National Pollutant Discharge Elimination System (NPDES) Permit Program

F A C T S H E E T

Regarding an NPDES Permit To Discharge to Waters of the State of Ohio
for the **Wadsworth WWTP**

Public Notice No.: 10-05-069
Public Notice Date: May 26, 2010
Comment Period Ends: June 26, 2010

OEPA Permit No.: **3PD00022*QD**
Application No.: **OH0027936**

Name and Address of Applicant:

City of Wadsworth
120 Maple Street
Wadsworth, Ohio 44281

Name and Address of Facility Where Discharge Occurs:

City of Wadsworth WWTP
1015 Airport Drive
Wadsworth, Ohio 44281
Medina County

Receiving Water: **River Styx**

Subsequent Stream Network: **Chippewa Creek to Tuscarawas River to Muskingum River to the Ohio River**

Introduction

Development of a Fact Sheet for NPDES permits is mandated by Title 40 of the Code of Federal Regulations, Section 124.8 and 124.56. This document fulfills the requirements established in those regulations by providing the information necessary to inform the public of actions proposed by the Ohio Environmental Protection Agency, as well as the methods by which the public can participate in the process of finalizing those actions.

This Fact Sheet is prepared in order to document the technical basis and risk management decisions that are considered in the determination of water quality based NPDES Permit effluent limitations. The technical basis for the Fact Sheet may consist of evaluations of promulgated effluent guidelines, existing effluent quality, instream biological, chemical and physical conditions, and the relative risk of alternative effluent limitations. This Fact Sheet details the discretionary decision-making process empowered to the Director by the Clean Water Act and Ohio Water Pollution Control Law (ORC 6111). Decisions to award variances to Water Quality Standards or promulgated effluent guidelines for economic or technological reasons will also be justified in the Fact Sheet where necessary.

Effluent limits based on available treatment technologies are required by Section 301(b) of the Clean Water Act. Many of these have already been established by U.S. EPA in the effluent guideline regulations (a.k.a. categorical regulations) for industry categories in 40 CFR Parts 405-499. Technology-based regulations for publicly-owned treatment works are listed in the Secondary Treatment Regulations (40 CFR Part 133). If regulations have not been established for a category of dischargers, the director may establish technology-based limits based on best professional judgment (BPJ).

Ohio EPA reviews the need for water-quality-based limits on a pollutant-by-pollutant basis. Wasteload allocations are used to develop these limits based on the pollutants that have been detected in the discharge, and the receiving water's assimilative capacity. The assimilative capacity depends on the flow in the water receiving the discharge, and the concentration of the pollutant upstream. The greater the upstream flow, and the lower the upstream concentration, the greater the assimilative capacity is. Assimilative capacity may represent dilution (as in allocations for metals), or it may also incorporate the break-down of pollutants in the receiving water (as in allocations for oxygen-demanding materials).

The need for water-quality-based limits is determined by comparing the wasteload allocation for a pollutant to a measure of the effluent quality. The measure of effluent quality is called PEQ - Projected Effluent Quality. This is a statistical measure of the average and maximum effluent values for a pollutant. As with any statistical method, the more data that exists for a given pollutant, the more likely that PEQ will match the actual observed data. If there is a small data set for a given pollutant, the highest measured value is multiplied by a statistical factor to obtain a PEQ; for example if only one sample exists, the factor is 6.2, for two samples - 3.8, for three samples - 3.0. The factors continue to decline as samples sizes increase. These factors are intended to account for effluent variability, but if the pollutant concentrations are fairly constant, these factors may make PEQ appear larger than it would be shown to be if more sample results existed.

Summary of Permit Conditions (This summary reflects only the changes made in this propsed permit compared to the existing permit conditions)

- Since hexavalent chromium, and free cyanide were not detected in all past 70 samples, monitoring has been dropped for these two parameters. Based on reasonable potential assessment, Bis(2-ethylhexyl) Phthalate has been recommended for monitoring only without a limit.

- Based on reasonable potential assessment, selenium and TDS (total dissolved solids) have been added in the effluent table for monitoring. In order to reduce nutrient impact into the receiving stream, reduction of phosphorus is needed and therefore discharge limit has been recommended.

- Final effluent limits are proposed for *Escherichia coli.* Water quality standards for *E. coli* became effective in March 2010. A compliance schedule is proposed for meeting these new *E.Coli* limits. Based on best professional judgment, it is proposed that the plant comply with its current fecal coliform limits during the interim period.

- Operator certification requirements have been included in Part II, Item A of the permit in accordance with rules adopted in December 2006.

- Parts IV, V, and VI have been included with the draft permit in order to ensure that any storm water flows from the facility site are properly regulated and managed.

- Based on Ohio EPA's toxicity test results, facility's toxicity test results and the federal requirement for biomonitoring, semi-annual acute and chronic testing with two species has been recommended in the permit.

