

Delaware
Sediment and Stormwater Program
Technical Document

Article 2.
Policies and Procedures

2.01

Delegated Agencies

Background

The Delaware Sediment and Stormwater Law and *Delaware Sediment and Stormwater Regulations* (“*Regulations*”) apply throughout the state regardless of county or municipal jurisdiction. The Sediment and Stormwater Program is implemented statewide by the Department’s Division of Watershed Stewardship. However, in order to more fully integrate with local requirements and procedures, implementation of the Sediment and Stormwater Program may be delegated to a local agency.

Once a local agency has been granted implementation authority, it is known as a Delegated Agency. The Delegated Agency receives delegation for a three-year period, after which time the agency’s efforts are evaluated to determine whether the agency should continue as a Delegated Agency for an additional three-year period.

Based on their long history of working with landowners on soil and water conservation efforts, Conservation Districts are given first consideration in delegation of program implementation. However, any state agency, county or municipal government may request delegation to implement the Sediment and Stormwater Program locally. Jurisdictions having an MS4 permit are uniquely suited to implement the Sediment and Stormwater Program locally. A list of current Delegated Agencies can be found on the DNREC Division of Watershed Stewardship Sediment and Stormwater Program website.

Requests for Delegation

Requests for delegation are submitted to the Department Cabinet Secretary by January 1st of the year preceding the State fiscal year for which delegation is being sought. Based on information submitted with the request for delegation, the Department evaluates the agency’s ability to provide implementation of the Sediment and Stormwater Program and the request for delegation is either granted or denied by the Department Secretary no later than April 1st of the same year. If the agency requesting delegation is currently a Delegated Agency, and the Department does not respond to the request by the April 1st deadline, the agency may continue to operate as a Delegated Agency of the Sediment and Stormwater Program.

Agencies requesting delegation must demonstrate their ability to provide effective implementation of the Sediment and Stormwater Program in accordance with the *Delaware Sediment and Stormwater Regulations*. The agency must show that they have the staffing resources to implement the program. Program personnel must have

the necessary education and training to perform their duties. The agency must have documented procedures, checklists, forms, and fee schedules as necessary to accomplish plan review and approval, construction review, and maintenance reviews in accordance with the *Delaware Sediment and Stormwater Regulations*. A Delegated Agency may submit procedures to the Department for determination that the Delegated Agency's documented procedures are functionally equivalent to the procedures set forth in the *Delaware Sediment and Stormwater Regulations*. The Department maintains a list of items that must be submitted by the agency when requesting delegation.

Prior to re-delegation to current Delegated Agencies, the Department conducts a delegation review and provides documentation of the review with recommendations for program improvement as necessary. When an agency is granted delegation the delegation authority becomes effective July 1st of the State fiscal year for which delegation has been requested. Delegation is granted for a period not to exceed three years. If the Department believes that the Delegated Agency needs to be re-evaluated sooner than three years, the Department establishes a probationary delegation period of less than three years. The Department will provide the Delegated Agency with specific improvement items that must be addressed during the probationary delegation period. The Department will meet with the Delegated Agency as necessary during the probationary period to ensure that the improvement items are addressed.

Responsibilities

A Delegated Agency assumes all responsibilities for implementation of the Sediment and Stormwater Program for all private residential, commercial, industrial, and institutional, as well as county and municipal land development and construction within their specified county or municipal boundaries. A Delegated Agency reviews and approves Sediment and Stormwater Management Plans prior to the start of construction, provides oversight of plan implementation during construction, and performs regular maintenance reviews of the permanent stormwater management facilities once construction is complete.

The Delegated Agency follows all Department guidance and directives as it relates to the implementation of 7 Del. C. Ch. 40, and the *Delaware Sediment and Stormwater Regulations*, and as contained in this manual. Delegated agencies' personnel are required to maintain certification in Department-sponsored training courses to include Contractor Certification and Certified Construction Reviewer.

In addition to implementation of 7 Del. C. Ch. 40, the Delegated Agency is responsible for checking for compliance of construction sites with the requirements of the *Regulations Governing the Control of Water Pollution*, Section 9.1.02, known as Special

Conditions for Stormwater Discharges Associated with Construction Activities.

Checking for compliance includes the following tasks:

- Prior to the Delegated Agency approving a Sediment and Stormwater Management Plan, the Delegated Agency reviewer will verify that a Notice of Intent (NOI) to discharge stormwater from the construction activity has been submitted to the Department and is being tracked in the NOI database.
- During the pre-construction meeting the Delegated Agency construction reviewer will notify or remind the owner's representative of the responsibility to maintain a copy of the approved plan and completed NOI on site.
- During the pre-construction meeting the Delegated Agency construction reviewer will notify or remind the owner's representative of the responsibility to provide maintenance reviews of erosion and sediment controls and constructed stormwater management measures. These reviews must be completed by the owner as required in the Delaware Regulations Governing the Control of Water Pollution, Section 9.1.02, Monitoring.
- During the course of regular construction reviews, the Delegated Agency construction reviewer will verify that the NOI and approved plan are on site and that the owner's weekly self-inspections are being completed and records are being kept on site.
- Verifying that construction site stormwater discharge turbidity monitoring logs are being maintained on site for projects that require discharge monitoring.
- When the Delegated Agency becomes aware that ownership of the project has changed, the Delegated Agency will notify or remind the owner(s) of their responsibility to submit Transfer of Authorization and/or Co-Permittee applications to the Department.
- At the completion of the project, the Delegated Agency will verify that conditions have been met prior to the owner submitting the Notice of Termination (NOT) for the project.

Education and training in the requirements of *Regulations* is the responsibility of the Department, however the Delegated Agencies may participate in the development and delivery of Department-sponsored education and training materials, courses and workshops. In addition, Delegated Agencies may perform their own outreach efforts.

Enforcement of violations of the *Regulations* is the responsibility of the Department and is not the responsibility of the Delegated Agency. However, if the Delegated Agency has adopted the *Regulations* into their municipal or county code, the Delegated Agency may choose to pursue enforcement actions under that code. Some Delegated Agencies, including Conservation Districts, do not have the ability to enforce the *Regulations* directly through fines or stop work orders, but the Delegated Agency may

coordinate with the county or municipality for this result. When a violation has been referred to the Department for enforcement, the Delegated Agency coordinates with the Department on the enforcement action. This coordination is covered in Article 4.02 Enforcement and Penalties.

Delegated Agency Program Changes

Delegated Agencies may impose fees to support their program implementation. Development of any proposed fee schedule, including changes to a fee schedule, must include the input of the regulated community through an advisory committee established by the Delegated Agency with concurrence of the Department. An opportunity for public review and comment must be provided for any proposed fee schedule prior to adoption.

A Delegated Agency may adopt alternative requirements that are compatible with or more restrictive than the Regulations or the requirements of this document. Alternative requirements established by the Delegated Agency are not effective until they have been approved by the Department following a public review and comment period.

A Delegated Agency may sub-delegate elements of their delegated authority to another responsible entity. Sub-delegation shall not be effective until it has been approved by the Department following a public review and comment period.

When applicable, Delegated Agencies may follow local public notice procedures for adopting new codes and ordinances to fulfill the public review and comment period requirement for program changes as listed above. However, in the absence of local procedures the following procedure shall be utilized:

1. The agency shall advertise the proposed program change in a newspaper of general circulation in the county in which the change is proposed and in a daily newspaper of general circulation throughout the State. The advertisement shall include (1) a description of the agency as a Delegated Agency of the Department's Sediment and Stormwater Program, (2) the nature of the proposed program change (i.e. fee schedule change), (3) a brief description of the proposed program change, and (4) the place at which a copy of the proposed program changes may be reviewed.
2. If a meritorious request is made to the Department or Delegated Agency within 15 days or a reasonable time specified in the advertisement, a public hearing shall be held on the proposed change. A public hearing request shall be deemed meritorious if it exhibits a familiarity with the proposed program change and a reasoned statement of the proposed program change's probable impact.
3. All public hearings shall be conducted in accordance with 7 Del. C. Ch. 60 §6006.

4. The Delegated Agency shall be responsible for the cost of the advertisement and of any public hearings.

Failure to Implement Program

At any time during the delegation period, if the Department determines that the Delegated Agency is not performing its duties of implementing the Sediment and Stormwater Program, delegation may be suspended or revoked, following the prescribed procedure:

1. The Department provides a written notice of violation to the Delegated Agency containing requirements for correcting the infraction.
2. Within 60 days the Delegated Agency will provide a written response to the Department explaining how the Delegated Agency has corrected the infraction in accordance with Department requirements.
3. After 120 days from the original notice of violation, if the Delegated Agency has not made satisfactory improvements, as viewed by the Department, to meet the requirements of the original notice of violation, the Department will provide a written notice of suspension or revocation of delegation.
4. At any time, if suspension or revocation of delegation is being considered, the Delegated Agency will be provided an opportunity for a hearing before the Secretary or Secretary's designee prior to suspension or revocation.

During a period of suspension or revocation the authority for implementation of the Sediment and Stormwater Program for that agency's area reverts to the Department.

2.02

Plan Policies and Procedures

Background

Unless an activity is exempt based upon Section 1.4 of the *Delaware Sediment and Stormwater Regulations*, a Sediment and Stormwater Management Plan (Plan) must be approved prior to any land disturbance taking place on the project. When a building or grading permit is required for the project, the Plan approval should precede issuance of the building or grading permit. This process must be agreed upon by the Department or Delegated Agency and the agency responsible for issuing building or grading permits.

The Plan provides details for construction site stormwater best management practices (BMPs) to be implemented during construction as well as permanent stormwater management systems. The Plan also includes all computations to support the design of the construction site stormwater BMPs and permanent stormwater management systems.

The Plan is developed by a licensed professional in the State of Delaware and addresses all applicable elements of the *Regulations*. The Plan includes the seal of the licensed professional in accordance with the requirements of the licensing board.

A signed owner's certification statement is included on the plan. By signing the statement, the owner certifies that (1) all land clearing, grading, construction and development shall be done pursuant to the approved Plan, (2) responsible personnel certified by the Department will be in charge of all land clearing, grading, construction, or development, and (3) Department or Delegated Agency personnel shall have access to the site at reasonable times for the purposes of review and enforcement. The owner's certification must contain the original signature of the owner on the approved Plan.

