



Chesterfield County, Virginia Department of Environmental Engineering

9800 Government Center Parkway– P.O. Box 40– Chesterfield, VA 23832-0040
(804) 748-1035 phone – (804) 768-8629 fax – chesterfield.gov

Chesterfield Guidance for Site Specific Determinations of Perennial Flow

Perennial Streams shall be identified using a scientifically valid system of in-field indicators as determined by the Director of Environmental Engineering. Acceptable methods include, but are not limited to, the most current version of The North Carolina Stream Identification method developed by the North Carolina Division of Water Quality and/or the perennial stream mapping protocol developed by Fairfax County (Virginia) Department of Public Works.

Other site-specific methods may be used so long as they have been determined to be scientifically valid by the Virginia Department of Conservation and Recreation, Division of Chesapeake Bay Local Assistance and are acceptable to, and have been coordinated with the Director of Environmental Engineering. In field protocols are available through the Department of Environmental Engineering.

All site specific determinations should include a narrative describing how, when and where the observations were made, the weather conditions at the time of observation and the study's final conclusion on whether the stream is perennial or intermittent. Additional information may be required depending on the method used. Specific requirements of approved methods are outlined in the sections **Field Indicator Protocols** and **Documented Observation (Photographic Method)**

Professional disciplines required for making field determinations of perennial flow will vary depending on the protocol or method used. Those using an ecologically based method should have an educational background, training and experience in stream ecology or the appropriate training and experience in the particular protocol employed.

Field Indicator Protocols

The use of field indicator protocols entails the evaluation of observations made of stream geomorphology, hydrology and biology. The Virginia Department of Conservation and

Recreation, Division of Chesapeake Bay Local Assistance has reviewed and found two field indicator protocols to be acceptable for making site-specific determinations. The first is a method developed by the North Carolina Division of Water Quality. The second is a modification of the North Carolina method developed by Fairfax County, Virginia.

The North Carolina and Fairfax County protocols have both recorded a range of scores, representative of the perennial stream transition points. Based upon field-testing of these methods, a stream in Chesterfield County should be considered to be perennial if the score equals or exceeds 30 for the North Carolina protocol or 25 for the Fairfax County protocol.

However, some streams that score below 30 for the North Carolina Method or 25 for the Fairfax method may be considered perennial based upon the best professional judgment of the Water Quality staff, or if biological indicators that require water for entire life cycles are present (e.g. fish, crayfish, amphibians, mussels or clams, large, multi-year tadpoles or benthic macroinvertebrates).

Photographs may be used to help identify field conditions at the time the study was completed. The use of photographs to classify a stream as intermittent must follow the guidelines set forth under the section: **Documented Observation Method (Photographic Method)**.

Guidelines for Field Indicator Protocols

Stream flow determinations should be made at least 48 hours after the last known rainfall. This will ensure that observations are made of conditions representative of base flow conditions and are not influenced by recent precipitation events.

Determinations should not be made without first walking up and down the full length of the channel. This initial examination allows the evaluator to study the nature of the channel, observe characteristics of the watershed and observe characteristics that indicate the source of water that may predominately or solely contribute to flow. As a general rule of thumb, several hundred feet (sometimes more) of channel should be examined to make determinations. Several stream reaches may need to be assessed in order to get an accurate representation of stream conditions.

Reduced topography, which can result in fewer channel-forming features, can make the scoring of stream geomorphology problematic in the low gradient streams of flood plains or in the Coastal Plain Region. In these areas, particular note and emphasis should be taken of in

stream biology in order to determine if a stream is perennial or intermittent. A stream may be considered perennial if biological indicators that require water for entire life cycles are present (e.g. fish, crayfish, amphibians, mussels or clams, large, multi-year tadpoles or benthic macroinvertebrates).

Data sheets for each stream reach assessed must be submitted with each application. Data sheets must include weather observations at the time the data was collected and may be supplemented by photographs of site conditions at each reach. Note-Photographs of stream channels will not be accepted as evidence that a stream is intermittent unless the procedures outlined in the section **Documented Observation Method (Photographic Method)** are followed. Data sheets should be submitted to the county as closely as possible to the date the fieldwork was performed.

