1**TMDL:** Sugar-Pecatonica River Basin, Wisconsin
**Date:** August 24, 2005

**DECISION DOCUMENT**
**SUGAR-PECATONICA RIVER BASIN SEDIMENT TMDLs**

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; chlorophyl *a* and phosphorus loadings for excess algae; length of riparian buffer; or number of acres of best management practices.

*Comments:*

The Wisconsin Department of Natural Resources (WDNR) developed sediment TMDLs for impaired streams in the Sugar-Pecatonica River Basin. By implemented measures to reduce the sediment loading, these TMDLs will also address degraded habitat, temperature, biological oxygen demand (BOD), dissolved oxygen (DO), and phosphorous impairments in the watershed. The Table below identifies the waterbody segments covered by the TMDL submittal as they appear on the Wisconsin 2004 303(d) list. According to Wisconsin's 303(d) list for 2004, all the impaired waterbody segments are identified with a high priority ranking.

| WBIC | TMDL_ID | Impaired Stream Segment Name | County | Impairment | Priority | Stream Segment Length |
|---|---|---|---|---|---|---|
| 899800 | 10 | Apple Branch | Iowa | degraded Habitat<br>sediment<br>temperature | high | 2.8 miles |
| 896800 | 14 | Argus School Branch | Green | degraded Habitat<br>sediment<br>temperature | high | 2 miles |
| 900700 | 57 | Braezels Branch | Green | degraded Habitat<br>sediment | high | 4 miles |
| 897300 | 59 | Buckskin School Creek | Green | degraded Habitat<br>sediment | high | 6 miles |
| 880500 | 708 | Burgy Creek | Green | degraded Habitat<br>sediment<br>temperature | high | 10 miles |
| 898500 | 74 | Cherry Branch | Iowa | degraded Habitat<br>sediment | high | 5.8 miles |
| 910800 | 111 | Dodge Branch | Iowa | degraded Habitat<br>sediment | high | 14.1 miles |
| 910800 | 112 | Dodge Branch | Iowa | degraded Habitat<br>sediment | high | 0.7 miles |
| 910800 | 113 | Dodge Branch | Iowa | degraded Habitat<br>sediment | high | 6.9 miles |
| 901000 | 115 | Dougherty Creek | Green | BOD<br>degraded Habitat<br>DO<br>phosphorus<br>sediment | high | 1.4 miles |
| 909200 | 162 | German Valley Branch | Dane | degraded Habitat<br>sediment | high | 7 miles |
| 887800 | 185 | Henry Creek | Dane | degraded Habitat<br>sediment | high | 1 miles |
| 899500 | 206 | Jockey Hollow Creek | Green | degraded Habitat<br>sediment | high | 2.4 miles |
| 882900 | 232 | Legler School Branch | Green | degraded Habitat<br>sediment | high | 9 miles |
| 883100 | 365 | Pioneer Valley Creek | Green | degraded Habitat<br>sediment | high | 5 miles |
| 908500 | 367 | Pleasant Valley Branch | Dane | degraded Habitat<br>sediment | high | 5 miles |
| 901500 | 709 | Prairie Creek | Green | degraded Habitat<br>sediment | high | 2 miles |
| 879500 | 421 | Searles Creek | Green | degraded Habitat | high | 9 miles |

| WBIC | TMDL_ID | Impaired Stream Segment Name | County | Impairment | Priority | Stream Segment Length |
|---|---|---|---|---|---|---|
| | | | | sediment | | |
| 880400 | 435 | Silver School Branch | Green | degraded Habitat sediment | high | 3 miles |
| 917700 | 436 | Silver Spring Creek | LaFayette | degraded Habitat sediment | high | 5 miles |
| 877000 | 457 | Spring Creek | Green | degraded Habitat sediment | high | 10 miles |
| 908200 | 480 | Syftestad Creek | Dane | degraded Habitat sediment | high | 5 miles |
| 891300 | 493 | Twin Grove Branch | Green | degraded Habitat sediment | high | 6 miles |

The Sugar-Pecatonica River Basin is located in southern Wisconsin with a drainage basin of approximately 1,832 square miles in Dane, Rock, Lafayette, Green, and Iowa counties. Land use in the basin is mainly agricultural, dominated by dairy farming, cash cropping (corn, alfalfa, and soybean), and livestock feeding operations. Urbanizing areas are also present, mainly closer to the city of Madison. Other land uses in the basin are woodland, often present along the region's steep hillsides, and wetland, which usually occurs along stream and river margins.