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<u>Procedures for Participation in the Formulation of Final Determinations</u>

The draft action shall be issued as a final action unless the Director revises the draft after consideration of the record of a public meeting or written comments, or upon disapproval by the Administrator of the U.S. Environmental Protection Agency.

Within thirty days of the date of the Public Notice, any person may request or petition for a public meeting for presentation of evidence, statements or opinions. The purpose of the public meeting is to obtain additional evidence. Statements concerning the issues raised by the party requesting the meeting are invited. Evidence may be presented by the applicant, the state, and other parties, and following presentation of such evidence other interested persons may present testimony of facts or statements of opinion.

Requests for public meetings shall be in writing and shall state the action of the Director objected to, the questions to be considered, and the reasons the action is contested. Such requests should be addressed to:

Legal Records Section
Ohio Environmental Protection Agency
P.O. Box 1049
Columbus, Ohio 43216-1049

Interested persons are invited to submit written comments upon the discharge permit. Comments should be submitted in person or by mail no later than 30 days after the date of this Public Notice. Deliver or mail all comments to:

Ohio Environmental Protection Agency
Attention: Division of Surface Water
Permits and Compliance Section
P.O. Box 1049
Columbus, Ohio 43216-1049

The OEPA permit number and Public Notice numbers should appear on each page of any submitted comments. All comments received no later than 30 days after the date of the Public Notice will be considered.

Citizens may conduct file reviews regarding specific companies or sites. Appointments are necessary to conduct file reviews, because requests to review files have increased dramatically in recent years. The first 250 pages copied are free. For requests to copy more than 250 pages there is a five-cent charge for each page copied. Payment is required by check or money order, made payable to Treasurer State of Ohio.

For additional information about this fact sheet or the draft permit, contact Raj Chakrabarti by phone at (614) 644-2027or by email at raj.chakrabarti@epa.state.oh.us.

Location of Discharge/Receiving Water Use Classification

The Wadsworth WWTP discharges to the River Styx at River Mile 3.34. The approximate location of the facility is shown in Figure 1.

The River Styx flows into the Chippewa Creek which flows into the Tuscarawas River which flows into the Muskingum River which then flows into the Ohio River. The River Styx is designated for the following uses under Ohio's Water Quality Standards (OAC 3745-1-24): Modified Warmwater Habitat (MWH), Agricultural Water Supply (AWS) and Industrial Water Supply (IWS); Primary Contact Use-Class B.

This section of the River Styx is designated by the Ohio EPA River Code 17-553 and the USEPA River Reach number 05040001-031. The River Styx study area is shown in Figure 2.

Use designations define the goals and expectations of a waterbody. These goals are set for aquatic life protection, recreation use and water supply use, and are defined in the Ohio WQS (OAC 3745-1-07). The use designations for individual waterbodies are listed in rules -08 through -32 of the Ohio WQS. Once the goals are set, numeric water quality standards are developed to protect these uses. Different uses have different water quality criteria.

Use designations for aquatic life protection include habitats for coldwater fish and macroinvertebrates, warmwater aquatic life and waters with exceptional communities of warmwater organisms. These uses all meet the goals of the federal Clean Water Act. Ohio WQS also include aquatic life use designations for waterbodies which cannot meet the Clean Water Act goals because of human-caused conditions that cannot be remedied without causing fundamental changes to land use and widespread economic impact. The dredging and clearing of some small streams to support agricultural or urban drainage is the most common of these conditions. These streams are given Modified Warmwater or Limited Resource Water designations.

Recreation uses are defined by the depth of the waterbody and the potential for wading or swimming. Uses are defined for bathing waters, swimming/canoeing (Primary Contact) and wading only (Secondary Contact - generally waters too shallow for swimming or canoeing).

Water supply uses are defined by the actual or potential use of the waterbody. Public Water Supply designations apply near existing water intakes so that waters are safe to drink with standard treatment. Most other waters are designated for agricultural and industrial water supply.

Facility Description and Facility Expansion

The Wadsworth WWTP was constructed in 1954, and the last major plant modification was in 2005-2008. The facility had a design flow of 3.6 MGD until 2005. The Wadsworth WWTP expanded from 3.6 to 5.0 MGD. The Wadsworth WWTP serves the City of Wadsworth and Sharon Township.

The overall plant capacity for average design flow was raised from 3.6 MGD to 5.0 MGD, while the design peak daily and hourly influent flows was raised to 10 MGD and 15 MGD respectively. New primary settling tanks and final settling tanks were installed. The biological treatment processes were converted from two-stage nitrification to single-stage nitrification. New tertiary filters were installed and chlorination was replaced by ultraviolet disinfection. Sludge storage volume and processing capabilities were increased through the conversion of certain existing aeration and settling tanks to aerated sludge storage tanks, and the addition of a new belt filter press. Total sewage sludge generated at the facility for the most recent year is 503.44 dry tons. The sludge is used for land application.

