

**South Fork Red River, Sand Lick Fork and Stump Cave Branch Chlorides TMDL REVISION**  
**Powell County, Kentucky**  
**TMDL ID# 1107**  
**September 27, 2011**

**A. TMDL Background:**

The South Fork Red River, Sand Lick Fork and Stump Cave Branch chloride TMDL (“the TMDL”) was originally approved on August 24, 1999. At the time the TMDL was finalized, the document addressed the original 303(d) listed segments of South Fork Red River from River Mile (RM) 0.0 to 10.1, Sand Lick Fork from RM 0.0 to 5.3, and Stump Cave Branch from RM 0.0 to 2.4, all impaired for the Warm Water Aquatic Habitat (WAH) designated use. For this TMDL, the loading capacity was determined by multiplying the chronic water quality criterion (WQC) for chlorides by the estimated 7-day, 10-year (7Q10) low-flow stream value. Kentucky WQC for chronic exposure is 600 milligrams per liter (mg/l) for the WAH designated use. This method is described in the ‘Target Identification’ section of the document (page 4). Original TMDL allocations are presented in Table 1. The original TMDL segments are depicted in Figure 1.

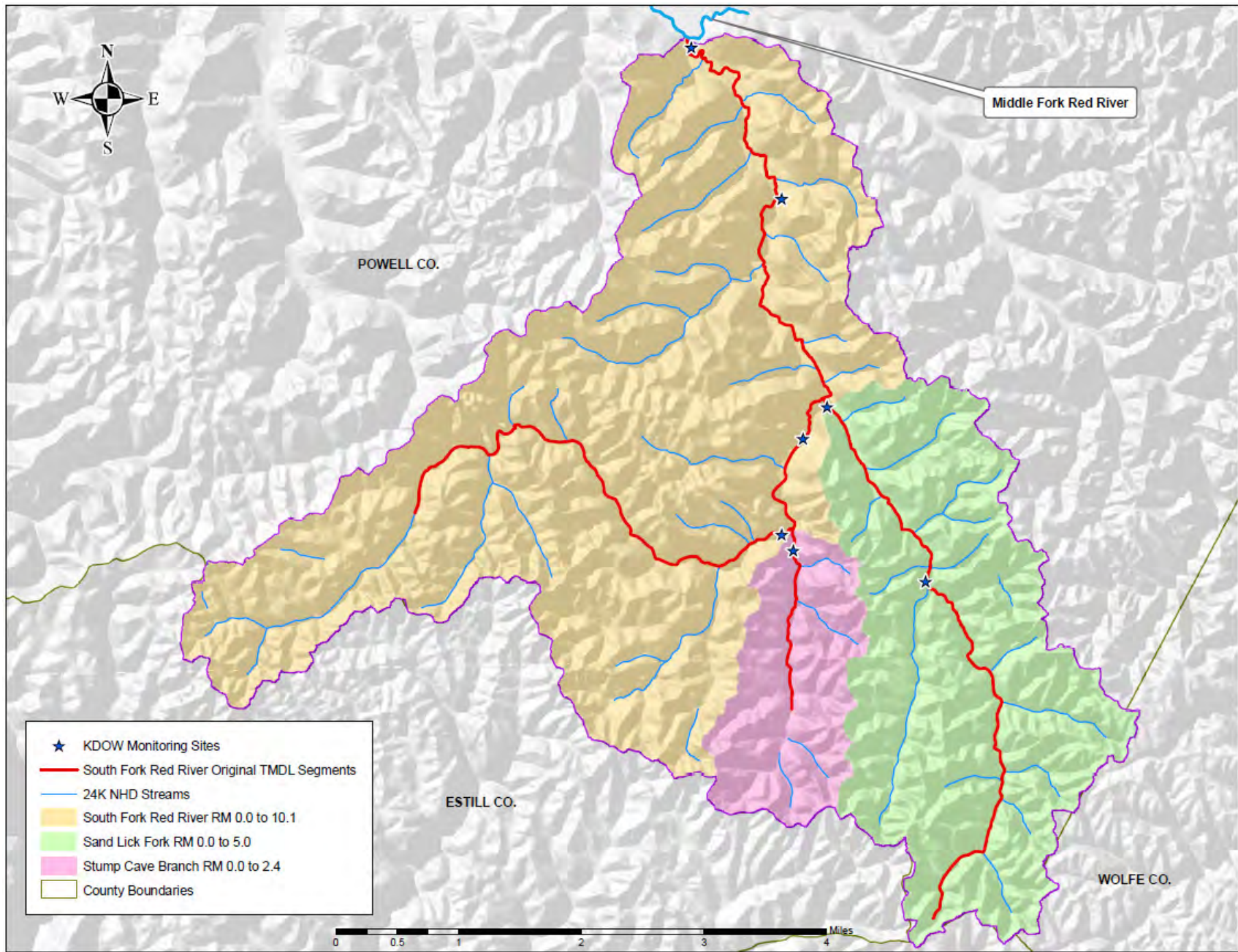
**Table 1 Original TMDL Allocations**

Waterbody and Segment	7Q10 <sup>(1)</sup> Flow (ft <sup>3</sup> /sec)	TMDL <sup>(2)</sup> (lbs/day)	Background (lbs/day)	Margin of Safety <sup>(3)</sup> (lbs/day)	Current and Future WLA <sup>(4)</sup> (lbs/day)	LA <sup>(5)</sup> (lbs/day)
South Fork Red River RM 0.0 to 10.1	0.32	1,030	110	180	470	270
Sand Lick Fork RM 0.0 to 5.3	0.10	323	35	58	144	86
Stump Cave Branch RM 0.0 to 2.4	0.04	128	14	23	57	34

- Notes:**
- 1) The 7Q10 low-flow value was estimated at the mouth of each watershed based on the provisions outlined on page 4 in the Target Identification section of the document
  - 2) The TMDL was determined by multiplying the chronic criterion for chlorides by the estimated 7Q10 low flow
  - 3) The Margin of Safety is an explicit 20% of the TMDL minus background and any (then) KPDES-permitted facilities (see the TMDL Development section).