The Department or the Delegated Agency reviews the Plan for compliance with the *Regulations* and once it is found acceptable, the Plan is approved. The approval date and expiration dates are stamped onto the Plan and an approval letter is issued.

Plan Life

Regardless of the level of activity on the project site, the approved Plan remains valid for three years following the date of approval of the Plan. The three year limit for a Plan approval allows for the incorporation of improved sediment and stormwater management technology into approved Plans. All approved Plans, including those for which construction has commenced and/or is ongoing, are subject to re-evaluation after

three years. If construction on the project site has not been completed and the project closed out within three years of the approval date, the approval must be extended, or a revised Plan must be re-approved by the approval agency, either the Department or the Delegated Agency. The approval agency sets the criteria, including fees, for extension or re-approval of a Plan.

It is the responsibility of the project owner to contact the Department or the Delegated Agency prior to Plan expiration to discuss necessary measures to extend or re-approve the Plan. When the Plan expires, it is no longer valid. In the absence of a valid Plan, the NPDES general permit requirements to discharge stormwater from a construction activity are not met and the project may be subject to enforcement.

If, at the three-year Plan expiration date, the Department or the Delegated Agency determines that the design criteria are unchanged and no Plan revisions are necessary from the original approval, Plan approval may be extended for a time frame not to exceed an additional three years. The cases when a Plan approval may be extended include large projects for which the construction period is expected to be longer than three years, and projects which have been delayed in the start of construction due to funding or other permitting requirements.

Plans approved to comply with previous regulations must maintain plan approval in three-year approval periods and must commence construction no later than December 31, 2019. A plan approved to comply with previous regulations where construction has not commenced by December 31, 2019 shall expire. A new plan in compliance with current regulations shall be submitted to the Department or Delegated Agency for review and approval before commencement of construction.

Plans that have received an extension based on a variance in accordance with Article 2.05 will have one (1) year from the approval date of the variance to obtain Sediment and Stormwater Management Plan approval under the requirements of the previous regulations. Subsequent three-year approval periods will be based on that date going forward and will be subject to the same limits as above. Variances remain in effect for one year unless renewed following public hearing pursuant to §6011.

Individual pad sites in commercial developments or outparcels in a business or industrial park setting which were considered in the overall stormwater management design for the project site under previous regulations will be considered grandfathered under the previous regulations as long as construction commences on those lots no later than December 31, 2019. After that date, individual pad sites and outparcels will be subject to the full requirements of the current regulations.

Sediment and Stormwater Management Plans for phased projects may be extended for the entire project area that has been previously approved as long as construction has commenced on any part of that plan. Project phases that have not commenced construction may be extended when the Sediment and Stormwater Management Plan for that phase has been approved with the overall plan.

Phases shown on a conceptual plan that have not been reviewed for compliance with the Sediment and Stormwater Management Plan requirements will not be eligible for extension. A Sediment and Stormwater Management Plan must be developed for those phases separately.

Plan Revisions

At any time, if the approved Plan needs to be modified, additional sediment and stormwater control measures may be required as deemed necessary by the Department or the Delegated Agency. If such modifications are not approved within the time period specified by the Department or Delegated Agency, the original approval will be rescinded and the Plan will be considered invalid. Any proposed changes to the approved Plan, including those initiated by the owner, prior to the three-year expiration date shall be reviewed by the Department or the Delegated Agency to determine whether a formal Plan revision is needed or whether a field change will suffice.

When a revision of a portion of the Plan is approved by the Department or Delegated Agency, the original approval and expiration dates for the project stand. A new approval date is issued only when the entire Plan is reviewed for compliance.

Grandfathering

Plans in the review process prior to January 1, 2014 where Plan approval is granted within 18 months shall not be subject to the requirements of the regulations. These Plans are subject to the previous regulations unless the owner chooses to comply with the current regulations. Once approved, the approved Plan remains valid for three years.

Plans in the review process prior to January 1, 2014 where the approval is not granted within 18 months may be considered invalid if the applicant has not demonstrated a good faith effort to gain approval. In such case the applicant will be notified by the Department or Delegated Agency that the project is no longer eligible for grandfathering and will be subject to the full requirements of the regulations.

Plans are considered to be “in the review process” when they have documented completion the first plan review step, such as a project application meeting or the first formal submittal step if a project application meeting is not required. Determination of what qualifies as the first plan review step is described by each Delegated Agency’s plan review policies and procedures. A compilation of all Delegated Agency policies has been provided in the DNREC policy document: “Review, Approval, and Extension of Projects Submitted Prior to the Effective Date of Revised *Delaware Sediment and Stormwater Regulations*”.

When a Plan revision is necessary for a Plan that has been approved to comply with previous regulations, those revisions shall be subject to the requirements of the previous regulations. When a revision of a portion of the Plan is approved by the Department or Delegated Agency, the original approval and expiration dates for the project stand. A new approval date is issued only when the entire Plan is reviewed for compliance.

Additional guidance on Grandfathering is included in Article 2.02.1.

Sunseting

Plans that have been approved to comply with previous regulations remain valid for three years from the Plan approval date. After three years, the Plan expires. Projects which have commenced construction prior to the time of Plan expiration may have their Plan approvals extended in accordance with Plan extension procedures developed by the Department or Delegated Agency. The Plan extension will not require revisions to bring the Plan into full compliance with revised regulations.

Commencement of construction means that the construction of the approved Plan is visible with the construction of a structure or infrastructure, roads, water and sewer lines, stormwater management systems, etc. General earth moving is not considered commencement of construction.

Plans that have been approved to comply with previous regulations where construction has not commenced may have the plan approval extended in three-year approval periods, but must begin construction on or before December 31, 2019. If construction has not commenced by December 31, 2019, the plan will expire. Construction of the project will require a new plan to be developed, reviewed, and approved to comply with the revised regulations.

To provide an example of the sunset provision, if an approved project has not commenced construction as of January 1, 2014, that plan approval may be extended in three-year approval periods to remain valid, but construction must begin no later than December 31, 2019. All projects starting construction on or after January 1, 2020 will be starting construction based upon a plan approved to comply with the revised regulations.

Pre-development Condition

When considering the pre-development condition of a project site for the purposes of compliance with RPv for redevelopment criteria, the pre-development condition of the site shall be based upon the most current aerial photography available for the project site location.

Section 1.4.2 of the *Delaware Sediment and Stormwater Regulations* exempts disturbances of less than 5,000 square feet, except in cases where cumulative disturbances exceed a total of 5,000 square feet. The Department or Delegated Agency will use best available aerial imagery and/or field measurements to determine the cumulative disturbances that would not be exempt. In no case will the review of cumulative disturbances consider disturbances that occurred prior to January 1, 2014.

Technical Document

The policies, procedures and guidelines established in this Technical Document have been developed to assist the regulated community in gaining compliance with the *Delaware Sediment and Stormwater Regulations*. Any additions, corrections or revisions to this Technical Document require public notice prior to adoption of the change. The following procedure shall be utilized for public notice:

1. The Department shall advertise the proposed change in a newspaper of general circulation in the county in which the change is proposed, if applicable, and in a daily newspaper of general circulation throughout the State. The advertisement shall include (1) a brief description of the Department's Sediment and Stormwater Program, (2) the nature of the proposed change (i.e. Technical Document revision), (3) a brief description of the proposed change, and (4) the place at which a copy of the proposed changes may be reviewed.
2. If a meritorious request is made to the Department or Delegated Agency within 15 days or a reasonable time specified in the advertisement, a public hearing shall be held on the proposed change. A public hearing request shall be deemed meritorious if it exhibits a familiarity with the proposed change and a reasoned statement of the proposed program change's probable impact.
3. All public hearings shall be conducted in accordance with 7 Del. C. Ch. 60 §6006.
4. The Department shall be responsible for the cost of the advertisement and of any public hearings.

2.02.1

Example Grandfathering Scenarios

Background

In order to provide additional guidance to the regulated community regarding the grandfathering provisions of the *Delaware Sediment & Stormwater Regulations (DSSR)*, the Department has established policy interpretations for the following scenarios:

Scenario 1: Plan expired prior to 12/31/13; construction had commenced.

Under this scenario, the Department or Delegated Agency would grant a 3-year administrative extension from the most recent expiration date in accordance with Section 1.3.2.2 of the revised *DSSR*. The applicant is responsible for acquiring any additional extensions as necessary to complete the project in accordance with Sections 1.3.2.1 and 3.6 of the revised *DSSR*. Projects that expired more than three years prior to December 31, 2013 would need to submit a variance request in accordance with Section 1.5 of the revised *DSSR* to allow the plan approval to be extended.

Scenario 2: Plan expired prior to 12/31/13; construction had not commenced.

Under this scenario, the applicant may choose to redesign the plan to comply with the revised *DSSR* or to apply for a variance to the Department in accordance with Section 1.5 of the revised *DSSR*. Article 2.05.1 of the Technical Document contains standard forms to be completed by the applicant for the variance request. The Department may be able to advertise a group of variance requests for public notice, but the variance itself is granted or denied for each individual request. The applicant is responsible for any costs associated with public notice requirements. The Department will review the request with assistance from the appropriate Delegated Agency to verify that the expired plan met the intent of the previous *DSSR* through the use of Green Technology Best Management Practices (GTBMPs). Expired plans that did not employ GTBMPs would generally not be supported by the Sediment & Stormwater Program for a variance.

Scenario 3: Plan expired prior to 12/31/13 for master plan project which included future building pads and/or parcels; regional SWM facility completed.

Under this scenario, the applicant would submit a Sediment & Stormwater Plan for proposed development of pad site or parcel to appropriate Delegated Agency. The Delegated Agency verifies the proposed development meets the requirements of the original design of the regional SWM facility. If so, the plan can be approved without additional SWM requirements. If not, the proposed development must comply with the revised *DSSR*. The applicant is responsible for acquiring any additional extensions as necessary to complete the project in accordance with Section 1.3.2.1 and 3.6 of the

revised *DSSR*. If construction has not commenced on any remaining pads and/or parcels as of December 31, 2019, those pads and/or parcels will be required to comply with the revised *DSSR*.

