

Biological Monitoring Fact Sheets

Aquatic Life Monitoring (ALM)

ALM events are typically scheduled as part of the cooperative monitoring schedule and are conducted to provide baseline data on environmental conditions and to determine if aquatic life uses/dissolved oxygen criteria are being attained. ALM samples can contribute to the establishment of an appropriate aquatic life use, if the optional diel event is included in the data gathering efforts. An ALM is appropriate for routine monitoring sites, and should be representative of the water body being assessed. Data is gathered over a one year sampling period with at least one month between each monitoring event.

Biological Events	Number of Index Period Events	Number of Critical Period Events
Fish assemblage characterization	1	1
Benthic macroinvertebrate community characterization		
Stream physical habitat assessment		
Instantaneous field measurements		
Flow discharge measurement		
24-hour DO monitoring		
* Conventional water chemistry sample		

*Conventional water chemistry is optional, but strongly recommended for the evaluation of the biological event.

Two biological events are required over **one year**. One event is to be conducted during the critical period (July 1 – September 30) and the other event during the non-critical portion of the index period (March 15 - June 30 or October 01 - October 15) with, at least one month between monitoring events.

When the ALM is conducted and the samples indicate that the presumed use is supported, this will be adequate information to confirm the aquatic life use. However, if the ALM is conducted on a water body not listed in either Appendix A or D of the Texas Surface Water Quality Standards (TSWQS) and the samples indicate that the presumed use is not supported, an Aquatic Life Assessment (ALA) or Use Attainability Analysis (UAA) will be necessary to determine the appropriate aquatic life use and the **optional diel events** (detailed below) must be added to the data gathering effort. The Water Quality Standards Group must be notified and consulted with to determine the appropriateness of an ALA or UAA.

When the ALM is conducted on a water body listed in either Appendix A or D of the TSWQS and the samples indicate that the adopted use is not supported, the water body will be listed on the 303(d) List. A UAA will be necessary to determine the appropriate aquatic life use and option 1 must be added to the data gathering effort. The Water Quality Standards Group must be notified and consulted with to determine the appropriateness of a UAA.

Optional Diel Events

Biological Events	Number of Index Period Events	Number of Critical Period Events
24-hour DO monitoring	1	2
Flow discharge measurement		

Besides the two monitoring events described above, a minimum of **three additional diel events coupled with flow discharge measurements** must be conducted. Two events must be conducted during the critical period and one event must be conducted during the non-critical portion of the index period.

Aquatic Life Assessment (ALA)

An ALA is conducted on an unclassified water body not already included in Appendix D of the TSWQS, and which has previously been assessed and determined not to attain the presumed aquatic life use and/or the associated dissolved oxygen criterion (i.e., listed in Category 5c). The purpose is to determine the appropriate aquatic life use and the associated dissolved oxygen criterion.

Biological Events	Number of Index Period Events	Number of Critical Period Events
Fish assemblage characterization	1 st year 1; 2 nd year 1	1 st year 1; 2 nd year 1
Benthic macroinvertebrate community characterization		
Stream physical habitat assessment		
Instantaneous field measurements		
Flow discharge measurement		
24-hour DO monitoring		
Conventional water chemistry sample		

Four biological events are required over **two years**. For each year, one event is to be conducted during the critical period (July 1 – September 30) and the other event during the non-critical portion of the index period (March 15 - June 30 or October 01 - October 15) with, at least one month between monitoring events.

Site/reach selection must ensure that adequate data are generated to accurately characterize biotic integrity through the entire study area. This may involve more than one site depending on the size of the water body. **Site/reach selection must be done in consultation with TCEQ Water Quality Standards Group.**

Exceptions to the number of biological events required as determined by the Water Quality Standards Group. If an ALA was required based on the results of ALM and the first year's samples from the ALA *indicate agreement* with the results of the ALM, then the second year's biological events for the ALA are not required. If an ALA was required based on the results of ALM and the first year's samples from the ALA *are not in agreement* with the results of the ALM, then the second year's biological events for the ALA are required. The aquatic life use indicated by the combined results of the ALA and ALM will be considered for *Appendix D* in the next TSWQS revision.