The upgraded plant provides complete primary, secondary, and tertiary treatment for flows up to 10 MGD. Flows above 10 MGD undergo primary and tertiary treatment with an internal bypass around secondary treatment and blending prior to discharge. Such treatment bypass is prohibited except under conditions where the bypass occurs in full compliance with all the provisions of 40 CFR 122.41(m) and Part III Item II of the NPDES permit for the Wadsworth WWTP. The plant is designed such that the blended discharge will meet current NPDES permit standards.

602 station is for the blending of the bypass around secondary treatment. Wadsworth WWTP is required to monitor for biological oxygen demand (BOD), suspended solids, ammonia, and flow for this bypass.

The Wadsworth WWTP is 100% separate sanitary sewers. The inflow and infiltration rate is approximately 1,200,000 gpd. To minimize inflow/infiltration a comprehensive sanitary sewer evaluation was done in 2006. Stimulus funding has been granted to inspect and reline sewers in 2009.

On January 16, 1985 Wadsworth's industrial pretreatment program was approved by Ohio EPA. The Pretreatment Implementation Review Task Force requirements were approved on July 23, 1991; the local sewer ordinance was adopted on July 23, 1991; and the Enforcement Response Plan was approved on July 23, 1991. Three categorical industrial users discharge to the Wadsworth WWTP.

Description of Existing Discharge

Table A presents a summary of unaltered monthly operation report data for the period January 2004 through December 2008 for the Wadsworth WWTP as well as current permit limits.

Tables B present a summary of analytical results for outfall 001 effluent samples compiled from the annual pretreatment reports submitted by the Wadsworth WWTP, and from bioassay tests done by Ohio EPA.

Table 1 summarizes the chemical specific data for outfall 001 and presents the average and maximum Projected Effluent Quality (PEQ) values.

Assessment of Impact on Receiving Waters

An assessment of the impact of a permitted point source on the immediate receiving waters includes an evaluation of the available chemical/physical, biological, and habitat data which have been collected by Ohio EPA pursuant to the Five-Year Basin Approach for Monitoring and NPDES Reissuance. Other data may be used provided it was collected in accordance with Ohio EPA methods and protocols as specified by the Ohio Water Quality Standards and Ohio EPA guidance documents. Other information which may be evaluated includes, but is not limited to: NPDES permittee self-monitoring data; effluent and mixing zone bioassays conducted by Ohio EPA, the permittee, or U.S. EPA.

In evaluating this data, Ohio EPA attempts to link environmental stresses and measured pollutant exposure to the health and diversity of biological communities. Stresses can include pollutant discharges (permitted and unpermitted), land use effects, and habitat modifications. Indicators of exposure to these stresses include whole effluent toxicity tests, fish tissue chemical data, and fish health biomarkers (for example, fish blood tests).

Use attainment is a term which describes the degree to which environmental indicators are either above or below criteria specified by the Ohio Water Quality Standards (WQS; Ohio Administrative Code 3745-1). Assessing use attainment status for aquatic life uses primarily relies on the Ohio EPA biological

criteria (OAC 3745-1-07; Table 7-15). These criteria apply to rivers and streams outside of mixing zones. Numerical biological criteria are based on measuring several characteristics of the fish and macroinvertebrate communities; these characteristics are combined into multimetric biological indices including the Index of Biotic Integrity (IBI) and modified Index of Well-Being (MIwb), which indicate the response of the fish community, and the Invertebrate Community Index (ICI), which indicates the response of the macroinvertebrate community. Numerical criteria are broken down by ecoregion, use designation, and stream or river size. Ohio has five ecoregions defined by common topography, land use, potential vegetation and soil type.

Three attainment status results are possible at each sampling location -full, partial, or non-attainment. Full attainment means that all of the applicable indices meet the biocriteria. Partial attainment means that one or more of the applicable indices meet the biocriteria or one of the organism groups reflects poor or very poor performance. An aquatic life use attainment table is constructed based on the sampling results and is arranged from upstream to downstream and includes the sampling locations indicated by river mile, the applicable biological indices, the use attainment status (i.e., full, partial, or non), the Qualitative Habitat Evaluation Index (QHEI), and comments and observations for each sampling location.

From the most recent biological assessment of the study area, please refer to the following document *Total Maximum Daily Loads for the Tuscarawas River Watershed*, approved in July 2009. http://www.epa.ohio.gov/portals/35/tmdl/TuscarawasRiverTMDL_final_jul09_wo_app.pdf

The report concludes nutrient impairment downstream from the discharge of Wadsworth's effluent. Wadsworth is required to reduce phosphorus discharge from existing 3 mg/l to 1 mg/l within a year. Figure 3 explains the concentration of nutrients (ammonia and phosphorus) upstream and downstream of Wadsworth WWTP.