2.03

Fees and Financial Guarantees

Fees to Support Program Implementation

Agencies responsible for carrying out the Sediment and Stormwater Program may impose fees to support their program implementation, to include program management, plan review and approval, construction review, compliance assistance, maintenance reviews, and education and training. If the Delegated Agency has a source of funding that is provided through State General or local revenues, then the implementation of the Sediment and Stormwater Management Program will not necessitate the imposition of a fee to cover the cost of program implementation.

Delegated Agencies may develop their own fee schedules to provide for administration and management of the Delegated Agency, and the unfunded costs of plan review, construction review, compliance assistance, maintenance review, and education and training. The number of needed personnel and the direct and indirect expenses associated with those personnel shall be developed by Delegated Agencies with the concurrence of the Department. Those expenses will then form the basis for determining unit plan review, construction review and maintenance review costs which will be utilized in development of a fee schedule.

The fee schedule may include phased payment of fees. The owner must pay the fee as prescribed by the Department or Delegated Agency. The Department or Delegated Agency shall be responsible for the collection of fees at appropriate times. When the Department is the approval agency, the fee is \$80 per disturbed acre to the nearest 0.1 acre, to be paid in full prior to plan approval.

Financial Guarantees

The Department or Delegated Agency may develop procedures to require a financial guarantee for construction of the elements of the approved Sediment and Stormwater Management Plan. The financial guarantee will ensure that action can be taken by the Department or Delegated Agency to make corrections, at the owner's expense, should the owner fail to initiate or maintain those measures identified in the approved Sediment and Stormwater Management Plan after being given proper notice and within the time specified by the Department or Delegated Agency.

When required, the owner shall submit to the Department or Delegated Agency a financial guarantee in accordance with accepted Department or Delegated Agency procedures prior to the onset of construction activities. The financial guarantee, or the

unexpended or unobligated portion thereof, shall be returned to the owner following issuance by the Department or Delegated Agency of a Notice of Completion.

At the discretion of the Department or Delegated Agency, and as specified in accepted procedures, the financial guarantee may be extended beyond the time period specified above to cover a reasonable period of time, not to exceed one year, for testing the practices during storm events and for initial maintenance activities. The Department or Delegated Agency shall have the discretion to adopt provisions for a partial release of the financial guarantee upon the completion of specified stages or phases of development as outlined in accepted procedures.

Public Review and Comment Period Requirements

An opportunity for public review and comment must be provided for any proposed fee schedule or financial guarantee procedure prior to adoption. When applicable, Delegated Agencies may follow local public notice procedures for adopting new codes and ordinances to fulfill the public review and comment period requirement for fee schedule development or changes or financial guarantee procedure.

Development of any proposed fee schedule, including changes to a fee schedule, or financial guarantee procedures must include the input of the regulated community through an advisory committee established by the Delegated Agency with concurrence of the Department. In the absence of local public notice procedures the following steps shall be utilized:

1. The agency shall advertise the proposed fee schedule, fee schedule change, or financial guarantee procedure in a newspaper of general circulation in the county in which the change is proposed and in a daily newspaper of general circulation throughout the State. The advertisement shall include (1) a description of the agency as a Delegated Agency of the Department's Sediment and Stormwater Program, (2) the nature of the proposal (i.e. fee schedule change), (3) a brief description of the proposal, and (4) the place at which a copy of the proposal may be reviewed.
2. If a meritorious request is made to the Department or Delegated Agency within 15 days or a reasonable time specified in the advertisement, a public hearing shall be held on the proposal. A public hearing request shall be deemed meritorious if it exhibits a familiarity with the proposal and a reasoned statement of the proposal's probable impact.
3. All public hearings shall be conducted in accordance with 7 Del. C. Ch. 60 §6006.
4. The Delegated Agency shall be responsible for the cost of the advertisement and of any public hearings.

2.04 Offset Provisions

Background

The Department recognizes that some project sites will have limitations in their ability to comply with the Resource Protection event (RPv) requirements of the *Delaware Sediment and Stormwater Regulations* using traditional stormwater best management practices (BMPs). An offset is an option for compliance with the RPv requirements when those requirements cannot be fully met on the project site. Typically, an offset will be proposed for sites having limitations; however, there may be special circumstances where the Department may consider approval of an offset as a means for compliance for reasons other than site limitations.

Stormwater management offsets can include fees-in-lieu, trading, retrofitting previously unmanaged sites, mitigation, construction of off-site management measures, banking, or other similar techniques when approved by the Department. The technical protocols to determine whether a particular offset is acceptable and a management framework to oversee the process must be provided. While any of the various offset options may be considered for any project site, in order to ensure that at least one offset option has the criteria for implementation defined, the Department has developed a procedure for a fee-in-lieu offset.

Procedures

Plan Review

All projects that require a detailed Sediment and Stormwater Plan approval will follow the three-step submittal process. The first step in the submittal process is the project application meeting. Upon independent completion of the Stormwater Assessment Study (SAS), the owner's representative will schedule a project application meeting with the approval agency. At the project application meeting, the owner and/or owner's representative and the approval agency will discuss methods for complying with the Sediment and Stormwater Regulations on the site, including site design techniques and BMPs to be implemented in order to meet the RPv requirements. The result of the SAS and project application meeting is a Stormwater Assessment Report (SAR), at which time the owner and/or owner's representative will indicate how they may overcome any assessment items rated "Significant" for the site. It is at this awareness step in the process that an owner may begin considering an offset for compliance.

The second step in the plan review and approval process is submittal of the Preliminary Sediment and Stormwater Management Plan. The Preliminary Sediment and Stormwater Plan requirements are fully described in Section 3.3 of the *Regulations* and Technical Document Article 3.02.2. The submittal of the preliminary plan will demonstrate either full compliance with the RPv using onsite BMPs, or the need to consider an offset. The current version of the Delaware Urban Runoff Management Model (DURMM) compliance tool will be utilized to determine whether the suite of BMPs on a particular site fully meet the RPv criteria. Following review of the Preliminary Sediment and Stormwater Management Plan by the approval agency, if the RPv criteria are not fully met on the site, the Department will require an offset for complete compliance with the RPv requirements.

Maximum Extent Practicable Determination

Sections 5.2.3 and 5.6.3 of the Delaware Sediment and Stormwater Regulations require compliance with the RPv requirements to the “maximum extent practicable”, or MEP. A project will be determined to have met the MEP threshold on a particular site when the cost to construct the stormwater management BMPs necessary to meet the required runoff reduction exceeds the “per cubic foot of volume” cost to construct a bioretention stormwater BMP. The current estimated cost to construct a bioretention facility is \$10 per cubic foot of volume treated based on an analysis prepared by the Center for Watershed Protection (see Technical Document Article 2.04.1) under contract to the Department.

In order to verify that MEP has been met on a particular site, the owner’s representative will submit a cost estimate to DNREC for review. The cost estimate will represent the cost of construction of the stormwater management BMPs designed for the site to fully comply with RPv requirements. When the cost estimate shows that construction of BMPs on site will exceed the MEP threshold, an offset may be considered. DNREC will provide correspondence concurring that the project site has met the MEP Determination criteria and is eligible to provide an offset rather than constructing on-site stormwater management BMPs.

The MEP Determination should be the benchmark that if exceeded, allows options for compliance to be considered which may include:

1. Continuing with construction of on-site BMPs to meet R_{Pv} requirements which might exceed the MEP costs;
2. Requesting approval of an offset option contained in the Technical Document for compliance with the R_{Pv}. Offset options include trading, banking, mitigation, retrofitting previously unmanaged sites, and construction of offsite management measures; or
3. Contributing a fee-in-lieu to a fund to be used to plan, design, and construct stormwater management projects.

Offset Type Selection

Once it has been determined that a site is eligible to provide an offset rather than to construct on-site stormwater management BMPs, the owner must provide an offset to make up for the shortfall in meeting the R_{Pv} requirements using on-site BMPs. The owner may propose an offset that will be used to fulfill R_{Pv} requirements, with Department approval, which could include:

- Fees-in-lieu
- Trading
- Banking
- Mitigation
- Retrofitting previously unmanaged sites
- Construction of off-site management measures

As stated previously, any of these offset options may be considered for any project site. To ensure that at least one offset option has the criteria for implementation defined, the Department has developed a procedure for a fee-in-lieu offset. The Department will review other offset proposals as developed and submitted for approval. Final approval of an offset proposal depends upon the Department's findings as to whether the proposed offset proposal meets the goals of the *Delaware Sediment and Stormwater Regulations*.

Fee-in-Lieu Offset Procedure

When the fee-in-lieu offset option is proposed, the owner will pay a fee-in-lieu in the amount of \$18 per cubic foot of volume of runoff that is not able to be reduced or managed onsite. The fee-in-lieu amount of \$18 per cubic foot of stormwater volume represents the estimated costs to construct plus the 20-year present value for maintaining an off-site stormwater management BMP to manage runoff that cannot be managed onsite. The proposed fee-in-lieu amount was derived from the same analysis performed by the CWP to determine MEP (see Technical Document Article 2.04.1). The fee-in-lieu amount will be re-visited and updated as necessary to adjust to varying planning and construction costs, as well as to account for new technologies that may be more representative than bioretention.

While the overall goal for the Rpv is to reduce runoff volume, the Department recognizes there is also benefit derived from traditional stormwater management BMPs that only provide water quality treatment by reducing pollutant concentration. For projects that opt for the fee-in-lieu offset, the fee amount can be reduced by providing such water quality treatment practices. The fee will be reduced by an amount equivalent to the total reduction in total nitrogen (TN) load as computed by DURMM.

The fee-in-lieu amount, less any adjustments for TN reduction, for the phase of the project beginning construction must be submitted to the Department prior to commencement of construction of each phase. Upon submittal of the fee-in-lieu amount for a particular project phase, the project owner's obligation for compliance with the Rpv requirements for that phase will be met. The owner remains responsible for compliance with Conveyance Event (Cv) and Flooding Event (Fv) requirements, which are not eligible for compliance through an offset.

