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DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL
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Office of the
Secretary

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~~Secretary's Order No. 2005-W-0025~~

**Re: Final Regulation Amending Total Maximum Daily Loads for the Murderkill
River Watershed**

Date of Issuance: **May 12, 2005**

Effective Date: **June 11, 2005**

Under the authority vested in the Secretary of the Department of Natural Resources and Environmental Control (“Department” or “DNREC”) under 29 *Del. C.* §§8001 et seq., 29 *Del. C.* §§10111 *et seq.* and 7 *Del. C.* §6010 (a), the following findings, reasons and conclusions are entered as an Order of the Secretary in the above-referenced rulemaking proceeding.

In Secretary’s Order No. 2001-A-0044, issued November 15, 2001, the Department promulgated a final regulation for Total Maximum Daily Loads (“TMDLs”) for the Murderkill River watershed (“2001 TMDLs”). Kent County Levy Court (“Kent County”) appealed the regulation to the state Environmental Appeals Board and Superior Court. The Department agreed to stay the regulation’s application to Kent County’s wastewater treatment facility pending the outcome of the appeals, and entered into settlement negotiations to resolve the dispute. The negotiations resulted in two agreements with Kent County, the collection of new water quality data, and refinements to the model used to establish the 2001 TMDLs. Based upon the refined model, the

Department held a public workshop on August 12, 2004 to review and hear comments on the changes to the TMDLs that it would be proposing. The proposed regulation to amend the TMDLs was published in the *Delaware Register of Regulations* on March 1, 2005.

Based on the record, including the public hearing record reviewed in the May 11, 2005 Hearing Officer's Report ("Report") appended hereto, the proposed regulation is adequately supported and is not arbitrary or capricious. The Report reviews and summarizes the public hearing record, which was developed at the April 7, 2005, public hearing. The Report recommends approval of the proposed regulation as a final regulation without modification. I agree with the Report and adopt it as part of this Order along with its reasons.

The proposed regulation is based upon sound scientific evidence, is consistent with state and federal law, and is a reasoned regulation that will result in improved water quality within the Murderkill River watershed. The improvements will occur through the TMDLs, which will require nonpoint sources to reduce nitrogen by 30% and phosphorous by 50% from their 1997 base line levels. The TMDLs also will require limits on the three point sources that discharge directly into the waters through stream discharge permits. The proposed TMDLs reflect changes since 2001, such as the elimination of one point source, and the future move by the City of Harrington's wastewater treatment plant away from a direct water discharge and to spray irrigation of its treated wastewater effluent. The TMDLs also result in the resolution of Kent County's appeals, which will allow the TMDLs to apply to the Kent County wastewater treatment plant. Accordingly, the proposed TMDLs should be approved as a final regulation.

The Report discusses the comments submitted by the Mid-Atlantic Environmental Law Clinic. These comments, if adopted, would result in a significant delay in the establishment of amended TMDLs. The proposed regulation reflects a reasonable regulation that should be approved now as it represents a clear improvement over the 2001 TMDLs. The Department has collected updated data and reflected it in a revised model used to evaluate the water quality of the Murderkill River, particularly the lower portion that is influenced by tidal waters. Nothing in the comments supports the further delay. The comments, including Kent County's, may be appropriate for consideration as part of the Department's ongoing regulation of the Murderkill River watershed's water quality. In conclusion, the following findings and conclusions are entered:

1. The Department, acting through this Order of the Secretary, adopts the proposed regulation as a final regulation, as set forth in the Appendix B to the Report, under 29 *Del. C.* §6010 (a) and pursuant to the federal Clean Water Act, 33 *U.S.C* §1251 *et seq.* and the United States Environmental Protection Agency's regulations pursuant to the Clean Water Act;

2. The issuance of the proposed regulation as a final regulation will protect and improve the water quality of the Murderkill River watershed, as defined by elevation maps, and allow the Pollution Control Strategy to be developed for the Murderkill River watershed;

3. The issuance of the proposed regulation as a final regulation will allow the appeal of the existing TMDLs by Kent County to be resolved and allow TMDLs to apply to the Kent County wastewater treatment plant that are acceptable to Kent County and will avoid further appeals;

4. The TMDLs that are approved by this Order were developed consistent with the applicable law and regulatory standards and are adequately supported by technical analysis;

5. The Department provided adequate public notice of the proceeding and the public hearing in a manner required by the law and regulations, held a public hearing in a manner required by the law and regulations, and considered all timely and relevant public comments in making its determination;

6. The Department's proposed regulation, as published in the March 1, 2005, *Delaware Register of Regulations* and set forth in Appendix B to the Report, is adequately supported, not arbitrary or capricious, is consistent with the applicable laws and regulations, and should be approved as a final regulation to go into effect ten days after its publication in the next available issue of the *Delaware Register of Regulations*; and that;

7. The Department shall provide written notice to the persons affected by the Order, as determined by those who participated in this rulemaking at either the public workshop or at the public hearing, including participation through the submission of written comments.

s/John A. Hughes

John A. Hughes
Secretary

HEARING OFFICER'S REPORT

TO: The Honorable John A. Hughes
Secretary, Department of Natural Resources and Environmental Control

FROM: Robert P. Haynes, Esquire
Hearing Officer, Office of the Secretary
Department of Natural Resources and Environmental Control

RE: Proposed Regulation Amending the Total Maximum Daily Loads for the
Murderkill River Watershed

DATE: May 11, 2005

I. BACKGROUND

This Hearing Officer, delegated authority by the Secretary of the Department of Natural Resources and Environmental Control (“DNREC” or “Department”) pursuant to 29 *Del. C.* §§6606 and 8003, presided over a duly noticed public hearing held commencing at 6:00 p.m. April 7, 2005 at the Felton Fire Hall, Felton, Delaware. The hearing was held to consider public comments on the Department’s proposed regulation to amend the Total Maximum Daily Loads (“TMDLs”) for the Murderkill River watershed, as defined by elevation maps.