Water Quality may require additional fieldwork to be performed if it is deemed necessary.

Those using the North Carolina or Fairfax field indicator protocol methods should have an educational background, training and experience in stream ecology or the appropriate training and experience in the particular protocol employed.

Documented Observation Method (Photographic Method)

Observations of stream flow shall be made in accordance with the following:

- Observations of stream flow or lack thereof shall be made at intervals of 50 feet or less along the entire length of the stream channel.
- If the channel crosses property lines, observations shall be made beginning a minimum of 150 feet downstream from the property line, to a point a minimum of 150 feet above the property line. (This may be modified by the Director of Environmental Engineering if access to offsite properties is denied.
- Additional photos shall be taken at any control sections within the study reach and at any control sections upstream and downstream from the property boundary. A control section is a culvert, natural grade control, headcut or other section with a hard bottom where flow would be readily visible.
- Photographs shall be taken facing upstream and downstream at each photo point.

- A second set of observations at the same photo points must be made no sooner than 7 and no later than 30 days after the original observations.

The Weekly Palmer Drought Severity Index (PDSI) for the Virginia Eastern Piedmont Region at the National Weather Service Climate Prediction Center (NOAA et al) shall be used to determine the general hydrologic conditions at the time of observation. Chesterfield County may use or require additional meteorological data from local rain gauge stations or monitoring sites to evaluate general conditions. Water Quality tracks the Weekly PDSI and can provide data if needed or find the weekly values can be found at:

http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/cdus/palmer_drought/

Photographic documentation of the absence of stream flow will not be accepted as definitive proof that a stream is intermittent if the weekly Palmer Drought Severity Index (PDSI) is -1.0 (abnormally dry/mild drought) or drier at any time during a period extending from 30 days prior to the date that the first set of observations are made through 30 days after the date when the second set of observations are made.

Palmer Classifications

4.0 or more extremely wet
3.0 to 3.99 very wet
2.0 to 2.99 moderately wet
1.0 to 1.99 slightly wet
0.5 to 0.99 incipient wet spell
0.49 to -0.49 near normal
-0.5 to -0.99 incipient dry spell
-1.0 to -1.99 mild drought
-2.0 to -2.99 moderate drought
-3.0 to -3.99 severe drought
-4.0 or less extreme drought

Observations shall be made at the true channel bottom, located below the movable bed material. Where the channel bed is armored, the presence of flow within the armoring layer must be checked.

Water Quality shall be advised prior to or within three days of completion of the first set of observations of the intent to submit photographic documentation of intermittent stream

conditions. Water Quality will coordinate a field review with the landowner or agent of the landowner for the second set of observations whenever possible.

The Documented Observation Method (Photographic Method) shall include:

The date, time, name of the observer and weather conditions at the time of observation, as well as photographs looking upstream and downstream documenting each observation. Photographs shall capture the various stream features (e.g. pools, riffles, and runs) along the stream. Photographs of the stream shall be taken close enough to see the channel bed and banks, shall show the channel bottom and any armoring materials and shall be unobstructed by vegetation. If a clear view cannot be obtained by relocating the point of observation, vegetation may be trimmed to obtain a clear view. Photographs of the channel shall include identifiable stationary landmarks in the field so that the point of observation can be verified at a later date if necessary. Identifiable landmarks include survey markers with identification, structural objects such as culverts, bridges, nearby buildings or unique natural features. Photographs must have a visible date stamp or certification by the observer of the date the photographs were taken.

The submitted report for the Documented Observation Method must include:

- Daily precipitation, maximum and minimum temperature, and cloud cover from the nearest National Weather Service weather station for a period of 30 days preceding the date that the first set of observations were made through 30 days after the date when the second set of observations were made.
- Copies of the Weekly Palmer Drought Severity Index (PDSI) for the Virginia Eastern Piedmont Region at the National Weather Service Climate Prediction Center for a period of 30 days prior to the date that the first set of observations were made through 30 days after the date when the second set of observations were made.

Please direct questions on our process for perennial flow and resource protection area designations to the Water Quality Manager by email or phone at (804)748-1035.