There are no point sources discharging sediments on the impaired waters in the Sugar-Pecatonica River Basin. Nonpoint sources identified in the TMDL report as contributing to the impairments include the run-off from agricultural activities (dairy farming, cash cropping, and livestock feeding operations), urban run-off from stormwater dischargers, and streambank erosion.

Excessive runoff and erosion of solids and hydrologic loadings contribute to the increase in sedimentation in the Sugar-Pecatonica River Basin. Sedimentation reduces the suitable habitat for fish and macroinvertebrate communities. Filling-in of pools reduces the amount of available cover for juvenile and adult fish. Sedimentation of riffle areas reduces the reproductive success of fish by reducing the exposed gravel substrate necessary for appropriate spawning conditions. Sedimentation also affects macroinvertebrate biomass (fish food source) which tends to be lower in areas with predominantly sand substrate than a stream substrate with a mix of gravel, rubble and sand. Sedimentation also causes elevated turbidity which reduces the penetration of light necessary for photosynthesis in aquatic plants, reduces the feeding efficiency of visual predators and filter feeders, and lowers the respiratory capacity of aquatic invertebrates by clogging their gill surfaces. In addition, other contaminants such as nutrients (phosphorous and BOD-substances) attached to sediment particles can be transported to lakes and streams during runoff events. Nutrient enrichment can contribute to dissolved oxygen sags by stimulating aquatic plants (algae) growth and their oxygen consumption demands. Water temperature increases can be caused as a result of stream bank erosion widening of the river channels which expose more of the river water to direct sunlight. Water temperature increases causes the cold water communities to suffer a variety of ill effects, which can range from decreased spawning success to death. Water temperature increases can also influence the dissolved oxygen sags because less oxygen is soluble as temperature increases. Reductions in runoff rates and solids loads from nonpoint sources such as agricultural runoff and stream bank erosion are necessary to reduce impacts on the aquatic life and meet water quality standards (WQS). WDNR believes that implementation measures to reduce sediment loads will also reduce the amounts of phosphorus, BOD-substances, and heat entering the waters, and therefore address the low DO and temperature impairments.

USEPA finds that the TMDL document submitted by WDNR satisfies all requirements of 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.

*Comments:*
WDNR identified the narrative standard set forth at Section NR 102.04 (1) intro and (a) of the Wisconsin Administrative Code (WAC) as the applicable standard for excessive sedimentation. This standard states in part, "Substances that will cause objectionable deposits on the shore or in the bed of a body of water, shall not be present in such amounts as to interfere with public rights in waters of the state." The goal of the Sugar-Pecatonica TMDLs is to re-establish a balanced and sustainable aquatic community consistent with the water quality standards designated uses. The designated uses applicable to the Sugar-Pecatonica impaired segments are set forth at Section NR 102.04(3) intro, (a), (b) and (c) of the WAC (Page 3 of the final TMDL report). The designated uses of the Sugar-Pecatonica impaired segments are summarized in the Table below and Table A1 of Appendix A in the final TMDL report.

| WBIC | TMDL_ID | Impaired Stream Segment Name | Designated Use |
|---|---|---|---|
| 899800 | 10 | Apple Branch | Cold water communities |
| 896800 | 14 | Argus School Branch | Cold water communities |
| 900700 | 57 | Braezels Branch | Cold water communities |
| 897300 | 59 | Buckskin School Creek | Cold water communities |
| 880500 | 708 | Burgy Creek | Cold water communities |
| 898500 | 74 | Cherry Branch | Cold water communities |
| 910800 | 111 | Dodge Branch | Warm water sport fish communities |
| 910800 | 112 | Dodge Branch | Warm water sport fish communities |
| 910800 | 113 | Dodge Branch | Cold water communities |
| 901000 | 115 | Dougherty Creek | Warm water forage fish communities |
| 909200 | 162 | German Valley Branch | Cold water communities |
| 887800 | 185 | Henry Creek | Cold water communities |
| 899500 | 206 | Jockey Hollow Creek | Warm water forage fish communities |
| 882900 | 232 | Legler School Branch | Warm water forage fish communities |

