



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

JUL 26 2007

REPLY TO THE ATTENTION OF:

WW-16J

2007 AUG -3 A 8:42
OFFICE OF
WATER QUALITY

Marylou Renshaw, Chief
Watershed Planning Branch
Office of Water Quality
Indiana Department of Environmental Management
100 North Senate Avenue
Indianapolis, IN 46204

Dear Ms. Renshaw:

The United States Environmental Protection Agency (U.S. EPA) has conducted a complete review of the final Total Maximum Daily Load (TMDL) submittal, including supporting documentation and information, for *E. coli* in 11 stream segments in the East Fork Whitewater River Watershed, located in Wayne, Union, Fayette, and Franklin Counties of Indiana. Based on this review, U.S. EPA determined that Indiana's TMDLs for one pollutant (*E. coli*) for these 11 waterbody segments meet the requirements of Section 303(d) of the Clean Water Act and U.S. EPA's implementing regulations at 40 C.F.R. Part 130. Therefore, by this letter, U.S. EPA hereby approves Indiana's 11 TMDLs for *E. coli* in the East Fork Whitewater River 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 appreciate your hard work in this area and the submittal of the TMDL as required. If you have any questions, please contact Mr. Kevin Pierard, Chief of the Watersheds and Wetlands Branch at 312-886-4448.

Sincerely yours,

Linda Holst
Acting Director, Water Division

Enclosure

cc: Staci Goodwin, IDEM, w/enclosure

1900 10 10

Date: JUL 26 2007

**DECISION DOCUMENT FOR APPROVAL OF THE
EAST FORK WHITEWATER RIVER WATERSHED TMDL IN INDIANA**

Section 303(d) of the Clean Water Act (CWA) and 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 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. Use of the term "should" below denotes information that is generally necessary for 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 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 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 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:

Location Description: The East Fork Whitewater River watershed is an eight digit (05080003) hydrologic unit code (HUC) watershed located in the Whitewater River Basin on the eastern border of southeast Indiana (Figure 1a of the TMDL submittal). The TMDL addresses approximately 73.96 miles of the East Fork Whitewater River watershed in Wayne, Union, Fayette, and Franklin Counties, Indiana. The headwaters of the East Fork Whitewater River are located in northeast Wayne County and western Ohio. The forks join in east central Wayne County and flow south through Union and Franklin Counties. In northern Franklin County, the East Fork converges with the main stem of the Whitewater River.

The TMDL submittal addresses the impaired segments of the East Fork Whitewater River watershed from its headwaters to its confluence with the main stem of the Whitewater River. The East Fork Whitewater watershed TMDL addresses impairments in the East Fork Whitewater River, and its tributaries including Lick Creek, Elkhorn Creek, Silver Creek, Hanna Creek, and one Unnamed Tributary. These streams are impaired by elevated levels of *E. coli* during the recreational season.

All eleven (11) of the impaired segments addressed in this TMDL are located in the Whitewater River Basin. The impaired segments included in Table 1 of the TMDL submittal are found below:

Waterbody Name	Segment ID Number(s)	Length (Miles)	Impairment
MIDDLE FORK EAST FORK WHITEWATER RIVER	ING0374_00, ING0374_01	4.26	<i>E. coli</i>
WEST FORK EAST FORK WHITEWATER RIVER	ING0375_00, ING0375_T1023	9.5	<i>E. coli</i>
WHITEWATER RIVER, EAST FORK	ING0376_T1013, ING0376_T1027	5.69	<i>E. coli</i>
LICK CREEK	ING0377_01	2.15	<i>E. coli</i>
ELKHORN CREEK	ING0378_01	7.13	<i>E. coli</i>
WHITEWATER RIVER, EAST FORK-UNNAMED TRIBUTARIES (HUNT RD)	ING0379_T1001	6.89	<i>E. coli</i>
SILVER CREEK - WHITEWATER LAKE	ING037D_00	25.63	<i>E. coli</i>
HANNA CREEK - DUBOIS CREEK	ING037F_00	12.71	<i>E. coli</i>

The TMDL submittal addresses the East Fork Whitewater River in two (2) sections. These are the Main Stem Segments located in the northern and western portions of the watershed (TMDL submittal, Figure 1b) and the Tributary Segments in the eastern portion of the watershed (TMDL submittal, Figure 1c).

