



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 5

77 WEST JACKSON BOULEVARD

CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF:

WW-16J

MAR 31 2005

Ms. Martha Clark Mettler
Office of Water Quality
Indiana Department of Environmental Management
100 N. Senate Ave.
P.O. Box 6015
Indianapolis, IN 46206-6015

APR 11 4 22 PM '05
IDEM
OFFICE OF
WATER QUALITY

Dear Ms. Mettler:

The United States Environmental Protection Agency (U.S. EPA) has reviewed the final Total Maximum Daily Load (TMDL) for the Upper Mill Creek Watershed in Indiana, which includes the following segments: INW0361_T1010, INW0362_T1011, INW0365_T1012, INW0362_00, INW0363_00, INW0364_00, INW0365_00, INW0366_00, INW0367_00, INW036F_00, and INW036G_00, located in the West Fork White River Basin. The Indiana Department of Environmental Management's (IDEM) TMDL addresses the E. coli impairment of recreational use in Hendricks, Putnam, Morgan, and Owen Counties. Based on this review, U.S. EPA has determined that Indiana's 11 TMDLs for E. coli meet 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, U.S. EPA hereby approves 11 TMDLs for the Upper Mill Creek Watershed in Indiana. 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 submitting these TMDLs, which address 11 E. coli impairments. We look forward to future TMDL submissions by the State of Indiana. If you have any questions, please contact Mr. Kevin Pierard, Chief of the Watersheds and Wetlands Branch at 312-886-4448.

Sincerely yours,

Jo Lynn Traub
Director, Water Division

Enclosure

It is a pleasure to have you here, and we are glad to see you. We are all well, and hope you are the same. We are all looking forward to seeing you again. We are all well, and hope you are the same. We are all looking forward to seeing you again.

Yours truly,
[Signature]

We are all well, and hope you are the same. We are all looking forward to seeing you again. We are all well, and hope you are the same. We are all looking forward to seeing you again.

TMDL: Pathogen TMDL for the Upper Mill Creek Watershed, Indiana

Approval Date:

MAR 31 2005

DECISION DOCUMENT FOR THE UPPER MILL CREEK WATERSHED TMDL

Section 303(d) of the Clean Water Act (CWA) and U.S. EPA's implementing regulations at 40 C.F.R. Part 130 describe the statutory and regulatory requirements for approvable TMDLs. Additional information is generally necessary for U.S. EPA to determine if a submitted TMDL fulfills the legal requirements for approval under Section 303(d) and U.S. 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. Use of the term "should" below denotes information that is generally necessary for U.S. EPA to determine if a submitted TMDL is approvable. These TMDL review guidelines are not themselves regulations. They are an attempt to summarize and provide guidance regarding currently effective statutory and regulatory requirements relating to TMDLs. Any differences between these guidelines and U.S. EPA's TMDL regulations should be resolved in favor of the regulations themselves.

1. Identification of Waterbody, Pollutant of Concern, Pollutant Sources, and Priority Ranking

The TMDL submittal should identify the waterbody as it appears on the State's/Tribe's 303(d) list. The waterbody should be identified/georeferenced using the National Hydrography Dataset (NHD), and the TMDL should clearly identify the pollutant for which the TMDL is being established. In addition, the TMDL should identify the priority ranking of the waterbody (see section 9 below) and specify the link between the pollutant of concern and the water quality standard (see section 2 below).

The TMDL submittal should include an identification of the point and nonpoint sources of the pollutant of concern, including location of the source(s) and the quantity of the loading, e.g., lbs/per day. The TMDL should provide the identification numbers of the NPDES permits within the waterbody. Where it is possible to separate natural background from nonpoint sources, the TMDL should include a description of the natural background. This information is necessary for U.S. 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 spatial extent of the watershed in which the impaired waterbody is located;
- (2) the assumed distribution of land use in the watershed (e.g., urban, forested, agriculture);
- (3) population characteristics, wildlife resources, and other relevant information affecting

the characterization of the pollutant of concern and its allocation to sources;
(4) present and future growth trends, if taken into consideration in preparing the TMDL (e.g., the TMDL could include the design capacity of a wastewater treatment facility); and
(5) an 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; chlorophyll *a* and phosphorus loadings for excess algae; length of riparian buffer; or number of acres of best management practices.