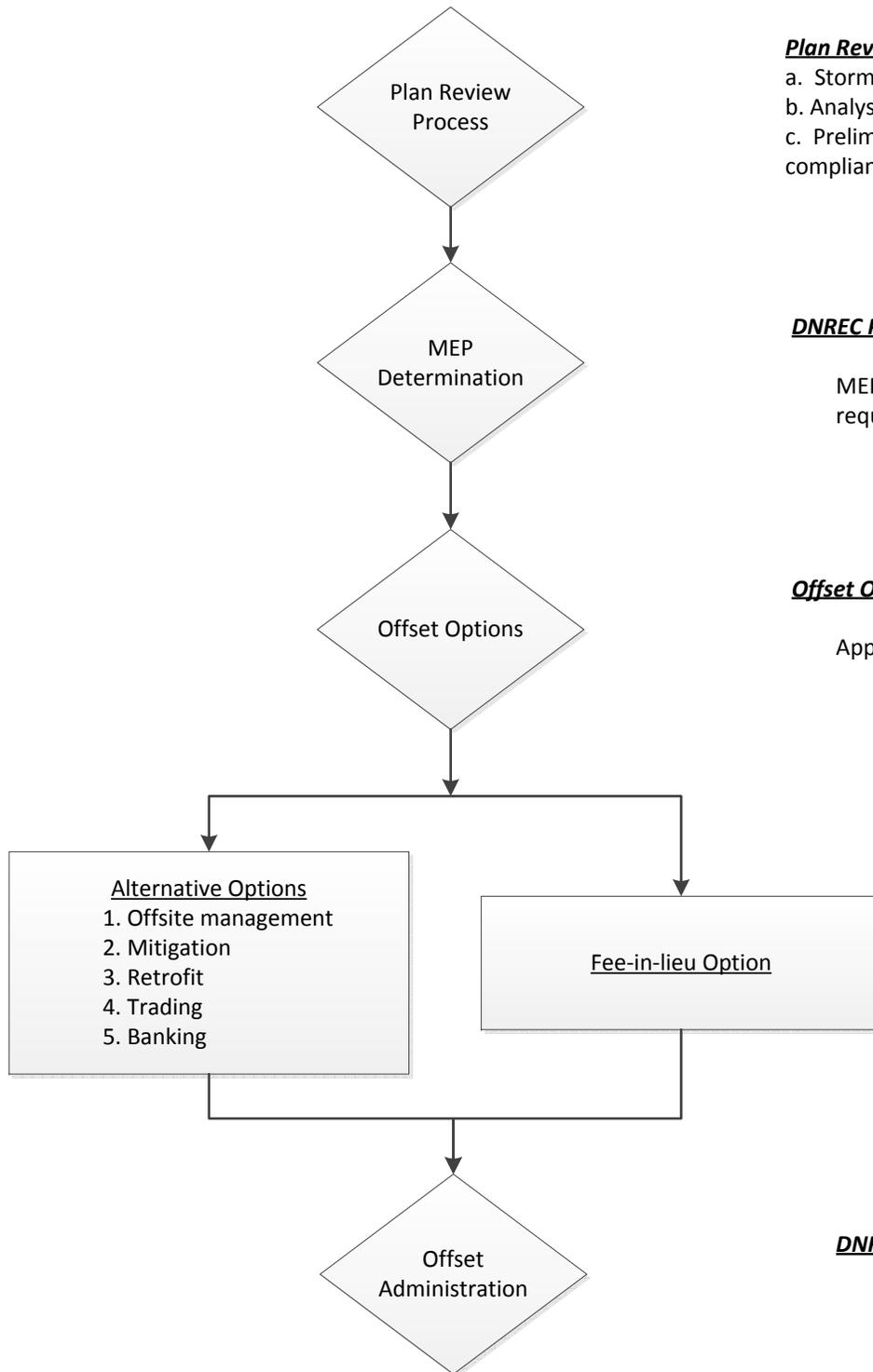
Disbursements of fees-in-lieu collected by the Department will be managed through the Water Infrastructure Advisory Council (WIAC) (29 Del. C. Ch. 80 Subchapter 1, Section 8011). The WIAC provides guidance, policy advice, and assistance in the statewide effort to develop funding options for capital and maintenance programs related to drainage, stormwater management, and flood control.

The WIAC will assist in policy development and implementation of funding stormwater projects using the offset fees-in-lieu collected. Stormwater BMP project locations will be prioritized according to the location from which the fees-in-lieu have been collected, with consideration given to the recommendations from Watershed Management Plans when applicable. The WIAC will make the final recommendation for when and where collected fees-in-lieu will be used.

Administration of contracts to plan, design and construct projects using fees-in-lieu collected will be handled by the Department in collaboration with the WIAC. The Department will verify that fees-in-lieu collected are used to implement stormwater projects that meet the volume management goals of the *Delaware Sediment and Stormwater Regulations*.

Sediment and Stormwater Plans for funded projects will be reviewed and approved by the Delegated Agency that has jurisdiction over the site for which the project is approved. Construction review and Operation and Maintenance review of BMPs constructed using fee-in-lieu funds will be conducted by the Delegated Agency that approves the Sediment and Stormwater Plan.

The Department will monitor the function of BMPs constructed under the fee-in-lieu program in total to verify that an equivalent stormwater runoff reduction benefit is realized in the watersheds for which the fees-in-lieu have been collected. Adjustments to the criteria for determining where collected fees-in-lieu will be used will be recommended by the Department to the WIAC as necessary to ensure that equivalent stormwater runoff reduction benefit is realized.



Plan Review Process Indicates Site May Qualify for Offset

- a. Stormwater Assessment Report (SAR) contains multiple “Significant” ratings
- b. Analysis indicates on-site compliance may be an inferior solution
- c. Preliminary Sediment & Stormwater Plan (H&H study) indicates on-site compliance costs may exceed Maximum Extent Practicable (MEP)

DNREC Proposal for MEP

MEP defined as estimated construction costs to meet Rpv volume reduction requirements > \$10/cu. ft.

Offset Options

Applicant proposes offset option

DNREC Proposal for Fee-in-Lieu Option

- a. Use cu.ft. of runoff as “common currency”
- b. Alternative practices may be considered using an “exchange rate” with the “common currency”
- c. Based on \$18/cu.ft.
- d. Collect fee-in-lieu upfront as default for all offset options and then refund the fee when an alternative option is implemented within a prescribed time frame

DNREC Proposal for Offset Administration

Initially DNREC/CWAC function

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Introduction

The Center for Watershed Protection (CWP) has been asked to evaluate available resources and propose a cost basis for an in-lieu fee structure to be implemented by Delaware Department of Natural Resources and Environmental Control (DNREC) for new and re-development projects that are unable to manage the entire stormwater volume associated with the Resource Protection Event (RPE) as may be required by regulation or permit on the development site. The ideal cost basis for an in-lieu fee program should reflect the typical costs of implementing the on-site accepted Best Management Practices (BMPs) on new and re-development projects, including such factors as:

- Capital cost of constructing the BMP;
- Opportunity cost of the land area encumbered by the BMP;
- Long-term operation and maintenance (O&M) of the BMP; and
- Design and engineering costs (in order to support DNREC's implementation of equivalent regional or off-site strategies with the collected fees).

In an effort to synthesize the variety of BMP types and cost data, and develop a simple metric for a fee structure, DNREC has elected, for the purposes of this in-lieu fee assessment, to reflect the typical capital and long term operation and maintenance costs of stormwater BMP implementation with a fee structure based on those of Bioretention Filters (Bioretention). The use of a single surrogate BMP for a cost basis helps to simplify the wide range in potential costs (and corresponding fees) that could be assessed on any given development site (as compared with a fee structure based on or influenced by site specific BMP selection).

DNREC has also elected to defer the application of a land value adjustment that would reflect the opportunity cost of the land otherwise encumbered by a stormwater BMP. Independent of the actual acreage of developable land impacted by the BMP, there is a direct relationship between the cost of the BMP and the foregone opportunity of using the land. The opportunity cost in commercial or urban areas may be the largest cost factor of a BMP (Wossink and Hunt, 2003). A fee adjustment based on a determination of land values may be addressed in the future.

The use of a single surrogate BMP for a cost basis is further refined by the use of the design treatment volume measured in cubic feet as the unit of measure: dollars per cubic feet (as opposed to impervious acres or other sizing parameter). The design RPE treatment volume will be defined by DNREC.

In-Lieu Fee Recommendation

Based on the review of available literature (as noted in Table 3), we recommend that DNREC adopt an in-lieu fee of **\$23 per cubic foot of treatment volume that is not managed on-site**. This fee range represents a rounding of the most recent and seemingly reliable construction and maintenance cost estimates, and includes a present value for 20 years of Operation and maintenance costs (O&M). Table 1 provides a summary of some of the more useful resources, and Table 4 provides a more complete list of

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references with notes. Emphasis was placed on the data collected from Williamsburg Environmental Group (WEG, 2010) and Raleigh, NC (2010). This proposed in-lieu fee amount was also supported by the data provided for the DELDOT Middletown Yard Bioretention Cost Estimate (Trout 2010).

It is also recommended that DNREC establish an additional fee amount based on a per-project basis rather than a per-cubic foot basis. This recommendation results from the understanding that site assessment, engineering and design, and permit acquisition costs rarely correspond with project size or corresponding BMP size or treatment volume.

Finally, we recommend that DNREC establish criteria for when the in-lieu fee is allowed. This would include any requirements for a minimum on-site volume management or other requirements that must be met prior to allowing the in-lieu fee. (See In Lieu Fee Benefits section below for further discussion of this issue.)

Table 1. Bioretention Construction Costs			
Source	Construction Costs¹ (\$/ft³)	Basis for Costs	Notes
Weiss (2007)	18.39 ²	Cost formula	Formula based on WQv; Includes present costs of 20-year O&M
City of Raleigh, NC (2010)	15.15 ³	Project costs	Cost/ft ² converted w/ typical section; No long term O&M included
WEG (2010)	14.65 ³	Project costs	Cost/ft ² converted w/ typical section; No long term O&M included
Chavez (2007)	8.86	Project costs	Average costs of 4 urban (paved catchment) installations in OK; total costs, volume, drainage area and surface area provided; No long term O&M included
CWP (2007)	8.35 ⁴	Cost formula	updates Brown and Schueler (1997); No long term O&M included
Brown & Schueler (1997)	7.45 ⁴	Cost Formula	Base Construction costs, No long term O&M included
Wossink & Hunt (2003)	5.45 ²	Cost formula	Clay soils; Includes present costs of 20-year O&M

¹ Costs are provided in units of 2010 dollars per cubic foot of treatment or water quality volume.