Development of Water-Quality-Based Effluent Limits

Determining appropriate effluent concentrations is a multiple-step process in which parameters are identified as likely to be discharged by a facility, evaluated with respect to Ohio water quality criteria, and examined to determine the likelihood that the existing effluent could violate the calculated limits.

***Parameter Selection**:* Effluent data for the Wadsworth WWTP were used to determine what parameters should undergo wasteload allocation. The parameters discharged are identified by the data available to Ohio EPA - Monthly Operating Report (MOR) data submitted by the permittee, compliance sampling data collected by Ohio EPA, and any other data submitted by the permittee, such as priority pollutant scans required by the NPDES application or by pretreatment, or other special conditions in the NPDES permit. The sources of effluent data used in this evaluation are as follows:

Self-monitoring data (LEAPS)	January 2004 through December 2009
Ohio EPA data (compliance, pretreatment)	January 2005 through October 2008

The effluent data were checked for outliers and the following values were eliminated: phosphorus (1594, 1977, 2537, 2020 mg/l) and mercury (85.5 ng/l). The average and maximum projected effluent quality (PEQ) values are presented in Table 1. For a summary of the screening results, refer to the parameter groupings in Table 5.

This data is evaluated statistically, and Projected Effluent Quality (PEQ) values are calculated for each pollutant. Average PEQ (PEQ_{avg}) values represent the 95th percentile of monthly average data, and maximum PEQ (PEQ_{max}) values represent the 95th percentile of all data points. The average and

maximum PEQ values are presented in Table 1.

The PEQ values are used according to Ohio rules to compare to applicable water quality standards (WQS) and allowable wasteload allocation (WLA) values for each pollutant evaluated. Initially, PEQ values are compared to the applicable average and maximum WQS. If both PEQ values are less than 25 percent of the applicable WQS, the pollutant does not have the reasonable potential to cause or contribute to exceedances of WQS, and no wasteload allocation is done for that parameter. If either PEQ_{avg} or PEQ_{max} is greater than 25 percent of the applicable WQS, a wasteload allocation is conducted to determine whether the parameter exhibits reasonable potential and needs to have a limit or if monitoring is required. See Table 5 for a summary of the screening results.

Wasteload Allocation Results : For those parameters that require a WLA, the results are based on the uses assigned to the receiving waterbody in OAC 3745-1. Dischargers are allocated pollutant loadings/concentrations based on the Ohio Water Quality Standards (OAC 3745-1). Most pollutants are allocated by a mass-balance method because they do not degrade in the receiving water. Wasteload allocations using this method are done using the following general equation: Discharger WLA = (downstream flow x WQS) - (upstream flow x background concentration). Discharger WLAs are divided by the discharge flow so that the allocations are expressed as concentrations.

The assimilative capacity was divided among Hubbell Power Systems, Inc., Wadsworth WWTP and Rittman WWTP in order to account for possible interactivity of the discharges. The CONSWLA program for conservative parameters was used to model those parameters requiring allocations. The study area is depicted in Figure 2.

The applicable waterbody uses for this facility's discharge and the associated stream design flows are as follows:

Aquatic life (WWH)		
Toxics (metals, organics, etc.)	Average	Annual 7Q10
	Maximum	Annual 1Q10
Ammonia-N	Average	Summer/winter 30Q10
Agricultural Water Supply		Harmonic mean flow
Human Health (nondrinking)		Harmonic mean flow

Allocations are developed using a percentage of stream design flow as specified in Table 3, and allocations cannot exceed the Inside Mixing Zone Maximum criteria.

The data used in the WLA are listed in Tables 2 and 3. The wasteload allocation results to maintain all applicable criteria are presented in Table 4. The current ammonia limits have been evaluated using the wasteload allocation procedures and are protective of water quality standards.

Whole Effluent Toxicity WLA Whole effluent toxicity (WET) is the total toxic effect of an effluent on aquatic life measured directly with a toxicity test. Acute WET measures short term effects of the effluent while chronic WET measures longer term and potentially more subtle effects of the effluent.

Water Quality Standards for WET are expressed in Ohio's narrative "free from" WQS rule [OAC 3745-1-04(D)]. These "free froms" are translated into toxicity units (TUs) by the associated WQS Implementation Rule (OAC 3745-2-09). Wasteload allocations can then be calculated using TUs as if they were water quality criteria.

The wasteload allocation calculations for WET are similar to those for aquatic life criteria - using the

chronic toxicity unit (TU_c) and 7Q10 flow for the average and the acute toxicity unit (TU_a) and 1Q10 flow for the maximum. These values are the levels of effluent toxicity that should not cause instream toxicity during critical low-flow conditions. For the Wadsworth WWTP, the wasteload allocation values are 0.33 TU_a and 1.11 TU_c.

