GUIDANCE FOR AN EXTERNAL ENTITY INTERESTED IN PURSUING A CHANGE TO A WATER QUALITY STANDARD BASED ON NONANTHROPOGENIC CONDITIONS (6-29-20)

1.0 SUMMARY

The Department of Environmental Quality (DEQ) has prepared this guidance for cases where an entity external to the DEQ is interested in pursuing a modification to an existing water quality standard because the existing standard may be more stringent than the nonanthropogenic condition, as provided for in 75-5-222(1), MCA. This work is referred to as the nonanthropogenic standard development process. DEQ is currently working on implementation of 75-5-222(1), MCA; including development of one or more nonanthropogenic standards (refer to *Standards, More Information, and Supporting Technical Documents* at https://deq.mt.gov/water/Programs/sw). DEQ will continue to develop guidance, references, and examples that can be used by external entities, and will also provide updates to this guidance paper when appropriate.

2.0 CONSULTATIONS

For each step of the nonanthropogenic standard process, it is recommended that the external entity consult with DEQ. This will provide the external entity with a better understanding of potential outcomes as each step of the process unfolds. Specific DEQ consultation topics are provided in the process steps defined below (**Section 3.0)**. DEQ also recommends that the entity consult with potentially affected stakeholders during early stages of the process. DEQ will consult with the Environmental Protection Agency (EPA) as appropriate, and consult with stakeholders knowledgeable of existing and/or downstream beneficial uses to assist with identifying those uses as part of Step 3.3. DEQ may also consult with these stakeholders as part of Step 3.5 to assist with properly characterizing the nonanthropogenic condition as it may relate to protecting those uses.

3.0 NONANTHROPOGENIC STANDARD DEVELOPMENT PROCESS STEPS

The recommended steps for an external entity pursuing a nonanthropogenic standard are incorporated into the **Figure 1** flow chart. Note that **Step 3.1** and **Step 3.2** can be accomplished in either order.

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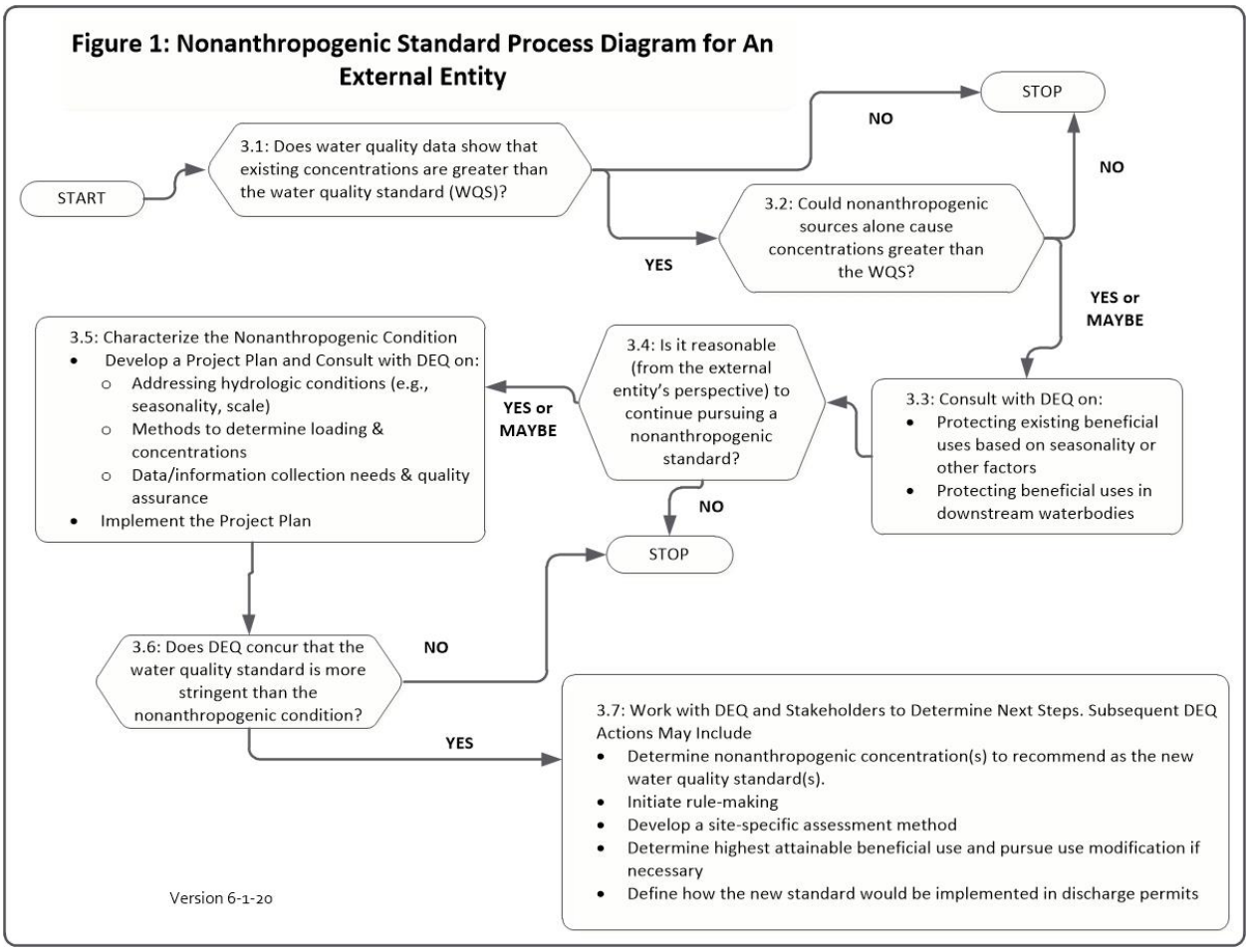