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² Construction Costs include present value of long term (20 year) operation and maintenance (O&M); Cost formula solved using WQv derived from Simple Method with 1 ac. drainage area; Rv =.95; 100% impervious, P=1”

³ Construction costs in units of \$/ft² were applied to a typical cross section (Table 2) to determine the treatment volume capacity in ft³.

⁴ Cost formula solved using WQv derived from Simple Method with 1 ac. drainage area; Rv =.95; 100% impervious, P=1”

Available BMP Construction Cost Data

The trail of relevant and available BMP cost data appears to start in 1997 with *The Economics of Stormwater BMPs in the Mid-Atlantic Region* (Brown & Schueler, 1997). This report is cited numerous times in subsequent cost studies, and provides cost formulas for bioretention base construction costs (defined as the sum of the excavation, control structure, and appurtenances costs) and total construction costs (includes the base construction cost plus design and engineering). These costs are reported in terms of the water quality volume (WQv) and are therefore directly related to the size of the contributing drainage area and overall footprint of the practice.

Several observations regarding the source studies should be considered when comparing the wide range of reported and predicted construction costs. Several of the cost studies reference the use of cost data based on a blend of engineer estimates, contractor bids, bond prices, and property owner interviews. Lump sum amounts that are typical of bond prices may be orders of magnitude different from engineer estimates or contractor bids due to line items for individual materials or labor costs often included in engineer estimates. In addition, contractor bids may reveal numerous design or project-specific options related to bioretention soil mix components and substitutions, or design enhancements to improve hydraulic performance (Chavez et al. 2007) that may significantly influence the cost.

In general, the variability observed in the cost data for all stormwater BMPs is most likely due to factors such as evolving regulations and water quality volume requirements, different BMP design and construction specifications in different jurisdictions, and variable site specific conditions such as location, soil conditions, topography, etc. Additional variability can be attributed to regional or situational contractor costs such as initial clearing, seasonal schedules, and peripheral costs such as mobilization and material availability (i.e.: bioretention soil media being blended on site or imported). As such, attempts to minimize the number of undocumented variables may be difficult if not impossible; however, referencing cost data based on the water quality or treatment volume rather than drainage area size has been observed in most cases to have less scatter (Weiss et al. 2007). While this does not eliminate the variability, it does help support the use of the design treatment volume as an appropriate basis for an in-lieu fee program.

In reviewing the available literature and resources, questions were raised regarding the consistency of terms such as contributing drainage area (impervious cover or total area?), capture volume of practice (total volume including porosity of soil media and stone or surface storage volume only?), etc. In some

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cases it appeared that the reference to these terms and design parameters was not consistent, even within the same report. This is important when attempting to normalize the data to a consistent unit value such as drainage area or treatment volume. For example, some studies refer to the water quality volume without defining how the volume may have been calculated. In order to maintain consistency, cost formulas that required a WQv or contributing drainage area were evaluated using the Simple Method to determine the water quality volume from a 1 acre drainage area, with an $R_v = .95$ (100% impervious) and $P=1''$. In some cases, the drainage area was incrementally increased to evaluate the equations sensitivity to increased drainage area.

Where cost data was provided in terms of surface area (cost per square foot), the unit cost was converted to a cost per cubic foot of treatment volume available using the typical sections described in **Table 2**.

Table 2: Typical Bioretention Cross Section			
Layer	Depth (ft)	Porosity	Effective Storage Depth (ft)
Surface Ponding	0.75	1.0	0.75
Bioretention Soil Media	2.0	.25	0.5
Gravel	1.0	0.4	0.4
Total	3.75		1.65

Operation and Maintenance

Long term O&M data is very limited outside the few source studies such as EPA (1999) and Wossink and Hunt (2003). While long term O&M can be a significant cost factor when selecting a BMP, there is very little data on actual costs. In most cases, available data consists of expected O&M costs of recently constructed BMPs based on general guidelines presented as a percentage of the total construction costs (Weiss et al. 2007). However there appears to be no statistically relevant data to support the majority of these claims, and the regression-based equations for calculating the anticipated annual maintenance costs associated with various BMPs found in state manuals and EPA fact sheets are almost always derived from the same handful of studies performed in the early to mid 1990s (Young, 2006).

Numerous studies reference the annual cost of maintenance for bioretention systems as 5% to 7% of construction costs from EPA (1999). Using the low end of this annual cost range (5%), and evaluating a 20-year maintenance period (while ignoring interest rates, inflation, and other factors related to present value) one would expect the present value of the 20-year maintenance costs to approximate 100% of the construction costs (20 years x 5%/yr). Weiss et al. (2007) computed the present value of 20 years of O&M of 5% of the construction cost using a 20-year running average of municipal bond yield rates for interest rate values and historical consumer price index (CPI) based inflation rates, yielding a present value (in 2003 dollars) of approximately 93% of construction costs (or a total cost of approximately 1.93 times the construction costs).

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Using the construction costs as an indicator of O&M costs implies a relationship between construction costs and practice surface area. Interestingly, the O&M costs formula developed by Wossink and Hunt is directly correlated to practice size since it is based on the contributing drainage area; However, the computed 20-year present value ranges from approximately \$3,000 for a half acre impervious drainage area to \$3,800 for a 2 acre impervious drainage area (20-year present cost = $3,437(DA)^{0.152}$) indicating a an insignificant increase in the annual cost as a function of practice size. This also suggests an extremely low annual cost for bioretention O&M, although possibly an accurate annual cost for residential raingardens.

***Note:** The term raingarden has evolved to describe a lower cost and simpler practice, typically built on individual lots in relatively permeable soils (requiring no underdrain or other hydraulic structures) by volunteers or individual homeowners (CWP, 2007). Alternatively, bioretention requires an engineered design, materials specifications, and construction inspections. This distinction may have evolved naturally as stormwater programs and design specifications have become more sophisticated. This may also explain the significant hierarchy in the reported unit costs in Table 1: \$5 to \$10 per cubic foot of treatment volume in earlier cost studies, and \$15 to \$20 per cubic foot in later studies.*

An alternative to predictive cost formulas for commercial development and redevelopment is to consider maintenance service provider estimates: maintenance service providers rarely have construction costs on which to base an estimate, and indicate that surface area of the practice is the primary driver of annual maintenance costs, currently assessed at approximately \$0.50 to \$0.75 per square foot of surface area per year (assuming no extraneous factors such as extreme disrepair due to lack of previous maintenance, plant mortality, etc.)(personal communication with Stormwater Maintenance LLC). Assuming an average of \$0.63/ft²/yr and a 1 acre impervious drainage area, this translates to a 20-year present value of \$7.60/ft³ for O&M costs. By comparison, the present value of 20 years of annual O&M costs equivalent to of 5% of construction costs per year is approximated by Weiss as \$8.87/ft³. While this is in the same general range as the contractor defined unit present value, it is based on a percentage of a predicted construction cost of approximately \$9.52/ft³, which may be considered low when compared to more recent cost estimates (WEG, Raleigh, 2010).

Design and Engineering Costs

Design and Engineering costs are itemized in Brown and Schueler, 1997. These costs can be highly variable and in many cases actual project specific costs can be significantly different (both higher and lower) than those noted. It should be noted that the design costs for bioretention tend to be more consistent on a per practice basis (rather than based on practice size), meaning the size of the practice will not significantly influence the base design and engineering costs. Likewise, costs related to permitting and obtaining approvals is very site specific and difficult to quantify on a unit cost basis. While the costs noted by Brown and Schueler have not been disputed, we recommend that the design and engineering surcharge be studied further and a lump sum fee based on a per-project basis be established.

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In Lieu Fee Benefits

The main purpose for implementing an in lieu fee program is to address the fact that implementation of stormwater management practices can be considerably more costly in dense, high-imperviousness developments, than in low density, low-imperviousness developments. Further, on these dense development sites, it may be cost effective to provide stormwater management practices for a portion of the required management volume, but achieving compliance for the entire volume could, in some cases, become disproportionately expensive. Allowing an in lieu payment for a portion of the required management volume and installing stormwater management practices in a more cost effective manner or location will therefore reduce the overall cost of compliance.

Improved cost effectiveness is not the only benefit possible from an in lieu fee program, however. If implemented properly, an in lieu fee program can also lead to an overall increase in the volume of stormwater management provided from a given development project. The District of Columbia has performed preliminary analysis of this phenomenon. Their analysis, based on the District’s proposed 1.2” stormwater retention requirement, is shown in Table 3 and Figure 1 below.

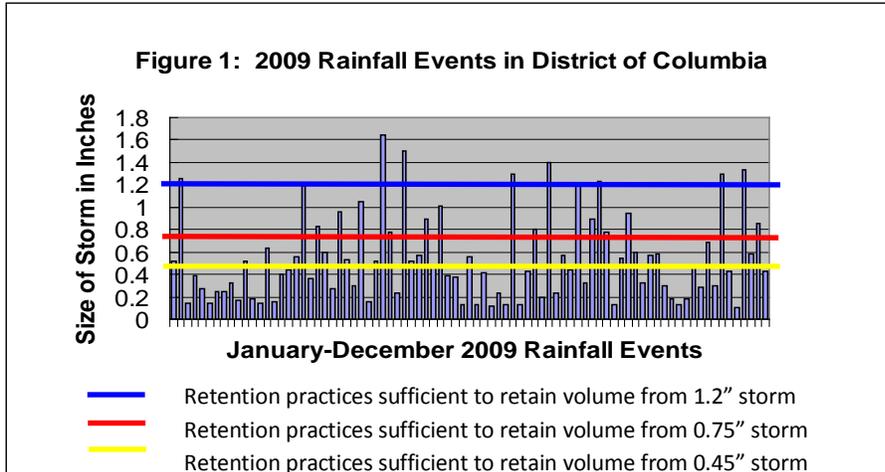
Table 3: Preliminary Comparison of Cost Savings and Retention			
	Scenario A (No Trading)	Scenario B (Trading)	
	1.2” Retention on Site 1	Site 1 - 0.75" Retention Site 2 - 0.45" Retention	% Change via Trading
1.2” Storm Volume Retained	7,739 gal.	7,739 gal.	0
Annual Volume Retained*	280,280	428,675	53%

*Annual volume retained, based on 2009 rainfall data. Both site 1 and site 2 are .25 acres and 100% impervious. (Excerpted from Van Wye, 2011)

When all of the required stormwater from the example site is retained on-site, it leads to an annual retention volume of 280,280 gallons. However, if a portion (0.45”) of the required 1.2” is retained at an off site location, the annual retention volume will increase to 428,675 gallons – a 53% increase. This occurs because: 1. the total amount of impervious surface treated has doubled from 0.25 acres to 0.50 acres, and 2. Most rainfall events are less than 1.2”, so the full capacity of the stormwater management practices in Scenario A are rarely utilized. When smaller stormwater management practices are spread between two sites, their capacity is utilized more frequently, leading to a greater annual retention volume. Figure 1, which is a graph of the rainfall events in the District in 2009 illustrates this concept more clearly. The blue line indicates the 1.2” management level. Most storm events do not reach this

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level. The red and yellow lines, representing 0.75" and 0.45", respectively, are reached much more often. (Van Wye, 2011)



(Excerpted from Van Wye, 2011)

Conclusions and Recommendations: Bioretention Total Costs

The Construction Costs ($\$/\text{ft}^3$ of Treatment Volume) provided in table 1 represent the values derived from the references listed. The design treatment volume is taken as reported, calculated using the Simple Method and a 1 acre impervious drainage area, or calculated based on the treatment volume capacity of a typical bioretention cross section as represented in Table 2. The construction costs were then converted to 2010 dollars using the Engineering News-Record Construction Cost Index History (ENR).

