**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**
**REGION III**
**1650 Arch Street**
**Philadelphia, Pennsylvania 19103-2029**

# Decision Rationale
# Total Maximum Daily Loads
# Chartiers Creek Watershed
# For Acid Mine Drainage Affected Segments

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**Jon M. Capacasa, Acting Director**
**Water Protection Division**

**Date: _____**

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## I. Introduction

The Clean Water Act (CWA) requires a Total Maximum Daily Load (TMDL) be developed by the state for those waterbodies identified as impaired where technology-based and other controls will not provide for attainment of water quality standards. A TMDL is a determination of the amount of a pollutant from point, nonpoint, and natural background sources, including a margin of safety, that may be discharged to a water quality-limited waterbody without violating water quality standards.

The Pennsylvania Department of Environmental Protection (PADEP), Bureau of Watershed Conservation, submitted the *Chartiers Creek Watershed TMDL*, dated April 2003 (TMDL Report), to EPA for final Agency review on March 14, 2003. This report included TMDLs for three metals (aluminum, iron, and manganese) and addressed seven (7) segments on Pennsylvania's 1996 Section 303(d) list of impaired waters.

EPA's rationale is based on the TMDL Report and information contained in the attachments to the report. Our review determined that portions of the TMDL did not meet the following eight regulatory requirements pursuant to 40 CFR Part 130. EPA is, therefore, approving the TMDLs for Campbells Run, Robinson Run, Millers Run, Half Crown Run, Little Chartiers Creek and Chartiers Run, *i.e.*, six (6) segments. EPA is unable to approve the TMDLs for Chartiers Creek due to a lack of specific point source data.

1. The TMDLs are designed to implement the applicable water quality standards.

2. The TMDLs include a total allowable load as well as individual wasteload allocations (WLAs) and load allocations (LAs).

3. The TMDLs consider the impacts of background pollutant contributions.

4. The TMDLs consider critical environmental conditions.

5. The TMDLs consider seasonal environmental variations.

6. The TMDLs include a margin of safety (MOS).

7. There is reasonable assurance that the proposed TMDLs can be met.

8. The TMDLs have been subject to public participation.

## II. Summary

Table 1 presents the 1996 and 1998 Section 303(d) listing information for the water quality limited segments within the Chartiers Creek Watershed.

**Table 1. State Water Plan (SWP) Subbasin: 20-F Ohio River**

| Year | Mile | Segment | Stream Code | Stream Name | Designated Use | Data Source | Source | EPA Cause |
|---|---|---|---|---|---|---|---|---|
| 1996 | 2.0 | N/A | 36786 | Campbells Run | WWF | 305(b) Report | RE | Metals |
| 1998 | 2.0 | N/A | 36786 | Campbells Run | WWF | 305(b) Report | RE | Metals |
| 1996 | 0.8 | 4686 | 36787 | UNT Campbells Run | WWF | 305(b) Report | RE | Metals |
| 1998 | 0.8 | 4686 | 36787 | UNT Campbells Run | WWF | SWMP | AMD | Metals |
| 1996 | 6.5 | 4681 | 36777 | Chartiers Creek | WWF | 305(b) Report | RE | Metals |
| 1998 | 19.9 | 4681 | 36777 | Chartiers Creek | WWF | SWMP | AMD | Metals |
| 1998 | 3.11 | 971001-1040-TVP | 37135<br>37139 | UNTs Chartiers Creek | WWF | UP | UR/SS<br>AMD<br>AMD | Siltation<br>Metals<br>Siltation |
| 1998 | 3.2 | 971024-0940-ALF | 37043<br><br>37050 | Chartiers Run<br><br>UNT. Chartiers Run | WWF | UP | AMD<br>Cn<br>HM<br>HM<br>AMD<br>Cn | Siltation<br>Siltation<br>OHA<br>Metals<br>OHA |
| 1998 | 5.97 | 971024-1030-ALF | 37051<br>37052<br>37055 | UNTs Chartiers Run | WWF | UP | AMD<br>Cn<br>AMD<br>HM<br>HM<br>Cn | Metals<br>OHA<br>Siltation<br>Siltation |
| 1998 | 4.11 | 971028-1000-ALF | 37052<br>37058<br>37059<br>37060<br>37061 | UNTs Chartiers Run | WWF | UP | Ag<br>Ag<br>Ag<br>HM<br>HM | Siltation<br>Nutrients<br>Turbidity<br>Turbidity<br>pH |
| 1996 | 1 | 5846 | 63300 | Half Crown Run | WWF | 305(b) | RE | Metals |
| 1998 | 1.1 | 5846 | 63300 | Half Crown Run | WWF | SWMP | AMD | Metals |