| WBIC | TMDL_ID | Impaired Stream Segment Name | Designated Use |
|---|---|---|---|
| 883100 | 365 | Pioneer Valley Creek | Warm water forage fish communities |
| 908500 | 367 | Pleasant Valley Branch | Cold water communities |
| 901500 | 708 | Prairie Brook Creek | Cold water communities |
| 879500 | 421 | Searles Creek | Warm water sport fish communities |
| 880400 | 435 | Silver School Branch | Cold water communities |
| 917700 | 436 | Silver Spring Creek | Cold water communities |
| 877000 | 457 | Spring Creek | Warm water sport fish communities |
| 908200 | 480 | Syftestad Creek | Cold water communities |
| 891300 | 493 | Twin Grove Branch | Warm water sport fish communities |

WDNR established a numeric water quality target of 0.9 tons/acre/year of sediment for the impaired segments in the Sugar-Pecatonica in order to meet the narrative WQS and support the corresponding designated uses in the table above. This numeric target of 0.9 tons/acre/year of sediment established by WDNR is based on a reference stream approach which used two streams (Syftestad Creek and German Valley Branch) that showed considerable aquatic life habitat and water quality improvements (IBI≥50; HBI≤3.50; sustainable fishery) from their impaired conditions and are considered no longer impaired according to the best professional judgment of WDNR water quality staff. The results from modeling the current (improved) conditions for these two reference streams correspond to a unit area load of 0.9 tons/acre/year of sediment.

Although sediment has been determined to be the pollutant of concern, WDNR will be monitoring the aquatic communities to determine the effectiveness of the TMDL implementation, as the aquatic life is the designated use being affected. Various measures, such as biotic indices (IBI ≥ 50) and sustainable fishery year classes (I and II), will be used as surrogate targets in order to assess whether the goal of meeting the designated uses for each stream will be met.

USEPA finds that the TMDL document submitted by WDNR satisfies all requirements of 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 steam 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.

*Comments:*
WDNR will consider that the listed waterbody segments in the Sugar-Pecatonica River Basin are meeting the narrative WQS when the appropriate water communities are established. To achieve this, WDNR used a numeric target of 0.9 tons/acre/year of sediment to calculate the total load capacity of sediment for the impaired waterbody segments in the Sugar-Pecatonica River Basin. The total load capacity of sediment for the Sugar-Pecatonica impaired segments are summarized in the Table below and Table 4 of the final TMDL report.

| WBIC | TMDL_ID | Impaired Stream Segment Name | Existing Conditions (*Tons/Year*) | % Load Reduction | WLA (*Tons/Year*) | LA (*Tons/Year*) | TMDL (*Tons/Year*) |
|---|---|---|---|---|---|---|---|
| 899800 | 10 | Apple Branch | 2369 | 19% | 0 | 1925 | **1925** |
| 896800 | 14 | Argus School Branch | 1209 | 1.2% | 0 | 1194 | **1194** |
| 900700 | 57 | Braezels Branch | 3200 | 0% | 0 | 3642 | **3642*** |
| 897300 | 59 | Buckskin School Creek | 4007 | 0% | 0 | 4020 | **4020*** |
| 880500 | 708 | Burgy Creek | 19889 | 27% | 0 | 14515 | **14515** |
| 898500 | 74 | Cherry Branch | 7653 | 31% | 0 | 5298 | **5298** |
| 910800 | 111** | Dodge Branch | 19746 | 0% | 0 | 24173 | **24173*** |
| 910800 | 112 & 113** | Dodge Branch | 21740 | 31% | 0 | 14918 | **14918** |
| 901000 | 115 | Dougherty Creek | 2030 | 11% | 0 | 1799 | **1799** |
| 909200 | 162 | German Valley Branch | 6694 | 13% | 0 | 5845 | **5845** |
| 887800 | 185 | Henry Creek | 503 | 17% | 0 | 418 | **418** |
| 899500 | 206 | Jockey Hollow Creek | 2256 | 27% | 0 | 1647 | **1647** |
| 882900 | 232 | Legler School Branch | 2764 | 16% | 0 | 2323 | **2323** |
| 883100 | 365 | Pioneer Valley Creek | 1450 | 0% | 0 | 1926 | **1926*** |
| 908500 | 367 | Pleasant Valley Branch | 5316 | 3.5% | 0 | 5132 | **5132** |
| 901500 | 708 | Prairie Brook Creek | 3624 | 52% | 0 | 1740 | **1740** |
| 879500 | 421 | Searles Creek | 17916 | 36% | 0 | 11449 | **11449** |
| 880400 | 435 | Silver School Branch | 5172 | 42% | 0 | 3022 | **3022** |
| 917700 | 436 | Silver Spring Creek | 4870 | 20% | 0 | 3897 | **3897** |
| 877000 | 457 | Spring Creek | 16082 | 38% | 0 | 9986 | **9986** |
| 908200 | 480 | Syftestad Creek | 3403 | 0.3% | 0 | 3393 | **3393** |
| 891300 | 493 | Twin Grove Branch | 5865 | 27% | 0 | 4283 | **4283** |

