MD 28/198

Montgomery County Government

Executive Regulation

Office of the County Executive
Montgomery County, Maryland

Subject	Number
Regulations for Water Quality Review-Special Protection Areas	29-95
Originating Department	**Effective Date**
Department of Environmental Protection	October 24, 1995

Montgomery County Regulation on:

WATER QUALITY REVIEW FOR DEVELOPMENT IN
DESIGNATED SPECIAL PROTECTION AREAS

DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES MANAGEMENT

Issued by: County Executive
Regulation No. 29-95

Authority: Code Section 19-67
Council Review: Method 2 under Code Section 2A-15
Register Vol. 11, Issue 5
Comment Deadline: May 30, 1995
Effective Date: October 24, 1995
Sunset Date: None

SUMMARY: Provides regulatory guidance on the setting of performance goals, specifies minimum requirements and methods used for baseline stream monitoring and best management practices monitoring, and provides other technical guidance on related activities required to implement the requirements of Bill 26-94 entitled Water Quality Review - Special Protection Areas.

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BACKGROUND INFORMATION: The regulations implement a coordinated process that requires enhanced water quality review and monitoring of new development impacts within special protection areas that are designated pursuant to Council Bill 26-94. Monitoring results are used to develop quantitative information on the physical and pollutant loading impacts that different land uses have on fragile stream systems and on the effectiveness of stormwater controls, construction site sediment controls and other pollutant source controls, subdivision controls, and site planning required by the County and the M-NCPPC. Monitoring results are applied to improve the design and effectiveness of required controls and to report annually to the Executive and Council of the observed impacts approved land uses and mitigation techniques are having on water quality within special protection areas.

OCE/REH

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Section 1. Authority. In accordance with the procedures authorized in Chapter 19, Article V, entitled "Water Quality Review - Special Protection Areas," Section 19-67, the following Executive Regulation applies to an application for approval of, or significant amendment to, a development plan, diagrammatic plan, schematic development plan, project plan, preliminary plan of subdivision, special exception, or site plan, in designated special protection areas.

Section 2 - Definitions.

Active Floodplain means the flat area adjacent to the channel constructed by the stream and overflowed by the stream at a recurrence interval of about two years or less.

Best Management Practices (BMP) means techniques that are most effective in eliminating or reducing the amount of pollution or other detrimental impact to a watershed or wetland.

Best Management Practices Monitoring Plan means a statement prepared by an applicant describing how the applicant will monitor and assess the effectiveness of its best management practices.

Bank Full Discharge means the water discharged when stream water just begins to overflow into the active floodplain.

Base Flow means that portion of the stream discharge that is derived from natural storage (i.e., groundwater outflow and the draining of large lakes and swamps or other sources outside the net rainfall that create surface runoff); discharge sustained in a stream channel, not a result of direct runoff, and without the effects of regulation, diversion, or other works of man. Also called sustaining, normal, ordinary, or groundwater flow.

Baseline Stream Monitoring means biological, habitat, and physical/chemical monitoring conducted by the Department to assess and quantify stream conditions in special protection areas prior to development of these areas.

Cumulative Impact means the impact on water quality, stream habitat, and aquatic biological communities within a special protection area watershed which may result from the incremental impact of a development project when added to other past, present, and future developments within that watershed. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. Impacts may include beneficial and/or detrimental effects.

Development Impact Monitoring means the monitoring conducted by the Department to measure the effects that development projects occurring within special protection areas have on in-stream water quality, stream habitat, and resident aquatic life.

Environmentally Sensitive Areas means areas having beneficial features to the natural environment, including but not limited to: steep slopes; habitat for Federal and/or State rare, threatened, and endangered species; 100-year ultimate floodplains; streams; seeps; springs; wetlands, and their buffers; priority forest stands; and other natural features in need of protection.

Index of Biotic Integrity is a measurement of the aquatic community's structure and function within special protection areas as compared to the aquatic community inhabiting the least impaired reference streams within a specific region.

Performance Goals mean goals that are established for development projects, located within special protection areas, to enhance protection of on-site water resources or other environmental features relating to those water resources. Performance goals for streams are expressed as narrative or numeric targets which represent biological, physical, and chemical measures of stream health to be achieved or maintained. Performance goals for best management practice effectiveness are expressed as narrative or numeric targets for achieving base flow preservation, peak storm flow reduction, and pollutant removal. Performance goals may also include measures that quantify the extent and effectiveness of public education measures to reduce the on-site generation on non-point pollution sources.

Reference Condition means the measurement of the biological community and the physical and/or chemical parameters found in the set of reference streams for Montgomery County.

Reference Stream means a stream, or a portion of a stream selected by the Department to define a reference condition for a water body that represents a minimally impaired stream.

Special Protection Area (SPA) means a geographic area where: 1) existing water resources or other environmental features directly relating to those water resources are of high quality or unusually sensitive; and 2) proposed land uses would threaten the quality of preservation of those resources or features in the absence of special water quality protection measures which are closely coordinated with appropriate land use controls.

Special Protection Area Conservation Plan means a plan developed by the Department for a special protection area, which identifies those natural resource parameters that must be protected to achieve and maintain a high level of water quality protection for SPA watersheds that, at a minimum, meet established State water quality standards as defined in COMAR 26.08.01-.04. SPA conservation plans are derived from baseline and reference stream monitoring conducted by the Department in accordance with the stream monitoring program, and, as deemed appropriate by the Department, from previously conducted water quality inventories, technical studies, and functional master plans which contain credible information on water quality, aquatic life, hydrology, and riparian conditions.

Standard Scientific Format means the orderly presentation of results of required stream and best management practice monitoring (e.g., goals, objectives, methods, materials, results, references) using the standard format for technical publications as presented in the scientific literature. (e.g., the North American Journal of Fisheries Management, American Fisheries Society.)

Stream Monitoring Plan means a statement prepared by the Department describing the location of monitoring stations and the nature, form, and frequency of monitoring to be conducted to evaluate the impacts of development on water resources in a special protection area. A plan must also describe what will be monitored with regard to: (a) faunal groups, (b) stream and riparian habitat features, (c) biological features, and (d) physical and chemical properties.

