City: _____ State: _____ Zip: _____
Phone: _____ Fax: _____ Email Address: _____

C. **Property Owner Name** (If different from above): _____
Mailing Address: _____ City: _____ State: _____ Zip: _____
Phone: _____ Fax: _____ Email Address: _____

III. Comprehensive Stormwater Pollution Prevention Plan (C-SWPPP) Preparer Information ☐ Change of Information

A, **C-SWPPP Preparer Name:** _____
B. **Registered Professional** ☐Engineer ☐Landscape Architect ☐Tier B Land Surveyor **S. C. Registration #:** _____
C. **Company/Firm Name:** _____ **S. C. COA # :** _____
Mailing Address: _____ City: _____ State: _____ Zip: _____
Phone: _____ Fax: _____ Email Address: _____

IV. Project/Site Information ☐ Change of Information

A. **Type of Construction Activity(ies)** (Select **ALL** that apply):
☐ Commercial ☐ Industrial ☐ Institutional ☐ Mass Grading ☐ Linear ☐ Utility/Infrastructure
☐ Residential: Single-family ☐ Residential: Multi-family ☐ Multi-use (Commercial & Residential)
☐ Site Preparation (No New Impervious Area) ☐ Other (Specify) _____

B. **Site Address/Location** (street address, nearest intersection, etc.) _____
City/Town (If in limits): _____ Zip Code: _____
Latitude: ___°___'___" N Longitude: -___°___'___" W (Source): ☐GPS ☐ Web Site: _____
Tax Map Number (s) (List all): _____

C. Is this site located on **Indian Land**? ☐Yes ☐No

D. **Proposed Start Date**: _____ **Proposed Completion Date**: _____

E. **Disturbed Area** (nearest tenth of an acre): _____ **Total Area** (acres): _____

F. **Modification Only:**(nearest tenth of an acre)**: Disturbed Area: Current (Approved) Area:** _____
Disturbed Area Change (Increase Only): _____ **Total Disturbed Area (After Change):** _____

G. Is this project part of a **Larger Common Plan for Development or Sale (LCP)**? ☐ Yes ☐ No
LCP/ Overall Development Name: _____ Check here if this is the **First Phase**. ☐

Previous State Permit/File Number: _____ **Previous NPDES Coverage Number**: SCR10 _____

H. Any **Flooding Problems** exist downstream of or adjacent to this site? ☐Yes ☐No (If yes, provide detailed description of flooding problems and applicable floodway/flood zone information in the C-SWPPP).

I. Active **SCDES Warning Notice**, **Notice to Comply or Notice of Violation** for this site or LCP? ☐Yes ☐No

J. List Relevant **State and Federal Environmental Permits or Approvals** applied for or obtained for this site (e.g., **RCRA, USACOE, Nationwide**, etc.). **If None, list None**.

_____

K. **Any Waiver(s)/Variances/Exceptions Requested for this Project**? (If yes, identify below and include **Waiver Request and Justifications** in the C-SWPPP for each proposed request).

1. Small Construction Activity Waiver(s) From NPDES permitting **(Section 1.4 & Appendix B)**? ☐ Yes ☐ No
If yes, Identify requested waiver: ☐ Rainfall Erosivity Waiver ☐ TMDL Waiver ☐ Equivalent Analysis Waiver

2. Detention Waiver **(72-302(B)**? ☐ Yes ☐ No | 3. Other (Specify): _____

V. Waterbody Information (Attach additional sheet(s) as needed) ☐ Change of Information

A. **Receiving Waterbody(s) (RWB) Information** (List the nearest and next nearest receiving waterbodies to which the sites stormwater discharges will drain. If stormwater discharges drain to multiple waterbodies, list all such waterbodies).

1. Name of Receiving Waterbodies (RWB)	2. Distance to RWB (feet)	3. Classification of RWB
a. Nearest: _____		
b. Next Nearest: _____		
c. Coastal Zone ONLY: Coastal Receiving Water (CRW): _____		Not Applicable
d. Other Waterbodies: _____		

B. **Waters of the U.S. / State Information** (Attach additional sheet(s) as needed)

Waters of the U.S./ State	1. On the site?	2. Delineated/ Identified?	3. Impacts?	4. Amount of impacts
a. Jurisdictional wetlands	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	_____ Ac
b. Non-jurisdictional wetlands	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	_____ Ac
c. Other Water(s): _____	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	_____ Ac _____ Feet
d. Coastal Zone ONLY: Direct Critical Area	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	_____ Ac _____ Feet

5. If yes for impacts in B.3, describe each impact and activity, and list all permits (e.g., USACOE Nationwide Permit, SCDES General Permit) and certifications that have been applied for or obtained for each impact:
_____

C. **S.C. Navigable Waters (SCNW) Information (Section 2.6.5)** The Department will address any issues related to State Navigable Waters' Program under SC Regulation 19-450 during the review of the C-SWPPP for activities that will **NOT** require a 404 permit or a 401 certification. (Attach additional sheet(s) as needed).

1. Are S. C. Navigable Waters (SCNW) on the site: ☐Yes ☐ No
a. If **no**, do not complete this question. Proceed to Section D (Impaired Waterbodies).
b. If **yes**, provide the name of S.C. Navigable Waters (SCNW) on the site: _____

2. If **yes for C.1**, will construction activities cross over or occur in, under, or thru the SCNW? ☐Yes ☐ No
If yes, describe SCNW activities (e.g., road crossing, sub-aqueous utility line, temporary or permanent structures, etc.) and proceed to Section C.3: _____

3. Identify permits providing coverage of SCNW activities proposed for your site. If NONE, list none.

Permits/Certifications	Permit or Certification No.	Corresponding Covered SCNW Activity(ies)
a. SCDES General/ Other SCDES Permit		
b. USACOE **404 Permit or 401 Certification**		
c. SCNW Permit If applied for or issued, identify **Date applied for or issued:** _____		☐ **All Activities** or ☐ **Some Activities (Describe):**

d. If a SCNW Permit has NOT been applied for provide an additional plan sheet that shows plan and profile views (drawn to scale) of the SCNW and associated activities. Include a description of all proposed activities on this plan.

D. **Impaired Waterbodies Information** (Attach additional sheet(s) as needed)

1. 303(d) Listed Impaired Waterbodies

a. Name of **Nearest SCDES Water Quality Monitoring Stations (WQMS)(s)** that receives stormwater from your construction site and/or thru an MS4 and the **Name of the Corresponding Waterbody?**		b. **Is this WQMS(s) listed on the most current 303(d) List? If No, proceed to Section 2 of this table. If Yes, complete items c thru f.**	c. List the pollutant(s) identified as **"CAUSES"** of the impairment	d. Will any pollutants causing the impairment be present in your site's construction stormwater discharges?	e. If **yes for d**, list the **"USE SUPPORT"** impairment(s) affected by the pollutant(s) identified in c.
Nearest SCDES WQMS(s)	**Corresponding Waterbody**				
		☐ Yes ☐ No		☐ Yes ☐ No	
		☐ Yes ☐ No		☐ Yes ☐ No	
		☐ Yes ☐ No		☐ Yes ☐ No	

f. If **yes for d** above, **will use of the BMPs proposed for your project ensure the site's discharges will NOT contribute to or cause further WQS violations for the impairment(s) listed in c?** ☐ Yes ☐ No
(NOTE: If no for f, this site is NOT eligible for coverage under the CGP). See Instructions.

2. TMDL Impaired Waterbodies

a. Name of **Nearest SCDES Water Quality Monitoring Stations (WQMS)(s)** that receives stormwater from your construction site and/or thru an MS4?	b. Has a TMDL(s) been developed for this WQMS(s)? **If No, identify as such below and proceed to Section VI. If Yes, complete items c thru f of this table.**	c. If **yes for b**, what pollutants are listed as "CAUSES" or causing the impairment?	d. If **yes for b**, has the standard been **"ATTAINED" or " Fully Supported"** for the impairment(s)?	e. If **no for d (Not Attained)**, will any pollutants causing the impairment be present in your site's construction stormwater discharges?
	☐ Yes ☐ No		☐ Yes ☐ No	☐ Yes ☐ No
	☐ Yes ☐ No		☐ Yes ☐ No	☐ Yes ☐ No
	☐ Yes ☐ No		☐ Yes ☐ No	☐ Yes ☐ No

f. If **yes for e** above, **are your discharges consistent with the assumptions and requirements of the TMDL(s)?** ☐ Yes ☐ No
(NOTE: If no for f, this site is NOT eligible for coverage under the CGP). See Instructions.

VI. Signatures and Certifications DO NOT SIGN IN BLACK INK!

Read the Certifications below (in entirety). Provide date, printed name, and signatures below. If you are a **New Owner/Operator**, as Primary Permittee you must also sign and date the applicable Comprehensive SWPPP Acceptance & Compliance Agreement below.

C-SWPPP PREPARER: "One copy of the C-SWPPP, all specifications and supporting calculations, forms, and reports are herewith submitted and made a part of this application. I have placed my signature and seal on the design documents submitted signifying that I accept responsibility for the design of the system. Further, I certify to the best of my knowledge and belief that the design is consistent with the requirements of Title 48, Chapter 14 of the Code of Laws of SC, 1976 as amended, pursuant to Regulation 72-300 et seq. (if applicable), and in accordance with the terms and conditions of SCR100000." **(This should be the person identified in Section III).**

_____ _____ _____

Printed Name of C-SWPPP Preparer **Signature of C-SWPPP Preparer** **S. C. Registration #**

PRIMARY PERMITTEE: "I or I (on behalf of my company and its contractors and agents), as the case may be, certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I understand that SCDES enforcement actions may be taken if the terms and conditions of the C-SWPPP are not met and I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

"I or I (on behalf of my company and its contractors and agents), as the case may be, also hereby certify that all land-disturbing construction and associated activity pertaining to this site shall be accomplished pursuant to and in keeping with the terms and conditions of the approved plans and SCR100000. I also certify that a responsible person will be assigned to the project for day-to-day control. I hereby grant authorization to the to S. C. Department of Environmental Services (SCDES) and/or the local implementing agency the right of access to the site at all times for the purpose of on site inspections during the course of construction and to perform maintenance inspections following the completion of the land-disturbing activity." **(See Section 122.22 of S.C. Reg. 61-9 for signatory authority information.)** Having understood the above information, I am signing this certification as Primary Permittee to the aforementioned NPDES general permit."

_____ _____

Printed Name of Primary Permittee **Title/Position**

_____ _____

Signature of Primary Permittee **Date Signed**

NPDES CGP FEE SCHEDULE A

(All Counties EXCEPT Beaufort, Berkeley, Charleston, Colleton, Dorchester, Georgetown, Horry, and Jasper)

The schedule should be attached to SCDES Form 2617. Do not send payment in window envelope. **DO NOT MAIL CASH** SCDES will notify the Project Owner/ Operator if the submitted check or credit card payment cannot be processed. **The review clock will start when acceptable payment is received.**

1. Identify (√) the Project Review Type(s) **Enter NPDES Coverage Fee of $125 in the right-hand column if any of the following project/review types apply to this application.** Proceed to Item 2.	**(√)**	**NPDES Coverage Fee**
a. Project or LCP (Item IV.G) that will ultimately disturb one (1) acre or more Note: If your project will ultimately disturb less than one (1) acre **AND** is NOT a part of a Larger Common Plan, coverage under SCR100000 is not required; see https://des.sc.gov/sites/des/files/Library/D-2628.pdf (Notification Form for Sites Disturbing Less Than 1-Acre Not Part of a Larger Common Plan, Non-Coastal County"	☐	$ _____. 00
b. New Owner/Operator (Transfer of Ownership)/Company Name Change ($125 NPDES Coverage fee is required by the Department for Transfers of Ownership and Company Name Changes)	☐	
c. Unpermitted Ongoing Project or Late Notification	☐	
d. MS4 Project Review (Item I.A and I.B) ($125 payable to Department thru MS4 Reviewer)	☐	
e. Other (Specify): _____	☐	

2. Determine the Project Review Fees (Review fees cannot exceed $2000 for a project)		
PROJECT OR LCP THAT WILL ULTIMATELY DISTRUB ONE (1) ACRE OR MORE	**(√)**	**Review Fees**
a. Enter the disturbed area (Item IV.E) for this project. Proceed to Items 2.b and 2.c.	_____ (Nearest tenth of an acre)	
b. Will this project or LCP (Item IV.G) ultimately disturb more than 1.0 acres	☐Yes ☐No	
c. Is this project exempt from S. C. Reg. 72-300 et seq.?	☐Yes ☐No	
1. If this project will **not** ultimately disturb more than 1.0 acre, and is not part of an LCP, **your project is automatically covered under this permit and the NPDES coverage fee and review fee are not required.** See the **BOW-SPWS** for "Less Than 1-Acre of Land Disturbance – Non-Coastal Counties". 2. If this project will ultimately disturb more than 1.0 acre, proceed to Item 2.d.		
d. Enter the project review fees (based on $100/disturbed area) in the right-hand column. (Multiply the disturbed area (Item 2.a) by $100/disturbed area). If the disturbed area for this project (Item 2.a.) totals 20.0 acres or more, enter $2000 in the right-hand column. Review fees cannot exceed $2000 for a project.		$ _____. 00

3. Total Required Fees **Add the values in the right-hand columns of Items 1 and 2.d.** Proceed to Item 4. **(The Department will not review this project until all required fees are received).**	$ _____. 000

4. Identify the Method of Payment:

☐ **Payment by Check:**

Attach a **signed and dated check payable to SCDES** to the **front** of this Fee Schedule.
Please note that all checks must be **less than 30 days old** and must be for the **entire required fees**.

☐ **Payment by Credit Card: (Check here if you wish to pay via credit card using the on-line payment system).**

The Department will contact you to provide instructions and the invoice number necessary for online payment.
Please provide an e-mail address where the invoice number may be sent: _____

For official use only: **Invoice Number** _____

NPDES CGP FEE SCHEDULE B

(ONLY for Beaufort, Berkeley, Charleston, Colleton, Dorchester, Georgetown, Horry, and Jasper Counties)
Submit payment for NPDES Coverage fees only to SCDES.

The schedule should be attached to SCDES Form 2617. Do not send payment in window envelope. **DO NOT MAIL CASH**. SCDES will notif the Project Owner/ Operator if the check or credit card payment cannot be processed. **The review clock will start when acceptable payment is received and after the project is deemed consistent with the S.C. Coastal Zone Management Plan**.

1. Identify (√) the Project/Review Types (NOTE: You may ONLY select Item 1.a OR 1.b BELOW). Enter NPDES coverage fee of $125 in the right-hand column if any of the following project/review types apply to this application. **Proceed to Item 2.**	(√)	NPDES Coverage Fee(s)
a. Project or LCP that is located within ½ mile of CRW (Item V.A) that will ultimately disturb more than 0.5 acres (if select a, do not select b)	☐	$ _____. 00
b. Project or LCP that is NOT located within ½ mile of CRW (Item V.A) that will ultimately disturb one (1) acre or more (if select b, do not select a)	☐	
c. New Owner/Operator (Transfer of Ownership)/Company Name Change ($125 NPDES Coverage fee is required by the Department for Transfers of Ownership and Company Name Changes)	☐	
d. Unpermitted Ongoing Project or Late Notification	☐	
e. MS4 Project Review (Item I.A and I.B)	☐	
f. Other (Specify): _____	☐	

2. Determine the Project Review Fees (Review fees cannot exceed $2000 for a project).
NOTE: COMPLETE ITEM 2.a BELOW. COMPLETE EITHER SECTION 3 OR SECTION 4. DO NOT COMPLETE BOTH SECTIONS.

a. Enter the disturbed area (Item IV.E) for this project. Proceed to Item 3 OR Item 4. _____ (nearest tenth of an acre)

3. PROJECT OR LCP LOCATED WITHIN ½ MILE OF A CRW (ITEM V.A)	(√)	Review Fees
a. Will this project or LCP (Item IV.G) ultimately disturb more than 0.5 acres?	☐Yes ☐No	
b. Is this project exempt from S. C. Reg. 72-300 et seq.?	☐Yes ☐No	

1. If this project will **NOT** ultimately disturb more than 0.5 acres and is not part of an LCP, **your project is automatically covered under this permit and the NPDES coverage fee and review fee are not required.** See section 1.3.1.B. See the **BOW-SPWS** for "Less Than 1-Acre of Land Disturbance - Coastal Counties".
2. If this project or LCP will ultimately disturb more than 0.5 acres, **proceed to Item 3.c.**

c. Enter the project review fees (based on $100/ disturbed acre) in the right-hand column. (Multiply the disturbed area (Item 2.a.) by $100/disturbed area). If the disturbed area for this project (Item 2.a.) totals 20.0 acres or more, enter $2000 in the right-hand column. Review fees cannot exceed $2000 for a project. **Proceed to item 3.d**	$ _____. 00
d. Total Required Fees (Coastal Project located WITHIN ½ mile of a CRW (Item V.A) Add the values in the right-hand columns of Items 1 and 3.c. (The Department will not review this project until all required fees are received). **Proceed to Item 5.**	$ _____. 00

4. PROJECT OR LCP NOT LOCATED WITHIN ½ MILE OF A CRW (ITEM V.A)	(√)	Review Fees
a. Will this project or LCP (Item IV.G) ultimately disturb one (1) acre or more?	☐Yes ☐No	
b. Is this project exempt from S. C. Reg. 72-300 et seq.?	☐Yes ☐No	

1. If this project will **NOT** ultimately disturb one (1) acre or more, and is not part of an LCP, coverage under SCR100000 is NOT required; see the **BOW-SPWS** for "Less Than 1-Acre of Land Disturbance - Coastal Counties".
2. If this project or LCP will ultimately disturb one (1) acre or more, **proceed to Item 4.c.**

c. Enter the project review fees (based on $100/ disturbed acre) in the right-hand column. (Multiply the disturbed area (Item 2.a.) by $100/disturbed area). If the disturbed area for this project (Item 2.a.) totals 20.0 acres or more, enter $2000 in the right-hand column. Review fees cannot exceed $2000 for a project. **Proceed to item 4.d.**	$ _____. 00
d. Total Required Fees (Coastal Project NOT located WITHIN ½ mile of a CRW (Item V.A) Add the values in the right-hand columns of Items 1 and 4.c. (The Department will not review this project until all required fees are received). **Proceed to Item 5.**	$ _____. 00

5. Identify the Method of Payment: ☐ **Payment by Check:** (Attach a signed and dated check payable to SCDES to the front of this fee schedule. All checks must be less than 30 days old and must be for the entire amount of required fees). ☐ **Payment by Credit Card:** (Check here if you wish to pay via credit card using the on-line payment system). The Department will contact you via e-mail to provide instructions and the invoice number necessary for online payment. **Please provide an e-mail address where the invoice number may be sent:**

_____

For official use only: Invoice Number _____

Instructions for Completing the Notice or Intent (NOI)

If you are uncertain whether you need to obtain coverage under the NPDES General Permit for Stormwater Discharges from Construction Activities, SCR100000 (CGP), if you cannot access the websites listed on the NOI and instructions, or if you have any other questions, contact the Stormwater Permitting Section (**SWP**) at (803) 898-4300 or Coastal Stormwater Permitting Section (**CSWP**) at (843) 953-0200. Projects located in the S.C. Coastal Zone (**SCCZ**—Beaufort, Berkeley, Charleston, Colleton, Dorchester, Georgetown, Horry, and Jasper counties) are reviewed by **CSWP**. Please see the Bureau of Water, Stormwater Permitting website (**BOW-SPWS**): https://des.sc.gov/Stormwater for guidance and additional information regarding the CGP.

Who Must File a NOI:

• If S.C. Department of Transportation (SCDOT) is the Primary Permittee (Owner/ Operator), this NOI form (Form 2617) should not be used.
• The Owner/ Operator of a single project or larger common plan for development or sale (LCP—see item IV.G of instructions) that will ultimately disturb 1 acre or more (all counties).
• In the **SCCZ**, the Owner/Operator of a single project or LCP that is located within ½ mile of a coastal receiving water (CRW) (See item V.A of the instructions) and will ultimately disturb more than 0.5 acres.
• See the **BOW-SPWS** for "Less Than 1-Acre of Land Disturbance - Non-Coastal Counties" and "Less Than 1-Acre of Land Disturbance - Coastal Counties".

Where to File:

See the **BOW-SPWS** for a current list of the areas that are reviewed by Municipal Separate Storm Sewer System (MS4) operators and entities that have delegated review authority. For projects in these areas, the initial submittal should be made to the MS4 operator; if initial submittal is made to SCDES for projects in these areas, the review process may be delayed. Please contact the appropriate entity for additional information and requirements; for example, the MS4 operator may require that a different application form be submitted. If a project crosses jurisdictional boundaries (e.g., sewer line in Greenville County and the city of Mauldin), then submittals to all appropriate MS4 operators, delegated entities, and SCDES must be coordinated.

Projects Located in the SCCZ	All Other Areas
SCDES—Bureau of Water **Coastal Stormwater Permitting Section** **1362 McMillan Ave., Suite 400** **Charleston, S.C. 29405**	**SCDES—Bureau of Water** **Stormwater Permitting Section** **2600 Bull Street** **Columbia, SC 29201-1708**

Submittal Package for SWP and CSWP:

• **When SCDES performs a full technical review**, you must include the original, signed NOI form, appropriate fee schedule (A B) with required fees, one (1) copy of the Comprehensive Stormwater Pollution Prevention Plan (C-SWPPP), and one (1) copy of all other supporting documentation with the initial submittal**.** For projects in the **non coastal counties** disturbing **greater than or equal to 1 acre and less than or equal to 2 acres**, one (1) copy of the C-SWPPP and one (1) copy of supporting documentation can be submitted with the initial submittal. In the **SCCZ**, applications for Coastal Zone Consistency certification are to be filed with requests for NPDES construction coverage and will then be routed internally to the Bureau of Coastal Management (BCM) for review. BCM submittal requirements can be located at: https://des.sc.gov/CZC
• **When a regulated MS4 or entity implementing Regulation 72-300 performs the technical review,** you must include a copy of the MS4 approved NOI form or MS4 approved application, the $125 NPDES fee, and one (1) copy of the MS4 approval. In the **SCCZ**,applications for Coastal Zone Consistency certification are to be filed with requests for NPDES construction coverage and will then be routed internally to BCM for review.
• **For projects ultimately disturbing more than 1 acres**, the checklist must be completed and attached when SCDES reviews your C-SWPPP. In the **SCCZ**, for projects ultimately disturbing more than 0.5 acres and located within ½ mile of a CRW, the checklist must be completed and attached. See **BOW-SPWS** for the most current version of the checklist. If this project will **NOT** ultimately disturb more than 0.5 acres (Coastal Counties) or more than 1.0 acre (Non-Coastal Counties) AND is not part of an LCP, **your project is automatically covered under this permit and the NPDES coverage fee and review fee are not required.** See the **BOW-SPWS** for "Less Than 1-Acre of Land Disturbance - Coastal Counties AND "Less Than 1-Acre of Land Disturbance – Non-Coastal Counties.
• **For Modification projects where SCDES performs a technical review**, see Section I of the instructions and Form B. Complete the applicable sections of the NOI Form. Complete the Form B Checklist. Submit an original, signed NOI form, appropriate fee schedule (C) with required fees, one (1) copy of SWPPP revisions, and one (1) copy of all other supporting documentation, including necessary engineering calculations. **No review clock is required for Modification reviews**.

Authorization to discharge is granted based on the timeframes specified in the table below. For project sites located in the SCCZ, the timeframes provided below do not commence until a Coastal Zone Consistency determination has been issued for the site.

Review Type	Allotted Review Time Frame
Regulated MS4 or entity implementing Regulation 72-300	**7 business days of SCDES receipt of a complete NOI and fee payment.**
SCDES (when construction site is subject to State C-SWPPP reviews)	**20 business days of SCDES receipt of a complete NOI and fee payment.**

S. C. Coastal Zone (SCCZ) Requirements:

For projects that are located within ½ mile of a CRW and involve greater than 0.5 acres of land disturbance, a registered engineer, landscape architect, or Tier B surveyor must prepare, amend when necessary, certify, and stamp the C-SWPPP as required and allowed by the qualified individual's respective act and regulations. Regulation 72-307(C)(5)(g) establishes additional requirements for projects located in the **SCCZ**. The additional water quality measures are outlined in Chapter III, Section XIII of the South Carolina Coastal Zone Management Program, as refined available at https://des.sc.gov/CZMP

Fee Schedules:
Make sure to answer all applicable questions on the appropriate Fee Schedule. Complete Fee Schedule A for Non-Coastal projects; Schedule B for Coastal projects. Attach Form A, as required, for Transfer of Ownership. Attach Form B for major modifications to a prior approved project with Fee Schedule C if SCDES reviews your modification.

