

# KANSAS-LOWER REPUBLICAN BASIN TOTAL MAXIMUM DAILY LOAD

## Waterbody: Ninemile Creek Watershed Water Quality Impairment: Zinc

### 1. INTRODUCTION AND PROBLEM IDENTIFICATION

**Subbasin:** Lower Kansas

**County:** Jefferson and Leavenworth

**HUC 8:** 10270104

**HUC 11:** 050

**Drainage Area:** 69.1 square miles.

**Main Stem Segments:** 15 and 17, starting at confluence of Kansas River, headwaters near McLouth

**Tributary Segments:** Cow Creek (58)

**Designated Uses:** Expected Aquatic Life Support; Secondary Contact Recreation; Food Procurement on Main Stem Segments  
Expected Aquatic Life Support; Secondary Contact Recreation; on Cow Creek

**1998 303d Listing:** Table 1–Predominant Point and Non-point Source Impacts

**Impaired Use:** Aquatic Life Support

**Water Quality Standard:** Typical criterion for Ninemile Cr is 0.2 mg/L based on  
 $WER[EXP[(0.8473 * (LN(hardness)))] + 0.884]$   
Table 1b. KAR 28-16-28d(d); WER = 1.0, Hardness Range = 193-208 mg/L CaCO<sub>3</sub>

### 2. CURRENT WATER QUALITY CONDITION AND DESIRED ENDPOINT

**Level of Support for Designated Use under 1998 303d:** Partially Supporting Aquatic Life

**Monitoring Sites:** Station 680 near Linwood

**Period of Record Used:** 1997

**Flow Record:** Calculated by proportional drainage correction from Stranger Creek near Tonganoxie (USGS Station 06892000); 30 years average daily flow.

**Current Condition:** Since loading capacity varies as a function of the flow present in the stream, this TMDL represents a continuum of desired loads over all flow conditions, rather than fixed at a single value. Flow duration data were examined from the Linwood Gaging Station for each of the three defined seasons: Spring (Apr-Jun), Summer-Fall (Jul-Oct) and Winter (Nov-Mar). High flows and runoff equate to lower flow durations, baseflow and point source influences generally occur in the 85-99% range. Load curves were established for typical Aquatic Life criterion by multiplying the flow values along the curve by the applicable water quality criterion and converting the units to derive a load duration curve of pounds of zinc per day. These load curves represent the TMDL since any point along the curve represents water quality at the standard at that flow. Historic excursions from WQS are seen as plotted points above the load curves. Water quality standards are met for those points plotting below the applicable load duration curves.

The only excursion from the criteria was noted during Summer/Fall (2.63 mg/l in August 1997). Seventeen percent of samples (1 of 6) exceeded the criteria, indicative of a baseline of partial support for the aquatic life designated use.

**PERCENT OF SAMPLES OVER WATER QUALITY STANDARDS BY FLOW AND SEASON**

STREAM NAME	I M P A I R M E N T	S E A S O N	MAGNITUDE	DURATION					F R E Q U E N C Y	Current Condition of Water Quality at Site 680 Over 1997
				0 TO 10 %	10 TO 30 %	30 TO 60 %	60 TO 90 %	90 TO 100 %		
NINEMILE CREEK	Z I N C	S	% OVER MANAGE- MENT GOAL	0	0	0	0	0	0/3 = 0%	1/6 = 17% Exceedence
		S F	% OVER MANAGE- MENT GOAL	0	0	50	0	0	1 / 2 = 50%	
		W	% OVER MANAGE- MENT GOAL	0	0	0	0	0	0/1 = 0%	

**Desired Endpoints of Water Quality (Implied Load Capacity) at Site 680 over 2004 - 2008:**

Overall, the endpoint of this TMDL will be to reduce the percent of samples over the applicable criteria from 17% to less than 10% for samples taken over the monitoring period of 2004-2008. This TMDL endpoint meets water quality standards as measured and determined by Kansas Water Quality Assessment protocols. These assessment protocols are similar to those used to cite the stream segments in this watershed as impaired on the Kansas 1998 Section 303d list. Near summer median flow conditions not more than a total of 4.3 pounds per day is necessary to maintain the aquatic life support criterion.

Seasonal variation is accounted for by the seasonal flow analysis of this TMDL. More detailed seasonal endpoints can be developed in 2004 to reflect additional sampling and confirmation of impaired status.

### **3. SOURCE INVENTORY AND ASSESSMENT**

There are no industries known to be in the watershed which utilize zinc in their processes. Four point sources are in the watershed, one is a rock quarry, McLouth is in the upper watershed and monitoring point near Linwood is located near the confluence with the Kansas River. The Lawrence Rest Area along the Kansas Turnpike also lies within the drainage. Although the lagoon system is not permitted for metals and handles the wasteload associated with restrooms in the area, the impervious area may receive occasional spillage of zinc in automotive fluids from parked cars and truck using the area. The excursion from the criterion occurred during a mild runoff event. It is possible a spike of zinc left the rest area and was delivered to the stream during a rain storm.

### **4. ALLOCATION OF POLLUTION REDUCTION RESPONSIBILITY**

Additional assessment will be necessary to ascertain source and load contributions.

**Point Sources:** Since none of the point sources are associated with processes involving zinc, there will be no Wasteload Allocation made for zinc under this TMDL.

**Non-Point Sources:** It is possible that the spike of zinc detected in monitoring emanated from the stormwater runoff from the Lawrence Rest Area of the Kansas Turnpike. At a flow of 4 cfs on Ninemile Creek, a Load Allocation of 3.9 pounds of zinc per day is necessary to adhere to the water quality criterion. This is a 13-fold reduction from the load seen at the time of the water quality excursion. The range of permissible loads extends from one pound per day at 1 cfs to 97 pounds per day at 100 cfs, allowing for a 10% MOS.