Stream Monitoring Program means activities conducted by the Department to carry out a stream monitoring plan for property in a special protection area, including:

(1) an inventory and evaluation of water resources to measure basline conditions; and

(2) an assessment of any impairment of the biological, chemical, and physical integrity of the stream over time related to development impacts in any special protection area.

Technical Manual means the provisions found in Section 12 of this regulation.

Water Quality means the chemical, physical, and biological factors required to maintain a designated State Use Class, and maintain conformance with the anti-degradation requirements of State Water Quality Standards as defined in COMAR 26.08.01-.04.

Section 3 - Applicability. The following requirements apply to a person proposing a land disturbing activity within a special protection area:

A. **Privately owned property.**

1. All persons proposing to disturb land within a SPA, except as provided by law, must submit, for review and approval, a water quality inventory which covers any portion of the project located within the SPA.

2. Except as exempted under Section 4, all persons proposing to disturb land within a SPA must also submit a preliminary water quality plan and a final water quality plan if they are:

   (i) required by law to obtain approval of a development plan, diagrammatic plan, schematic development plan, project plan, special exception, preliminary plan of subdivision, or site plan; or

   (ii) seeking approval of an amendment to an approved development plan, diagrammatic plan, schematic development plan, project plan, special exception, preliminary plan of subdivision, or site plan; or

   (iii) specifically required to submit a water quality plan in a land use plan, watershed plan, comprehensive water supply and sewer system plan amendment, or by resolution of the County Council.

B. **Publicly owned property.** Before engaging in any land disturbing activity on publicly owned property in an area designated as a SPA, the applying agency or department proposing the land disturbing activity should prepare a water quality inventory which covers that portion of the project located within the SPA and/or a combined preliminary and final water quality plan.

C. **Exception.** This regulation does not apply to projects on properties that have valid, approved record plats for the entirety of the project and for which no amendments are required on or before October 31, 1994, to accommodate development of the sites.

Section 4 - Exemptions

A. **Applicability.** An applicant, unless otherwise specifically required to do so, need not submit a preliminary or final water quality plan if:

1. a project on agricultural, residential, or mixed use zoned property contains:

   (i) a proposed impervious area of less than 8% of the total area covered by the development approval application; or

   (ii) a cumulative area of 10 acres or less, and a proposed impervious area of less than 15% of the total land area covered by the development approval application.

2. a project on property zoned for industrial or commercial use consists of a cumulative land area of two acres or less covered by the development approval application.

B. **Cumulative impacts.** In reviewing an application submitted in accordance with this regulation, the Department or Planning Board, as applicable, must assess the cumulative impact of all previously approved development if an application for new or additional development approval is submitted for property that was either:

1. previously approved for development, and exempt under Section 4 of this Regulation; or

2. part of a larger tract of land located in a special protection area that was:

   (i) approved for development under this regulation; and

   (ii) under common or related ownership when it was approved for development.

C. **Piecemeal applications.** An applicant must not avoid the application of this regulation by submitting piecemeal applications for property under common or related ownership.

Section 5 - Process to develop an SPA conservation plan.

A. **Applicability.** A SPA conservation plan will be developed by the Department for each area designated as a SPA. The plan will be based upon the baseline and reference stream monitoring conducted by the Department in accordance with the stream monitoring program, and, as appropriate, upon the Department's review of other data derived from previously conducted water quality inventories, technical studies, and functional master plans which contain credible information on water quality, aquatic life, hydrology, and riparian habitat conditions. The SPA conservation plan will be used as guidance to develop site specific performance goals, and best management practices (BMP) performance goals.

B. **Stream monitoring priorities.** The Director, where possible, will establish priorities for monitoring subwatershed areas before development, based on the anticipated timing of development within a two year period, as indicated by the Planning Director. The Planning Director must notify the Director in writing at the time of initial designation of each SPA, and, on or around November 1 of each calendar year, indicate when development is anticipated, including its staging, within each SPA within the succeeding two years. Notification is intended to allow for the necessary time required to establish average baseline conditions supported by a minimum of two years of monitoring data prior to start of construction.

C. **Stream monitoring program design.**

1. The objective of the stream monitoring program is to determine the biological condition and stream channel characteristics of the watershed. Monitoring the development site during and after development activities enables the Department to link changes in the biological condition and stream channel characteristics to the performance of BMPs.

2. Stream monitoring protocols for each special protection area will be designed and developed by the Department to be as comparable as possible with other State, County, and Federal assessments of surface waters in the northern piedmont and coastal plain ecoregions in and around the County.

3. The stream monitoring program will include assessments of freshwater fish, benthic macroinvertebrates, aquatic habitat, stream channel characteristics, riparian habitat conditions, and other appropriate physical/chemical measurements.

4. Analysis of data by the Department will be based on comparisons to the set of minimally impaired streams (reference conditions) within the County or within adjacent areas of the same ecoregion.

D. **Baseline monitoring and development impact monitoring implementation.**

1. Baseline monitoring data must be collected by the Department in anticipation of development within a special protection area subwatershed. Site selection for baseline information will be determined so that subwatershed water quality can be assessed.

2. When the precise locations of specific development projects are identified within a subwatershed, the Department will conduct development impact monitoring during and after development. Locations and number of monitoring stations will be contingent upon the size of the development, the location of the development in the subwatershed, and the anticipated location of structural and nonstructural BMPs. Development impact monitoring will commence after the final water quality plan is approved and prior to sediment control permit issuance.

Section 6 - Performance goals

A. **Purpose.** Performance goals will be established for each development application within a special protection area. Performance goals will be developed to implement the SPA conservation plan. Performance goals will be established to:

1. Protect, maintain, and restore water quality, natural stream environments, and the ecological balance of aquatic communities within the County;
2. Mimic natural watershed processes;
3. Stimulate innovative and integrated applications of site plan, sediment control, and stormwater management measures to limit changes to natural hydrology, reduce the on-site generation of pollutants that impact water quality, and mitigate impacts on adjacent and downstream conditions;
4. Develop better measures of assessing BMP effectiveness;
5. Seek improved best management practice designs with higher effectiveness to protect water quality and minimize maintenance; and
6. Protect downstream receiving waters.