The Murderkill River watershed is located in the southeastern portion of Kent County, beginning at the headwaters of the Murderkill River west of Felton near the Maryland border and ending at the Delaware Bay at Bowers Beach approximately twenty miles to the east. The last ten miles of the river, from approximately Frederica, are tidal waters. The watershed has a drainage area of approximately 106 square miles, and includes the Murderkill’s tributaries Spring Creek, Double Run, Pratt Branch, Browns Branch, and Hudson Branch. The watershed includes several shallow, man-made ponds at Killens Pond, Courseys Pond, Andrews Lake, and McGinnis Pond. The watershed includes the municipalities of Harrington, Frederica, Felton, Viola, and South Bowers Beach

In Secretary’s Order No. 2001-A-0044, issued December 11, 2001, the Department promulgated a regulation that established TMDLs (“2001 TMDLs”) for nutrient and oxygen

consuming compounds for the Murderkill River watershed. The TMDLs were developed to comply with Section 303(d) of the federal Clean Water Act, 33 U.S.C. §§1251 *et seq.* and regulations promulgated by the United States Environmental Protection Agency (“EPA”). The federal law requires the Department to periodically identify and rank its waters for which existing pollution controls are not sufficient to meet Delaware’s water quality standards. The Department first identified the Murderkill River watershed in its 1996 list submitted pursuant to Section 303(d), and most recently in the list issued February 25, 2005.

In its 2001 TMDLs, the Department determined that TMDLs were needed for the Murderkill River watershed for dissolved oxygen, as measured by the five day carbonaceous biochemical oxygen demand (“CBOD5”), nitrogen, phosphorus, and bacteria concentration. The water quality was based upon underlying data collected beginning in December 1996 at monitoring stations within the watershed. The Department contracted with a consultant, HydroQual, Inc., to review the data and prepare a report, entitled “A Model for the Murderkill River Watershed” (“Model”), which was completed in February 2001. The Model was based on an EPA approved modeling methodologies known as Water Analysis Simulation Program (“WASP5”) and its underlying hydrodynamic and water quality models, named “DYNHYD5” and “EUTROWASP,” respectively.

The 2001 TMDLs included Waste Load Allocations for nitrogen, phosphorous and CBOD5 for the four point sources, and Load Allocations for nonpoint sources that would reduce nitrogen by 560 pounds annually, or 30% and phosphorous by 96 pounds annually, or 50% from their 1997 base-line levels. The Department also used conservative assumptions as its margin of Safety in its Model. Under the 2001 regulation, the Kent County Wastewater Treatment facility on the Murderkill River located east of Frederica should have a point source WLA based upon a maximum flow of 15 million gallons per day, a total nitrogen load limit of 375 pounds per day, a

total phosphorous load limit of 25 pounds per day, and the CBOD5 load limit of 625 pounds per day. The watershed's only other point sources that discharge into the watershed are the City of Harrington's wastewater treatment facility on Brown's Branch in Harrington, and the Canterbury Crossing Mobile Home Park wastewater treatment facility, a small private wastewater treatment facility on the Double Run east of Viola.. The Southwood Acres Mobile Home Park wastewater treatment facility, which was a point source in the 2001 TMDLs, is no longer a point source in the proposed regulation as it ended its stream discharge since the TMDLs were issued in 2001.

Kent County Levy Court ("Kent County"), as owner of the Kent County Wastewater Treatment facility, appealed the Department's TMDLs regulation to the Environmental Appeals Board and to Superior Court. On December 20, 2001, the Department and Kent County reached an agreement whereby the Department agreed to re-examine certain aspects of its Model and collect additional water quality data, and to stay the regulation insofar as it imposed new waste load allocation upon Kent County's facility.

Pursuant to the December 20, 2001 Agreement, the Department conducted additional water quality testing in September 2002, and used improved measuring equipment to collect the data. As a result of this new information, the Department's consultant submitted re-calibrated models in April 16, 2003 that showed that the original model underestimated the cross-section area of the river and its flows. As the result of this finding, and after evaluation of several loading scenarios and negotiations with Kent County, the Department concluded that the TMDLs should be amended by the proposed TMDLs that are the subject of this rulemaking proceeding.

As part of the proposed TMDLs process, the Department negotiated with Kent County an agreement, dated May 18, 2004, whereby the Department agreed to allow Kent County's wastewater treatment plant to operate at an average annual flow rate of up to 16.3 million gallons per day, to allow continued study of the watershed with Kent County's participation in the study,

and that Kent County would have time to meet the water quality standards established in its National Pollutant Discharge Elimination System (“NPDES”) permit. The revised Model and the draft TMDLs were the subject of a public workshop held on August 12, 2004. The final Technical Analysis Model was submitted on March 1, 2005, and the proposed amendment of the TMDLs was published in the March 1, 2005 issue of the *Delaware Register of Regulations*, 8 *Del. Reg.* 1266-68. A duly noticed public hearing was held on April 7, 2005, at which time the public hearing record was closed.