| Table 1. State Water Plan (SWP) Subbasin: 20-F Ohio River | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1998 | 6.35 | 971009-1245-TVP | 36989<br>37004 - 37009 | UNTs Little Chartiers Creek | WWF | UP | UR/SS<br>AMD<br>AMD | Siltation<br>Suspended Solids<br>Metals |
| 1998 | 6.19 | 971009-1050-TVP | 36989<br>37001<br>37002<br>37003<br>37015 | UNTs Little Chartiers Creek | WWF | UP | AMD<br>AMD | Suspended Solids<br>Metals |
| 1996 | 2.5 | 4688 | 36827 | Millers Run | WWF | 305(b) | RE<br>RE | Suspended Solids<br>Metals |
| 1998 | 5.13 | 4688 | 36827 | Millers Run | WWF | SWMP | RE<br>RE | Suspended Solids<br>Metals |
| 1996 | 6.0 | 5842 | 63294 | N. Branch Robinson Run | WWF | 305(b) | RE | Other Inorganics<br>Metals |
| 1998 | 2.42 | 5842 | 63294 | N. Branch Robinson Run | WWF | SWMP | AMD<br>AMD | Metals<br>Other Inorganics |
| 1998 | 1.55 | 5843 | 63294 | N. Branch Robinson Run | WWF | SWMP | AMD | Metals |
| 1996 | 4.2 | 5845<br>6610 | 63295 | UNT. N. Branch Robinson Run | WWF | 305(b) | RE | Metals |
| 1998 | 1.85 | 5845 | 63295 | UNT. N. Branch Robinson Run | WWF | SWMP | AMD | Metals |
| 1998 | 1.5 | 6610 | 63295 | UNT. N. Branch Robinson Run | WWF | SWMP | AMD | Metals |

Other Inorganics are sulfates
RE = Resource Extraction
WWF = Warm Water Fishes
SWMP = Surface Water Monitoring Program
AMD = Acid Mine Drainage
Ag = Agriculture
Cn = Construction
HM = Habitat Modification
UR/SS = Urban Runoff/Storm Sewers
OHA = Other Habitat Alterations
UNT = Unnamed Tributaries
See Attachment E, Excerpts Justifying Changes Between the 1996, 1998 and Draft 2000 Section 303(d) Lists.
The use designations for the stream segments in this TMDL can be found in PA Code Title 25 Chapter 93.

The TMDLs were developed using the Watershed Analysis Risk Management Framework (WARMF) model to ensure that water quality standards are attained as required by Pennsylvania's water quality standards Pennsylvania Code Title 25, Chapter 93.5(b). Tables 2a, 2b, and 2c summarize the TMDLs for the Chartiers Creek Watershed as determined by PADEP.

**Table 2A. TMDLs, WLA, LA, and MOS for Aluminum**

| Stream Code | Stream Name | LA lbs/yr | WLA lbs/yr | MOS lbs/yr | TMDL lbs/yr |
|---|---|---|---|---|---|
| 36777 | Mouth of Chartiers Creek | 67,334 | 2,766 | 3,689 | 73,790 |
| 36786 | Campbells Run | 1,277 | 0 | 67 | 1,344 |
| 36787 | UNT Campbells Run | 484 | 0 | 25 | 509 |
| 36794 | Mouth of Robinson Run | 15,820 | 0 | 833 | 16,652 |
| 63294 | North Branch Robinson Run | 1,751 | 0 | 92 | 1,843 |
| 63295 | UNT. North Branch Robinson Run | 343 | 0 | 18 | 361 |
| 63300 | Half Crown Run | 575 | 0 | 30 | 605 |
| 36827 | Mouth of Millers Run | 15,595 | 0 | 821 | 16,415 |
| 36943 | Mouth of Little Chartiers Creek | 25,089 | 2,766 | 1,466 | 29,321 |
| 37015 | UNT Little Chartiers Creek | 179 | 0 | 9 | 188 |
| 37001 | UNT Little Chartiers Creek | 1,573 | 0 | 83 | 1,656 |
| 37002 | UNT Little Chartiers Creek | 304 | 0 | 16 | 319 |
| 37003 | UNT Little Chartiers Creek | 330 | 25 | 19 | 374 |
| 36989 | UNT Little Chartiers Creek | 6,251 | 659 | 364 | 7,274 |
| 37004 | UNT Little Chartiers Creek | 289 | 0 | 15 | 304 |
| 37005 | UNT Little Chartiers Creek | 137 | 0 | 7 | 145 |
| 37006 | UNT Little Chartiers Creek | 111 | 0 | 6 | 117 |
| 37007 | UNT Little Chartiers Creek | 121 | 0 | 6 | 127 |
| 37008 | UNT Little Chartiers Creek | 60 | 0 | 3 | 63 |
| 37009 | UNT Little Chartiers Creek | 154 | 0 | 8 | 162 |
| 37043 | Mouth of Chartiers Run | 5,588 | 0 | 294 | 5,882 |
| 37050 | UNT Chartiers Run | 1,916 | 0 | 101 | 2017 |
| 37051 | UNT Chartiers Run | 84 | 0 | 4 | 89 |
| 37055 | UNT Chartiers Run | 1,942 | 0 | 102 | 2,044 |
| 37052 | UNT Chartiers Run | 665 | 0 | 35 | 700 |
| 63869 | UNT Chartiers Creek | 1,238 | 0 | 65 | 1,303 |