B. **Use of performance goals.** The Department will establish performance goals for each development project. Performance goals will be based upon consideration of the development site location within the subwatershed, site topography and hydrology, presence of environmentally sensitive areas, and results of available baseline stream monitoring within the watershed. Where possible, numeric performance goals will be based on pre-development baseline monitoring results and parameters established in SPA conservation plans. BMP performance goals will be developed and evaluated using the most currently available and pertinent monitoring information and published research. Achievement of performance goals will be measured and analyzed using protocols or procedures for best management practices monitoring that the Department specifies to the applicant at the pre-application meeting and development impact monitoring conducted by the Department.

C. **Nature of performance goals.** Performance goals established for each project will vary based upon the above considerations. Following is a listing of types of performance goals that may be considered for each project, their rationale, and specific examples of how these goals may be expressed quantitatively or qualitatively depending upon the conditions that exist for a particular site.

1. **Stream/aquatic life habitat protection.**

   Rationale: To maintain, preserve, or improve the pre-development aquatic community.

   Examples of goals:

   (i) Protect, and maintain habitat features identified in the water quality plan.

   (ii) Restore or create habitat which promotes natural recovery toward stream habitat reference conditions.

   (iii) Promote recovery of the aquatic community as measured by pre and post-development comparisons to the reference condition.

2. **Maintain stream base flow.**

   Rationale: Maintenance of stream base flow, particularly during low flow periods, is essential to supporting the critical habitat needs of the aquatic biological community. Base flow reductions decrease the wetted width and depth of stream riffle, run, and pool aquatic habitats. Maximum base flow preservation is important to maintain viable populations of existing or target species. Reductions in base flow may also result in increased stream temperatures, and lower dissolved oxygen levels to the detriment of aquatic life.

   Examples of goals:

   (i) Limit the reduction of base flow in streams with:

   a. Drainage areas of 1000 acres or less, or

   b. In first and second order streams with minimum base flows of 2 cubic feet/second (cfs) or less, as identified through baseline stream monitoring during the low flow period of the year (July to October).

   (ii) Maintain post-development mean daily baseflow, as measured during the critical low flow period of the year, so as not to reduce available on-site aquatic habitat below pre-development conditions.

3. **Protect seeps, springs, and wetlands.**

   Rationale: Seeps/springs and wetlands are principal outlets for groundwater flow into a stream. These are the sources of cold water recharge necessary to maintain water temperature within the tolerance limits of the biological community.

Examples of goals:

(i) Protect natural recharge areas of perennial seeps and springs that provide cold water to streams. Construct recharge areas, as necessary and feasible, to mimic the function of natural recharge areas that cannot be protected.

(ii) Protect vernal pools that provide amphibian habitat by inclusion within stream buffer lines.

4. **Maintain natural on-site stream channels.**

Rationale: Channels originating from perennial or intermittent springs/seeps and wetlands deliver the cold groundwater to the receiving stream. Maintaining the integrity of the channel will help maintain the quality of the flow.

Examples of goals:

(i) Perennial streams:

a. Use bio-engineering techniques in conjunction with effective upland site planning and stormwater controls to help stabilize and protect desirable stream habitat features most vulnerable to anticipated development impacts.

b. As discrete project phases in sub-watersheds are completed and stabilized, implement immediate measures to restore damaged stream habitat caused by the project. Use bio-engineering or other appropriate habitat restoration techniques.

(ii) Intermittent streams:

a. Protect those intermittent channels formed primarily by intermittent springs and seeps at a higher level than intermittent channels formed primarily by overland surface flow. These channels may convey cold water originating from ground water recharge.

b. Use intermittent channels from surface flows and associated stream buffers as part of a system for quality treatment of stormwater.

c. Stabilize the channel banks with bio-engineered solutions, perhaps in combination with traditional methods where appropriate.

5. **Minimize storm flow runoff increases.**

Rationale: The frequency of runoff events that create erosion in stream channels in a given subwatershed needs to be managed. In general, bankfull discharges cause the most damage to the quality of the stream channel habitat. Cumulative increases in subwatershed runoff affect downstream channels as well as on-site channels. Therefore, analysis to determine the storm events that cause bankfull discharge will be conducted within and/or downstream of the development project site.

Examples of goals:

(i) Design storm flow controls to manage on-site and downstream bankfull discharges at or below pre-construction frequencies.

(ii) Reduce the frequency and duration of bankfull events, and associated sediment loadings resulting from bank erosion.

(iii) Maintain current bankfull storm frequency and duration if bank stability and channel conditions are determined to be in an optimal to sub-optimal range.

(iv) Reduce bankfull frequency and duration, or stabilize banks through bio-engineered and structural best management practice solutions if habitat is determined to be in marginal to poor condition.

6. **Identify and protect stream banks prone to erosion and slumping.**

Rationale: Even with on-site stormwater management, prolonged storm flow releases from development can cause stream bank erosion and habitat impairment, especially in the most erosion prone stream reaches.

Examples of goals:

(i) Identify the most erosion prone stream bank areas, and stabilize them with a combination of structural and bio-engineered solutions to anticipate the altered flow regime resulting from development.

(ii) Determine the new volume, rate, and bank height of storm water runoff resulting from the site's BMPs. Stabilize the stream bank areas most prone to erosion and provide in-stream habitat features to maintain stream channel conditions required for the new flows.

7. **Minimize increases to ambient water temperature.**

Rationale: Peak stream temperatures and their duration are additional primary determinants of the biological community structure that can be maintained in a stream. The peaks and duration of temperature extremes during low flow periods of the year should not increase beyond the limits of those documented during baseline monitoring, or the upper temperature limits specified in State Water Use Standards (COMAR 26.08.01 to 04). Base flow bypasses from stormwater controls, and preventive forest preservation, natural succession, and afforestation measures undertaken in stream buffers are methods to reduce the elevation of ambient water temperature.

Examples of goals:

(i) As the stream flows through the site, maintain the existing temperature conditions at an optimal level.

(ii) If monitored water temperature increases as the stream flows through the site or if the project is expected to increase stream temperatures, reduce heating effects to maintain ambient water temperature to State Water Use Standards temperature criteria (COMAR 26.08.02.03-3).