Additional Diel Events

Biological Events	Number of Index Period Events	Number of Critical Period Events
24-hour DO monitoring	1 st year 1; 2 nd year 1	1 st year 2; 2 nd year 2
Flow discharge measurement		

Besides the four monitoring events described above, a minimum of **six additional diel events coupled with flow discharge measurements** must be conducted. Four of the events should be conducted during the critical period with two during year 1, and two during year 2. The remaining two events should be conducted during the index period with one during year 1, and one during year 2.

An effort should be made to collect all samples when flows are at, or above the critical low flow condition. Any deviations from the above procedure should be discussed with the Water Quality Standards Group.

Exceptions to the number of additional diel events required as determined by the Water Quality Standards Group. If an ALA was required based on the results of ALM and the first year's samples from the ALA *indicate agreement* with the results of the ALM, then the second year's additional diel events for the ALA are not required. If an ALA was required based on the results of ALM and the first year's samples from the ALA *are not in agreement* with the results of the ALM, then the second year's additional diel events for the ALA are required.

Aquatic Life Use Attainability Analysis (UAA)

A UAA is conducted to establish or change an assigned aquatic life use or dissolved oxygen criteria. The purpose is to determine the appropriate aquatic life use and the associated dissolved oxygen criteria. All activities should be coordinated through the Water Quality Standards Group to determine the appropriateness of the UAA study plan.

Biological Events	Number of Index Period Events	Number of Critical Period Events
Fish assemblage characterization	1	1 st year 1; 2 nd year 1
Benthic macroinvertebrate community characterization		
Stream physical habitat assessment		
Instantaneous field measurements		
Flow discharge measurement		
24-hour DO monitoring		
Conventional water chemistry sample		

Three biological events are required over **two years**. Two of the events are to be conducted during the critical period (July 1 – September 30) with one during year 1 and the second during year 2. The third event should be conducted during the non-critical portion of the index period (March 15 - June 30 or October 01 - October 15) in either year 1 or year 2. There should be at least one month between monitoring events.

Site/reach selection must ensure that adequate data are generated to accurately characterize biotic integrity through the entire study area. To accomplish this, sampling of multiple sites/reaches will be required for most water bodies. **Site/reach selection should be done in consultation with TCEQ Water Quality Standards Group.**

Additional Diel Events

Biological Events	Number of Index Period Events	Number of Critical Period Events
24-hour DO monitoring	3	1 st year 2; 2 nd year 2
Flow discharge measurement		

Besides the three monitoring events described above, a minimum of **seven additional diel events coupled with flow discharge measurements** must be conducted. Three of the events should be conducted during the critical period with two during year 1, and two during year 2. The remaining three events should be conducted during the index period with no more than six events from both the critical and index periods in any one year.

An effort should be made to collect all samples when flows are at, or above the critical low flow condition. Any deviations from the above procedure should be discussed with the Water Quality Standards Group.

Receiving Water Assessment (RWA)

An RWA is conducted on unclassified water bodies that are the subject of a wastewater permitted activity. The purpose is to generate physical, chemical, and biological data to be used in identifying the appropriate aquatic life use and the associated dissolved oxygen criterion.

Biological Events	Number of Index Period Events	Number of Critical Period Events
Fish assemblage characterization		1
Benthic macroinvertebrate community characterization		
Stream physical habitat assessment		
Instantaneous field measurements		
Flow discharge measurement		
*24-hour DO monitoring		
*Conventional water chemistry sample		

One biological event is required, but two are strongly recommended for determining the appropriate aquatic life use. An effort should be made to ensure that data are collected during the index period (March 15 - October 15) and preferably within the critical period (July 1 - Sept. 30).

***Conventional water chemistry and 24-hour DO monitoring are optional, but strongly recommended for the evaluation of the biological event.**

The RWA typically involves a single site located upstream of an existing discharge or downstream of a proposed new discharge. Additional sites may be required depending on the size of the discharge. Study sites/reaches should be representative of the water body(ies) being evaluated and should be selected in consultation with TCEQ Water Quality Standards Implementation Team.

The aquatic life use indicated by the RWA will be considered for *Appendix D* in the next TSWQS revision.