Comment:

The Upper Mill Creek Watershed is located in the West Fork White River basin (HUC #05120203060), and comprises, in part, three segments of Mill Creek (INW0361_T1010, INW0362_T1011, and INW0365_T1012), two segments of East Fork Mill Creek (INW0363_00 and INW0364_00), two segments of Mud Creek (INW0366_00 and INW0367_00), one segment for Crittenden Creek (#INW0362_00), one segment for Mill Creek upstream of Cagles Mill Lake (INW036F_00), one segment for Doe Creek-Ferguson Branch & other tributaries (INW036G_00), and one segment for Sallust Branch & other tributaries (INW0365_00). Eleven segments and approximately 88 miles in the Upper Mill Creek Watershed will be addressed by this Total Maximum Daily Load (TMDL), located in Hendricks, Putnam, Morgan, and Owen Counties.

In 1998 and 2002, Mill Creek was listed on the Indiana Department of Environmental Management's (IDEM) 303(d) list as impaired for pathogens upstream of US Highway 40 in Hendricks County. This portion of Mill Creek, in addition to Crittenden Creek, East Fork Mill Creek, Sallust Branch, Mud Creek, Mill Creek (upstream of Cagles Mill Lake), and Doe Creek-Ferguson Branch were determined by IDEM to be impaired for pathogens due to impairment of recreational uses as indicated by the elevated levels of *E. coli* bacteria, and are listed on IDEM's 2004 303(d) list (Page 1 of the TMDL Report¹).

Historical data collected by IDEM showed elevated levels of *E. coli* for Mill Creek in 1996. In 2001, IDEM performed an intensive survey of the watershed upstream of US Highway 40 in Hendricks County. Data showed violations of the single-sample standard for *E. coli* from samples collected at sixteen of the seventeen sites, sampled during Indiana's recreation season of April 1st-October 31st. The sixteen sites that violated the single-sample standard also violated the geometric mean standard (Page 2 of the TMDL Report).

E. coli load duration curves were created using data provided by IDEM. Load duration curves illustrate *E. coli* exceedances as it relates to flow. IDEM illustrates this relationship in Attachment B of the TMDL Report, and also compares this relationship to the single-sample

¹TMDL Report refers to the final report entitled "Total Maximum Daily Load (TMDL) for *Escherichia coli* (*E. coli*) for the Upper Mill Creek Watershed, Hendricks, Putnam, Morgan, and Owens Counties" dated January 24, 2005.

standard and geometric mean standard during both recreational and non-recreational seasons. Based on the load duration curve in Attachment B of the TMDL Report, results indicate that E. coli exceedances of both the single-sample standard and geometric mean standard were more likely to occur during periods of high flow.

Page 3 of the TMDL Report states that probable sources of E. coli to the impaired watershed include wildlife, failing septic tanks, and smaller livestock operations that are not regulated due to their small size. To date, IDEM has identified seven (7) permitted point sources and two (2) MS4 communities² in the Upper Mill Creek Watershed in Indiana (Page 4 of the TMDL Report).

The land use in the watershed is dominated by agriculture, accounting for approximately 77%-84% of land use in the watershed (Page 3 and Figure 3 of the TMDL Report). There are twelve (12) Confined Feeding Operations (CFOs) in the Upper Mill Creek Watershed as defined by IDEM. Of these 12, one is defined as a Concentrated Animal Feeding Operation (CAFO) and therefore subject to the National Pollutant Discharge Elimination System (NPDES) regulations. IDEM believes that these CFOs are not contributing sources of E. coli because there are no open enforcement actions at this time, indicating compliance of the CFO or CAFO permit³ (Page 5 of the TMDL Report). Because this TMDL uses the phased approach, the TMDL strategy may be amended as new information on the watershed is developed, to better account for contributing sources of E. coli bacteria and to determine where load reductions in the watershed are most appropriate.

U.S. EPA finds the State's approach acceptable and it meets the requirements of this section.

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

The TMDL submittal must include a description of the applicable State/Tribal water quality standard, including the designated use(s) of the waterbody, the applicable numeric or narrative water quality criterion, and the antidegradation policy. (40 C.F.R. §130.7(c)(1)). U.S. EPA needs this information to review the loading capacity determination, and load and wasteload allocations, which are required by regulation.

The TMDL submittal must identify a numeric water quality target(s) – a quantitative value used to measure whether or not the applicable water quality standard is attained. Generally, the pollutant of concern and the numeric water quality target are, respectively, the chemical causing the impairment and the numeric criteria for that chemical (e.g., chromium) contained in the water quality standard. The TMDL expresses the relationship between any

²See "Conversation Record" dated March 21, 2005.