3.1 Water Quality Data Comparison to the Existing Standard

This initial screening step is a comparison of data to the numeric water quality standard. Note that for some waterbody – pollutant combinations DEQ may have already completed this task. If not, then the external entity should consult with DEQ to ensure that:

- The data properly represent the location(s) of concern and appropriately represents current conditions (e.g., DEQ often only considers data less than 10 years old as being representative of current conditions).
- The data adequately represent seasonal and hydrological variability.
- The data are appropriately summarized to avoid overrepresenting results that are lacking in spatial or temporal distinction. For example, two samples taken on the same day that are closely located may represent only one unique sample.
- An appropriate statistical approach is used for comparing the data to the existing water quality standard.
- Proper quality assurance and quality control procedures were used to collect and analyze the data.

- There is an appropriate amount of data for an adequate comparison to the water quality standard.

DEQ suggests that if there are water quality data gaps, the external entity should develop a sampling and analysis plan (SAP) consistent with DEQ recommendations for water quality data collection (this can be further enhanced by including DEQ as a signatory on the SAP). A SAP template, DEQ monitoring protocols, and other helpful monitoring information are provided on DEQ's website (refer to *Monitoring & Assessment* at: https://deq.mt.gov/water/Programs/sw).

If the results from this step indicate that the water quality standard is currently met, then there is no need to continue.

3.2 Initial Evaluation of Potential Nonanthropogenic Conditions

There should be information to suggest that nonanthropogenic sources alone could be causing concentrations to be greater than the standard. If not, then there is no need to continue.

There are numerous approaches that an entity could take to help determine the potential for significant nonanthropogenic sources. Consultation with DEQ is recommended since DEQ may have pollutant source information, can help determine what constitutes nonanthropogenic sources, and can help ensure proper application of reference data.

Pollutant sources need to be considered at the complete watershed scale and from a seasonal perspective. Anthropogenic influences on pollutant fate and transport must also be considered. For example, a pollutant source may be nonanthropogenic in a one waterbody, but flow transfer from that waterbody for irrigation may result in what has now become an anthropogenic influence on another waterbody. Flow transfers or withdrawals for irrigation can also result in an anthropogenic modification to the seasonality of the pollutant load via subsurface irrigation returns.