  - 4) The WLA is equal to 50% of the TMDL minus background; the WLA for South Fork Red River includes the loading for a now inactive KPDES-permitted facility (20 lbs/day; see the TMDL Development section)
  - 5) The LA is equal to 50 % of the TMDL minus background and also includes the MOS. Permit applications may be approved up to the amount of the LA contingent upon approval by KDOW and removal of nonpoint sources in the watershed such as separator tanks, abandoned holding ponds and wells (see the TMDL Development section)

**B. Purpose of Proposed Revision:**

The TMDL was finalized for the original segment of South Fork Red River from RM 0.0 to 10.1, as indicated on the 1998 303(d) List. The Sand Lick Fork and Stump Cave Branch chloride TMDLs are not being revised and will not be discussed in this Revision. As part of the 2000 305(b) Report and subsequent 2002 303(d) List, Kentucky divided South Fork Red River into two segments based on biological and habitat data collected at two sites along the main stem in 1998. Kentucky Division of Water (KDOW) is revising the TMDL to provide allocations for the new segments from RM 0.0 to 3.9 (GNIS ID: KY515547\_01) and 3.9 to 10.1 (GNIS ID: KY515547\_02), as indicated on Kentucky’s current Integrated Report.



**Figure 1 South Fork Red River Watershed Monitoring Sites and Original TMDL Segments**

**C. Justification for Revision:**

The original TMDL document provided loading allocations at the mouth of South Fork Red River, Sand Lick Fork and Stump Cave Branch. The TMDL stated that the period of greatest impact (i.e. critical condition) for chlorides on aquatic life occurred during low-flow conditions (see the Problem Definition section of the document) and also provided estimated 7Q10 low-flow stream values at each monitoring site in the watershed. These values were estimated based on the provisions outlined in the Target Identification section of the document (page 4). TMDL loads were subsequently derived by multiplying the WQC for chlorides by the estimated 7Q10 value. The monitoring sites and original TMDL segments are depicted in Figure 1.

