

Performance Criteria for Proposed Development in the Upper Paint Branch Watershed

Background

In 1973, the Maryland Department of Natural Resources (Md. DNR) identified two self-propagating populations of brown trout inhabiting Paint Branch and its tributaries. To protect the Paint Branch watershed and the trout fishery, special land and water resource management is needed. The two primary methods of land and water resource management are:

- land use controls; and
- best management practices (BMP's)¹ for land development.

The *1981 Eastern Montgomery County Master Plan* recommends RE-1 and RE-2C zoning for most of the undeveloped land in the Paint Branch watershed upstream of Fairland Road. This zoning replaced R-200 zoning, which is two to four times as dense. This rezoning reduces the possibility of adverse impacts to the watershed from development. Within the areas designated for the RE-1 and some of the areas designated for the RE-2C zones, there is a PD-2 option. The master plan states that the PD-2 option would be considered only if an applicant could demonstrate that development at a PD-2 density could provide better protection for the environment. Only a few small properties in the upper Paint Branch watershed have been rezoned to PD-2 since the 1981 Master Plan. In the

1990 Trip Reduction Amendment to the *Eastern Montgomery County Master Plan*, the PD-2 option is removed on all properties except those zoned PD; this action was done to help reduce ultimate vehicular traffic in residential zones.

Since the adoption of the *1981 Eastern Montgomery County Master Plan*, monitoring of the stream system, primarily by Md. DNR and more recently by MCDEP, has shown that the upper Paint Branch has been subjected to increasing stressed conditions. Therefore, a strategy that focuses more strongly on conservation and protection of natural areas and vegetation cover, especially forest, in upper Paint Branch is needed to prevent the irreversible degradation of Paint Branch's high quality conditions and unique natural resource. This strategy involves a park acquisition program that greatly expands upon the 1981 Master Plan program, and the application of stringent performance criteria for new development in the upper watershed. The park acquisition program is covered in the *1995 Limited Amendment to the Eastern Montgomery County Master Plan for Expanded Park Acquisition for Resource*

¹ A best management practice is a method considered to be the most effective and practicable means available to prevent or reduce the amount of pollutants or other detrimental water resource impacts generated from non-point sources. Non-point source pollution is pollution that originates from diffuse sources and not from discernible, confined, or discrete sources. For example, fertilizers or pesticides on lawns that are carried in surface water runoff to a stream are non-point source pollutants. In contrast, nitrogen and phosphorus compounds discharged into a stream from a wastewater treatment plant are point-source pollutants.

Management and Protection of the Paint Branch Watershed. The performance criteria are based upon BMP's that would protect the Paint Branch watershed and its trout resource. They also respond to the Maryland Department of Environment (MDE) standard criteria for Use III Waters (Natural Trout Waters).²

Assuring that BMP's are incorporated into development design is the responsibility of various county and state agencies during a coordinated review process for new development projects. Within this development framework, lead agency responsibility has been designated so that final authority over which BMP's or other methods of development should be employed is left to the appropriate agency with the others acting in an advisory capacity. The reviewing agencies act under current laws, regulations and guidelines that are in place in the County and State. Among those which apply to Paint Branch are; the Zoning Ordinance of Montgomery County, the Subdivision Regulations, the Stormwater Management and Sediment Control Laws and Regulations, the Forest Conservation law, and the Planning Board's Environmental Guidelines. In addition, on July 11, 1995, the Montgomery County Council designated the upper Paint Branch watershed (i.e., upstream of Fairland Road) as a Special Protection Area (SPA), thus making it subject to the SPA law and regulations. The Council also authorized the continued application of the 1981 Master Plan Performance Criteria to new development within the Paint Branch SPA.

Since 1981, a significant portion of the Paint

Branch performance criteria have been incorporated into the county laws, regulations and guidelines mentioned above. As such, the application of the criteria falls under the responsibility of various reviewing agencies acting in their "lead" capacity. This plan endorses this approach for the continued application of the performance criteria. The criteria have been updated and modified and are presented in a manner which reflects this approach. Application of these criteria shall occur at the time a project is subject to regulatory review by the Planning Board or MCDEP. This includes review of preliminary subdivision and site plans, special exceptions cases, mandatory referrals, and water quality review. In addition, for any property undergoing rezoning, the Performance Criteria should be considered as part of the judgement to grant or deny the requested zoning. Where development plans or site plans are required, the Performance Criteria also provide guidance to developing and evaluating these plans. Any criteria which are not covered by current laws or regulations, or are insufficiently covered by future changes to laws and regulations, should still be required as part of all proposed development within Paint Branch.