II. SUMMARY OF THE PUBLIC HEARING RECORD

The public hearing record contains a ten page verbatim transcript of the public hearing, and documents, marked as Exhibits (“Ex.”), which were admitted into the record as hearing exhibits. Representatives of Kent County attended the public hearing, spoke in support of the adoption of the proposed regulation, and provided extensive written comments included as Kent County Ex. 1. A representative from the City of Harrington attended, but did not make any comments. The Mid-Atlantic Environmental Law Center (“MAELC”), a not-for-profit environmental law firm, provided written comments, dated April 7, 2005, which were included in the public hearing record as MAELC Ex. 1.

Hassan Mirasjadi, D.Sc., P.E., presented the Department’s exhibits into the record, which consisted of the following: DNREC Ex. 1, a copy of the proposed regulation as published in the March 1, 2005 *Delaware Register of Regulations*; DNREC Ex. 2, the December 20, 2001, Agreement between DNREC and Kent County; DNREC Ex. 3, the May 18, 2004, Agreement between DNREC and Kent County; DNREC Ex. 4, Department’s Technical Analysis for Amendment of the 2001 Murderkill River TMDLs, dated March 1, 2005; DNREC Ex. 5, DNREC’s presentation at the August 12, 2004 workshop; DNREC Ex. 6, the consultant’s April 16, 2003 revision of the 2001 Model; DNREC Ex 7, the February 2001 Model for the Murderkill

River Watershed; DNREC Ex. 8, the Delaware Surface Water Quality Standards, dated July 11, 2004; and DNREC Ex. 9, the Delaware 2004 Combined Watershed Assessment Report (305(b) and Determination for the Clean Water Act Section 303(d) List of Waters Needing TMDLs, dated February 25, 2005.

MAELC's comments in MAELC Ex. 1 raised the following argument : 1) the proposed TMDLs do not include any potential for growth in the community; 2) the propose TMDLs rely on old data to determine the nitrogen, phosphorous and dissolved oxygen in the water; 3) the proposed TMDLs increases the amount of pollutants released into the Murderkill River from the existing TMDLs; 4) the proposed TMDLs would increase the amount of total P released over the Department's target level for one portion of the Murderkill; 5) The proposed TMDLs do not reduce the discharge of CBOD, N or P from the three point sources and require all the reductions in the pollutants to be from nonpoint sources, which are the most difficult to regulate; 6) the proposed TMDL fails to breakdown the non-point sources into some cognizable sub-categories, such as urban runoff, etc.; and 7) the proposed TMDLs do not include an express margin of safety, which is contrary to the federal regulation.

Kent County presented extensive written comments in a notebook binder introduced as Kent County Ex. 1. The Kent County comments were based upon an analysis prepared by its experts, Drs. Paul Jensen and Kent Price. These comments focused on the following criticisms: 1) the Model used a water quality criteria that is not attainable even for pristine tidal wetlands; 2) the Model does not represent tidal wetlands; 3) the Model's hydraulics were in error; 4) the Model departed from accepted modeling principles; and 5) the Model failed to reasonably represent tidal wetland waters and was not properly calibrated and tested. These comments basically stress the need to recognize the tidal wetland environment, which 'decouples the relationship between nutrients and oxygen used in conventional models such DNREC used for

the Murderkill TMDLs. Kent County stressed that its comments are not in opposition to the proposed TMDLs, but are offered to reflect Kent County's position and to work with the Department for future improvements to the Model, data collection and the overall scientific analysis of the water quality of the Murderkill River watershed. Based upon this representation, a more detailed review of the Kent County comments will be deferred until when the issues presented by the comments are considered in the context of another review of draft or proposed TMDLs.

III. DISCUSSION AND REASONS

The Department's Division of Water Resources ("DWR") Watershed Assessment Section prepared a Response Document, which is attached hereto as Appendix A and incorporated herein. This document provides technical advice from the Department's experts and comprehensively addresses the comments received during this public hearing process.¹

As the above review of the public hearing record indicates, the proposed amendment reflects modifications based upon new and improved data and collection methods. Based on the extensive comments from Kent County and MAELC, it is evident that the TMDLs remain the subject of some continued dispute, despite the Department's efforts to reach a compromise. The proposed TMDLs are supported by Kent County, which advocates prompt approval of the proposed regulation as a final regulation. Consequently, Kent County's comments presumably are intended as more of an educational purpose for the Department to consider in a subsequent TMDLs revision.

MAELC's comments advocate changes that, if adopted by the Secretary, would require delaying the proposed regulation. First, MAELC seeks the Department to conduct additional studies to update the water quality data to reflect more current information. In addition, MAELC

¹ The Response Document is not in the public hearing record, but in response to the public hearing record to assist the Hearing Officer and the Secretary in reviewing the public hearing record and providing technical advice.

proposes several changes, any one of which would be considered a substantive change to the proposed regulation. Under the Administrative Procedures Act, 29 Del. C. §§10118(c), any substantive change to a proposed regulation requires an agency to issue a new public notice and hold a new public hearing on the change. This legal requirement would entail considerable delay even if MAELC had proposed specific language for any of its proposed changes, which it did not. From a practical manner, even if the MAELC's comments had merit, the Department should go forward with the proposed regulation as it represents a reasonable and well-supported compromise to end the litigation over the 2001 TMDLs and to allow the Department and Kent County Agreement that settles the litigation to be implemented. Absent approval of the proposed regulation, the Kent County litigation will likely continue, and may ultimately result in a court ruling that the Department must implement the very TMDLs that are being reviewed in this Report. Thus, the only real result of adopting MAELC's comments is even more delay in establishing TMDLs that apply to Kent County's facility.