Office Mechanics and Filing:
The original NOI form for projects located outside of MS4 areas and supporting documentation will be kept in the Central Office files (hard copy or digitized copy) in accordance with the Retention Schedule.

Date: Enter today's date.

Check if project is receiving SCIIP Funding: Check if project is receiving SCIIP funding and add grant number from RIA.

Project/Site Name: The Project/ Site Name should be a unique or distinguishing name (e.g., not Proposed Subdivision). NOTE: SCDES must be notified in writing if the Project/ Site Name changes.

County: If the project is in multiple counties, list the county in which the majority of the site is located. If part of the project is in the SCCZ, then list the coastal county in which the majority of the site is located and submit the project to CSWP; see the "Where to File" section. List the other counties in which the site is located in the C-SWPPP.

Prior Approved NPDES Permit Number (Major Modification or Change of Information Only): Provide the NPDES permit number (SCR number)or File Number previously assigned to the project or LCP.

Expedited Review Program (ERP): For additional information about ERP, see the ERP website https://des.sc.gov/environment/water/swater/expeditedReview.htm. SCDES will notify the Project Owner/ Operator if the project is selected for review in the ERP. There are additional required fees for participation in this program; these ERP fees should not be submitted until SCDES has notified the Project Owner/ Operator that the project was selected for participation in the ERP. **In the SCCZ, please note that projects impacting Geographic Areas of Particular Concern (GAPCs) and/or wetlands may not eligible for participation. Consult** BCM **staff**.

I. Notice of Intent (NOI) Application Type(s) (See Section 2.4 of CGP for submission deadlines and notification requirements)

A. **Project (Application) Type -** Select **ALL** applicable application types that best describe your project or application. Section 2 of the Construction General Permit (CGP) may be reviewed for further information on each type of application listed in this section. As an example, if your project is one that is a new startup, then "New Project" should be selected. If your project is a new startup that will be located in Beaufort County, that will also be expedited, then "New Project", "OCRM Project Review", and "Expedited Review Program" should each be selected to describe your application. To determine if the project design is considered to be above regulatory requirements or Low Impact Development, see the "Expedited Review Standard Operating Procedures" document. If **none** of the application types listed in this section apply or clearly define the intent of your project, select "Other" and provide specific details that clearly describe the intent of your NOI application.

NOTE: SCDES must be notified in writing within fourteen (14) business days of a new Owner (person, lending institution, government institution, etc.) taking title to or ownership of a prior approved ongoing NPDES construction project/site. A new Property Owner must complete all applicable sections of Form A (Transfer of Ownership) and submit this form to the Department or respective MS4 with the NOI application. Written notification is also required when the Owner or Developer's company name changes for a prior approved construction permit.

NOTE: Major Modifications allowed by the Department are listed in Section 3.1.7 of the CGP. If your project is a major modification, complete Form B, Fee Schedule C, and applicable sections of the NOI per directions identified on Form B. Please note that Section V (Waterbody Information) of the prior approved NOI must be reviewed for changes prior to submitting any modification request to the Department. If changes have occurred, identify as Change of Information on the NOI form and provide the revised information in this section. Attach a detailed Narrative and revised C-SWPPP documents to the major modification request.

A. MS4 Reviewer and MS4 Operator - If this project is located inside a Municipal Separate Storm Sewer System (MS4) and must be reviewed and approved by a MS4 entity prior to submission to SCDES, then select "MS4 Project Review" as application type in Item A and provide the names of the entities that will perform the review and the MS4 Operator. Urbanized area boundary maps are available at http://cfpub.epa.gov/npdes/stormwater/urbanmapresult.cfm?state=SC. See the following website for information about MS4s: https://des.sc.gov/MS4s. Note: Some MS4s have increased their review jurisdiction boundaries beyond the original urbanized area map. Please confirm with the appropriate MS4 regarding review jurisdiction.

II. Primary Permittee Information

Identify whether the Primary Permittee is a person or a company. If a company, identify if it is a lending institution or government entity. Provide the Employer Identification Number (EIN) as established by the U.S. Internal Revenue Service for the company. The EIN is commonly referred to as the taxpayer ID. If the company does not have an EIN (e.g., single member LLC, sole proprietorship). **DO NOT list a Social Security number**

A. Primary Permittee Name - Provide the complete, legal name of the person or entity (company) that will be the Primary Permittee (Owner/Operator, O/O) for the project. If a person, provide the Title or Position. If a company, provide the complete, legal name of the company. Do not list the D/B/A (Doing Business As) name. **NOTE: If S.C. Department of Transportation (SCDOT) is the O/O, this NOI form (Form 2617) should NOT be used.** Provide the complete mailing address of the person/company identified in II.A as the Primary Permittee.

B. Contact/ODSA Name – Complete if different from II. A or O/O is a company. Provide the complete legal name of the person identified as the Contact or Operator of Daily Site Activities (ODSA) for the project. This can be someone other than the person that has signatory authority for the company. Often the Contact person is also referred to as the ODSA. Provide the complete mailing address for the person, other than the permittee, the Department may contact. This address can be different from the mailing address entered for the O/O.

C. Property Owner Name – If different from II.A or B, list the complete, legal name of the current Property Owner(s) of the site. Enter the complete mailing address for the Property Owner. **NPDES coverage will be issued to the Primary Permittee identified in Section II.A, not the Property Owner, unless same entity.** If there are multiple Property Owners, attach additional sheets with all information requested in Section II.C.

III. Comprehensive Stormwater Pollution Prevention Plan (C-SWPPP) Preparer Information

A. C-SWPPP Preparer Name – Provide the name of the C-SWPPP Preparer for this project.

B. Registered Professional – Identify whether the C-SWPPP Preparer is a Registered South Carolina Professional Engineer, Tier B Surveyor, or Landscape Architect. For projects disturbing more than 2 acres, the C-SWPPP preparer must be one of the listed professionals or federal government employee as described in Title 40, Chapter 22,and as required and allowed by the qualified individual's respective act and regulations. In the **SCCZ**, projects that are located within ½ mile of a CRW and that involve greater than 0.5 acres of land disturbance, the C-SWPPP preparer must be one of the listed professionals or federal government employee as described in Title 40, Chapter 22, and as required and allowed by the qualified individual's respective act and regulations.

C. Company/Firm Name - Provide the complete, legal name of the company and S.C. Certificate of Authorization (S.C. COA number). Enter the complete mailing address. SCDES may contact the C-SWPPP Preparer via email. See the following websites for information about COA requirements for Landscape Architecture firms http://www.dnr.sc.gov/land/LandscArch/LAlicense.html and Engineering and Surveying firms http://www.llr.state.sc.us/POL/Engineers/. Enter N/A for S.C. COA if the firm is not required to have a COA.

IV. Project/Site Information

A. Type of Construction Activity (ies) - Select **ALL** activity types that best describe the development proposed for the site. "Institutional" includes schools and other publicly owned projects, except linear projects. "Site Preparation" includes clearing, grubbing, and grading only; no new impervious areas should be proposed if this activity type is selected. If none describe the development, then select "Other" and list the activity.

B. Site Address/Location - List the site address. If the site address is unknown, list the road name(s) on which the site is located, the nearest intersection, or other detailed description of the site location. List a city/town only if the site is within the city/ town limits. List zip code (if known). Provide the latitude/longitude and tax map numbers. See the following website for assistance in obtaining latitude/ longitude coordinates: http://www.epa.gov/tri/report/siting_tool/index.htm. Latitude (from 32° to 35°) and longitude (-78° to -83°) should be for the center of the site. Minutes (') and seconds (") should be from 0 to 59. Identify the lat/long data source.

C. Indian Lands – Identify if this site is located on Indian lands.

D. Proposed Start Date/Completion Date – Provide proposed project start and completion dates.

E. Disturbed Area/Total Area - Enter the disturbed area for the project and the total area for the site. The disturbed areas must be **rounded to the nearest tenth of an acre**. For subdivisions, if the exact build-out is not known, the disturbed area can be estimated using the following equation:
Disturbed area= 2(Maximum Footprint of House)(# of lots) + Road/ Right-of-Way areas + Other easements/ disturbance. **NOTE: Provide written notification if the actual disturbed area exceeds the disturbed area on the approved NOI.**

F. Modification Only: Change to Disturbed Area – If your modification to a prior approved project will increase or decrease the disturbed area, complete this section and see Section I of the Instructions. Enter the current approved disturbed area and proposed increase (+) or decrease (-) to the disturbed area. If no change, enter 0.0. Enter the new total disturbed area (after change). Round each entry to the nearest tenth of an acre.

G. Larger Common Plan for Development or Sale (LCP) - The plan in LCP is "broadly defined as any announcement or piece of documentation (including a sign, public notice or hearing, sales pitch, advertisement, drawing, permit application, zoning request, computer design, etc.) or physical demarcation (including boundary signs, lot stakes, surveyor markings, etc.) indicating construction activities may occur on a specific plot." [63 Federal Register No. 128, July 6, Page 6 1998, p. 36491] For example, if master calculations have been prepared and/ or submitted for an entire site, then all phases and parcels at that site would be considered part of an LCP. If the site is part of a subdivision, industrial park, commercial park, etc., then it is considered to be part of an LCP. List a unique, distinguishing LCP/ Overall Development name. This name should not reference a specific phase. This LCP/ Overall Development name should also be listed on all NOIs for future projects that are part of this LCP, including subsequent phases. Check the box if this is the first phase of the LCP. List the previous state permit/ file number and previous NPDES coverage number if applicable. (**DO NOT** enter SCR100000). If not known, contact the Department for assistance.

H. **Flooding Problems** – Identify whether flooding problems exist on the site, or downstream or adjacent to the site. If yes, provide detailed explanation of the extent and impact in your C-SWPPP. **NOTE:** All C-SWPPP applications must include a Floodway Map/FEMA Flood Insurance Map (See Checklist) with an outline of the project boundary on the map. **NOTE:** The Department does not regulate the placement of fill in floodplains. Contact local city or county official.

I. **Active SCDES Warning Notice/Notice to Comply/Notice of Violation** – Select yes if SCDES has issued a Warning Notice, Notice to Comply, or Notice of Violation for the site or any site within the LCP. Provide additional information about the Notice (e.g., Order number) and a copy of correspondence with SCDES regarding the Notice in your C-SWPPP.

J. **State and Federal Environmental Permits or Approvals** – List relevant state and federal permits applied for. See §122.21(f) of S.C. Regulation 61-9 https://des.sc.gov/sites/des/files/Library/Regulations/R.30-9.pdf for a list of permits, approvals, and programs that should be considered. If inaccurate, NPDES coverage may be invalid.

K. **Waiver(s)** - Identify any waivers requested for your project or construction site. Provide details and required justifications in the C-SWPPP.

V. Waterbody Information

A. Receiving Waterbody(s) (RWB) Information

1. The **Nearest** receiving waterbody (RWB) is the nearest Waters of the State (WoS). See definition in §122.2 of S.C. Regulation 61-9 - https://des.sc.gov/sites/des/files/Library/Regulations/R.30-9.pdf to which the site's stormwater discharges will drain. The nearest RWB must be listed in reference to a named waterbody, if the RWB is unnamed. For example, if the site's stormwater discharges drain to a stream on the site, then the nearest RWB would be the stream. If the stream is not named, then determine the nearest named waterbody (e.g., Grove Creek) into which the stream will flow and list the nearest RWB as a tributary to the named waterbody (e.g., Tributary to Grove Creek). Then, the **Next Nearest** named RWB would be Grove Creek. If the site's stormwater discharges drain to multiple waterbodies, then list all such waterbodies; attach additional sheets, if necessary.

2. Provide the **distance**, in feet to each receiving waterbody.

3. Provide the **classification** for each named waterbody. See S.C. Regulation 61-69 (https://des.sc.gov/sites/des/files/Library/Regulations/R.61-69.pdf) for a list of classifications of waterbodies within S.C. If the nearest RWB is unnamed, then search the document for the nearest named RWB. If the nearest, named RWB is not listed, then continue searching the document for the next, named waterbody, proceeding downstream from the site. For example, a site in Anderson County drains to a tributary of Hornbuckle Creek, then to Hornbuckle Creek, then to Middle Branch, and then to Brushy Creek/ Big Brushy Creek. First, search the document for Hornbuckle Creek, then Middle Branch, then Brushy Creek. Because there are 3 listings for Brushy Creek, the next, named waterbody (Saluda River) must be determined. Note that the county for this record for Brushy Creek is listed as Pickens because the headwaters of Brushy Creek are in Pickens County. The classification of the tributary to Hornbuckle Creek is "FW—Freshwaters".

4. **SCCZ Only:** Provide the **Coastal Receiving Water (CRW)** to which the site's stormwater discharges will drain. This distance is used to determine permitting requirements. Coastal Receiving Water is defined as *a receiving water body as defined in the Policies and Procedures of the South Carolina Coastal Zone Management Program, updated July 1995. This includes all regularly tidally influenced salt and fresh water marsh areas, all lakes or ponds which are used primarily for public recreation or a public drinking water supply, and other water bodies within the coastal zone, excluding wetlands, swamps, ditches and stormwater management ponds which are not contiguous via an outfall or similar structure with a tidal water body.*

5. Provide the distance, in feet to the CRW. **Classification of RWB is not applicable for CRW.**

B. Waters of the U. S. /State Information (See Section 2.6.2 thru 2.6.6 of the CGP)

1. Complete the "**On the Site**?" column for items a-d. If yes is selected for that column, then the next 3 columns must be completed. If there are other waters of the U.S./ State (WoS) on the site not listed in items a and b (e.g., stream, river, lake, pond), then list those in item c. Jurisdictional wetlands are under ACOE jurisdiction.
2. **Delineation** means identification by U.S. Army Corps of Engineers (USACOE) or wetlands consultant. Also, see the checklist for information about delineation requirements. If there are WoS within 100' of the disturbed area that were not delineated/identified, then explain this in the narrative; this includes WoS that are not on the project site but are within 100' of the disturbed area. **For Direct Critical Area in the SCCZ,** delineation means identification by BCM or wetlands consultant. BCM staff may require identification of Direct Critical Area by BCM staff as part of its Coastal Zone Consistency review.
3. **Impacts** - If construction activities will occur in and/ or will impact WoS, then select yes for "Impacts?"
4. **Amount of Impacts** - List the amount of impacts to WoS. Provide an additional, separate plan sheet that shows all WoS on the site and the impacted areas. If there are proposed impacts to WoS, please contact USACOE (866-329-8187) and SCDES Water Quality Certification, Standards & Wetlands Programs Section (803-898-4300) to determine additional requirements before submitting this NOI. In the **SCCZ**, also contact SCDES OCRM Wetlands Section (843-953-0200). **Please note that it is the Project Owner/ Operator's responsibility to ensure that all WoS are shown and identified in the C-SWPPP. See Sections 2.6**

6. **If yes for impacts in B.3, describe each impact and activity, and list all permits** (e.g., U.S. Army Corps of Engineers (USACOE) Nationwide Permit, SCDES General Permit) and certifications that have been applied for or obtained for each impact. Describe the activity(s), whether the impact is permanent or temporary, and any other relevant information. Provide a copy of all permits and certifications for and correspondence with USACOE and SCDES for the impacts. Include all plats referenced in the permits or correspondence.

C. S. C. Navigable Waters (SCNW) Information

1. **Are SCNW on the site?** See https://des.sc.gov/NavigableWaters for the definition of SCNW and other information related to SCNW. Or, contact SCDES Water Quality Certification, Standards & Wetlands Programs Section at (803) 898-4300 for assistance determining the navigability of the waters on your site or with questions related to SCNW. **If yes to C.1,** list the **name of the SCNW**. If the SCNW is not named, then provide a description that references the nearest, named waterbody (e.g., tributary to Grove Creek). **If no to C.1,** do not complete questions C.2 thru C.3 of this section.
2. If yes to C.1 and construction activities proposed by your project will cross over or occur in, under, or thru the SCNW, describe SCNW activities (e.g., road crossing, sub-aqueous utility line, temporary or permanent structures, etc.). This includes temporary and permanent crossings with roads, utility lines, etc.
3. Identify permits providing SCNW Activity(ies) coverages for your site.
   a. Identify **USACOE 404 Permit or 401 Certification** issued for the site. Identify permit number(s) or certification(s) and corresponding activities covered under each.
   b. If applicable, identify the date the **SCNW permit** was applied for. Identify whether the permit applied for will cover ALL activities listed in C.2 of some activities listed in C.2. List covered activities.
   c. If a **SCNW permit** has NOT already been applied for or issued for all of the activities in SCNW for this site, then those activities and conditions can be addressed during the review of the C-SWPPP, and a separate State Navigable Waters permit is not required. **Provide an additional plan sheet with plan and profile views (drawn to scale) of SCNW and associated activities; include activities description on the plan sheet.**

D. Impaired Waterbodies Information (Section 3.2.12)

NOTE: The TMDL, 303(d), and Non-Point Source water quality tool is a mapping system showing detailed information on WQMS locations, water quality status, and much more. The tool is available at the following website along with instructions for using the tool: https://des.sc.gov/TMDL.

In the SCCZ, list the nearest upstream and downstream SCDES WQMS(s) and corresponding waterbody(ies). Additionally, shellfish stations only monitor for Fecal coliform bacteria. Include both the nearest shellfish monitoring station(s) and full WQMS(s) on the NOI for both upstream and downstream locations when shellfish monitoring stations are present. If a shellfish monitoring site is not present then you only need to list the full WQMS(s). When a shellfish monitoring station is present, everything but Fecal coliform bacteria needs to be assessed at the full WQMS(s). Shellfish monitoring stations begin with numbers and full WQMS(s) begin with letters.

1. 303(d) Listed Impaired Waterbodies

a. List the nearest SCDHEC Water Quality Monitoring Station(s) to which the site's construction stormwater discharges will drain and its corresponding waterbody. See the following website for the most current 303(d) List for Impaired Waters and related information: https://des.sc.gov/TMDL. **NOTE: DHEC has determined that construction SW discharges are expected to contain pollutants causing the following impairments: TURBIDITY, BIO (Macroinvertebrate), TP (Total Phosphorus), TN (Total Nitrogen), Chlorophyll-a, and FC (Fecal coliform) in Shellfish Harvesting Waters in the SCCZ.** Carefully evaluate whether the site's construction SW discharges will contain any pollutants causing other impairments not explicitly listed above. You should also ~~consider previous land uses at the site in answering this question. For example, if the previous land use was~~ a copper processing facility and the impairment at the nearest WQMS is copper, then you should carefully evaluate whether the site's construction SW discharges would contain copper.

b. Identify whether this **WQMS is listed on the most current 303(d) List**. The 303(d) list is available in Microsoft Excel and Adobe Reader formats. WQMS locations are available for each watershed at the website provided in 1.a as well using the **TMDL, 303(d), and Non-Point Source water quality tool**. To search the 303(d) list to determine whether a WQMS is listed, select "Edit" from the top toolbar of your web browser. Then, select "Find". Enter the WQMS exactly as listed on the map and hit enter. **If none of the WQMS(s) are found, then select "No" and proceed to item V.D.2 (TMDL Impaired Waterbodies). If any of the WQMS(s) are found, then select "Yes" and proceed to item c.**

c. **If yes for b,** list the impairment(s) or pollutants identified as cause(s) of the impairment (see last column labeled "CAUSE") for the WQMS(s) and proceed to item **d**.

d. Identify whether the site's stormwater discharges contain any pollutants causing the impairment(s). **If no for d, proceed to item V.D.2 (TMDL Impaired Waterbodies). If yes to d and the receiving water is listed on the most current 303(d) List of Impaired Waters** for a sediment or a sediment-related parameter, BIO (macroinvertebrate), turbidity, Total Phosphorous, Total Nitrogen, Chlorophyll-a, or Fecal coliform in Shellfish Harvesting Waters in the SCCZ. You must carefully evaluate all selected BMPs and their performance to ensure that the construction site's Stormwater discharges will not contribute to or cause a violation of water quality standards. **If yes for d and the disturbed area is less than 25 acres**, include an evaluation of the Best Management Practices (BMPs) proposed for the site as described in Section 3.2.12.B(I) of the CGP in the C-SWPPP. **If yes for d and the disturbed area is greater than or equal to 25 acres**, then provide a written qualitative and quantitative assessment of the BMPs proposed in the C-SWPPP for the site as

described in section 3.2.12.B(II) of the CGP.

e. **If yes to d , list the "USE" support impairment (AL, FISH, REC, SHELLFISH) affected by the pollutant or impairment listed in item c.**

f. **If yes for d, will use of the BMPs proposed for your project ensure the stormwater discharges leaving the site will NOT contribute to or cause further water quality standard violations for the impairment(s) listed in c? NOTE: If your answer to item f is NO, this site is NOT eligible for coverage under the CGP.** You may contact the Department to determine if an individual permit application is necessary or you may revise your project to include appropriate Best Management Practices, controls, and procedures to bring your discharge into compliance

2. TMDL Impaired Waterbodies

a. List the **nearest SCDHEC water quality monitoring station(s)** to which the site's construction stormwater discharges will drain. List WQMS identified in part V.D.1.a of this table.

b. Identify whether a TMDL is listed for this WQMS**.** NOTE: See the following website for a list of all WQMS with Approved S.C. Total Maximum Daily Loads (TMDLs): https://des.sc.gov/TMDL. Select "Approved SC TMDLS", then select "Sites Covered Under an Approved TMDL and Corresponding WQ Attainment Status". Select "Edit" from the top toolbar. Then, select "Find". Enter the WQMS exactly as listed and hit enter.
If a WQMS is NOT found, then select "No," Stop and proceed to Section VI. If a WQMS is found, then select "Yes" and proceed to item c.

c. If yes for b, identify and list the impairment(s) or pollutants listed as **CAUSE(S**) of the impairment (see 7th column labeled "CAUSE") and proceed to item **d**. If the WQMS(s) is impaired for more than one parameter, then the WQMS will be listed multiple times on successive rows.

d. If yes for b, identify whether the standard has been ATTAINED for the impairment(s). NOTE: See the 8th column labeled "USE SUPPORT" to determine if the standard has been attained for each impairment for each WQMS. **"FULLY SUPPORTED" means the standard has been attained for the impairment listed in the "CAUSE" column. "NOT SUPPORTED" means that the standard has NOT been attained for that impairment**.
If no for d (the standard has NOT been attained (NOT SUPPORTED) for all impairments for all WQMS(s)), proceed to item e. If yes for d (the standard has been attained for all impairments for all WQMS(s)), proceed to Section VI.

e. Identify whether the site's stormwater discharges contain any pollutants causing the impairment(s). **If no for e, proceed to Section VI. If yes for e, proceed to f.**

f. If yes for e, **are your discharges consistent with the assumptions and requirements of the TMDL(s)? NOTE: If your answer to item f is NO, this site is NOT eligible for coverage under the CGP.** You may contact the Department to confirm that adherence to a C-SWPPP that meets the requirements of the CGP will be consistent with the TMDL. Where a TMDL has not specified a WLA applicable to construction stormwater discharges, but has not specifically excluded these discharges, adherence to a C-SWPPP that meets the requirements of the CGP will generally be assumed to be consistent with the approved TMDL. If the TMDL specifically precludes such discharges, the site is not eligible for coverage under the CGP.

VI. Signatures and Certifications

DO NOT SIGN IN BLACK INK! The NOI must have original signatures unless the application being submitted to SCDES is one approved by an MS4.

C-SWPPP Preparer - The same registered professional must sign and seal the NOI form, C-SWPPP, calculations, and supporting documentation.

Primary Permittee - If the Primary Permittee or Project Owner/ Operator is a company, print the name of the person who is signing the NOI for the Owner/ Operator. A person with signatory authority for the Owner/ Operator must sign the application. The C-SWPPP Preparer cannot sign the application for the Owner/ Operator. The C-SWPPP, all reports, including monthly reports, and any information requested by SCDES must be prepared under the direction or supervision of a person with signatory authority for the Owner/ Operator or a duly authorized representative.