The unit cost data provided by WEG and the City of Raleigh represent a reliable cost estimate of \$14.65 to \$15.15 per cubic foot of treatment volume based on the typical section provided (derived from the per square foot cost of bioretention surface area). These values can be further supported and refined with additional project bid estimates. In the meantime, we recommend that the base construction cost of \$15 per cubic foot of treatment volume be used as the base construction costs for an in-lieu fee.

The present cost of long term O&M should be assessed based on actual costs as provided by maintenance providers. Based on an initial (and unscientific) survey, we recommend that the in-lieu fee include the present value of a 20-year O&M program assessed as $\$7.60/\text{ft}^3$ of treatment volume.

The Design and Engineering costs are not adequately defined and should be considered further, to be applied on a per project basis.

It may also be helpful to review the following references for additional information on incorporating land opportunity costs into the fee if so desired:

- Sharma (2006)
- Sample (2003)

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- EPA(1999)

Based on the above discussion, we recommend a total in-lieu fee based on the referenced sources of \$23/ft³ of treatment volume. It is also recommended that the in-lieu fee be periodically adjusted to reflect inflation, changes in design standards, or other factors that influence construction or long term O&M costs.

Proposed Revisions to Delaware Sediment & Stormwater Regulations

Fee-In-Lieu Example

2.04.3-1

Effective April 2016

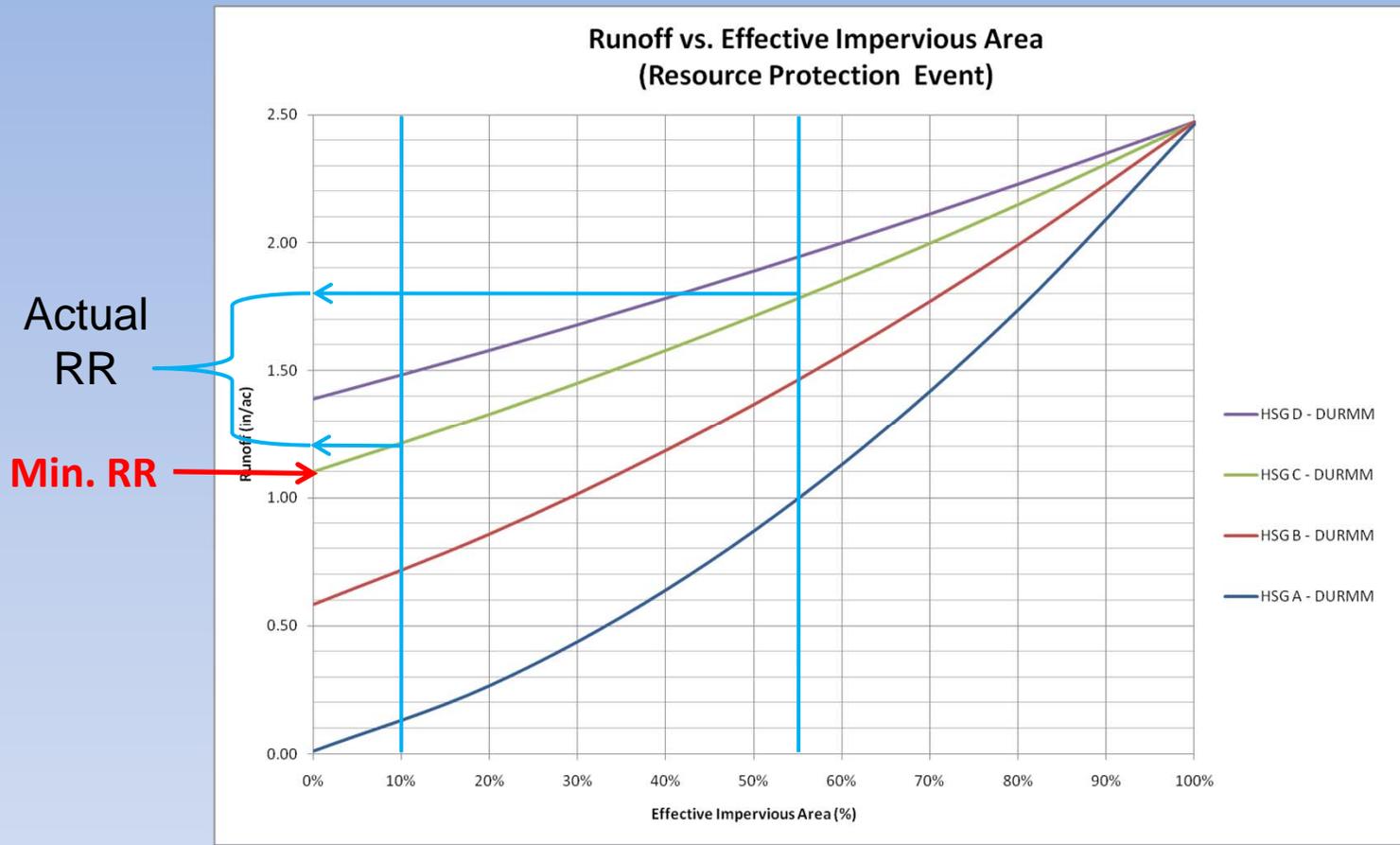
Proposed Revisions to Delaware Sediment & Stormwater Regulations: Fee-In-Lieu

- Equivalent to cost to treat runoff volume not managed
- Based on land acquisition, construction, and maintenance costs for bioretention
- Analysis was performed by Center for Watershed Protection using regional data
- Fee = **\$18/cu.ft.** runoff volume not managed

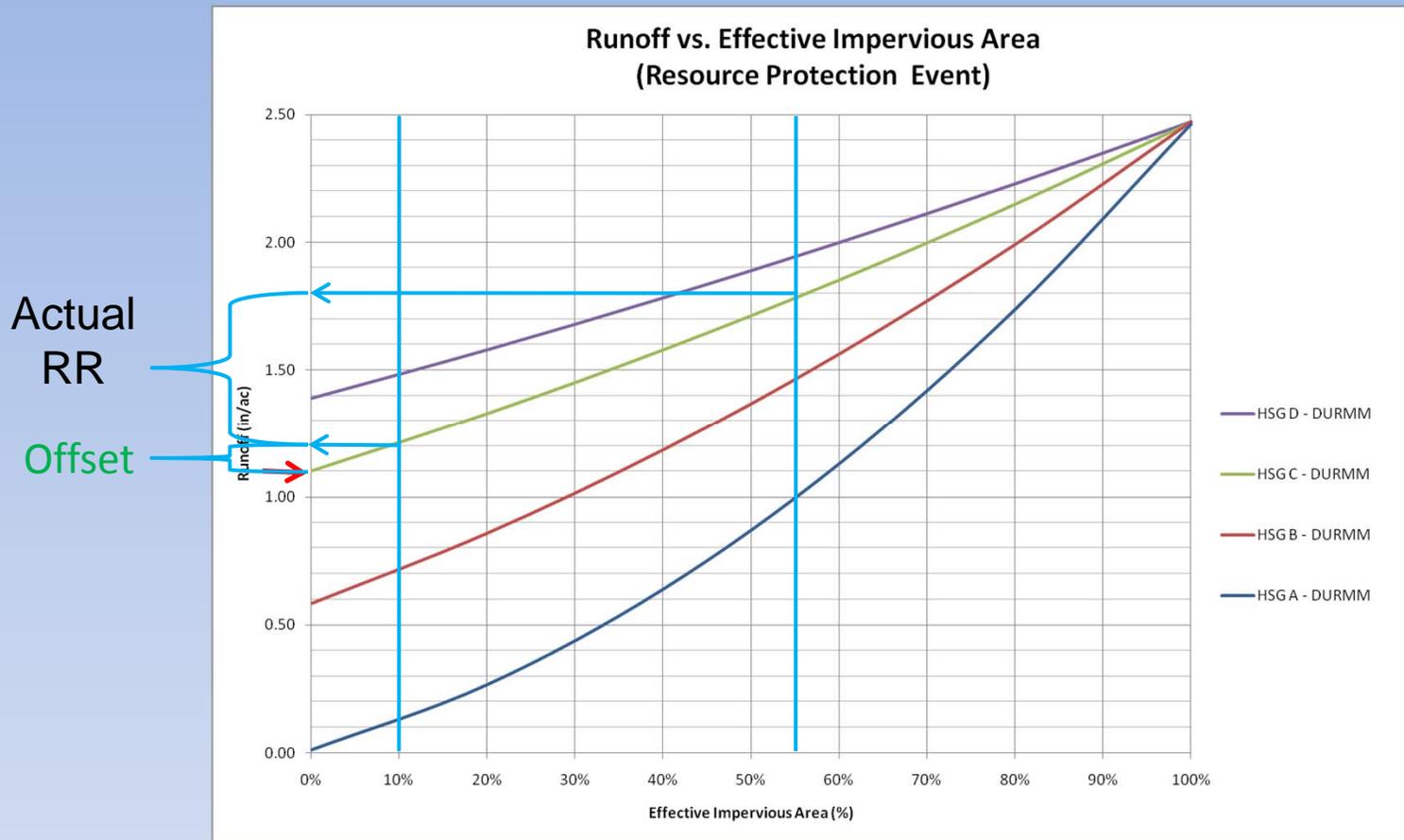
Example Site



- Site Data
 - 55% Imperviousness
 - HSG C Soils
- After Runoff Reduction
 - 10% Effective Imperviousness