³See "Response to EPA's Comments on Draft Upper Mill Creek Watershed TMDL" submitted by IDEM with Final TMDL Report.

necessary reduction of the pollutant of concern and the attainment of the numeric water quality target. Occasionally, the pollutant of concern is different from the pollutant that is the subject of the numeric water quality target (e.g., when the pollutant of concern is phosphorus and the numeric water quality target is expressed as Dissolved Oxygen (DO) criteria). In such cases, the TMDL submittal should explain the linkage between the pollutant of concern and the chosen numeric water quality target.

Comment:

Total body contact during the recreational season (April 1st - October 31st) currently represents the impaired designated use of the Upper Mill Creek Watershed. IDEM believes that the cause of this impaired designated use is attributed to E. coli exceedances of the Water Quality Standard (WQS).

For IDEM, 327 IAC 2-1-6(d) establishes the total body contact recreational use E. coli WQS for all waters in the non-Great Lakes system as follows:

“E. coli bacteria, using membrane filter (MF) count, shall not exceed one hundred twenty-five (125) per one hundred (100) milliliters as a geometric mean based on not less than five (5) samples equally spaced over a thirty (30) day period nor exceed two hundred thirty-five (235) per one hundred (100) milliliters in any one (1) sample in a thirty (30) day period.”

The E. coli targets of 125 cfu/100 ml (based on geometric mean) and 235 cfu/100 ml (based on single sample maximum) identified in the TMDL (Pages 2-3 of the TMDL Report) are consistent with Indiana's WQSs.

U.S. EPA finds the State's approach acceptable and it meets the requirements of this section.

3. Loading Capacity - Linking Water Quality and Pollutant Sources

A TMDL must identify the loading capacity of a waterbody for the applicable pollutant. U.S. EPA regulations define loading capacity as the greatest amount of a pollutant that a water can receive without violating water quality standards (40 C.F.R. §130.2(f)).

The pollutant loadings may be expressed as either mass-per-time, toxicity or other appropriate measure (40 C.F.R. §130.2(i)). If the TMDL is expressed in terms other than a daily load, e.g., an annual load, the submittal should explain why it is appropriate to express the TMDL in the unit of measurement chosen. The TMDL submittal should describe the method used to establish the cause-and-effect relationship between the numeric target and the identified pollutant sources. In many instances, this method will be a water quality model.

The TMDL submittal should contain documentation supporting the TMDL analysis, including the basis for any assumptions; a discussion of strengths and weaknesses in the analytical process; and results from any water quality modeling. U.S. EPA needs this information to review the loading capacity determination, and load and wasteload allocations, which are required by regulation.

TMDLs must take into account *critical conditions* for stream flow, loading, and water quality parameters as part of the analysis of loading capacity. (40 C.F.R. §130.7(c)(1)). TMDLs should define applicable *critical conditions* and describe their approach to estimating both point and nonpoint source loadings under such *critical conditions*. In particular, the TMDL should discuss the approach used to compute and allocate nonpoint source loadings, e.g., meteorological conditions and land use distribution.

Comment:

For most pollutants, TMDLs are expressed on a mass loading basis (e.g., pounds per day). For E. coli, however, mass is not necessarily an appropriate measure, and U.S. EPA allows pathogen TMDLs to be expressed in terms of organism counts (or resulting concentration). This pathogen TMDL is concentration based and is consistent with Indiana water quality standard (327 IAC 2-1.5-8(e)(2)). The loading capacity for all segments is equal to the water quality standard of 125 E. coli per 100 ml.

IDEM's pathogen TMDL approach is based upon the premise that all discharges (point and non-point) must meet the WQS when entering the waterbody. If all sources are meeting the WQS at discharge, then the waterbody will by definition meet the WQS and the designated use. IDEM performed a load duration curve analysis on the Upper Mill Creek Watershed to further investigate potential sources of E. coli (Linkage Analysis and E. coli Load Duration Curves: Page 5 of the TMDL Report). A load duration curve uses cumulative flow data plotted against water quality data (in this case, E. coli) at various sampling points in the watershed (Attachment B of the TMDL Report). The plots show under what flow conditions the water quality exceedences occur. Those exceedences at the right side of the graph occur during low flow conditions (such as septic systems and illicit sewer connections) and exceedences on the left side of the graphs occur during higher flow events (such as runoff). IDEM has reviewed these load duration curves, and believes that E. coli sources are attributed to both wet-weather and dry-weather events. The U. S. EPA agrees with this review. Using the load duration curve approach allows IDEM to determine which implementation practices are most effective for reducing E. coli loads based on flow regime. For example, if loads are significant during storm events, implementation efforts can target those BMPs that will most effectively reduce storm water run-off. This allows for a more efficient implementation effort. This TMDL is concentration-based, and ties directly into Indiana's water quality standard for E. coli. The target for this TMDL is the water quality standard, and therefore meeting this loading capacity will result in water quality standards being attained.