**Defined Margin of Safety:** Ten percent of the applicable zinc load shall be the defined margin of safety. At the flow conditions during the time of detecting the excursion, the margin of safety is equivalent to 0.4 pounds per day.

**State Water Plan Implementation Priority:** Because it appears this watershed's zinc load is rare or incidental this TMDL will be a Low Priority for implementation.

**Unified Watershed Assessment Priority Ranking:** This watershed lies within the Lower Kansas Subbasin (HUC 8: 10270104) with a priority ranking of 1 (Highest Priority for restoration work).

**Priority HUC 11s and Stream Segments:** Pending additional monitoring and assessment, no priority subwatersheds or stream segments.

## 5. IMPLEMENTATION

### Desired Implementation Activities

1. Confirm and minimize contributions of zinc loading to creek.

### Implementation Programs Guidance

Until the 2004 assessment of the continuation of monitoring is made, no direction can be made to those implementation programs.

**Timeframe for Implementation:** Continued monitoring over the years 2000-2004.

**Targeted Participants:** No targets until 2004 assessment.

**Milestone for 2004:** The year 2004 marks the midpoint of the ten-year implementation window for the watershed. At that point in time, additional monitoring data from Station 680 will be reexamined to confirm the impaired status of the streams within this watershed. Should the case of impairment remain, source assessment, allocation and implementation activities will ensue

**Delivery Agents:** Depends upon confirmation of impairment and assessment of probable sources. The Kansas Turnpike Authority may participate should future assessments indicate the Lawrence Rest Area is a source of consistent zinc loadings into the creek.

### Reasonable Assurances:

**Authorities:** The following authorities may be used to direct activities in the watershed to reduce pollution.

1. K.S.A. 65-164 and 165 empowers the Secretary of KDHE to regulate the discharge of sewage into the waters of the state.
2. K.S.A. 65-171d empowers the Secretary of KDHE to prevent water pollution and to protect the beneficial uses of the waters of the state through required treatment of sewage and established water quality standards and to require permits by persons having a potential to discharge pollutants into the waters of the state.

**Funding:** The State Water Plan Fund, annually generates \$16-18 million and is the primary funding mechanism for implementing water quality protection and pollution reduction activities in the state through the Kansas Water Plan. The state water planning process, overseen by the Kansas Water Office, coordinates and directs programs and funding toward watersheds and water resources of highest priority. Typically, the state allocates at least 50% of the fund to programs supporting water quality protection. This TMDL is a Low Priority consideration and should not receive funding.

**Effectiveness:** Improvements in reducing zinc loading to streams can be accomplished once the source is established, particularly through stormwater retention off-site of impervious areas.

## 6. MONITORING

KDHE will continue to collect bimonthly samples at Station 680 on a rotational basis, including zinc samples over each of the three defined seasons in two of the years between 1999-2003. Based on that sampling, the status of 303d listing will be evaluated in 2004. Should impaired status remain, the desired endpoints under this TMDL will be refined and direct more intensive sampling will need to be conducted under specified seasonal flow conditions over the period 2004-2008.

## 7. FEEDBACK

**Public Meetings:** Public meetings to discuss TMDLs in the KLR Basin were held March 10, 1999 in Topeka, April 27 in Lawrence and April 29 in Manhattan. An active Internet Web site was established at <http://www.kdhe.state.ks.us/tmdl/> to convey information to the public on the general establishment of TMDLs and specific TMDLs for the Kansas-Lower Republican Basin.

**Public Hearing:** A Public Hearing on the TMDLs of the Kansas-Lower Republican Basin was held in Topeka on June 3, 1999.

**Basin Advisory Committee:** The Kansas-Lower Republican Basin Advisory Committee met to discuss the TMDLs in the basin on December 3, 1998; January 14, 1999; February 18, 1999; March 10, 1999; May 20, 1999 and June 3, 1999.

**Discussion with Interest Groups:** Meetings to discuss TMDLs with interest groups include:  
Agriculture: November 10, 1998; December 18, 1998; February 10, 1999; April 10, 1999, May 4, 1999, June 8, 1999 and June 18, 1999.  
Municipal: November 12, 1998, January 25, 1999; March 1, 1999; May 10, 1999 and June 16, 1999.  
Environmental: November 3, 1998; December 16, 1998; February 13, 1999; March 15, 1999, April 7, 1999 and May 3, 1999.  
Conservation Districts: March 16-18, 24-25, 1999

**Milestone Evaluation:** In 2004, evaluation will be made as to current condition and the degree of impairment which has occurred within the watershed of Ninemile Creek. Subsequent decisions will be made regarding implementation approach and follow up of additional implementation.

**Consideration for 303d Delisting:** Ninemile Creek will be evaluated for delisting under Section 303d, based on the monitoring data over the period 1999-2003. Therefore, the decision for delisting will come about in the preparation of the 2004 303d list. Should the streams continue

to be listed as impaired in 2004, the next evaluation for delisting will occur with the preparation of the 2008 Section 303d list. Should modifications be made to the applicable water quality criteria during the ten year implementation period, consideration for delisting, development of desired endpoints of this TMDL and implementation activities will be adjusted accordingly.

**Incorporation into Continuing Planning Process, Water Quality Management Plan** and the Kansas Water Planning Process: Under the current version of the Continuing Planning Process, the next anticipated revision will come in 2002 which will emphasize revision of the Water Quality Management Plan. At that time, incorporation of this TMDL will be made into both documents. Recommendations of this TMDL will be considered in *Kansas Water Plan* implementation decisions under the State Water Planning Process after Fiscal Years 2004.

Approved January 26, 2000.