Listing Information: In 2002, Indiana's section 303(d) list cited segments of the East Fork Whitewater River as being impaired for *E. coli*. In 2002, an intensive reassessment of the watershed was completed by IDEM collecting data from 16 sites each sampled six (6) times (see Figures 2a and 2b of the TMDL submittal). Samples were collected over a 30-day period from June 10, 2002 to July 22, 2002. Because one week of sampling was omitted for quality assurance reasons, the overall sampling lasted for a longer duration. IDEM's sampling protocol is consistent with the monitoring frequency requirements included in Indiana's water quality standard (WQS) for *E. coli*. The reassessment documented elevated levels of *E. coli* in the East Fork Whitewater River Watershed. The single sample maximum was exceeded at twelve (12) of the sites and geometric mean standard was exceeded at eleven (11) of the sixteen (16) sites. Additional samples collected by external organizations between 2003 and 2006 have also documented *E. coli* samples above these levels.

Based on the reassessment IDEM will add additional segments of the East Fork Whitewater River Watershed to the 2008 303(d) List. These segments include tributaries of the East Fork Whitewater River, Dubois Creek and its tributaries, and the Hanna Creek Tributaries.

Topography and Land Use: Based on 1992 data, approximately 68% of the landuse in the East Fork Whitewater River watershed is categorized as agricultural (TMDL submittal, Figure 3a). Remaining landuse consists of 21% forest, 6% urban, 3% water, and 2% wetlands. Also based on 1992, approximately 81% of the land use in the Tributary sub-watershed is classified as agriculture (TMDL submittal, Figure 3b). The remaining land use consists of 17% forest, 1% water, 1% wetland, and less than 1% urban. A comparison of 1992 landuse information with aerial photos taken 2003 showed little change along both sub-watersheds.

Pollutant of concern: The pollutant of concern is *E. coli*.

Pollutant sources: There are both point sources and nonpoint sources of *E. coli* in the East Fork Whitewater River watershed. The nonpoint sources include:

Wildlife – deer, geese, ducks, raccoons, turkeys, and other animals;

Septic systems

County Health Departments within the watershed report septic failures. Wayne County Health Department estimates that approximately 20-25% of the 8,000 septic systems in the County are failing. Union, Franklin, and Fayette Counties were unable to establish failure rates for their respective counties (page 4 of the TMDL submittal);

Confined Feeding Operations (CFOs) and Concentrated Animal Feeding Operations (CAFO)

There is one (1) active CFO in the Main Stem sub-watershed and two (2) active CFOs in the Tributary sub-watershed (Figures 6 and 9 of the TMDL submittal). None of the CFOs are considered a CAFO by IDEM. The CFO and CAFO regulations (327 IAC 16, 327 IAC 15) require operations “not cause or contribute to an impairment of surface waters of the state”. The active CFO in the East Fork Whitewater watershed does not have open enforcement actions at this time. Therefore, this operation is not considered by IDEM to be a significant source of *E. coli* for the East Fork Whitewater River watershed. However, IDEM stated that CFOs could be sources of *E. coli* during high flow conditions identified on the water quality duration curves, and that CFOs have “the potential to cause a violation of the *E. coli* water quality standard through land application or a malfunction at the facility.” (Page 9, TMDL submittal).

Small Livestock Operations

There are also many small livestock operations in the watershed. Due to their small size, these operations are not regulated under the CFO or CAFO regulations. No specific information on these small livestock operations is currently available, however, these operations may still have an impact on the water quality and the *E. coli* impairment.

