

Decision Process for pH and Mine Impacted Waters

All pH impairments are identified based on COMAR §26.08.02.03, which states that: “Normal pH values may not be less than 6.5 or greater than 8.5” in Use I, IP, II, III, IIIP, IV, or IVP waters. It is undesirable to incorrectly identify a water body as impaired when the observed condition is of a natural origin. Factors such as the presence of a peat or black water bog or swamp would be considered as natural conditions, and therefore, not impaired under the CWA §303(d) listing process.

Another natural condition which should not be used to identify a water body as pH impaired is an abundance of algae or aquatic plants that elevate pH levels above 8.5 as a result of photosynthetic-driven chemical reaction, unless the condition is being caused by a defined nutrient enrichment source. Certain conditions in close proximity to limestone springs may also have natural pH values outside of the standards. Streams that do not meet the criterion for pH, and which cannot be demonstrated to have failed as a result of natural conditions, will be listed as impaired.

Streams influenced by abandoned coal or clay mining operations (those that predate the permitting authority or designated as “pre-law”) and having a pH below 6.5 would be listed as impaired.

The decision process for evaluating pH in Maryland waters is summarized in the following flowchart shown in Figure 1.

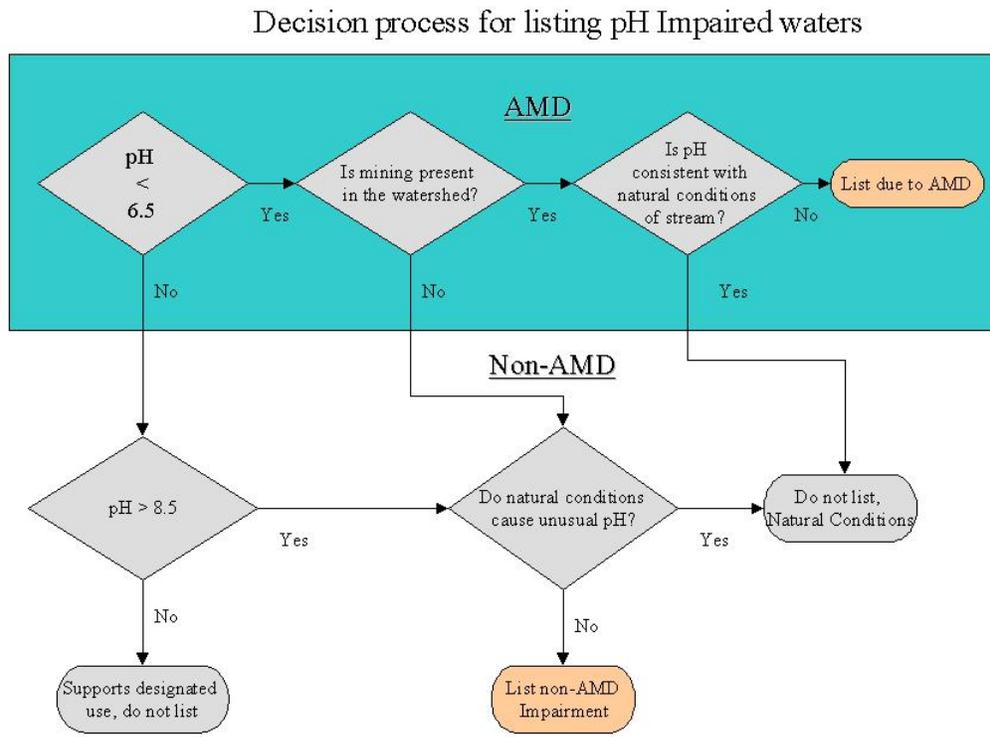


Figure 1: Flow chart of pH decision process.

1. An assessment using the flow chart can be applied to any size water body provided that the monitoring locations adequately characterize the water body being assessed. State staff will exercise best professional judgment in determining what water body size is appropriate. See section below on Geographic Scale of Assessment.
2. Ideally, an impairment decision should be based on a sufficient number of samples (generally 10 or more) to adequately characterize potential diurnal and seasonal variations.
3. If 10% or more of the samples violate the pH numeric criteria and cannot be traced to naturally occurring conditions, the 8-digit stream watershed will be considered to not meet the standards for its designated uses and listed as impaired on Category 5 (impaired, may need a TMDL).
4. If less than 10% of the samples violate the pH numeric criteria, best professional judgment will be used to determine if the water body should be listed as impaired. In the event the waterbody is not listed, additional samples will be collected for future consideration.

Geographic Scale of Assessment

For the purposes of the Integrated Report, MDE is required to georeference assessments within a GIS. This helps to provide perspective when reviewing the extent of water quality impairments. Monitoring of pH is usually conducted in headwater streams near suspected sources of acid mine drainage. As a result, assessments of pH tend to be applied at the stream segment level to avoid providing an inaccurate assessment over a wide geographic area. Most of Maryland's current pH assessments are applied to all stream length above a monitoring location, up to the headwaters or to the next pH monitoring station. In general, this is the scale at which future pH assessments will be applied. However, the State reserves the right to have a flexible assessment scale that can be adapted to any unique geographic and/or data scenario.