See below for a summary and §122.22 of S.C. Reg. 61-9 (Appendix C of the CGP) for complete information about signatory authority requirements.

- Corporation: A responsible corporate officer (e.g., president, vice-president, certain managers)
- Partnership or Sole Proprietorship: A general partner or the proprietor, respectively
- Municipality, State, Federal or Other Public Agency: Principal executive officer or ranking elected official.

Appendix C. South Carolina Department of Environmental Services Stormwater Management and Sediment and Erosion Control Plan Review Checklist for Design Professionals

In the case of any conflicting information between **Appendix C** and the information in the main body of the manual, the stricter requirements will supersede.

SC DEPARTMENT of ENVIRONMENTAL SERVICES

Stormwater Management and Sediment and Erosion Control Plan Review Checklist For Design Professionals

This Plan Review Checklist for Design Professionals has been developed to aid those who prepare Stormwater Pollution Prevention Plans (SWPPPs). Adjacent to the heading for most sections are references from the corresponding portion of the NPDES General Permit for Stormwater Discharges from Construction Activities (SCR100000), which was issued on March 30, 2026. SWPPP Preparers should not utilize this checklist as a substitute for the language in the permit and should review the permit itself for more information on each specific requirement. The permit may be found at:

https://des.sc.gov/programs/bureau-water/stormwater/stormwater-construction-activities

In the space provided please indicate the location and page number(s) where each item below can be found in your SWPPP or supporting calculations. If an item is not applicable, put N/A. The Department reserves the right to modify this checklist at any time. The Coastal Zone consists of the following counties: Beaufort, Berkeley, Charleston, Colleton, Dorchester, Georgetown, Horry, and Jasper.

Project Information:
Project Name: _____ County: _____

Checklist Completed by:
Printed name: _____ Signature: _____ Date: _____

PLANS AND MAPS

1. CURRENT COMPLETED APPLICATION FORM/NOTICE OF INTENT
   - Original Signature of individual with signatory authority for the applicant according to requirements set forth in R.61-9.122.22 (see Appendix C)
   - All items completed and answered
   - Fee Schedule

2. COPIES OF PLANS AND CALCULATIONS
   - Plans stapled together!
   - ONE set of plans and supporting documentation (report, calculations, maps, etc.)
   - Supporting documentation tabbed (e.g., Maps, Pre-Development calculations) and pages numbered [no loose pages]

3. LOCATION MAP (3.2.7.A.IV) Location in C-SWPPP: _____
   - North arrow and scale
   - Outlined project location
   - Labeled road names

4. PROJECT NARRATIVE (3.2.1) Location in C-SWPPP: _____
   - Scope of project outlined, including a brief description of pre- and post-development conditions

4. PROJECT NARRATIVE (cont'd)
   - Summary table of pre- and post-development flows (at least 2- and 10-year, 24-hour storm events)
   - Existing flooding problems in the surrounding area described
   - Disturbed area calculations included for subdivision projects or LCP disturbing 1 or more acres
     - For subdivisions if the site is not to be mass-graded, the following formula should be used to determine the amount of disturbance:

       Amount of Disturbance = 2[Max Restricted Building Size][Number of Lots] + Right of Way (ROW) areas {ROW areas include clearing for roads, utilities, easements etc.}

     - If this equation is used, include a note on the plans stating: "The site is not to be mass-graded. Only 2 times the footprint is to be cleared as the lots are developed. The assumed disturbance on each lot is _____ sq. ft."

5. TOPOGRAPHIC MAP (3.2.7.A.I) Location in C-SWPPP: _____
   - Project boundary outlined
   - Route of runoff from site to nearest waterbody shown
   - Road names adjacent to site labeled

6. SOILS INFORMATION (3.2.7.A.II) Location in C-SWPPP: _____
   - Project boundary outlined
   - Predominate soil types found at the site identified on the plans or on a separate map
   - *Note: Soils information is available from the Natural Resource Conservation Service through their website:* http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm

7. FLOODWAY/ FLOODPLAINS(3.2.7.A.III) Location in C-SWPPP: _____
   - Project boundary outlined, if in close proximity to floodplain/ floodway
   - *Note: The Department does not regulate the placement of fill in floodplains. Please see your local city or county official.*

8. SITE PLANS CHECKLIST:
   - Location map with site outlined on first plan sheet (map should have enough detail to identify Surface Waters of the State within 1 mile of the site)
   - North arrow and scale
   - Property lines and adjacent landowners' names
   - Legend
   - Registered engineer's signed and dated seal
   - Engineering Firm's Certificate of Authorization seal
   - If the SWPPP has been developed by a Registered Professional Engineer, Registered Landscape Architect or Tier B Land Surveyor, the following statement must be included on the site plans:

     "I have placed my signature and seal on the design documents submitted signifying that I accept responsibility for the design of the system. Further, I certify to the best of my knowledge and belief that the design is consistent with the requirements of Title 48, Chapter 14 of the Code of Laws of SC, 1976 as amended, pursuant to Regulation 72-300 et seq. (if applicable), and in accordance with the terms and conditions of SCR100000."

   - Existing and proposed contours for entire disturbed area
   - Limits of disturbed area
   - Locations of off-site material, waste, borrow, or construction equipment storage areas, excluding roll-off containers (Note: Some off-site disturbed areas may require a separate application for NPDES coverage)
   - Location and identification of any stormwater discharges associated with industrial activity (not construction)
   - Location of Concrete Washout and other Pollution Prevention Measures
   - Easements
   - Road profiles with existing and proposed ground elevations (if no contours are shown on the plans)
   - Grassing and stabilization specifications (temporary and permanent)

8. SITE PLANS CHECKLIST: (cont'd)
   - Standard notes
   - Temporary and permanent control measures (provide details of all sediment and erosion control measures used; make sure the label or legend on the plans matches the name on the detail)
     Note: Maintenance requirements for each BMP should be listed on the detail.
     Note: If details from the BMP Handbook are used, then the inspection frequency must be changed to be in accordance with the new CGP (see Standard note 3).

9. WATERS OF THE STATE, INCLUDING WETLANDS (3.2.4.C) Location in C-SWPPP: _____
   - Delineation of all waters of the State (WoS), including wetlands, shown and labeled on plans (delineation not required if a 100-ft undisturbed buffer can be maintained between the WoS and all land-disturbing activities)
   - Additional, separate plan sheet that shows all WoS on the site and the impacted areas with a description of the activity(s), whether it is permanent or temporary, and any other relevant information.
   - If impacts to WoS, outlined areas of impacts and labeled that no work can begin in this area until all necessary USACOE permits, SCDES 401 Certifications, and Critical Area Permits (Coastal Zone only) have been obtained and are effective.
   - *Note: If there are proposed impacts to WoS, then it is advised that you contact USACOE (866-329-8187) and/ or S.C. Department of Environmental Services Water Quality Certification, Standards & Wetlands Programs Section (803-898-4300) to determine additional requirements before submitting the Notice of Intent (NOI).*
   - *Note: If WoS are to be impacted, work cannot be performed in these designated areas until all necessary permits have been acquired*
   - *Note: If a USACOE permit is required for construction of or access to a temporary or permanent stormwater management structure, NPDES permit coverage cannot be granted until the USACOE permits and S.C. Department of Environmental Services 401 Section certifications are obtained.*
   - *Note: Coastal Counties Only - If there are proposed wetland impacts and your project is located within one of the eight coastal counties, then it is advised you contact SCDES Bureau of Coastal Management (BCM) (843-953-0200) to determine additional requirements before submitting the Notice of Intent (NOI).*

10. NAVIGABLE WATERS (3.2.4) Location in C-SWPPP: _____
    - Extra plan sheet showing impacts to navigable water and description of activity included if S.C. Navigable Waters (SCNW) crossing and separate SCNW permit has not been obtained for all activities
    - *Note: For NOIs initially submitted to MS4s /delegated entities, if project has SCNW crossing and if separate SCNW permit has not been obtained for this crossing, then this item will be reviewed by SCDES before NPDES coverage will be granted.*

11. TMDL/ 303d IMPAIRED WATERBODIES (3.2.12) Location in C-SWPPP: _____
    - List the nearest SCDES Water Quality Monitoring Station (WQMS) that the site's stormwater discharges drain to and the waterbody on which it is located: _____
      _____
      Coastal Zone Only: List the nearest upstream and downstream WQMS(s) and corresponding waterbody(ies) above. This requirement only applies when the receiving water body for your site is tidally influenced. Note, shellfish stations only monitor for Fecal coliform bacteria. Include both the nearest shellfish monitoring station(s) and full WQMS(s) for both upstream and downstream locations when shellfish monitoring stations are present. If a shellfish monitoring station is not present, then only list the full WQMS(s). When a shellfish monitoring station is present, everything but Fecal coliform bacteria needs to be assessed at the full WQMS(s). Shellfish monitoring stations begin with numbers and full WQMS(s) begin with letters
    - Link to Water Quality Information Tool and Instructions: https://gis.des.sc.gov/stormwater/
    - Qualitative and quantitative assessment (described in Section 3.2.12.B of SCR100000), if nearest WQMS listed on the current 303(d) List of Impaired Waters and if site's stormwater construction discharges contain the pollutant of impairment and if site disturbs 25 or more acres
    - Evaluation of selected BMPs if nearest WQMS listed on the current 303(d) List of Impaired Waters and if site's stormwater construction discharges contain the pollutant of impairment and if site disturbs less than 25 acres

11. TMDL/ 303d IMPAIRED WATERBODIES (con't)
    - Pollutants of concern include TURBIDITY, BIO(Macroinvertebrate), TP(Total Phosphorus), TN(Total Nitrogen), and Chlorophyll-A. Coastal Counties Only: Fecal Coliform (FC) in shellfish harvesting waters
    - If Approved TMDL developed for nearest WQMS and if site's stormwater construction discharges contain the pollutant of impairment, show that measures and controls on SWPPP meet assumptions and requirements of TMDL (may need to contact 303(d)/TMDL Program for assistance)
    - For TURBIDITY, BIO(Macroinvertebrate) consider inclusion of BMPs to reduce sediment load such as: sediment traps and basin designed to meet 80% sediment removal efficiency (regardless of size), additional measures to stabilize site, limited clearing and grading
    - For TP(Total Phosphorus), TN(Total Nitrogen), and Chlorophyll-A consider inclusion of BMPs to reduce nutrient load. This could include limited clearing and grading, soil samples for to determine nutrient requirements during grassing
    - For Fecal Coliform (FC) in shellfish harvesting waters, this may include location of porta-johns and waste receptacles
    - *Note: To ensure sufficient Water Quality Monitoring Stations are selected to assess all of the identified parameters for construction stormwater, include monitoring stations that contain assessments for the first twelve parameters. Some stations only assess one parameter and should not be relied upon for the entire 303(d)/TMDL assessment for construction stormwater discharges. In addition, fecal coliform (for Shellfish Harvesting waters) must be assessed within the coastal critical area and nutrients and/or chlorophyll must be assessed in lakes/reservoirs*

Construction

12. CONSTRUCTION SEQUENCE (3.2.3) Location in C-SWPPP: _____
    - Construction Sequence should accurately reflect the nature and timing of construction activities for the site
    - Sequence should begin with the installation of perimeter controls and end with the removal of sediment and erosion control measures once the site has been finally stabilized
    - Address conversion of any temporary sediment control structures to permanent measures (i.e., conversion of a sediment basin to a permanent detention basin)
    - Sequence should reflect implementation and transition between each phased plan (see Item 13 below)

13. PHASED SEDIMENT & EROSION CONTROL PLANS (3.2.9) Location in C-SWPPP: _____
    - Phased Sediment and Erosion Control Plans are not required when land-disturbance is 5 acres or less
    - For land-disturbance between 5 and 10 acres, a two-phased stormwater management and sediment and erosion control plan is required for all non-linear projects. Each phase must be shown on a separate plan sheet. Plans should address the transition between phases.
        - Phase 1 – Initial Land Disturbance – Must include perimeter sediment and erosion control BMPs required prior to initial/ mass clearing and other appropriate BMPs needed to maintain compliance with the permit. On some sites, this may include appropriate BMPs for demolition of existing structures
        - Phase 2 – Stabilization - Sediment and erosion control BMPs required during the remainder of grading and construction. Must also include appropriate BMPs for stabilization – grassing, inlet protection, etc.
    - For land-disturbance greater than 10 acres, a three-phased stormwater management and sediment and erosion control plan is required for all non-linear projects. Each phase must be shown on a separate plan sheet. Plans should address the transition between phases.
        - Phase 1 – Initial Land Disturbance – Must include perimeter sediment and erosion control BMPs required prior to initial/ mass clearing and other appropriate BMPs needed to maintain compliance with the permit. On some sites, this may include appropriate BMPs for demolition of existing structures
        - Phase 2 – Construction - Sediment and erosion control BMPs required during the majority of grading and construction activities.
        - Phase 3 – Stabilization - Sediment and erosion control BMPs required near the completion of the construction project. Must also include appropriate BMPs for stabilization – grassing, inlet protection, etc

14. UTILITY LINES Location in C-SWPPP: _____

- Limits of disturbance include areas necessary for installation of all utilities (cable, electrical, natural gas, water and sewer), as appropriate
- For instances where the location of cable, electric, and natural gas has not been determined at the time the SWPPP is developed, SWPPP preparer may include a note that the installation of these is to be within the permitted limits of disturbance and that installation outside of these areas will require a modification to the permit
- Inlet protection provided at all existing inlets that receive flows from the disturbed areas; also add this as a note on the plans
- For all utility lines crossing WoS, narrative and detail showing sediment and erosion control measures provided on plans
- Note for construction entrances to be provided at all locations where construction traffic accesses a paved roadway

15. BUFFERS – SEE GUIDANCE DOCUMENT (3.2.4.C) Location in C-SWPPP: _____

- Select Compliance Option A, B, or C and provide appropriate documentation
  - Double row of silt fence provided in all areas where a 50' undisturbed buffer cannot be maintained between the disturbed area and the WoS
  - Minimum 10' maintenance buffer provided between last row of silt fence and WoS; or, if buffer not provided, then statement from P.E. on plans indicating how silt fence will be installed and maintained without impacts to WoS
- Ensure discharges into a buffer zone are non-channelized and non-concentrated to prevent erosion, and first treated by the construction site's sediment and erosion controls
- Ensure any velocity dissipation measures implemented within a buffer zone comply with 3.2.4.C.III. (d)
- Additional Local Requirements may apply

16. FLOW CONTROL (3.2.10) Location in C-SWPPP: _____

- Control stormwater volume and velocity within the site during construction to minimize erosion within the site
- Control stormwater rates and volume at outlets during construction to minimize erosion to downstream channels and streambanks

17. CONSTRUCTION SITE HYDROLOGY (3.2.8.V AND 3.2.6.A.II) Location in C-SWPPP: _____

- *Note: MS4s may have additional requirements for the management of stormwater, sediment, and/or erosion.*
- Pre-development drainage area map and during construction drainage area map outlining the area contributing to sediment basins, traps, and rock sediment dikes. Include all site drainage outlet points on each drainage area map.
- During construction hydrologic analysis calculations for the 10-year, 24-hour storm event at each outfall point for sediment trapping efficiency calculations and/or skimmer sizing
- Analysis performed using SCS 24-hour storm for routed structures (Rational method is not acceptable)
- Rainfall data from SCDES Storm Water Management BMP Handbook (BMP Handbook) or other appropriate source used in all calculations
- Additional construction site hydrology information and hydrologic analysis calculations may be provided as a means of addressing non-numeric effluent limits during construction
- Curve Number for construction hydrologic analysis needs to reflect construction/ disturbed conditions. Curve Numbers for newly-graded areas are:
  - Hydrologic Soil Group "A": 77
  - Hydrologic Soil Group "B": 86
  - Hydrologic Soil Group "C": 91
  - Hydrologic Soil Group "D": 94

18. SEDIMENTOLOGY & SEDIMENT BASIN/TRAP DESIGN (3.2.8.V AND 3.2.6.A.II)
Location in C-SWPPP: _____

- Trapping efficiency calculations showing that all sediment basins/ traps are capable of achieving a sediment trapping efficiency of at least 80% for the 10-year, 24-hour storm event, if 10 or more disturbed acres drain to a common point (stream, lake, etc.)
- Additional trapping efficiency calculations may be necessary to satisfy construction buffer requirements or may be provided as a means of addressing non-numeric effluent limits
- Sediment basins provide storage for the 10-year, 24-hour storm event for disturbed conditions or 3600 ft^3/ acre draining to the basin, if 10 or more disturbed acres drain to a common point (stream, lake, property line, etc.)
- Sediment basins and traps designed for total area draining to them. Sediment traps only used for drainage areas of less than 5 acres
- Sediment trap storage calculations, showing that 1800 ft^3/ total acre draining to each trap is provided below the spillway
- If trapping efficiency calculations are required for sediment traps, then provide peak outflow, q_{po}, calculations; the 10-year, 24-hour storm event for construction conditions cannot overtop the trap's spillway
- Drainage area map outlining the area draining to each basin/trap. Copies of figures used to determine V_{15} (SV-1) and trapping efficiency (ST-1, SB-1, SB-2), if Design Aids from BMP manual are used to determine trapping efficiencies. When the soil type is A/D, B/D or C/D, the chart for high water tables must be used to calculate sediment trapping efficiency for sediment ponds in the Coastal Zone.
- When multiple soil types exist within a drainage area, use the soil type with the smallest D15 or particle size for the appropriate depth to determine the settling velocity, V15. Do not use an average D15.
- Sediment basins must dewater via an outlet structure that pulls water from the surface, unless infeasible. Options for this include skimmers and flashboard risers. Surface dewatering is not required for traps.
- Porous baffles must be provided in sediment basins, unless infeasible
- Forebays must be installed, unless infeasible
- Public Safety should be taken into consideration as a factor in design of sediment basins. Alternative BMPs must be utilized where a construction site limitations would preclude a safe design
- Silt fence only used in areas with drainage areas of less than ¼ acre per 100 LF of fence and not used in areas with concentrated flows
- Clean-out stake, marked at ½ the designed sediment storage depth, provided in all sediment basins/ sediment traps
- *Note: Consult the BMP Handbook for information on the design of these and other devices.*
- *Note: The Design Aids in the BMP Handbook cannot be used to determine trapping efficiencies for structures in series. Modeling is required in those instances. If the flow for the10-year, 24-hour storm for construction conditions overtops the structure or the structure's spillway, then the Design Aids cannot be used.*

19. CONVEYANCE MEASURES AND STABLE CHANNELS (3.2.6.A.III) Location in C-SWPPP: _____

- All channels and diversion ditches able to handle the 10-year storm event with non-erosive velocities of less than 5 feet per second during construction (use appropriate CN for disturbed areas) and post-construction (if velocity exceeds 5 ft/s, then permanent measures to reduce the velocity to a non-erosive rate must be provided)
- Stabilization of conveyance channels is to be completed within 7 days of channel construction
- Rock check dams provided in temporary diversions
- Installation detail for erosion control blanket (ECB) or turf reinforcement matting (TRM) if ECBs or TRMs to be used
- Stabilized temporary conveyance channels should be utilized to divert concentrated stormwater flows from running onto and within the disturbed area

20. INLET PROTECTION (3.2.6.A.II(a) and (b)) Location in C-SWPPP:

- Provided at all inlets (existing and proposed)
- Inlet protection details provided for pre-paving and after roadways have been paved
- Hay bales are not acceptable
- Steel posts and buried fabric shown for filter fabric inlet protection

20. INLET PROTECTION (cont'd)
- Filter fabric under the grate is not acceptable unless it is part of a manfactured best management practice made for inlet protection that is specifically designed to hang underneath the grate
- *Note: The Department recommends that an inlet not have more than one (1) acre draining to it.*

21. ENERGY DISSIPATORS/ OUTLET PROTECTION (3.2.10)
- All outlets stabilized with appropriately sized riprap apron or other structure
- Riprap detail shows apron dimensions and stone sizes for each pad or each pipe diameter
- Filter fabric installed beneath all riprap
- Note that appropriate outlet protection and energy dissipation is also required for post-construction

22. SLOPES AND/ OR EMBANKMENTS (3.2.6.A.III(e) and 3.2.10) Location in C-SWPPP: _____
- All slopes stabilized
- Minimize Disturbance to Steep Slopes (3H:1V) or greater
- Divert concentrated flows around steep slopes using slope drains or temporary diversions
- Utilize appropriate measures to prevent erosion (erosion control blankets, surface roughening, terracing, etc.)
- Slope drains designed in accordance with the BMP Handbook
- Slope drains provided where concentrated flows discharge onto a fill slope
- *Note: Measures, in addition to grassing or hydroseeding, include synthetic or vegetative matting, diversion berms, temporary slope drains, etc.*
- *Note: If retaining walls or fill slopes are to be constructed at the downstream property line, the Department recommends a 10' buffer to allow for construction and maintenance. If a 10' buffer is not provided, then provide permission from the adjacent property owner for possible land-disturbing activities on his property.*

Post-Construction

23. POST CONSTRUCTION HYDROLOGIC ANALYIS (3.2.8.A.II) Location in C-SWPPP: _____
- *Note: MS4s may have additional requirements for post construction hydrologic analysis.*
- Pre- and post-developed hydrologic analysis calculations for the 2- and 10-year, 24-hour storm events at each outfall point
- Drainage area maps that clearly correspond to the calculations (pre- and post-development)
- Analysis points for comparing runoff rates and the total drainage area analyzed do not change from pre- to post-development, although the immediate drainage areas contributing to each analysis point might shift.
- Post-development discharges less than or equal to pre-development discharges for each outfall point (if not, then see "Detention Waiver" section below)
- Analysis performed using SCS 24-hour storm (Rational method is not acceptable)
- Rainfall data from SCDES Storm Water Management BMP Handbook (BMP Handbook) or other appropriate source used in all calculations
- *Note: The curve number for open water, marshes, etc. should be 98.*

24. DISCHARGE POINTS (3.2.6.A.III) Location in C-SWPPP: _____
- Storm drainage or pond outfalls carried to an existing drainage outfall such as a pipe, ditch, etc.
- No new point discharges onto adjacent property where there was not a point discharge previously, unless written permission from the adjacent property owner is provided
- Level spreaders, plunge pools, etc. provided when the proposed outlet is near the property line and not directed to an existing outfall, such as a creek or ditch
- Twenty (20)-foot minimum buffer is provided between the property line and the discharge point
- Outlets shall not discharge on fill slopes
- *Note: This requirement also applies during construction.*

25. DETENTION ANALYSIS AND BASIN DESIGN (3.2.8.A.III) Location in C-SWPPP: _____

- Analysis
  - *Note: MS4s may have additional requirements for detention analysis and basin design.*
  - Pond routing using a volume-based hydrograph for the 2- and 10-year, SCS 24-hour storm event (Drain:Edge, ICPR, HEC-1, SedCAD, HYDRAFLOW, etc. perform full pond routings; TR55 does not perform a full pond routing; rational method cannot be used)
  - Hydrologic and hydraulic calculations necessary to determine the impact of hydrograph timing modifications of the proposed land-disturbing activity, with and without the detention structure (results of analysis will determine the need to modify the detention design or eliminate the detention requirement—see note 2 below)
  - Inputs and outputs from analysis program
  - Summary table of the peak inflows, peak outflows, discharge velocities, and maximum water surface elevations (WSE) for the 2- and 10-year, 24-hour storm events for each detention structure
  - Stage-storage-discharge relationship for the outlet structure of each detention structure
  - If a rating curve for the outlet structure must be generated externally from the analysis program (Drain:Edge, HEC-1, etc.), data and equations used to rate the outlet structure
  - As-built of existing detention pond if the site drains to an existing detention pond (see below)
  - *Note: The Department recommends using the 10% rule in performing analysis. The hydrologic analysis should be conducted for the larger drainage area, where the site in question encompasses 10% of the total drainage area. For example, if your site is 10 acres, then the hydrologic analysis should be performed at the point downstream where the contributing drainage area, including your 10-acre site, is approximately 100 acres.*

