VIRGINIA SOIL AND WATER CONSERVATION BOARD GUIDANCE DOCUMENT ON THE METHODOLOGY FOR IDENTIFYING PERENNIAL STREAMS

(Approved December XX, 2020)

Summary:
This guidance document provides guidance to agricultural producers on the methodology the Board and the Department will utilize to identify perennial streams for the purpose of ensuring compliance with §62.1-44.123 of the Code of Virginia.

Electronic Copy:
An electronic copy of this guidance in PDF format is available on the Regulatory TownHall under the Virginia Soil and Water Conservation Board at http://townhall.virginia.gov/L/GDocs.cfm.

Contact Information:
Please contact the Department of Conservation and Recreation's Division of Soil and Water Conservation by calling 804.225.3653 with any questions regarding the application of this guidance.

Disclaimer:
This document is provided as guidance and, as such, sets forth standard operating procedures for the Department of Conservation and Recreation in administering the responsibilities established in §62.1-44.123 on behalf of the Virginia Soil and Water Conservation Board (Board). This guidance provides a general interpretation of the applicable Code and Regulations but is not meant to be exhaustive in nature. Each situation may differ and may require additional interpretation. This is not intended to and cannot be relied on to create any rights, substantive or procedural, on the part of any person or entity.

Methodology to Identify Perennial Streams

I. Authority:

The Code of Virginia, §62.1-44.123, states:

> "Any person who owns property in the Chesapeake Bay watershed on which 20 or more bovines are pastured shall install and maintain stream exclusion practices sufficient to exclude all such bovines from any perennial stream in the watershed."

The fifth enactment clause in both Chapters 1185 and 1186 of the 2020 Acts of Assembly requires the Board to adopt a methodology to be used for identifying perennial streams no later than December 31, 2020.

> 5. That the Virginia Soil and Water Conservation Board, as established pursuant to § 10.1-502 of the Code of Virginia, shall establish, no later than December 31, 2020, the methodology for identifying perennial streams, as defined in § 62.1-44.122 of the Code of Virginia, as created by this act.

II. Definitions:

Board means the Virginia Soil and Water Conservation Board

Department means the Virginia Department of Conservation and Recreation, Division of Soil and Water Conservation

Intermittent stream means a body of water flowing in a natural or manmade channel that contains water for only part of the year. During the dry season and periods of drought, these streams will not exhibit flow.

Perennial stream, as defined by §62.1-44.122, means a body of water depicted as perennial on the most recent U.S. Geological Survey 7-1/2-minute topographic quadrangle map (scale 1:24,000) or identified by a method, established in guidelines approved by the Department, that does not require field verification.. For the method, perennial stream means a body of water that flows in a natural or manmade channel year-round during a year of normal precipitation.

III. Discussion and Interpretation

Utilizing information from several existing individual datasets, a new dataset will be developed to identify the perennial stream segments in Virginia's portion of the Chesapeake Bay Watershed (watershed). Reference datasets that will be used to develop this new perennial dataset include:

- The Virginia Information Technology Agency's (VITA) Virginia LIDAR dataset, which is available for the entire watershed and, in many instances, contains multiple years of data for certain locations;
- SSURGO dataset that includes information about soils as collected by the National Cooperative Soil Survey over the course of a century;
- 2002 VGIN-created stream network (derived from digital elevation models (DEMs)); and
- The United States Geological Survey's National Hydrography Dataset (NHD).

Process to develop base dataset of stream segments

Due to the spatial inaccuracy of existing spatial databases representing hydrology, it is necessary to create new lines that represent the center of stream channels. A precise representation of the

location of the stream channel is necessary to assist with determining compliance with §62.1-44.123.

VITA's Virginia LIDAR data is the primary base data layer used to create the dataset. The LIDAR dataset is used to create precise digital elevation models (DEMs). The DEMs are then used to create the general stream features across the watershed. Aerial imagery base maps and the Virginia HUC features map are also included to create this initial stream feature layer.

To further refine the initial stream feature layer, the DEMs are used to model hydrologic processes including the accumulation of water and the direction of the flow of water. As there may be regional variations in the effectiveness of this process, quality control testing is conducted to ensure that the results accurately reflect the actual hydrology in each region. The stream features are then subdivided into smaller segments and these smaller segments are reviewed for perennial identification.

Identifying perennial stream segments from the base dataset

Reference datasets provide additional information for each stream segment and assist with the identification of whether a segment is perennial or intermittent. Each stream segment will have information overlaid from the reference datasets to provide additional details that may impact that segment's identification.

There are three reference datasets that are utilized to identify a stream segment as perennial.

1. The SSURGO individual soil classifications is used to examine whether wet or flooded soils are present in a certain stream segment.
2. To account for the impacts of a year with low rainfall on a stream segment, a dataset of water features developed by VGIN from data collected in 2002 is used. There was a severe drought statewide during 2002, therefore, a stream segment included in this dataset has a high likelihood of being perennial.
3. The NHD dataset contains information indicating potential water flow through stream segments; this information can be used to assist with the identification of segments in the new base datasets that are likely to be perennial. This dataset's resolution is not the same scale as the new base stream segment dataset; therefore, a larger search threshold is used for comparison of NHD features with the new base dataset.

As each of the reference datasets contain different characteristics of a perennial stream segment, a segment will only be identified as perennial when two of the three reference datasets contain perennial characteristics for that segment.

Quality control for the final dataset

Once stream segments are identified as perennial or intermittent, several quality control processes are undertaken to ensure the integrity of the final dataset including the use of tools to check the processing of all connected features in the dataset. As an example of such processes, stream segments are reviewed to ensure all segments upstream of an intermittent feature are

similarly identified as intermittent. For each hydrologic area, four segments will be sampled to ensure the identification of those segments is accurate. Each segment is examined to confirm the correct reference dataset information has been utilized as well.

Additionally, the four segments are evaluated against aerial imagery for certain characteristics of perennial stream segments. This evaluation looks for the presence of a stream bed and bank (which is indicative of perennial water flow); stream sinuosity (streams with low channel slope gradients will typically show high sinuosity if the stream is perennial); and the appearance of riffles or pools (these repeated combinations can be observed readily in perennial streams).

IV. Moving Forward

Access to the final dataset of stream segments

Once the final dataset of stream segments for the watershed has been developed, including the completion of all the necessary quality control checks, the Department will provide public access to the dataset on its website.

Previous regulatory determination of stream segments

If a previous regulatory determination has been made regarding the perenniality of a stream segment (such as a perennial stream determination made by a locality under the authority provided by the Chesapeake Bay Preservation Act) and the determination conflicts with the identification made by the Department, the Department will recognize the previous regulatory determination, provided proof of the determination is available.

V. Adoption, Amendments, and Repeal:

This document shall remain in effect until rescinded or superseded.

Appendix 1

Applicable Code of Virginia Authorities.

The Code of Virginia contains the following authorities applicable to this Guidance:

§ 62.1-44.123. (For contingent effective date, see § 62.1-44.119:1) Bovine livestock stream exclusion.

Any person who owns property in the Chesapeake Bay watershed on which 20 or more bovines are pastured shall install and maintain stream exclusion practices sufficient to exclude all such bovines from any perennial stream in the watershed.