The chronic toxicity unit (TU_c) is defined as 100 divided by the IC_{25}:

$$TU_c = 100/IC_{25}$$

This equation applies outside the mixing zone for warmwater, modified warmwater, exceptional warmwater, coldwater, and seasonal salmonid use designations except when the following equation is more restrictive (Ceriodaphnia dubia only):

$$TU_c = 100/\text{geometric mean of NOEC and LOEC}$$

The acute toxicity unit (TU_a) is defined as 100 divided by the LC_{50} for the most sensitive test species:

$$TU_a = 100/LC_{50}$$

This equation applies outside the mixing zone for warmwater, modified warmwater, exceptional warmwater, coldwater, and seasonal salmonid use designations.

Reasonable Potential/ Effluent Limits/Hazard Management Decisions

After appropriate effluent limits are calculated, the reasonable potential of the discharger to violate the water quality standards must be determined. Each parameter is examined and placed in a defined "group". Parameters that do not have a water quality standard or do not require a wasteload allocation based on the initial screening are assigned to either group 1 or 2. For the allocated parameters, the preliminary effluent limits (PEL) based on the most restrictive average and maximum wasteload allocations are selected from Table 4. The average PEL (PEL_{avg}) is compared to the average PEQ (PEQ_{avg}) from Table 1, and the PEL_{max} is compared to the PEQ_{max}. Based on the calculated percentage of the allocated value [($PEQ_{avg} \div PEL_{avg}$) X 100, or ($PEQ_{max} \div PEL_{max}$) X 100)], the parameters are assigned to group 3, 4, or 5. The groupings are listed in Table 5.

The final effluent limits are determined by evaluating the groupings in conjunction with other applicable rules and regulations. Table 6 presents the final effluent limits and monitoring requirements proposed for Wadsworth WWTP outfall 3PD00025001 and the basis for their recommendation.

The limits proposed for dissolved oxygen, total suspended solids, summer and winter ammonia-nitrogen. oil and grease, and $CBOD_5$ (5-day carbonaceous biochemical oxygen demand) are based on the existing permit.

The limits recommended for pH are based on Ohio Water Quality Standards (OAC 3745-1-07).

Water quality standards for *E. coli* became effective in March 2010, and it is proposed that the facility meet these new final effluent limits no later than 12 months from the effective date of the permit. Based on best professional judgment, it is proposed that the plant comply with its current fecal coliform limits during the interim period. A compliance schedule has been provided in the permit.

Based on reasonable potential for requiring monitoring in NPDES permits [OAC 3745-33-07(A)], monitoring is proposed for cadmium, total recoverable chromium, nickel, lead, nitrate+nitrite and Bis (2-

ethylhexyl) Phthalate. These pollutants were included in Groups 2 and 3 under the risk assessment procedures (Table 5). Continued monitoring will help to maintain a current data base on the level of these pollutants in the plant effluent. This data will be used to assess reasonable potential at future permit renewals. As explained earlier, under river impact assessment study that, due to nutrient enrichment, phosphorus limit based on TMDL recommendation, has been introduced in the permit. The entity needs to comply with phosphorus limits (monthly average 1mg/l and daily maximum 1.5 mg/l) within one year from the effective date of the permit.

Since there has been no detection of hexavalent chromium and free cyanide in the last 70 samples, monitoring requirement has been removed.

The Ohio EPA risk assessment (Table 5) places zinc and mercury (before the mixing zone phase out time becomes effective after 11/15/2010) in group 4. Based on this reasonable potential assessment, zinc monitoring will continue at the present frequency of once per month. Mercury is also placed under group 5 (Table 5) beginning November 15, 2010 (i.e., after the mixing zone phase out time).

For mercury, the agency was confirmed by April 1, 2010 letter from Burgess and Nipple, consultant for Wadsworth WWTP, that Wadsworth will comply with existing water quality based mercury limit and they do not need a mercury variance. Therefore, the existing permit limits (10 ng/l monthly average and 845 ng/l daily maximum) have been maintained in the draft permit. The appropriate reporting code 50092 for low-level mercury testing (quantification level of 1 ng/l) has been assigned in the permit effluent tables

Selenium and copper are placed under group 5 (Table 5). Out of three selenium samples two were non-detect. Using the discretion allowed under [OAC 3745-33-07(A)(5)], monitoring is recommended in order to collect more selenium samples and a better characterization of this pollutant is made. Copper limit is justified based on reasonable potential assessment. The existing limit, more stringent that WLA based limit is remaining in the permit due to antibacksliding rule.

Comparison of PEQ values with PEL qualifies TDS to be a group 5 parameter which is missing in Table 5. However, due to insufficient data, instead of a limit, TDS has been recommended for monitoring.

Based on reasonable potential for requiring monitoring in NPDES permits [OAC 3745-33-07(A)], no effluent monitoring is proposed for the following parameters: arsenic, antimony, molybdenum, strontium, dibromochloromethane, barium, calcium, chlorides, magnesium, potassium, sodium and silver.