For this TMDL, IDEM uses a cost-effective TMDL approach that serves as an alternative to

perform modeling on the Upper Mill Creek Watershed, while still addressing the reductions necessary to meet WQS for E. coli bacteria. An additional strength of the TMDL is the shared responsibility for E. coli reductions among various municipalities in the TMDL watershed, which encourages collective implementation efforts. In addition, the TMDL approach IDEM has developed allowed the incorporation of relatively recent data (2001) to be used during the development of this TMDL, providing a more focused assessment of E. coli exceedances in the watershed. This allows for a better determination of where load reductions are most appropriate in the Upper Mill Creek Watershed, based upon the information available.

Weaknesses of the TMDL analysis are that Non-Point Source (NPS) load allocations were not assigned to specific sources within the watershed, and the identified sources of E. coli were assumed based on the data collected in the watershed, rather than determined by detailed monitoring and sampling efforts. Moreover, specific reductions were not quantified. However, U.S. EPA believes the weaknesses discussed in this TMDL are outweighed by the strengths of the TMDL approach and is appropriate based upon the information available. In the event that E. coli levels do not meet WQSs in response to implementation efforts described in the TMDL Report (Pages 9-10), the TMDL strategy may be amended as new information on the watershed is developed, to better account for contributing sources of the impairment and to determine where reductions in the Upper Mill Creek Watershed are most appropriate.

For this TMDL, the critical period for total body contact recreation is April 1st -October 31st. E. coli sources to the Upper Mill Creek Watershed arise from a mixture of wet and dry weather-driven conditions, and there is no single critical condition that is protective for all other conditions. Loadings occur from both dry weather sources (such as failing septic systems and conventional point sources) and wet weather sources (such as run-off), and therefore the TMDL was not developed for any particular loading condition. There is no critical condition for flow because the E. coli limit must be met under all flow conditions in this TMDL, and secondly, exceedances occurred during periods of both low-flow and high-flow. More importantly, since this TMDL is based on Indiana's concentration-based water quality standard (327 IAC 2-1.5-8(e)(2)) of 125 E. coli per 100 ml, water quality standards will be met regardless of flow conditions during the recreational season.

U.S. EPA agrees with the concentration-based approach for pathogen TMDLs, and the overall approach is consistent with EPA's *Protocol for Developing Pathogen TMDLs* (EPA 841-R-00-002). The approach used by Indiana for the Upper Mill Creek Watershed meets the requirements of 40 CFR 130.2(1): "TMDLs can be expressed in terms of mass per time, toxicity, or other appropriate measures."

U.S. EPA finds the State's approach acceptable and it meets the requirements of this section.

4. Load Allocations (LAs)

U.S. EPA regulations require that a TMDL include LAs, which identify the portion of the

loading capacity attributed to existing and future nonpoint sources and to natural background. Load allocations may range from reasonably accurate estimates to gross allotments (40 C.F.R. §130.2(g)). Where possible, load allocations should be described separately for natural background and nonpoint sources.

Comment:

Because the TMDL is concentration based, the load allocation for all segments is equal to 125 E. coli per 100 ml, which is the water quality standard. IDEM has identified wildlife, failing septic tanks, and smaller livestock operations as sources of E. coli (Pages 3 and 5 of the TMDL Report), and established a load allocation of 125 E. coli per 100 milliliters, which applies to all nonpoint sources. IDEM also identified twelve (12) CFOs in the Upper Mill Creek Watershed, one of which is considered a CAFO. The CAFO will be addressed in the Waste Load Allocation section below. As previously stated (section 1 above), IDEM does not believe that the eleven (11) CFOs are contributing sources of E. coli. This determination was made by IDEM because there are no open enforcement actions at this time, indicating compliance of the CFO permit. There are, however, smaller livestock operations in the watershed that are not regulated by CFO or CAFO regulations due to their small size. IDEM believes that these operations are a contributing source of E. coli.

