



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 5

77 WEST JACKSON BOULEVARD  
CHICAGO, IL 60604-3590

05 MAR 2001

OFFICE  
OF  
WATER MANAGEMENT  
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REPLY TO THE ATTENTION OF  
W-16J

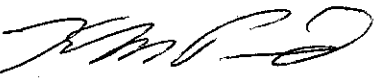
Matthew C. Rueff, Assistant Commissioner  
Office of Water Management  
Indiana Department of Environmental Management  
P.O. Box 6015  
100 North Senate Avenue  
Indianapolis, Indiana 46206-6015

Dear Mr. Rueff:

The United States Environmental Protection Agency (U.S. EPA) has conducted a complete review of the final Total Maximum Daily Load (TMDL), including supporting documentation and follow up information, for Kokomo Creek that addresses the dissolved oxygen and total ammonia 303(d) listing. Kokomo Creek is a 36 mile watershed that is located in the Wildcat Creek watershed in north-central Indiana. Based on this review, U.S. EPA has determined that Indiana's TMDL for dissolved oxygen and ammonia meets the requirements of Section 303(d) of the Clean Water Act (CWA) and U.S. EPA's implementing regulations at 40 C.F.R. Part 130. Therefore, by this order, U.S. EPA hereby approves Indiana's TMDL for these impairments in the Kokomo Creek Watershed. The statutory and regulatory requirements, and U.S. EPA's review of Indiana's compliance with each requirement, are described in the enclosed decision document.

We wish to acknowledge Indiana's effort in this submitted TMDL, and look forward to future quality TMDL submissions by the State of Indiana. If you have any questions, please contact Mr. Kevin Pierard, Chief of the Watersheds and Nonpoint Source Branch at 312-886-4448.

Sincerely yours,

  
for JoLynn Traub  
Director, Water Division

Enclosure.

**TMDL: Kokomo Creek, Indiana**  
**Effective Date:**

## **REVIEW ELEMENTS OF TMDLs**

Section 303(d) of the Clean Water Act (CWA) and EPA's implementing regulations at 40 C.F.R. § 130 describe the statutory and regulatory requirements for approvable TMDLs. The following information is generally necessary for EPA to determine if a submitted TMDL fulfills the legal requirements for approval under Section 303(d) and EPA regulations, and should be included in the submittal package. Use of the verb "must" below denotes information that is required to be submitted because it relates to elements of the TMDL required by the CWA and by regulation.

### **1. Description of Waterbody, Pollutant of Concern, Pollutant Sources and Priority Ranking**

The TMDL analytical document must identify the waterbody as it appears on the State/Tribe's 303(d) list, the pollutant of concern and the priority ranking of the waterbody. The TMDL submittal must include a description of the point and nonpoint sources of the pollutant of concern, including the magnitude and location of the sources. Where it is possible to separate natural background from nonpoint sources, a description of the natural background must be provided, including the magnitude and location of the source(s). Such information is necessary for EPA's review of the load and wasteload allocations which are required by regulation. The TMDL submittal should also contain a description of any important assumptions made in developing the TMDL, such as: (1) the assumed distribution of land use in the watershed; (2) population characteristics, wildlife resources, and other relevant information affecting the characterization of the pollutant of concern and its allocation to sources; (3) present and future growth trends, if taken into consideration in preparing the TMDL; and, (4) explanation and analytical basis for expressing the TMDL through *surrogate measures*, if applicable. *Surrogate measures* are parameters such as percent fines and turbidity for sediment impairments, or chlorophyll *a* and phosphorus loadings for excess algae.