Point sources include:

National Pollutant Discharge Elimination System (NPDES) Permitted Dischargers

There are four (4) NPDES permitted dischargers with a sanitary component to their discharge in the TMDL watershed. Three (3) of the NPDES dischargers are in the assessed HUCs of the Main Stem sub-watershed and one (1) is in the Tributary sub-watershed of the East Fork Whitewater River watershed (Figure 4 of the TMDL submittal).

The three (3) permitted dischargers in the Main Stem sub-watershed have *E. coli* limits. These facilities are not considered by IDEM to be significant sources of the *E. coli*.

The one (1) permitted discharger in the Tributary sub-watershed, Liberty Municipal STP, has TRC limits and does have a sanitary component to its discharge. The Liberty Municipal STP has a flow of less than 1 MGD and has not violated its TRC limit in the past five years. It is presumed by IDEM that a facility maintaining adequate chlorine levels in the contact tank would meet *E. coli* WQS by default. Therefore, this facility is not considered by IDEM to be significant sources of *E. coli*. IDEM plans to issue *E. coli* limits to Liberty Municipal STP in the next permit cycle (Personal Communication, IDEM, 7/23/2007).

A summary of NPDES sources, by permit type, is included below.

Table 1. NPDES Permits in the Main Stem Sub-watershed (from TMDL submittal)

Facilities with <i>E. coli</i> Limits		
Permit No.	Facility Name	Receiving Waters
IN0025615	Richmond Municipal STP	East Fork Whitewater River
IN0022446	Brookville Municipal STP	East Fork Whitewater River
IN0045668	Cloverleaf Mobile Home Park	King Ditch

Table 1b: NPDES Permits in the Tributary Sub-watershed

Facilities with Total Residual Chlorine Limits		
<u>Permit No.</u>	<u>Facility Name</u>	<u>Receiving Waters</u>
IN0020681	Liberty Municipal STP	Silver Creek and Hanna's Creek

Storm Water General Permit Rule 13

IDEM identified the City of Richmond, located in the Main Stem of the East Fork Whitewater River, as the only municipal separate storm sewer system (MS4) community in the watershed. IDEM considers the MS4 to be a potential source of *E. coli* to the East Fork Whitewater River, but found it difficult to determine if the MS4 community is a significant source of *E. coli*.

Combined Sewer Overflows (CSOs) and Sanitary Sewer Overflows (SSOs)

IDEM considers CSOs and SSOs significant sources of *E. coli* in the East Fork Whitewater River watershed. There is one CSO community (City of Richmond) identified by IDEM along the East Fork of the Whitewater River (Figure 5 of the TMDL submittal). The City of Richmond has four CSOs, including three outfalls which discharge into the East Fork Whitewater River. IDEM's Office of Enforcement and the City of Richmond are working on an agreed order to address the CSOs and SSOs in the collection system. SSOs are not permitted by IDEM and are considered illegal discharges.

IDEM's water quality duration curve analyses, summarized in Section 3 of this decision document, indicate that the highest levels of *E. coli* are found throughout the watershed during mid-range to high flow conditions. High *E. coli* values, associated with mid-range to high flow conditions, are indicative of *E. coli* transportation by field tiles and overland flow (TMDL submittal, page 8).

Priority ranking: IDEM scheduled this TMDL based on the data available from the basin-rotation schedule, which represents the most accurate and current information on water quality within the waterbodies covered by this TMDL (Page 2 of the TMDL). IDEM's TMDL development schedule corresponds with their basin-rotation water quality monitoring schedule. The development of most of IDEM's TMDLs is based on this schedule to take advantage of all available resources. Prioritization is based on whether the designated uses are being met, the magnitude of the impairment, and other plans for the watershed. For example, some watershed groups may want to implement some best management practices (BMPs) and assess their success without a TMDL.

EPA finds that the TMDL submittal from IDEM satisfies all requirements concerning this first element.

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)). 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 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:

The Numeric Target Section of the TMDL submittal describes designated uses and numeric criteria applicable to this watershed.