- Design
  - Detail of outlet structure and cross-section of the dam/ berm or pond bank, including elevations and dimensions that correspond to the calculations
  - Orifice constructability should be considered (do not specify orifice diameters with increments of less than ¼")
  - Small orifices (those less than 3") are prone to clogging
  - Maximum WSE for the 10-year storm event below the emergency spillway with 0.5-ft of freeboard between maximum WSE for the 10-year storm and the emergency spillway
  - Maximum WSE for the 100-year storm event below the embankment with 0.5-ft of freeboard between maximum WSE for the 100-year storm and the embankment
  - Dewatering time calculations for the 10-year storm event (dry ponds must drain completely within 72 hours)
  - Bottom of all detention and retention ponds graded to have a slope of not less than 0.5%
  - If the pond is to be used for sediment control during construction, temporary horseshoe-shaped riprap berm in front of any low level outlets provided during construction and shown on the pond detail for dry ponds
  - Permanent maintenance access to all permanent detention structures (easements may be needed for structures surrounded by lots)
  - Infiltration systems designed in accordance with S.C. Reg. 72-307.C(11) [specify how items a-j have been addressed]
  - Low Impact Development measure, bioretention cells, infiltration, and other post-construction practices should be installed only <u>after</u> the drainage area to these practices has been stabilized
  - *Note: Emergency spillways should not be built on fill slopes.*
  - *Note: The Department recommends installation of a trash rack or other debris-screening device on all pond risers.*
  - *Note: The Department recommends a maximum slope of 3:1 on pond embankments to allow for ease of maintenance.*
  - *Note: The Department recommends installation of sediment forebay at each outfall into the detention/ sediment basin. This is a requirement during construction.*

26. DETENTION WAIVER Location in C-SWPPP: _____

- *Note: If the 2- and 10-year, 24-hour post-developed flow rates exceed the pre-developed rates,* waivers *from detention may be granted in accordance with regulation 72-302(B) on a case-by-case basis*
- Justification and a written request, including the following statement: *"the increased flows will not have a significant <u>adverse impact</u> on the downstream/adjacent properties"*

26. DETENTION WAIVER (cont'd)
- A project may be eligible for a waiver or variance of stormwater management for water quantity control if the applicant can demonstrate that:
  - The proposed project will have no significant adverse impact on the receiving natural waterway or downstream properties; or
  - The imposition of peak control requirements for rates of stormwater runoff would aggravate downstream flooding
- Waiver signed by the project's Professional Engineer
- *Note: See note in checklist item 25 regarding the 10% rule.*

27. USE OF EXISTING STORMWATER MANAGEMENT STRUCTURES (3.2.8.A.VI) Location in C-SWPPP: _____
- An as-built survey must be provided for all previously approved detention ponds that will receive flows from new construction
- Prepared by a South Carolina Licensed Land Surveyor
- Grades/ contours/ depths for pond
- Elevations and dimensions of all outlet structures, including:
  - Pipe and orifice inverts and diameters
  - Weir elevations and dimensions
  - Riser dimensions and elevations
  - Emergency spillway dimensions and elevations
  - Locations and inverts for all pipes discharging into the pond

28. PERMANENT WATER QUALITY REQUIREMENTS (3.2.8.A.IV) Location in C-SWPPP: _____
- Permanent water quality addressed (all projects or LCP that disturb 5 or more acres)
  - Wet ponds designed to catch the first ½" of runoff from the entire area draining to the pond and release it over at least a 24-hour period
  - Dry ponds designed to catch the first 1" of runoff from the entire area draining to the pond and release it over at least a 24-hour period
  - Infiltration Practices designed to accept, at a minimum, the first 1" of runoff from all impervious areas and designed in accordance with S.C. Reg. 72-307.C(11) [specify how items a-j have been addressed]
  - For areas not draining to a pond or infiltration practice, show how permanent water quality requirements were addressed
- Water quality orifices should be a size that is conducive to proper operation and maintenance. Orifices less than 3" in diameter are prone to clogging
- Projects located within one-half (1/2) mile of a receiving water body in the Coastal Zone must meet Section III.C.3.XIII.A of the Coastal Zone Management Program Refinements (CZMP). Designs must show that the first ½ inch of runoff from the entire site or the first one (1) inch of runoff from the built upon area, whichever is greater, can be stored onsite when permanent water quality ponds having a permanent pool are proposed for the project. Projects with stormwater outlets draining within 1000 feet of shellfish beds need to retain the first 1.5 inches of runoff on site.
  - *"Receiving Water Body" as it relates to additional Coastal Zone stormwater management requirements is also known as a "Coastal Receiving Water" and means all regularly tidally influenced salt and fresh water marsh areas, all lakes or ponds which are used primarily for public recreation or a public drinking water supply, and other water bodies within the coastal zone, excluding wetlands, swamps, ditches and stormwater management ponds which are not contiguous via an outfall or similar structure with a tidal water body.*
- Bridges and golf courses proposed in the Coastal Zone are subject to the additional water quality requirements contained in section III.C.3.XIII.C and D of the CZMP.
- Waters of the U.S./State are not used for permanent water quality control (alternative means of treatment must be used if an existing pond is to be used for water quantity control).
- *Note: Other non-traditional stormwater controls such as Bioretention areas, constructed wetlands, etc. may be used. Consult the BMP Handbook for information on the design of these devices.*
- *Note: Pre-fabricated or proprietary treatment devices are approved on a case-by-case basis if adequate removal efficiency can be demonstrated. Provide pollutant removal efficiency data, preferably from a third-party testing company. Type of system selected should be based on the ability to remove the pollutants of concern in that area/situation (bacteria, hydrocarbons, etc.).*

29. PERMANENT STORMWATER MANAGEMENT STRUCTURE MAINTENANCE (4.3.B)
Location in C-SWPPP: _____

- Signed agreement from the responsible party accepting ownership and maintenance of the structure
- If maintenance responsibility is transferred after NPDES coverage is granted, an updated agreement should be submitted with the Notice of Termination
- Description of maintenance plan to be used
- Schedule of maintenance procedures (e.g., every 6 months)
- Detailed or manufacturer-specific maintenance items for proprietary control devices (oil-water separators, etc.), underground detention structures, exfiltration systems and non-traditional stormwater controls (constructed wetlands, bioretention, etc.)
- Typical maintenance items to be addressed
  - Grass to be mowed
  - Trees to be removed from within the pond and on the embankment
  - Trash and sediment to be removed from inside of and around the pond outlet structure
  - Orifices to be cleaned and unclogged
  - Outlet pipe to be cleaned, inspected, and repaired
  - Sediment accumulation to be removed from pond
  - Pond bottom to be regraded to provide proper drainage towards the outlet discharge point
  - Energy dissipator to be cleaned and repaired
  - Emergency spillway, if applicable, to be inspected and repaired
  - Erosion on side slopes, if present, to be addressed
  - The Department must be notified in writing of any changes in maintenance responsibility for the stormwater devices at the site (include this statement in agreement).
- *Note: The Department recommends that the county, city, or other governing utility, which has the authority to accept the ownership and maintenance of a storm drainage system also accept the permanent stormwater management structure.*
- *Note: If the entity or person with maintenance responsibility changes, then a new maintenance agreement, signed by the new person responsible for maintenance, must be provided to the Department. If a new, signed maintenance agreement is not provided to the Department, then the entity/ person who signed the most recent maintenance agreement on file with the Department will be considered the responsible entity.*

Standard Notes

1. If necessary, slopes, which exceed eight (8) vertical feet should be stabilized with synthetic or vegetative mats, in addition to hydroseeding. It may be necessary to install temporary slope drains during construction. Temporary berms may be needed until the slope is brought to grade.

2. Stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than fourteen (14) days after work has ceased, except as stated below.
   - Where stabilization by the 14th day is precluded by snow cover or frozen ground conditions stabilization measures must be initiated as soon as practicable.
   - Where construction activity on a portion of the Site is temporarily ceased, and earth-disturbing activities will be resumed within 14 days, temporary stabilization measures do not have to be initiated on that portion of the Site.

3. All sediment and erosion control devices shall be inspected once every calendar week. If periodic inspection or other information indicates that a BMP has been inappropriately, or incorrectly, the Permittee must address the necessary replacement or modification required to correct the BMP within 48 hours of identification.

4. Provide silt fence and/or other control devices, as may be required, to control soil erosion during utility construction. All disturbed areas shall be cleaned, graded, and stabilized with grassing immediately after the utility installation. Fill, cover, and temporary seeding at the end of each day are recommended. If water is encountered while trenching, the water should be filtered to remove sediment before being pumped back into any waters of the State.

5. All erosion control devices shall be properly maintained during all phases of construction until the completion of all construction activities and all disturbed areas have been stabilized. Additional control devices may be required during construction in order to control erosion and/or offsite sedimentation. All temporary control devices shall be removed once construction is complete and the site is stabilized.

6. The contractor must take necessary action to minimize the tracking of mud onto paved roadway(s) from construction areas and the generation of dust. The contractor shall daily remove mud/soil from pavement, as may be required.

7. Residential subdivisions require erosion control features for infrastructure as well as for individual lot construction. Individual property owners shall follow these plans during construction or obtain approval of an individual plan in accordance with S.C Reg. 72-300 et seq. and SCR100000.

8. Temporary diversion berms and/or ditches will be provided as needed during construction to protect work areas from upslope runoff and/or to divert sediment-laden water to appropriate traps or stable outlets.

9. All waters of the State (WoS), including wetlands, are to be flagged or otherwise clearly marked in the field. A double row of silt fence is to be installed in all areas where a 50-foot buffer can't be maintained between the disturbed area and all WoS. A 10-foot buffer should be maintained between the last row of silt fence and all WoS.

10. Litter, construction debris, oils, fuels, and building products with significant potential for impact (such as stockpiles of freshly treated lumber) and construction chemicals that could be exposed to storm water must be prevented from becoming a pollutant source in storm water discharges.

11. A copy of the SWPPP, inspections records, and rainfall data must be retained at the construction site or a nearby location easily accessible during normal business hours, from the date of commencement of construction activities to the date that final stabilization is reached.

12. Initiate stabilization measures on any exposed steep slope (3H:1V or greater) where land-disturbing activities have permanently or temporarily ceased, and will not resume for a period of 7 calendar days.

13. Minimize soil compaction and, unless infeasible, preserve topsoil.

14. Minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other wash waters. Wash waters must be treated in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge;

15. Minimize the discharge of pollutants from dewatering of trenches and excavated areas. These discharges are to be routed through appropriate BMPs (sediment basin, filter bag, etc.).

16. The following discharges from sites are prohibited:

    - Wastewater from washout of concrete, unless managed by an appropriate control;
    - Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials;
    - Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance; and
    - Soaps or solvents used in vehicle and equipment washing.

17. After construction activities begin, inspections must be conducted at a minimum of at least once every calendar week and must be conducted until final stabilization is reached on all areas of the construction site.

18. If existing BMPs need to be modified or if additional BMPs are necessary to comply with the requirements of this permit and/or SC's Water Quality Standards, implementation must be completed before the next storm event whenever practicable. If implementation before the next storm event is impracticable, the situation must be documented in the SWPPP and alternative BMPs must be implemented as soon as reasonably possible.

19. A Pre-Construction Conference must be held for each construction site with an approved On-Site SWPPP prior to the implementation of construction activities. For non-linear projects that disturb 10 acres or more this conference must be held on-site unless the Department has approved otherwise.

Appendix D. Minor Construction Activity Certification Form

Berkeley County, South Carolina
Stormwater Management

1003 Highway 52 Suite 120
Moncks Corner, SC 29461-6120
(843) 719-4127

Minor Construction Activity Certification

ALL REQUESTED INFORMATION MUST BE PROVIDED ON THIS FORM

OWNER INFORMATION

Owner: _____
Address: _____
City: _____ State: _____ Zip Code: _____
Phone: _____ Fax: _____
E-mail: _____

PROPERTY INFORMATION

Parcel/TMS#(s): _____
Lot Number(s): _____
Development Name/Phase: _____
City: _____ Zip Code: _____
Total Acres: _____ Disturbed Acres: _____ Impervious Acres: _____
Lots Applied For: _____

CONTRACTOR/OPERATOR INFORMATION (IF APPLICABLE)

Company: _____
Operator Name: _____
License #: _____
Address: _____
City: _____ State: _____ Zip Code: _____
Phone: _____ Fax: _____
E-mail: _____

Berkeley County, South Carolina
Stormwater Management
1003 Highway 52 Suite 120
Moncks Corner, SC 29461-6120
(843) 719-4127

Minor Construction Activity Certification

I certify that my site meets the following conditions (Read and initial each box):

☐ **My site will not exceed one (1) acre of land disturbance and/or construction activity.**

☐ **My site is not Commercial, Industrial, or part of a larger common plan of development.** (Refer to section 1.10 of the Berkeley County Design Standards Manual.)

☐ **There will be no modification of an existing watercourse or creation of a new watercourse.** (If modification or creation of a watercourse is to occur, a technical report prepared by a licensed engineer must be submitted to the Berkeley County Engineering Department. Refer to Section 2.2.2.1 of the Berkeley County Stormwater Design Standards Manual.

I certify by my signature below, under penalty of law, that I understand and will implement all Berkeley County construction activity management requirements. I further certify that Berkeley County inspectors may enter the property as necessary to ensure compliance with all related requirements.

Operator Signature: _____ Date: _____

Owner Signature: _____ Date: _____

Appendix E. Compliance Calculator Guidance

BERKELEY COUNTY LID COMPLIANCE SPREADSHEET SUMMARY

The Berkeley County LID Compliance Spreadsheet shows whether the Runoff Reduction Volume for new development was retained and if detention requirements were met though the installation of BMPs. The Site Data sheet calculates the Runoff Reduction Volume (ft^3) for new development. This is based on a design storm of 1.2-inches, unless within 1,000 feet of a shellfish bed, then the design storm is 1.5-inches. The pre- and post-development land cover is recorded in this sheet.

The BMPs sheet shows the contributing drainage area draining to each BMP and the storage volume for each BMP. Each BMP has a runoff reduction credit assigned to it that determines how much of its storage volume is retained and can be applied to meet the regulated runoff reduction volume. Some BMPs only help to meet detention requirements and provide no retention volume. This sheet indicates whether the runoff reduction volume target was achieved.

The Channel and Flood Protection sheet indicates if detention requirements for the 2, 10, 25, and 100-year storms have been met.

The Berkeley County LID Compliance Spreadsheet was altered from the "South Carolina Compliance Calculator for SMS4 and Statewide Regulations" and includes the following change:

- The Berkeley County spreadsheet calculates the Runoff Reduction Volume that needs to be retained instead of a Treatment Volume.
- Berkeley County's 85^{th} percentile storm is used as the retention design storm (1.2-inches).
- The question, "Is Site Located Within 1/2 Mile of a Coastal Receiving Water?" was removed as the 1.2-inch storm is more restrictive than the 1-inch requirement when within 1/2 mile of a coastal receiving water.
- In the BMPs sheet, the Runoff Reduction Credits (ft^3) assigned to each BMP was updated to reflect the values in Table 4.1-1 in the Low Impact Development in Coastal South Carolina: A Planning and Design Guide.
- The Target Rain Event (in) was updated to values found in NOAA Atlas 14, Volume 2, Version 3 Moncks Corner 4 N Station ID: 38-5946.
- The "Additional Detention Required?" question was updated to remove the "*Only if required by local government" stipulation. The spreadsheet states that the detention must be met for the 2, 10, 25, and 100-year storms.

The question, "Is Site Located Within 1,000 ft of a Shellfish Bed?" remains and is unchanged.

BERKELEY COUNTY LID COMPLIANCE SPREADSHEET GUIDANCE

(replaces Section A.2 of Low Impact Development in Coastal South Carolina: A Planning and Design Guide)

The following guidance explains how to use each of the worksheets in the compliance calculator spreadsheet.

Note: All cells highlighted in blue are user input cells. Cells highlighted in gray are calculation cells, and cells highlighted in yellow are constant values that generally should not be changed.

SITE DATA SHEET

1. Enter the name of the proposed project on line 9.
2. Enter the pre-development land cover areas (in acres) of forest cover, turf cover, and impervious cover on the site for Natural Resource Conservation Service (NRCS) soil types A, B, C, and D in cells C15-C17, E15-E17, G15-G17, and I15-I17, respectively.
3. Verify/enter the NRCS runoff curve numbers for each land use/soil type combination in cells D15-D17, F15-F17, H15-H17, and J15-J17. Default values have already been included in these cells, but they can be changed if necessary.
4. Enter the post-development land cover areas (in acres) of forest cover/open space, turf cover, and impervious cover on the site for Natural Resource Conservation Service (NRCS) soil types A, B, C, and D in cells C24-C26, E24-E26, G24-G26, and I24-I26, respectively.
5. Verify/enter the NRCS runoff curve numbers for each land use/soil type combination in cells D24-D26, F24-F26, H24-H26, and J24-J26. As with the pre-development entries, default values have already been included in these cells, but they can be changed if necessary.
6. From the land cover input, weighted site-runoff coefficients (Rv) will be calculated (Column M) for both the pre-development and post-development land cover conditions, based upon the Rv values listed in cells L4 –O6. The Rv values determine what fraction of rainfall is converted to runoff for small storm events.
7. Answer yes or no to the question on line 29 regarding the location of the site. The runoff reduction volume target (cell C33 depends on the answers to these questions. If the site is not located within 1,000 feet of a shellfish bed, the runoff reduction volume target is equal to the runoff produced by 1.2 inch of rainfall over the entire project:

$$RRV = \frac{1.2\ inch}{12} \times Rv \times A \times 43{,}560$$

Where:

RRV	=	Runoff Reduction Volume Target (ft^3)
Rv	=	Runoff Coefficient determined in cell M27.
A	=	Disturbed Area (acres)

If the site is located within 1,000 feet of a shellfish bed, the runoff volume target becomes the maximum of the runoff produced by 1.2 inch of rainfall over the entire project, or 1.5 inch of runoff over the project's impervious cover:

$$RRV = MAX\left(\frac{1.2\ inch}{12} \times Rv \times A \times 43{,}560, \frac{1.5\ inch}{12} \times IA \times 43{,}560\right)$$

Where:

RRV	=	Runoff Reduction Volume Target (ft^3)
Rv	=	Runoff Coefficient determined in cell M27.
A	=	Disturbed Area (acres)
IA	=	Impervious Area (acres)

8. The spreadsheet also calculates a Design Storm (cell E33). This is the rainfall required to produce the target runoff reduction volume, and is used on the BMP Sheet to determine the runoff volume received by the various BMPs. The Design Storm is calculated as:

$$P = \frac{RRv}{3630 \cdot A \cdot Rv}$$

Where:

P	=	Design Storm (in.)
RRv	=	Runoff Reduction Volume (ft^3)
A	=	Disturbed Area (acres)
Rv	=	Runoff Coefficient

The Design Storm will be equal to 1.2 inches unless the shellfish bed requirements described in Step 7 are triggered.

BMP SHEET

1. Apply BMPs to the drainage area to address the target runoff reduction volume by indicating the area in square feet of forest cover, turf cover, and impervious cover to be treated by a given BMP in Columns B, C, and D. This will likely be an iterative process. The available BMPs include the following:
    a. Bioretention - Enhanced
    b. Bioretention - Standard
    c. Permeable Pavement - Infiltration
    d. Permeable Pavement - Standard
    e. Infiltration
    f. Green Roof
    g. Rainwater Harvesting
    h. Disconnection to A/B or Amended Soils
    i. Disconnection to Forest Cover/Open Space
    j. Grass Channel in A/B or Amended Soils
    k. Grass Channel in C/D Soils
    l. Dry Swale
    m. Wet Swale
    n. Regenerative Stormwater Conveyance (RSC)
    o. Filtration
    p. Dry Detention Practice
    q. Wet Detention Pond
    r. Wetland
2. Enter the BMP's storage volume (ft^3) in Column E.
3. The volume from direct drainage to the BMP is calculated and reported in Column F, according to the following formula:

$$V_{dd} = 3630 \cdot P \cdot (Rv_F \cdot A_F + Rv_T \cdot A_T + Rv_I \cdot A_I)$$

Where:

V_{dd}	=	Volume from Direct Drainage (ft^3)
P	=	Design Storm (in.)
Rv_F	=	Runoff coefficient from forest
A_F	=	Area of forest (acres) from Column B
Rv_T	=	Runoff coefficient from turf
A_T	=	Area of turf (acres) from Column C
Rv_I	=	Runoff coefficient from impervious cover
A_I	=	Area of impervious cover (acres) from Column D

4. If more than one BMP will be employed in series, any overflow from upstream BMPs (VUS) will be accounted for in Column G.
5. The total volume captured by the practice (VCAP) is reported in Column H and is equal to the following:

$$V_{CAP} = Minimum(Sv, V_{US} + V_{DD})$$

Where:

VCAP	=	Runoff Reduction Volume captured by the practice (ft3)
Sv	=	Storage Volume (ft3)
VUS	=	Volume of runoff from upstream practice (ft3)
VDD	=	Volume of runoff from direct drainage (ft3)

6. The spreadsheet calculates the volume credited in Column J, based on the storage volume of the BMP and the runoff reduction credit percentage assigned to the BMP in Column I (Table A-1). Regardless of the storage volume of the BMP, the storage achieved cannot be greater than the total volume received by the BMP (Column H).

Table A-1. Runoff Reduction Credit for Each BMP

Practice Type	Runoff Reduction Credit
Bioretention - Enhanced	100%
Bioretention - Standard	60%
Permeable Pavement - Infiltration	100%
Permeable Pavement - Standard	50%
Infiltration	100%
Green Roof	100%
Rainwater Harvesting	100%
Disconnection to A/B or Amended Soils	50%
Disconnection to C/D Soils	25%
Disconnection to Forest Cover/Open Space	75%
Grass Channel in A/B or Amended Soils	20%
Grass Channel in C/D Soils	10%
Dry Swale	60%
Wet Swale	0%
Regenerative Stormwater Conveyance (RSC)	100%
Filtration	0%
Dry Detention Practice	0%
Wet Detention Pond	0%
Wetland	0%

7. The Runoff Reduction Volume Credited is calculated in **Column J**, and is equal to the following:

$$WQv_{CR} = CR \cdot V_{CAP}$$

Where:

WQv_{CR}	=	Water Quality Volume Credited (ft^3)
CR	=	Credit (%)
V_{CAP}	=	Volume Captured by the Practice (ft^3)

8. The Remaining Runoff Reduction Volume (Column K) is calculated as:

$$RRV_R = RRV_{REC} - RRV_{CR}$$

Where:

RRV_R	=	Runoff Reduction Volume Remaining (ft^3)
RRV_{REC}	=	Runoff Reduction Volume Received (ft^3)
RRV_{CR}	=	Runoff Reduction Volume Credited (ft^3)

9. Any runoff volume remaining can be directed to a downstream BMP by selecting a practice from the pull-down menu in Column L. Selecting a BMP from the menu will automatically direct the runoff volume remaining to Column G for the appropriate BMP.
10. The Target Runoff Reduction Volume is calculated in Cell B31.
11. The Total Runoff Reduction Volume Credited is calculated in Cell J26, and reported in Cell C31.
12. Cell D31 reports whether the Target Volume has been achieved for the site.

CHANNEL AND FLOOD PROTECTION

This sheet assists with calculation of Adjusted Curve Numbers that can be used to calculate peak flows associated with the 2-year storm, 10-year storm, or other storm events.

1. Indicate the appropriate depths for the 2-year, 10-year, 25-year, and 100-year 24-hour storms (or other storms as needed) on line 5 (The values provided are taken from NOAA Atlas 14, Volume 2, Version 3 Moncks Corner 4 N Station ID: 38-5946).
2. The Total Site Area (from the Site Data Tab), is reported in Cell C7.
3. The Runoff Reduction Volume (cf) is calculated in Cell C8, using the following equation:

$$V_{RR} = \sum_{BMPs} WQv_{CAP-BMP} \cdot RR_{BMP}$$

Where:

VRR	=	Runoff Reduction Volume achieved (ft^3)
$WQv_{CAP-BMP}$	=	Water Quality Volume Captured by Each BMP (ft^3) (from Column H of the BMPs Tab)
RRBMP	=	Runoff Reduction Credit (%) for Each BMP (from Column AK of the BMPs Tab)

4. As indicated in the Site Data sheet, each cover type is associated with a NRCS curve number. Cells D15–G20 show the pre-development land cover areas and curve numbers that were indicated on the Site Data Sheet. Using these curve numbers, a weighted curve number is calculated in cell G22.
5. Cells D27–G32 show the post-development land cover areas and curve numbers that were indicated on the Site Data Sheet. Using these curve numbers, a weighted curve number is calculated in cell G39.
6. Using NRCS methodology, line 38 calculates the pre-development runoff volume (inches) for the various storm events.