8. **Minimize sediment loading.**

Rationale: Excessive loadings of fine sediment can destroy the stream riffle habitats of benthic macroinvertebrates and fresh water fish. Maintaining the quality of the riffle habitat is critical because most members of the macroinvertebrate community reside in riffle habitat. Loss of this community also eliminates the primary food source for insectivorous fish, causing a reduction in the quality of this biological community as well. Excessive sediment loads can smother and destroy the eggs of species that use riffle habitat for spawning. Excess sedimentation fills in pools, reducing habitat for fish. Abrasive sediment loadings also contribute to stream bank instability by accelerating stream bed and bank erosion. This further compounds siltation damages downstream.

Examples of goals:

(i) During construction phases, stream embeddedness levels should remain within pre-construction levels.

(ii) Post development embeddedness levels should return to pre-development levels within one year after completion and stabilization of each defined phase of the development project.

(iii) The recovery of the riffle benthic community and riffle fish community should be to pre-development levels as described by measurements of community structure and function.

9. **Minimize nutrient loadings.**

   Rationale: Excessive nutrient loadings can cause algae blooms and alter the community composition of the stream fish and macroinvertebrates. Excessive nutrient loadings can be especially damaging when introduced to downstream water supply reservoirs and to other slow moving impounded or tidal waters. The State has established tributary protection strategies to reduce the impact of nitrogen and phosphorus loadings on the Chesapeake Bay of upstream tributaries.

   Examples of goals:

   (i) Measure or provide estimates, acceptable to the Department, of pollution reduction achieved through implementation of educational pollution source control programs targeted to resident citizens and the business community.

   (ii) Design BMPs to achieve specified ranges of nutrient reduction. Implement best management practice monitoring plan to measure nutrient reductions observed from best management practices designed to provide water quality control.

10. **Control insecticides, pesticides, and toxic substances.**

    Rationale: Toxic concentrations of chemicals are extremely dangerous to all forms of life. If not controlled, acute or chronic toxic impairment can destroy or lessen the aquatic community downstream of the development.

    Examples of goals:

    (i) Maintain levels of toxic compounds below concentration thresholds established in United States Environmental Protection Agency criteria and State water quality standards.

    (ii) Include language in Homeowners Association documents or other appropriate educational materials to implement site specific Integrated Pest Management pollution source control programs that minimize the use of herbicides, pesticides, and insecticides.

    (iii) Reduce the use of potentially toxic substances by the resident community, (e.g., oil and antifreeze dumping, proper use of pesticides).

    (iv) Measure or provide estimates, acceptable to the Department, of reductions in toxic pollution achieved through implementation of educational pollution source control programs targeted to resident citizens and the business community.

    (v) For high density commercial, industrial, and mixed use developments with large impervious areas, special consideration must be given to the control of hydrocarbons, heavy metals, and other pollutants normally associated with intense land use.

In addition to the performance goals set forth above, the Department may establish other performance goals based on the need to protect unique water quality features or federal/ state designated rare, threatened, or endangered species.

D. **Performance criteria.** Performance goals will be applied and monitored to assess relationships between land use, the effectiveness of various BMPs, individually and in combination, and measured impacts of development on water quality, stream habitat, and aquatic life. The Director will present an annual report to the County Executive and County Council on development impacts in SPAs and on the performance of mitigation measures provided by improved site plans and BMP designs.

Section 7 - Pre-Application Meeting

A. **Purpose.** Prior to submission of the water quality inventory and formal plans for review and approval, the applicant must attend a pre-application meeting with the Department and the Planning Department. The pre-application meeting is required to provide the applicant with advance guidance concerning the development of acceptable preliminary water quality inventory or preliminary water quality plan submissions. At the meeting, representatives from the Department and the Planning Department will discuss with the applicant all available information received about the site and ways to achieve the performance goals.
The purpose of the meeting is to:

1. Present the applicant with the proposed performance goals that are to be used for the development of the site layout;

2. Discuss the conceptual approach and possible locations of preferred structural and non-structural best management practice and their estimated suitability for achieving the performance goals;

3. Review monitoring protocols, and procedures to be followed by the applicant in developing a best management practice monitoring plan,

4. Review development impact monitoring protocols and procedures that will be used by the Department in development impact monitoring; and

5. Use innovative site layouts and linked best management practice options to maximize protection of water quality, stream habitat, and aquatic life.

B. **Written request.** The applicant must request the Director, in writing, to set up a pre-application meeting. The Director or designee will provide, within 10 working days of the receipt of the applicant's written request, written information regarding the time and location of the pre-application meeting, information required from the applicant for the meeting, and information to be provided by the Department and Planning Department for the meeting.

C. **Submittals required.** At a minimum, the applicant must supply three copies of these specific elements of the required water quality inventory at least 30 working days prior to the pre-application meeting:

1. Location and rating of infiltratable soils based on the latest edition of the soil survey for Montgomery County, Maryland. On-site soils analysis will be required with the applicant's formal submission of the water quality inventory.

2. Forest stand delineation and natural resources inventory to include:

   (i) Stream buffer delineation in accordance with the Planning Board's Environmental Guidelines.

   (ii) Erodible soils and areas of steep slopes.

   (iii) Location of all field delineated intermittent and perennial springs, seeps, and wetlands.

3. A drainage area map showing the upstream drainage area, hydrologically important fractures, and the location of existing developed areas and BMPs in the subwatershed (as identified in the Department's inventory of stormwater management facilities).

D. **Department responsibility.** At a minimum, the Department will supply three copies of the following information at least six working days prior to the pre-application meeting;

1. Available results and analysis of baseline stream monitoring in the subwatershed.

2. Proposed performance goals for the site and for selected BMPs. The ranges of the numeric performance goals should be designed to protect the water quality on the site and downstream, and to encompass the variability associated with the effectiveness of the specific BMP.

3. Proposed monitoring protocols and procedures to be followed by the applicant in developing a BMP monitoring plan.

4. A summary of development impact monitoring that the Department will perform to evaluate impacts of the applicant's development project.