Use Designation: The impaired designated use for the waterbodies in the East Fork Whitewater River watershed is for full body contact recreational use during the recreational season, April 1st through October 31st.

Numeric Standards: Indiana Administrative Code 327 IAC 2-1-6(d) established the full body contact recreational use *E. coli* Water Quality Standard (WQS) for all waters in the state of Indiana 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.**”

Targets: The target for these TMDLs is the standard as stated in the previous paragraph, for both the geometric mean portion and the single sample maximum portion, which is applicable from April 1st through October 31st (Page 3 of TMDL submittal “Numeric Targets” Section). If the numeric standard is met, the river will meet the assigned designated use (327 IAC 2-1-6(d)). As discussed in the “TMDL Development” Section of the TMDL submittal, the water quality duration curves, representing the allowable load of *E. coli*, were calculated using both the single sample maximum and geometric mean standards as target lines.

EPA finds that the TMDL submittal from IDEM satisfies all requirements concerning this second element.

3. Loading Capacity - Linking Water Quality and Pollutant Sources

A TMDL must identify the loading capacity of a waterbody for the applicable pollutant. 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. 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:

Loading capacity: IDEM has determined that the loading capacity for the impaired waterbodies is the water quality standard; that is, 125 cfu/100 ml (geometric mean of 5 samples equally spaced over a 30 day period) and a sample maximum of 235 cfu/100 ml (Personal Communication, IDEM, 7/21/2006). The water quality duration curves representing the allowable load of *E. coli*, or the loading capacity, were calculated by IDEM using the single sample maximum and geometric mean standards of 235 *E. coli* per 100 ml and 125 *E. coli* per 100 ml, respectively.

IDEM believes the geometric mean portion of the WQS provides the best overall characterization of the status of the watershed. EPA agrees with this, as stated in the preamble of "The Water Quality Standards for Coastal and Great Lakes Recreation Waters Final Rule" (69 FR 67218-67243, November 16, 2004) on page 67224 "...the geometric mean is the more relevant value for ensuring that appropriate actions are taken to protect and improve water quality because it is a more reliable measure, being less subject to random variation, and more directly linked to the underlying studies on which the 1986 bacteria criteria were based." IDEM will be relying on the geometric mean portion of the WQS to track implementation activity and results.

Typically, loading capacities are expressed as a mass per time (e.g. pounds per day). For *E. coli*, however, states often use concentration to measure loading capacity rather than mass per time, with concentration being the amount of matter in a given volume. This approach is consistent with EPA's regulations which define "load" as "an amount of matter . . . that is introduced into a receiving water. . . ." (40 CFR §130.2). To establish the loading capacities for the East Fork Whitewater River Watershed, IDEM used Indiana's WQS for pathogens which has a geometric mean for a 30 day period and a single sample maximum of an amount of bacteria colonies per 100 milliliters of receiving water. Thus, the loading capacity is expressed as a concentration, i.e. the amount of bacteria colonies per volume of water. A loading capacity is "the greatest amount of loading that a water can receive without violating water quality standards." (40 CFR §130.2). Loading capacity set at the WQS will assure that the water does not violate WQS.

Method for cause and effect relationship: IDEM developed *E. coli* water quality and load duration curve analyses for all sixteen sampling sites in the East Fork Whitewater River watershed (Attachments B and C of the TMDL). Three sampling sites (GMW070-0021, GMW070-0003, and GMW070-0004) were selected as representative of the Main Stem Sub-watershed. One sampling site (GMW070-0015) was selected as representative of the Tributary Sub-watershed. Measured flow data are used to develop the water quality and load duration curves. The U.S. Geological Survey (USGS) flow gage on the East Fork Whitewater River at Brookville was used to generate the duration curves for the watershed.

The water quality and load duration curve analysis considers how stream flow conditions relate to a variety of pollutant loadings and their sources (point and nonpoint). The water quality duration curves (Attachment B of the TMDL) were included in the TMDL as a visual representation of the flow conditions at which the *E. coli* WQS violations occur. Details on how the duration curves were developed are included on pages 8-10 of the TMDL.