IDEM assigns the same LA to all source categories - 125 E. coli per 100 ml. IDEM has determined that the best way to achieve the WQS is to distribute relative responsibility among the various units of government based upon their respective jurisdiction over lands. The government entities with the largest percent land area for the Hendricks County portion of the Upper Mill Creek Watershed are Franklin Township (9.0%), Liberty Township (8.6%), Clay Township (8.48%), Marion Township (3.54%), Center Township (2.45%), and the City of Danville (0.24%). The Putnam County government and its corresponding portion of land include Cloverdale Township (14.5%), Jefferson Township (10.67%), Marion Township (2.03%), Washington Township (0.94%), and Warren Township (0.32%). The Morgan county government will account for Adams Township (10.12%), Ashland Township (8.0%), Monroe Township (2.99%) and Gregg Township (2.74%), while the Owen County government will account for Taylor Township (5.24%), Jennings Township (4.92%), Harrison Township (3.4%), and Jackson Township (1.82%) (Page 8, Table 3, and Figure 6 of the TMDL Report). By assigning responsibility to each entity to meet the same loading capacity (125 E. coli per 100 ml), all communities/government entities are required to meet the same water quality target. IDEM's approach to look at loading capacity on a watershed scale incorporates all potential E. coli sources into the reduction effort and fosters the implementation efforts described below (sections 8 & 10). The U.S. EPA believes these allocations are appropriate given the amount of data for the watershed.

Achieving the load allocation for the Upper Mill Creek TMDL greatly depends on control of NPSs through implementation activities such as Best Management Practices (BMPs). IDEM will work with local stakeholder groups to achieve water quality improvements through the use of BMPs (Page 11 of the TMDL Report).

U.S. EPA finds the State's approach acceptable and it meets the requirements of this section.

5. Wasteload Allocations (WLAs)

U.S. EPA regulations require that a TMDL include WLAs, which identify the portion of the loading capacity allocated to individual existing and future point source(s) (40 C.F.R. §130.2(h), 40 C.F.R. §130.2(i)). In some cases, WLAs may cover more than one discharger, e.g., if the source is contained within a general permit.

The individual WLAs may take the form of uniform percentage reductions or individual mass based limitations for dischargers where it can be shown that this solution meets WQSs and does not result in localized impairments. These individual WLAs may be adjusted during the NPDES permitting process. If the WLAs are adjusted, the individual effluent limits for each permit issued to a discharger on the impaired water must be consistent with the assumptions and requirements of the adjusted WLAs in the TMDL. If the WLAs are not adjusted, effluent limits contained in the permit must be consistent with the individual WLAs specified in the TMDL. If a draft permit provides for a higher load for a discharger than the corresponding individual WLA in the TMDL, the State/Tribe must demonstrate that the total WLA in the TMDL will be achieved through reductions in the remaining individual WLAs and that localized impairments will not result. All permittees should be notified of any deviations from the initial individual WLAs contained in the TMDL. U.S. EPA does not require the establishment of a new TMDL to reflect these revised allocations as long as the total WLA, as expressed in the TMDL, remains the same or decreases, and there is no reallocation between the total WLA and the total LA.

Comment:

IDEM has determined that the waste load allocation is 125 E. coli per 100 ml, which is the WQS for E. coli. The sanitary waste discharge limit for point sources is also set by IDEM rule to be the WQS (327 IAC 2-1.5-8(e)(2)). For each point source, individually and collectively, IDEM is assigning a WLA of 125 E. coli per 100 ml.⁴

There are a total of 7 permitted point source dischargers in the Upper Mill Creek Watershed (Page 7 of the TMDL Report). Of these 7 permitted point source dischargers, four⁵ are permitted to discharge sanitary waste and IDEM will be pursuing E. coli permit limits for these facilities when they come up for renewal (Page 5 of the TMDL Report). In the event that these 4 dischargers do not receive E. coli limits when the permit is up for renewal, the WLA for these dischargers is still set at 125 E. coli/100 ml.

⁴See "Response to EPA's Comments on Draft Upper Mill Creek Watershed TMDL" submitted by IDEM with Final TMDL Report.

⁵Cloverdale STP (IN0022616), Lieber State Recreation Area (IN0030279), Camp Otto (IN0059765), and Cascade Junior/Senior High School (IN0037401).

Of the three remaining point source dischargers, one (Amo-Coatseville STP IN0043877) has E. coli and residual chlorine limits in its permit. This facility has not violated its E. coli limit for the past three years. Therefore, this discharger is not considered to be a significant source of E. coli since it is considered to be in compliance with its permit limit. However, the WLA of 125 E. coli per 100 ml still applies. The Cloverdale Water Department (IN0059846) does not have a sanitary component to its discharge, and therefore is not considered to be a contributing source of E. coli by IDEM.

The Town of Stilesville Waste Water Treatment Plant (WWTP) (IN005996) did not contain E. coli permit limits prior to 2003 because at that time IDEM believed that E. coli levels would not exceed Indiana WQS due to natural attrition of E. coli. According to IDEM, newer studies indicated that E. coli bacteria from this discharger may live longer than initially expected, and as a result, monitoring requirements for E. coli were added to its permit in April 2003 (Page 4 of the TMDL Report). Monitoring results from this discharger indicate end-of-pipe E. coli values ranging from 20 cfu/100 ml to 63 cfu/100 ml within the recreational season. Based on these values, IDEM considers the Town of Stilesville WWTP as a potential source of E. coli to the Upper Mill Creek Watershed, and therefore the WLA is 125 cfu per 100 ml. Because this TMDL uses the phased approach, the TMDL strategy and assumptions may be amended as new information on the watershed is developed.