Turning to the specific MAELC comments, MAELC first questions the Model's failure to make projections for future growth in an area that now is predominately rural. The DWR response properly recognizes that TMDLs are based upon existing water quality conditions, and that future growth must occur based upon the existing water quality conditions. Any assumption on future growth and the loss of farm land to development is speculative at this time. Instead, the actual changes should be addressed when it influences the water quality in the future. The federal regulations require the Department to regulate and report on the progress to improve the water quality in the listed waters so that they meet the water quality standards. It is unlikely that the proposed TMDLs will, if approved, be the last TMDLs issued for the Murderkill River watershed. Consequently, future regulations will reflect the actual changes that may occur. It should be noted, however, that the proposed TMDLs reflect the proposed elimination of the City

of Harrington's wastewater treatment plant as a point source. Consequently, this known and measurable change has been reflected in the TMDLs.

MAELC also opposes the proposed TMDLs because they rely on older information, but MAELC provides no support that the information that the Department relies upon is not reasonably representative of the water quality. MAELC presumably seeks the Department to totally update the Model's data with newer information. This is an unreasonable request that should be rejected. There always will be some delay between the collection of data and the issuance of a final regulation based upon the data collected. The collection of new data, its analysis, and incorporation into the Model and then in a proposed regulation would unduly delay the proposed TMDLs for at least another year. The regulatory process for this proposed regulation has taken several years. The fact that the updated data from the September 2002 water quality survey did not include all the criteria is not any reason to reject the continued use of the prior data recorded used in the 2001 TMDLs. MAELC offers no substantive criticism other than to note that the data is not as current as it could be. DWR, the Department's experts in water quality, determined that the information collected for the 2001 TMDL was reasonably representative of the existing water quality, as updated for the additional data collected in September 2002. Consequently, I find that MAELC's comments offer no reason to dispute the Department's reliance on the data used in the Model as being reasonably representative of the water quality within the Murderkill River watershed for the purpose of supporting the proposed TMDLs.

MAELC also commented on the fact that the proposed TMDL do not reduce the NPDES permit limits for CBOD5, nitrogen or phosphorous for the four point sources in the watershed, and that the Kent County wastewater treatment facility would receive in the proposed TMDLs a higher total nitrogen limit than in the 2001 TMDLs. MAELC is correct that Kent County's

wastewater treatment facility receives in the proposed TMDLs an increase from 375 pounds per day to 751 pounds per day in its total nitrogen limit set in the 2001 TMDLs.. However, the proposed regulation is based upon the Department's recognition that the Model used to establish the 2001 TMDLs underestimated the Murderkill River's flows and its assimilative capacity. The proposed regulation reflects Kent County's challenge to the 2001 TMDLs, and the Department's recognition of problems in its original Model. Thus, it is appropriate to consider the resolution of the litigation in a mutually acceptable compromise, particularly where the December 20, 2001 agreement stayed the 2001 TMDLs insofar as they applied to Kent County's facility and the proposed TMDLs will apply to Kent County's facility.

DWR also notes in its response that the 2001 TMDLs and the proposed TMDLs include significant reductions to the nitrogen and phosphorous in the watershed from nonpoint sources. In addition, the proposed regulation reflects the removal of the Harrington municipal wastewater treatment plant as a full time point source. The proposed TMDL recognize Harrington's proposed change of replacing a fulltime stream discharge with a spray irrigation system in the next few years, which will be reflected in the next NPDES permit issued to Harrington.

MAELC also comments on the level of phosphorous the proposed TMDLs allow at the segment 47 of the Murderkill, which MAELC contends should not be allowed as it is higher than the Department's target level of phosphorous. DWR's response states that the higher than target level of 0.2 mg/l for phosphorous is not as applicable to free flowing streams, such as at segment 47. Instead, the target was used as guidance for the slower flowing portions downstream of segment 47. DWR points out that the Model showed that there will be no negative downstream impact from using a phosphorous level above the Department's target level, and that, based on these results, DWR considers the amount over the target for phosphorous to be acceptable. The issue of target levels also was raised in Kent County's comments, which pointed out that the

Department's use of any targets was not proper as they were not regulations. Kent County is correct in that the targets are not regulations, but the Department may use targets as advisory, non binding guidance for its regulation of water quality and either follow them or explain the reason why it is not following them. The proposed TMDLs highlight the flexibility of a target, where the Department may find a level above a target to be acceptable when there is a reasonable and adequately supported explanation for accepting a level higher than the target. I find DWR's explanation reasonable and adequately supported.

MAELC comments question the proposed TMDLs' failure to specify with more particularity the load allocation into specific nonpoint sources categories, such as urban runoff, etc. DWR's response indicates that the allocation between point and nonpoint sources and the implementation and enforcement of TMDLs occurs within the development of a Pollution Control Strategy, which occurs after TMDLs are established. The specific identification and measurement of nonpoint source still would be based upon estimating, and the MAELC comments offer no solution that avoids the reliance on assumptions. MAELC also does not explain why the creation of specific subcategories of nonpoint sources would benefit the water quality. Thus, I see no reason to delay the proposed TMDLs to pursue such a time consuming study that would not provide any more science, but instead would exchange one set of assumptions with another.

The MAELC comments states that the margin of safety used in the proposed TMDLs was implicit, and the failure to specify a margin of safety is contrary to federal regulation, citing 40 *CFR* §130.7. The cited regulation states, in pertinent part, that "TMDLs shall be established as levels necessary to attain and maintain a margin of safety, which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality." The regulation continues that "[d]eterminations of TMDLs shall take into account critical conditions

for stream flow, loading, and water quality parameters.” Thus, the federal regulation does not mandate an express margin of safety, but only that the Department should include a margin of safety into its proposed TMDLs. The DWR response indicates that a margin of safety was included in the TMDLs based upon the assumptions used in the Model. As stated in DWR’s response, the Model uses conservative assumptions, such as the three point sources would discharge at their maximum permitted flow and loads at the same time, which discharges would also occur during times of low flow and high water temperatures. The use of a specific formula or percentage for a margin of safety is not required, but only the inclusion of a margin of safety in the use of conservative assumptions. Thus, the proposed TMDLs do include a margin of safety based upon the conservative assumptions used for discharges and stream conditions, and which is consistent with the federal regulations.