*The total load capacities designated for the streams 2 are higher than the current existing loads because these streams have achieved reductions beyond the pollutant loads that the streams can handle to attain and maintain water quality standards. Since the fish communities in these streams are still responding to the previously achieved sediment reductions and haven't yet met their designated uses, WDNR emphasized that they strongly advocate for the maintenance of implementation practices in order to maintain the current lowered sediment loads in the streams.

**The sediment load for the Dodge Branch segment ID# 111 was obtained using the loads in Table 4 by subtracting the Dodge Branch 111 load from the Dodge Branch 113 load (which includes the other Dodge Branch segments (ID# 112 and ID# 113)).

WDNR used the RUSLE2 model for estimating the sediment loading for the impaired waterbody segments in the Sugar-Pecatonica River Basin. RUSLE2 is a model that predicts long-term, average-annual erosion by water, and can be used for a broad range of farming, conservation, mining, construction, and forestry sites. RUSLE2 was developed primarily to guide conservation planning, inventory erosion rates and estimate sediment delivery. The model is based on the Revised Universal Soil Loss Equation (RUSLE). The major inputs to the RUSLE2 model included information on land use, cropping practices, soil, slope, and climate data. In

order to help access the historic trends in the watersheds, the RUSLE2 model was used to simulate cropland and forested land conditions before and after the involvement of the Conservation Reserves Program (CRP) and the implementation of current conservation practices. The sediment loads from pre-CRP and post-CRP conditions were then compared with recent 2002 and 2004 stream assessments to establish reference conditions for the development of the TMDL total load capacity. The results from modeling the current (improved) conditions for two reference streams (Syftestad Creek and German Valley Branch) that showed considerable aquatic life habitat and water quality improvements (IBI≥50; HBI≤3.50) were used to identify a unit area load of 0.9 tons/acre/year of sediment which was then extrapolated to the watersheds for each of the streams in order to calculate their total load capacities. For further information on load assessment and modeling, refer to pages 11 – 14 of the final TMDL report.

WDNR has determined that the reductions in sediment will achieve the water quality target of establishing the appropriate aquatic communities in the listed segments. Establishment of the appropriate aquatic communities has been determined by WDNR to be an adequate surrogate for the narrative WQS. Since sediments impact the aquatic communities in several ways (reproduction, food supply, raising water temperature, lowering DO), 1which affect the aquatic communities year round, no specific critical condition exists.

USEPA finds that the TMDL document submitted by WDNR satisfies all requirements of 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.

*Comments:*
The load allocations (LAs) for the impaired waterbody segments in the Sugar-Pecatonica River Basin are the same as the total loading capacities (Table below and Table 4 of the final TMDL report), as there are no point sources discharging sediment into the streams (WLAs=0) and the margin of safety (MOS) is implicit. Nonpoint sources (NPS) identified in the TMDL report as contributing to the impairments in the Sugar-Pecatonica River Basin segments include the run-off from agricultural activities (dairy farming, cash cropping, and livestock feeding operations), streambank erosion, and non-regulated urban run-off from stormwater dischargers. The table below indicates the reductions in sediment load from nonpoint sources that are needed for the impaired waterbody segments in the Sugar-Pecatonica River Basin to meet the total loading capacities.