In general, the first step is to develop flow duration curves, which relate flow values measured at each monitoring station to the percent of time those flow values are met or exceeded. Flows are ranked from extremely low flow, exceeded nearly 100% of the time, to extremely high flow which is rarely exceeded.

Flow duration curves are then used to develop water quality duration and load duration curves by multiplying flow values along the curve by the applicable WQS for *E. coli* (see Attachments B and C of the TMDL submittal). The water quality duration curves, representing the allowable load in terms of concentration (loading capacity) of *E. coli*, were calculated using the single sample maximum and geometric mean standards as target lines. IDEM plotted *E. coli* data on the water quality duration curves to provide a visual display of water quality conditions in the watershed, in terms of *E. coli* concentrations (in cfu/100ml units). The *E. coli* data points that are above the target lines exceed the WQSs, those that fall below the target lines meet the WQSs.

The load duration curves (see Attachment C of the TMDL submittal) provide a visual display of water quality conditions in the watershed in terms of daily *E. coli* load (in cfu/day units)

compared to WQS target lines. IDEM also plotted *E. coli* load data on the load duration curves by multiplying *E. coli* sample concentration data by the flow associated with each sample collection event. The *E. coli* load data points that are above the curve exceed the WQS-based loading target, those that fall below the curve meet the loading target.

Analysis of the data, through the use of load and water quality duration curves, for most sampling points the East Fork Whitewater River watershed indicates that higher *E. coli* impacts occur during mid to high flow conditions. IDEM identified the majority of sources of *E. coli* as nonpoint and wet weather sources, which include small animal operations, wildlife, CSOs, and leaking and failing septic tanks.

The next step is to determine where reductions need to occur. A summary of the required reductions for the East Fork Whitewater River watershed is included in the following tables:

Table 2. Water Quality Duration Curve Analysis Summary Table for the Main Stem Sub-Watershed

<i>E. coli</i> Standard = 125 mpn/100 mL				
Waterbody Name	Monitoring Site ID	<i>E. coli</i> Geometric Mean (cfu/100mL)	% Reduction in <i>E. coli</i> loadings Required to meet WQS	Flow Range with Highest <i>E. coli</i> Values
Middle Fk E Fk Whitewater River	GMW070-0021	159.21	21.49%	Mid-range to high flow
E Fk Whitewater River	GMW070-0002	728.27	82.84%	Mid-range to high flow
W Fk E Fk Whitewater River	GMW070-0003	410.94	69.58%	All flows
E Fk Whitewater River	GMW070-0063	353.63	64.65%	Mid-range to high flow
E Fk Whitewater River	GMW070-0004	173.05	27.77%	Mid-range to high flows
Unnamed Trib	GMW070-0058	255.02	50.98%	Mid-range to high flow
E Fk Whitewater River	GMW070-0006	107.31	0.00%	Mid-range to high flow
E Fk Whitewater River	GMW070-0056	93.64	0.00%	Mid-range to high flow
Whitewater Lake Boat Ramp	GMW070-0054	2.92	0.00%	Mid-range to high flow
Quakerstown SRA Swimming Beach	GMW070-0055	2.72	0.00%	Mid-range to high flow
Brookville Reservoir	GMW070-0053	1.75	0.00%	Mid-range to high flow

Table 3. Water Quality Duration Curve Analysis Summary Table for the Tributary Sub-Watershed

<i>E. coli</i> Standard = 125 mpn/100 mL				
Waterbody Name	Monitoring Site ID	<i>E. coli</i> Geometric Mean (cfu/100mL)	% Reduction in <i>E. coli</i> loadings Required to meet WQS	Flow Range with Highest <i>E. coli</i> Values
Lick Cr	GMW070-0059	361.85	65.46%	Mid-range to high flow
Elkhorn Cr	GMW070-0062	193.1	35.27%	Mid-range to high flow
Silver Cr	GMW070-0016	336.12	62.81%	Mid-range to high flow
Hanna Cr	GMW070-0015	313.48	60.13%	Mid-range to high flow
Dubois Cr	GMW070-0052	550.81	77.31%	Mid-range to high flow

Critical conditions: *E. coli* sources to the East Fork Whitewater River watershed arise from a mixture of dry and wet weather-driven conditions. There is no critical condition for flow because the *E. coli* limit must be met under all flow conditions in this TMDL. The water quality standards will be met regardless of flow conditions during the recreational season.