Environmental Analysis

To ensure that water quality standards are maintained in Paint Branch and its tributaries (especially Good Hope, Gum Springs, Left Fork, Right Fork, and the Mainstem north of Fairland Road), an environmental analysis of any proposed development in this area is necessary. The environmental analysis is to be produced by the applicant for a development project and should provide the site-specific information necessary to assess the development plan to determine if the standards and requirements set forth for the watershed are met. The environmental analysis shall include an analysis of natural features and an analysis of the proposed development. The information required under these analyses may be submitted to either MNCPPC and/or MCDEP, as appropriate, under most current county laws and regulations and agency review authority. Items which are not covered by existing processes should be included in the submission to MNCPPC.

The following site parameters would need to be considered as part of an environmental analysis:

² The Md. Department of the Environment Water Resources Administration has established four water use classes, each with a corresponding set of standards:

- I Water Contact Recreation and Aquatic Life
- II Shellfish Harvesting
- III Natural Trout Waters
- IV Recreational Trout Waters

Use III, or "Natural Trout Waters" are waters that are capable of supporting natural trout populations, including propagation, and their associated food organisms. "Propagation" means the continuance of species by generation of successive production in the natural environment, as opposed to the maintenance of species by artificial culture and stocking.

³ A Special Protection Area is defined as a watershed or part of a watershed in Montgomery County that contains existing water resources or other environmental features directly relating to those water resources that are of high quality or unusually sensitive, and where proposed land uses would threaten the quality or preservation of the resources in the absence of special water quality protection measures. A Special Protection Area is created through action by the Montgomery County Council or adoption in a master plan.

Bold text indicates language that is recommended by the Paint Branch Technical Work Group to be added to the 1981 Master Plan performance criteria. Strikeout text indicates language from the 1981 Master Plan performance criteria that is recommended to be deleted.

I. Analysis of Natural Features

A. Site information currently required as part of a natural resources inventory/forest stand delineation (NRI-FSD) per the Environmental Guidelines and Forest Conservation Law:

- Topography:
 - existing terrain of the site; and
 - identification of slopes between 15 and 25%, and 25% and greater.
 - Soils/Geology:
 - soil types including drainage characteristics, susceptibility to erosion, and areas of moderate and severe erosion;
 - Vegetation:
 - **inventory of forest and trees.**
 - Physical Habitat (Stream Environment):
 - location of perennial/intermittent streams **and associated buffers;**
 - **location of wetlands, seeps and springs and associated buffers; and,**
 - **location of major drainage courses (i.e., ephemeral streams).**
 - Hydraulics:
 - existing drainage of the site;
 - ultimate 100-year floodplain;
- B. Additional site information which would currently be submitted for properties within Upper Paint Branch per Special Protection Area law:**
- Vegetation:
 - inventory of the different vegetation types and areas of the site with emphasis on streamside vegetation, wetland areas, mature woods and areas under stress due to erosion, poor soils, steep slopes, etc.
- Soils/Geology:
 - depth of seasonal high water table; and
 - geologic conditions.
 - Physical Habitat (Stream Environment):
 - Stream characteristics:
 - stream gradient;
 - substrate suitability;
 - areas of channel or streambed erosion;
 - habitat suitability for trout and their support organisms.
 - Hydrology:
 - Surface Water:
 - base flow of receiving stream.
 - Groundwater:
 - groundwater characteristics (depth, yield, storage, etc.);
 - location and character of springs **and seeps;** and
 - recharge areas **for stream baseflow, seeps, and springs.**
 - Hydraulics:
 - existing and future channel velocities.
 - Water Quality:
 - existing water quality conditions **as provided to the applicant by MCDEP through compilation of documented stream quality data.**

II. Analysis of Proposed Development

A. Current Standard Submission Requirements per the Montgomery County Zoning Ordinance:

- Size and Location of Development:
 - proximity of physical development to stream channels, wetlands, floodplains, and appropriate buffers; and
 - area of physical development (ground coverage including buildings, roads, parking areas, walks, and other transportation ways).
 - ~~proximity to headwaters (for any given perennial/intermittent stream)~~
- Proposed Drainage Plan:
 - stormwater management concept plan

including the types of storm water conveyance and impervious area ~~and measures to augment ground water recharge to maintain sufficient base flows of streams.~~

- Sewerage and Water Systems:
 - proximity of water and sewer lines to stream channels, **wetlands, springs, seeps and buffers,**
 - location of septic fields, and
 - location of primary and alternative well locations.
- **Forest Conservation Plan per the Forest Conservation Law:**
 - **plans and worksheet showing proposed forest/tree loss, limits of disturbance and tree protection devices, forest/tree conservation areas (size and location), reforestation and/or afforestation areas (size and location), and conservation easements (size and location); stream buffer areas, by law, have the highest priority for forest retention, forest plantings, and protection, at a minimum, through conservation easements.**