| Stream Code | Stream Name | LA lbs/yr | WLA lbs/yr | MOS lbs/yr | TMDL lbs/yr |
|---|---|---|---|---|---|
| 37135 | UNT Chartiers Creek | 1,811 | 0 | 95 | 1,907 |
| 37139 | UNT Chartiers Creek | 752 | 0 | 40 | 792 |

**Table 2B. TMDLs, WLA, LA, and MOS for Iron**

| Stream Code | Stream Name | LA lbs/yr | WLA lbs/yr | MOS lbs/yr | TMDL lbs/yr |
|---|---|---|---|---|---|
| 36777 | Mouth of Chartiers Creek | 210,995 | 4,581 | 11,346 | 226,922 |
| 36786 | Campbells Run | 12,460 | 0 | 656 | 13,116 |
| 36787 | UNT Campbells Run | 3,845 | 0 | 202 | 4,048 |
| 36794 | Mouth of Robinson Run | 39,435 | 0 | 2,076 | 41,510 |
| 63294 | North Branch Robinson Run | 10,852 | 0 | 571 | 11,423 |
| 63295 | UNT North Branch Robinson Run | 1,437 | 0 | 76 | 1,513 |
| 63300 | Half Crown Run | 2,537 | 0 | 134 | 2,671 |
| 36827 | Mouth of Millers Run | 8,409 | 0 | 443 | 8,851 |
| 36943 | Mouth of Little Chartiers Creek | 844 | 4,517 | 282 | 5,643 |
| 37015 | UNT Little Chartiers Creek | 1 | 0 | <1 | 1 |
| 37001 | UNT Little Chartiers Creek | 17 | 0 | 1 | 18 |
| 37002 | UNT Little Chartiers Creek | 3 | 0 | <1 | 3 |
| 37003 | UNT Little Chartiers Creek | <1 | 75 | 4 | 79 |
| 36989 | UNT Little Chartiers Creek | 276 | 1,318 | 84 | 1,678 |
| 37004 | UNT Little Chartiers Creek | 16 | 0 | 1 | 17 |
| 37005 | UNT Little Chartiers Creek | 7 | 0 | <1 | 8 |
| 37006 | UNT Little Chartiers Creek | 6 | 0 | <1 | 6 |
| 37007 | UNT Little Chartiers Creek | 7 | 0 | <1 | 7 |
| 37008 | UNT Little Chartiers Creek | 3 | 0 | <1 | 3 |
| 37009 | UNT Little Chartiers Creek | 8 | 0 | <1 | 9 |
| 37043 | Mouth of Chartiers Run | 28,223 | 64 | 1,572 | 29,859 |
| 37050 | UNT Chartiers Run | 22,885 | 0 | 1,271 | 24,157 |
| 37051 | UNT Chartiers Run | 310 | 0 | 17 | 327 |
| 37055 | UNT Chartiers Run | 4,454 | 0 | 247 | 4,701 |

| Stream Code | Stream Name | LA lbs/yr | WLA lbs/yr | MOS lbs/yr | TMDL lbs/yr |
|---|---|---|---|---|---|
| 37052 | UNT Chartiers Run | 485 | 0 | 27 | 512 |
| 63869 | UNT Chartiers Creek | 329 | 0 | 18 | 348 |
| 37135 | UNT Chartiers Creek | 45 | 0 | 2 | 47 |
| 37139 | UNT Chartiers Creek | 18 | 0 | 1 | 19 |