| WBIC | TMDL_ID | Impaired Stream Segment Name | LA (*Tons/Year*) | NPS Current Sediment Load (*Tons/Year*) | NPS Load Reduction (*Tons/Yr*) | NPS % Load Reduction |
|---|---|---|---|---|---|---|
| 899800 | 10 | Apple Branch | **1925** | 2369 | 444 | 19% |
| 896800 | 14 | Argus School Branch | **1194** | 1209 | 15 | 1.2% |
| 900700 | 57 | Braezels Branch | **3642** | 3200 | 0 | 0% |
| 897300 | 59 | Buckskin School Creek | **4020** | 4007 | 0 | 0% |
| 880500 | 708 | Burgy Creek | **14515** | 19889 | 5374 | 27% |
| 898500 | 74 | Cherry Branch | **5298** | 7653 | 2355 | 31% |
| 910800 | 111** | Dodge Branch | **24173** | 19746 | 0 | 0% |

| WBIC | TMDL_ID | Impaired Stream Segment Name | LA (*Tons/Year*) | NPS Current Sediment Load (*Tons/Year*) | NPS Load Reduction (*Tons/Yr*) | NPS % Load Reduction |
|---|---|---|---|---|---|---|
| 910800 | 112 &113** | Dodge Branch | **14918** | 21740 | 6822 | 31% |
| 901000 | 115 | Dougherty Creek | **1799** | 2030 | 231 | 11% |
| 909200 | 162 | German Valley Branch | **5845** | 6694 | 849 | 13% |
| 887800 | 185 | Henry Creek | **418** | 503 | 85 | 17% |
| 899500 | 206 | Jockey Hollow Creek | **1647** | 2256 | 609 | 27% |
| 882900 | 232 | Legler School Branch | **2323** | 2764 | 441 | 16% |
| 883100 | 365 | Pioneer Valley Creek | **1926** | 1450 | 0 | 0% |
| 908500 | 367 | Pleasant Valley Branch | **5132** | 5316 | 184 | 3.5% |
| 901500 | 708 | Prairie Brook Creek | **1740** | 3624 | 1884 | 52% |
| 879500 | 421 | Searles Creek | **11449** | 17916 | 6467 | 36% |
| 880400 | 435 | Silver School Branch | **3022** | 5172 | 2150 | 42% |
| 917700 | 436 | Silver Spring Creek | **3897** | 4870 | 973 | 20% |
| 877000 | 457 | Spring Creek | **9986** | 16082 | 6096 | 38% |
| 908200 | 480 | Syftestad Creek | **3393** | 3403 | 10 | 0.3% |
| 891300 | 493 | Twin Grove Branch | **4283** | 5865 | 1582 | 27% |

**The sediment load for the Dodge Branch segment ID# 111 was obtained using the loads in Table 4 by subtracting the Dodge Branch 111 load from the Dodge Branch 113 load (which includes the other Dodge Branch segments (ID# 112 and ID# 113)).

USEPA finds that the TMDL document submitted by WDNR satisfies all requirements of 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 permitees 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.

*Comments:*

There are point sources located on two of the impaired streams: Cherry Branch and Dodge Branch. Cottonwood Dairy, permit# 0059021, is located on Cherry Branch. As part of the permit for a Concentrated Animal Feeding Operation, they are required to contain waste in a detention

basin. Except for episodic events, WDNR doesn't expect any run-off from this dairy farm; therefore the waste load allocation is zero. Also, on Dodge Branch, there are two wastewater treatment facilities: Dodgeville, permit# 0026913, and Hollandale, permit# 0031330. The treatment facilities do not discharge sediment; therefore they are not directly related to the TMDL for Dodge Branch.

Since there are no point sources discharging sediments on the impaired waters in the Sugar-Pecatonica River Basin, the waste load allocations are zero.

USEPA finds that the TMDL document submitted by WDNR satisfies all requirements of 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.