#### *Comment:*

Kokomo Creek is located in the Wildcat Creek watershed in north central Indiana. Kokomo Creek is approximately 16 miles long, and its watershed drains 36 square miles. The stream was listed on Indiana's 1996 and 1998 section 303(d) lists due to impairments associated with dissolved oxygen, ammonia nitrogen and PCBs. The TMDL that has been submitted to EPA for approval addresses the dissolved oxygen and ammonia nitrogen issues. The PCB issue will be addressed at a later date. At downstream sampling sites the dissolved oxygen standard violations were determined to be

caused by wastewater treatment plant effluent, and the discharge from illicit septic drainage tiles. The ammonia nitrogen violation was identified in the effluent discharge data for Kokomo Regency mobile home park. There were no identified instream total ammonia nitrogen violations identified in sampling. The dissolved oxygen issue identified at the upstream sites was determined to be due to the presence of nuisance algal growth associated with increased nutrient concentrations. That nutrient was identified as phosphorus associated with nonpoint sources.

## **2. Description of the Applicable Water Quality Standards and Numeric Water Quality Target**

The TMDL submittal must include a description of the applicable State/Tribe water quality standard, including the designated use(s) of the waterbody, the applicable numeric or narrative water quality criterion, and the antidegradation policy. Such information is necessary for EPA's review of the load and wasteload allocations which are required by regulation. A numeric water quality target for the TMDL (a quantitative value used to measure whether or not the applicable water quality standard is attained) must be identified. If the TMDL is based on a target other than a numeric water quality criterion, then a numeric expression, usually site specific, must be developed from a narrative criterion and a description of the process used to derive the target must be included in the submittal.

### *Comment:*

As defined in the Indiana State water quality standards [327IAC 2-1-6(b)(3)], the criteria for dissolved oxygen for Kokomo Creek is a dissolved oxygen of 4.0 mg/l minimum and 5.0 mg/l daily average. The ammonia nitrogen violations were identified as permit violations and not instream violations. The applicable Indiana State water quality standard that was applied is a narrative criteria used to regulate ammonia [327IAC 2-1-6(b)(5)]. Numeric criteria used for the development of permit limits was based on table for chronic toxicity for total ammonia nitrogen.

In the upstream portion of Kokomo Creek, phosphorus was chosen as the limiting nutrient for the excessive algal growths which were depressing dissolved oxygen below water quality standards. The TMDL set the phosphorus limits at a numeric target of 0.01 mg/l. This target was selected based on an evaluation of the sampling data showing that reference sites with no apparent algae problem had an average total phosphorus of approximately 0.01 mg/l. Reference sites were located within the Wildcat Creek watershed of which Kokomo Creek is a part. This is a reasonable and acceptable approach.

## **3. Loading Capacity - Linking Water Quality and Pollutant Sources**

As described in EPA guidance, a TMDL identifies the loading capacity of a waterbody for a

particular pollutant. EPA regulations define loading capacity as the greatest amount of loading that a water can receive without violating water quality standards (40 C.F.R. § 130.2(f)). The loadings are required to be expressed as either mass-per-time, toxicity or other appropriate measure (40 C.F.R. § 130.2(i)). The TMDL submittal must identify the waterbody's loading capacity for the applicable pollutant and describe the rationale for the method used to establish the cause-and-effect relationship between the numeric target and the identified pollutant sources. In most instances, this method will be a water quality model. Supporting documentation for the TMDL analysis must also be contained in the submittal, including the basis for assumptions, strengths and weaknesses in the analytical process, results from water quality modeling, etc. Such information is necessary for EPA's review of the load and wasteload allocations which are required by regulation.

In many circumstances, a *critical condition* must be described and related to physical conditions in the waterbody as part of the analysis of loading capacity (40 C.F.R. § 130.7(c)(1)). The critical condition can be thought of as the "worst case" scenario of environmental conditions in the waterbody in which the loading expressed in the TMDL for the pollutant of concern will continue to meet water quality standards. *Critical conditions* are the combination of environmental factors (e.g., flow, temperature, etc.) that results in attaining and maintaining the water quality criterion and has an acceptably low frequency of occurrence. *Critical conditions* are important because they describe the factors that combine to cause a violation of water quality standards and will help in identifying the actions that may have to be undertaken to meet water quality standards.

*Comment:*

The downstream point source loading capacity was developed using a QUAL2E model. This model is the most widely used computer model for simulating water quality associated with multiple point source discharges. The critical condition used to develop controls for continuous point source discharges is the drought stream flow identified as a 7Q10 flow value. For the purpose of this modeling the 7Q10 was identified as 0.2 (cfs).