Potential Abstraction

$$S = \frac{1000}{(CN - 10)}$$

Where:

S	=	potential abstraction (in.)
CN	=	weighted curve number

Runoff Volume

$$Q = \frac{(P - 0.2 \cdot S)^2}{(P + 0.8 \cdot S)}$$

Where:

Q	=	runoff volume (in.)
P	=	precipitation depth for a given 24-hour storm (in.)
S	=	potential abstraction (in.)

7. Line 39 calculates the post-development runoff volume based solely on land cover (without regard to the BMPs selected on the BMP sheet). Line 40 then subtracts the runoff reduction volume provided by BMPs, from Cell C8.

8. Based upon the reduced runoff volumes calculated in line 40, the spreadsheet then calculates corresponding reduced curve numbers for each storm event. This Adjusted Curve Number is reported on line 41.
9. Line 42 compares the pre-development runoff volume in line 38 with the post-development (with BMPs) runoff volume in line 40. If the post-development volume (with BMPs) for the 10-year or 25-year storm is less than or equal to the pre-development volume for a given storm event, then detention is not required. If the post-development volume (with BMPs) for the 10-year or 25-year storm is greater than the pre-development volume for a given storm event, then detention will be necessary, and the Adjusted Curve Numbers form line 41 should be used to calculate the post-development peak runoff rates.

Appendix F. Approval Process for Construction Application

BERKELEY COUNTY STORMWATER MANAGEMENT

PROGRAM APPROVAL PROCESS FOR CONSTRUCTION APPLICATION

For Minor Construction Activities

For single-family residential projects not part of an LCP (including site/stormwater management plan and encroachment permit application plan) located within **regulated area** (can be viewed from Berkeley County GIS Mapping Service: http://gis.co.berkeley.sc.us/disclaimer.htm - MS4 Regulated Area) **and** disturbing less than **one acre**:

1. Documents necessary to submit to Berkeley County Engineering (BCE) for stormwater management plan approval:
   a. Minor Construction Activity Certification Form
   b. If construction includes modification of an existing watercourse or creation of a new watercourse, a Technical Report which consists of documentation clearly substantiating that changes made on-site will not adversely impact upstream or downstream properties
2. BCE approves Construction Application and returns a copy of the approved Construction Application.

BERKELEY COUNTY STORMWATER MANAGEMENT

PROGRAM APPROVAL PROCESS FOR CONSTRUCTION APPLICATION

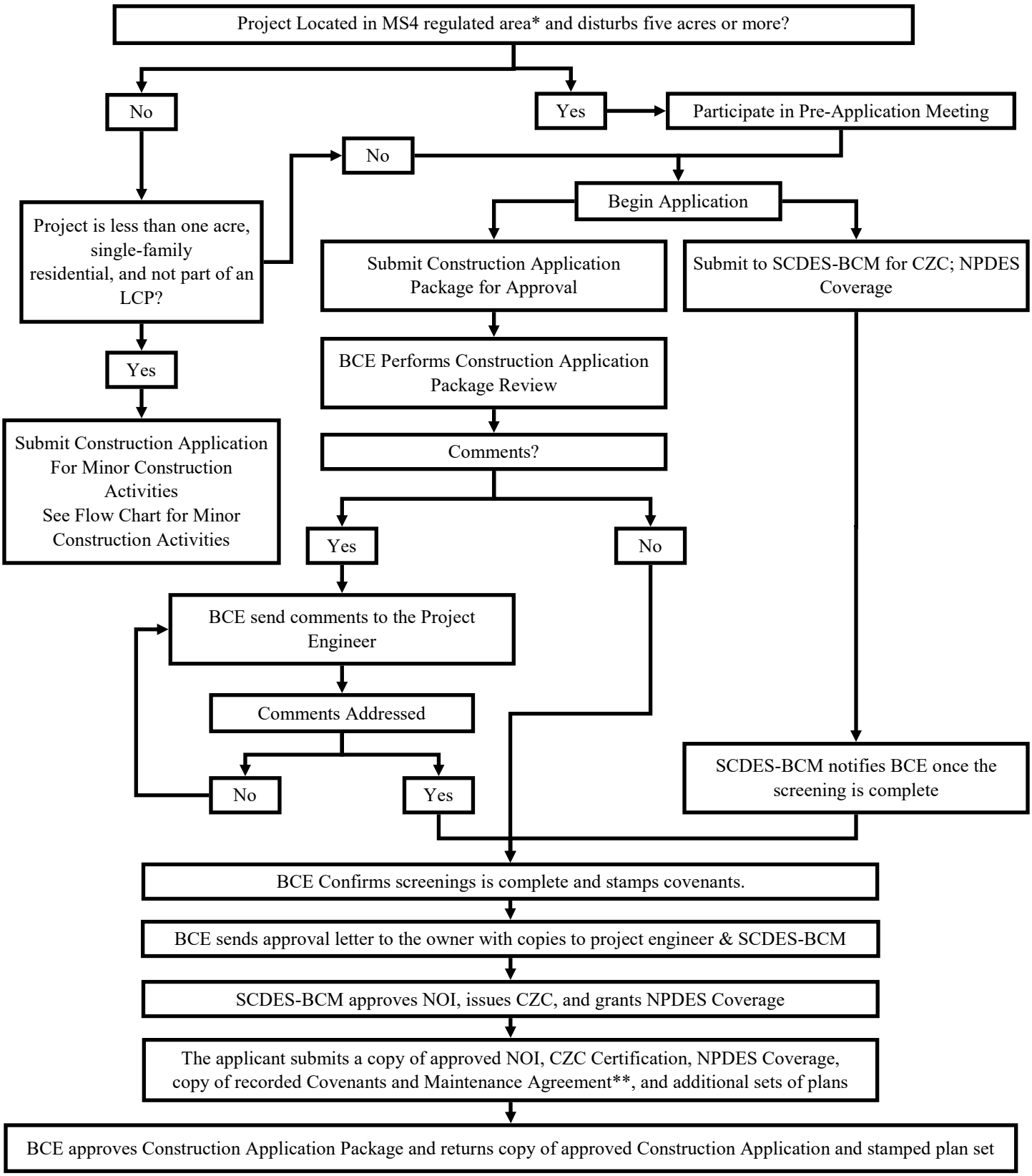
For Intermediate or Major Construction Activities

For residential projects disturbing **one acre** or more, all non-single-family residential projects, all sites that are an LCP or part thereof, and all non-residential projects (including subdivision plan, site/stormwater management plan, and encroachment permit application plan) **and** located within **regulated area** (can be viewed from Berkeley County GIS Mapping Service: http://gis.co.berkeley.sc.us/disclaimer.htm - MS4 Regulated Area):

1. For Major Construction Activities (5 acres or more), schedule a Pre-Application Meeting to coordinate stormwater management submittal requirements with the County Engineer.
2. Documents necessary to submit to Berkeley County Engineering (BCE) for stormwater management plan approval:
   a. Completed Construction Application
   b. Copy of the SCDES-BCM Notice of Intent (NOI) Form D-2671
   c. One set of technical report/engineering calculations
   d. Stormwater Management Plan
   e. One complete set of Construction Plans and Erosion Protection and Sediment Control Plans
   f. Specifications
   g. Construction Sequence Schedule
   g. Stormwater Pollution Prevent Plans
   h. Proof of application of additional permits the site may require
   i. Covenants for Permanent Maintenance of Stormwater Systems (Covenants) signed and notarized. If someone other than the owner is the responsible party for maintenance activities of stormwater systems, a maintenance agreement between the operator and owner must be submitted along with the Covenants.

   For Major Construction Activities, the following are additionally required:
   j. Stormwater Master Plan (if project is located in a special protection area).
   k. Phased Plan, identifying all BMPs and grading work implemented during specific portions of a site's construction sequence.
2. Once all BCE comments are addressed and review is complete, and BCE receives notification from SCDES-BCM that Coastal Zone Consistency (CZC) screening is complete:
   a. BCE stamps the Covenants and returns the Covenants to the owner.
   b. The owner records the Covenants in the Office of the Berkeley County Register of Deeds.
   c. BCE approves the stormwater management plan.
   d. BCE sends the approval letter to the applicant with copies to the project engineer and SCDES-BCM. This approval of the stormwater management plan does not constitute, in any way, the right to start construction.
3. SCDES-BCM approves NOI, issues CZC Certification and, authorizes coverage under the NPDES Phase II Construction General Permit (NPDES CGP).
4. Once the above steps are completed, the applicant submits:
   a. A copy of SCDES-BCM's approved NOI
   b. A copy of CZC Certification
   c. A copy of SCDES's letter authorizing coverage under NPDES CGP
   d. A copy of the recorded Covenants and maintenance agreement where applicable
   e. Additional sets of the approved stormwater management plans based on the type of construction activity

Construction Application Review and Approval Flow Chart
For Intermediate and Major Construction Activities



BCE: Berkeley County Engineering
CZC Costal Zone Consistency
NPDES Coverage: NPDES Phase II Construction General Permit Coverage

*Regulated area can be viewed from Berkeley County GIS Mapping Service: http://gis.co.berkeley.sc.us/disclaimer.htm - MS4 Regulated Area
**If someone other than the owner is the responsible party for maintenance activities of stormwater systems, maintenance agreement between the operator and owner

Appendix G. Construction Sequence

CONSTRUCTION SEQUENCE		
STEP	PHASE	DESCRIPTION
1	PERMITTING	RECEIVE NPDES COVERAGE FROM SCDHEC. (MAINTAIN ONSITE AT ALL TIMES)
2	PERMITTING	RECEIVE CONSTRUCTION APPROVAL AND APPROVED PLANS FROM BERKELEY COUNTY. (MAINTAIN ONSITE AT ALL TIMES)
3	PRE-CONSTRUCTION	FLAG: WORK LIMITS, TREE BARRICADE LOCATIONS, BUFFER AREA PROTECTION DELINEATIONS AND PERIMETER SILT FENCE LAYOUT.
4	PRE-CONSTRUCTION	HOLD PRECONSTRUCTION CONFERENCE & NOTIFY BERKELEY COUNTY ENGINEERING AT LEAST FORTY-EIGHT (48) HOURS PRIOR TO LAND DISTURBING ACTIVITY.
5	PRE-CONSTRUCTION	NOTIFY SCDHEC EQC OR OCRM OFFICE AND USACE IN ACCORDANCE WITH RESPECTIVE PERMITS PRIOR TO BEGINNING LAND DISTURBING ACTIVITIES.
6	PRE-CONSTRUCTION	REVIEW TEMPORARY DIVERSION DITCH PLAN, TREE PROTECTION AND PERIMETER CONTROLS WITH BERKELEY COUNTY INSPECTOR. TAKE PICTURES OF ALL PROTECTED TREES AND LOCATIONS WHERE SITE WORK TIES INTO EXISTING SITE CONDITIONS TO DOCUMENT PREDEVELOPMENT CONDITIONS.
7	SWPPP INITIAL	INSTALL CONSTRUCTION EXITS/ENTRANCES.
8	SWPPP INITIAL	PERFORM CLEARING AND GRUBBING AS NECESSARY FOR INSTALLATION OF PERIMETER EROSON CONTROL MEASURES.
9	SWPPP INITIAL	INSTALLATION OF PERIMETER CONTROLS. (SILT FENCE, ETC.)
10	SWPPP CONSTRUCTION	PERFORM CLEARING AND GRUBBING OF THE FOLLOWING AREAS: SEDIMENT BASINS & TRAPS, TEMPORARY DIVERSIONS. (INSTALL ALL NECESSARY SEDIMENT AND EROSION CONTROL BMPS)
11	SWPPP CONSTRUCTION	CONSTRUCT SEDIMENT BASINS & ASSOCIATED OUTFALL STRUCTURES, TEMPORARY DIVERSIONS. BEGIN CLEARING AND GRUBBING FOR LAY DOWN AREAS AND STOCK-PILE LOCATIONS. (INSTALL ALL NECESSARY SEDIMENT AND EROSION CONTROL BMPS)
12	SWPPP CONSTRUCTION	CLEAR AND GRUB THE REMAINDER OF THE APPROVED LIMITS OF DISTURBANCE. (INSTALL ALL NECESSARY SEDIMENT AND EROSION CONTROL BMPS)
13	SWPPP CONSTRUCTION	ROUGH GRADE SITE AND COMMENCE EXCAVATION OF PERMANENT DETENTION BASINS. (INSTALL ALL NECESSARY SEDIMENT AND EROSION CONTROL BMPS)
14	SWPPP CONSTRUCTION	INSTALL STORM DRAIN SYSTEM AND UTILITIES. PLACE INLET PROTECTION AS EACH STORM INLET IS INSTALLED. INSTALL RIPRAP WHERE SHOWN ON THE APPROVED PLANS, AS SOON AS PRACTICAL.
15	SWPPP CONSTRUCTION	COMPLETE FINE GRADING, INSTALL CURB, GUTTER AND PAVEMENT.
16	SWPPP STABILIZATION	REPLACE INLET PROTECTION AS NEEDED FOR SURFACE COURSE INSTALLATION.
17	SWPPP STABILIZATION	CLEAN-OUT AND REMOVE CONCRETE WASHOUT.
18	SWPPP STABILIZATION	COMPLETE PERMANENT / FINAL STABILIZATION.
19	SWPPP STABILIZATION	CLEAN-OUT TEMPORARY SEDIMENT BASINS.
20	SWPPP STABILIZATION	REMOVAL OF TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES AFTER THE ENTIRE AREA DRAINING TO THE STRUCTURE IS FINALLY STABILIZED.
21	SWPPP STABILIZATION	PERFORM AS-BUILT SURVEYS OF DETENTION STRUCTURES AND SUBMIT TO MS4 FOR ACCEPTANCE.
22	POST CONSTRUCTION	SUBMIT NOTICE OF TERMINATION (NOT) TO SCDHEC.

Appendix H. South Carolina Department of Environmental Services Stormwater Pollution Prevention Plan Written Guidance and Template

SC DHEC's Stormwater Pollution Prevention Plan (SWPPP) Template

Overview

To aid in the development of a site-specific Comprehensive Stormwater Pollution Prevention Plan (C-SWPPP) and an On-site Stormwater Pollution Prevention Plan (OS-SWPPP) for construction sites seeking coverage under the South Carolina's NPDES General Permit for Stormwater Discharges from Construction (CGP), the following template has been provided as guidance. It is recommended that this template be use in conjunction with the NPDES General Permit for Stormwater Discharges from Construction Activities (CGP) and the latest editions of the SC DHEC's Plan Review Checklist for Design Professionals and Stormwater BMP Handbook. All are available for download on SC DHEC's Stormwater website, http:///www.scdhec.gov/stormwater.

This template covers the majority of the requirements that may need to be addressed to obtain coverage under the CGP for most construction sites located within South Carolina. However, additional provisions may need to be included within the C-SWPPP or OS-SWPPP to address site-specific conditions. Please review the current edition of the CGP to ensure all requirements have been met before submitting your C-SWPPP for review and approval.

As noted above, this template has been designed to create both the C-SWPPP and the OS-SWPPP. Sections 1 through 3 should be the same for each document, with the bulk of the differences between the C-SWPPP and OS-SWPPP will be within the appendices.

Using this Template to Create the C-SWPPP

This template includes an example of a site-specific Comprehensive SWPPP as a Microsoft Word document. A set of instruction has been provided for each section and some sections have been provided with sample language. The SWPPP preparer can easily add tables, diagrams, text and other sources of information to address the needs for a specific construction site. The C-SWPPP derived from this template can then be sent in for review and approval.

Using this Template to Create the OS-SWPPP

After approval, this template may also be used to generate the required On-Site SWPPP. Simply rename the approved C-SWPPP document to the OS-SWPPP and remove the Engineering Report Appendix. Be sure that Appendix E, F, G and H are included. If they were not included with the C-SWPPP, please add them prior to implementation of the approved C-SWPPP at the construction site.

Disclaimer

The information and guidance presented within this document represent design templates that are recommended, however their effectiveness is dependent on the proper identification of stormwater management BMPs to address site-specific conditions. No guarantee of permit coverage is implied upon inclusion or acceptance of the use of this template within a Permittee's application package for coverage under the NPDES General Permit for Stormwater Discharges from Construction Activities (SCR100000).

Comprehensive Stormwater Pollution Prevention Plan (C-SWPPP) For Construction Activities:

Project/Site Name:

Insert Company or Organization Name

Project Address/Location:
Insert Address
Insert City, State, Zip Code
Insert Telephone Number
Insert Fax/Email

Primary Permittee:

Insert Company or Organization Name

Permittee/Owner Contact:
Insert Address
Insert City, State, Zip Code
Insert Telephone Number
Insert Fax/Email

SWPPP Preparer:

Insert Company or Organization Name
Insert Name
Insert Address
Insert City, State, Zip Code
Insert Telephone Number
Insert Fax/Email

Day-to-Day Operator:

Insert Company or Organization Name
Insert Name
Insert Address
Insert City, State, Zip Code
Insert Telephone Number
Insert Fax/Email

(Leave Blank if not known.)

C-SWPPP Preparation Date:

__ __ / __ __ / __ __ __ __

Modification Dates:
Modification I: __ __ / __ __ / __ __ __ __
Modification II: __ __ / __ __ / __ __ __ __

Table of Contents

Section 1 *PROJECT OVERVIEW*

Section 2 *SITE FEATURES AND SENSITIVE AREAS*

Section 3 *COMPLIANCE REQUIREMENTS*

Appendices *REFERENCE MATERIAL*

C-SWPPP is acronym for Comprehensive Storm Water Pollution Prevention Plan
****OS-SWPPP is acronym for On-Site Storm Water Pollution Prevention Plan***

Section 1 PROJECT OVERVIEW

1.1 Narrative (CGP Section 3.2.1)

Construction Activities and BMP Summary

Instructions: *Include a brief summary of the proposed construction activities and the BMPs that will be implemented to manage stormwater and to provide sediment and erosion control. Identify if the construction activities are required to be implemented through phased plans as specified in Section 3.2.9.B. Also, identify any proposed permanent water quality/quantity BMPs.*

- Sample Language - Project Summary -
This construction site includes the clearing and grubbing of existing agricultural land, grading of the existing contours, and the construction of two commercial buildings and a large parking lot. Perimeter Control BMPs and a sediment basin will be installed prior to the initiation of the mass clearing/grubbing and grading of the site, and the sediment basin will be the primary sediment control BMP used during the lifespan of all construction activities, until final stabilization is reached. Once final stabilization is reached the sediment basin will be converted into a wet detention pond to treat post-development water quality and quantity. The construction activities at this site will be implemented in 3 distinct Erosion Prevention and Sediment Control Phases. The first phase includes the initial installation of perimeter controls, sediment control BMPs, and the construction entrance. The second phase includes the bulk of the construction activities and the implementation of internal stormwater management BMPs. The final phase, Phase 3, includes the final stabilization of the site and conversion of the sediment basin into a permanent water quality and quantity control structure.

Pre-Development Conditions

Instructions: *Include a brief summary of the pre-development drainage conditions. Identify the number of outfall locations and any pre-existing stormwater management structures. Reference the Site Maps, Drainage Maps, and Engineering Reports that may provide more details on these conditions.*

Post-Development Conditions

Instructions: *Include a brief summary of the post-development drainage conditions. Identify the number of outfall locations and any changes from pre-development stormwater drainage. Reference the Site Maps, Drainage Maps, and Engineering Reports that may provide more details on these conditions. Include a pre/post peak discharge table summarizes these flows.*

- Sample Language - Peak Discharges -

As shown in **Table 1.1-A**, the post-development peak discharges are less than or equal to the pre-development peak discharges for each of the **4** identified outfalls.

Table 1.1-A: Pre/Post Peak Discharges

Summary of Pre/Post Peak Discharges					
Outfall A			Outfall B		
	Pre	Post		Pre	Post
2-YR			2-YR		
10-YR			10-YR		
100-YR			100-YR		
Outfall C			Outfall D		
	Pre	Post		Pre	Post
2-YR			2-YR		
10-YR			10-YR		
100-YR			100-YR		

Flooding Issues

Instructions: *Include a description of existing and potential flooding problems at the site due to pre-construction drainage conditions, and any potential flooding problems within the surrounding area that may be a direct result of current site conditions or the proposed site development. Identify if the site is located within a floodplain. Reference any appendix that contains additional information.*

Residential Subdivision Information (As Applicable)

Instructions: *Identify if this C-SWPPP was developed for a Primary or a Secondary Permittee. If for a Primary Permittee, identify whether this C-SWPPP may be used by Secondary Permittees to obtain coverage or if Secondary Permittees are required to develop their own C-SWPPP for permit coverage.*

Identify if the subdivision is to be mass-graded or not. If the subdivision is not to be mass graded include the disturbed area calculations and the subsequent note identified in Item 4 of the Stormwater Management and Sediment and Erosion Control Plan Checklist for Design Professionals.

1.2 Stormwater Management and Sediment Control (CGP Section 3.2.2)

Instructions: *This section may be used to address all applicable requirements identified in Section 3.2.2 of the Construction General Permit. This includes identification of stormwater discharges from industrial activities regulated by the NPDES Industrial Stormwater Program (batch concrete plants, asphalt plants, etc), various types of BMPs, stockpile management, construction entrances, dust control, and pollutant identification. These sections should contain very general information and might be able to used for most sites.*

Sample Language has been provided for the majority of the items identified in the CGP. **Bolded text** *is language that will differ from site to site.*

- Sample Language -

Erosion Prevention BMPs

As the existing site is cleared, grubbed and graded to the proposed contours shown on the construction site plans, erosion prevention BMPs shall be placed throughout the construction site to aid in the prevention of sediment-laden stormwater runoff. These BMPs shall be focused in areas with high potential of erosion, areas preceding infiltration practices, and shall be applied to all steep slopes. That is slopes equal to or greater than **3H:1V**.

Each erosion prevention measure shall be selected on a site-specific basis and details have been provided on the construction site plans. The plans identify all proposed Erosion Prevention BMPs and the recommended installation, maintenance, and inspection procedures.

Examples of Erosion Prevention BMPs are, but are not limited to, surface roughening, temporary seeding, erosion control blankets, turf reinforcement mats, sodding, riprap, outlet protection, dust control, and polyacrylamide (PAM). Information on the design and proper use of Erosion Prevention BMPs can be located in the SC DHEC's BMP Handbook.

Sediment Control BMPs

Sediment Control BMPs are designed to remove some of the sediment accumulated within stormwater runoff, to the best extent practicable. These BMPs help prevent sediment impacts to adjacent properties and water bodies from stormwater discharges originating from construction sites.

Typically these BMPs are placed near each of the site's outfalls and are installed prior to clearing and grubbing of the site (before large areas of soil are exposed). However, these BMPs can also be located throughout the construction site and, in these circumstances, are installed after mass grading has occurred. Placement, sizing and modifications of Sediment Control BMPs should be left to the SWPPP preparer and/or the Site Engineer. **Contractors must consult the SWPPP Preparer as listed at the front of this SWPPP before making any significant changes to these BMPs**.

Each sediment control BMP shall be selected on a site-specific basis. Examples of Sediment Control BMPs are, but are not limited to sediment traps, sediment basins, silt fence, rock check dams, rock sediment dikes, sediment tubes, and inlet protection. Please consult SC DHEC's BMP Handbook for more information on Sediment Control BMPs.

Structural Control BMPs and Floodplain Placement

This site-specific SWPPP utilizes the following structural control BMPs: **retention pond, detention pond, Bioretention areas, perimeter earthen berms, permanent vegetated swales, and storm sewer systems**. These practices have been designed to either divert flows from exposed soils, to retain/detain flows, and to otherwise limit the runoff and the discharge of pollutants from disturbed areas of the construction site.

Throughout the lifespan of the construction project these BMPs will be installed and maintained, as required by the SWPPP and the construction site plans, until final stabilization has been achieved for the areas draining to each BMP. Upon final stabilization, each structural control BMP must be modified to the post-construction conditions shown within the approved construction site plans or removed, if the structural BMP was a temporary structure.

Any Structural Control BMPs that are being proposed within the 100-yr floodplains will require approval from the local regulating agency, since SC DHEC does not have the authority to regulate within the associated flood plains. Approvals from the local agency will be located in **Appendix C, Additional Approvals/Certifications** of this SWPPP. If the required approval is not located in this SWPPP, please contact the Primary Permittee listed on the title sheet of this SWPPP before performing work within the floodplain.