5. A map and table giving the location, and contact address of on-going monitoring programs in the SPA subwatershed. Monitoring partnerships, where possible, that allow efficient use of resources are encouraged.

E. **Written summary by applicant.** The applicant will provide a written summary of the pre-application meeting including documentation of the established performance goals, best management practice monitoring protocols and procedures to be followed, and a list of items the applicant must include as part of the water quality plan submission. The applicant's written summary must contain any corrections requested by the Department during the pre-application meeting. Upon the Director's written approval, the summary will constitute the official public record of the meeting's results.

Section 8 - Water Quality Inventory

A. **Elements of Water Quality Inventory.** The applicant's water quality inventory submission must include the following:

1. **Stormwater Management Concept Plan.** All stormwater management concepts must be designed in accordance with Chapter 19, Article II, Montgomery County Code, Maryland Law, and all associated regulations.

2. **Sediment Control Concept Plans.**

   (i) All sediment control concept plans must be designed in accordance with Chapter 19, Article I, Montgomery County Code, Maryland Law, and associated regulations.

   (ii) Sediment control plans must include phased land disturbance and provisions for prompt stabilization.

   (iii) Land disturbing activities must be kept to a minimum through staging and phasing of all construction activities.

3. **Documentation of impervious areas.** A plan describing the proposed development which minimizes impervious areas and, if applicable, meets imperviousness limits for the project as are required in a land use plan, watershed plan, comprehensive water and sewerage system plan, or specified in a County Council resolution designating a SPA.

4. **Additional documentation.** Documentation showing avoidance, minimization, or proposed mitigation for impacts on environmentally sensitive areas, and on priority forest conservation areas as specified in the Planning Board's Environmental Guidelines. Documentation must also include:

   (i) Rationale in narrative form that any proposed encroachment is both necessary and unavoidable in that location; and

   (ii) Description as to how flexibility in Chapter 59 of the County Code ("Zoning Ordinance") and other County regulations has been utilized (e.g. percent housing mix, minimum lot size, reduced width street right-of-way, "environmental" primary cross section) to avoid and minimize impacts.

5. **Other.** Any other information required in the Technical Manual.

Section 9 - Water Quality Plan Submissions

A. **Elements of a Preliminary Water Quality Plan.** Preliminary Water Quality Plans must include:

1. **Water quality inventory.**

2. **Description of the proposed development project.** This must be in tabular or note form and include:

   (i) All information as required on the Department's current stormwater management concept plan application form;

   (ii) Zoning, with appropriate standards;

   (iii) Type and number of dwelling units allowed and proposed;

   (iv) Overall impervious area and impervious area outside of sensitive areas, with density and related impervious area assumptions specified ("typical" or average lot may be used); and

   (v) Amount (acreage) and percentage of environmental sensitive areas disturbed, preserved, and in total.

3. **Documentation of applications to State and Federal agencies for wetlands permits.** When applicable, this documentation shall be in the form of written acknowledgement by the receiving agency, that all applications have been accepted for review. Documentation of proposed wetland mitigation measures should also be submitted.

4. **Description of other mitigation techniques.** Environmental protection techniques and plans, including those not otherwise required by law, regulation, or guideline, which are included in the preliminary water quality plan must be described in writing. This description should indicate how the following sediment and erosion control, stormwater management, and other water quality protective measures, are incorporated within the water quality plan or, if not included, provide justification acceptable to the Department:

   (i) **Linked BMP systems.** BMP applications will be linked in series to progressively minimize sediment and stormwater impacts wherever possible.

   (ii) **Stabilization Requirements.** Vegetative stabilization of perimeter controls and areas specified must occur within three days of installation of temporary sediment and erosion control structures.

(iii) **Phased Grading.** Phased grading to minimize land disturbance during the development and construction process.

(iv) **Roads.**

a. The requirement for open section roads shall not be waived except as provided in Chapter 49 of the County Code.

b. If open section roads cannot be implemented where they would normally apply, options for reducing road width or other means to reduce impacts of impervious surfaces on the stream hydrology, water quality, and aquatic life must be considered.

(v) **Stream Buffers.** All County stream buffers will be shown on all water quality plan maps showing sediment and erosion control plans or stormwater management control plans. Stormwater and sediment control structures are not to be placed within the stream valley buffer except as approved by the Department and the Planning Board.

(vi) **Ground Water Recharge.** Opportunities to provide recharge of clean stormwater into the ground water supply will be maximized. Stormwater requiring treatment will be conveyed to a water quality treatment best management practice.

5. **Documentation of anticipated performance.** Each proposed BMP or group of BMPs must be documented to show how it will achieve the performance goals selected for the site.

6. **BMP monitoring plan.** Monitoring plans must meet the requirements specified in the pre-application meeting and identify:

(i) Performance goals established for the site and for any specific best management practices.

(ii) A description and characterization of the BMPs chosen for the monitoring plan. The characterization of and description of the BMP will meet the minimum required in the preapplication meeting.

(iii) A description and characterization of the monitoring protocol, as established by the Department, that will include:

a. Methods
b. Frequency of data recording.
c. Length and season of monitoring.
d. Data analysis (including statistical and graphical analysis).
e. Report milestones.

(iv) The protocols to use for specific BMP monitoring are those supplied during the preapplication meeting. The monitoring protocols are designed to provide biologically meaningful information about the BMP performance and changes in stream water quality.

(v) The final BMP's monitoring program and monitoring timeline approved by the Department will be submitted along with the applicant's final water quality plan. Upon approval, the monitoring program will be implemented according to the approved timeline.

B. **Elements of Final Water Quality Plans.** The plan must include:

1. **Final stormwater management concept plan** approved by the Department.
2. **Final sediment control concept plan** approved by the Department.
3. **Final BMP monitoring plan** approved by the Department. The final BMP monitoring plan must contain:

   (i) Final narrative and numeric performance goals to use to monitor the effectiveness of the BMPs.
   (ii) Documentation and basis for the numeric goals.
   (iii) Final selection of BMPs chosen for the monitoring plan, including best management practice design characterization.
   (iv) Final BMP monitoring protocol.
   (v) Final methods for data collection, handling, analysis, and reports including monitoring frequencies, monitoring duration and season.
   (vi) Schedule for implementing BMP monitoring and reporting requirements.