**D. Revised TMDL Allocations:**

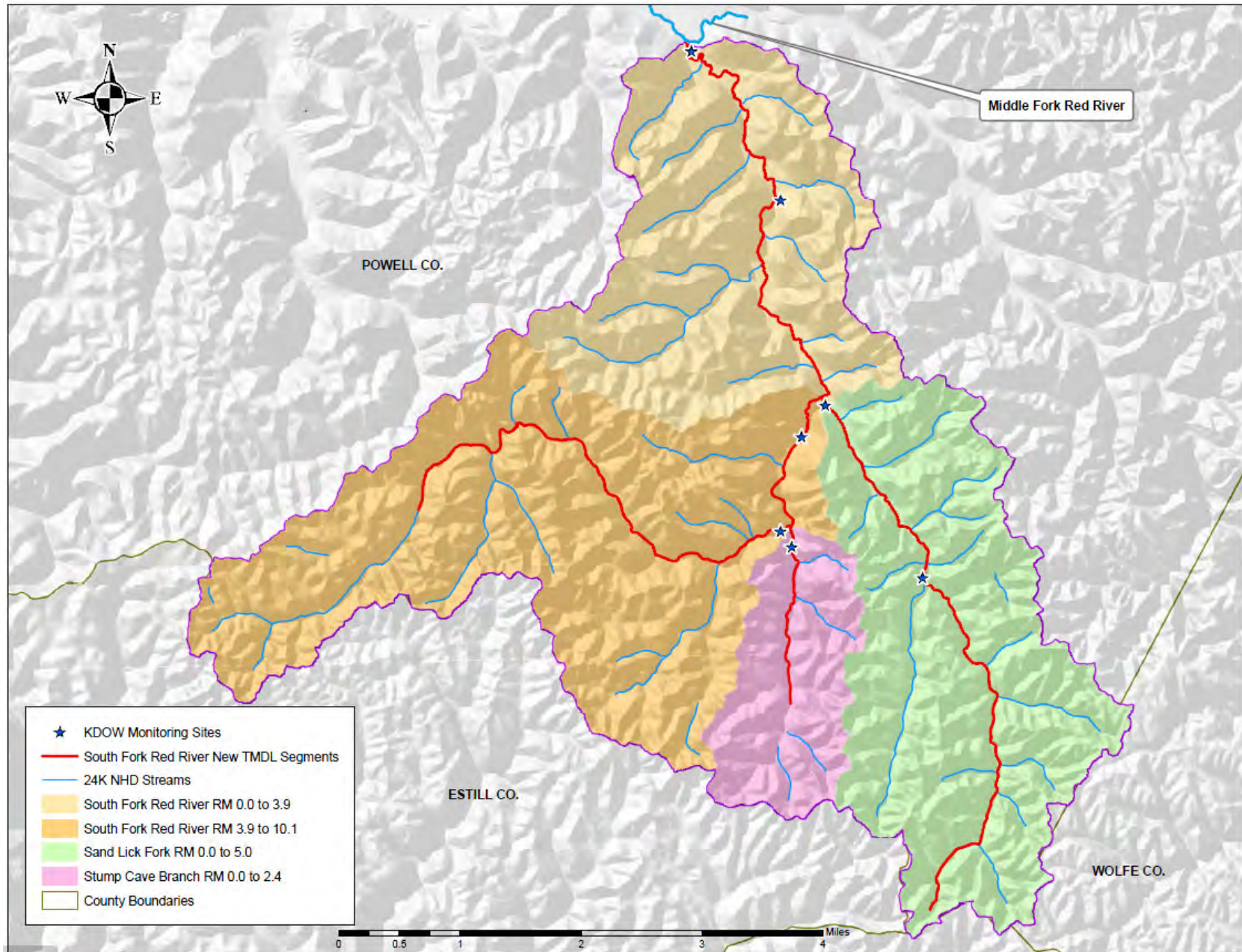
Additional stream monitoring of the South Fork Red River main stem occurred in late 1998 however the data was not assessed and did not appear in a 305(b) Report until after the TMDL was finalized in 1999. The data collected in 1998 indicated that both segments of the main stem now fully support their WAH designated use. KDOW has proposed a new category (4D) to EPA for waterbodies with an approved TMDL that now support their designated use. KDOW will move these segments to this category upon approval.