Construction Entrances and Dust Control

All access areas into and out of the limits of disturbance, as shown on the construction site plans, are required to be equipped with a construction entrance. The use of this BMP will limit the amount of sediment being transported by construction vehicles onto existing roadways or other impervious areas. Any tracked sediment, along with any attached pollutants, deposited on impervious areas could be washed downstream during the next rain event. Each construction entrance must be installed as shown in the details section of the construction site plans.

If a new entrance or exit is required, that is not shown on the plans, install the construction entrance as noted by the construction entrance detail, mark the location on the plans and make a record of this minor modification in the SWPPP's modification log, which is located within one of the appendices of the On-site SWPPP.

Each stabilized construction entrance should be used in conjunction with Street Sweeping measures if it becomes apparent that sediment is still being tracked onto adjacent impervious areas, even with the use of the construction entrance.

During extremely dry conditions, drought, and/or excessive winds, the construction site

should be treated for dust control to prevent the suspension of fine sediment particles into the air, being carried offsite, and deposited on adjacent properties or surface waters. This practice may not be directly called out for on the construction site plans. A water tanker used to spray the soil down may be an effective way to prevent excessive dust at a construction site.

Water Quality BMPs During Construction

Site-specific water quality BMPs (e.g., sediment basins, sediment traps, rock check dams, and rock sediment dikes) must be installed prior to the mass clearing, grubbing and grading of the site, and must be kept in functioning order throughout the lifespan of all construction activities. Each of these BMPs must be maintained and inspected until all areas draining to these BMPs have reached final stabilization, approved by the construction site inspector or the SWPPP Preparer, and recorded within the stabilization log located as an appendix of the On-site SWPPP.

The location, installation procedures, and maintenance procedures for each water quality BMP can be found within the approved construction site plans.

Post-Construction Water Quality

All construction sites disturbing 5 acres or more, including construction activities associated with Larger Common Plans disturbing 5 acres or more (for sites located within an MS4 this may be 1 acre or more), must be designed to treat water quality post-construction. These water quality controls must be installed and stabilized prior to terminating coverage under the CGP. These controls will require routine maintenance to remain functional; this is to be conducted by the Primary Permittee or the entity that accepts responsibility for these structures once construction has been completed. Additional information, including permanent maintenance and inspection procedures, can be found in **Appendix C** of the OS-SWPPP or within the construction site plans.

Upon final stabilization, each construction site will have to make the transition from temporary BMPs to permanent BMPs. This transition may include the conversion of a sediment basin to a detention basin, a sediment trap to a bioretention area, or diversion swales to permanently vegetated swales. All post-construction (permanent) water quality and water quantity BMPs are identified in the final phase of the Erosion and Sediment Control located within the construction site plans.

Other Stormwater Management Procedures

Based on the nature, conditions, and/or procedures associated with this construction site, the following items must be followed and adopted by all those conducting land disturbing activities at this site:

- All construction debris must be stockpiled in designated areas, which have been provided with the proper BMPs to prevent the discharge of pollutants through stormwater runoff form building or other similar materials off-site or into surface waters.

- Any additional waste material or stockpile material (i.e., soil and mulch) must also be stored in the designated areas as shown on the Construction Site Plans or as the contractor, responsible for day-day activities at this site, deems appropriate. Silt fence or an approved equal shall surround all stockpiled materials.
- All parties conducting work at this construction site must be informed of and make note of pollutant sources, both industrial and construction, at this site, and be informed of all controls and measures the will be implemented to prevent the discharge of these pollutants in stormwater runoff.
- Any additional non-stormwater discharges, as referenced in the CGP, should be eliminated or reduced to the maximum extent feasible. All unpreventable non-stormwater discharges shall be treated through the approved stormwater management system before release off-site. Following is a list of allowable non-stormwater discharges:
    - Fire hydrant flushing
    - Wash water without detergents
    - Water used for dust control
    - Potable water
    - Building wash down water without detergents
    - Uncontaminated pavement wash water
    - Uncontaminated condensation from mechanical equipment
    - Uncontaminated ground or spring water
    - Water from foundation of footing drains
    - Uncontaminated excavation dewatering
    - Landscape irrigation.
- **(Additional notes specific to your construction site may be inserted here and below in list format or however you see fit. The regulatory agency may request additional notes here after initial review of the submitted SWPPP.)**

1.3 Sequence of Construction

Instructions: *This section is provided to ensure that a construction sequence has been provided for the proposed activities. For most sites, this section can simply reference the construction sequence located within the construction site plans. In certain situations more detail on each step identified within the construction sequence may be desired or may be necessary to be provided.*

Additional tables or lists may be provided in addition to the sample language provided below. Any additional information will be beneficial to those implementing the proposed construction activities and associated BMPs.

- Sample Language -
The construction sequence for this project has been provided on **sheet EPSC-1** of the construction site plans. Each item/step of that construction sequence has been listed is the sequence that they should be implemented.

For additional information or questions on the sequencing please contact the SWPPP Preparer or the Permittee referenced on the cover of this SWPPP.

1.4 Non-Numeric Effluent Limits

Instructions: *This section may be used to address applicable Non-Numeric Effluent Limits identified in Section 3.2.10 of the Construction General Permit. Some of these requirements can be addressed solely on the Construction Site Plans, but some may be better addressed within the SWPPP document.*

Sample Language has been provided for the Non-Numeric Effluent Limits that are required to be addressed within the SWPPP Document. Portions of the sample language may need to be revised to meet site-specific conditions.

- Sample Language -

Stormwater Volume and Velocity Control

During the implementation of construction activities, all parties performing work at this construction site whose work may affect the implementation of the SWPPP must be informed of and directed on how to comply with this Non-Numeric Effluent Limit, which requires the management of stormwater runoff **within** the construction site and at **each outfall**. The purpose of this requirement is to control the stormwater volume and velocity at these locations to minimize erosion.

Specifically, each responsible party should be made aware of the practices that have been or should be implemented at the construction site to accomplish these particular stormwater management practices. Below is a list of practices that may be utilized within the disturbed area and at each outfall at construction sites to control stormwater volume and velocity:

Volume Control

- Limiting the amount of disturbed area and exposed soils
- Staging and/or Phasing of the Construction Sequence;
- Sediment Basins and Sediment Traps
- Diverting off-site flow around the construction site;
- Controlling the Drainage Patterns within the Construction Site;
- Temporary Stabilization of Disturbed Areas.

Velocity Control

- Surface Roughening and/or other Slope Stabilization Practices;
- Level Spreaders, Riprap Plunge Pools and/or other Velocity Dissipation BMPS located at the Construction Site's and Sediment Basin Outfalls.
- Use of Rock Checks, Sediment Tubes, Etc. in Temporary Diversions Swales and Ditches.
- Use of Erosion Control Blankets, Turf Reinforcement Mats, and other Non-Vegetative BMPs that can be used to Quickly Stabilize Disturbed Areas.

The SWPPP Preparer/Engineer should approve any modifications (Additional BMPs

or Changes to Existing BMPs) to address the management of stormwater volume and velocity prior to implementation. All approved SWPPPs that were issued coverage under the CGP should include ample BMPs and other control measures to address this specific Non-Numeric Effluent Limit.

Soil Exposure, Compaction and Preservation

Throughout construction activities, **the amount of soil exposed during construction should be kept to a minimum**. This may be accomplished by minimizing the amount the disturbed area within the permitted Limits of Disturbance (shown on the approved construction site plans) to only that which is necessary to complete the proposed work. For areas that have already been disturbed and where construction activities will not begin for a period of 14 days or more, temporary stabilization techniques must be implemented.

Prior to implementation of any major grading activities, **topsoil is to be preserved** by placing it in areas designated for stockpiling until final grades are reached. Each stockpile must be equipped with proper sediment and erosion controls to preserve the topsoil and protect adjacent areas from impacts. Once final grades have been reached, the preserved topsoil should be utilized to apply to areas identified for stabilization. Topsoil contains nutrients and organisms that aid in the growth of vegetation.

The **Compaction of Soil** should also be minimized to the degree practicable during grading activities. This is especially important during the replacement of topsoil to aid in a quick establishment of vegetative cover. Compaction of soil may also reduce rainfall's ability to infiltrate into the soil, increasing the amount of stormwater runoff.

Soil Stabilization

Throughout construction activities, soil stabilization techniques are to be initiated as soon as practicable whenever any clearing, grading, excavating, or other land-disturbing activities have permanently or temporarily ceased on any portion of the construction site and will not resume for a period exceeding 14 calendar days. For areas where initiating stabilization measures is infeasible, (e.g., where snow cover, frozen ground, or drought conditions preclude stabilization), initiate vegetative or non-vegetative stabilization measures as soon as practicable.

Steep Slopes (Slopes of 30% grade or greater)

All disturbed steep slopes (30% grade, ~3H:1V, or greater), and steep slopes to be created through grading activities must be managed in a fashion that limits the potential of erosion along the slopes. All parties whose work is/was responsible for the creation/disturbance of steep slopes must comply with the following items:

- **Minimize the Disturbance** of all steep slopes, when possible.
- **Divert Concentrated or Channelized Flows** of stormwater away from and around steep slope disturbances.
- **Use Specialized BMP Controls** including temporary and permanent seeding

with soil binders, erosion control blankets, surface roughening, reducing continuous slope length with terracing or diversions, gradient terraces, interceptor dikes and swales, grass-lined channels, pipe slope drains, subsurface drains, level spreaders, check dams, seep berms, and triangular silt dikes to minimize erosion.

- **Initiate Stabilization Measures** as soon as practicable on any disturbed steep slope areas where construction activities have permanently or temporarily ceased, and will not resume for a period exceeding 7 calendar days.
- **A Vegetative and/or Non-Vegetative Cover** must be established within 3 working days from the time that stabilization measures were initiated.

Stabilization of steep slopes should be a priority for those performing work at the construction site. At the very least, runoff control BMPs should be implemented to transport stormwater runoff from the top of the slope to the toe of the slope. An example of this is to install diversion swales along the top of slope and direct the runoff towards pipe slopes drains to transports the runoff to the toe of the slope. All pipe slope drain outlets are to be equipped proper outlet protection.

Sediment Discharge Minimization

Permittees, Contractors, and all other parties responsible for conducting land-disturbing activities are required to install and maintain all erosion and sediment BMPs that are identified on the approved construction site plans. These BMPs have been designed and approved to address such factors as the amount, frequency, intensity and duration of precipitation, the nature of resulting stormwater runoff, and soil characteristics, including the range of soils particle sizes expected to be present on the construction site. **Proper installation, inspection, and maintenance will allow these BMPs to operate at maximum efficiencies in order to minimize sediment discharges to the maximum extent practical.**

Pollutant Discharge Minimization

Permittees, Contractors, and all other parties responsible for conducting land-disturbing activities are required to install, implement, and maintain effective pollution prevention measures to minimize the discharge of pollutants. At a minimum, the following items must be implemented:

- **Minimize the discharge of pollutants from dewatering trenches and excavations** by managing runoff with the appropriate controls. Otherwise these discharges are prohibited;
- **Minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other wash waters**. Wash waters must be treated in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge;
- **Minimize the exposure of building materials, building products, construction wastes, trash,** landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste and other materials present on the site to precipitation and to stormwater; and
- **Minimize the discharge of pollutants from spills and leaks** and implement

chemical spill and leak prevention and response procedures.

Prohibited Discharges

Permittees, Contractors, and all other responsible parties for conducting land-disturbing activities are prohibited to discharges, from the construction site, the following items:

- **Wastewater from washout of concrete**, unless managed by an appropriate control;
- **Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials**;
- **Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance**; and
- **Soaps or solvents used in vehicle and equipment washing**.

1.5 Buffer Zone Management

Instructions: *This section may be used to address applicable Buffer Zone Management Requirements identified in Section 3.2.4.C of the Construction General Permit. A Buffer Zone Narrative is required to be provided within the SWPPP Document.*

Sample Language has been provided below for the Buffer Zone Narrative for each Compliance Option listed in the CGP. Additional language has been provided as a "General Information" section on the Buffer Zone Management Requirements. Portions of the sample language may need to be revised to meet site-specific conditions.

- Sample Language -

Buffer Zone Narrative (Compliance Option A)

Per Section 3.2.4.C of the CGP, a buffer zone has been proposed along the **unnamed tributary of the Catawba River** as shown on **sheet EC-1** of the construction site plans. A buffer zone width of **30-ft** will be maintained along this surface water, as directed by **Compliance Option A** from the CGP.

This **30-ft** buffer zone is to be identified on the site by flagging, installation of tree protection fence or other practices to make it readily identifiable prior to the implementation of other perimeter BMPs and commencement of construction activities. All perimeter BMPs and sediment control BMPs, as shown on **sheet EC-1** of the construction site plans, are to be installed prior to the discharge of stormwater runoff into the buffer zone from disturbed areas.

Inspection and maintenance of the buffer zone is to be conducted until final stabilization is reached, or as otherwise approved. All maintenance procedures and inspection requirements for the provided buffer zones can be found on plan **sheet EC-1**.

Buffer Zone Narrative (Compliance Option B)

Per Section 3.2.4.C of the CGP, a buffer zone has been proposed along an **unnamed**

tributary of the Catawba River as shown on **sheet EC-1** of the construction site plans. A buffer zone width of **20-ft** will be maintained along this surface water, as directed by **Compliance Option B** from the CGP.

Compliance Option B was selected due to **existing clearing within 30-ft of the unnamed tributary of the Catawba River**. **The current state of the project area was an agricultural field reaching to within 20-ft of the surface water**. For this reason, a buffer zone width less than the required minimum width as listed in Section 3.2.4.C of the CGP will be provided. **Pre-Existing Development** is one of the Exceptions listed in Section 3.2.4.C of the CGP that allows for the selection of Compliance Option B.

This **20-ft** buffer zone is to be identified on the site by flagging, installation of tree protection fence or other practices to make it readily identifiable prior to the implementation of other perimeter BMPs and commencement of construction activities. All perimeter BMPs and sediment control BMPs, as shown on **sheet EC-1** of the construction site plans, are to be installed prior to the discharge of stormwater runoff into the buffer zone from disturbed areas.

Inspection and maintenance of the buffer zone is to be conducted until final stabilization is reached, or as otherwise approved. All maintenance procedures and inspection requirements for the provided buffer zones can be found on plan **sheet EC-1**.

Additionally, a **Surface Water Protection Plan**, which outlines a list of procedures to protect the **Tributary of the Catawba River** has been provided on plan sheet **EC-1**.

Buffer Zone Narrative (Compliance Option C)

Per Section 3.2.4.C of the CGP, a buffer zone is required to be provided along the **unnamed tributary of the Catawba River;** however, an undisturbed buffer zone is not capable of being provided due **to pre-existing development that has disturbed** the majority of the required buffer zone area. For this reason, **Compliance Option C** was selected for this project.

Compliance Option C was selected since **the pre-existing development** has stripped the buffer zone area from natural strands of vegetation. **The pre-existing state of the project area was a parking area and grassed area that extended to within a few feet of the surface waters**. For this reason, a buffer zone will not be provided as allowed through Compliance Option C listed in Section 3.2.4.C of the CGP.

In lieu of a buffer zone, all sediment control BMPs discharging to **this tributary** have been designed to meet an 80% trapping efficiency to prevent impacts to this surface water. Supporting Calculations demonstrating these trapping efficiencies can be found in **Appendix D** of this SWPPP.

All perimeter BMPs and sediment control BMPs, as shown on **sheet EC-1** of the

construction site plans, are to be installed prior to the discharge of stormwater runoff into the adjacent surface water from disturbed areas. Inspection and maintenance of these BMPS are to be conducted until final stabilization is reached. All maintenance procedures and inspection requirements for these BMPs can be found on plan **sheet EC-1**.

Additionally, a **Surface Water Protection Plan**, which outlines a list of procedures to protect the **Tributary of the Catawba River** has been provided on plan sheet **EC-1**.

Additional Buffer Zone Information

All construction sites that contain or are adjacent to surface waters must provide a vegetated buffer of at least 30 linear feet, or 45 linear feet when the surface water is classified as a Sensitive Waters (Section 3.2.4.C of South Carolina's CGP). This requirement is only applicable during construction. Work may conducted within the buffer area once all disturbed areas discharging towards the buffer zone have had final stabilization measures implemented. This work must have been included within the SWPPP at the time of coverage approval.

Buffer Zones Requirements should be explained in detail during the Pre-Construction Conference. These details should include the outlining of the exact location of where the buffer starts and ends, the sediment and erosion controls precluding the buffer and all other general information pertinent to maintaining the buffer zone area during construction.

All contractors and sub-contractors shall be made aware of the buffer zones and establish a work procedure that preserves and protects these areas. The buffer zones should be flagged prior to any perimeter control placement and, most importantly, before mass clearing and grubbing. These areas must also be inspected during construction for areas of excessive sediment impacts, which may need to be removed if sediment impacts are evident within the buffer zone.

In the event that a portion of a buffer is accidentally disturbed, the contractor shall temporarily stabilize the area as soon as possible and consult with the construction site's inspector, permittee, and/or engineer on the installation of any additional sediment control or erosion prevention measure to protect the portion of the buffer still undisturbed.

1.6 Certification Statement

Instructions: *This section is used by the SWPPP Preparer to certify that all sections of the SWPPP have been prepared or approved by the SWPPP Preparer. This statement should also be included on the site plans.*

Sample Language has been provided as the recommended certification statements for this section. Portions of the sample language may need to be revised to meet site-specific conditions.

- Sample Language -
"I have placed my signature and seal on the design documents submitted signifying that I accept responsibility for the design of the system. Further, I certify to the best of my knowledge and belief that the design is consistent with the requirements of Title 48, Chapter 14 of the Code of Laws of SC, 1976 as amended, pursuant to Regulation 72-300 et seq. (if applicable), and in accordance with the terms and conditions of SCR100000." *Name* _____ *Title*_____ *Date* _____ *(Signature and Seal)*

Section 2

SITE FEATURES AND SENSITIVE AREAS

2.1 Sources of Pollution

Instructions: *This section can be used to address section 3.2.5 of the CGP. Identify any potential sources of pollution, including sediment and fertilizers, which are likely to affect the quality of stormwater discharges from the construction site.*

Sample Language has been provided below. Portions of the sample language may need to be revised to meet site-specific conditions. Additionally, a sample table has been provided to list these potential sources of pollution.

- Sample Language -

Throughout construction activities, each permittee, contractor, and person responsible for conducting work will need to ensure that sources of pollution are managed to prevent their discharge from the construction site. Expected pollution sources during construction have been identified in **Table 2.1-A**, but due to the nature of construction activities, it is often tough to predict all pollution sources that may appear throughout the life of a construction project. For that reason, the following table has also been provided to help all those performing work at this construction site identify possible sources of pollution

Stormwater runoff subjected to the identified pollution sources must be treated by the appropriate BMPs as directed by this SWPPP.

In the event that any additional sources of pollution are identified during construction, the person(s) with day-to-day operational control at the site is to add the new source(s) to **Table 2.1-A** and consult with the SWPPP Preparer to properly address this source and to prevent the discharge of it's pollutant through stormwater runoff.

Table 2.1-A: Potential Sources of Pollution

Source	Material or Chemical	Location*	Appropriate Control Measures
Loose soil exposed/disturbed during clearing, grubbing and grading activities	Sediment	All areas within the Limits of Disturbance	As directed by the construction Plans. This includes Silt Fence, sediment tubes, sediment basins, and sediment traps.
Areas where construction equipment are cleaned, a.k.a. concrete washout	Heavy Metals & pH	Located adjacent to each construction entrance	Concrete Washout Basin as shown on sheet C-8 of the plans.
Water encountered during trenching	Nutrients & Sediment	In and around any trenching activities.	Direct water into impoundments such as basins or traps to allow for the sedimentation of the listed pollutants.
Paving Operations	Sediment & Trash	All areas to be paved.	Inlet protection.

Material Delivery and Storage Areas	Nutrients, pH, Sediment, Heavy Metals, oils & grease	All areas used as storage areas	Silt fence and/or sediment dikes
Equipment fueling and maintenance areas	Metals, hydrocarbons, oils and greases	Areas surrounding fuel tanks	Provide secondary containments, locate in upland areas. Repair leaking and broken hoses.
Paints	Metal oxides, stoddard solvent, talc, calcium-carbonate, arsenic	Throughout site, primarily in areas of building construction	Washwater should be contained and is prohibited from being discharged

***Area where material/chemical is used on site.**

2.2 Surface Waters

Instructions: *This section can be used to address requirements found in Section 3.2.4.A of the CGP. This includes the identification of all Waters of the State (WoS) located on the project site in which the construction site has been proposed, any receiving waters accepting stormwater discharges from construction activities, and any impacts to Waters of the State/ Waters of the United States. For each impact to Waters of the State explain applicable permits and certifications that have been obtained, or are in the process of being obtained, from the U.S. Army Corps of Engineers and DHEC 401 Water Quality Section. When a construction site includes proposed impacts to Water of the U.S. or a Critical Area Permit is required in the Coastal Zone, the ability of DHEC to grant coverage under the CGP is governed based on criteria outlined in Section 2.6.2 and 2.6.3 of the CGP.*

Sample Language has been provided below. Sample language should be revised to address site-specific conditions. Reference construction site plan sheets and the Notice of Intent that may contain additional information pertinent to this section. Maps and other visual aids are often helpful.

- Sample Language -

Stormwater runoff from the proposed construction sites discharges from **2** locations as outlined in **Figure 2.2** to an **unnamed tributary of Stony Fork Creek**, which lies along the northwest boundary of the site. One outfall is located in the northwest corner. The

second outfall is located in the northeast corner of the site where it discharges through a proposed detention pond into an existing ditch located in SCDOT Right-of-Way along State Road. From the unnamed tributary, the stormwater runoff from this site will enter Stony Fork Creek. Stony Fork Creek discharges into Fishing Creek.

96 LF of the unnamed tributary of Stony Fork Creek, outlined on the construction plans has been identified as a jurisdictional stream. This area is proposed for grading for the construction of a building and proposed detention pond. A 404 permit has been obtained from the USACOE and a DHEC 401 Water Quality Certification has been issued and are included in **Appendix L**.

Figure 2.2: Stormwater Runoff Route

2.3 Impairments and TMDLs

Instructions: *This section can be used to address section 3.2.12 of the CGP. Identify any impairments or TMDLs cited for any of the receiving waters listed in Section 2.2 of this SWPPP template.*

Sample Language has been provided below. This language gives a detailed overview of impaired waters and TMDLs, common pollutants that may be found in construction stormwater discharges. The SWPPP for any site discharging to one of these waterbodies must include appropriate BMPs to ensure that the site's construction stormwater discharges will not contribute to the impairment identified. Sample language should be revised to address site-specific conditions.

- Sample Language -

Some Waters of the State (WoS) have been identified as not meeting the State's water quality standards for recreational swimming, fish consumption, aquatic life use, and/or shellfish harvesting for one or more pollutants even after controls for point and nonpoint source pollution have been put in place. These waterbodies have been classified as "impaired." Once these waterbodies have been identified they are listed on the State's 303(d) List of Impaired Waterbodies. South Carolina lists impairments as "stations" where samples were taken along a waterbody.

The most recently-approved 303(d) list can be found at the following link:

http://www.scdhec.gov/environment/water/tmdl/index.htm#4

After a pre-determined period of time, DHEC is obliged to develop a Total Maximum Daily Load (TMDL) for the pollutant of concern for each impaired station listed on the 303(d) List. A TMDL is the amount of a single pollutant (such as bacteria, nutrients, metals) that can enter a waterbody on daily basis and that waterbody still meet water quality standards. "TMDL" refers to both a calculation of a pollutant entering a waterbody as well as the document containing this calculation along with source assessments, watershed and land use information, reductions and allocations information, implementation and other relevant information, maps, figures, and pictures.

Once a TMDL has been developed and approved by the EPA, the impaired WoS is removed from the 303(d) list. A separate list is maintained for WoS with approved TMDLs.

Any construction site whose discharges are released into a WoS listed on the 303(d) List or for which an EPA-approved TMDL has been developed must address the specific pollutant set forth in the TMDL and/or potential pollutants for the impairment. The SWPPP must include a description of BMPs to address these pollutants.