B. Additional requirements currently required per the Special Protection Area Law:

- Proposed Drainage Plan:
 - **stormwater management concept plan that, in addition to meeting standard requirements, would include extraordinary measures, such as linked BMP's to progressively minimize sediment and stormwater impacts;**
 - **engineered stormwater management measures that avoid environmentally-sensitive areas such as streams and buffers, wetlands, floodplains, where feasible;**
 - proposed impervious area; and
 - proposed measures to augment groundwater recharge to maintain sufficient base flows of streams.
- Impact on Water Quality:
 - **Water quality parameters that would be of concern and should be monitored**

may include, but are not limited to:

- water temperature;
 - dissolved oxygen concentration;
 - total suspended solids;
 - **total dissolved solids;**
 - turbidity;
 - BOD₅;
 - pH;
 - **total organic carbon;**
 - **total phosphorous;**
 - **nitrate;**
 - **copper;**
 - toxics; and
 - total residual chlorine.
 - ~~fecal coliform density (increased nutrient load—both soluble and insoluble);~~
 - ~~nutrients.~~
- Impact on Aquatic Habitat:
 - **Aquatic habitat impact parameters that are of concern and should be monitored may include, but are not limited to:**
 - sediment deposition;
 - channel velocities;
 - streambed scouring/channel erosion;
 - **substrate fouling;**
 - **riffle embeddedness; and**
 - **stream baseflow.**
 - Site Maintenance:
 - erosion and sediment control (during and after construction); and
 - land application of substances (fertilizer, pesticides, etc.) or potential for deposition of residuals (refuse, vegetable debris, etc.).

In a watershed environment, all of these factors and more will interact in a cumulative way to establish the water quantity and quality of the stream and the associated impact on the stream habitat and biota. Therefore, it is difficult to set specific individual site standards for most of the parameters listed above. For the purposes of monitoring and administering development, especially cluster and planned development, the following performance criteria, updated and modified from the 1981 Eastern Montgomery County Master Plan, should be adhered to.

Performance Criteria

A. Location and Size of Development

1. Low density development **that results in low site imperviousness (10 percent or less) is preferred in the upper Paint Branch watershed (i.e., north of Fairland Road).** ~~(two-acre lots or larger) is preferred in the headwaters of Paint Branch.~~
2. Any physical development⁴ should be located as far away from the stream and its headwaters area as possible to provide the maximum protective buffer.
3. The cluster development is **normally** preferred to minimize the area of the site that is actually physically changed.
4. Physical development should not occur within 150 feet of **streams, wetlands, seeps and springs or within the regulatory stream buffer, whichever is greater.** ~~the 100-year ultimate floodplain~~
5. Development of areas with steep slopes (25 ~~15~~ percent or more), **stream buffers, poorly drained soils, documented** groundwater recharge areas, wetlands, and other environmentally sensitive areas should be avoided.
6. **A combination of structural and** non-structural Best Management Practices (BMP's), urban and agricultural, should be utilized to reduce pollutant loading—especially sediment—in receiving streams. ~~These BMP's should be incorporated into an erosion and sediment control plan.~~
7. Sewer lines and septic fields should be sited and constructed in such a manner as to maximally reduce the potential for ground and surface water contamination.
8. Water and sewer line stream crossings should be minimized. Where crossings do

⁴ Physical development refers to the structure-installed improvements, roads, driveways, parking areas, paths, etc.

occur, they should be placed away from trout-spawning areas.

9. Stream buffers should be designed and established to accomplish the following:
 - a. complement on-site erosion/sediment control measures by serving as a back-up natural filter/trap;
 - b. maintain or improve the water temperature regimen of the stream(s);
 - c. provide groundwater storage/recharge for the stream(s); and
 - d. prevent the siting of structures within the 100-year ultimate floodplain.

Stream buffer width should be based upon: ~~Characteristics to be examined to be examined to determine stream buffer width should include:~~

- a. soil type and infiltration rate;
- b. types and density of vegetative cover and soil holding ability, and
- c. slope of the land adjacent to the stream.

Stream buffers must remain undisturbed except for unavoidable and necessary development infrastructure.

Note: Stream buffers are currently defined in Planning Board guidelines and Section A.4. of these Performance Criteria.

