



EPA Region 7 TMDL Review

TMDL ID: NE-LO1-10000,
NE-LO1-30000,
NE-LO1-30300,
NE-LO2-10000,
NE-LO2-11400,
NE-LO2-30000,
NE-LO2-40000,
NE-LO3-10000,
NE-LO3-50300,
NE-LO4-10000,
NE-LO4-20000

Waterbody IDs: NE2-LO1-10000, LO1-30000, LO1-30300, LO2-10000, LO2-11400, LO2-30000, LO2-40000, LO3-10000, LO3-50300, LO4-10000, LO4-20000

Waterbody Name: LOUP RIVER BASIN

Tributary: Beaver Creek, Cedar River, Calamus River, Dismal River, Oak Creek, and Mud Creek

Pollutant: E. coli BACTERIA

State: NE

HUCs: 10210001, 10210002, 10210003,
10210004, 10210005, 10210006,
10210007, 10210008, 10210009,
10210010

BASIN: LOUP RIVER BASIN

Submittal Date: December 13, 2005

Approved: yes

Submittal Letter

State submittal letter indicates final TMDL(s) for specific pollutant(s)/water(s) were adopted by the state, and submitted to EPA for approval under section 303(d) of the Clean Water Act.

In a letter received by EPA on December 13, 2005 the referenced TMDL was officially submitted for approval.

Water Quality Standards Attainment

The water body's loading capacity for the applicable pollutant is identified and the rationale for the method used to establish the cause-and-effect relationship between the numeric target and the identified pollutant sources is described. TMDL and associated allocations are set at levels adequate to result in attainment of applicable water quality standards.

The loading capacity is set for *E. coli*. The relationship between the targeted pollutant and the water quality standards is direct. NPDES regulated point source loads are set at the water quality standard of a monthly geometric mean of 126 colony forming units (cfu) per 100 mL at the "end of pipe" for all segments discharging directly to a recreational segment. Dry weather discharges are limited to a seasonal geometric mean of 126 cfu/100 mL and non-discharging facilities are limited to zero (0) cfu. Nonpoint source reductions were derived using flow duration curves for *E. coli*. TMDLs for the segments are given as percent reductions by segment, for nonpoint sources; LO1-10000 (81%), LO1-30000 (42%), LO1-30300 (75%), LO2-10000 (44%), LO2-11400 (67%), LO2-30000 (26%), LO2-40000 (46%), LO3-10000 (46%), LO3-50300 (57%), LO4-10000 (66%), and LO4-20000 (72%). These limits and reductions should result in water quality attainment.

Numeric Target(s)

Submittal describes applicable water quality standards, including beneficial uses, applicable numeric and/or narrative criteria. If the TMDL is based on a target other than a numeric water quality criterion, then a numeric expression, site specific if possible, was developed from a narrative criterion and a description of the process used to derive the target is included in the submittal.

Assigned beneficial uses for all listed segments are primary contact recreation, aquatic life (warm water class A or cold water class B, Agricultural water supply class A and Aesthetics. These Loup River Basin segments were listed as impaired in the Nebraska 2002 section 303(d) list because of *E. coli* bacteria. In Nebraska's 2004 Surface Water quality Integrated Report these segments were listed as impaired for primary contact recreation. Water quality targets for *E. coli* bacteria are 126 cfu/100mL as a geometric mean and will apply to all segments listed in this TMDL during the recreational period of May 1 – September 30.

Numeric Target(s) and Pollutant(s) of concern

An explanation and analytical basis for expressing the TMDL through surrogate measures (e.g., parameters such as percent fines and turbidity for sediment impairments, or chlorophyll-a and phosphorus loadings for excess algae) is provided, if applicable. For each identified pollutant, the submittal describes analytical basis for conclusions, allocations and margin of safety that do not exceed the load capacity.

The water quality standard is 126cfu/100mL as a geometric mean during the recreational period. This is a direct measure. WLA in this TMDL are given as concentration, directly targeting the criterion. LA are expressed as percent reductions which will result in the target concentration in the segments identified. The margin of safety is given as an extra percent reduction of LA to target concentrations 10% below the criterion.

Source Analysis

Important assumptions made in developing the TMDL, such as assumed distribution of land use in the watershed, population characteristics, wildlife resources, and other relevant information affecting the characterization of the pollutant of concern and its allocation to sources, are described. Point, non point and background sources of pollutants of concern are described, including magnitude and location of the sources. Submittal demonstrates all significant sources have been considered.