**Table 2C. TMDLs, WLA, LA, and MOS for Manganese**

| Stream Code | Stream Name | LA lbs/yr | WLA lbs/yr | MOS lbs/yr | TMDL lbs/yr |
|---|---|---|---|---|---|
| 36777 | Mouth of Chartiers Creek | 190,386 | 2,994 | 10,178 | 203,558 |
| 36786 | Campbells Run | 7,224 | 0 | 380 | 7,604 |
| 36787 | UNT Campbells Run | 2,637 | 0 | 139 | 2,776 |
| 36794 | Mouth of Robinson Run | 63,661 | 0 | 3,351 | 67,012 |
| 63294 | North Branch Robinson Run | 17,501 | 0 | 921 | 18,422 |
| 63295 | UNT North Branch Robinson Run | 1,705 | 0 | 90 | 1,794 |
| 63300 | Half Crown Run | 2,782 | 0 | 146 | 2,928 |
| 36827 | Mouth of Millers Run | 5,749 | 0 | 303 | 6,051 |
| 36943 | Mouth of Little Chartiers Creek | 2,029 | 2,994 | 264 | 5,288 |
| 37015 | UNT Little Chartiers Creek | 5 | 0 | <1 | 5 |
| 37001 | UNT Little Chartiers Creek | 19 | 0 | 1 | 20 |
| 37002 | UNT Little Chartiers Creek | 4 | 0 | <1 | 4 |
| 37003 | UNT Little Chartiers Creek | 1 | 50 | 3 | 54 |
| 36989 | UNT Little Chartiers Creek | 312 | 862 | 62 | 1,235 |
| 37004 | UNT Little Chartiers Creek | 5 | 0 | <1 | 5 |
| 37005 | UNT Little Chartiers Creek | 2 | 0 | <1 | 2 |
| 37006 | UNT Little Chartiers Creek | 2 | 0 | <1 | 2 |
| 37007 | UNT Little Chartiers Creek | 2 | 0 | <1 | 2 |
| 37008 | UNT Little Chartiers Creek | 1 | 0 | <1 | 1 |
| 37009 | UNT Little Chartiers Creek | 3 | 0 | <1 | 3 |
| 37043 | Mouth of Chartiers Run | 32,098 | 0 | 1,689 | 33,787 |
| 37050 | UNT Chartiers Run | 9,164 | 0 | 482 | 9,647 |

| Stream Code | Stream Name | LA lbs/yr | WLA lbs/yr | MOS lbs/yr | TMDL lbs/yr |
|---|---|---|---|---|---|
| 37051 | UNT Chartiers Run | 422 | 0 | 22 | 444 |
| 37055 | UNT Chartiers Run | 6,391 | 0 | 336 | 6,727 |
| 37052 | UNT Chartiers Run | 707 | 0 | 37 | 744 |
| 63869 | UNT Chartiers Creek | 297 | 0 | 16 | 312 |
| 37135 | UNT Chartiers Creek | 15 | 0 | 1 | 16 |
| 37139 | UNT Chartiers Creek | 27 | 0 | 1 | 28 |

The TMDL is a written plan and analysis established to ensure that a waterbody will attain and maintain water quality standards. The TMDL is a scientifically-based strategy which considers current and foreseeable conditions, the best available data, and accounts for uncertainty with the inclusion of a MOS value. Conditions, available data, and the understanding of the natural processes can change more than anticipated by the MOS. If this occurs, the option is always available to refine the TMDL for resubmittal to EPA. Pennsylvania's Unassessed Waters Protocol, PADEP's method of conducting biological assessments of Pennsylvania's waters, was developed in 1996 and implementation began in 1997. PADEP's goal is a statewide assessment of surface waters in Pennsylvania. After completion of the initial assessments, the long-range goal is to reassess all waters on a five-year cycle. Therefore, while the TMDL should not be modified at the expense of achieving water quality standards expeditiously, the TMDL may be modified when warranted by additional data or other information.

## III. Background

The Chartiers Creek Watershed is approximately 260 square miles in area. Chartiers Creek and several of its tributaries were listed on the 1996 Section 303(d) list of impaired waters due to AMD. The geology of the basin consists of sedimentary rocks of shale, sandstone and siltstone, coal, and limestone. The Pittsburgh Coal seam is exposed on the stream banks were the stream erodes below the coal seam. This seam has been and continues to be mined for its coal. The majority of the mines are in the northwest portion of the watershed. The major landuses within the watershed include forest land, cropland, and strip mines.

The Chartiers Creek Watershed is affected by pollution from AMD. This pollution has caused high levels of metals and elevated sulfates in several waters within the watershed including the mainstem of Chartiers Creek.

The Eighty-Four Mine is the only active mining operation in the watershed. A nonmining facility within the watershed, Allegheny Ludlum, is permitted to discharge iron. At the time of this report Allegheny Ludlum did not have a numeric effluent limit for iron but was required to monitor for its presence in one of its discharge points. Two other facilities are identified by EPA as point sources discharging to Chartiers Creek but are not provided with WLAs in the TMDL Report. For this reason, EPA is not approving the TMDLs for Chartiers Creek.

The remaining discharges in the watershed are from abandoned mines and will be treated as nonpoint sources. For purposes of these TMDLs only, point sources are identified as permitted discharge points and nonpoint sources are identified as other discharges from abandoned mine lands which include tunnel discharges, seeps (although none were specifically identified), and surface runoff. Abandoned and reclaimed mine lands are treated in the allocations as nonpoint sources because there are no National Pollutant Discharge Elimination System (NPDES) permits associated with these areas. As such, the discharges associated with these landuses were assigned LAs (as opposed to WLAs). The decision to assign LAs to abandoned and reclaimed mine lands does not reflect any determination by EPA as to whether there are unpermitted point source discharges within these landuses. EPA is not determining that these discharges are exempt from NPDES permitting requirements. Each segment on the Section 303(d) list will be addressed as a separate TMDL.