The upstream nonpoint source loading capacity was developed using the Generalized Watershed Loading Function (GWLF) model. This model was an appropriate tool to apply to the upstream portion since loadings were most associated with wet weather flows and runoff. Lack of specific data precluded the use of more complex models. Therefore, based on available data and the nature of the nutrient loading, the use of the GWLF model was appropriate and reasonable for development of upstream loadings.

The upstream dissolved oxygen depletion is a result of algal growths. The critical condition for the upstream algal impairment is expected to be the summer low flow period, because that period is most conducive to algal growths. The observed summer concentrations of total phosphorus were compared to the target concentration of 0.01 mg/l total phosphorus to estimate the necessary loading reductions. This is a reasonable approach.

#### **4. Load Allocations (LAs)**

EPA regulations require that a TMDL include LAs, which identify the portion of the loading capacity allocated to existing and future nonpoint sources and to natural background (40 C.F.R. § 130.2(g) ). Load allocations may range from reasonably accurate estimates to gross allotments (40 C.F.R. § 130.2(g) ). Where it is possible to separate natural background from nonpoint sources, load allocations should be described separately for background and for nonpoint sources.

If the TMDL concludes that there are no nonpoint sources and/or natural background, or the TMDL recommends a zero load allocation, the LA must be expressed as zero. If the TMDL recommends a zero LA after considering all pollutant sources, there must be a discussion of the reasoning behind this decision, since a zero LA implies an allocation only to point sources will result in attainment of the applicable water quality standard, and all nonpoint and background sources will be removed.

*Comment:*

Modeling conclusions identified a load reduction of 1.98 metric tons/year or approximately 29% from 6.91 metric tons/year to 4.94 metric tons/year. Based on this reduction the nonpoint source total phosphorus loadings from row crop agriculture need to be reduced 33% in conjunction with the elimination of the total phosphorus loadings from the Kokomo Regency Mobile Home Park. This reduction is presented in accordance with the statement above.

#### **5. Wasteload Allocations (WLAs)**

EPA regulations require that a TMDL include WLAs, which identify the portion of the loading capacity allocated to existing and future point sources (40 C.F.R. § 130.2(h) ). If no point sources are present or if the TMDL recommends a zero WLA for point sources, the WLA must be expressed as zero. If the TMDL recommends a zero WLA after considering all pollutant sources, there must be a discussion of the reasoning behind this decision, since a zero WLA implies an allocation only to nonpoint sources and background will result in attainment of the applicable water quality standard, and all point sources will be removed.

In preparing the wasteload allocations, it is not necessary that each individual point source be assigned a portion of the allocation of pollutant loading capacity. When the source is a minor discharger of the pollutant of concern or if the source is contained within an aggregated general permit, an aggregated WLA can be assigned to the group of facilities. But it is necessary to allocate the loading capacity among individual point sources as necessary to meet the water quality standard.

The TMDL submittal should also discuss whether a point source is given a less stringent wasteload allocation based on an assumption that nonpoint source load reductions will occur. In such cases, the State/Tribe will need to demonstrate reasonable assurance that the nonpoint source reductions will occur within a reasonable time.

*Comment:*

Wasteload allocations were developed for three alternatives. The first two alternatives are based on a design flow of 0.25 million gallons per day (MGD) at the new Taylor Township Regional Sanitary District (RSD). The new Taylor Township RSD will be built at the design capacity of 0.25 MGD. The third alternative is based on a future expansion of the Taylor Township RSD to a design flow of 0.50 MGD. All load limits in the permits are expressed as concentration limits.

The first alternative would consist of a new regional wastewater treatment facility called the Taylor Township RSD. Under this alternative, Kokomo Regency and Taylor high school would be tied into the Taylor Township RSD. At a design flow of 0.25 MGD, the permit limits would consist of CBOD5 limits of 15 mg/l summer and 25 mg/l winter; and ammonia nitrogen limits of 1.5 mg/l summer and 2.1 mg/l winter. Also under this alternative Timbernest Apartments is given its own permit limits, set at a design flow of 0.015 MGD, consisting of CBOD5 limits of 25 mg/l summer and 25 mg/l winter; and ammonia nitrogen limits of 2.61 mg/l summer and 3.73 mg/l winter.