4. **Water quality certifications and wetlands disturbance permits** as required by state and federal agencies, or if not yet issued, progress reports acknowledged by state and federal agencies.

5. **Other.** Terms, conditions, and requirements as established in the approved preliminary water quality plan or in case of a preliminary water quality plan in conjunction with a development approval before the District Council; the terms, conditions, and requirements as required to be revised by the Planning Board or the Department to conform to the District Council action on the development plan, schematic plan, or diagrammatic plan.

Section 10 - Application Requirements and Approval Procedures

A. **Application submittal.** Applications for water quality inventories and plans must be submitted concurrently to the Department and the M-NCPPC for review.

B. **Public notice and request for informational meeting.** The Department shall give written notice of the submission of preliminary water quality plans for review and approval. The Department will conduct a public information meeting to review the submission and receive public input if requested to do so in writing within 15 days after notice is given. The applicant or designee must attend such meetings and be prepared to give information as requested.

C. **Approval of Final Water Quality Plan.** The Planning Board must not give final approval of a water quality plan until the Department gives its approval.

D. **Instruments of security.** The Department will require bonds, other financial instruments, or certificates of guarantee to be posted to insure compliance with the provisions of the regulations, including monitoring. The bonds, other financial instruments, or certificates of guarantee may be combined with sediment control and stormwater management bonds as allowed by Chapter 19, Articles I & II of the County Code.

E. **Amendments and modifications.** All modifications to an approved water quality plan are considered as significant amendments pursuant to Chapter 19, Article V, Section 19-65 (a)(3)(A) and will be resubmitted for review and approval in accordance with Section 3 of the executive regulation, except for minor modifications where:

1. Field Inspections or design evaluation reveal minor changes are needed; or
2. The changes do not significantly affect site layout; or
3. An emergency situation exists as determined by the Director.

All minor modifications will be handled through the Department or the Planning Department for any element within their respective jurisdiction as provided under Chapter 19, Article V, Section 19-65 (a)(3)(B) and (C).

F. **Other elements required with stormwater management and sediment control permit applications.** All development, as appropriate, must have a water quality plan with a complete water quality inventory approved by the Department at the time of detailed design plan submittal for stormwater management and sediment control permits. Any project where a wetland permit or a water quality certification is required by the State must have a valid water quality certification approved by the State prior to the issuance of the stormwater/sediment control permit.

G. **Qualifications for persons submitting data under this Article.** Preliminary and Final Water Quality Plan submissions should be submitted by a multi-disciplinary team of qualified professionals consisting of engineers, hydrologists, aquatic ecologists, and surveyors. Qualified professionals should possess the following minimum combinations of education, skills, and experience:

1. For submission of BMP design plans:

   BMP plans submitted to the Department must be certified as meeting the requirements of this regulation and must be sealed by a professional engineer registered in the State of Maryland, or other qualified professional.

2. For submission of best management practice monitoring plans:

   B.S. degree in aquatic ecology, biology, natural resources management, hydrology, engineering, or related field as determined by the Department, and five years combined experience in the following three areas:

   (i) the design and/or monitoring of best management practices
   (ii) stream/watershed management and restoration, and
   (iii) hydrological studies to support land use initiatives.

   The experience requirements can be met by one person of a professional team, or met by the combined experience of the team. The educational requirements are to be met by each member.

3. Education can be substituted for experience. A Master's degree in a relevant field is equivalent to one year of experience, and a Ph.D. degree in a relevant field or P.E. is equivalent to two years of experience.

4. The composition of the design team shall be submitted for the Department's approval prior to commencement of all work.

Section 11 - Enforcement Agreement. Each final water quality plan must contain an enforceable agreement, including an approved financial security instrument, with the Planning Board and the Director, as applicable, requiring maintenance of all facilities required by the plan and best management practices monitoring.

Section 12 - Technical Manual - Additional guidance for implementing this regulation. This Technical Manual provides general guidance for carrying out the monitoring, data analysis, reporting work, and supplemental requirements as required to implement the requirements of this regulation. At the pre-application meeting the Department will provide detailed guidance on the specific monitoring procedures and protocols for the applicant to follow in carrying out the BMP monitoring plan, and any supplemental requirements that will be applied to each development project. The Department will develop these requirements based on review of the applicant's submittal of information required in advance of the pre-application meeting as specified in Section 7.C.

A. **Required Monitoring/Water Quality Data Submission/Reporting Protocols.**

1. **Stream Monitoring Program.**

(i) A stream monitoring plan will be prepared by the Department to guide the implementation of the stream monitoring program.

(ii) The stream monitoring program must be included in the preliminary water quality plan.

(iii) The objective of the stream monitoring program is to determine the biological condition and stream channel characteristics of the subwatershed prior to development activities. Monitoring the development site, during and after development activities, will enable the Department to link changes in the biological condition and stream channel characteristics to the performance of BMPs. Development impact monitoring may require different sample location procedures.

(iv) Selection of stream monitoring locations will be determined by the Department when the Planning Director indicates future development is anticipated in a SPA subwatershed. Selection of sites will be determined by the size and complexity of the subwatershed, the ability to locate and prioritize anticipated development in the subwatershed, and available resources.

2. **Baseline monitoring by the Department conducted under the stream monitoring program.**

(i) Minimum monitoring requirements include the Department's assessment of the following:

a. Benthic macroinvertebrates
b. Freshwater fish
c. In-stream habitat

(ii) Baseline information will be collected for freshwater fish, benthic macroinvertebrates, and habitat conditions. Biological indices of community structure, function, and health will be used to determine the current biological condition as compared to reference conditions.

(iii) Procedures for monitoring freshwater fish, benthic macroinvertebrates, and in-stream habitat will follow the Department's most current version of the Montgomery County water quality program's stream monitoring protocols.

3. **Development impact monitoring by the Department conducted under the stream monitoring program.**

   (i) Development impact monitoring data will be used to assess the impact and recovery of biological communities as compared to baseline information and reference conditions. This will enable the Department to assess the magnitude of any changes within the watershed. Comparing baseline information to reference conditions will enable the Department to determine the magnitude of any impairment present in the watershed before, during, and after construction activities.