*Comments:*
WDNR included an implicit margin of safety by not accounting during modeling for additional reductions in sediment delivery due to deposition and infiltration loss in the drainage system. The numeric targets set by WDNR for these TMDLs represent the worst case scenario in which all sediment eroding from agricultural fields is delivered to the receiving waterbodies. During modeling, some conservative assumptions were made that justify the implicit margin of safety. These include: 100% of the study area was assumed to be silt-loam, with a low to medium organic content producing a higher and more conservative erosion potential**;** The selection of fixed acres for soybeans when setting the agricultural rotations resulted in a conservative assumption because the fields under soybeans produce the most erosion**;** The selection of a fixed percentage for conventional tillage practices when setting the tillage practices, instead of allocating based on the percentage of cropping practices according to countywide data, resulted in a conservative assumption because conventional tillage was found to be the most erosive practice**;** Simulations didn't account for additional controls of sediment created through riparian vegetative buffers implemented under the Conservation Reserve Enhancement Program (CREP) and efforts to stabilize stream banks, which makes this conservative because the model underestimates the load of sediment that will be reduced. As WDNR is implementing efforts on reducing overland sediment flow as well as streambank restoration, overall sediment reduction may be more than needed.

USEPA finds that the TMDL document submitted by WDNR satisfies all requirements of 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) ).

*Comments:*
The TMDL submittal appropriately considers seasonal variation. Sediment enters the waterbody segments in the Sugar-Pecatonica River Basin through rainfall and snowmelt runoff events throughout the year. Most of the sediment enters during spring runoff and intense summer rainstorms, but to some extent it occurs year-round. The sediment enters the streams due to episodic events (storms) rather than "seasonal" events. This temporal variation in sediment loads has been accounted for in the RUSLE2 modeling through the use of average annual conditions. In addition, the best management practices (BMPs) selected to achieve the load allocation were selected and designed to function for the 10-year or 25-year, 24-hour design storms, in order to address these episodic events.

USEPA finds that the TMDL document submitted by WDNR satisfies all requirements of 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.

*Comments:*
To reduce the sediment load into the Sugar-Pecatonica River Basin, WDNR recommends the implementation or maintenance of the following practices:

- Minimize and eliminate the grazing of cattle on the wooded hill slopes. Areas that are still adversely impacted from previous grazing operations should be stabilized with vegetation.
- Efforts to enroll areas near channels and create riparian buffers through the use of the Conservation Reserve Enhancement Program need to be continued and areas already enrolled need to be kept in enrollment.

- Stream banks with active erosion can be large sources of sediment and thus need to be stabilized. Cattle need to be fenced out of channels and off channel banks. In areas where cattle need to cross, stable crossings need to be maintained.
- Efforts to promote conservation tillage need to continue. As the dairy rotations give way to cash cropping efforts need to concentrate on ensuring no-till operations for corn-soybean rotations.
- Areas with slopes greater than a C-slope (greater than 12%) that are currently being cropped should be encouraged into permanent pasture.

WDNR has demonstrated adequate reasonable assurance that the necessary nonpoint source reductions will occur by having various programs in place that will address the sediment movement into the Sugar-Pecatonica River Basin. First, the Sugar-Pecatonica River Basin is part of a priority watershed project, Nonpoint Source Control Plan for the Lower East Branch Pecatonica River Priority Watershed Project. The project has already been underway for several years and implemented nonpoint source control measures to meet specific water resource objectives for the Lower East Branch Pecatonica River and its tributaries. The project funded conservation practices that included**:** barnyard runoff control systems, roof runoff systems, stream crossings, well decommissioning, milkhouse filter strips, grassed waterways, diversions, manure storage systems, rotational grazing systems, streambank rip rap, lunker structures, stream fencing, streambank shaping, diversions, heavy use areas, spring developments, tile, filterstrips, eaves and downspouts, nutrient management plans, contour strips, wildlife dams, terraces, wetland restoration, wetland scrapes, lazy gates, rock wiers, cattle mounds, critical area seeding, rock lined waterway, willow matt projects, willow fascenes projects, stream meander repairs, ditch plugs, tile breaks, rock chutes, cattle water access, water tanks for grazers, and stream barbs.

Farmers may enroll in the Conservation Reserve Enhancement Program (CREP) or similar programs to establish vegetated buffers on cropland and marginal pastures. Farmers enrolled in CREP in the Dane, Green, Iowa and Lafayette counties maintain 1726.3, 747.2, 1340.8, and 2530.0 acres, respectively, as grass and forest riparian buffers. Another program available to farmers is the Conservation Reserve Program, which takes highly erodible lands out of agricultural use.