Under alternative two Timbernest Apartments, along with Kokomo Regency and Taylor high school, would be tied into the Taylor Township RSD. This alternative would also have a design flow of 0.25 MGD. Under this alternative the permit limits for the Taylor Township RSD would consist of CBOD5 limits of 15 mg/l summer and 25 mg/l winter; and ammonia nitrogen limits of 1.5 mg/l summer and 2.1 mg/l winter.

Load limits for a third alternative were based on a future expansion of the Taylor Township RSD and set for a design flow of 0.5 MGD. Those permit limits would consist of CBOD5 limits of 10 mg/l summer and 25 mg/l winter; and ammonia nitrogen limits of 1.42 mg/l summer and 1.99 mg/l winter.

The expected start date for construction of the new Taylor Township RSD is scheduled for July 2001 with a projected completion by December 2002.

## **6. Margin of Safety (MOS)**

The statute and regulations require that a TMDL include a margin of safety to account for any lack of knowledge concerning the relationship between load and wasteload allocations and water quality (CWA § 303(d)(1)(C), 40 C.F.R. § 130.7(c)(1)). EPA guidance explains that the MOS may be implicit, i.e., incorporated into the TMDL through conservative assumptions in the analysis, or

explicit, i.e., expressed in the TMDL as loadings set aside for the MOS. If the MOS is implicit, the conservative assumptions in the analysis that account for the MOS must be described. If the MOS is explicit, the loading set aside for the MOS must be identified.

*Comment:*

The margin of safety has been reasonably presented under both the model used for point source control of CBOD5 and ammonia nitrogen for attainment of dissolved oxygen and ammonia toxicity standards and for the model for the nonpoint source control of phosphorus to attain dissolved oxygen standards. The 7Q10 low flow used in the QUAL2E model are very conservative. Under the GWLF model, the endpoint of 0.10 mg/l of total phosphorus was selected using fairly rigorous criteria for identification of reference sites which had averaged dissolved oxygen concentrations of at least 7.0 mg/l and dissolved oxygen swings of less than 2.0 mg/l. This is acceptable as a conservative assumption considering that the dissolved oxygen standard for Kokomo Creek is 4.0 mg/l minimum and 5.0 mg/l daily average.

## **7. Seasonal Variation**

The statute and regulations require that a TMDL be established with consideration of seasonal variations. The method chosen for including seasonal variations in the TMDL must be described (CWA § 303(d)(1)(C), 40 C.F.R. § 130.7(c)(1)).

*Comment:*

Seasonality was expressed in the TMDL in the point source permit limits by identifying both summer and winter limits for CBOD5 and ammonia nitrogen. Having both summer and winter effluent limits recognizes the different assimilative capacity of the stream for different climatic conditions. Seasonality was expressed for the nonpoint source limit development using the GWLF model which takes into account a multi year period using actual weather conditions and observed changes in watershed activities. The nonpoint source loads are reflective of seasonal changes in weather and other conditions that can vary over the course of a year. Allowable loads are greater during wet weather months, recognizing that is when most of the nonpoint source loads occur. The higher summer loads are still protective of the chosen summer critical condition.

## **8. Monitoring Plan for TMDLs Developed Under the Phased Approach**

EPA's 1991 document, *Guidance for Water Quality-Based Decisions: The TMDL Process* (EPA 440/4-91-001), recommends a monitoring plan when a TMDL is developed under the phased approach. The guidance recommends that a TMDL developed under the phased approach also should provide assurances that nonpoint source controls will achieve expected load reductions. The

phased approach is appropriate when a TMDL involves both point and nonpoint sources and the point source is given a less stringent wasteload allocation based on an assumption that nonpoint source load reductions will occur. EPA's guidance provides that a TMDL developed under the phased approach should include 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.