The Surface Mining Control and Reclamation Act of 1977 (SMCRA, Public Law 95-87) and its subsequent revisions were enacted to establish a nationwide program to, among other things, protect the beneficial uses of land or water resources, and public health and safety from the adverse effects of current surface coal mining operations, as well as promote the reclamation of mined areas left without adequate reclamation prior to August 3, 1977. SMCRA requires a permit for the development of new, previously mined, or abandoned sites for the purpose of surface mining. Permittees are required to post a performance bond that will be sufficient to ensure the completion of reclamation requirements by the regulatory authority in the event that the applicant forfeits. Mines that ceased operating by the effective date of SMCRA, (often called "pre-law" mines) are not subject to the requirements of SMCRA.

These TMDLs were completed by PADEP to meet the sixth year (2003) TMDL milestone commitments under the requirements of the 1997 TMDL lawsuit settlement agreement. Sixth year milestones include the development of TMDLs for 20% of the waters listed on Pennsylvania's 1996 Section 303(d) list of impaired waters by the effects of AMD or 40 waters since 2001, and 60% of waters listed impaired by non-AMD related impacts or 27 waters since 2001. Delisted waters may count for 20% of the requirement.

*Modeling Procedure*

Beginning in 1998, Systech Engineering and the electric power industry, Allegheny Power, Electric Power Research Institute (EPRI), and the American Electric Power, approached Region III with a proposal to provide a calibrated watershed model for use in developing TMDLs in the Cheat River Watershed in West Virginia. Subsequently, the offer was extended to PADEP. The model to be used was the Watershed Analysis Risk Management Framework (WARMF), a proprietary computer program developed by Systech Engineering, Inc., under the sponsorship of EPRI. The regulatory agency, in this case, PADEP, develops the TMDLs.

WARMF contains catchment, river, and reservoir models that use meteorology, air quality, managed flow, observed hydrology and water quality, landuse, and point source data to support TMDL development on a subwatershed basis. Refer to *Users' Guide to WARMF* (Herr et al., 2000) for a more detailed discussion of simulated processes and model parameters.

*Adaptation of WARMF to Calculate TMDLs for Chartiers Creek Watershed in Pennsylvania* (Chen, Loeb and Herr, 2001) describes the modeling approach for the Chartiers Creek Watershed in detail. Configuration of WARMF involved the subdivision of the Chartiers Creek Watershed into modeling units and continuous simulation of flow and water quality for these units using meteorological, landuse, stream, mining, and pollutant-specific data. Pollutants that were simulated include metals, dissolved and suspended solids, carbon, nutrients, fecal coliform, dissolved oxygen, alkalinity, and pH.

After the model was configured, calibration was performed at multiple locations throughout the Cheat Watershed. Calibration refers to the adjustment or fine-tuning of modeling parameters to reproduce observations. Model calibration focused on two main areas: hydrology and water quality. Model calibration is also described in the report *Adaptation of WARMF to Calculate TMDLs for Chartiers Creek Watershed in Pennsylvania* (Chen, Loeb and Herr, 2001).

The Chartiers Creek Watershed drains a 257 square mile area southeast of Pittsburgh. Site-specific data was compiled for the watershed and used in the WARMF model. The first step in developing a TMDL through WARMF is to delineate the watershed. This task was completed through the use of United States Geological Survey (USGS) digital elevation maps (DEMs). DEMs provide the model with relief patterns and allow the modeler to demarcate the subbasins in the watershed. Landuse data for the watershed was imported into WARMF via GIS ArcInfo files. Ten landuse categories are used to represent the watershed.

Meteorological data was obtained from the National Climatic Data Center's (NCDC) database. Pittsburgh International Airport meteorologic station was used to represent the watershed's climatological patterns. The Pittsburgh station is a few miles east of the watershed. USGS stream flow data was imported into the WARMF model as well. Data was collected from various gaging stations in the watershed. The USGS gages on Chartiers Creek at Lagonda and Carnegie had daily flow records over an extended period of time. The remaining stations had sporadic data. Water quality data was collected from a wide range of sources over differing time frames. Although most of the data was collected sporadically, two stations were monitored monthly over an extended period of time. Most of the data was collected from Chartiers Creek.

