UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 7
11201 Renner Boulevard
Lenexa, Kansas 66219

3 0 SEP 2015

Dr. Susan Mosier
Interim Secretary
Kansas Department of Health and Environment
1000 S.W. Jackson, Suite 540
Topeka, Kansas 66612-1368

Dear Dr. Mosier:

RE: Approval of a TMDL document for Augusta City Lake

This letter responds to the submission from the Kansas Department of Health and Environment, originally received by the U.S. Environmental Protection Agency, Region 7, on June 24, 2015, for a Total Maximum Daily Load document which contained a TMDL for eutrophication. Augusta City Lake was identified on the 2014 Kansas Section 303(d) list as impaired. This submission fulfills the Clean Water Act statutory requirement to develop TMDLs for impairments listed on a state's § 303(d) list. The specific impairment (water body segment and cause) is:

Water Body Name	WBID	Cause
Augusta City Lake	KS-WA-17-LM040001	Eutrophication

The EPA has completed its review of the TMDL document with supporting documentation and information. By this letter, the EPA approves the submitted TMDL. Enclosed with this letter is the Region 7 TMDL Decision Document which summarizes the rationale for the EPA's approval of the TMDL document. The EPA believes the separate elements of the TMDL described in the enclosed document adequately address the cause of concern, taking into consideration seasonal variation and a margin of safety.

Although the EPA does not approve the monitoring or implementation plans submitted by the state, the EPA acknowledges the state's efforts. The EPA understands that the state may use the monitoring plan to gauge the effectiveness of the TMDL and determine if future revisions are necessary or appropriate to meet applicable water quality standards. The EPA recognizes that technical guidance and support are critical to determining the feasibility of and achieving the goals outlined in the TMDL document. Therefore, the implementation plan in this TMDL document provides information regarding implementation efforts to achieve the loading reductions identified.

The EPA is currently in consultation under Section 7 of the Endangered Species Act with the U.S. Fish and Wildlife Service regarding this TMDL document. While we are approving the TMDL at the present time, we may decide that changes to the TMDL document are warranted based upon the results of the consultation when it is completed.

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The EPA appreciates the thoughtful effort that the KDHE has put into this TMDL document. We will continue to cooperate with and assist, as appropriate, in future efforts by the KDHE to develop TMDLs.

Sincerely,

Karen A. Flournoy
Director
Water, Wetlands and Pesticides Division

Enclosure

cc: Mr. John Mitchell, Director, Division of Environment, KDHE
Mr. Tom Stiles, Chief, Watershed Planning, Monitoring and Assessment Section, KDHE

EPA Region 7 TMDL Review

TMDL ID: KS-WA-17-LM040001 **State:** KS
Document Name: AUGUSTA CITY LAKE

Basin(s): WALNUT RIVER BASIN
HUC(s): 11030017
Water body(ies): AUGUSTA CITY LAKE
Tributary(ies): ELK CREEK
Cause(s): EUTROPHICATION (NUTRIENTS/CHLOROPHYLL-A/TROPHIC STATE)

Submittal Date: 6/26/2015 **Approved:** Yes

Submittal Letter and Total Maximum Daily Load Revisions

The state submittal letter indicates final TMDL(s) for specific pollutant(s) and water(s) were adopted by the state, and submitted to the EPA for approval under Section 303(d) of the Clean Water Act [40 CFR § 130.7(c)(1)]. Include date submitted letter was received by the EPA, date of receipt of any revisions and the date of original approval if submittal is a revised TMDL document.

A total maximum daily load document for Augusta City Lake was submitted to the U.S. Environmental Protection Agency on June 24, 2015. The Kansas Department of Health and Environment submitted the TMDL document by mail with a signed submittal letter. The EPA reviewed the TMDL document and provided comments. Comment responses and revised Augusta City Lake TMDL were provided on August 20, 2015.

Water Quality Standards Attainment

The targeted pollutant is validated and identified through assessment and data. 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. The TMDL(s) and associated allocations are set at levels adequate to result in attainment of applicable water quality standards [40 CFR § 130.7(c)(1)]. A statement that the WQS will be attained is made.