Limits and monitoring requirements proposed for the disposal of sewage sludge by the following management practices are based on OAC 3745-40: land application, removal to sanitary landfill or transfer to another facility with an NPDES permit.

Additional monitoring requirements proposed for the final effluent, influent, and sludge stations are included for all facilities in Ohio and vary according to the type and size of the discharge. In addition to permit compliance, this data is used to assist in the evaluation of effluent quality and treatment plant performance, for designing plant improvements, and conducting future stream studies

Whole Effluent Toxicity WLA

Whole effluent toxicity or "WET" is the total toxic effect of an effluent on aquatic life measured directly with a toxicity test. Acute WET measures short term effects of the effluent while chronic WET measures longer term and potentially more subtle effects of the effluent.

Water Quality Standards for WET are expressed in Ohio's narrative "free from" WQS rule (OAC 3745-

1-04(D)). These "free froms" are translated into toxicity units (TUs) by the associated WQS Implementation Rule (OAC 3745-2-09). Wasteload allocations can then be calculated using TUs as if they were water quality criteria.

The allowable effluent toxicity (AET) is a factor considered in evaluating whole effluent toxicity. The AET calculations are similar to those for aquatic life criteria (using the chronic toxicity unit (TU_c) and 7Q10 for average and the acute toxicity unit (TU_a) and 1Q10 for maximum). For the Wadsworth WWTP, the AET values are $0.33TU_a$ and 1.11 Tu_c.

When the calculated wasteload allocation is less than 1.0 TU_a, the wasteload allocation is defined as:

Dilution Ratio (downstream flow to discharger flow)	Allowable Effluent Toxicity (percent effects in 100% effluent)
up to 2 to 1	30
greater than 2 to 1 but less than 2.7 to 1	40
2.7 to 1 to 3.3 to 1	50

The WLA is 30% mortality in 100% effluent based on the dilution ratio of 1.1 to 1.
This is because of the following:

$$\frac{\text{Downstream flow}}{\text{Discharger flow}} = \frac{\text{Upstream flow + Discharger flow}}{\text{Discharger flow}} = \frac{0.685\text{ cfs} + 7.73\text{ cfs}}{7.73\text{ cfs}} = \frac{8.415\text{ cfs}}{7.73\text{ cfs}} = 1.09 = 1$$

Based on the current permit requirement, Wadsworth did four tests with no indication of any significant toxicity. However, the toxicity tests run by Ohio EPA in September 8, 2008 showed the effluents were acutely toxic to *Ceriodaphnia.* Within 24-hours exposure all *C. dubia* were dead in the 8 September effluent grab. By test end daphnid mortality was 80 percent in the acute mixing zone and the 9 September effluent grab. No other mortality or adverse effects were observed in the ambient waters. With composite effluents, no mortality or adverse effects were observed in any of the test concentrations.

It is quite evident more tests are needed to characterize the effluent toxicity. Federal regulation requires annual toxicity tests with at least two species. Quarterly toxicity tests should continue for the life of the permit. Since the receiving stream is effluent dominated, chronic toxicity tests with measurements of acute end points is recommended in the permit.

Other Requirements

Sanitary Sewer Overflow Reporting
Provisions for reporting sanitary sewer overflows (SSOs) are also proposed in this permit. These provisions include: the reporting of the system-wide number of SSO occurrences on monthly operating reports; telephone notification of Ohio EPA and the local health department, and 5-day follow up written reports for certain high risk SSOs; and preparation of an annual report that is submitted to Ohio EPA and made available to the public. Many of these provisions were already required under the "Noncompliance Notification", "Records Retention", and "Facility Operation and Quality Control" general conditions in Part III of Ohio NPDES permits.

Operator Certification
Operator certification requirements have been included in Part II, Item A of the permit in accordance with rules adopted in December 2006. These rules require the Wadsworth WWTP to have a Class IV wastewater treatment plant operator in charge of the sewage treatment plant operations discharging

through outfall 001.

Operator of Record
In December 2006, Ohio Administrative Code rule revisions became effective which affect the requirements for certified operators for sewage collection systems and treatment works regulated under NPDES permits. Part II, Item A of this NPDES permit is included to implement rule 3745-7-02 of the Ohio Administrative Code (OAC). It requires the permittee to designate one or more operators of record to oversee the technical operation of the treatment works.

Storm Water Compliance
Parts IV, V, and VI have been included with the draft permit in order to ensure that any storm water flows from the facility site are properly regulated and managed. As an alternative to complying with Parts IV, V, and VI, the Wadsworth WWTP may seek permit coverage under the general permit for industrial storm water (permit # OHR000004) or submit a "No Exposure Certification." Parts IV, V, and VI will be removed from the final permit if: 1) the Wadsworth WWTP submits a Notice of Intent (NOI) for coverage under the general permit for industrial storm water or submits a No Exposure Certification, 2) Ohio EPA determines that the facility is eligible for coverage under the general permit or meets the requirements for a No Exposure Certification, and 3) the determination by Ohio EPA can be made prior to the issuance of the final permit.