In conclusion, the regulatory framework for protecting and improving the quality of the Delaware’s waters envisions the issuance of TMDLs, and their amendment from time to time in response to changing conditions and science. This proposed regulation reflects the latest evolution in that process. The proposed regulation reflects the newer information collected in 2002 and modifications to the Model that was used to establish the 2001 TMDLs. These changes are appropriate to reflect, and the Department relied on a Technical Analysis to support the proposed TMDLs. The Department will continue to seek to improve its studies and information for further amendment when necessary or appropriate, and with use the collaborative process with Kent County, MAELC and others to resolve disputes before a proposed regulation is subject to a formal notice and public hearing.

The proposed regulation, if adopted, also resolves the litigation over the 2001 TMDLs. MAELC also seeks changes, but adopting its proposed changes would result in considerable delay and is not warranted by the substantive changes MAELC proposes. Consequently, the

Department's proposed TMDLs are a reasonable proposed regulation that is adequately supported, is not arbitrary and capricious, and reflects qualitative improvements over the existing regulation, which should be amended to reflect the improvements. My review of the comments finds that there is no support for amending the proposed regulation at this time because any change would delay the issuance of the final TMDLs, but that the Department should continue to work with Kent County, MAELC, and others towards further future refinement and improvements to the TMDLs.

IV. RECOMMENDED FINDINGS AND CONCLUSIONS

Based on the record developed, I find and conclude that the record supports approval of the proposed regulation set forth in Appendix B hereto as a final regulation. In conclusion, I recommend the Secretary adopt the following findings and conclusions:

- 1.) The Department has jurisdiction under its statutory authority to make a determination in this proceeding;
- 2.) The Department provided adequate public notice of the proceeding and the public hearing in a manner required by the law and regulations;
- 3.) The Department held a public hearing in a manner required by the law and regulations;
- 4.) The Department considered all timely and relevant public comments in making its determination;
- 5.) The Department's proposed regulation, as published in the March 1, 2005, *Delaware Register of Regulations* and set forth in Appendix B hereto, is adequately supported, not arbitrary or capricious and is consistent with the applicable laws and regulations. Consequently it should be approved as a final regulation, which shall go into effect ten days after its publication in the next available issue of the *Delaware Register of Regulations*; and that

6..) The Department shall submit the proposed regulation as a final regulation to the *Delaware Register of Regulation* for publication in its next available issue, and shall provide written notice to the persons affected by the Order.

s. Robert P. Haynes _____

Robert P. Haynes, Esquire
Hearing Officer

Appendix A
Division Response Document

MEMORANDUM

TO: Robert P. Haynes, Esquire
Hearing Officer, Office of the Secretary

FROM: Hassan Mirsajadi

THROUGH: Brad L. Smith
John W. Schneider

DATE: May 11, 2005

*Section 1.01 SUBJECT: Division of Water Resources Response to
Public Comments re Proposed Amendments to the 2001 Total
Maximum Daily Loads Regulation for the Murderkill River
Watershed*

INTRODUCTION AND BACKGROUND

The Delaware Department of Natural Resources and Environmental Control (DNREC) has proposed to amend the 2001 Total Maximum Daily Loads (TMDLs) for nutrients and oxygen demanding materials for the Murderkill River Watershed.

The 2001 Murderkill River TMDLs regulation, adopted in December 2001, established the maximum amount of nutrients and oxygen demanding materials that can be discharged from point and nonpoint sources. The 2001 Murderkill TMDLs includes Waste Load Allocations (WLAs) for point sources, Load Allocations (LAs) for nonpoint sources, and a Margin of Safety (MOS).

Following adoption of the TMDLs regulation in December 2001, Kent County Levy Court, which owns and operates the Kent County Wastewater Treatment Plant Facility, appealed the regulation to the State Environmental Appeals Board and the State Superior Court. During settlement negotiations, which have been concluded, and as a result of additional technical studies, the Department concluded that the original hydrodynamic and water quality WASP5 model of the Murderkill River needed to be modified. Following refinement of the WASP5

model, and upon evaluating several loading scenarios, DNREC concluded that the 2001 TMDLs regulation should be amended.

Proposed amendments to the 2001 Murderkill TMDLs were presented during a public workshop on August 12, 2004. A public hearing was held on April 7, 2005. The notices advertising the public workshop and hearing were published in two local and regional newspapers. In addition, notice of the public hearing and proposed regulations were published in March 1, 2005 issue of the Delaware Register of Regulations (Volume 8, Issue 9).

Prior to and during the public hearing of April 7, 2005, DNREC received comments regarding proposed amendments of the 2001 Murderkill TMDLs. The following table lists commenter's name, affiliation, the date the comment was received, and comment number. The comments and DNREC's responses follow.