The Environmental Quality Incentives Program (EQIP) is another option available to farmers. EQIP is a federal cost-share program administered by the NRCS that provides farmers with technical and financial assistance. Farmers may receive up to 75% reimbursement for installing and implementing run-off management practices. Practices implemented in Green County using EQIP funds include: grassed waterways, stream bank assessment and improvement, well abandonment, roof runoff collection, lined waterway diversions, and critical area stabilization. Green County also used EQIP funds for two manure storage structures in 2005. Dane County spent EQIP funds in the 2004 fiscal year for nutrient management and planning cost sharing. Practices implemented in Lafayette County using EQIP funds include: barnyard runoff control systems, grade stabilization and structures, diverted waterways, stream bank improvement (riprap, shading, and seeding), cattle crossings, and well abandonment.

Another option available is the Wildlife Habitat Incentives Program (WHIP). This is a voluntary program through the Natural Resources Conservation Service that provides technical and cost-share assistance primarily on private lands. Dane County is one of the counties in the Sugar-Pecatonica River Basin that uses WHIP funds to protect stream banks and implement habitat restoration.

Counties in the watersheds may also apply to the Targeted Runoff Management (TRM) grant program through the WDNR. The TRM program is a competitive grant program that provides financial assistance to control polluted runoff from both rural and urban sites. Between 2004 and 2005 three grants have been awarded for projects in the watersheds in the Sugar-Pecatonica River Basin.

All of the counties in the Sugar-Pecatonica River Basin receive funding from the Department of Agriculture, Trade and Consumer Protection (DATCP) to implement their Land and Water Resources Management Plans. Impaired waters are a priority in each of the county plans.

In addition to the programs mention above, there are a series of future enforcement of nonpoint source performance standards and prohibitions that will likely take place in the watersheds of these impaired waters. It is also anticipated that regulatory agricultural and non-agricultural performance standards and performance standards called for in Wisconsin Statutes will be implemented in the watershed for these impaired waters. This means that any new development occurring in these watersheds will need to reduce sediment erosion by 80% per NR 216 and NR 151 requirements. Administrative rules passed by the Natural Resources Board identify that watersheds with impaired waters will have the highest priority for enforcement.

USEPA finds that the TMDL document submitted by WDNR satisfies all requirements of this eighth element.

## 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.

*Comments:*
WDNR intends to monitor selected streams in the Sugar-Pecatonica Basin based on the rate of implementation of the TMDLs, including sites such as German Valley and Pleasant Valley Creeks where implementation of Targeted Restoration Management (TRM) grants are aimed at removing these streams from the impaired waters list. Monitoring will continue until it is deemed that the stream has responded to the point where it is meeting its codified use or until funding for these studies is discontinued. In addition, WDNR intends to monitor selected streams on a 5 to 6 year interval as part of a baseline monitoring strategy to assess temporary conditions and note trends in overall stream quality. Monitoring will consist of metrics contained in the WDNR's baseline protocol for wadeable streams, such as the Index of Biological Integrity (IBI), the current habitat assessment tool, and water quality parameters at a subset of sites.

USEPA finds that the TMDL document submitted by WDNR satisfies all requirements of this ninth element.

## 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.

*Comments:*
The submitted TMDL report does not contain a formal implementation plan, since it is not required as a condition for TMDL approval under the current U.S. EPA regulations. However, the Wisconsin Department of Natural Resources (WDNR) has identified ongoing activities which have been identified under the reasonable assurance section.

Also, the waterbody segments in the Sugar-Pecatonica River Basin are part of the Nonpoint Source Control Plan for the Lower East Branch Pecatonica River Priority Watershed Project. The Watershed Plan, Chapter 5 discusses implementation for nonpoint source pollution controls for the impaired waterbodies in the Lower East Branch Pecatonica River. Implementation includes the following:

- Agencies involved
- Best Management Practices (BMPs) necessary to control nonpoint source run-off
- Cost related issues
    - Cost-shared budget
    - Cost containment policies
    - Cost-share agreement reimbursement procedures
- Staffing needs
- Schedule for project implementation
- Involvement of other programs
- Project budget
    - Cost-sharing
    - Staffing
    - Information and education cost

While this information was reviewed, it did not form a basis for the decision.