The Section 303(d) listed water is Augusta City Lake, KS-WA-17-LM040001. Augusta City Lake is located in hydrologic unit code, 11030017. The state identification code is LM040001 and the listed cause of impairment is eutrophication. All uses in Augusta City Lake are impaired to a degree by eutrophication. Chlorophyll a concentrations average 22.6 micrograms per liter for the entire period of record (1985-2013). For the recent period of record, 2006-2013, the average chlorophyll a concentration climbs to 32.8 µg/L resulting in a corresponding Trophic State Index value of 64.8 indicating it is hypereutrophic. Chlorophyll a concentrations were measured in duplicate samples taken once during the summers of 1985, 1989, 1991, 1998, 2006 and 2013. For the period of record, chlorophyll a concentrations were greater than the chlorophyll a target of 10 µg/L with the 2013 sample measuring an average of 48.7 µg/L. Table 2 of the TMDL document for Augusta City Lake contains the data for the period of record.

The ratio of total nitrogen to total phosphorus has been used to determine which of these nutrients is most likely limiting plant growth in Kansas aquatic ecosystems. The TN:TP ratio in Augusta City Lake indicates the lake was co-limited by nitrogen and phosphorus in 1998 and 2006 while the 2013 ratio indicates the lake may have been moving toward a nitrogen limited state. However, the limited data set makes it difficult to determine which of the nutrients may be limiting plant growth in the lake. In 2011, a 10 µg/L chlorophyll a target was established by the KDHE as the source water threshold for significantly reducing occurrences of taste and odor problems in public water supplies.

The period of record average Secchi depth in Augusta City Lake is 0.53 meters with a slight improvement to 0.58 meters for the recent period of record. The lowest Secchi depth measurement was taken in August 1989 at 0.43

meters while the highest reading of 0.70 meters was measured in 2006.

Total nitrogen values were available for the samples taken in 1998, 2006, and 2013 resulting in an entire period of record (1998-2013) average of 1.0 milligrams per liter TN. The TN has ticked upward over the period of record concluding with the 2013 sample measuring 1.42 mg/L TN. The recent period of record average is 1.14 mg/L TN.

Total phosphorus concentrations in Augusta City Lake averages 0.071 mg/L for the entire period of record. The influence of the 2013 measurement of 0.18 mg/L TP contributed to a concentration of 0.12 mg/L TP in Augusta City Lake for the recent period of record.

The TMDL target will be to achieve the Kansas Water Quality Standards supporting the designated uses by eliminating impacts associated with excessive eutrophication. In order to improve the trophic condition from its current hypereutrophic status, the desired endpoint will be to maintain summer chlorophyll a average concentrations below 10 µg/L, corresponding to a TSI of 53.2, with the reductions focused on nutrients (TN and TP) entering the lake. Reduction in nutrient loading will address the accelerated succession of aquatic biota and the development of objectionable concentrations of algae and algae by-products. A chlorophyll a endpoint of 10 µg/L will also ensure long-term protection to fully support primary contact recreation within the lake.

Achievement of the endpoints indicates loads are within the loading capacity of the lake, the water quality standards are attained, and full support of the designated uses of the lake has been achieved. Seasonal variation has been incorporated in this TMDL since the peaks of algal growth occur in the summer months. The current average condition for Augusta City Lake utilized in the model input was based on 2000-2013 data from the KDHE lake station LM040001 with calibration and reductions focused on area-weighted means generated by the BATHTUB model. Based on the BATHTUB reservoir eutrophication model, the TN and TP entering Augusta City Lake must be reduced by 81 percent and 76 percent, respectively. These reductions at the inflow to Augusta City Lake will result in a 61 percent reduction in the concentration of TN, a 64 percent reduction of the concentration in TP and a 70 percent reduction in the concentration of chlorophyll a within the lake.

Loading capacity for TN is 5,195 pounds per year and TP for this lake is 568.1 lb/year.

Designated Use(s), Applicable Water Quality Standard(s) and Numeric Target(s)

The submittal describes applicable water quality standards, including beneficial uses, applicable numeric and/or narrative criteria, and a numeric target. If the TMDL(s) 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.

Augusta City Lake designated uses are primary contact recreation Class A, expected aquatic life support, domestic water supply, food procurement, groundwater recharge, industrial water supply, irrigation and livestock watering.

All uses in Augusta City Lake are impaired to a degree by eutrophication.

Water Quality Criteria: Nutrients - Narrative: The introduction of plant nutrients into streams, lakes, or wetlands from artificial sources shall be controlled to prevent the accelerated succession or replacement of aquatic biota or the production of undesirable quantities or kinds of aquatic life (KAR 28-16-28e(c)(2)(A)).