This step is intended as an initial screening. A more detailed analysis of nonanthropogenic conditions is covered in **Step 3.5**.

3.3 Consult with DEQ on Beneficial Use Protection Considerations

There are two parts to this step, both of which involve consultation with DEQ regarding anticipated beneficial use protection requirements. The first part involves ensuring that the existing beneficial uses are protected in the waterbody where the nonanthropogenic standard is being pursued. The second part involves ensuring protection of beneficial uses further downstream and in downstream waterbodies. Though a final determination on beneficial use protection requirements is part of **Step 3.7**, it is important for the external entity to be aware of how these requirements could potentially influence the practicality of pursuing a nonanthropogenic standard.

3.3.1 Protecting Existing Waterbody Uses

This step involves discussion with DEQ on the potential seasonal or hydrologic beneficial use considerations that could result in nonanthropogenic standard variability during a calendar year. As part

of the process, DEQ will need to define the highest attainable use based on nonanthropogenic conditions in the waterbody. Some uses, such as aquatic life, could be limited because of the nonanthropogenic influences on water quality, resulting in the need for a beneficial use modification via rulemaking. However, evaluating the highest attainable use must involve consideration of critical seasons, hydrologic periods and hydrologic events for one or more existing uses, and the extent that the nonanthropogenic condition supports use(s) during those seasons, periods, or events. Because of the often-inherent variability of nonanthropogenic conditions, this could lead to a nonanthropogenic standard that varies seasonally or varies based on hydrologic conditions. For example, it is possible that the nonanthropogenic condition is not more stringent than the existing standard when fish are spawning or when the water is used for irrigation during specific seasons or opportunistically during hydrologic events.

Note that the purpose of this step is not for DEQ to make the final determinations regarding beneficial use support requirements and modifications (ultimately, that is the Board of Environmental Review's role); it is instead intended to be part of the initial screening process to help an external entity evaluate the practicality of pursuing a nonanthropogenic standard.

3.3.2 Protecting Beneficial Uses in Downstream Waterbodies

This step involves discussion with DEQ on the protection of downstream beneficial uses and ramifications for the nonanthropogenic standard process. As stated within 75-5-222 (1), MCA: "The department shall implement the standard in a manner that provides for the water quality standards for downstream waters to be attained and maintained." This will be accomplished through a final determination of how the nonanthropogenic standard is defined during **Step 3.7**, and/or via a final determination of how wastewater or other discharge permits will be specifically addressed during **Step 3.7**. However, the following points will help DEQ and an external entity evaluate potential downstream beneficial use protection requirements:

a. Potential effects of new or increased discharges (to the waterbody where the nonanthropogenic standard is being considered) on water quality and beneficial uses in a downstream waterbody.
b. Downstream waterbodies currently not meeting a water quality standard for the pollutant(s) being evaluated.
c. Existing Total Daily Maximum Load (TMDLs) requirements and/or relevant watershed scale analyses of pollutant loading impacts on downstream uses.

Consistent with **Step 3.3.1**, the purpose of this step is not for DEQ to make the final determinations regarding downstream beneficial use support requirements; it is instead intended as part of the initial screening process to help an external entity evaluate the practicality of pursuing a nonanthropogenic standard.

3.4 External Entity Determination to Continue

Based on the information from **Step 3.1** through **Step 3.3**, the external entity may want to examine the anticipated cost benefits of a nonanthropogenic standard prior to moving to **Step 3.5** since **Step 3.5** could involve a significant expenditure of resources. Considerations might include:

- The extent to which existing water quality is above the water quality standard

- The extent to which nonanthropogenic sources are likely contributing to elevated concentrations and the effort that will be required to demonstrate this extent. Watershed size could greatly influence the effort required to demonstrate the nonanthropogenic condition.
- Potential seasonal or downstream beneficial use protection requirements.