EPA finds that the TMDL submittal from IDEM satisfies all requirements concerning this third element.

4. Load Allocations (LAs)

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:

Load Allocation: The Load Allocation Section of the TMDL submittal identifies the load allocation for the segments in the watershed as equal to the Water Quality Standard. As stated in Section 2 above and on page 3 of the TMDL submittal, the standard is 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.”

IDEM calculated the geometric means and reductions needed for each sampling site in the watershed (Attachments B and C of the TMDL, Tables 2 and 3 above). The load duration curves for the East Fork Whitewater River watershed can be used to determine a daily mass loading, if needed. The daily mass loading will vary depending on stream flow. These curves will be used by IDEM to target those critical flow regimes for implementation, and to determine the reduction needed for each sampling site in the watershed (Table 2 above). Thus, rather than determine reductions based upon land use types or source categories, the reductions are based upon geographical location.

IDEM determined the percent reduction necessary to meet WQS by comparing the geometric mean for each segment with the load allocation (see the *Water Quality Duration Curve Analysis Summary* Tables 2 and 3 in Section 3, above; and pages 8-10 of the TMDL submittal). Section 1 of this decision document includes a discussion of nonpoint sources in the watershed.

EPA finds that the TMDL submittal from IDEM satisfies all requirements concerning this fourth element.

5. Wasteload Allocations (WLAs)

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. 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:

Wasteload Allocation (WLA): There are four (4) permitted dischargers in the East Fork Whitewater River watershed with a sanitary component to their discharge. Three (3) of these four (4) permitted dischargers already have *E. coli* limits in their permits. IDEM has

recommended the remaining one (1) permitted facility with a sanitary component to their discharge receive *E. coli* limits in their next permit cycle.

The Waste Load Allocation Section of the TMDL submittal identifies the waste load allocation for all facilities subject to NPDES regulation (see Table 1 above) as equal to the Water Quality Standard.

The WLA for prohibited discharges from SSOs and septic systems with straight pipe discharges directly to streams is set at zero (0.0).

The City of Richmond is the only CSO and SSO community in the watershed. IDEM considers the CSO to be a potential source of *E. coli* to the East Fork Whitewater River. Richmond has four CSO outfalls that discharge into the East Fork Whitewater River, and three SSO outfalls that discharge into the Main Stem Sub-watershed (pages 12-13 of the TMDL submittal). Richmond submitted a CSO Long Term Control (LTC) Plan to IDEM in 2001 which is currently in review. The WLA for the Richmond CSOs discharging to East Fork Whitewater River is set at the WQS, or the monthly geometric mean of 125 cfu/100ml and a single sample maximum of 235 cfu/100ml, from April 1st through October 31st. The New Castle CSO discharging to Bowery Brook (identified as outfall# 003C) is a prohibited CSO, and therefore has a WLA set at zero (page 13 of the TMDL submittal).

According to IDEM, the City of Richmond is the only municipal separate storm sewer system (MS4) community in the watershed. IDEM also considers the MS4 community to be a potential source of *E. coli* to the East Fork Whitewater River. The permit for this MS4 community was issued in January 2005. Guidelines for MS4 permits and timelines are outlined in Indiana's Municipal Separate Storm Sewer System (MS4) Rule 13 (327 IAC 15-13-10 and 327 IAC 15-13-11). The WLA for City of Richmond MS4 is set at the WQS, or the monthly geometric mean of 125 cfu/100ml and a single sample maximum of 235 cfu/100ml, from April 1st through October 31st (page 13 of the TMDL submittal).

