

## **SUBSTANTIVE CHANGES TO ASSESSMENT METHODOLOGY FROM 2016 TO 2018**

### **1.0 ASSESSMENT BACKGROUND**

No substantive changes were made to this section.

### **2.0 INTEGRATED REPORTING CATEGORIES**

- The phrase “Assessment Unit (AU)” was introduced and replaces (and is synonymous with) “monitoring segment” throughout the document. This will be more consistent with EPA terminology used in the Integrated Report guidance.
- Language was added to the text to clarify intent and use of the reporting categories.
- Category 3 was divided into sub-categories “a” and “b” and an additional bullet was added to “b” to satisfy requests to illustrate how prioritization is given to certain waters.

### **3.0 DATA MANAGEMENT**

The title of this section was changed to “Data Management” and the chapter was reorganized. Text was added, deleted, or simply moved around as indicated in the subsection remarks below.

#### **3.1 Water Quality Data Types**

This is a new subsection. With the addition of continuous data (for dissolved oxygen pH, and temperature) as part of the assessment process there was a need to describe different data types.

#### **3.2 Data Assembly**

Beaver Lake period of record for site specific nutrient criteria assessment was added to maintain consistency with how criteria were developed.

#### **3.3 Data Quality Considerations**

Previously, all data quality considerations were outlined in one bulleted list. However, this was confusing as there were some parameters with exceptions to those considerations. To alleviate confusion, ADEQ staff implemented a two-phase data quality requirement process to more accurately convey all data quality requirements for each parameter. The new two-phase system is introduced and defined in Section 3.3(and its subsections).

##### **3.3.1 Individual Data Sets**

- This section clarifies the data quality requirements for an individual dataset.

##### **3.3.2 Aggregate Data Sets**

- This section clarifies that data can be combined to create an aggregate dataset.
- Some language originally used in another section was moved to this section due to the reorganization of Section 3.0.

#### **3.4 Tiered Approach to Qualifying Data**

- Language was added to the text to clarify intent.
- Table 1 was revised to fully comply with new data quality requirements.
- Original sub-section “Biological Integrity Data” was removed. Existing tables did not comply with data quality requirements. All biological integrity methodology is covered in Section 5.0.

### **3.5 Data Quantity Considerations**

Most text in this section was previously in a different section and moved here. This was part of reorganizing Section 3.0. Minor language was added to the existing text to clarify intent.

### **3.6 Data Representativeness Considerations**

Spatial and temporal representativeness is discussed, in general, within this section; however, most original text concerning “spatial distribution” and “temporal distribution” was removed. These topics are now discussed as Phase II data quality requirements within each specific parameter’s subsection of Section 6.0.

### **3.7 Statistical Confidence**

Due to comments and concerns that the traditional method of data analysis was not scientifically robust enough, ADEQ implemented the use of Binomial Distribution Method for analyzing certain data for assessment purposes. This section discusses the binomial distribution method and clarifies which data this method will be used with and why.

### **3.8 Internal Data Assessment Method**

Title changed from “WQAR” as some internal data is not assessed through WQAR for technical reasons. Other than that, no substantive changes were made within this section.

### **3.9 External Data Assessment**

Language was added to clarify how external data are assessed.

### **3.10 Impairment Source Determination**

No substantive changes were made to this subsection.

### **3.11 Final Assessment Decision Process**

This is a new section. Language was added to clarify how final attainment decisions are made.

## **4.0 WATER QUALITY STANDARDS**

### **4.1 Antidegradation**

No substantive changes were made to this section.

### **4.2 Designated Uses**

Text was added to describe designated uses and Table 4 was revised to be more inclusive.

### **4.3 Water Quality Criteria**

Clarifying language was added to both sub-sections. No major changes.

## **5.0 BIOLOGICAL INTEGRITY**

- Title change. Section 5.0 was originally titled “General Standards” and had one subsection titled “Biological Integrity.” The section title was changed to “Biological Integrity” and the subsection removed.
- Figures 1 and 2 were added to illustrate the biological integrity assessment process. Clarifying language was added throughout section.
- Table 5 was updated to better clarify biological condition scoring criteria ranges.
- Table 6 was updated to show appropriate Percent Comparable Estimate ranges.

## **6.0 SPECIFIC STANDARDS**

- Language was deleted concerning the rounding method as ADEQ is no longer using the rounding method for data analysis. (Data analysis is now covered in Section 3.0 Data Management.)
- Language was added to further explain general Phase II data quality requirements.

### **6.1 Temperature – 6.12 Ammonia**

For all parameters:

- Parameter specific Regulation No. 2 language was updated to comply with the most currently approved version of Reg. 2.
- Parameter specific Phase II Data Quality Requirements were added.
- Parameter specific Listing and De-Listing methodologies were updated as necessary.

### **6.1 Temperature**

- Language concerning continuous data requirements, listing methodology, and de-listing methodology was added.
- Assessment methodology was not changed for discrete data.

### **6.2 Turbidity**

Language was clarified. Assessment methodology was not changed.

### **6.3 pH**

- Language concerning continuous data requirements, listing methodology, and de-listing methodology was added.
- Assessment methodology was not changed for discrete data.

### **6.4 Dissolved Oxygen**

- Language concerning continuous data requirements, listing methodology, and de-listing methodology was added.
- Reg. 2 language regarding determining effluent discharge limits removed.
- Assessment methodology was not changed for discrete data.

## **6.5 Radioactivity**

Language was clarified. Assessment methodology was not changed.

## **6.6 Bacteria**

Methodology was changed from previous cycles to include assessments for multiple years (seasons) or a single year (season) of data.

## **6.7 Toxic Substances**

Language was clarified. Assessment methodology was not changed.

## **6.8 Fish Consumption**

Language was clarified. Assessment methodology was not changed.

## **6.9 Nutrients**

- A definition of “wadeable” was added.
- A definition of “paired data” was added.
- Dissolved oxygen water quality translators for wadeable streams and rivers were changed to be consistent with assessment methodologies outlined in Section 6.4. Now either diel or long term continuous D.O. data can be used at the same exceedance rates as outlined in Section 6.4. This change is seen in the text and in Figure 3: Nutrient Assessment Flowchart for Wadeable Streams and Rivers.
- pH water quality translator for wadeable streams and rivers was changed to be consistent with assessment methodologies outlined in Section 6.3.

## **6.10 Site Specific Minerals**

- Section was revised to only include site specific minerals.
- Reg. 2 language concerning non-site specific language was removed.
- Assessment methodology was not changed.

## **6.11 Non Site Specific Minerals and Domestic, Agricultural, and Industrial Water Supply Uses**

- Non-site specific minerals were added to this section as all of these designated uses apply the 250/250/500 mg/L criteria for Chlorides, Sulfates, and TDS, respectively.
- Assessment methodology was not changed.

## **6.12 Ammonia**

- This section was reorganized and some text was revised for clarity.
- The date range of April 1 thru October 31 (for fish early life stage present) was removed and no date range is specified. Date ranges were too restrictive and were not applicable to all species within all waters. “Fish early life stage present” will be determined via literature, biological sampling, or other means.

- Assessment methodology was not changed.

### **APPENDICES A, B, AND C**

Appendices A, B, and C were removed. These appendices provided summary tables of assessment criteria for five (5) parameters for Arkansas's ecoregions, lakes, and major rivers.