The introduction of plant nutrients into surface waters designated for domestic water supply use shall be controlled to prevent interference with the production of drinking water (K.A.R. 28-16-28e(c)(3)(A)).

The introduction of plant nutrients into surface waters designated for primary or secondary contact recreational use shall be controlled to prevent the development of objectionable concentrations of algae or algal by-products or nuisance growths of submersed, floating, or emergent aquatic vegetation (KAR 28-16-28e(c)(7)(A)).

The KDHE-established chlorophyll a target of 10 micrograms per liter for public water supply lakes, will also ensure long-term protection to fully support primary contact recreation. All other uses and proposed uses will be protected at the stated total phosphorus and chlorophyll a targets.

Trophic state assessments of potential algal productivity were made based on chlorophyll a and nutrient levels. Elm Creek above Augusta City Lake is the only registered stream directly feeding the lake. There is no monitoring water quality data for Elm Creek. Daily flow values and flows for the BATHTUB model were

developed by applying the ratio of the watershed size of United States Geological Survey 07147070 (426 square miles) to the watershed size of Elm Creek (7.70 square miles) to the flows seen at USGS 07147070 (1/1/1990-12/31/2013). According to the USGS Lake Hydro data, the mean runoff in the watershed is 5.81 inches per year; the mean precipitation in the watershed is 31.5 inches per year and the mean loss due to evaporation for the lake is 57.7 inches per year.

For modeling purposes, Augusta City Lake was considered one segment. Water quality data for the main basin segment was populated using the average of the 2006-2013 data from the KDHE lake monitoring station on Augusta City Lake LM040001. Segment depth was estimated using the Kansas Biological Survey 2010 bathymetric study on Augusta City Lake. Model input data for the tributary to Elm Creek was estimated by applying the nutrient concentrations measured at the KDHE's permanent stream station SC038 located on the Walnut River in the same 12 digit Hydrologic Unit Code (11030070207) as Augusta City Lake. Flow for Elm Creek was estimated by applying the ratio of the watershed size of the Elm Creek watershed to the watershed size of USGS 07147070 watershed to the flows seen at USGS 07147070. The BATHTUB model was calibrated for Augusta City Lake and results estimate that the lake retains 63 percent of the total nitrogen and 73 percent of the total phosphorus load annually. Based on modeling results, the combined reduction of total nitrogen and total phosphorus results in reaching the chlorophyll a endpoint more readily than reducing TP alone. A 76 percent reduction of TN and an 81 percent reduction of TP within the inflow to Augusta City Lake are necessary to achieve the TMDL endpoint of an area-weighted mean of 10 micrograms per liter chlorophyll a in the lake

The ultimate endpoint for this TMDL will be to achieve the Kansas Surface water quality standards fully supporting the designated uses in Augusta City Lake by eliminating impacts associated with excessive eutrophication. In order to improve the trophic condition of Augusta City Lake from its current hypereutrophic status, the desired endpoint will be to maintain summer chlorophyll a average concentrations below 10 micrograms per liter, corresponding to a Carlson Trophic State Index of 53.2, with the reductions focused on nutrients (TN and TP) entering the lake. Reduction in nutrient loading will address the accelerated succession of aquatic biota and the development of objectionable concentrations of algae and algae by-products as determined by the chlorophyll a concentrations in the lake. A chlorophyll a endpoint of 10 micrograms per liter will also ensure long-term protection to fully support primary contact recreation within the lake.

Achievement of the endpoints indicates loads are within the loading capacity of the lake, the water quality standards are attained, and full support of the designated uses of the lake has been achieved. Seasonal variation has been incorporated in this TMDL since the peaks of algal growth occur in the summer months. The current average condition for Augusta City Lake utilized in the model input was based on 2000-2013 data from the KDHE lake station LM040001 with calibration and reductions focused on area-weighted means generated by the BATHTUB model.

Pollutant(s) of Concern

A statement that the relationship is either directly related to a numeric water quality standard, or established using surrogates and translations to a narrative WQS is included. An explanation and analytical basis for expressing the TMDL(s) through surrogate measures, or by translating a narrative water quality standard to a numeric target is provided (e.g., parameters such as percent fines and turbidity for sediment impairments, or chlorophyll-a and phosphorus loadings for excess algae). For each identified pollutant, the submittal describes analytical basis for conclusions, allocations and a margin of safety that do not exceed the loading capacity. If the submittal is a revised TMDL document, there are refined relationships linking the load to water quality standard attainment. If there is an increase in the TMDL(s), there is a refined relationship specified to validate that increase (either load allocation or wasteload allocation). This section will compare and validate the change in targeted load between the versions.