EPA finds that the TMDL submittal from IDEM satisfies all requirements concerning this fifth element.

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 allocations and water quality (CWA §303(d)(1)(C), 40 C.F.R. §130.7(c)(1)). 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:

This TMDL uses an implicit margin of safety because no rate of decay was used for the pathogens. Since pathogenic organisms have a more limited capability of surviving outside their hosts, a rate of decay would normally be used. Applying a rate of decay into a TMDL calculation could result in a discharge limit greater than the water quality standard.

IDEM determined that applying the *E. coli* WQS to all flow conditions and with no rate of decay for *E. coli* is a conservative approach that provides for greater protection of the water quality.

EPA finds that the TMDL submittal from IDEM contains an appropriate MOS satisfying all requirements concerning this sixth element.

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:

Seasonal variation is addressed by expressing the TMDL in terms of the *E. coli* WQS for full body contact during the recreational season (April 1st through October 31st) as defined by 327 IAC 2-1-6(d). There is no applicable full body contact *E. coli* WQS during the remainder of the year in Indiana. Because this is a concentration-based TMDL, *E. coli* WQS will be met regardless of flow conditions in the applicable season.

EPA finds that the TMDL submittal from IDEM satisfies all requirements concerning this seventh element.

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, 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 EPA to determine that the

TMDL, including the load and wasteload allocations, has been established at a level necessary to implement water quality standards.

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, 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 outlines several Reasonable Assurance activities, summarized below:

National Pollutant Discharge Elimination System (NPDES) Permitted Dischargers

Three (3) of these four (4) permitted dischargers already have *E. coli* limits in their permits. IDEM has recommended the remaining one (1) permitted facility with a sanitary component to their discharge receive *E. coli* limits in their next permit cycle.

Storm Water General Permit Rule 13

The City of Richmond is the only MS4 community in the East Fork Whitewater River watershed identified by IDEM. IDEM issued the MS4 permit in January 2005, and implementation of the permit should improve water quality in the East Fork Whitewater River watershed. Guidelines for MS4 permits and timelines are outlined in Indiana's Municipal Separate Storm Sewer System (MS4) Rule 13 (327 IAC 15-13-10 and 327 IAC 15-13-11).

Confined Feeding Operations (CFOs) and Confined Animal Feeding Operations (CAFOs)

CFOs and CAFOs are required to manage manure, litter, and process wastewater pollutants in a manner that does not cause or contribute to the impairment of *E. coli* WQS.

Watershed Projects

IDEM has recently hired a Watershed Specialist for this area of the state. The Watershed Specialist will be available to assist stakeholders with starting a watershed group, facilitating planning activities, and serving as a liaison between watershed planning and TMDL activities in the East Fork Whitewater River watershed.

Watershed Groups

The Friends of the Middle Fork, in conjunction with Wayne County, are implementing the Middle Fork Watershed Project. This project plans to reduce nonpoint source releases by implementation of "Best Management Practices" (BMPs). BMPs are practices used in agriculture, forestry, urban land development, and industry to reduce the potential for damage to natural resources from human activities. The group has already increased no-till acreage and improved pest management. Future activities include removing livestock access to streams and increasing awareness of septic system failures. These BMPs should enhance water quality for the Middle Fork Whitewater River, which flows into the East Fork Whitewater River in Wayne County.

In addition, the Wayne County Soil and Water Conservation District and Wayne and Union Counties Waste Management District participate in the *Waste-Not* campaign and conduct outreach storm water concerns. Increased public awareness of the issues may also impact individual behaviors and improve water quality for the East Fork Whitewater River Basin.

EPA finds that this criterion has been adequately addressed.

9. Monitoring Plan to Track TMDL Effectiveness

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:

IDEM will monitor the East Fork Whitewater River watershed on a five year rotating basin schedule or when a portion of the TMDL implementation is in place. Monitoring will be adjusted as needed for continued source identification and determination of whether standards are being met.