Based on DEM, landuse, mine overburden, and other input information entered into WARMF, the model used the daily meteorology to simulate runoff from the catchments.[1] This runoff is routed to the streams within the watershed. The simulation is performed on every catchment and river segment every day throughout the years modeled.[2] During the calibration, modeled stream data was compared with the observed flow conditions to insure that the model accurately reflected observed conditions. Parameters within the model, such as evaporation coefficients or soil capacity, were fine tuned to create an accurate calibration. WARMF was calibrated to a three-year period of observed flow on Chartiers Creek at Lagonda. The simulated flow matched the observed general flow patterns well. The model over-predicted the lowest flows and under-predicted the highest flows but the model did match the data trends. A six-year

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[1]Chen, C.W., C. Loeb, and J. Herr. 2001. *Adaptation of WARMF to Calculate TMDL for Chartiers Creek Watershed in Pennsylvania.*

[2]Ibid 2

data set was used for calibrating Chartiers Creek at Carnegie. Once again the simulated results accurately reflected the trends seen in the observed data. The model under-predicted the highest 50 to 80% of flows while over predicting the highest 90 to 95% of flows.

WARMF simulates a wide range of water quality parameters. Water quality calibration was run for eight stations within the watershed. The sporadic sampling location makes it more difficult to determine if the model is truly reflecting observed conditions, since most conditions are never observed. However, the calibration did follow the trends seen in the data for dissolved oxygen, pH, alkalinity, nutrients, and chlorides. For a more detailed account of the calibration process, please see *Adaptation of WARMF to Calculate TMDL for Chartiers Creek Watershed in Pennsylvania,* Chen 2001.

WARMF calculates the daily loadings of point and nonpoint source pollutants.[3] The loading assessment of Chartiers Creek was based on a simulation from 1993 to 1996.[4] For a more detailed account of the allocation process, please see *Adaptation of WARMF to Calculate TMDL for Chartiers Creek Watershed in Pennsylvania,* Chen 2001.

## IV. Discussions of Regulatory Requirements

***EPA finds that PADEP has provided sufficient information to meet the eight basic requirements for establishing Metals TMDLs on Campbells Run, Robinson Run, Millers Run, Half Crown Run, Little Chartiers Creek and Chartiers Run. Pennsylvania has not provided enough information to meet the eight basic requirements for establishing a Metals TMDL on Chartiers Creek. The State failed to develop wasteload allocations for point sources discharging to the Chartiers Creek segment. EPA is, therefore, not approving the TMDLs for metals on Chartiers Creek.***

*1. The TMDLs are designed to implement the applicable water quality standards.*

Water quality standards are state regulations that define the water quality goals of a waterbody. Standards are comprised of three components, including designated uses, criteria necessary to protect those uses, and antidegradation provisions that prevent the degradation of water quality. All of the stream segments evaluated in the Chartiers Creek Watershed have been designated by Pennsylvania as warm water fishes with criteria protecting the aquatic life uses. The designations for these stream segments can be found at Pennsylvania Code Title 25 § 93.9. To protect the designated uses, as well as the existing uses, the water quality criteria shown in Table 3 apply to all evaluated segments. The table includes the instream numeric criterion for each parameter and any associated specifications.

**Table 3. Applicable Water Quality Criteria**

[3]Ibid 2

[4]Ibid 2

| Parameter | Criterion Value (mg/l) | Duration | Total Recoverable/ Dissolved |
|---|---|---|---|
| Aluminum (Al) | 0.75 | Maximum | Total Recoverable |
| Iron (Fe) | 1.5<br>0.3 | 30-day Average<br>Maximum | Total Recoverable<br>Dissolved |
| Manganese (Mn) | 1.0 | Maximum | Total Recoverable |
| pH (units) | 6.0 - 9.0 | Inclusive | N/A |
| Sulfate ($SO_4$) | 250* | Maximum | N/A |

*Applicable at potable water supply

EPA finds that these TMDLs will attain and maintain the applicable narrative and numerical water quality standards.

Although segments are listed for other "inorganics" *i.e.*, sulfate, PADEP recently modified Pennsylvania Code Title 25 § 96.3 to include a new Subsection (d) to limit the application of the sulfate criterion to the intake point of all existing or planned surface potable water supply. North Branch Robinson Run is the only segment listed for "other inorganics." There are no potable water supply intakes downstream of North Branch Robinson Run within the Chartiers Creek Watershed. Chartiers Creek discharges to the Ohio River downstream of the Allegheny and Monongahela Rivers, therefore, it may be assumed that sulfates in North Branch Robinson Run have no impact on any potable water supply on the Ohio River.

*2. The TMDLs include a total allowable load as well as individual WLAs and LAs.*

A. Wasteload Allocations (WLAs)

Pennsylvania's report indicates that there are two known point source discharges of metals in the watershed. Therefore, a WLA has been developed for these facilities. The WARMF model does not explicitly simulate contributions from individual precipitation-driven sources in the watershed, *e.g.*, Eighty-Four Mine. The Eighty-Four Mine's (PA0213608) loads were estimated based on available information on the facility.[5] Since discharges from permitted mining facilities are directly related to hydrologic processes, it was felt that their discharge would closely follow the simulated flow patterns within the receiving stream. The Eighty-Four Mine's discharge was an estimated percent of the stream flow based on the relative area of the mine to the drainage area. This assumption was used to determine the WLA for aluminum, iron, and manganese. The Allegheny Ludlum (PA0000273) facility's discharge is not precipitation driven and the WLA was developed based on its discharge monitoring record from 1996 through 1999. Federal regulations require that subsequent to TMDL development and approval, point sources permitted effluent limitations be water quality-based.[6] In addition, PA Code Title 25,

[5]Tetra Tech. 2003. *Total Maximum Daily Load for the Chartiers Watershed Pennsylvania*.