*Comment:*

The TMDL does contain a follow-up monitoring plan which can be found on page 31-32 of the TMDL. Kokomo Creek sampling will occur in phases as each part of the TMDL recommended control strategies are completed. The sampling will begin in 2001 during both high flow and low flow conditions for a period of three years. All stream surface water samples will be collected as grab samples, and will be analyzed for ammonia nitrogen, and total phosphorus. At the same time field tests will be made for pH, temperature, turbidity, specific conductance, chlorophyll a, and dissolved oxygen. Dissolved oxygen measurements will be collected in the late afternoon to correspond with the peak dissolved oxygen period, and again the following morning to correspond with the low dissolved oxygen period.

## **9. Implementation Plans**

On August 8, 1997, Bob Perciasepe (EPA Assistant Administrator for the Office of Water) issued a memorandum, "New Policies for Establishing and Implementing Total Maximum Daily Loads (TMDLs)," that directs Regions to work in partnership with States/Tribes to achieve nonpoint source load allocations established for 303(d)-listed waters impaired solely or primarily by nonpoint sources. To this end, the memorandum asks that Regions assist States/Tribes in developing implementation plans that include reasonable assurances that the nonpoint source load allocations established in TMDLs for waters impaired solely or primarily by nonpoint sources will in fact be achieved. The memorandum also includes a discussion of renewed focus on the public participation process and recognition of other relevant watershed management processes used in the TMDL process. Although implementation plans are not approved by EPA, they help establish the basis for EPA's approval of TMDLs.

*Comment:*

Under the current regulations no formal implementation plan is required and the submitted Kokomo Creek TMDL was not accompanied by a formal implementation plan. However, the submitted TMDL for Kokomo Creek did describe both point and nonpoint control mechanisms that would be used to reduce loads and achieve water quality standards for dissolved oxygen and ammonia nitrogen.

Point source controls will be addressed in the construction of a new regional wastewater treatment



facility and corresponding permit limits for that facility and other point source dischargers. As part of these control measures some point sources will be taken off line and treated by the regional facility. Also illicit septic discharges will be removed and handled at the regional facility.

The nonpoint source activities will continue through the Lake and River Enhancement project, which is a voluntary program of local land users sponsored by the Indiana Department of Natural Resources. This effort is projected to reduce nonpoint source runoff to meet the required load reductions through the voluntary efforts of local land users. Such efforts could include such things as vegetative filter strips, grassed waterways, and stabilization structures. Also efforts will be made to promote the adoption of practices such as livestock waste utilization, reduced tillage, and integrated pest and nutrient management.

## **10. Reasonable Assurances**

EPA guidance calls for reasonable assurances when TMDLs are developed for waters impaired by both point and nonpoint sources. In a water impaired by both point and nonpoint sources, where a point source is given a less stringent wasteload allocation based on an assumption that nonpoint source load reductions will occur, reasonable assurance that the nonpoint source reductions will happen must be explained in order for the TMDL to be approvable. This information is necessary for EPA to determine that the load and wasteload allocations will achieve water quality standards.

In a water impaired solely by nonpoint sources, reasonable assurances that load reductions will be achieved are not required in order for a TMDL to be approvable. However, for such nonpoint source-only waters, States/Tribes are strongly encouraged to provide reasonable assurances regarding achievement of load allocations in the implementation plans described in section 9, above. As described in the August 8, 1997 Perciasepe memorandum, such reasonable assurances should be included in State/Tribe implementation plans and "may be non-regulatory, regulatory, or incentive-based, consistent with applicable laws and programs."

### *Comment:*

With the completion of the new regional wastewater treatment facility, illicit septic discharges and problematic point source dischargers will be provided with wastewater treatment that is designed to meet State water quality standards for both dissolved oxygen and ammonia nitrogen. The new regional wastewater treatment facility is scheduled to begin construction in July 2001 and be completed by December 2002.

Along with the point source controls, the nonpoint source recommendations are intended to be implemented through the Lake and River Enhancement project which was initiated by the Indiana Department of Natural Resources in 1999. The intent of this project is to provide both funding and