There is an established link between the narrative water quality standards for nutrients and numeric total nitrogen and total phosphorus targets. In eutrophication impairments, chlorophyll a concentrations are used as a translator in measuring algal growth and as a parameter for WQS. When excess phosphorus enters surface waters it stimulates blooms of algae and undesirable weeds, accelerating the natural aging of lakes, a condition commonly referred to as eutrophication.

There is an established link between the narrative water quality standards for nutrients and the numeric TP target. As outlined in the Kansas methodology for listing impaired waters, the TMDL target to maintain average summer chlorophyll a concentrations below 10 micrograms per liter as a measure of algal growth will meet the narrative WQS for primary contact recreation, drinking water supply and aquatic life. All other uses and proposed uses will be protected at the stated TP and chlorophyll a loading capacity targets.

Several metrics and indicators were provided to demonstrate the pollutant of concern used to address the cause of impairment - eutrophication. The BATHTUB model shows the relationship for phosphorus and chlorophyll a. These relationships provide a link between growing season phosphorus and the chlorophyll a concentrations.

The BATHTUB model shows the empirical relationship for phosphorus and chlorophyll a. This relationship provides a link between growing season total phosphorus and chlorophyll a concentration.

Source Analysis

Important assumptions made in developing the TMDL document, 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, nonpoint and background sources of pollutants of concern are described, including magnitude and location of the sources. The submittal demonstrates all significant sources have been considered. If this is a revised TMDL document any new sources or removed sources will be specified and explained.

In the absence of a national pollutant discharge elimination system permit, the discharges associated with sources were applied to the load allocation, as opposed to the wasteload allocation for purposes of this TMDL document. The decision to allocate these sources to the LA does not reflect any determination by the EPA as to whether these discharges are, in fact, unpermitted point source discharges within this watershed. In addition, by establishing these TMDL(s) with some sources treated as LAs, the EPA is not determining that these discharges are exempt from NPDES permitting requirements. If sources of the allocated pollutant in this TMDL document are found to be, or become, NPDES-regulated discharges, their loads must be considered as part of the calculated sum of the WLAs in this TMDL document. Any WLA in addition to that allocated here is not available.

There are two concentrated animal feeding operations in Augusta City Lake watershed (Permit Number A-WABU-SA01 and A-WABU-M003). These permitted or certified livestock facilities have waste management systems designed to minimize runoff entering their operation or detaining runoff emanating from their facilities. In addition, they are designed to retain a 25-year, 24-hr rainfall/runoff event as well as an anticipated two weeks of normal wastewater from their operations. Typically, this rainfall event coincides with stream flow occurring less than 1-5 percent of the time. It is likely that there are some smaller, unregistered livestock operations in the area. Depending on their proximity to the streams in the watershed, runoff from feedlots and grazing lands may be contributing to the nutrient load in Augusta City Lake. There are no federally permitted CAFOs in the watershed. On December 1, 2012, according to NASS, there were 38,000 head of hogs in Butler County.

Any CAFO that does not obtain an national pollutant discharge elimination system permit must operate as a no discharge facility. Any discharge from an unpermitted CAFO is a violation of Section 301 of the Clean Water Act. It is the EPA's position that all CAFOS should obtain an NPDES permit because it provides clarity of compliance requirements, authorization to discharge when the discharges are the result of large precipitation events (e.g., in excess of 25-year and 24-hour frequency/duration) or are from a man-made conveyance.

Any NPDES-permitted CAFO identified in this TMDL document are part of the assigned wasteload allocation. Animal feeding operations and unpermitted CAFOs are considered under the load allocation because there is currently not enough detailed information to know whether these facilities are required to obtain NPDES permits. This TMDL document does not reflect a determination by the EPA that such a facility does not meet the definition of a CAFO nor that the facility does not need to obtain a permit. To the contrary, a CAFO that discharges or proposes to discharge has a duty to obtain a permit. If it is determined that any such operation is a CAFO that discharges, any future WLA assigned to the facility must not result in an exceedance of the sum of the WLAs in this TMDL document as approved.