Article II. Murderkill River TMDLs Comments

Commenter	Article III. Affiliation	Date of Comment	Comment Number
Jenifer Woods	Widener Environmental Law Clinic	April 7, 2005	1 - 7
Hans A. Medlarz	Kent County	April 7, 2005	8 - 14

- 1. The proposed TMDL does not include any potential for growth in the community. While 55% of the watershed land use is agricultural only 14% is listed as urban with no accommodation for potential future growth. The TMDL is inadequate because it does not account for future growth in the community.**

Response: As required under Section 303(d) of the Clean Water Act (CWA) and its implementing regulations, the proposed amendments to the 2001 Murderkill River TMDLs include a load allocation for nonpoint sources. This allocation will establish the maximum amount of nutrients and oxygen demanding materials that can be discharged from nonpoint sources into Murderkill River and its tributaries and ponds. Any future growth and/or land conversion within the watershed should comply with these requirements. Additionally, the proposed amendments will establish maximum amounts of nutrients and oxygen demanding materials that can be discharged from point sources. Therefore, DNREC believes the proposed amendments to the 2001 TMDLs addresses future growth within the watershed.

- 2. The TMDL calculation used old data to determine the nitrogen, phosphorous and dissolved oxygen in the water. While it is understood by the Commentors that the current Murderkill TMDL is an amended draft from the original TMDL that was drafted in 2001, the data relied upon is now outdated. As a practical matter, an effective**

TMDL would include recent data and not include calculations that are almost 9 years old.

Response: The proposed amendments to the 2001 Murderkill TMDLs were developed based on modifications to the WASP model of the Murderkill River using extensive hydrodynamic data which was collected during the fall of 2002. The original WASP model was calibrated and verified using extensive water quality data that was collected in 1997 and 1998. Considering these factors, the Department believes that both historic and recent data have been used for Murderkill River model development, calibration, and modification.

- 3. The Amended TMDL increases instead of reduces the amount of pollutants released into the Murderkill River. For example, the Total Nitrogen permitted for the Kent County facility in the original TMDL was 375 lbs/d; now the permitted amount for Kent County is 751 lbs/d. By not reducing the amount of pollutants flowing into the Murderkill River this TMDL fails to meet the regulatory definition of a TMDL.**

Response: DNREC disagrees with this comment and believes that the proposed nitrogen load allocation for the Kent County Facility is significantly lower than what the facility is currently permitted to discharge. Furthermore, the Department believes the proposed amendments to the 2001 Murderkill River TMDLs meet the requirements of a TMDL.

Section 303(d) of the Clean Water Act and its implementing regulations require establishing TMDLs (point source load allocations, nonpoint source load allocations, and a margin of safety) that would result in attainment of applicable water quality standards. Since the result of extensive hydrodynamic monitoring of the Murderkill River during the fall of 2002 showed that the original WASP model underestimated the River's size and assimilative capacity, the model was modified to take this additional data into consideration. The proposed amended TMDLs will ensure that all applicable water quality standards and nutrient targets in the Murderkill River and its tributaries and ponds are attained. Considering these factors, the Department believes the proposed amendments to the 2001 Murderkill River TMDLs meet the requirements of a TMDL.

- 4. The current TMDL does not reduce the amount of pollution flowing into the Murderkill River. In fact, the concentration of total phosphorus for segment 47 of the Murderkill River exceeds the target level. DNREC's rationale behind the exceedance of the total phosphorus is that there is "no apparent adverse downstream impact, the exceedance of the target value at this segment is considered acceptable." Exceeding the target value should always be unacceptable. By exceeding the amount of pollutants flowing into the Murderkill River this TMDL fails to meet the regulatory definition of a TMDL.**

Response: DNREC disagrees with this comment and emphasizes that both the 2001 Murderkill River TMDLs and the proposed amendments to the 2001 TMDLs will result in significant reductions of point and nonpoint source loads, hence meeting the regulatory

definition of a TMDL. Several tables and graphs are included in the 2001 and 2005 Murderkill River TMDLs technical analysis documents which show the magnitude of the load reductions.

With regard to the total phosphorous concentration in segment 47 exceeding the target value, it should be noted that, in the absence of national nutrient criteria, DNREC has considered an upper threshold value of 0.2 mg/l for total phosphorous to prevent nutrient overenrichment and excessive algal growth. For free flowing streams, such as segment 47 of the Murderkill River Model, the short residence time of water flowing through this segment would generally prevent excessive algal growth at the site. Therefore, the nutrient target values for free flowing segments are established to mainly protect downstream impacts. Since the results of extensive modeling and scenario analyses have shown that the minor exceedance of the target value at Segment 47 would not result in downstream water quality impairment or excessive algal growth, this minor exceedance is considered acceptable.

- 5. None of the NPDES permitted dischargers were required to reduce their present NPDES permit limits for CBOD5, nitrogen, or phosphorus. Presumably, this would leave the reduction to the non-point sources for which the load allocations for are “best estimates” or “reasonably accurate estimates.” Non-point sources are the most difficult to regulate and there is no explanation of how DNREC intends to monitor or regulate them to reduce the discharge of phosphorus and dissolved oxygen. Thus, this TMDL fails to meet the regulatory definition of a TMDL.**

Response: DNREC disagrees with this comment and believes that both the 2001 Murderkill River TMDLs and the proposed amendments to the 2001 TMDLs would result in significant reduction of point and nonpoint source loads; hence meet the regulatory definition of a TMDL. Several tables and graphs are included in the 2001 and 2005 Murderkill River TMDLs technical analysis documents which show the magnitude of the load reductions.

Both the 2001 TMDLs and proposed amendments call for the development of a Pollution Control Strategy (PCS). A Murderkill River Tributary Action Team has nearly completed a draft PCS which will be used by the Department to develop mandatory and voluntary nonpoint source load reduction requirements and goals.