The estimated 7Q10 low-flow stream value (0.16 ft<sup>3</sup>/ sec) provided for the monitoring site above the Sand Lick Fork tributary was used to calculate the TMDL for the headwater segment from RM 3.9 to 10.1 (GNIS ID: KY515547\_02). This 7Q10 value is half of the value (0.32 ft<sup>3</sup>/ sec) estimated at the mouth and another site downstream of Sand Lick Fork therefore the same 7Q10 low-flow stream value (0.16 ft<sup>3</sup>/ sec) was used to set the TMDL for the RM 0.0 to 3.9 segment (GNIS ID: KY515547\_01). The two estimated 7Q10 values add up to the original 7Q10 value used to set the TMDL in 1999. The estimated 7Q10 values for all monitoring sites are provided in Table 1 of the document (page 6). Revised TMDLs for the South Fork Red River are provided in Table 2 and depicted in Figure 2.

**Table 2 Revised TMDL Allocations**

Waterbody and Segment	7Q10 <sup>(1)</sup> Flow (ft <sup>3</sup> /sec)	TMDL <sup>(2)</sup> (lbs/day)	Background (lbs/day)	Margin of Safety <sup>(3)</sup> (lbs/day)	Current and Future WLA <sup>(4)</sup> (lbs/day)	LA <sup>(5)</sup> (lbs/day)
South Fork Red River RM 0.0 to 3.9	0.16	516	110	81	203	122
South Fork Red River RM 3.9 to 10.1	0.16	516	110	81	203	122

- Notes:**
- 1) The 7Q10 low-flow value was estimated at several locations throughout the watershed based on the provisions outlined on page 4 in the Target Identification section of the document. The 7Q10 flow estimated near RM 4.3 of the South Fork Red River, above Sand Lick Fork, was 0.16 ft<sup>3</sup>/ sec. This is half of the estimated 7Q10 at the mouth of South Fork Red River (0.32 ft<sup>3</sup>/ sec).
  - 2) The TMDL was determined by multiplying the chronic criterion for chlorides by the estimated 7Q10 low-flow value.
  - 3) The Margin of Safety is an explicit 20% of the TMDL minus background (see the TMDL Development section).
  - 4) The WLA is equal to 50% of the TMDL minus background; there are currently no active KPDES-permitted facilities in the watershed.
  - 5) The LA is equal to 50 % of the TMDL minus background and also includes the MOS. Permit applications may be approved up to the amount of the LA contingent upon approval by KDOW and removal of nonpoint sources in the watershed such as separator tanks, abandoned holding ponds and wells (see the TMDL Development section).



**Figure 2 South Fork Red River Watershed Current TMDL Segments and Watershed Areas**

#### **E. Other Considerations**

The TMDL was developed with consideration given to the entire watershed. Although the intent of this Revision is to document allocations for each of the segments of South Fork Red River, implementation efforts should remain consistent with the spirit of the watershed approach. The 'Implementation Controls' section of the document (page vii) describes the approach to be used by KPDES-permitted sources while the 'Source Assessment' section (page 5) describes the approach to be used by non-KPDES-permitted sources in the watershed such as abandoned wells, tanks and holding ponds that were associated with previously un-permitted oil production.

#### **F. Public Participation:**

The South Fork Red River Watershed chloride TMDL was placed on Public Notice on March 30, 1999. South Fork Red River was re-segmented as part of the 2000 305(b) Report and the 2002 303(d) List, which was placed on Public Notice August 7, 2002. This revision does not present any new information that has not been provided to the public for comment; therefore, further public notice is not necessary.