

In-Stream Monitoring Provisions for Resource Extraction Individual Permits in OSRW Watersheds with Federally Listed Fish Species

Outstanding state resource waters (OSRWs) are those surface waters designated by the Energy and Environment Cabinet pursuant to 401 KAR 10:031, Section 8, and includes certain unique waters of the commonwealth, including those with federally threatened or endangered species. The Kentucky Division of Water (KDOW) is obligated by 10:031, Section 8(2) to protect the water quality and habitat of those streams supporting a federally listed endangered or threatened species. Federally listed species are afforded additional protection by Section 9 of the Endangered Species Act (ESA) of 1973, as amended, which prohibits any person subject to the jurisdiction of the United States to cause “take” of a listed species. Any significant habitat modification or degradation, including in this case, water quality degradation, which results in death or injury to a listed species by significantly impairing behavioral patterns, including breeding, feeding, or sheltering would constitute “take” under the ESA.

Provisions for OSRW Streams

- 1) A two year, pre-resource extraction monitoring program is required for all permits involving OSRWs before any land disturbance has occurred, in accordance with Methods for Conducting Resource Extraction Intensive Surveys in Outstanding State Resource Waters, KDOW 2010b. These data will be used to determine background conditions prior to activity.
- 2) Prior to onset of sampling, a comprehensive study plan shall be submitted to KDOW and U.S. Fish and Wildlife Service (USFWS) for review and approval by both agencies. **This study plan must have all the requirements listed in the Quality Assurance Project Plan template (KDOW 2010a).** Copies of Kentucky Department of Fish Wildlife Resources (KDFWR) and USFWS collecting permits shall be included with the study plan.
- 3) No in-stream disturbances shall occur in the OSRW or in any blue-line tributary stream as delineated by the U.S.G.S 7.5 minute Quadrangle Map unless approved by the KDOW.
- 4) A 100-foot buffer zone shall be maintained for each stream including tributary streams. Width variances of the buffer zone may be granted on a case-by-case basis. Streams within the watershed of the OSRW shall not be used for sediment control or permanent material storage without prior approval from KDOW.
- 5) All underground activities within the immediate watershed of an OSRW shall adhere to a 150-foot minimum subsidence zone buffer so that no stream will be impacted by loss of flow and/or habitat disturbance.
- 6) Federally listed fish population surveys must be completed only by those persons who hold a valid KDFWR Scientific Wildlife Collecting Permit and a USFWS Section 10 Recovery Permit.

- 7) For resource extraction projects, applicants must also contact the USFWS, Kentucky Field Office regarding the potential development of a Protection and Enhancement Plan (PEP). Sampling provisions discussed in this document will be incorporated into the PEP, but the PEP will include other conservation and protective measures for the species.
- 8) Active resource extraction monitoring provisions include monthly water chemistry and yearly habitat assessment, macroinvertebrate community assessment, stream substrate and sediment transport analysis and federally listed fish population survey to ensure that fish populations are not adversely affected by the permitted activity.
- 9) In-stream, physico-chemical parameters for pre-resource extraction and active resource extraction monitoring provisions are listed in the table below:

Characteristic	Minimum	Average	Maximum	Sample Type
Flow (cfs)		Report	Report	Instantaneous
Dissolved Oxygen (mg/L)		Report	Report	Grab
Temperature (°F)		Report	Report	Grab
Conductivity (µS/cm)		Report	Report	Grab
Alkalinity (as mg/l CaCO ₃)		Report	Report	Grab
pH (standard units)	Report		Report	Grab
TDS (mg/l)		Report	Report	Grab
Sulfates (as mg/l SO ₄)		Report	Report	Grab
Chlorides (mg/l)		Report	Report	Grab
Total Calcium (µg/l)		Report	Report	Grab
Total Magnesium (µg/l)		Report	Report	Grab
Total Sodium (µg/l)		Report	Report	Grab
Total Potassium (µg/l)		Report	Report	Grab
Antimony (µg/l)		Report	Report	Grab
Arsenic (µg/l)		Report	Report	Grab
Cadmium (µg/l)		Report	Report	Grab
Copper (µg/l)		Report	Report	Grab
Iron (µg/l)		Report	Report	Grab
Lead (µg/l)		Report	Report	Grab