B. Soil and Slope Conditions

1. **Highly pervious soils or documented groundwater recharge areas should be maintained as open space, parkland, or for stormwater management facilities that promote infiltration.** ~~Structural development should be located on soils with a low infiltration capacity as opposed to soils with a high infiltration capacity. Pervious soils should be maintained as open space and parkland.~~
2. Physical development should not occur in areas where the slope equals or exceeds **25 ~~15~~ percent or in stream buffer areas.**
2. ~~Poor soils—eroded or poorly drained—should be treated with vegetative cover, as recommended by Montgomery County Soil~~

~~Conservation District (MSCD).~~

3. Steep slope areas (~~25 to 45~~ percent or more) **and stream buffer areas** should be incorporated into the site's open space.
4. ~~Additional erosion control measures (as recommended by MSCD) should be utilized where moderately or severely eroded soils exist.~~

C. Vegetation and Tree Cover

1. ~~Trees and other natural vegetation should not be disturbed except at the specific site of structural development.~~
1. Vegetation along the channel banks should not be disturbed ~~under any conditions.~~ **except for necessary and unavoidable development infrastructure such as some types of stormwater management facilities, roads for access, and sewer lines.**
2. Wetland areas should not be disturbed ~~under any conditions.~~ **except for necessary and unavoidable development infrastructure.**
3. When a development site consists of both cropland and forestland, it is preferable to develop the area of cropland. Where that is not possible, and development occurs on the forestland, the residual cropland should be reforested.
4. Areas adjacent to streams **and within stream buffer areas** should be stabilized with appropriate vegetation.

D. Imperviousness

1. Development should not result in more than 10 percent of the total site area in impervious surface (including structures, roadways, parking areas, paths, etc.).
2. Stormwater conveyance systems which enhance infiltration and decrease runoff volumes and velocities should be used.
3. Porous materials should be used in the

construction of pathways, driveways, parking areas, etc., to limit **effective** impervious surfaces.

E. Hydrologic Criteria

1. The stormwater management concept plan **should must** account for the following:
 - a. Drainage for the development site should limit runoff to maintain the base flow and channel velocity of the receiving stream.
 - b. Where possible, natural drainage should be utilized instead of structural drainage. No modification of existing natural drainageways should occur.
 - c. **Where possible, drainage systems that reduce stormwater runoff velocities, such as grass-lined drainage swales or vegetated swales with check dams, should be utilized in development projects. These systems should be shaded where possible. The velocities of stormwater runoff should be reduced by including alternative drainage systems instead of traditional drainage systems. These systems may include: dutch drains, drainage swales, stone filled ditches, or grass lined ditches. These systems should be shaded.**
 - d. Wet ponds are prohibited in the Paint Branch watershed. If structural measures are required, **stormwater control measures that avoid or minimize thermal impacts. Above ground structures should be designed with shading. infiltration devices, underground storage, and/or dry ponds should be considered (for water quality reasons, dry ponds should be designed to detain "first flush" stormwater). These should be designed with shading.**
 - e. ~~Flows should be diverted from potentially erosive areas through the use of standard diversion techniques such as~~

~~interceptor berms or diversion dikes during and after construction.~~

2. The base flow of springs and streams should be ~~maintained~~ **monitored and protected through the combined stringent application of low-density residential land uses and existing laws, regulations and guidelines.**
3. Groundwater recharge areas should be **identified** and protected **through the combined stringent application of low-density residential land uses and existing laws, regulations and guidelines.**
4. The installation of any in-stream structures which will prevent or inhibit the natural movement of aquatic life, or the conversion of any stream or spring into a hydraulically efficient storm sewer system, ~~should be discouraged~~ **should not be allowed unless unavoidable.**

F. Hydraulic Criteria

1. As a minimum, ~~no landscape modification~~ **no clearing or grading** may occur within 100 feet of any stream or within 25 feet of the ultimate 100 year floodplain ~~whichever distance is greater.~~ **the stream buffer area, except for unavoidable and necessary development infrastructure.**
2. Effective energy dissipation techniques should be employed at all storm drainage outfalls to reduce upland and channel erosion.
3. No bridge support or pilings should be located within the stream.
4. Storm ~~drain sewer~~ outfalls should be sited as hydrologically remote from waterways as possible **while maintaining sufficient channel stability and erosion control.**

G. ~~Water Quality Criteria~~ *Items in this area are struck out (as shown below) or have been moved to either Section A or the new Section G.*

~~Maryland's Water Quality Standards for Class III Waters (Natural Trout Waters) must be maintained. Therefore, the following measures are recommended.~~

- ~~7. Site drainage ways should be shaded when necessary to prevent high temperature storm water from being discharged into the receiving streams.~~