Site Data: 55% Impervious, HSG C Soil, 10% Effective Impervious after RR
 Runoff = 1.8"
 Minimum RR = 1.8" – 1.1" = 0.7" (38% Reduction)
 Actual RR = 1.8" – 1.2" = 0.6" (33% Reduction)



Site Data: 55% Impervious, HSG C Soil, 10% Effective Impervious after RR

Runoff = 1.8"

Minimum RR = 1.8" – 1.1" = 0.7" (38% Reduction)

Actual RR = 1.8" – 1.2" = 0.6" (33% Reduction)

Offset Volume = 1.2" – 1.1" = 0.1" = 0.1 ac-in/ac = 363 cf/ac

Offset Fee = \$18/cf x 363 cf/ac = \$6,534/ac

2.04.3-5

Effective April 2016

Proposed Revisions to Delaware Sediment & Stormwater Regulations: Fee-In-Lieu Option

- Rpv offset fee-in-lieu may be further reduced by implementing additional water quality treatment practices
- Offset fee-in-lieu reduction shall be equivalent to the combined **TN** removal for those practices

Treatment BMP Removal Efficiencies*

BMP Standards and Specifications

Detention Practices

10.0 Detention Practices

Definition: Detention Practices are storage practices that are explicitly designed to provide stormwater detention for the Conveyance Event, Cv (10-year) and Flooding Event, Fv (100-year). Design variants include:

- 10-A Dry Detention Pond
- 10-B Dry Extended Detention Basin
- 10-C Underground Detention Facilities



Dry Detention Ponds and Dry Extended Detention Basins are widely applicable for most land uses and are best suited for larger drainage areas. An outlet structure restricts stormwater flow so it backs up and is stored within the basin. The temporary ponding reduces the maximum peak discharge to the downstream channel, thereby reducing the effective shear stress on the bed and banks of the receiving stream. Dry Detention Ponds receive some credit for pollutant removal, while Dry Extended Detention Basins receive both runoff reduction and pollutant removal credits.

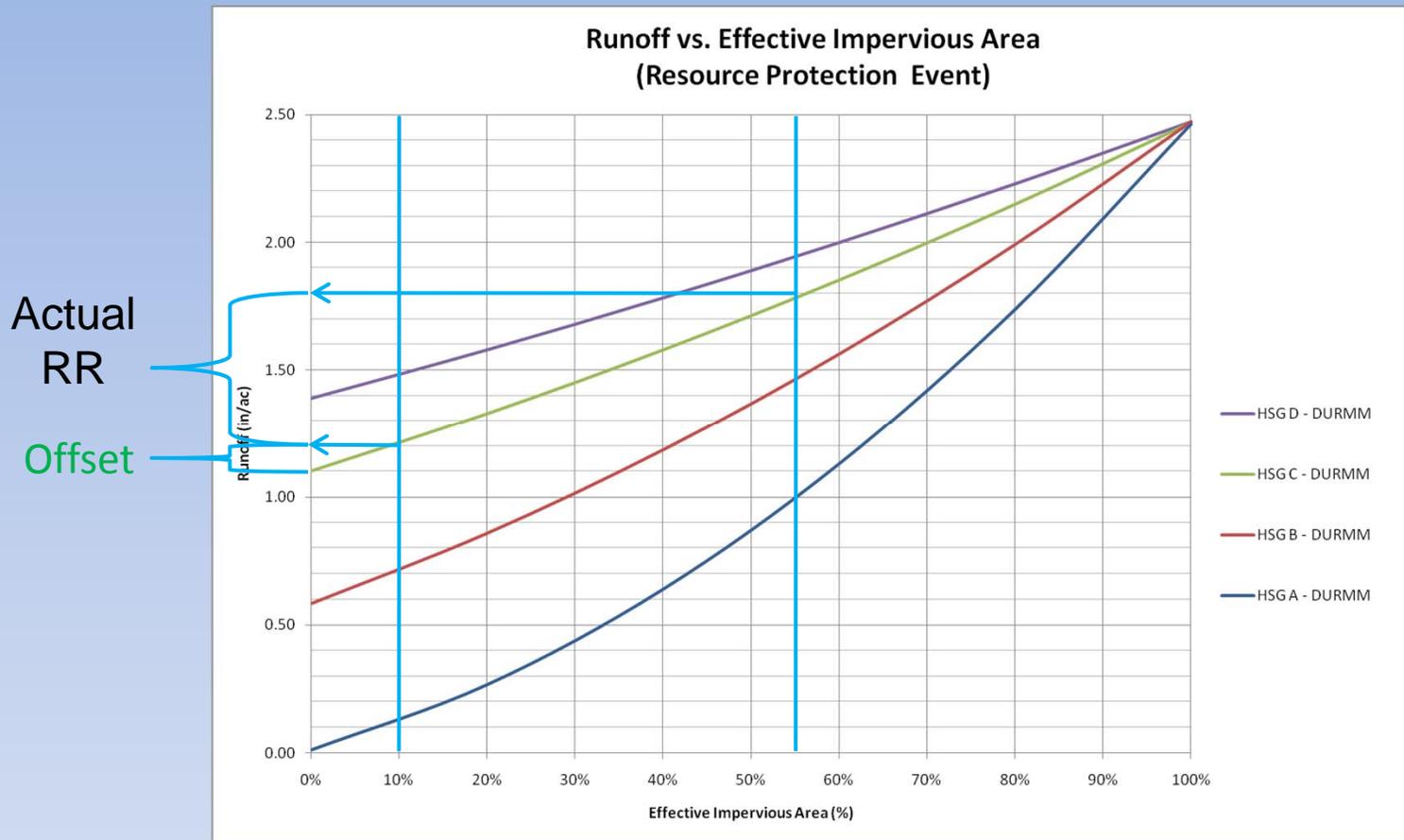
The key difference between Dry Detention Ponds and Dry Extended Detention Basins is that, in addition to management of the Cv and Fv, a Dry Extended Detention Basin provides up to a 24-hour detention of all or a portion of the Resource Protection Volume (RPV). An under-sized outlet structure restricts stormwater flow so it backs up and is stored within the basin. The temporary ponding enables particulate pollutants to settle out and reduces the maximum peak discharge to the downstream channel, thereby reducing the effective shear stress on banks of the receiving stream. Extended detention differs from a Dry Detention Pond's stormwater detention, since it is designed to achieve a minimum drawdown time, rather than a maximum peak rate of flow. Dry Detention Ponds, which are designed only to manage the larger Conveyance Event and Flooding Event will often detain smaller storm events for only a few minutes or hours.

Underground Detention Facilities include vaults and tanks. Underground Detention Vaults are box-shaped underground stormwater storage facilities typically constructed with reinforced concrete. Underground Detention Tanks are underground storage facilities typically constructed with large diameter metal or plastic pipe. Both serve as an alternative to surface dry detention for stormwater quantity control, particularly for space-limited areas where there is not adequate land for a dry detention basin or multi-purpose detention area. Prefabricated concrete vaults are available from commercial vendors. In addition, several pipe manufacturers have developed packaged detention systems. Underground detention vaults do not receive any runoff reduction or pollutant removal credit, and should be considered only for management of larger storm events.

10.1

- **TN: 20%**
- **TP: 20%**
- **TSS: 60%**

*EPA CBP Removal Efficiencies As Used In DURMM v.2



Original Offset Fee = $\$18/\text{cf} \times 363 \text{ cf}/\text{ac} = \$6,534/\text{ac}$

Offset Fee w/Dry Extended Detention Treatment BMP

Removal Efficiency for TN = 20%

Fee Adjustment = $0.20 \times \$6,534 = \$1,307$

Adjusted Fee = $\$6,534 - \$1,307 = \$5,227/\text{ac}$

2.04.3-8

2.05

Regulatory Interpretation and Variances

Regulatory Interpretation - Background

7 Del. C. §4006 clearly defines the Department's role in developing a state stormwater management program. §4006 (b) gives the Department the authority to provide technical assistance to local agencies in implementing this chapter, and also to develop standards, guidelines and criteria for program elements.

(b) In carrying out this chapter, the Department shall have the authority to:

(1) Provide technical and other assistance to districts, counties, municipalities and state agencies in implementing this chapter;

(2) Develop and publish, as regulation components, minimum standards, guidelines and criteria for delegation of sediment and stormwater program components, and model sediment and stormwater ordinances for use by districts, counties and municipalities;

The Department's role in providing technical assistance extends to the technical interpretation of the standards, guidelines and criteria supporting the *Regulations* when necessary or as requested by Delegated Agencies. Because of the different types of Delegated Agencies, including municipal governments, State agencies and Conservation Districts, there is a need for different methods of clarifying the requirements of the Regulations.

Local municipalities are governed by codes and ordinances and some local governments contain references to state requirements or set local standards that meet or exceed the state requirements. When local codes and ordinances are in conflict with the state requirements, the conflict should be brought to the attention of the Department to determine whether the conflict needs a legal opinion for resolution or whether the technical interpretation may be made by the Department program experts to resolve the conflict.

More commonly, Department and Delegated Agency staff are asked during the plan review and approval process or during construction to interpret the *Regulations* or Technical Document and offer an interpretation or a decision based on that review.

Local Review and Interpretation

Because program implementation is delegated by the Department to local agencies, an initial request by an owner or owner representative to clarify a program requirement should be made to the local Delegated Agency. A written response to requests for interpretations of a program requirement will be provided to the owner or owner representative making the request.

The Department meets with each Delegated Agency on a regular basis and there is constant contact between the Department and Delegated Agencies to answer questions, interpret standards, and make decisions regarding interpretations. The Department will offer guidance to the Delegated Agency to render a local decision on an issue having local implications.

If a local Delegated Agency is unable to interpret a requirement of the regulations or any other program issue, or if the interpretation will have greater than local implications, the Delegated Agency will request a Department interpretation. Conversely, if an owner or owner representative has a program concern, policy question or conflict with a local interpretation of the Regulations or standards, they may seek an interpretation from the Department as well.