The primary permittee and/or contractor must ensure that the construction site discharges remain in compliance with the State's water quality standards. To do so, these parties will have to ensure the function of all approved BMPs to handle the specific pollutant.

Construction Stormwater Discharges are expected to contain pollutants that contribute and/or can cause the following impairments to receiving water bodies: BIO (Macroinvertebrate Community), Turbidity, TP (Total Phosphorus), TN (Total Nitrogen), CHLA (Chlorophyll-a), and Fecal Coliform in waters classified for Shellfish Harvesting in the coastal zone. The presence of any of these impairments in receiving waters will require approval control of the site's construction stormwater discharges. Information on each of these impairments and how to treat stormwater runoff for these impairments has been provided below.

Impairments Effected by Construction Site Discharges and Methods to Control Potential Pollutants Causing or Contributing to the Impairements

1. **BIO (Macroinvertebrate Community):** A balanced and varied group of Macroinvertebrate organisms is an indicator of a healthy stream that supports aquatic life. A balanced community can be defined as a natural, diverse group of organisms (including Macroinvertebrate) characterized by the ability to sustain itself through season changes, presence of food chain species and a lack of domination by pollutant tolerant or invasive species. If these conditions do not exist, then the site may be considered impaired due to the presence of an undesirable or non-existent Macroinvertebrate community. Sediment from construction sites may further threaten the propagation of these organisms.

   Address by: Examples include limiting the amount of disturbed area, designing sediment control BMPs to remove the maximum amount of sediment possible, immediate stabilization of disturbed areas, and other practices may be utilized to control the discharge of sediment from construction sites.

2. **Turbidity:** Turbidity can be generally defined as the "cloudiness" of a waterbody and may be caused by the growth of aquatic phytoplankton and the presence of suspended solids in the water column. In SC, a water quality standard for turbidity is applicable to all waters of the State (see R. 61-68 D. 11. for numeric targets by waterbody classification). Turbidity levels that exceed the water quality standard may reduce light penetration, thereby inhibiting aquatic flora growth, and may reduce the ability of fauna, such as fish, to absorb oxygen across their gills.

   Address by: Examples include limiting the amount of disturbed area, designing sediment control BMPs to remove the maximum amount of sediment possible, immediate stabilization of disturbed areas, and other practices may be utilized to control the discharge of sediment from construction sites.

3. **TP (Total Phosphorus):** Similar to total nitrogen, TP is an essential nutrient for the propagation of aquatic life. In SC, a water quality standard for TP is applicable to lakes greater than 40 acres (see R. 61-68 D. 11. for numeric and narrative targets). At acceptable levels, TP is assimilated by aquatic flora ensures the propagation of an overall balanced, indigenous aquatic community. TP levels that exceed the water quality standard are considered impaired and may cause negative impacts to the overall heath of the aquatic community by promoting excessive algal growth in lakes. Phosphorous may enter a site's stormwater when excess amounts of the nutrient are applied to the site during temporary or final stabilization.

   Address by: To prevent this soil should be tested to determine the quantity of the nutrient present in the soil and the correct amount that needs to be added so that it is absorbed by the vegetation.

4. **TN (Total Nitrogen):** Similar to total phosphorus, TN is an essential nutrient for the propagation of aquatic life. In SC, a water quality standard for TN is applicable to lakes greater than 40 acres (see R. 61-68 D. 11. for numeric and narrative targets). At acceptable levels, TN is assimilated by aquatic flora and ensures the propagation of an overall balanced, indigenous aquatic community. TN levels that exceed the water quality standard are considered impaired and may cause negative impacts to the overall heath of the aquatic community by promoting excessive algal growth in lakes. Nitrogen may enter a site's stormwater when excess amounts of the nutrient are applied to the site during temporary or final stabilization

   Address by: Examples include that the soil should be tested to determine the quantity of the nutrient present in the soil and the correct amount that needs to be added so that it is absorbed by the vegetation.

5. **Chlorophyll-a (CHLA):** CHLA is a pigment present in the cells of photosynthetic flora and some algal species. The presence of CHLA in an aquatic environment is a water quality indicator of the overall productivity in the aquatic system. CHLA is linked to the levels of TP, TN and light penetration in the water column. In SC, a water quality standard for CHLA is applicable to lakes greater than 40 acres (see R. 61-68 D. 11. for numeric and narrative targets). CHLA levels that exceed the water quality standard may suggest that other undesirable water quality impacts are present as the aquatic system may be too productive to support the propagation of an overall balanced, indigenous aquatic community. Excess nutrients may discharge from a construction site during temporary and final stabilization. Limiting the amount of phosphorus and nitrogen applied while establishing vegetation will prevent excessive levels of CHLA in receiving waters.

   Address by: Examples include that the soil should be tested to determine the quantity of the nutrients present in the soil and the correct amount that needs to be added so that it is absorbed by the vegetation.

6. **Fecal Coliform (FC) in Shellfish Harvesting waters:** Fecal Coliform is an indicator bacteria for other pathogens which may be present in a waterbody. Shellfish Harvesting Waters are tidal salt waters protected for shellfish harvesting and must be protected to a higher standard than other waters because of the risk to human health posed by ingesting shellfish from areas with high levels of bacteria. Bacteria levels increase following rain events. Potential sources of bacteria on construction sites include improperly located porta-johns and litter that may attract rodents and other animals.

   Address by: Porta-johns should be placed away from WoS and not placed on catch basins and other drainage structures. Litter and construction debris should be placed in identified areas and emptied on a routine basis.

Impairment Sources and Prevention

Construction sites can contribute to these impairments directly through the release of excess soil and/or nutrients within stormwater runoff. For this reason, proper sediment and erosion control BMPs should be implemented and the design of the stormwater management systems, during both construction and post-construction, should address the control of stormwater runoff. A reduction in the volume released or the rate at which this volume is released can significantly improve the quality of stormwater runoff and limit the amount of the pollutants that contribute to the above listed impairments.

As an example, sediment basins and/or traps should be used during construction to allow for sedimentation of soils/nutrients, and to control the release of stormwater into the impaired water body. Vegetated Detention and Infiltration structures should be implemented as post-construction BMPs to control stormwater volumes. Caution is advised when using fertilizers to reach Final Stabilization; excess fertilizer can contributes to each of the above listed impairments.

Site-Specific Requirements

This construction site's discharges drain into WoS that is either Impaired or has an established TMDL for the following impairment(s): BIO (macroinvertebrate), turbidity, Total Phosphorus, Total Nitrogen, Chlorophyll-a, and Fecal Coliform. Due to the possibility of pollutants in construction stormwater discharges from this site that may contribute to any of these impairments, the following must be conducted throughout the lifespan of all land-disturbing activities at this site:

- Monthly monitoring of the construction site's outfalls;
- Biweekly inspections of all the primary sediment control BMPs;
- Employee training/acknowledgement during the Pre-Construction Meeting;
- Installation of additional BMPs to meet the water quality standards (as directed by the SWPPP preparer and as approved by the regulating agency); and
- All sediment control BMPs have been designed to meet or exceed an 80% trapping efficiency.

Additionally post-construction BMPs may be required to be installed, once final stabilization is reached, to address any established TMDL or Impairment once construction operations have been completed.

2.4 Critical Areas (CZC only)

Instructions: *This section can be used to address section 3.2.4.B of the CGP. Identify all Critical Areas located within and/or directly adjacent to the proposed disturbed areas. Identify all impacts to any Critical Areas, which includes coastal waters, tidelands, beaches, and beach/dune systems.*

Section 3

Compliance Requirements

3.1 SWPPP Availability

Instructions: *This section can be used to address section 3.1.6 of the CGP. Identify where the copy of the On-Site SWPPP (OS-SWPPP) is being retained, either on-site or off-site, as allowed by the CGP. List any other applicable requirements from the CGP that will be beneficial to determine where to retain the OS-SWPPP and when and to whom it will need to be made available.*

3.2 Pre-Construction Conferences

Instructions: *This section can be used to address section 4.1 of the CGP. Include information on when a Pre-Construction Conference is required and who is responsible to relay the requirements of the approved OS-SWPPP to all those responsible for performing construction activities at the site. Identify where the Pre-Construction Conference is to be held and site the documentation that was use to record the attendance of this meeting (See Appendix G).*

3.3 Inspection Requirements

Instructions: *This section can be used to address section 4.2 of the CGP. Identify the scope and frequency of all site inspections. List the inspector qualifications for the proposed construction site and identify where the inspection reports are to be stored (See Appendix E). Reference the use of rain gauges and a rainfall log (See appendix F).*

3.4 Maintenance Requirements

Instructions: *This section can be used to address section 4.3 of the CGP. Include references of the maintenance of all proposed BMPs, whether this information is provided within the SWPPP document or within the Construction Site Plans.*

Include Information on any required maintenance for permanent BMPs and reference the submitted maintenance agreement and permanent maintenance plans.

3.5 Record Keeping

Instructions: *This section can be used to address section 3.1.1.H.V.(h). Identify all required logs used to track the progress, the compliance, the modifications, and those associated for performing work at the construction site. Reference the location of these logs within the OS-SWPPP Appendices.*

3.6 Final Stabilization

Instructions: *This section can be used to address how the site is to reach final stabilization, through the use of permanent seeding, impervious areas, and other permanent BMPs. It should also note that once final stabilization has been reached on all disturbed areas, the Notice of Termination is to be submitted.*

Appendix A

Site Maps

To develop a site-specific SWPPP for a construction map, an assortment of site maps must be used in addition to an on-site assessment to develop an effective stormwater sediment and erosion control plan. The maps located in this appendix have been obtained from various sources, or have been developed by the SWPPP Preparer. Listed below is standard information on a few of the type of maps that may be found within this Appendix.

Locations Maps

A general location map is helpful to identify nearby water bodies in proximity to other properties, and can be a useful tool used to locate the site when on the road. This map should include the outlined project locations, labeled roadways, a North arrow and a scale. SWPPP Preparers may opt to locate this map on the first sheet of the construction site plans in lieu of including it in this appendix.

Site Maps

Site maps tend to go a step beyond a typically location map by adding zooming in on the limits of disturbance and identifying a number of features at the construction site related to land-disturbing activities and stormwater management practices. Each site map should include the following: Stormwater flow directions and discharge locations, Areas and features to be protected, Outline of disturbed areas, Locations of all major BMPs, Areas to remain stabilized, and Adjacent features (e.g., road and water bodies).

Topographic Maps

Topographic Maps can be very useful when determining the existing contours at a construction site, not to mention the existing drainage patterns. These maps must include the project boundary outline, route of runoff from site to nearest waterbody shown, and adjacent road names. These maps are readily available on the Internet (e.g., www.terraserver.com) or by contacting the US Geological Survey Store (http://store.usgs.gov).

Soils Maps

Soils Maps are helpful tools used to determine the soil types and other soil characteristics that are located at a construction site. Each soils map must contain the project boundary outline and the predominate soil types found at the site. Soils Maps can be readily obtain online from the NRCS (http://soils.usda.gov).

Floodway Maps

Floodway Maps are used to determine the location of the 100-yr Flood Plain and other related flooding issues at or adjacent to the construction site. Each Floodway Map must contain the project boundary outline and a legend. These maps can be readily obtain online from FEMA (www.fema.gov).

Appendix B

Drainage Maps

Drainage maps become an essential tool when both developing and reviewing hydrology models of a construction site during the various phases of developing such a site (i.e. pre-development conditions, construction conditions, and post-development conditions). Typically these maps are enhanced site maps that add the features of drainage basins outlines and their respective outfall markers. Each SWPPP must contain, at a minimum, a pre-development and a post-development drainage map for the entire on-site area and adjacent off-site areas that contribute runoff to any of the marked outfall locations.

Additional drainage maps should also be included for any sediment control BMP in which sediment trapping efficiency calculations are required to be submitted. A drainage map for “During Construction” conditions should also be included if the basin and subbasin drainage patterns differ from both the pre-development and post-development patterns.

All provided drainage maps must clearly correspond to any calculations submitted for review, the outfall locations chosen for comparing runoff rates and the total drainage area analyzed (from pre- to post-development conditions) may not change. However, the immediate drainage areas contributing to each outfall location may shift.

Each Drainage Map should be provide on an 11x17 sheet and must show the contours for the specific stage of construction each map represents.

Appendix C

Additional Approvals/Certifications

This appendix has been provided as a catchall to store any additional correspondences that may be required to either obtain coverage under the current CGP or to implement land-disturbing activities at a construction.

Examples and descriptions of such correspondences have been listed below. All associated correspondences and approval for this site-specific SWPPP can be located on the following pages.

Coastal Zone Consistency Certification

A **Coastal Zone Consistency** (CZC) Certification needs to be obtained for all land disturbing activities located within any of the eight coastal counties (Beaufort, Berkeley, Charleston, Colleton, Dorchester, Georgetown, Horry and Jasper) before applying coverage under the NPDES Permit Program. These certifications establish that all land and water uses within these critical areas are consistent with both the State's Coastal Zone Management Plan (SCCZMP) and the Federal Coastal Zone Management Act.

CZC Certifications ensures that any land disturbance activities will be conducted in a manner in which they preserve, protect, develop, and where possible, restore and enhance the resources located within South Carolina's coastal zone.

Please contact the DHEC-OCRM office nearest you for all information on the types of permits or certifications needed for your particular project. More information on 401 Certifications can be found on DHEC's website via the following link:

http://www.scdhec.gov/environment/water/401.htm

USACE's Jurisdictional Determinations

The procedure of identifying and locating jurisdictional waters of the US regulated by the Corps under Section 404 of the Clean Water Act and Section 10 of the Rivers & Harbors Act of 1899 is commonly referred to as the "**Jurisdictional Determination Process**", a "wetland determination" or a "delineation". In general, these determinations are good for five years from the date the Corps notifies you in writing that you have accurately delineated the jurisdictional features on your property.

This survey procedure establishes a line that identifies and separates the Corps regulated areas from non-regulated areas. Regulated (i.e., jurisdictional) areas can include wetlands, stream channels, rivers, lakes, ponds and coastal and offshore waters.

The JD process is essential when investigating, planning, designing, or submitting an application for a permit from the Corps to determine if the proposed work will occur in wetlands or waters of the US. More information on Jurisdictional Determinations can be found on USACE's website via the following link, http://www.sac.usace.army.mil/.

USACE's Section 404 Permits

Section 404 of the Clean Water Act regulates the discharge of dredged, excavated, or fill material in wetlands, streams, rivers, and other U.S. waters. The U.S. Army Corps of Engineers is the federal agency authorized to issue Section 404 Permits for certain activities conducted in wetlands or other U.S. waters.

Depending on the scope of the project and method of construction, certain farming activities may require this permit. Examples include ponds, embankments, and stream

channelization. More information on Section 404 Permits can be found on USACE's website via the following link, http://www.sac.usace.army.mil/.

SC DHEC 401 Water Quality Certification

All activities requiring a Federal 404 permit (a U.S. Army Corps of Engineers permit for the discharge of dredged or fill material) result in a discharge to waters or wetlands, so SCDHEC must take certification action on all 404 permit applications. U.S. Coast Guard Permits and Federal Energy Regulatory Commission Permits also require states to take Water Quality Certification action.

During review of applications for Water Quality Certification, the Department looks at whether or not there are feasible alternatives to the activity, if the activity is water dependent, and the intended purpose of the activity. Certification is denied if the activity will adversely affect existing or designated uses. The Federal permit cannot be issued if certification is denied. Regulation 61-101 entitled Water Quality Certification directs the Department in processing applications for certification.

More information on 401 Certifications can be found on DHEC's website via the following link, http://www.scdhec.gov/environment/water/401.htm.

Jurisdictional Floodplain Management Certifications

South Carolina's Department of Health and Environmental Control does not regulate the placement of fill and/or fill materials within a floodplain. This approval needs to be granted by local authorities, either county or city engineers.

Contact your local regulating authorities to obtain information on how to obtain the proper approvals for the placement of fill in floodplains.

Other Local Ordinance Certifications and Approvals

Any additional documentation certifying that you meet any local, state, or federal ordinances should be included in this appendix. If you have any questions on what should be kept in this appendix, please contact SC DHEC's Bureau of Water, 803-898-4300, and ask to speak to someone in the Stormwater Permitting Section.

Appendix D

Engineering Reports

Hydrologic Analysis

Each hydrologic analysis was performed in a manner consistent with SC Regulations 72-300 and the SC DHEC Stormwater Management BMP Handbook. Each analysis, at a minimum, meets the following requirements or guidelines:

- Analysis Points (Outfalls) for comparing runoff rates and the total drainage area analyzed do not change from pre- to post-development conditions (although the immediate drainage areas contributing to each analysis point my shift);
- Post-development and Construction runoff peak discharges for the 2-yr and 10-yr storm events are less then Pre-Development peak discharges at **each** outfall; and
- Each analysis was performed using a SCS 24-hour storm event.

Detention Analysis

Each detention structure analysis was performed using a volume-based hydrograph for the 2-, 10-, 25-, and 100-yr SCS 24-hour storm event. (TR-55 does not perform a full pond routing, and the rational method cannot be used to provide a full pond routing.) Also, for each detention structure a Stage-Storage-Discharge Relationship for the outlet structure has been provided/generate by the modeling software.

If a rating curve for the outlet structure had to be generated externally from the modeling software, the date and equations use to rate the outlet structure must also be included in this appendix.

Each of the detention ponds/basins have been modeled/designed to meet the following requirements:

- Maximum Water Surface Elevation (WSE) within the detention pond/basin for the 10-year storm event is below the emergency spillway with 0.5-ft of freeboard between maximum WSE for the 10-year storm and the emergency spillway;
- Maximum Water Surface Elevation (WSE) within the detention pond/basin for the 100-year storm event is below the emergency spillway with 0.5-ft of freeboard between maximum WSE for the 100-year storm and the embankment; and
- The detention structure completely dewaters within 72 hours.

Appendix E

Inspection Log and Reports

SWPPP Inspection Log

Name of Construction Site	Location of Construction Site

Date of Inspection	Inspector Name	Does Inspection Report require maintenance of installed BMPs?	
		☐ Yes	☐ No
		☐ Yes	☐ No
		☐ Yes	☐ No
		☐ Yes	☐ No
		☐ Yes	☐ No
		☐ Yes	☐ No
		☐ Yes	☐ No
		☐ Yes	☐ No
		☐ Yes	☐ No
		☐ Yes	☐ No
		☐ Yes	☐ No
		☐ Yes	☐ No

SWPPP Inspection Log (Continued)			
Date of Inspection	**Inspector Name**	**Does Inspection Report require maintenance of installed BMPs?**	
		☐ **Yes**	☐ **No**
		☐ **Yes**	☐ **No**
		☐ **Yes**	☐ **No**
		☐ **Yes**	☐ **No**
		☐ **Yes**	☐ **No**
		☐ **Yes**	☐ **No**
		☐ **Yes**	☐ **No**
		☐ **Yes**	☐ **No**
		☐ **Yes**	☐ **No**
		☐ **Yes**	☐ **No**
		☐ **Yes**	☐ **No**
		☐ **Yes**	☐ **No**

Appendix F

Rainfall Log and Reports

SWPPP Rainfall Records (January - June)										Year:	
January	Rainfall	**February**	Rainfall	**March**	Rainfall	**April**	Rainfall	**May**	Rainfall	**June**	Rainfall
1		1		1		1		1		1	
2		2		2		2		2		2	
3		3		3		3		3		3	
4		4		4		4		4		4	
5		5		5		5		5		5	
6		6		6		6		6		6	
7		7		7		7		7		7	
8		8		8		8		8		8	
9		9		9		9		9		9	
10		10		10		10		10		10	
11		11		11		11		11		11	
12		12		12		12		12		12	
13		13		13		13		13		13	
14		14		14		14		14		14	
15		15		15		15		15		15	
16		16		16		16		16		16	
17		17		17		17		17		17	
18		18		18		18		18		18	
19		19		19		19		19		19	
20		20		20		20		20		20	
21		21		21		21		21		21	
22		22		22		22		22		22	
23		23		23		23		23		23	
24		24		24		24		24		24	
25		25		25		25		25		25	
26		26		26		26		26		26	
27		27		27		27		27		27	
28		28		28		28		28		28	
29		29		29		29		29		29	
30				30		30		30		30	
31				31				31			

SWPPP Rainfall Records (July - December)										Year:	
July	Rainfall	**August**	Rainfall	**September**	Rainfall	**October**	Rainfall	**November**	Rainfall	**December**	Rainfall
1		**1**		**1**		**1**		**1**		**1**	
2		**2**		**2**		**2**		**2**		**2**	
3		**3**		**3**		**3**		**3**		**3**	
4		**4**		**4**		**4**		**4**		**4**	
5		**5**		**5**		**5**		**5**		**5**	
6		**6**		**6**		**6**		**6**		**6**	
7		**7**		**7**		**7**		**7**		**7**	
8		**8**		**8**		**8**		**8**		**8**	
9		**9**		**9**		**9**		**9**		**9**	
10		**10**		**10**		**10**		**10**		**10**	
11		**11**		**11**		**11**		**11**		**11**	
12		**12**		**12**		**12**		**12**		**12**	
13		**13**		**13**		**13**		**13**		**13**	
14		**14**		**14**		**14**		**14**		**14**	
15		**15**		**15**		**15**		**15**		**15**	
16		**16**		**16**		**16**		**16**		**16**	
17		**17**		**17**		**17**		**17**		**17**	
18		**18**		**18**		**18**		**18**		**18**	
19		**19**		**19**		**19**		**19**		**19**	
20		**20**		**20**		**20**		**20**		**20**	
21		**21**		**21**		**21**		**21**		**21**	
22		**22**		**22**		**22**		**22**		**22**	
23		**23**		**23**		**23**		**23**		**23**	
24		**24**		**24**		**24**		**24**		**24**	
25		**25**		**25**		**25**		**25**		**25**	
26		**26**		**26**		**26**		**26**		**26**	
27		**27**		**27**		**27**		**27**		**27**	
28		**28**		**28**		**28**		**28**		**28**	
29		**29**		**29**		**29**		**29**		**29**	
30		**30**		**30**		**30**		**30**		**30**	
31		**31**				**31**				**31**	

Appendix G

Additional Site Logs and Records

SWPPP Pre-Construction Conference Attendance Log	
Date & Time	**Description/Outline and Name of the Presenter of SWPPP and Site Requirements**

Name	Company	Signature

SWPPP Pre-Construction Conference Attendance Log (Continued)

Name	Company	Signature

SWPPP Contractor & Sub-Contractor Log

Name of Construction Site	Location of Construction Site

Company/Individual Name		Work Responsibilities
1.)		
Start Date:		
Completion Date:		
2.)		
Start Date:		
Completion Date:		
3.)		
Start Date:		
Completion Date:		
4.)		
Start Date:		
Completion Date:		
5.)		
Start Date:		
Completion Date:		
6.)		
Start Date:		
Completion Date:		
7.)		
Start Date:		
Completion Date:		
8.)		
Start Date:		
Completion Date:		
9.)		
Start Date:		
Completion Date:		
10.)		
Start Date:		
Completion Date:		

SWPPP Contractor & Sub-Contractor Log (Continued)		
11.)		
Start Date:		
Completion Date:		
12.)		
Start Date:		
Completion Date:		
13.)		
Start Date:		
Completion Date:		
14.)		
Start Date:		
Completion Date:		
15.)		
Start Date:		
Completion Date:		
16.)		
Start Date:		
Completion Date:		
17.)		
Start Date:		
Completion Date:		
18.)		
Start Date:		
Completion Date:		
19.)		
Start Date:		
Completion Date:		
20.)		
Start Date:		
Completion Date:		
21.)		
Start Date:		
Completion Date:		

SWPPP Modification Log

Name of Construction Site	Location of Construction Site

Type of Modification		Description of Modification		Location of Modification
☐ Major	☐ Minor			
Start Date:				
Completion Date:				
Reason for Modifications:			Approved/Implemented By:	
Type of Modification		**Description of Modification**		**Location of Modification**
☐ Major	☐ Minor			
Start Date:				
Completion Date:				
Reason for Modifications:			Approved/Implemented By:	
Type of Modification		**Description of Modification**		**Location of Modification**
☐ Major	☐ Minor			
Start Date:				
Completion Date:				
Reason for Modifications:			Approved/Implemented By:	
Type of Modification		**Description of Modification**		**Location of Modification**
☐ Major	☐ Minor			
Start Date:				
Completion Date:				
Reason for Modifications:			Approved/Implemented By:	
Type of Modification		**Description of Modification**		**Location of Modification**
☐ Major	☐ Minor			
Start Date:				
Completion Date:				
Reason for Modifications:			Approved/Implemented By:	