Sources of *E. coli* bacteria in the watersheds for these segments include point and nonpoint. Loads are quantified with flow duration curves. Point sources include specific permitted sources given in the TMDL by segment. There are a total of 26 NPDES permitted facilities in the basin. By segment the permitted facilities are; Columbus WWTF (NE0035025), Monroe WWTF (NE0046221), Genoa WWTF (NE0027341), Albion WWTF (NE0026573), St Edward WWTF (NE0027332), and Petersburg WWTF (NE0029157) in segment LO1-1000; Wolbach WWTF (NE0040088) and Greeley WWTF (NE0049212) in segment LO1-3000; Cedar Rapids WWTF (NE0049158), Fullerton WWTF (NE0026638), Primrose WWTF (NE0029220), and Spalding WWTF (NE0112909) in segment LO1-30300; Burwell WWTF (NE0021172), Ord WWTF (NE0024392), and Scotia WWTF (NE0023973) in segment LO2-10000; NGPC – Calamus Fish Hatchery (NE0124745) in segment LO2-11300; Taylor WWTF (NE0113000) in segment LO2-20000; Loup City WWTF (NE0045250), St. Paul WWTF (NE0027324), Dannebrog WWTF (NE0045136), and Ashton WWTF (NE0024350) in segment LO3-10000; Arcadia WWTF (NE0041297) in segment LO3-30000; Ravenna WWTF (NE0021547) in segment LO4-10000; Ansley WWTF (NE0043249) and Broken Bow WWTF (NE0027260) in segment LO4-10200; and Arnold WWTF (NE0028096) in segment LO4-30000. Additional point sources include numerous animal feeding operations and possible illicit discharges. Nonpoint sources include failing septic tanks, onsite wastewater systems, run-off from livestock pastures, improper or over-application of biosolids, urban storm water not regulated by permit and natural sources from wildlife. The load duration curves are divided by hydrology to indicate flows with primary nonpoint or point source influence. Nonpoint and background sources are not separated. It appears all major sources have been considered.

Allocation

Submittal identifies appropriate wasteload allocations for point, and load allocations for nonpoint sources. If no point sources are present the wasteload allocation is zero. If no nonpoint sources are present, the load allocation is zero.

The load capacity for *E. coli* bacteria is given as concentration and percent reduction. WLA, LA, and MOS are given.

WLA Comment

NPDES permitted facilities TMDLs are set at a monthly geometric mean of 126cfu/100mL. Dry weather discharges are set at a seasonal geometric mean of 126 cfu/100mL. Non-discharging facilities are set at zero.

LA Comment

The load allocation from watershed nonpoint sources are given as a percent reduction in load. By segment these reductions are: LO1-10000 (81%), LO1-30000 (42%), LO1-30300 (75%), LO2-10000 (44%), LO2-11400 (67%), LO2-30000 (26%), LO2-40000 (46%), LO3-10000 (46%), LO3-50300 (57%), LO4-10000 (66%), and LO4-20000 (72%).

Margin of Safety

Submittal describes explicit and/or implicit margin of safety for each pollutant. If the MOS is implicit, the conservative assumptions in the analysis for the MOS are described. If the MOS is explicit, the loadings set aside for the MOS are identified and a rationale for selecting the value for the MOS is provided.

An explicit MOS is given by targeting LA at 90% of the water quality standard. Implicit assumptions are that there is no die off of bacteria in the segments and that all permitted facilities discharge 126 cfu/100mL when some facilities disinfect their effluent.

Seasonal Variation and Critical Conditions

Submittal describes the method for accounting for seasonal variation and critical conditions in the TMDL(s).

The water quality criterion is only applicable during the recreational season of May 1 – September 30. The analysis undertaken for this TMDL only used data representative of this time period.

Public Participation

Submittal describes public notice and public comment opportunity, and explains how the public comments were considered in the final TMDL(s).

The availability of the TMDL was published in the Columbus Telegram, Custer County Chief, Phonograph-Herald (Howard Count) and the Sherman County Times. The TMDL was also made available on the NDEQ web site and announcement letters were sent to stakeholders. The public comment period ran from October 10, 2005 to December 1, 2005. No comments were received.

Monitoring Plan for TMDL(s) Under Phased Approach

The TMDL identifies the monitoring plan that describes the additional data to be collected to determine if the load reductions required by the TMDL lead to attainment of WQS, and a schedule for considering revisions to the TMDL(s) (where phased approach is used).

Future monitoring will follow the rotating basin scheme. The Loup Basin is scheduled to be targeted in 2008. Additional monitoring is required of the permitted facilities and compliance monitoring of the facilities also occurs either randomly or in response to inspection results.

Reasonable assurance

Reasonable assurance only applies when reductions in nonpoint source loading is required to meet the prescribed waste load allocations.

The WLA is set to meet water quality standards, no reasonable assurances are required of the LA.