Department Review and Interpretation

When the Department is asked to provide an interpretation of the *Regulations* or Technical Guidance document, a simple and straightforward issue will be handled with an informal request procedure. An e-mail request for interpretation will be accepted and an e-mail response will be provided to all affected parties, including the local Delegated Agency. When an informal interpretation has more than local implications, all Delegated Agencies will be provided with a copy of the response, so that future requests for interpretation of the same issue may be handled locally.

When the interpretation is more complex, including those cases when a legal interpretation is necessary to assist the program staff, the request for a Department decision must be made in writing with supporting documentation as necessary to evaluate the request. When necessary, based upon the opinion of Department Sediment and Stormwater Program staff, the Division Director will respond to the interpretation request. Further discussion within the Department may also involve a consultation with legal counsel or an informal opinion from the Secretary.

All formal interpretations of the regulations and supporting Technical Documents will be memorialized in writing and distributed to the owner or owner representative making the request for interpretation as well as all affected parties and all Delegated Agencies.

Professional Judgment Disputes

If an impasse over interpretation of technical and/or policy issues related to the Delaware Sediment & Stormwater Regulations occurs between the design consultant and the Delegated Agency, the consultant may request through the Delegated Agency to have the Department intercede. The consultant will itemize the issues in writing along with their position on each issue and forward the document and any supporting plans or computations to the Department and the appropriate Delegated Agency. The Department will review the itemized list of issues and include the issues on the agenda for discussion at the next regularly scheduled meeting between the Department and the Delegated Agency. The Department will coordinate a written response to the consultant through the Delegated Agency. The process may include a meeting among all affected parties if deemed necessary.

Alternative Compliance Review Requests

An owner or owner representative who cannot achieve strict compliance with an element of the policy, procedure, guideline or specifications included in the Technical Document may offer an alternative method of compliance and request an alternative compliance review by the Department or Delegated Agency. Documentation of the acceptance or rejection of the alternative compliance will be made in writing through an e-mail, memorandum, or plan review comment correspondence.

When a written decision of the program staff supported by legal review, Division Director or Secretary's decision is not sufficient to satisfy the Delegated Agency or owner requesting the alternative compliance review, the variance process in 7 Del. C. §6011 should be followed.

Variations and Appeals

Compliance with the requirements of the *Delaware Sediment and Stormwater Regulations* is expected of all projects subject to the regulations. Excluding items covered by Regulations section 1.7 Offset Provisions, the Department shall consider and decide applications for a variance from the provisions of the Regulations in accordance with the provisions of 7. Del C. §6011. A general application form for requesting a variance from the strict requirements of the

DSSR is included as Appx. 2.05.1 of this Technical Document. A separate application form specifically related to expired plans is included as Appx. 2.05.2.

The variance application requires public notice of the request giving the public 15 days to submit a meritorious request for a public hearing. Requests for a public hearing must be in writing and show familiarity with the proposed Technical Document changes and a reasoned statement of the changes' probable impact. The Secretary or his designee shall publish his decision on the requested variance and the decision shall be effective immediately. Any party may appeal the Secretary's decision to the Environmental Appeals Board. No variance can be in effect longer than 1 year, but may be renewed after another hearing pursuant to 7. Del C. §6011.

A temporary emergency variance to the requirements of the Regulations may be granted by the Department Secretary under the 7. Del C. §6012 procedure when the emergency is unforeseeable and severe hardship would be caused by the time period involved in obtaining a variance in accordance with the §6011 procedure. Temporary emergency variances are granted for a period not to exceed 60 days, and may not be extended more than one time. A temporary emergency variance may be granted in the case of a dam break, for example.



STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL
DIVISION OF WATERSHED STEWARDSHIP
89 Kings Highway
DOVER, DELAWARE 19901

PHONE: (302) 739-9921
FAX: (302) 739-6724

2.05.1
Sediment and Stormwater Variance Request

Pursuant to 7 *Del. C.* § 6011 and 7 *Del. Admin. C.* §5101-1.5 of the Sediment and Stormwater Regulations, the Department of Natural Resources and Environmental Control (Department) will accept, review and render decisions on applications for a variance from the provisions of the Regulations.

The applicant hereby submits to the Sediment and Stormwater Program a request for a variance to be considered by the Secretary of the Department. The Secretary's decision on the requested variance shall be published and the decision shall be effective immediately. Any person whose interests are substantially affected may appeal to the Environmental Appeals Board within 15 days of publication of the Secretary's decision. The variance shall be effective from the date of its approval until a final plan is approved unless the nature and scope of the project for which it was granted has changed.

Project Name: _____

Owner: _____

Mailing Address: _____

_____ Phone: _____

E-mail Address: _____

Contact Person Name (if different than owner): _____

Mailing Address: _____

_____ Phone: _____

E-mail Address: _____

FOR OFFICE USE

Sediment and Stormwater Program Findings:

Sediment and Stormwater Program Recommendation

Variance Request:

- Recommended for Approval
- Recommended for Denial

Signed by: _____ Date: _____

Printed Name: _____

Secretary's Decision:

Variance Request:

- Approved
- Denied

Signed by: _____ Date: _____

David Small, DNREC Secretary

f. Pursuant to 7 *Del. C.* § 6011, provide responses and explain how the following will be met. Responses must be provided for all items.

(1) Good faith efforts have been made to comply with this chapter;

(2) The person applying is unable to comply with this chapter because the necessary technology or other alternative methods of control are not available or have not been available for a sufficient period of time or the financial cost of compliance by using available technology is disproportionately high with respect to the benefits which continued operation would bestow on the lives, health, safety and welfare of the occupants of this State and the effects of the variance would not substantially and adversely affect the policy and purposes of this chapter;

(3) Any available alternative operating procedure or interim control measures are being or will be used to reduce the impact of such source on the lives, health, safety and/or welfare of the occupants of this State; and

(4) The continued operation of such source is necessary to national security or to the lives, health, safety or welfare of the occupants of this State.

NOTE: Applicant will be responsible for the cost of publishing the variance request and the Department's decision on the variance. Submit \$500.00 to cover these costs with this variance request.

Amount submitted: _____

Check # _____

Please make checks payable to DNREC Division of Watershed Stewardship.

Credit Card Information (Visa, Mastercard, Discover accepted)

Credit Card Number: _____

Exp. Date: _____ Security Code (last 3 digits on signature side of card): _____

Name on credit card: _____

Billing Address: _____

Phone Number: _____



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2.05.2
Sediment and Stormwater Variance Request

Pursuant to 7 *Del. C.* § 6011 and 7 *Del. Admin. C.* §5101-1.5 of the Sediment and Stormwater Regulations, the Department of Natural Resources and Environmental Control (Department) will accept, review and render decisions on applications for a variance from the provisions of the Regulations.

The applicant hereby submits to the Sediment and Stormwater Program a request for a variance of *Delaware Sediment and Stormwater Regulations* 3.6 Expiration of Plan Approval to allow for a previously approved and expired plan to have its approval extended based on the requirements of the previous *Delaware Sediment and Stormwater Regulations*. This variance request will be considered by the Secretary of the Department.

The Secretary's decision on the requested variance shall be published and the decision shall be effective immediately. Any person whose interests are substantially affected may appeal to the Environmental Appeals Board within 15 days of publication of the Secretary's decision. The variance shall be effective from the date of its approval until a final plan is approved unless the nature and scope of the project for which it was granted has changed.

Project Name: _____

Plan Approval Date: _____ Plan Expiration Date: _____

Sediment and Stormwater Approval Agency: _____

Owner: _____

Mailing Address: _____

_____ Phone: _____

E-mail Address: _____

Contact Person Name (if different than owner): _____

Mailing Address: _____

_____ Phone: _____

E-mail Address: _____

FOR OFFICE USE

Sediment and Stormwater Program Findings:

Sediment and Stormwater Program Recommendation

Variance Request:

- Recommended for Approval
- Recommended for Denial

Signed by: _____ Date: _____

Printed Name: _____

Secretary's Decision

Variance Request:

- Approved
- Denied

Signed by: _____ Date: _____

David Small, DNREC Secretary

Applicant shall supply responses for the following to support this variance request:

- a. How would compliance with the requirements the current *Delaware Sediment and Stormwater Regulations* affect this project with respect to implementation of stormwater best management practices (BMPs)? List Green Technology BMPs proposed under the previously approved plan. If none, provide justification.

- b. How would compliance with the requirements the current *Delaware Sediment and Stormwater Regulations* affect this project with respect to project timing? Provide a projected construction start date for the project if the variance is granted.

- c. How will the performance standards of the current *Delaware Sediment and Stormwater Regulations* be satisfied if the variance is granted?

- d. Provide a comparison of the cost of compliance with the current *Delaware Sediment and Stormwater Regulations* to the cost of implementation of the measures proposed in this variance request.

e. Pursuant to 7 *Del. C.* § 6011, provide responses and explain how the following will be met. Responses must be provided for all items.

(1) Good faith efforts have been made to comply with this chapter;

(2) The person applying is unable to comply with this chapter because the necessary technology or other alternative methods of control are not available or have not been available for a sufficient period of time or the financial cost of compliance by using available technology is disproportionately high with respect to the benefits which continued operation would bestow on the lives, health, safety and welfare of the occupants of this State and the effects of the variance would not substantially and adversely affect the policy and purposes of this chapter;

(3) Any available alternative operating procedure or interim control measures are being or will be used to reduce the impact of such source on the lives, health, safety and/or welfare of the occupants of this State; and

(4) The continued operation of such source is necessary to national security or to the lives, health, safety or welfare of the occupants of this State.

Submit the following documents:

- Last approved Sediment and Stormwater Management plan for the project, bearing the Department or delegated agency approval stamp.
- Record Plan for the project

NOTE: Applicant will be responsible for the cost of publishing the variance request and the Department's decision on the variance. Submit \$500.00 to cover these costs with this variance request.

Amount submitted: _____

Check # _____

Please make checks payable to DNREC Division of Watershed Stewardship.

Credit Card Information (Visa, Mastercard, Discover accepted)

Credit Card Number: _____

Exp. Date: _____ Security Code (last 3 digits on signature side of card): _____

Name on credit card: _____

Billing Address: _____

Phone Number: _____