3.5 Characterize the Nonanthropogenic Condition

Completion of this step will result in quantitatively defining the extent of nonanthropogenic influence on pollutant concentrations. This is also referred to as the demonstration of the nonanthropogenic condition. An example approach is provided by Figure 2.1 within the following report: 'Derivation of the Nonanthropogenic Arsenic Standards for Segments of the Upper and Middle Yellowstone River'. This report can be found at the website location identified in Section 1.0 above.

DEQ recommends that the external entity develop a comprehensive project plan, in consultation with DEQ, to help guide this work. The project planning process should involve the following:

- Define the hydrologic region. Ensure that seasonality and total watershed scale are adequately incorporated.
- Develop an inventory of likely non-anthropogenic and anthropogenic loading sources and pollutant transport mechanisms.
- Identify models or combination of models and associated assumptions for determining non-anthropogenic loading/concentrations.
- Compile existing data. Identify data and information collection requirements for modeling and source loading purposes. Develop SAPs to address data gaps.
- If a reference approach is incorporated into the analysis, then identify reference sites, provide justification for selection of sites, and define additional data collection goals for reference locations.
- A timeline for implementing the plan, particularly for addressing water quality sampling requirements to ensure proper consideration of seasonality and other hydrologic aspects; as well as quality assurance and quality control requirements. This timeline should be developed in consideration of any permitting or compliance schedules.

It is important to consult with DEQ on multiple aspects of the above components, such as:

- Applicability of data based on quality assurance and sampling dates.
- Development of sampling plans (SAPs) that define field data collection and analytical methods.
- Modeling approaches and associated quality controls.
- Modeling assumptions and information sources.

When implementing the project plan, the external entity should document planning updates or modifications that were necessary based on field or other conditions.

DEQ recognizes the potential variability in scale and approaches that could influence the amount of effort required to properly characterize nonanthropogenic conditions for an individual waterbody or a specific reach of a waterbody. DEQ also recognizes that the Yellowstone River arsenic example provided above represents a relatively high level of effort consistent with the large size of the Yellowstone

watershed. A comprehensive project plan and a DEQ-agreed upon level of acceptable accuracy for the range of nonanthropogenic influence can help address this variability.

Step 3.6 Comparison of the Nonanthropogenic Condition to the Standard

Step 3.5 should lead to a quantitative description of the nonanthropogenic condition such that a nonanthropogenic concentration(s) can be compared to the existing water quality standard in this step. If the results do not show the existing water quality standard as more stringent than the nonanthropogenic condition, then there is no reason to continue. If DEQ concurs that the results do show the water quality standard as more stringent than the nonanthropogenic condition, then the external entity may want to pursue nonanthropogenic standard development consistent with **Step 3.7**.

As part of this step, the external entity should consult with DEQ on appropriate statistical approaches for comparing nonanthropogenic concentrations to the water quality standard to help ensure DEQ concurrence.

3.7 Work with DEQ and Stakeholders on Next Steps

This part of the process represents a transition to rule making activities where DEQ will take on much of the work for completing the rulemaking. Subsequent DEQ actions may include:

- Determining the nonanthropogenic concentration(s) to be recommended as the new water quality standard(s). The value(s) will be based on the results from **Step 3.5** and further consideration of beneficial use support requirements discussed in **Step 3.3**.
- Defining a site-specific beneficial use subcategory consistent with the nonanthropogenic condition and the highest attainable use.
- Defining an assessment process that DEQ will use to make beneficial use support determinations through time.
- Providing details on how the new standard will be addressed in Montana Pollutant Discharge Elimination System (MPDES) permits.
- Initiation of rule-making through the Board of Environmental Review.
- Consultation with EPA and other stakeholders.
- Obtaining EPA approval on the final rule package for Clean Water Act purposes.