Characteristic	Minimum	Average	Maximum	Sample Type
Manganese (µg/l)		Report	Report	Grab
Mercury (µg/l)		Report	Report	Grab
Nickel (µg/l)		Report	Report	Grab
Selenium (µg/l)		Report	Report	Grab
Thallium (µg/l)		Report	Report	Grab
Total Settleable Solids (µg/l)		Report	Report	Grab
Total Suspended Solids (µg/l)		Report	Report	Grab
Zinc (µg/l)		Report	Report	Grab
Hardness (as mg/l CaCO ₃)		Report	Report	Grab

Water quality sampling sites shall be established on the main stem between each tributary that shall be affected by the proposed project. A control site shall be included above all disturbances in the watershed. Each tributary shall also be monitored for water quality parameters. These sampling sites shall coincide with the aquatic macroinvertebrate sites which shall be required. At least one of these sampling events shall be conducted during a rainfall event (> 1 inch of rain within a 24 hour period).

Two-Year, Pre-Resource Extraction Monitoring Program Provisions

- 1) Year One
 - A. Water Chemistry Characterization (every two weeks)
 - B. Habitat Assessment (once)
 - C. Macroinvertebrate Community Assessment (once)
 - D. Federally Listed Fish Population Survey (once)
 - E. Stream Substrate and Sediment Transport Analysis (once)
- 2) Year Two
 - A. Water Chemistry Characterization (monthly)
 - B. Habitat Assessment (once)
 - C. Macroinvertebrate Community Assessment (once)
 - D. Federally Listed Fish Population Survey (once)

- E. Stream Substrate and Sediment Transport Analysis (once)

Active Resource Extraction Monitoring Program- Continued Through Phase 2 Bond Release

- 1) Water Chemistry Characterization (monthly)
- 2) Habitat Assessment (yearly)
- 3) Macroinvertebrate Community Assessment (yearly)
- 4) Federally Listed Fish Population Survey (yearly)
- 5) Stream Substrate and Sediment Transport Analysis (yearly)

Required Standard Operating Procedures for Intensive Surveys:

Refer to *Methods for Conducting Resource Extraction Intensive Surveys in Outstanding State Resource Waters*, KDOW 2010b.

Data Reporting Provisions:

- 1) All quarterly reports will be compiled into a final calendar year report. All quarterly reports shall be submitted to the Division of Water and Kentucky Ecological Services Field Office, U.S. Fish and Wildlife Services, 3761 Georgetown Road, Frankfort, KY 40601.
- 2) All quarterly reports will be compiled into a final calendar year report.
- 3) All final reports will contain a yearly and seasonal comparison of all past reported data. This comparison will include but is not limited to water quality data, macroinvertebrate metric assessments and fish IBI scores and assessments.
- 4) All stations will be identified by latitude and longitude in decimal degrees. Mile points will also be given for each station.
- 5) The metrics that will be used to determine stream health will include but will not be limited to the following metrics for macroinvertebrates: Taxa richness; Total Number of Individuals; EPT; m%EPT; mHBI; %Ephemeroptera; %Clingers; and %Chironomidae+Oligochaeta.

For macroinvertebrates: calculation of the Macroinvertebrate Bioassessment Index (MBI) will be included in the report. The MBI template to be used is the MBI Template – Genus Species Full Pick Method.

For Fish: Index of Biotic Integrity (IBI) based on Kentucky Division of Water assessments and re-evaluations.

- 6) A CD shall be included with the aforementioned yearly report with all past, pre-mining sampling data included with the current sampling year's data. All data will be submitted in an Excel ® or equivalent spreadsheet format. Subsequent data CD's will include only the current sampling year. Data that shall be included but not limited to includes: Date of sampling; Time of sampling; Station ID, Number and all pertinent site information; Sampler ID; Method of sampling; Macroinvertebrates, fish, and water quality data in separate files and associated metrics with each site; and habitat information sheets.

REFERENCES

Kentucky Division of Water. 2010a. Quality Assurance Project Plan Individual Coal Mining Permits - Focus Monitoring for Water Quality, Biological Communities and Habitat Conditions. Kentucky Department of Environmental Protection, Frankfort, KY.

Kentucky Division of Water. 2010b. Methods for Conducting Resource Extraction Intensive Surveys in Outstanding State Resource Waters. Kentucky Department of Environmental Protection, Frankfort, KY.