Outfall Signage
Part II of the permit includes requirements for signs to be placed at each outfall to River Styx, providing information about the discharge. Signage at outfalls is required pursuant to Ohio Administrative Code 3745-33-08(A)

Table 1. Effluent Data for Wadsworth WWTP

	Number of	Number >	PEQ	PEQ

Parameter	Units	Samples	MDL	Average	Maximum
Self-Monitoring (MOR) Data					
Ammonia-S	mg/l	314	164	7.5117	10.29
Ammonia-W	mg/l	216	125	2.0346	3.2358
Bis(2-EHP)	µg/l	70	17	3.5186	5.112
Cadmium - TR	µg/l	70	0	--	--
Chlorine - TR	mg/l	551	0	--	--
Chromium - TR	µg/l	70	1	14.6	20
Chromium VI - Diss	µg/l	70	0	--	--
Copper - TR	µg/l	86	61	58.695	88.901
Cyanide - free	mg/l	70	0	--	--
Lead - TR	µg/l	70	0	--	--
Mercury - TR	ng/l	50	49	14.045	22.563
Nickel - TR	µg/l	69	8	24.82	34
Nitrate-N + Nitrite-N	mg/l	70	61	29.395	45.086
Phosphorus	mg/l	202	196	4.6277	6.885
Zinc - TR	µg/l	69	68	137.78	187.95
Ohio EPA and Pretreatment Program Data					
Arsenic - TR	µg/l	4	1	7.88	10.8
Barium	µg/l	4	1	44.38	60.8
Chlorides	mg/l	2	2	396.682	543.4
Dibromochloromethane	µg/l	3	1	2.409	3.3
Dissolved solids, total	mg/l	2	2	1759	2409
Magnesium	mg/l	2	2	63.802	87.4
Selenium - TR	µg/l	3	1	15.549	21.3
Strontium	µg/l	2	2	715.692	980.4

Table 2. Water Quality Criteria in the Study Area

Parameter	Units	Average Human Health	Average Agri Supply	Maximum Inside Aquatic Life	Maximum Inside Aquatic Life	Mixing Zone Maximum
Ammonia-S	mg/l	--	--	2.7	--	--
Ammonia-W	mg/l	--	--	6.6	--	--
Antimony	µg/l	4300	--	190	900	1800
Arsenic - TR	µg/l	--	100	150	340	680
Barium	µg/l	--	--	220	2000	4000
Bis(2-ehp)	µg/l	59[c]	--	8.4	1100	2100
Cadmium – TR [A]	µg/l	--	50	4.5	11	23
Chlorine - TR	mg/l	--	--	0.011	0.019	0.038
Chromium – TR [A]	µg/l	--	100	170	3600	7100
Chromium VI - Diss	µg/l	--	--	11	16	31
Copper – TR [A]	µg/l	1300	500	21	34	67
Cyanide - free	mg/l	220	--	0.012	0.046	0.092
Dibromochloromethane	µg/l	340[c]	--	--	--	--
Dissolved solids, total	mg/l	--	--	1500	--	--
Lead – TR [A]	µg/l	--	100	40	750	1500
Mercury - TR [B]	ng/l	12	10000	910	1700	3400
Molybdenum	µg/l	--	--	20000	190000	370000
Nickel – TR [A]	µg/l	4600	200	110	960	1900
Nitrate-N + Nitrite-N	mg/l	--	100	--	--	--
Selenium - TR	µg/l	11000	50	5	--	--
Silver [A]	µg/l	--	--	1.3	6.7	13
Strontium	µg/l	--	--	21000	40000	81000
Thallium	µg/l	6.3	--	17	79	160
Zinc – TR [A]	µg/l	69000	25000	280	280	550

[A] Aquatic Life Criteria is hardness-based.
[B] Bioaccumulative Chemical of Concern (BCC)
[C] This criterion is based on a carcinogenic endpoint.