   (ii) The Department will assess the need for additional monitoring stations for development impact monitoring. Additional monitoring locations will be selected to evaluate the performance of BMPs, assess the impact of the development on the stream, and to document the recovery of the biological community. The monitoring locations will be determined by the size and location of the development and the location of BMPs.

   (iii) Normally three to nine monitoring locations will be selected for each development. Monitoring locations will be selected upstream and downstream of the development site. Additional locations will be monitored to assess the impact of the development on the stream and the recovery of the biological community.

   (iv) Monitoring locations will be selected based on the size of the development, location in the watershed, and drainage area. Table 1 will be used as guidance to designate the number of required monitoring stations:

Table 1. Number of monitoring locations per different development acreages.

Number of Monitoring Locations	Development Acreage
2 - 3	50 - 200
4 - 5	200 - 300
6 - 7	300 - 400
8 - 9	> 400 *

* Note: The number of required sampling locations may be increased by one for each additional 100 acres of development in excess of 400 acres.

4. **BMP monitoring by the applicant.**

(i) A BMP monitoring plan will be submitted by the applicant to meet the requirements presented during the pre-application meeting and will be included in the preliminary and final water quality plans as approved by the Department.

(ii) The objective of the BMP monitoring program is to document the performance of selected BMPs in meeting the performance goals selected for the site, as established during the preapplication meeting.

(iii) For those BMPs to be monitored, the standard monitoring requirements for inflows and outflows of structural best management practices shall include, at a minimum:

a. Flow rate and volume
b. Temperature
c. pH
d. Conductivity
e. Turbidity

Unusual conditions, including, but not limited to project size, layout, and on-site conditions, may require that other physical, chemical, and biological monitoring requirements be added.

Monitoring will be required for nonstructural BMPs on a case-by-case basis, and will depend on the nature of the practice and its expected mitigation effects.

(iv) Detailed methods for monitoring the achievement of the performance goals for the selected BMP's will be supplied to the applicant by the Department during the pre-application meeting.

(v) General monitoring guidelines for BMPs that would apply to different development types and densities are shown in Tables 2 and 3. Table 4 describes the typical densities of each zoning category.

(vi) The final selection of the BMP monitoring sites will be done concurrently with the Department's approval of the final water quality plan.

(vii) The applicant will submit quarterly reports summarizing and analyzing the BMP monitoring data to the Department.

(viii) The applicant's raw data submissions to the Department must be on a 3.5" IBM compatible diskette in ASCII format with documentation on the structure of the database and data format as approved by the Department.

(ix) The report must follow standard scientific format as defined by the Department.

(x) Report will contain trend analysis, including graphical interpretation and descriptive statistics of the BMP parameters.

5. **Annual report by the Department.**

(i) An annual report summarizing and analyzing available results of stream and BMP monitoring data conducted within SPAs will be submitted to the County Executive and County Council with a copy to the Planning Board. The report will also be made available to the general public upon request. The report will be submitted to the County Council no later than February of the year following the completion of the annual field monitoring season.

(ii) The report will follow standard scientific format. It will contain trend analysis including descriptive statistics and graphical interpretation of biological indices and habitat assessments. The biological condition of each station will be compared to the appropriate reference condition.

B. **Supplemental requirements for stormwater management and erosion and sediment control concept plans for SPAs.**

1. **Purpose.** The purpose of these requirements is to reduce the environmental impacts which typically occur during and after site construction. These impacts include:

(i) The loss of sediment from the site during construction which adversely affects fish spawning areas and buries aquatic insect habitat.

(ii) Erosion within the stream buffers, both on and off-site.

(iii) Inhibition of fish passage by installing typical culvert crossings.

(iv) Temperature changes in the receiving streams caused by warm water runoff from impervious surfaces from site development. Increasing the stream temperature can harm cool water fish species.

(v) Runoff of nutrients, toxics, and/or other water pollutants caused by excessive fertilizer applications, improper use, handling, storage, or disposal of petroleum byproducts, pesticides, and other potential water contaminants.

(vi) Degradation to receiving streams from increased runoff and pollutants created by land development.

2. **Required water resource protection measures.** To mitigate these impacts, the following water quantity, quality, thermal impact reduction, and sediment control methods are required and must be incorporated into the concept package for review and approval.

3. **Water quantity design requirements.**

   (i) Unless otherwise approved by the Department, all proposed stormwater management facilities must be located entirely out of the stream buffer and outfall locations must be combined to reduce the amount of disturbance to the stream buffer.

   (ii) Provide measures, such as flow splitting, to increase the flow length and reduce temperature impacts to the stream during small storms. Tree plantings may be required if the existing tree stand does not provide sufficient shade.

   (iii) All on-site areas must have stormwater management controls. Provide either a private storm drain or permanent berm along the backs of lots to convey all runoff from developed areas to proposed stormwater management facilities. If this is physically impossible due to topography, then the applicant must demonstrate to the Department's satisfaction how stormwater quantity will be compensated by other proposed facilities.

   (iv) Stormwater management concept plans need to identify any off-site areas that are used in design computations for proposed outfall study points.

4. **Water quality design requirements.**

   (i) Infiltration trenches should be used whenever possible for water quality control. However, within SPAs, added measures such as a surface sand filter uphill of the trench for added treatment will be required. To provide enhanced nutrient removal, the surface of the sand filter may be required to have a porous soil layer which can support wetness tolerant plantings.

   (ii) Unless otherwise approved by the Department, water quality structures must be located outside of stream buffers.

   (iii) For ease of maintenance and improved pretreatment of grit and trash, the infiltration trenches should be designed to be shallow and receive surface runoff only. The sand filter underdrain must outlet onto the surface of the trench. In thermally sensitive streams, a modified infiltration trench design may be required to prevent the trench from failing and staying full of water. An underdrain pipe must be added in the bottom of the trench, similar to the sand filter, but the end of the pipe must be capped. If the infiltration trench fails over time and no longer drains into the soil, then the cap can be removed and the trench will function as a sand filter.