Although there is no municipal separate storm sewer system general permit in the watershed, the lake does lay within the boundaries of the city of Augusta resulting in about 14 percent of the watershed being designated as developed. During storm runoff events, the urban area of Augusta may contribute nutrient loads from lawn fertilizers and domestic pet waste along with sediment loads and other toxics found in the urban environment to Augusta City Lake.

The predominant land uses in the Augusta City Lake watershed are grassland 69 percent and developed land 14 percent. Together they account for 83 percent of the total land area in the watershed with the remaining land area composed of cultivated crops 6 percent, forest 6 percent, open water 5 percent and wetlands less than 1 percent. During precipitation runoff events, grasslands in the watershed may contribute to the nutrient and sediment loads in the lake, particularly on livestock grazing lands located in the riparian areas of the watershed. The watershed is

also 14 percent developed due to about 700 acres of the city of Augusta lying within the watershed. The urbanized area in the watershed may generate substantial nutrient loading from lawn fertilizers, sewers, domestic pet waste and other toxics found in the urban environment particularly during storm runoff events.

A portion of the Augusta City Lake watershed is a rural agricultural area. It can be assumed that all of the rural residences in the watershed are not connected to public sewer systems and according to the Spreadsheet Tool for Estimating Pollutant Load, there are a total of 188 septic systems in the 12 digit Hydrologic Unit Code that contains the lake sub-watershed with a 0.93 percent failure rate. Failing on-site septic systems have the potential to contribute to nutrient loading in the lake.

Due to inadequate data for Augusta City Lake on the potential for internal nutrient loading, no estimates of internal loading were made outside those inherently contained within the BATHTUB modeling of the lake.

According to the 2010 census data from the U.S. Census Bureau, the population of the Augusta City Lake watershed is approximately 3,136 people giving a population density of about 393 people per square mile. This is an increase of about 17 percent over the 2000 census results. Population growth in the watershed is expected to continue.

Nonpoint sources are significant contributors for the nutrient input and impairment to Augusta City Lake. Background levels may be attributed to nutrient recycling and leaf litter. The assessment suggests that runoff transporting nutrients associated with animal wastes and pastureland is contributing to the eutrophication of the lake. Additionally, nonpoint source loads are being generated in the developed portion of the watershed during storm water runoff events.

Undissolved nutrients bound to suspended solids in the inflow to Augusta City Lake are potentially significant sources of nutrients that may endure in the sediment layer until they are removed by dredging. These internal nutrient loads can undergo remineralization and resuspension and may be a continuing source of nutrients in Augusta City Lake. In addition, geological formations (i.e. soil and bedrock) may also contribute to nutrient loads and, with deciduous forest making up about 6 percent of the land cover in the watershed, leaf litter and wastes derived from natural wildlife in the area are also likely to add to the nutrient loads in the lake. Further nutrient loading is also occurring through the atmospheric deposition of nitrogen and phosphorus compounds to Augusta City Lake and its watershed.

The watershed of Augusta City Lake has an extremely low mean soil permeability value of 0.27 inches per hour. According to a USGS open-file report, the threshold soil-permeability values are set at 0.57 inches per hour for extremely low soil-permeability. Runoff is primarily generated as infiltration excess when soil profiles become saturated and produce excess overland flow due to rainfall intensities that are greater than soil permeability.

All known sources have been considered.

Allocation - Loading Capacity

The submittal identifies appropriate loading capacities, wasteload allocations for point sources and load allocations for nonpoint sources. If no point sources are present, the WLA is stated as zero. If no nonpoint sources are present, the LA is stated as zero [40 CFR § 130.2(i)]. If this is a revised TMDL document the change in loading capacity will be documented in this section. All TMDLs must give a daily number. Establishing TMDL "daily" loads consistent with the U.S. Court of Appeals for the D.C. circuit decision in Friends of the Earth, Inc. v. EPA, et al., No. 05-5015, (April 25, 2006).

LC (TMDL)= wasteload allocation + atmospheric load + load allocation + margin of safety

Total Nitrogen
5,195 pounds per year = 0 + 1,092 lb/yr + 3,584 lb/yr + 519 lb/yr or 38.2 pounds per day = 0 + 8 lb/day + 26.4 lb/day + 3.8 lb/day

Total Phosphorus
568.1 lb/yr= 0 + 38 lb/yr + 473.3 lb/yr + 56.8 lb/yr or 4.2 lb/day= 0 + 0.3 lb/day + 3.6 lb/day + 0.3 lb/day

The BATHTUB model shows the empirical relationship for phosphorus and chlorophyll a. This relationship provides a link between growing season total phosphorus and chlorophyll a concentration. Appendix B contains the daily loads as required by the EPA.

