



INSTRUCTIONS FOR THE INTERIM WATER QUALITY ANALYSIS MODULE

GENERAL

Water quality protection requires that the chemical, physical and biological properties of receiving waters shall not be altered. Each project site includes its own challenges and opportunities for stormwater management that result in water quality protection. The first step is to evaluate a site's compatibility with the proposed project. The greater the extent that natural conditions have been and will be altered on the site, the greater the challenges for stormwater management. The purpose of a water quality analysis is to ensure that the regulatory performance standards for erosion and sediment control and post construction stormwater discharges are properly incorporated to provide the necessary levels of protection to all waters of the Commonwealth. For all sites, applicants must demonstrate that designated and existing uses of receiving waters will be protected and maintained during and after construction.

During construction activities at all sites, accelerated erosion and sedimentation must be minimized to the maximum extent practicable. At all sites the net change from pre to post construction stormwater rate, volume and quality must be minimized to the maximum extent possible. Further, to protect water quality, the stormwater standard for construction projects in High Quality (HQ) and Exceptional Value (EV)* waters is no net change in stormwater runoff volume, rate or quality from pre to post construction conditions. Although not required, this no net change level of management may be suitable to protect uses for receiving waters other than HQ and EV.

If the Interim Water Quality Analysis Module is incomplete or insufficient, it will be returned to the applicant as administratively or technically incomplete with an explanation of why it is being returned, and therefore could result in delays in the permit process.

**NOTE: Also referred to collectively as Special Protection Waters.*

SECTION A. SITE ANALYSIS - BACKGROUND SITE FACTORS, SITE FACTORS INVENTORY AND SITE FACTORS ANALYSIS

This section of the interim water quality analysis module applies to both individual and general permit applicants.

General - The applicant's analysis and documentation of the background site factors is a critical step in utilizing natural site conditions to maximize the maintenance and protection of receiving waters. This

enables the applicant to prevent stormwater generation and discharge at the outset in the site planning process. Site assessment includes inventorying and evaluating the various natural resource systems that define each site. This process may require field evaluation and verification of the data or additional data collection. This process should provide all applicants (for both General Permit coverage and Individual Permits) with a foundation to develop Erosion and Sediment (E&S) Control and Post Construction Stormwater Management (PCSM) plans that will achieve the requirement to protect and maintain designated and existing uses of the receiving surface waters of the Commonwealth.

1. Background Site Factors. Use the check boxes to provide the appropriate response. Identify, describe, and/or specify supporting information. Use separate additional sheets as needed.

a. and b. Act 167 and MS4: Identify if the project is located within an area where the Act 167 Stormwater Management Plan has been approved by the Department of Environmental Protection (DEP), and/or an MS4 permit has been issued by the DEP. For additional information on areas covered by Act 167 and MS4 permits, please refer to the DEP's Stormwater Homepage under the "Technical Information" topic.

c. Identify if the project has the potential to discharge to special protection waters, including exceptional value wetlands; identify the most protective use for each receiving water.

d. Identify any special surface or groundwater protection area, including source water protection, public water supply or other significant water use area.

e. Identify special or unique hydrologic or natural features.

2. Site Factors Inventory. Use the check boxes to provide the appropriate response. Identify, describe, or specify supporting information for each site factor.

The water quality analysis procedure for erosion and sediment control and stormwater management requires an understanding of the natural systems that occur at the proposed project site. Existing vegetation and soil are crucial to understanding land development and the potential impact to waters of the Commonwealth. Evaluation and documentation of existing vegetation, soils, permeability, surface flow patterns, critical site features such as wetlands,

floodplains, riparian areas, natural drainage ways, special habitat areas, special geological formations (e.g., carbonate), steep slopes, shallow depth to water table, shallow depth to bedrock, and other factors must be provided and analyzed. Special value areas, including wetlands and floodplains and riparian areas, must be conserved and protected during land development. Critical natural areas, which also include sensitive areas, such as steep slopes, shallow bedrock, high water table areas, and other constraining features, should be avoided.

The presence of state or federal threatened or endangered species or critical habitat or dependence issues must be adequately documented by the appropriate natural resource agency. Special attention shall be given to ensuring that criteria for construction and operation are designed to protect the presence of all state or federal threatened or endangered species and critical habitat.

3. Site Factors Analysis. Use the check boxes to provide the appropriate response. Identify, describe, or specify supporting information for each site factor. For example, applicants need to evaluate where site conditions naturally provide stormwater opportunities and constraints, based on vegetation, types of soils and other features.

The site factors analysis requires a determination of the site limitations and opportunities within the site for optimal, low impact stormwater management. This analysis is based on the data gathered for the background site factors and site factors inventory. The intention is to evaluate and incorporate existing site features into the stormwater management design.