G. Construction and Maintenance Measures

- ~~1. Erosion and Sediment Control Plans must be strictly implemented.~~
1. **Stream Floodplain** buffer around natural waterways should be protected with appropriate measures during and after construction activities.
2. Prior to and during construction, the following measures should be taken:
 - a. **phase grading and clearing operations, where necessary; plan and phase grading and clearing operations to expose only the smallest practicable area of land at any one time during development (the period of exposure should be as short as possible);**
 - ~~b. avoid unnecessary clearing;~~
 - b. maintain natural vegetation to the greatest extent possible;
 - c. **minimize time that unstabilized areas are exposed to erosive forces.**
 - ~~d. cover spoil piles with plastic or other protective materials; and~~
 - e. ~~mulch and tamp areas which will remain exposed to erosive forces for a period greater than 15 days (if the exposure period is going to exceed 30 days, these areas should be mulched and seeded in accordance with approved MSCD practices).~~
3. Deposition of materials in the **stream buffer should be prohibited unless approved on appropriate development plans (i.e., sediment control or site plans).** ~~100 year floodplain should be discouraged.~~
4. Top soil should be stored and redistributed

on-site according to approved **MCDEP MSCD** practice.

5. Vegetative debris such as leaves and grass clippings **should not be disposed of in or near the stream.** ~~should be bagged or bundled. These clippings should not be put out for collection more than one day prior to pick up.~~
6. Conveyance system cleaning should be conducted at frequent intervals to remove silt and debris from catch basins and ditches.
7. **Where stormwater management facilities are not normally required (e.g., RE-2 or less dense development), there should be some provisions for trapping and removal of litter and debris from storm drainage systems in new developments.** ~~Litter traps should be installed in and along drainage ditches, culverts, roadways, parking lots, etc.~~
8. Urban and agricultural BMP's should be employed to protect water quality from:
 - a. misapplication of fertilizer and pesticide;
 - b. improper refuse pickup;
 - c. vegetative debris; and
 - d. animal waste.
9. The discharge of untreated swimming pool effluent into any stream or storm **drainage sewer** system is prohibited. Treated effluent must meet **Use Class III** water quality standards.

Criteria for Use III Waters (Natural Trout Waters)⁵

(a) Bacteriological. There may not be any sources of pathogenic or harmful organisms in sufficient quantities to constitute a public health hazard. A public health hazard will be presumed if the fecal coliform density exceeds a log mean of 200 per 100 ml. based on a minimum of not less than five samples taken over any 30 day period, or if 10 percent of the total number of samples taken during any 30-day period exceed a log mean of

400 per 100 ml. unless a sanitary survey approved by the Department of Health and Mental Hygiene discloses no significant health hazard.

(b) Dissolved Oxygen. The dissolved oxygen concentration may not be less than 5.0 mg. per liter at any time, with a minimum daily average of not less than 6.0 mg. per liter.

(c) Temperature. The maximum temperature outside the mixing zone determined in accordance with COMAR Regulation may not exceed 68°F. (20°C.) or ambient temperature of the receiving waters, whichever is greater. In addition, thermal barriers that adversely affects aquatic life may not be established.

(d) pH. Normal pH values may not be less than 6.5 nor greater than 8.5.

(e) Turbidity. Turbidity may not exceed levels detrimental to aquatic life. Turbidity in the receiving water resulting from any discharge may not exceed 150 NTU (Nephelometer Turbidity Units) at any time or 50 NTU as monthly average. Note that NTUs are equivalent measures to FTUs (Formazin Turbidity Units) and JTUs (Jackson Turbidity Units).

(f) Total Residual Chlorine. Except as provided in COMAR Regulations, MDE may not issue a permit allowing the use of chlorine or chlorine containing compounds in the treatment of wastewater discharging to Use III waters. ~~Total residual chlorine shall be less than .002 mg. per liter.~~

(g) Toxic Materials. All toxic substance criteria to protect fresh water aquatic organisms and the wholesomeness of fish for human consumption apply. ~~The toxic materials listed here may not exceed these designated limits at anytime.~~

- (i) Polychlorinated Biphenyls (PCB's) ~~.001 micrograms per liter;~~
- (ii) Endrin ~~.004 micrograms per liter;~~
- (iii) Toxaphene ~~.005 micrograms per liter;~~
- (iv) DDT ~~.001 micrograms per liter;~~
- (v) Benzidine ~~.1 micrograms per liter;~~
- (vi) Aldrin Dieldrin ~~.003 micrograms per liter.~~

⁵ Code of Maryland Regulations (COMAR) 26.08.02 Water Quality.