As discussed in #1 above, there is one facility defined as a CAFO under the NPDES regulations, and therefore requiring a WLA. The regulations governing the CFO and CAFO facilities (327 IAC 16, 327 IAC 15) require operations "not to cause or contribute to an impairment of surface waters of the state". Therefore, the WLA for the CAFO facility is 125 E. coli/100 ml. IDEM believes that these CFOs are not contributing sources of E. coli because there are no open enforcement actions at this time, indicating compliance of the CFO or CAFO permit⁶ (Page 5 of the TMDL Report).

According to IDEM, there are two (2) MS4 communities in the Upper Mill Creek Watershed.⁷ Guidelines and timelines for MS4 permits are outlined in Indiana's MS4 Rule 13 (327 IAC 15-13-10 and 327 IAC 15-13-11). The WLA for these sources is set at 125 E. coli/100 ml.

U.S. EPA finds the State's approach acceptable and it meets the requirements of this section.

6. Margin of Safety (MOS)

The statute and regulations require that a TMDL include a margin of safety (MOS) to account for any lack of knowledge concerning the relationship between load and wasteload

⁶See "Response to EPA's Comments on Draft Upper Mill Creek Watershed TMDL" submitted by IDEM with Final TMDL Report.

⁷See "Conversation Record" dated March 21, 2005.

allocations and water quality (CWA §303(d)(1)(C), 40 C.F.R. §130.7(c)(1)). U.S. EPA's 1991 TMDL 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:

Margins of safety can be either implicit (i.e., incorporated into the TMDL analysis through conservative assumptions), or explicit (i.e., expressed in the TMDL as a portion of the loadings). The Upper Mill Creek TMDL for pathogens contains an implicit margin of safety because no rate of decay was used. Since pathogenic organisms have a more limited capability of surviving outside their hosts, a rate of decay would normally be used. However, it was determined by the State that it is more conservative to use the water quality standard of 125 E. coli per 100 ml, and not to apply a rate of decay which could result in a discharge limit greater than the water quality standard. The above assumption regarding not using a rate of decay is a conservative assumption that accounts for an implicit margin of safety.

As stated in *EPA's Protocol for Developing Pathogen TMDLs* (EPA 841-R-00-002), many different factors affect the survival of pathogens in water. These factors include, but are not limited to sunlight, temperature, salinity, and nutrient deficiencies. These factors vary depending on the environmental condition/circumstances of the water, and therefore it would be difficult to assert that the rate of decay caused by any given combination and degree of these environmental variables were sufficient enough to meet the WQS of 125 E. coli per 100 ml. This is why it is more conservative to apply the State's water quality standard of 125 E. coli per 100 ml as the margin of safety, because this standard must be met at all times under all environmental conditions.

U.S. EPA finds the State's approach acceptable and it meets the requirements of this section.

7. Seasonal Variation

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

Comment:

The TMDL addresses the seasonal variation by setting load allocations for the months of April through October to protect for total body contact as set out in Indiana Rule 327 IAC 2-1-6(d) and 327 IAC 2-1.5-8(e)(2). There is no total body contact during the remainder of the year primarily due to cold weather. Although the TMDL specifically applies to the recreational season of April

to October, implementation of BMPs will likely result in load reductions throughout the year. Since this is a concentration based TMDL the water quality standard of 125 E. coli per 100 ml must be met at all river flows during the applicable seasons.

U.S. EPA finds the State's approach acceptable and it meets the requirements of this section.

8. Reasonable Assurances

When a TMDL is developed for waters impaired by point sources only, the issuance of a National Pollutant Discharge Elimination System (NPDES) permit(s) provides the reasonable assurance that the wasteload allocations contained in the TMDL will be achieved. This is because 40 C.F.R. 122.44(d)(1)(vii)(B) requires that effluent limits in permits be consistent with "the assumptions and requirements of any available wasteload allocation" in an approved TMDL.

When a TMDL is developed for waters impaired by both point and nonpoint sources, and the WLA is based on an assumption that nonpoint source load reductions will occur, U.S. EPA's 1991 TMDL Guidance states that the TMDL should provide reasonable assurances that nonpoint source control measures will achieve expected load reductions in order for the TMDL to be approvable. This information is necessary for U.S. EPA to determine that the TMDL, including the load and wasteload allocations, has been established at a level necessary to implement water quality standards.