- 6. The proposed TMDL fails to breakdown the non-point sources into some recognizable category of source such as urban runoff, etc. Failure to allocate specific loads to each non-point source or non-point source category contravenes the CWA and makes it impossible to set implementation goals. Thus, the Commentors recommend that EPA include individual or category load allocations in the Proposed TMDLs.**

Response: The proposed amendments to the 2001 Murderkill River TMDLs assign load allocations to nonpoint sources within the watershed. Assigning separate load allocations to various categories of land uses is beyond the scope of the current TMDLs. However, nonpoint source loads generated from various land use categories and the appropriate best

management practices needed to achieve required load reductions have been considered by the Tributary Action Team during the development of the Pollution Control Strategy.

- 7. The Margin of Safety for this TMDL is implicit. The statute and regulations require that a TMDL include a margin of safety to account for any lack of knowledge concerning the relationship between load and wasteload allocations and water quality [CWA §303(d)(1)(C), 40 CFR § 130.7 (c)(1). If the MOS is implicit, the conservative assumptions in the analysis that account for the MOS must be described. This TMDL does not account for the conservative assumptions and therefore this TMDL fails to meet the regulatory definition of a TMDL.**

Response: Several conservative assumptions were made during development of both the Murderkill River WASP model and proposed amendments to the 2001 TMDLs. The Murderkill River WASP model was developed using conservative reaction rates. Furthermore, the proposed amendments are based on conservative assumptions including 1) each point source facility is assumed to be discharging its maximum permitted flow and load during the entire modeling period, 2) all point source facilities are assumed to be simultaneously discharging their maximum flows and loads, and 3) critical environmental conditions (such as low stream flow and high water temperature) are assumed to be occurring at the same time the point source facilities are discharging their maximum flows and loads.

Since these conservative assumptions were made during development of both the Murderkill River WASP model and proposed amendments to the 2001 TMDLs, DNREC believes the use of an implicit margin of safety is justifiable.

- 8. Although considerable progress has been made, there remain some significant, unresolved issues relating to the proposed regulation. The comments submitted today reflect some of the areas in which additional work is required; these include the water quality science relating to nutrient loadings in the tidal portions of the Murderkill River, and the hydrodynamic and water quality modeling of the Murderkill River. Kent County has devoted considerable effort towards reviewing technical issues surrounding the Murderkill River, and appreciates the efforts of DNREC staff at all levels. Kent County expects that the Department will continue its work to address the remaining issues, and looks forward to participating in that effort.**

Response: DNREC believes that the proposed amendments to the 2001 Murderkill River TMDLs are based on the best information and data currently available and is scientifically defensible. At the same time, DNREC acknowledges that for any complex natural system such as the Murderkill River, additional studies will help to better characterize those complexities. DNREC looks forward to working with all interested parties, including Kent County, to plan and conduct such studies.

9. **In light of the unresolved nature of certain issues relating to the proposed regulation, Kent County respectfully submits the enclosed comments for the administrative record in this matter. (folder detailing unresolved issues regarding water quality condition of the Murderkill River watershed and the application of the WASP mathematical model was submitted by the Kent County).**

Response: Please see response to comment 8.

10. **The numerical nutrient criteria utilized by DNREC in promulgating the Amended 2001 Murderkill TMDL regulation are “targets” that have not been fully adopted by the Delaware Department of Natural Resources and Environmental Control as water quality standards and approved by the Environmental Protection Agency. (see State of Delaware Surface Water Standards, Section 4.6.2; Draft Technical Analysis for Amendment of the 2001 Murderkill River TMDLs, updated March 1, 2005, Chapter 1.5). As such, non-attainment of these nutrient “targets” does not provide DNREC with the authority to establish TMDLs for the waters of the State.**

Response: As required under Section 303(d) of the Clean Water Act and its implementing regulations, the proposed amendments to the 2001 Murderkill River TMDLs are designed to achieve applicable water quality standards with regard to dissolved oxygen in both fresh and marine waters of the River. With regard to nutrients (nitrogen and phosphorous), Section 4.6.2 of the State Surface Water Quality Standards provides narrative criteria which call for the minimization of the impact of nutrient inputs to surface waters from point and human-induced nonpoint sources. To implement these narrative criteria, DNREC used upper threshold levels of 3.0 mg/l for total nitrogen and 0.2 mg/l for total phosphorous. These target levels were selected based on literature values and best professional judgment. As required by USEPA guidelines, the proposed amendments to the 2001 Murderkill River TMDLs are designed to meet all applicable water quality standards and nutrient targets.

11. **Kent County notes that, for watersheds similar to the Murderkill, DNREC and EPA have assumed greater reductions for non-point sources (NPS) of nitrogen and phosphorous than are proposed for the Murderkill. For example, the Appoquinimink TMDLs recently approved by EPA uses NPS reductions of 60% for nitrogen and phosphorous while the proposed Murderkill TMDLs, without any explanation, have NPS reductions of only 30% nitrogen and 50% phosphorous.**

Response: Total Maximum Daily Loads (TMDLs) are established based on an evaluation of the magnitude and characteristics of sources of pollutants within a watershed and determination of the assimilative capacity of the waterbody. Then, using a mathematical model as a predictive tool, this assimilative capacity is distributed among point and nonpoint sources. To account for any uncertainty or data gaps, a portion of the assimilative capacity may be reserved as a margin of safety. Allocation of the assimilative capacity to various sources is accomplished after a detailed analysis of water quality impacts of various pollutant sources and upon ensuring that 1) the proposed load reductions will achieve applicable water quality standards, 2) the proposed load reductions are practical and achievable, and 3) all

sources of pollutants share the responsibility of achieving water quality standards in a fair and equitable way.