SWPPP Modification Log (Continued)

Name of Construction Site	Location of Construction Site

Type of Modification		Description of Modification	Location of Modification
☐ Major ☐ Minor			
Start Date:			
Completion Date:			
Reason for Modifications:		Approved/Implemented By:	

Type of Modification		Description of Modification	Location of Modification
☐ Major ☐ Minor			
Start Date:			
Completion Date:			
Reason for Modifications:		Approved/Implemented By:	

Type of Modification		Description of Modification	Location of Modification
☐ Major ☐ Minor			
Start Date:			
Completion Date:			
Reason for Modifications:		Approved/Implemented By:	

Type of Modification		Description of Modification	Location of Modification
☐ Major ☐ Minor			
Start Date:			
Completion Date:			
Reason for Modifications:		Approved/Implemented By:	

Type of Modification		Description of Modification	Location of Modification
☐ Major ☐ Minor			
Start Date:			
Completion Date:			
Reason for Modifications:		Approved/Implemented By:	

SWPPP Soil Stabilization Log

Name of Construction Site	Location of Construction Site

Type of Stabilization		Description of Stabilization	Location of Stabilization
☐ Final ☐ Temporary			
Initiate Date:			
Completion Date:			
Additional work proposed for this area:		Inspection Frequency for Stabilized Area:	
Type of Stabilization		**Description of Stabilization**	**Location of Stabilization**
☐ Final ☐ Temporary			
Initiate Date:			
Completion Date:			
Additional work proposed for this area:		Inspection Frequency for Stabilized Area:	
Type of Stabilization		**Description of Stabilization**	**Location of Stabilization**
☐ Final ☐ Temporary			
Initiate Date:			
Completion Date:			
Additional work proposed for this area:		Inspection Frequency for Stabilized Area:	
Type of Stabilization		**Description of Stabilization**	**Location of Stabilization**
☐ Final ☐ Temporary			
Initiate Date:			
Completion Date:			
Additional work proposed for this area:		Inspection Frequency for Stabilized Area:	
Type of Stabilization		**Description of Stabilization**	**Location of Stabilization**
☐ Final ☐ Temporary			
Initiate Date:			
Completion Date:			
Additional work proposed for this area:		Inspection Frequency for Stabilized Area:	

SWPPP Modification Log (Continued)

Name of Construction Site	Location of Construction Site

Type of Stabilization		Description of Stabilization		Location of Stabilization
☐ Final ☐ Temporary				
Initiate Date:				
Completion Date:				
Additional work proposed for this area:			Inspection Frequency for Stabilized Area:	
Type of Stabilization		**Description of Stabilization**		**Location of Stabilization**
☐ Final ☐ Temporary				
Initiate Date:				
Completion Date:				
Additional work proposed for this area:			Inspection Frequency for Stabilized Area:	
Type of Stabilization		**Description of Stabilization**		**Location of Stabilization**
☐ Final ☐ Temporary				
Initiate Date:				
Completion Date:				
Additional work proposed for this area:			Inspection Frequency for Stabilized Area:	
Type of Stabilization		**Description of Stabilization**		**Location of Stabilization**
☐ Final ☐ Temporary				
Initiate Date:				
Completion Date:				
Additional work proposed for this area:			Inspection Frequency for Stabilized Area:	
Type of Stabilization		**Description of Stabilization**		**Location of Stabilization**
☐ Final ☐ Temporary				
Initiate Date:				
Completion Date:				
Additional work proposed for this area:			Inspection Frequency for Stabilized Area:	

Appendix H

Construction General Permit SCR100000

A copy of the NPDES General Permit for Stormwater Discharges from Construction Activities (SCR100000) can be found at the following address:

http://www.scdhec.gov/environment/water/swater/docs/CGP-permit.pdf

Appendix I. Covenants for Permanent Maintenance of Stormwater Systems

BERKELEY COUNTY, SOUTH CAROLINA
Stormwater Management Program

1003 Highway 52 Suite 120
Moncks Corner, SC 29461-6120
(843) 719-4195

Covenants for Permanent Maintenance of Stormwater Systems

THE TERM STORMWATER SYSTEMS MAY REFER TO WATER QUANTITY AND/OR WATER QUALITYFACILITIES, AND BEST MANAGEMENT PRACTICES, BMPS (i.e., detention basins, retention basins, stormwater ponds, stormwater wetlands, water quality buffers, swales, ditches, pipes, inlets, separators, filtering devices, water quality structures, etc.)

THIS Covenant made and entered into this_____ day of_____, 20_____,

by and between (Insert Full Name of property owner) _____ hereinafter called the "Owner", and Berkeley County, South Carolina hereinafter called the "County".

WHEREAS, the Property Owner is the owner of certain real property described as Berkeley County Tax Map Number, (TMS#)_____ as recorded by deed in the Berkeley County Register of Deeds (ROD), Deed Book_____ Page_____, hereinafter called the "Property;" and

WHEREAS, the Owner is proceeding to, or has, made improvements on the Property; and

WHEREAS, the Site Plan/Subdivision Plan known as (Name of Plan/Development):

_____

hereinafter called the "Plan," which is expressly incorporated herein by reference, as approved, or to be approved, by the County, provides for the construction and maintenance of stormwater facilities, BMPs, and improvements within the confines of the Property; and

WHEREAS, the County requires that on-site stormwater facilities, BMPs, and improvements as shown on the Plan be constructed and adequately maintained by the Owner, its successors and assigns, including any homeowners association;

WHEREAS, the Owner, its successors and assigns, understands that the execution and adherence to the provisions of this Covenant is a condition precedent to the County's permitting, and/or approving the Site Plan, Storm Water Management Plan, and/or Subdivision Plan for the Property and the development located thereon;

NOW, THEREFORE, in consideration of the foregoing premises and mutual covenants the parties hereby agree as follows:

1. The on-site stormwater facilities, BMPs, and, improvements shall be constructed, operated, and maintained by the Owner, its successors and assigns, in accordance with the approved Plan and specifications identified in the Plan, as well as in accordance with State and federal requirements, the Berkeley County Stormwater Management Ordinance and Stormwater Design Standards Manual, and any and all other applicable County ordinances.

2. The Owner, its successors and assigns, including any homeowners association, shall adequately maintain the stormwater facilities, BMPs, and improvements on the Property. Adequate maintenance required by this Covenant shall include, but is not limited to, scheduled and corrective maintenance as described on/in the approved Plan and/or as described in the Berkeley County Stormwater Design Standards Manual for all stormwater facilities, BMPs, and improvements intended to manage and/or control stormwater on the Property, with such facilities, BMPs, and improvements to expressly include, but not be limited to pipes, drainage structures, ditches, swales, vegetation, berms, pond areas, outlet structures, maintenance shelf(s) and access roads, or any other improvement associated with stormwater on the Property but excluding any such improvements located on, under, or within any publicly owned or dedicated rights-of-way in which State or County has accepted maintenance of the roadways and/or drainage facilities. Adequate maintenance is herein defined as keeping such stormwater facilities, BMPs, and improvements in good working condition such that they satisfactorily perform their intended design functions.

3. The Owner, its successors and assigns, shall inspect the stormwater facilities, BMPs, and improvements as described on/in the approved Plan and/or as described in the Berkeley County Stormwater Design Standards Manual to assure safe and proper functioning of the stormwater facilities, BMPs, and improvements located on the Property. Any and all deficiencies identified during such inspections shall be repaired as necessary at the Owner's expense. A detailed repair plan may be required to be prepared by a professional engineer, licensed in the State of South Carolina.

4. The Owner, its successors and assigns, hereby grants permission to the County, its authorized agents and employees, to enter upon the Property and to inspect the stormwater facilities, BMPs, and improvements as deemed necessary by the County for purposes of protecting the public health, safety or welfare, for purposes of investigating or inspecting any reported or suspected deficiencies in the stormwater facilities, BMPs, and improvements on the Property, for purposes of responding to or investigating citizens' complaints relating to the management or control of stormwater on the Property, or for any other purpose deemed necessary by the County. The County shall provide the Owner, its successors and assigns, with a copy of any inspection findings, as well as a directive to commence with any required repairs. To the extent that the County does not agree with or to the contemplated repairs proposed by the Owner, the County may submit an alternate repair plan to the Owner or require the Owner to submit a detailed repair plan prepared by a professional engineer, licensed in the State of South Carolina.

5. In the event the Owner, its successors and assigns, fails to maintain the stormwater facilities, BMPs, and improvements on the Property in good working condition acceptable to the County, or fails to make repairs as specified in the inspection report within a reasonable time frame as established by the County, with such time frame not to be shorter than thirty (30) days, the County may enter upon the Property and take any and all action necessary to correct deficiencies identified in the inspection report. The Owner, its successors and assigns, shall be responsible for any and all expenses incurred by the County in taking such corrective action. This provision shall not be construed to allow the County to erect any structure of a permanent nature on the land of the Owner outside the easement for the stormwater management/BMP facilities. It is expressly understood and agreed that this Covenant imposes no obligation or responsibility on the County to routinely maintain or repair any stormwater facilities, BMPs, and improvements located on the property.

6. In the event that the County performs or undertakes work of any kind pursuant to this Covenant or expends any funds or resources in performance of said work for labor, use of equipment, supplies, material, and the like, the Owner, its successors and assigns, shall reimburse the County upon demand, within thirty (30) days of receipt of same.

7. This Covenant shall impose no liability on the County with respect to the maintenance or repair of any stormwater facilities, BMPs, and improvements on the Property, nor does the County assume any obligation or duty to undertake or perform any action allowed for, or permitted by, this Covenant. The Owner, its successors and assigns, further agrees to indemnify and hold the County harmless from any liability arising out of the management, operation, maintenance, or failure of any stormwater facilities, BMPs, and improvement subject to this Covenant.

8. Notwithstanding any right extended to the County pursuant to this Covenant, it is expressly recognized and acknowledged that the County retains all prosecutorial rights and remedies available to it, including the enforcement of any and all applicable County ordinances, against the Owner, its successors and assigns, relating to the operation, maintenance, and/or repair of stormwater facilities, BMPs, and improvements located on the Property.

9. This Covenant shall be recorded among the land records of Berkeley County, South Carolina, and shall constitute running with the land, and shall be binding on the Owner, its administrators, executors, assigns, heirs and any other successors in interests, including homeowners association.

IN WITNESS WHEROF the undersigned have caused this Covenant to be executed on the date first written above.

WITNESSES: OWNER:

_____ _____

Witness: Individual/Company/Corporation/Partnership Name

_____ By:_____

Witness: Title:

STATE OF SOUTH CAROLINA)
) ACKNOWLEDGEMENT
COUNTY OF BERKELEY)

I, the undersigned Notary Public, do hereby certify that _____

_____,

personally appeared before me this day and acknowledged the due execution of the foregoing instrument WITNESS my hand and seal this_____day of__, 20_____.

_____(SEAL)

Notary Public

My Commission Expires:_____

Appendix J. Transfer of Ownership Application

BERKELEY COUNTY, SOUTH CAROLINA
Stormwater Management Program

1003 Highway 52 Suite 120
Moncks Corner, SC 29461-6120
(843) 719-4195

Transfer of Ownership Application

A. Project Name: _____
B. Construction Application Number: _____
C. NPDES Permit Coverage Number (if applicable): SCR10_____
D. New Applicant Name: _____
E. Address: _____
City: _____, State: _____ Zip: _____
Phone: _____ Mobile: _____ Fax: _____
Email Address (optional): _____
F. Property Info: ☐ Check Box if same as above
G. Address: _____
City: _____, State: _____ Zip: _____
Tax Map Number(s):_____
H. Original Applicant Name: _____
Address: _____
City: _____, State: _____ Zip: _____
Phone: _____ Mobile: _____ Fax: _____
Email Address (optional): _____
I. Transfer Information: Transfer Date _____
   a. Is the entire CA being transferred to a new owner? ☐ Yes ☐ No
   b. Is this a subdivision where only a lot or a group of lots are being transferred? ☐ Yes ☐ No
   c. If Yes to Item I.b, list the lot, or group of lots being transferred: _____
J. Other Information:
   a. If there are no modifications being made to the plans, include five (5) sets of plans with signed Designer and Applicant's certification statements.
   b. If this is a subdivision where a lot or group of lots are being transferred, include a plat sheet with the lot or group of lots that are being transferred clearly outlined.

Original Applicant's Certification
I hereby relinquish the responsibility and ownership of the CA listed in Item B above. I realize that the construction responsibility for the identified project/lots/group of lots now belongs to the new applicant.

Original Applicant's Printed Name Original Applicant's Signature Date

New Applicant's Certification
I hereby certify that all construction and/or development will be done pursuant to this plan and I am responsible for the construction activities and related maintenance thereof. Berkeley County authorities will be allowed to enter the project site for the purpose of on-site inspections.

New Applicant's Printed Name New Applicant's Signature Date

Appendix K. Best Management Practice Inspection Checklist

BERKELEY COUNTY, SOUTH CAROLINA
Stormwater Management Program

1003 Highway 52 Suite 120
Moncks Corner, SC 29461-6120
(843) 719-4195

Best Management Practice Inspection Checklist

Below are the items that County Inspectors will address during each site inspection.

1. Are contractor's maintenance logs available?
2. Are contractor's set of plans available on-site?
3. What is the current status of construction: beginning, middle, nearing completion, complete?
4. Have areas been clear cutting? If so, does the total area exceed the 10-acre limit?
5. Are there any waterbody impacts (sediment, oil, grease, etc)?
6. Are there any roadway impacts (sediments, damaged asphalt, etc.)?
7. Have any adjacent properties been negatively impacted? If so, what is the extent of the impacts?
8. Are there any air/dust impacts?
9. Are all tree protections in place and maintained? Enter any additional comments on tree protection.
10. Are all channels stabilized? Enter any additional comments on stabilized channels.
11. Is there any evidence of channel erosion? Enter any additional comments on channel erosion.
12. Are all inactive areas stabilized?
13. Are all inactive slopes stabilized?
14. Are all inactive stock piles stabilized?
15. Enter any additional comments on stabilization needs.
16. Are all erosion prevention and sediment control (EPSC) devices properly installed and maintained?
17. Do the EPSC devices provide adequate protection?
18. Are there any unneeded controls or are there any that need to be removed (closeout)?
19. Enter any additional comments on EPSC devices.
20. Are there any instances of erosion across the site? If so, what is the percentage?
21. Enter the re-inspection date based on condition of the site and offsite impact.
22. Enter any additional comments as necessary.
23. Is any enforcement action necessary?

Appendix L. Best Management Practices Suggested Uses Tables

Table L-1. Structural Stormwater Quality BMP Suggested Land Uses

BMP	Land Requirement	Single Family	Multi Family	Low Density Commercial	High Density Commercial	Low Density Industrial	High Density Industrial
Wet Storm Water Ponds	MODERATE - HIGH	X	X	X	X	X	X
Wet Extended Pond	MODERATE - HIGH	X	X	X	X	X	X
Micropool Extended Pond	MODERATE - HIGH	X	X	X		X	
Shallow Wetland	MODERATE - HIGH	X	X	X		X	
Extended Detention Shallow Wetland	MODERATE - HIGH	X	X	X		X	
Pond/Wetland System	MODERATE - HIGH	X	X	X		X	
Pocket Wetland	MODERATE	X	X		X		X
Bioretention Areas	MODERATE	X	X	X	X	X	X
Sand Filtration Facilities	LOW			X	X	X	X
Infiltration Trenches	MODERATE	X	X	X	X	X	X
Enhanced Dry Swales	HIGH	X	X	X		X	
Pre-Fabricated Control Devices	LOW		X	X	X	X	X

Table L-2. Structural Stormwater Quality BMP Characteristics

BMP	Maintenance Burden	Costs	Aesthetically Pleasing	Provide Habitat	Drainage Area (Acres)	Soils
Wet Storm Water Pond	LOW	LOW	X	X	10 MIN 25 PREFERRED	HSG A SOILS MAY REQUIRE POND LINER HSG B SOILS MAY REQUIRE INFILTRATION TESTING
Wet Extended Pond with Aquatic Bench	LOW	LOW	X	X	10 MIN 25 PREFERRED	
Micropool Extended Pond	MODERATE	LOW	X	X	10 MIN	
Shallow Wetland	MODERATE	MODERATE	X	X	20 MIN	HSG A AND B SOILS MAY REQUIRE LINER
Extended Detention Shallow Wetland	MODERATE	MODERATE	X	X	20 MIN	
Pond/Wetland System	MODERATE	MODERATE	X	X	20 MIN	
Pocket Wetland	HIGH	MODERATE	X	X	5 MIN	
Bioretention Areas	LOW	MODERATE	X	X	5 MAX	CLAY OR SILTY SOILS MAY
Sand Filtration Facilities	HIGH	HIGH			5 MAX 2 PREFFERED	REQUIRE PRETREATMENT
Infiltration Trenches	HIGH	HIGH			5 MAX	INFILTRATION RATE > 0.5 IN/HR
Enhanced Dry Swales	LOW	MODERATE			5 MAX	PERMEABLE SOIL
Pre-Fabricated Control Devices	HIGH	HIGH	X (HIDDEN)		VARIES	NO REQUIREMENT

Table L-3. Structural Stormwater Uses

BMP	Water Quality	Channel Protection	Flood Protection	TSS Removal	Nutrient Removal	Metal Removal	Bacterial Removal
Wet Stormwater Pond	X	X	X	HIGH	MODERATE	MODERATE	MODERATE
Wet Extended Pond with Aquatic Bench	X	X	X	HIGH	HIGH	MODERATE	MODERATE
Micropool Extended Pond	X	X	X	HIGH	MODERATE	MODERATE	NO DATA
Shallow Wetland	X	X	X	HIGH	HIGH	MODERATE	HIGH
Extended Detention Shallow Wetland	X	X	X	HIGH	HIGH	MODERATE	HIGH
Pond/Wetland System	X	X	X	HIGH	HIGH	MODERATE	HIGH
Pocket Wetland	X	X		HIGH	HIGH	MODERATE	HIGH
Bioretention Areas	X			HIGH	MODERATE	MODERATE	NO DATA
Sand Filtration Facilities	X			HIGH	MODERATE	MODERATE	MODERATE
Infiltration Trenches	X			HIGH	MODERATE	HIGH	HIGH
Enhanced Dry Swales	X			HIGH	MODERATE	MODERATE	LOW
Pre-Fabricated Control Devices	X			HIGH	LOW-HIGH	LOW-HIGH	LOW-HIGH

Table L-4. Structural Stormwater Quality Trapping Efficiency

BMP	Monitoring	Pollutant Removal Efficiency %				
		TSS	TP	TN	Nitrate Nitrogen	Other
Surface Sand Filters	Yes	85	55	35	Neg	Bacteria: 40 – 80 Metals: 35 – 90
Perimeter Sand Filters	Yes	80	65	45	Neg	Hydrocarbons: 80
Organic Sand Filter	Yes	95	40	35	Neg	Hydrocarbons: 80 Soluble P: Neg Metals: 85
Gravel Filter	Yes	80	80	65	75	Hydrocarbons: 85 Metals: 50 – 75
Dry Enhanced Swales	Yes	90	65	50	80	Metals: 80 – 90
Wet Enhanced Swales	Yes	80	20	40	50	Metals: 40 – 70
Plain Drainage Channel	Yes	30	10	0	0	Bacteria: Neg
Vegetated Drainage Channel	Yes	65	25	15	Neg	Hydrocarbons: 65 Metals: 20 – 5 0 Bacteria: Neg
Vegetated Filter Strip	Yes	70	10	30	0	Metals: 40 – 50

Should be used as a general guide to expected effectiveness and not for design purposes.

Appendix M. Stormwater Management Minimum Best Management Practices (BMPs)

STORMWATER MANAGEMENT
MINIMUM BEST MANAGEMENT PRACTICES (BMPs)

All land disturbance and/or construction activity in Berkeley County shall implement and comply with the following requirements. Additionally, if the site has an approved Construction Application and/or Stormwater Management Plan, stormwater management requirements and BMPs specified in the approved plan of development must be implemented.

1. The site shall have adequate erosion and sediment control measures as necessary to prevent the movement of sediment and/or pollutants off the property, into wetlands, and receiving waters. These measures shall be installed within 24-hours of land disturbance and maintained until the project is stabilized. Proper construction of these measures can be found in SCDES's BMP Manual. Manufacturers recommended installation and maintenance procedures shall be followed as applicable.

- The maximum distance from the crest of a hill to a section of silt fence is 100 feet. When the distance from a crest to the property boundary is greater than 100 feet, an intermediate row of silt fence shall be used, or another control measure shall be employed.

- The maximum slope steepness (perpendicular to silt fence line) is 2H:1V. When exceeded, slope drains shall be employed.

- A maximum of ¼ acre drainage per 100 linear feet of silt fence should be used. When this is exceeded, an intermediate row of silt fence shall be used, or another control measure shall be employed. Sediment accumulated along silt fence shall be removed when it reaches 1/3 the height of the fence.

2. Nearby stormwater inlets, manholes, etc. in the street or on this or adjacent property shall be protected using sediment tubes, check dams, or inlet protection devices. These measures will be maintained throughout the construction process until the site is stabilized as detailed below.

3. Construction entrances shall be provided at entrances/exits (maximum of 2) as necessary. The stone in the entrance/exit shall be maintained throughout the construction process until the site is stabilized as detailed below. Sediment tracked onto streets shall be removed immediately for proper disposal.

4. Stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than fourteen days (14) after work has ceased, unless activity in that portion of the site will resume within twenty-one days. Existing/natural vegetation should be preserved as much as possible.

5. A site is considered stabilized once the entire disturbed area has a vegetative cover with a density of 70%. Seeding should be accompanied or replaced with erosion control mats as necessary to achieve this density. Final or permanent stabilization is considered achieved once the entire disturbed area has a permanent vegetative cover with a density of 70%. Final stabilization shall be implemented within fourteen (14) days of completion of all construction activities. After final stabilization is achieved, all control measures shall be removed from the site.

6. Site must be graded to achieve positive drainage away from the building(s).

7. Site must be graded to accommodate any existing offsite stormwater runoff and shall not block any existing runoff onto and throughout the site.

8. The construction activity will not cause or contribute to altering the natural drainage flow pattern of the site or adjacent properties. If the site is part of a larger common plan of development, the drainage must be constructed in accordance with the approved stormwater management plan.

9. The existing ground elevations at the property lines of a site must remain undisturbed and not altered unless a written agreement with the adjacent property owners has been obtained. If the site is part of a larger common plan of development, the site must be graded in accordance with the approved stormwater management plan.

10. Ensure good housekeeping for proper use, storage, clean up and disposal of the various materials used during construction activities. Construction materials include concrete, cement, paint products, solvents, gas, oils, fertilizers, etc.

- Construction debris and other waste shall be contained in a dumpster and covered with plastic. Covers that prevent exposure to precipitation shall also be used for stockpiles of soil.

- Chemicals, paints, solvents, gas, oils and other materials shall be stored properly to prevent leaks and low exposure risk to precipitation and stormwater runoff. They must be disposed properly. Never clean brushes or rinse paint containers into a street, gutter or storm drainage structure. Clean up leaks/spills immediately. Never hose down pavement of surfaces where materials or chemicals have spilled. Use dry-up method whenever possible.

- Never dispose or dump concrete or washout from the mixing of concrete onto driveways, streets, gutters, or storm drainage structures. Concrete wash water shall be disposed in an area of soil away from surface waters where soil can act as a filter or evaporate the water. Remaining concrete shall be disposed of in a dumpster or otherwise removed from the site. Be aware that this water can kill vegetation. Store bags of cement and plaster in a dry place to protect from rainfall/sprinklers/wind and away from gutters/storm drainage structures.

11. De-watering water shall be disposed of in a pervious area. Discharge of sediment from dewatering operations shall be prevented from entering storm sewers and surface waters.

12. All on-site stormwater facilities, BMPs, and improvements must be adequately maintained by the owner, its successors and assigns in good working condition such that they satisfactorily perform their intended design functions.

13. Berkeley County may require of sites the implementation of additional BMPs and/or modifications to existing BMPs.