Description	Allocations (lb/year)	Allocations (lb/day)*
Total Phosphorus Atmospheric Load	38	0.3
Total Phosphorus Nonpoint Source Load Allocation	473.3	3.6
Total Phosphorus Margin of Safety	56.8	0.3
Total Phosphorus TMDL	568.1	4.2
Total Nitrogen Atmospheric Load	1,092	8.0
Total Nitrogen Nonpoint Source Load Allocation	3,584	26.4
Total Nitrogen Margin of Safety	519	3.8
Total Nitrogen TMDL	5195	38.2

Wasteload Allocation Comment

The submittal lists individual wasteload allocations for each identified point source [40 CFR § 130.2(h)]. If a WLA is not assigned it must be shown that the discharge does not cause or contribute to a water quality standard excursion, the source is contained in a general permit addressed by the TMDL, or extenuating circumstances exist which prevent assignment of individual WLA. Any such exceptions must be explained to a satisfactory degree. If a WLA of zero is assigned to any facility it must be stated as such [40 CFR § 130.2(i)]. If this is a revised TMDL document, any differences between the original TMDL(s) WLA and the revised WLA will be documented in this section.

There are no point sources in the watershed, hence, the wasteload allocation assigned by this TMDL is zero.

Load Allocation Comment

All nonpoint source loads, natural background and potential for future growth are included. If no nonpoint sources are identified, the load allocation must be given as zero [40 CFR § 130.2(g)]. If this is a revised TMDL document, any differences between the original TMDL(s) LA and the revised LA will be documented in this section.

The total phosphorus nonpoint source load allocation is 473.3 pounds per year, or 3.6 pounds per day. The total nitrogen atmospheric deposition LA is 1,092 lb/yr, or 8.0 lb/day. All other nonpoint source TN LA is 3,584 lb/yr, or 26.4 lb/day. Water quality excursions are predominantly due to nonpoint source pollutants. Nonpoint sources are significant contributors for the nutrient input and impairment. Background levels may be attributed to nutrient recycling and leaf litter. The assessment suggests that runoff transporting nutrients associated with animal wastes and pastureland is contributing to the eutrophication of the lake. Additionally, nonpoint source loads are being generated in the developed portion of the watershed during storm water runoff events.

Undissolved nutrients bound to suspended solids in the inflow to Augusta City Lake are potentially significant sources of nutrients that may endure in the sediment layer until they are removed by dredging. These internal nutrient loads can undergo remineralization and resuspension and may be a continuing source of nutrients in Augusta City Lake. In addition, geological formations (i.e. soil and bedrock) may also contribute to nutrient loads and, with deciduous forest making up about 6 percent of the land cover in the watershed, leaf litter and wastes derived from natural wildlife in the area are also likely to add to the nutrient loads in the lake. Further nutrient loading is also occurring through the atmospheric deposition of nitrogen and phosphorus compounds to Augusta City Lake and its watershed.

Margin of Safety

The submittal describes explicit and/or implicit margins of safety for each pollutant [40 CFR § 130.7(c)(1)]. 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. If this is a revised TMDL document, any differences in the MOS will be documented in this section.

The margin of safety provides some hedge against the uncertainty of variable annual total nitrogen and total phosphorus loads and the chlorophyll a endpoint. The explicit MOS of 10 percent will be subtracted from the original calculated TN and TP loading capacity to compensate for the lack of knowledge about the relationship between the allocated loadings and the resulting water quality. The margin of safety for TN and TP is 3.8 pounds per day and 0.3 pounds per day, respectively.

Seasonal Variation and Critical Conditions

The submittal describes the method for accounting for seasonal variation and critical conditions in the TMDL(s) [40 CFR § 130.7(c)(1)]. Critical conditions are factors such as flow or temperature which may lead to the excursion of the WQS. If this is a revised TMDL document, any differences in conditions will be documented in this section.

This TMDL applies across all flow conditions, based on daily flow reporting, effectively addressing the condition brought about by high flow events when nutrient loading to the lake is relatively high. Seasonal variation has been incorporated in this TMDL since the peaks of algal growth occur in the summer months.