DNREC believes that the distribution of assimilative capacity among point and nonpoint sources is dependent on characteristics of a specific watershed. An allocation scheme for one watershed, such as the Appoquinimink River, may not be suitable for another watershed.

- 12. Section 4.1 of the Draft Technical Analysis (The Proposed Amended TMDL Analysis) establishes Scenario 25 as forming the basis for the proposed Amended TMDL. The load allocations developed in this scenario are those proposed by DNREC in the Amended 2001 Murderkill TMDL regulation. In Section 4.2 of the Draft Technical Analysis (Discussion of Regulatory Requirements for TMDLs), DNREC references Scenario 22 as being the basis, however. This incorrect reference should be changed to Scenario 25.**

Response: The technical document has been updated to correct this error.

- 13. Kent County is supportive of the proposed regulation, and urges its prompt adoption as a final regulation.**

Response: DNREC acknowledges and appreciates the support of the commentor.

- 14. We also urge the Department to continue its efforts to develop better science, better data, and better modeling to advance the understanding of the Murderkill Watershed.**

Response: The Department continuously looks for ways to improve its water quality management programs. As a result, many advances have been achieved since the original 2001 TMDLs were developed for the Murderkill River. The Department will continue to use the best science, monitoring data, modeling and other analytical tools, and public involvement processes available to it at the time each TMDL is developed. Also, please see response to comment 8.

cc. Kevin Donnelly

Appendix B
Proposed Regulation to be Adopted as a Final Regulation

Department of Natural Resources and Environmental Control

Division of Water Resources

Statutory Authority: 7 Delaware Code, Chapter 60

Amendment of the 2001 Total Maximum Daily Loads (TMDLs) for the Murderkill River Watershed, Delaware

A. INTRODUCTION and BACKGROUND

On December 2001, the Cabinet Secretary of the Delaware Department of Natural Resources and Environmental Control (DNREC) issued Order No. 2001-A-0044 adopting a Total Maximum Daily Loads (TMDLs) Regulation for nutrients and oxygen consuming compounds for the entire Murderkill River Watershed. The TMDLs, which are developed in compliance with requirements of Section 303(d) of the Clean Water Act (CWA), establish maximum amounts of pollutants that can be discharged to a waterbody from point and nonpoint sources while maintaining water quality standards. The TMDLs include Waste Load Allocations (WLAs) for point sources, Load Allocations (LAs) for nonpoint sources, and a Margin of Safety (MOS).

Following adoption of the Murderkill River TMDLs Regulation in December 2001, Kent County Levy Court, which owns and operates the Kent County Facility, appealed the TMDLs Regulation for the lower Murderkill River to the State Environmental Appeal Board and State Superior Court. As a result of settlement negotiations, which have been concluded, and additional technical studies, the Department concluded that the original hydrodynamic and water quality WASP5 model of the Murderkill River needed to be refined. Following refinement of the WASP5 model and evaluation of several loading scenarios, DNREC is amending the 2001 TMDLs Regulation.

B. The Amended Total Maximum Daily Loads (TMDLs) Regulation for the Murderkill River Watershed, Delaware

- Article 1. The total nitrogen waste load from the Kent County Facility and Canterbury Crossing Mobile Home Park shall be limited to 755.3 pounds per day. The waste load allocation for the Kent County Facility will be 751 pounds per day and for Canterbury Crossing Mobile Home Park will be 4.3 pounds per day.
- Article 2. The total phosphorus waste load from the Kent County Facility and Canterbury Crossing Mobile Home Park shall be limited to 62.7 pounds per day. The waste load allocation for the Kent County Facility will be 62.5 pounds per day and for Canterbury Crossing Mobile Home Park will be 0.2 pounds per day.

- Article 3. The CBOD5 (5-day Carbonaceous Biochemical Oxygen Demand) waste load from the Kent County Facility and Canterbury Crossing Mobile Home Park shall be limited to 1010.6 pounds per day. The waste load allocation for Kent County Facility will be 1001 pounds per day and for Canterbury Crossing Mobile Home Park will be 9.6 pounds per day.
- Article 4. Treated wastewater from the City of Harrington wastewater treatment facility shall be used for spray irrigation. However, during the winter season, as well as during wet weather periods, when spray irrigation of treated wastewater is not practical, the effluent may be discharged into Browns Branch. During periods of surface discharge, the maximum discharge flow rate shall not exceed 750,000 gallons per day and daily waste loads shall not exceed 140 pounds per day for total nitrogen, 0.75 pounds per day for total phosphorus, and 37.5 pounds per day for CBOD5. Furthermore, the total annual waste load discharged from the City of Harrington wastewater treatment facility to the surface waters of Browns Branch shall not exceed 9125 pounds per year for total nitrogen, 55 pounds per year for total phosphorus, and 3000 pounds per year for CBOD5.
- Article 5. The nonpoint source nitrogen load in the entire watershed shall be reduced by 30 percent (from the 1997 base-line). This shall result in a yearly-average total nitrogen load of 560 pounds per day.
- Article 6. The nonpoint source phosphorus load in the entire watershed shall be reduced by 50 percent (from the 1997 base-line). This shall result in a yearly-average total phosphorous load of 96 pounds per day.
- Article 7. Based upon hydrodynamic and water quality model runs and assuming implementation of reductions identified by Articles 1 through 6, DNREC has determined that, with an adequate margin of safety, water quality standards and nutrient targets will be met in the Murderkill River and its tributaries and ponds.
- Article 8. Implementation of this TMDL Regulation shall be achieved through development and implementation of a Pollution Control Strategy. The Strategy will be developed by DNREC in concert with the Murderkill River Tributary Action Team, other stakeholders, and the public.