SECTION B. THERMAL IMPACTS

This section of the interim water quality analysis module applies to both individual and general permit applicants.

The temperature of a stream could become elevated when riparian vegetation is removed or when stormwater exposed to impervious surfaces is heated prior to reaching the surface water, especially when pavements and rooftops are exposed to high temperatures and high intensity, short duration storm events during the summer months. Thermal impacts are particularly important for surface waters that have a fishery classification of Cold Water Fishes or Trout Stocking. This includes waters that are HQ waters due to an existing or designated use as a Class A wild trout stream.

Increasing impervious areas can lead to significant degradation of surface waters by altering the entire ecosystem. The applicant must evaluate such potential impacts associated with their project, and

avoid, minimize and/or mitigate such changes in temperature through site development design which utilizes Best Management Practices (BMPs) that address temperature such as reductions in the impervious footprint of the project, capturing and treating the "first flush" and preservation/installation of riparian buffers. There are additional BMPs identified in the PA Stormwater Best Management Practices Manual, Policy #363-0300-002, which may also be utilized to manage anticipated thermal impacts. The applicant should provide a summary of how thermal impacts will be avoided, minimized or mitigated.

SECTION C. ANTIDegradation ANALYSIS – Special Protection Waters Only

This section of the interim water quality analysis module applies to individual permit applications for special protection waters only.

The basic concept of antidegradation is to maintain and protect existing water quality for High Quality (HQ) and Exceptional Value (EV) waters (which include EV wetlands), and to protect designated and existing uses for all surface waters. For all projects in HQ and EV watersheds, applicants must demonstrate that there will not be a net increase in accelerated erosion and sedimentation from the construction runoff, and that the post construction runoff volume, rate and quality equals pre construction runoff volume, rate, and quality. These performance standards must be met by following the process set out in 25 Pa. Code section 93.4c(b) (relating to implementation of antidegradation requirements). The Antidegradation Analysis, under this Water Quality Analysis Module, outlines that process and must be completed and submitted by all applicants for projects in Special Protection Waters to demonstrate that the applicant has provided the appropriate level of protection for surface water bodies.

In general, this demonstration should include:

Minimizing the potential for accelerated erosion and sedimentation during the earth disturbance activity through site design, construction sequencing, use of Special Protection BMPs; and

No change in stormwater runoff volume through the 2-year/24-hour storm event, no change in stormwater runoff rate for the 1- through 100-year/24-hour storm event, and removal of pollutants in stormwater runoff through site design and the use of Special Protection BMPs.

Generally, stormwater management strategies that address quantity will in most cases address quality. In most instances water quality and the cumulative pollutant reduction or elimination requirement will be met when there is no net change in the pre/post

comparison of the volume and rate for the 2-year/24-hour storm. Other site-specific pollutants not normally found or in greater concentrations than normally found in stormwater must be managed to maintain and protect water quality in Special Protection Waters, to meet established water quality standards and to protect the more stringent of existing or designated uses for other waters.

PART 1. NON-DISCHARGE ALTERNATIVES. The requirement to consider non-discharge alternatives applies to an applicant proposing a project that may result in a new, additional, or increased discharge*, both during and/or after the construction activity, to HQ or EV waters. The module identifies, in order of preference, some non-discharge alternative BMPs for erosion and sediment control and stormwater management. The list of alternatives in the module is not exclusive or exhaustive. The permit applicant can expand this list through research and/or experience with different technologies. The permit applicant must take into account environmental and site factors.

**Note: In this NPDES Stormwater Construction Program, if the construction activity proposed for Special Protection Waters triggers the NPDES permit requirement, the Environmental Hearing Board has determined that there will be a new, increased or additional discharge, and this antidegradation analysis process in 25 Pa Code Section 93.4c must be documented.*

It should be noted that non-discharge alternatives might not, under all circumstances, be the most environmentally sound option. Environmentally sound non-discharge erosion and sediment control and post construction stormwater BMPs should take into consideration factors such as sensitivity of stream uses; the need for low flow augmentation of stream flow; sensitivity of groundwater uses in the area; secondary impacts (including suitability of geology or site conditions); management practice reliability; potential for spills and management practice failures; and operation and maintenance considerations.

Non-discharge BMPs - Erosion and sediment control. Persons planning or conducting earth disturbance activities in HQ or EV watersheds must minimize accelerated erosion and sedimentation to the maximum extent practicable. For purposes of this antidegradation analysis, applicants can ensure that existing water quality will be protected and maintained through the use of non-discharge erosion and sediment control BMPs in their E&S plan by documenting in the antidegradation analysis module that they have considered and have utilized to the maximum extent practicable: alternative siting, minimizing the amount of disturbance, maintaining (or installing) riparian buffers, and implementing other

water quality protective measures including installation of multiple or redundant BMPs in an effort to enhance overall performance and to protect, maintain, reclaim and restore the quality of waters and the existing and designated uses.