Public Participation

The submittal describes required public notice and public comment opportunities, and explains how the public comments were considered in the final TMDL(s) [40 CFR § 130.7(c)(1)(ii)].

An internet website was established at http://www.kdheks.gov/tmdl/index.htm to convey information to the public on the general establishment of TMDLs and specific TMDLs in the Upper Walnut Basin. A Public Hearing on the Walnut River Basin TMDLs was held in Emporia, Kansas on August 28, 2014, to receive comments on this TMDL. No written or verbal comments were received during the public notice period.

Monitoring Plan for TMDL(s) Under a Phased Approach

The TMDL identifies a monitoring plan that describes the additional data to be collected to determine if the load reductions required by the TMDL lead to attainment of water quality standards, and a schedule for considering revisions to the TMDL(s) (where a phased approach is used) [40 CFR § 130.7]. If this is a revised TMDL document, monitoring to support the revision will be documented in this section. Although the EPA does not approve the monitoring plan submitted by the state, the EPA acknowledges the state's efforts. The EPA understands that the state may use the monitoring plan to gauge the effectiveness of the TMDLs and determine if future revisions are necessary or appropriate to meet applicable water quality standards.

The KDHE will continue its 3-year sampling schedule in order to assess the trophic state of Augusta City Lake. Based on the sampling results, the 303(d) listing will be evaluated in 2026, continued sampling of Augusta City Lake every three years to assess the trophic status. Should impairment status continue, the desired endpoints under this TMDL will be refined and more intensive sampling will be conducted over the period 2026-2036 to assess progress in this implementation.

Augusta City Lake will be evaluated under Section 303(d), based on the monitoring data over the period 2016-2025. Therefore, the decision will come about in the preparation of the 2026 Integrated Report. Should modifications be made to the applicable water quality criteria during the ten-year implementation period, consideration for restoration, desired endpoints of this TMDL and implementation activities may be adjusted accordingly.

Reasonable Assurance

Reasonable assurance only applies when less stringent wasteload allocation are assigned based on the assumption that nonpoint source reductions in the load allocation will be met [40 CFR § 130.2(i)]. This section can also contain statements made by the state concerning the state's authority to control pollutant loads. States are not required under Section 303(d) of the Clean Water Act to develop TMDL implementation plans and the EPA does not approve or disapprove them. However, this TMDL document provides information regarding how point and nonpoint sources can or should be controlled to ensure implementation efforts achieve the loading reductions

identified in this TMDL document. The EPA recognizes that technical guidance and support are critical to determining the feasibility of and achieving the goals outlined in this TMDL document. Therefore, the discussion of reduction efforts relating to point and nonpoint sources can be found in the implementation section of the TMDL document, and are briefly described below.

The states have the authority to issue and enforce state operating permits. Inclusion of effluent limits into a state operating permit and requiring that effluent and instream monitoring be reported to the state should provide reasonable assurance that instream water quality standards will be met. Section 301(b)(1)(C) requires that point source permits have effluent limits as stringent as necessary to meet WQS. However, for wasteload allocations to serve that purpose, they must themselves be stringent enough so that (in conjunction with the water body's other loadings) they meet WQS. This generally occurs when the TMDL(s)' combined nonpoint source load allocations and point source WLAs do not exceed the WQS-based loading capacity and there is reasonable assurance that the TMDL(s)' allocations can be achieved. Discussion of reduction efforts relating to nonpoint sources can be found in the implementation section of the TMDL document.

The TMDL document lists a variety of authorities that may be used to direct activities in the watershed to reduce pollutants. The Kansas Water Plan and the Walnut Basin Plan provide the guidance to state agencies to coordinate programs intent on protecting water quality and to target those programs to geographic areas of the state for high priority implementation.

The State Water Plan 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. This watershed and its TMDL are located within a High Priority area and should receive support for pollution abatement practices that lower the loading of sediment and nutrients.

Nutrient control has been proven effective through proper implementation of comprehensive livestock waste management plans that effectively abate nutrient runoff associated with livestock facilities. Urban best management practices are important to implement due to their effectiveness at abating nutrient runoff particularly during storm runoff events. The key to success will be widespread utilization of proper livestock waste management within the watershed and implementation of urban best management practices in the developed area of the watershed.