## 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.

*Comments:*
The public comment period for the Sugar-Pecatonica River Basin TMDL report was from May 3, 2005 through June 3, 2005. On May 3, 2005 a news release for the public notice of the TMDL report was sent to various entities including: newspapers, television stations, radio stations, interest groups, and interested individuals. The news release indicated the public comment period and how to obtain copies of the public notice and draft TMDL report. Hard copies of the public notice and the draft TMDL were sent to key stakeholders in the watershed. In addition, copies of the TMDL report were available upon request and on WDNR's website: http://www.dnr.wi.gov/org/water/wm/wqs/303d/Draft_TMDLs.html. 1 WDNR received and properly addressed comments from the public during the public comment period.

USEPA finds that (with the successful completion of the above mentioned public participation period) the TMDL document submitted by WDNR satisfies all requirements of 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.

*Comments:*
U.S. EPA received the Sugar-Pecatonica River Basin sediment TMDLs on July 26, 2005, accompanied by a submittal letter dated July 5, 2005. The submittal letter states that this is the final TMDL submittal for the impaired waterbody segments in the Sugar-Pecatonica River Basin.

USEPA finds that the TMDL document submitted by WDNR satisfies all requirements of this twelfth element.

## 13. Conclusion

After a full and complete review, USEPA finds that the TMDLs for the Sugar-Pecatonica River Basin satisfy all of the elements of approvable TMDLs. This document addresses a total of **23** TMDLs for **23** waterbody segments with a total of **52** impairments from the 2004 Wisconsin 303(d) list.

| WBIC | TMDL_ID | Impaired Stream Segment Name | Pollutant | Impairment(s) Addressed |
|---|---|---|---|---|
| 899800 | 10 | Apple Branch | sediment | degraded Habitat<br>sediment |

| WBIC | TMDL_ID | Impaired Stream Segment Name | Pollutant | Impairment(s) Addressed |
|---|---|---|---|---|
| | | | | temperature |
| 896800 | 14 | Argus School Branch | sediment | degraded Habitat<br>sediment<br>temperature |
| 900700 | 57 | Braezels Branch | sediment | degraded Habitat<br>sediment |
| 897300 | 59 | Buckskin School Creek | sediment | degraded Habitat<br>sediment |
| 880500 | 708 | Burgy Creek | sediment | degraded Habitat<br>sediment<br>temperature |
| 898500 | 74 | Cherry Branch | sediment | degraded Habitat<br>sediment |
| 910800 | 111 | Dodge Branch | sediment | degraded Habitat<br>sediment |
| 910800 | 112 | Dodge Branch | sediment | degraded Habitat<br>sediment |
| 910800 | 113 | Dodge Branch | sediment | degraded Habitat<br>sediment |
| 901000 | 115 | Dougherty Creek | sediment | BOD<br>degraded Habitat<br>DO<br>phosphorus<br>sediment |
| 909200 | 162 | German Valley Branch | sediment | degraded Habitat<br>sediment |
| 887800 | 185 | Henry Creek | sediment | degraded Habitat<br>sediment |
| 899500 | 206 | Jockey Hollow Creek | sediment | degraded Habitat<br>sediment |
| 882900 | 232 | Legler School Branch | sediment | degraded Habitat<br>sediment |
| 883100 | 365 | Pioneer Valley Creek | sediment | degraded Habitat<br>sediment |
| 908500 | 367 | Pleasant Valley Branch | sediment | degraded Habitat<br>sediment |
| 901500 | 709 | Prairie Creek | sediment | degraded Habitat<br>sediment |
| 879500 | 421 | Searles Creek | sediment | degraded Habitat<br>sediment |
| 880400 | 435 | Silver School Branch | sediment | degraded Habitat<br>sediment |
| 917700 | 436 | Silver Spring Creek | sediment | degraded Habitat<br>sediment |
| 877000 | 457 | Spring Creek | sediment | degraded Habitat<br>sediment |
| 908200 | 480 | Syftestad Creek | sediment | degraded Habitat<br>sediment |
| 891300 | 493 | Twin Grove Branch | sediment | degraded Habitat<br>sediment |

1EPA's approval of these TMDLs extends to the waterbodies which are identified in this document and the TMDL document with the exception of any portions of the waterbodies that

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