EPA finds that this criterion has been adequately addressed.

10. Implementation

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, EPA policy recognizes that other relevant watershed management processes may be used in the TMDL process. EPA is not required to and does not approve TMDL implementation plans.

Comment:

There are several suggestions for BMPs in the TMDL watershed. They include structural or managerial practices that may be used to reduce *E. coli* runoff (TMDL submittal, page 14), such as:

- **Riparian Area Management**

Management of riparian areas protects stream banks and riverbanks with a buffer zone of vegetation, either grasses, legumes, or trees.

- **Manure Collection and Storage**

Collecting, storing, and handling manure in such a way that nutrients or bacteria do not run off into surface waters or leach down into groundwater.

- **Contour Row Crops**

Farming with row patterns and field operations aligned at, or nearly perpendicular to the slope of the land.

No-Till Farming

Farming without using tillage before or during planting to reduce soil erosion and improve water quality. Keeping topsoil particles in place retains soil nutrients, increases infiltration, and reduces the rate of water or wind travel over the topsoil surface.

- **Manure Nutrient Testing**

If manure application is desired, sampling and chemical analysis of manure should be performed to determine nutrient content for establishing the proper manure application rate in order to avoid over application and runoff.

- **Drift Fences**

Drift fences (short fences or barriers) can be installed to direct livestock movement. A drift fence parallel to a stream keeps animals out and prevents direct input of *E. coli* to the stream.

- **Pet Clean-up / Education**

Education programs for pet owners can improve water quality of runoff from urban areas.

Other implementation activities identified in the TMDL include:

- **Septic Management/Public Education**

Programs for management of septic systems can provide a systematic approach to reducing septic system pollution. Education on proper maintenance of septic systems as well as the need to remove illicit discharges could alleviate some anthropogenic sources of *E. coli*.

EPA reviews, but does not approve, implementation plans. EPA finds that this criterion has been adequately addressed.

11. Public Participation

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, EPA has explained that final TMDLs submitted to 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 EPA establishes a TMDL, EPA regulations require 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 EPA determines that a State/Tribe has not provided adequate public participation, EPA may defer its approval action until adequate public participation has been provided for, either by the State/Tribe or by EPA.

Comment:

The TMDL was public noticed from August 10, 2006 to September 8, 2006. A stakeholder meeting was held to provide an overview of the draft TMDL and provide an opportunity for public comments. The stakeholder meeting took place on August 10, 2006, at the Richmond City Council Chambers located in Richmond, Indiana. Copies of the draft TMDL were posted on the IDEM's Web site at:

<http://www.in.gov/idem/programs/water/tmdl/documents.html>. EPA sent in comments on the draft TMDL and they were adequately addressed in the final TMDL. IDEM received one comment letter from the public. The comments were adequately addressed by IDEM.

EPA finds that the TMDL submittal from Indiana satisfies all requirements concerning this eleventh element.

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 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 EPA review and approval. This clearly establishes the State's/Tribe's intent to submit, and 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:

EPA received the East Fork Whitewater River watershed TMDL on July 9, 2007 accompanied by a submittal letter also dated Jul 9, 2007. In the submittal letter, IDEM stated that the TMDL accompanying the letter is the Final TMDL submission for the State of Indiana for the East Fork Whitewater River watershed, which is impaired for *E.coli*. Eleven segments are listed in the submittal letter.

13. Conclusion

After a full and complete review, EPA finds that the TMDL submittal for the East Fork Whitewater River watershed, located in Wayne, Union, Fayette, and Franklin Counties, Indiana, satisfies all of the elements of an approvable TMDL. This approval concerns eleven TMDLs for waterbodies/impairments identified in the Table provided on page 2 of the TMDL submittal, and on page 2 of this decision document. Impairments addressed by these 11 TMDLs are pathogens from the pollutant *E. coli*.

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