U.S. EPA's August 1997 TMDL Guidance also directs Regions to work with States to achieve TMDL load allocations in waters impaired only by nonpoint sources. However, U.S. EPA cannot disapprove a TMDL for nonpoint source-only impaired waters, which do not have a demonstration of reasonable assurance that LAs will be achieved, because such a showing is not required by current regulations.

Comment:

The TMDL Report identifies point source discharges, run-off from wildlife, failing septic systems, and smaller animal livestock operations as sources of E. coli in the Upper Mill Creek Watershed TMDL. Reasonable assurance for point source discharges is demonstrated by permit controls for meeting current NPDES limits, as well as future changes to those permits that have a sanitary component to their discharge. Future changes may also be made to those permits that monitor for E. coli with data indicating that these sources have a reasonable potential to cause an exceedance of WQS. CFOs and CAFOs in the watershed are required to manage manure, litter, and processed wastewater pollutants in a manner that does not cause or contribute to the impairment of the E. coli WQS (Page 9 of the TMDL Report).

In addition, water quality is expected to improve in the Upper Mill Creek Watershed once issuance and implementation of MS4 permits occur. These permits will address stormwater impacts to the watershed.

IDEM plans to work with watershed coordinators and local government agencies to create watershed projects in the Upper Mill Creek Watershed. This will aid in identifying and reducing the NPS that contribute E. coli to the Upper Mill Creek Watershed. A watershed specialist hired by IDEM will assist stakeholders with starting a watershed group and facilitate planning activities, while acting as a liaison between watershed planning and TMDL activity.

IDEM identified potential future activities in the watershed to reduce E. coli run-off. This includes, but is not limited to, septic management programs to reduce septic system pollution. IDEM believes that the removal of illicit dischargers and proper education on septic system maintenance could reduce these sources of E. coli. Page 10 of the TMDL Report describes potential future activities in detail.

U.S. EPA finds that the State's approach acceptable.

9. Monitoring Plan to Track TMDL Effectiveness

U.S. EPA's 1991 document, *Guidance for Water Quality-Based Decisions: The TMDL Process* (EPA 440/4-91-001), recommends a monitoring plan to track the effectiveness of a TMDL, particularly when a TMDL involves both point and nonpoint sources, and the WLA is based on an assumption that nonpoint source load reductions will occur. Such a TMDL should provide assurances that nonpoint source controls will achieve expected load reductions and, such TMDL should include a monitoring plan that describes the additional data to be collected to determine if the load reductions provided for in the TMDL are occurring and leading to attainment of water quality standards.

Comment:

Monitoring will be performed by IDEM on the Upper Mill Creek Watershed as part of the five-year rotating basin schedule and/or once the TMDL is implemented. When results indicate that the waterbody may be meeting water quality standards, then sampling will be conducted to determine if the loading capacity of 125 E. coli/100ml is met in accordance with the 30-day geometric mean standard. If results indicate that the WQS has not been achieved, then IDEM will reassess the TMDL to determine more specifically the contributing sources of E. coli to the impaired watershed. Because this TMDL uses the phased approach, IDEM may amend the TMDL strategy as new information on the watershed is developed, to better account for contributing sources of the pollutant and to determine where load reductions in the Upper Mill Creek Watershed are most appropriate.

Indiana does not include a separate priority ranking, however, it prioritizes and schedules waters based on its five-year rotating watershed assessment approach.

U.S. EPA finds that the State's approach is acceptable.

10. Implementation

U.S. EPA policy encourages Regions to work in partnership with States/Tribes to achieve nonpoint source load allocations established for 303(d)-listed waters impaired by nonpoint sources. Regions may assist States/Tribes in developing implementation plans that include reasonable assurances that nonpoint source LAs established in TMDLs for waters impaired solely or primarily by nonpoint sources will in fact be achieved. In addition, U.S. EPA policy recognizes that other relevant watershed management processes may be used in the TMDL process. U.S. EPA is not required to and does not approve TMDL implementation plans.

Comment:

This TMDL does not contain a formal implementation plan. U.S. EPA is not required to and does not approve TMDL implementation plans. However, IDEM did identify some implementation activities that will work toward meeting the water quality standard for pathogens. As discussed under reasonable assurance (#8 above), future changes to those permits that have a sanitary component to their discharge may be made upon permit renewal as well as for those permits that monitor for E. coli with data indicating that these sources have a reasonable potential to cause an exceedance of WQS. MS4 permits are being issued, and watershed projects will be facilitated by IDEM in the Upper Mill Creek Watershed.