[6]It should be noted that technology-based permit limits may be converted to water quality-based limits according to EPA's *Technical Support Document For Water Quality-based Toxics Control*, March 1991, recommendations.

Chapter 96, Section 96.4(d) requires that WLAs shall serve as the basis for determination of permit limits for point source discharges regulated under Chapter 92 (relating to NPDES permitting, monitoring and compliance).

There are two additional point sources discharging in the watershed. These facilities are CONSOL Coal's AMD treatment facilities discharging to Chartiers Creek. The TMDL Report does not contain TMDLs for the treatment facilities. Therefore, EPA is not approving the metal TMDLs for Chartiers Creek. ***EPA regulations require that an approvable TMDL include individual Wasteload Allocations (WLAs) for each point source (40 CFR 122.44(d)(1)(vii)(B)).*** Table 4 presents the WLAs for the facilities that were addressed in the TMDL report.

**Table 4. WLA for Selected Facilities in the Watershed**

| Facility Name | Permit Number | Pollutant | WLA (lbs/yr) | WLA (lbs/day) |
|---|---|---|---|---|
| Eighty-Four Mining Co. | PA0213608 | Aluminum | 2,766 | 7.6 |
| Eighty-Four Mining Co. | PA0213608 | Iron | 4,517 | 12.3 |
| Eighty-Four Mining Co. | PA0213608 | Manganese | 2,994 | 8.2 |
| Allegheny Ludlum | PA0000273 | Iron | 64 | 0.2 |

B. Load Allocations (LAs)

For purposes of these TMDLs only, point sources are identified as permitted discharge points and nonpoint sources are identified as other discharges from abandoned mine lands which include tunnel discharges, seeps (although none were specifically identified), and surface runoff. Abandoned and reclaimed mine lands are treated in the allocations as nonpoint sources because there are no NPDES permits associated with these areas. As such, the discharges associated with these landuses were assigned LAs (as opposed to WLAs). The decision to assign LAs to abandoned and reclaimed mine lands does not reflect any determination by EPA as to whether there are unpermitted point source discharges within these landuses. EPA is not determining that these discharges are exempt from NPDES permitting requirements. As stated above, there are four permitted dischargers in the watershed, two of which have been provided with WLA.

*3. The TMDLs consider the impacts of background pollutant contributions.*

The TMDLs were developed using instream data which account for existing background conditions.

*4. The TMDLs consider critical environmental conditions*

The reductions specified in this TMDL apply at all flow conditions. The TMDL was based on observed data over a six-year period of time. The simulation therefore considered all flows and loads encountered during this period of time.

*5. The TMDLs consider seasonal environmental variations.*

The WARMF model was developed based on simulated data over an extended period of time that captured different seasonal loads and weather conditions. The model was developed to attain standards during the high flow conditions encountered during early spring and the drought conditions expected in early fall and all other conditions encountered during the year.

*6. The TMDLs include a MOS.*

The CWA and Federal regulations require TMDLs to include a MOS to take into account any lack of knowledge concerning the relationship between effluent limitations and water quality. EPA guidance suggests two approaches to satisfy the MOS requirement. First, it can be met implicitly by using conservative model assumptions to develop the allocations. Alternately, it can be met explicitly by allocating a portion of the allowable load to the MOS.

PADEP used an explicit MOS by allocating five percent of the TMDL load toward the MOS.

*7. There is reasonable assurance that the proposed TMDLs can be met.*

The *Recommendations* section highlights what can be done in the watershed to eliminate and/or treat pollutant sources. Two primary programs that provide reasonable assurance for maintenance and improvement of water quality in the watershed are PA's Growing Greener Grants and EPA's 319 funding. Several projects are being undertaken within the watershed to address the AMD issues occurring in the watershed. The Scott Conservancy has been awarded several EPA grants to reduce AMD in Scrubgrass Run and installed a passive treatment system and a Maelstrom Oxidizer. These abatement technologies have reduced the iron load to the stream by over 50%.

PADEP's efforts to reclaim abandoned mine lands, coupled with its duties and responsibilities for issuing NPDES permits will be critical in improving water quality in the Chartiers Creek Watershed.