Cost-effective BMPs. BMPs listed in the DEP's Erosion and Sediment Control Program Manual, Policy #363-2134-008, are presumed to be cost effective for purposes of this antidegradation analysis.

Non-discharge BMPs - Post construction stormwater management. Non-discharge BMPs must be used to control the quality, volume and rate of stormwater discharges. In order to meet the non-discharge alternative requirements, the applicant must first consider an alternative project site or discharge to water other than Special Protection Water. Where the project or discharge cannot be relocated, the applicant must then demonstrate the reduction of stormwater runoff generated by development and other activities through the use of BMPs that minimize impervious cover, use low impact development designs, use riparian buffers, and other innovative stormwater BMPs that provide infiltration or other volume and rate reduction.

PCSM Plans required in Section E of the NPDES permit application are based upon a comparative pre- and post construction stormwater management analysis. For purposes of this antidegradation analysis, applicants can ensure that existing water quality will be protected and maintained through the use of non-discharge post construction BMPs in their PCSM plan by documenting in the antidegradation analysis module that post construction runoff equals the pre construction runoff.

Cost-effective BMPs. The BMPs identified in DEP's Erosion and Sediment Control Program Manual, Policy #363-2134-008, and DEP's Pennsylvania Stormwater Best Management Practices Manual, Document #363-0300-002, are presumed to be cost effective for purposes of this antidegradation analysis. Please also see DEP's Water Quality Antidegradation Implementation Guidance Manual, Document #391-0300-002.

BMPs Not Listed in the Department's Manuals. If a non-discharge alternative BMP (other than those identified in DEP's manuals) is proposed, the applicant must provide data to support the BMP, including a demonstration that it is environmentally sound and cost effective when compared with the cost of a proposed discharge.

Non-Discharge E&S and PCSM Plans. If the applicant documents in the antidegradation analysis module that there will be no accelerated erosion and sedimentation during construction and no net change

in the pre to post construction stormwater runoff, the applicant does not need to continue down through the Antidegradation Best Available Combination of Technologies (ABACT) or Social or Economic Justification (SEJ) portions of the module.

PART 2. ANTIDEGRADATION BEST AVAILABLE COMBINATION OF TECHNOLOGIES (ABACT). In circumstances where a discharge cannot be avoided, an applicant must utilize ABACT BMPs in their E&S and PCSM Plans to demonstrate that any discharge will maintain and protect the existing quality and water uses of receiving surface waters. ABACT means the best available combination of cost-effective treatment, land disposal, pollution prevention and stormwater reuse best management practices.

Environmentally sound non-discharge ABACT BMPs should take into consideration factors such as sensitivity of stream uses (including the timing of the discharge and the temperature of the discharge); transitory effects on aquatic organisms; the critical life stages of aquatic life; sensitivity of groundwater uses in the area; secondary impacts (including suitability of geology or site conditions); management practice reliability; potential for spills and management practice failures; and operation and maintenance considerations.

ABACT - Erosion and Sediment Control. 25 Pa. Code Section 102.4(b)(6) identifies the minimum Erosion and Sediment Control ABACT BMPs. Some additional erosion and sediment control ABACT BMPs are identified in the module. The BMPs in §102.4(b)(6) include: (1) adopting special sediment basin requirements, (2) lining channels, collectors, and diversions with vegetation, rock, geotextile, or other non-erosive materials, and (3) immediately stabilizing disturbed areas upon completion or temporary cessation of an earth disturbance activity. BMPs listed in DEP's Erosion and Sediment Control Program Manual, Policy #363-2134-008, may also qualify as ABACT BMPs.

ABACT - Post Construction Stormwater Management. Where ABACT BMPs will be utilized, the applicant's pre to post comparative analysis should demonstrate that the net change in stormwater has been reduced to the maximum extent possible, and that the remaining discharge will be managed utilizing ABACT BMPs that will protect and maintain water quality and water uses. Some ABACT BMPs are identified in the interim module. BMPs listed in PA Stormwater Best Management Practices Manual, Policy #363-0300-002, may also qualify as ABACT BMPs.

BMPs Not Listed in the Department's Manuals. If ABACT BMPs (other than those identified in DEP's

manuals) are proposed, the applicant must provide data to support the BMPs including a demonstration that they will maintain and protect the existing quality of receiving surface waters.

PART 3. SOCIAL OR ECONOMIC JUSTIFICATION (SEJ) – For HQ Waters Only. If the applicant intends to demonstrate that a degrading discharge to a high quality water is necessary to accommodate important social or economic development in the area in which the waters are located, the procedure identified in Chapter 10 of the Water Quality Antidegradation Implementation Guidance, Document #391-0300-002, must be fully and accurately addressed in a separate submission, accompanying the permit application.