U.S. EPA finds that the State's approach is acceptable.

11. Public Participation

U.S. EPA policy is that there should be full and meaningful public participation in the TMDL development process. The TMDL regulations require that each State/Tribe must subject calculations to establish TMDLs to public review consistent with its own continuing planning process (40 C.F.R. §130.7(c)(1)(ii)). In guidance, U.S. EPA has explained that final TMDLs submitted to U.S. EPA for review and approval should describe the State's/Tribe's public participation process, including a summary of significant comments and the State's/Tribe's responses to those comments. When U.S. EPA establishes a TMDL, U.S. EPA regulations require U.S. EPA to publish a notice seeking public comment (40 C.F.R. §130.7(d)(2)).

Provision of inadequate public participation may be a basis for disapproving a TMDL. If U.S. EPA determines that a State/Tribe has not provided adequate public participation, U.S. EPA may defer its approval action until adequate public participation has been provided for, either by the State/Tribe or by U.S. EPA.

Comment:

The TMDL was public noticed from November 23, 2004 to December 23, 2004. No public comments on the draft report were received by IDEM. Prior to the public comment period,

IDEM held a public information meeting at the Danville Public Library in Danville, Indiana on July 27, 2004. In addition, copies of the draft TMDL were placed on the Indiana Department of Environmental Management internet web site.

U.S. EPA finds the State's approach acceptable and it meets the requirements of this section.

12. Submittal Letter

A submittal letter should be included with the TMDL submittal, and should specify whether the TMDL is being submitted for a *technical review* or *final review and approval*. Each final TMDL submitted to U.S. EPA should be accompanied by a submittal letter that explicitly states that the submittal is a final TMDL submitted under Section 303(d) of the Clean Water Act for U.S. EPA review and approval. This clearly establishes the State's/Tribe's intent to submit, and U.S. EPA's duty to review, the TMDL under the statute. The submittal letter, whether for technical review or final review and approval, should contain such identifying information as the name and location of the waterbody, and the pollutant(s) of concern.

Comment:

The U.S. EPA received the formal submittal of the final pathogen TMDL for the Upper Mill Creek Watershed in Indiana on January 26, 2005, along with a submittal letter from Martha Clark Mettler, Chief of the Watershed Branch, Office of Water Quality, dated January 21, 2005. On March 30, 2005, IDEM resubmitted the final Upper Mill Creek Watershed TMDL that included revised information on MS4 permits in the watershed. In the original submittal letter, IDEM stated that "The TMDL accompanying this letter is the final TMDL submission for the State of Indiana for the Upper Mill Creek Watershed 303(d) ID #134 and 504; Segment ID # INW0361_T1010, INW0362_T1011, INW0365_T1012, INW0362_00, INW0363_00, INW0364_00, INW0365_00, INW0366_00, INW0367_00, INW036F_00, and INW036G_00. This TMDL is being submitted per the requirement under Section 303(d) of the Clean Water Act and 40 CFR 130." The submittal letter included the name and location of the waterbody and the pollutant of concern.

U.S. EPA finds the State's approach acceptable and it meets the requirements of this section.

13. Conclusion

After a full and complete review, U.S. EPA finds that the TMDL for the Upper Mill Creek Watershed, Indiana (303(d) list # 134 and 504), satisfies all of the elements of an approvable TMDL. This approval is for 11 waterbody segments impaired by E. coli for a total of 11 TMDLs, each addressing the E. coli impairment (Table 1 below).

U.S. EPA's approval of this TMDL does not extend to those waters that are within Indian

Country, as defined in 18 U.S.C. Section 1151. U.S. EPA is taking no action to approve or disapprove TMDLs for those waters at this time. U.S. EPA, or eligible Indian Tribes, as appropriate, will retain responsibilities under the CWA Section 303(d) for those waters.

Table 1: Breakdown of Upper Mill Creek Watershed TMDL Segments		
Waterbody Name	Segment ID	Impairment
Mill Creek	INW0361_T1010	E. coli
	INW0362_T1011	E. coli
	INW0365_T1012	E. coli
Crittenden Creek	INW0362_00	E. coli
East Fork Mill Creek	INW0363_00	E. coli
	INW0364_00	E. coli
Sallust Branch and other tributaries	INW0365_00	E. coli
Mud Creek	INW0366_00	E. coli
	INW0367_00	E. coli
Mill Creek u/s Cagles Mill Creek	INW036F_00	E. coli
Doe Creek - Ferguson Branch and other tributaries	INW036G_00	E. coli