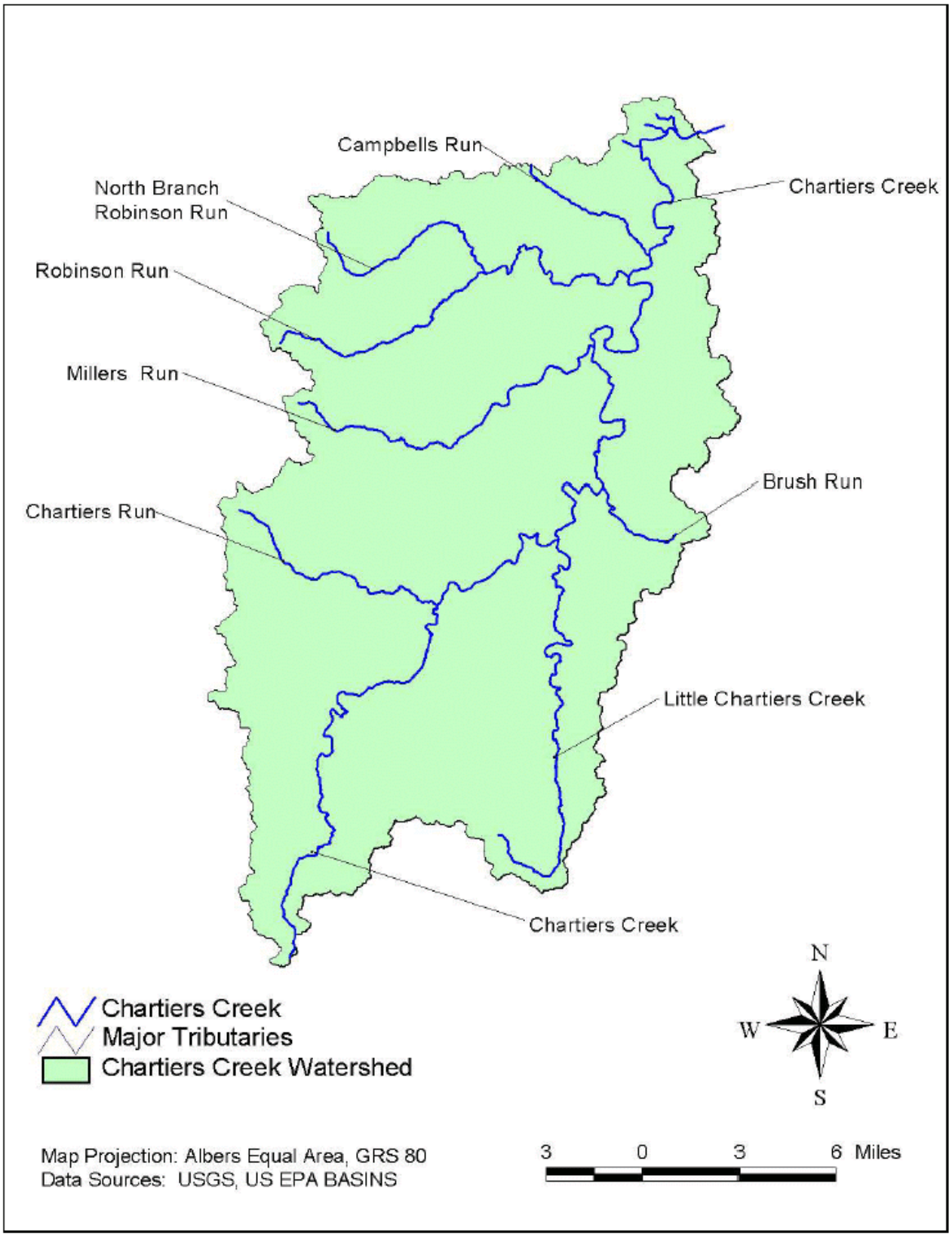
*8. The TMDLs have been subject to public participation.*

PADEP public noticed the draft TMDLs in the *Pennsylvania Bulletin* on December 16, 2001. A public meeting with watershed residents to discuss the final TMDLs was held on January 15, 2003, at the Chartiers Valley High School in Bridgeville, PA. PADEP held four previous public meetings in the watershed to present the WARMF program and to request data and to present preliminary TMDLs and allocations. Only EPA commented on the draft TMDL Report during the public comment period.

Although not specifically stated in the TMDL Report, PADEP routinely posts the approved TMDL report on their web site: www.dep.state.pa.us./watermanagement_apps/tmdl.

# Attachment A
# Watershed Maps


Upper Ohio
River Basin
PA
Philadelphia
Pittsburgh
OH
WV
Pittsburgh
Chartiers
Creek
Canonsburg
Washington
Little
Chartiers
Creek


Campbells Run
North Branch
Robinson Run
Chartiers Creek
Robinson Run
Millers Run
Brush Run
Chartiers Run
Little Chartiers Creek
Chartiers Creek
N
W
E
S
Chartiers Creek
Major Tributaries
Chartiers Creek Watershed
Map Projection: Albers Equal Area, GRS 80
Data Sources: USGS, US EPA BASINS
3 0 3 6 Miles