   (iv) Designs must provide a safe, non-erosive overflow for any proposed water quality structures. A berm with a vegetated weir lined with turf reinforcement mat is recommended.

(v) A geotechnical report must be provided, including in-place percolation tests for any proposed water quality structures. Fractures providing recharge to the site should be identified. Groundwater recharge structures will be designed and located so as to maintain infiltration of rainfall.

5. Thermal impact reduction.

(i) Shade all rip rap outfalls, infiltration trenches, and sand filter surfaces.

(ii) Provide a low flow channel in any proposed pond bottom lined with turf reinforcement mat. The bottom of the proposed pond should also be reforested with wetness tolerant tree and shrub species.

(iii) Unless otherwise approved by the Department and the Department of Transportation, open section roadways must be used.

(iv) Reforest the disturbance from any proposed pond barrel and pond outfall below the pond, if tree removal is excessive. Keep the tree and shrub plantings away from the embankment.

(v) Provide a mini-riser on any dry pond riser to prevent clogging of the trash rack and unwanted ponding of water.

(vi) Prevent warming of the groundwater by avoiding excavation into the groundwater tables for any proposed pond and water quality structures. If this cannot be avoided in dry ponds, then add drain tile to convey the groundwater seeps directly to the riser, and a drain at the end of the barrel to pass the water under the rip rap outfall to keep it cool.

6. Sediment control requirements.

(i) Use sediment traps with at least 3600 cubic feet of storage per acre of drainage area. Dewater all traps and the pond (while it functions for sediment control) to draw down the water before it warms up. Dewatering devices must be designed to remove fine particulate matter such as clay from runoff. Redundant structures can be used together to improve sediment removal efficiency.

(ii) If the pond is used for sediment control and its design storage is not sufficient for double the sediment storage, then a trap must be added uphill to make up the difference. The size of the pond must not be expanded.

(iii) Reduce the amount of disturbance by providing a phased grading and stabilization scheme. Where feasible, phased grading will be required and the entire site will not be allowed to be disturbed at the same time.

(iv) Unless otherwise directed by the Department, sediment controls must be located out of the stream buffers to preserve the existing trees and limit site disturbance.

(v) The use of "super" silt fences, will be required for all areas where silt fences are to be applied (e.g. for pond construction or culvert construction).

(vi) A meeting with the Department prior to detailed design plan submittal to discuss the erosion and sediment control strategy is recommended.

Subject	Number
Regulations for Water Quality Review-Special Protection Areas	29-95
Originating Department	**Effective Date**
Department of Environmental Protection	October 24, 1995

Table 2. Recommended monitoring protocols for selected physical parameters. This table presents the full range of physical parameters that could be monitored. All parameters will not be required to be monitored for most developments.

Densities:*1 / Physical Parameters:		Low Density		Medium Density		High Density	
		Head Waters	Main Stem	Head Waters	Main Stem	Head Waters	Main Stem
Baseflow	Method #1 Velocity meter	X	X				
	Method #2 flow meter or logger	"		X	X	X	X
Storm Flow	Method #1 crest gauge	X	X				
	Method #2 flow meter or logger			X	X	X	X
Temperature	Method #1 continual	X	X	X	X	X	X
Sediment: TSS	Method #1 TSS					X	X
Turbidity	Method #2 turbidity	X	X	X	X	X	X
Embeddedness	Method #3 embeddedness	X	X	X	X	X	X
pH	Method #1 hand held probe	X	X	X	X		
	Method #2 automated logger					X	X
Dissolved oxygen	Method #1 hand held probe	X	X	X	X		
	Method #2 automated logger					X	X
Conductivity	Method #1 hand held probe	X	X	X	X		
	Method #2 automated logger					X	X

*1 For an explanation of the zoning categories associated with these densities, please refer to Table 4.

Table 3. Recommended monitoring protocols for selected chemical parameters. This table presents the full range of chemical parameters that could be monitored. All parameters will not be required to be monitored for most developments.

Densities:*1 / Chemical parameters:		Low Density		Medium Density		High Density	
		Head Waters	Main Stem	Head Waters	Main Stem	Head Waters	Main Stem
Nutrients	Method #2 manual flow weighted composite*2			X	X		
	Method #3 automated flow weighted composite*2					X	X
Volatile organic compounds	Method #1 grab samples					X*3	X*3
Oil and grease	Method #1 grab samples					X*3	X*3
Residual chlorine	Method #1 grab samples					X*3	X*3
Metals	Method #1 grab samples					X*3	X*3

*1 For an explanation of the zoning categories associated with these densities, please refer to Table 4.

*2 One discrete sample from the beginning, rising, and descending limb of the storm hydrograph will also be taken.

*3 Applies only to high density commercial and industrial uses regardless of zone.

Montgomery County Government

Executive Regulation

Office of the County Executive
Montgomery County, Maryland

Subject	Number
Regulations for Water Quality Review-Special Protection Areas	29-95
Originating Department	**Effective Date**
Department of Environmental Protection	October 24, 1995

Table 4. Common zoning categories associated with different levels of density and imperviousness.*1
Low density development (8-15% imperviousness): Includes the Mineral Resource Recovery zone, and all agricultural and residential zones that, even with permitted options for increased density, would allow fewer than 2 dwelling units per acre*2.
Medium density development (15-25% imperviousness): Includes all residential zones that, even with permitted options for increased density, would allow 2 or more dwelling units per acre, but less than 5 dwelling units per acre*2.
High density development (25% or more imperviousness): Includes all zones allowing commerce, industrial, or mixed uses, and all residential zones that allow 5 or more dwelling units per acre*2.
*1 Information used to compile this table was supplied by the M-NCPPC, Department of Planning, Environmental Planning Division, March 3, 1995.
*2 As zoning categories are developed or changed, the Department will assign appropriate monitoring requirements based on the intensity of development and the nature of the activity corresponding to the zone.

Section 13 - Effective Date. This regulation takes effect immediately after adoption by the Montgomery County Council.

Douglas M. Duncan
County Executive

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APPROVED AS TO FORM AND LEGALITY.
OFFICE OF COUNTY ATTORNEY
BY A. K. Hart
DATE 8/25/95

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