Table 3. Instream Conditions for River Styx and Discharger Flow

Parameter	Units		Value	Basis
7Q10	cfs	annual	0.845	USGS gage #03116200, 1960-81 data
1Q10	cfs	annual	0.685	USGS gage #03116200, 1960-81 data
Harmonic Mean Q	cfs	annual	4.21	USGS gage #03116200, 1960-81 data
Instream Hardness	mg/l	annual	230.	LEAPS; 70 values, 2004-2009
Background Water Quality				
Antimony		annual	0.	No representative data available
Bis (2-ehp)		annual	0.	No representative data available
Cadmium		annual	0.	STORET; 12 values, 12<MDL,2003-2005
Chromium +6, diss.		annual	0.	No representative data available
Chromium, total		annual	0.	STORET; 12 values, 12<MDL,2003-2005
Copper		annual	0.	STORET; 12 values, 12<MDL,2003-2005
Dissolved solids, total		annual	426.	STORET; 11 values, 11<MDL,2003-2005
Nickel		annual	0.	STORET; 12 values, 12<MDL,2003-2005
Nitrate+Nitrite		annual	0.9	STORET; 11 values, 0<MDL,2003-2005
Lead		annual	1.	STORET; 11 values, 9<MDL,2003-2005
Mercury		annual	0.	STORET; 2 values, 0<MDL,2003-2005
Molybdenum		annual	0.	No representative data available
Selenium		annual	0.	STORET; 12 values, 12<MDL,2003-2005
Silver		annual	0.	No representative data available
Zinc		annual	5.	STORET; 11 values, 8<MDL,2003-2005
Discharge Flows				
Hubbell Power Sys., Inc	cfs	annual	0.0186	DSW
Wadsworth WWTP	cfs	design	7.74	DSW
Rittman WWTP	cfs	design	2.48	DSW

Table 4. Summary of Effluent Limits to Maintain Applicable Water Quality Criteria

Parameter	Units	Average Human Health	Average Agri Supply	Maximum Inside Aquatic Life	Aquatic Life	Mixing Zone Maximum
Antimony[B]	µg/l	6640.[A]	--	211.	980.	1800.
Bis (2-ehp)	µg/l	91.	--	9.3	1197.	2100.
Cadmium[B]	µg/l	--	71.[A]	4.9	12.	23.
Chromium^{+6}, dissolved[B]	µg/l	--	--	12.	17.	31.
Chromium, total[B]	µg/l	--	155.	189.	3927.	7100.
Copper	µg/l	1838.[A]	707.[A]	23.	36.	67.
Dissolved solids, total	mg/l	--	--	1617.	--	--
Lead[B]	µg/l	--	141.	43.	802.	1500.
Mercury[C]	µg/l	.017	14.[A]	1.0	1.8	3.4
Molybdenum[B]	µg/l	--	--	22185.	206826.	370000.
Nickel[B]	µg/l	6504.[A]	283.	119.	1026.	1900.
Nitrate+Nitrite	mg/l	--	154.	--	--	--
Selenium	µg/l	16987.	77.	5.5	--	--
Silver[B]	µg/l	--	--	1.4	7.3	13.
Zinc	µg/l	97380.[A]	35280.[A]	303.	298.	550.

[A] Allocation must not exceed the Inside Mixing Zone Maximum.

[B] Parameter would not require a WLA based on reasonable potential procedures, but allocation requested for use in pretreatment program.

[C] Bioaccumulative Chemical of Concern (BCC) no mixing zone allowed after 11/15/2010, WQS must be met at end-of-pipe, unless the requirements for an exclusion are met as listed in 3745-2-08 (L).

Table 5. Parameter Assessment

Group 1: Due to a lack of criteria, the following parameters could not be evaluated at this time.

Calcium	Chlorides	Magnesium
Phosphorus	Potassium	Sodium

Group 2: PEQ < 25% of WQS or all data below minimum detection limit; WLA not required. No limit recommended, monitoring optional.

Antimony	Arsenic	Barium	
Cadmium	Chlorine (TR)	Chromium (TR)	
Chromium^{+6} (dissolved)	Cyanide		
Dibromochloromethane, Lead		Nickel	Molybdenum
Silver	Strontium		

Group 3: PEQ_{max} < 50% of maximum PEL and PEQ_{avg} < 50% of average PEL. No limit recommended, monitoring optional.

Bis (2-EHP)	Nitrate+Nitrite

Group 4: $PEQ_{max} \geq$ 50% but <100% of the maximum PEL or $PEQ_{avg} \geq$ 50% but < 100% of the average PEL. Monitoring is appropriate.

Mercury (<11/15/10)	Zinc

Group 5: Maximum PEQ $\geq$ 100% of the maximum PEL or average PEQ $\geq$ 100% of the average PEL,or either the average or maximum PEQ is between 75 and 100% of the PEL and certain conditions that increase the risk to the environment are present. Limit recommended.

			Recommended Effluent Limits	
Parameter	Units	Applicable Period	Average	Maximum
Copper	µg/l	Annual	23.	36.
Mercury*	µg/l	Annual	0.017	1.8
Selenium	µg/l	Annual	5.5	--

* After11/15/2010

Table 6. Final effluent limits and monitoring requirements for the Wadsworth WWTP outfall 3PD00022001 and the basis for their recommendation.

		Effluent Limits				
		Concentration		Loading (kg/day)[a]		
Parameter	Units	30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	Basis[b]
Flow	MGD	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Temperature	°C	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Dissolved Oxygen	mg/l		Not less than 5.3			
$CBOD_5$	mg/l	11.	16.d	204.	313.d	EP
Suspended Solids	mg/l					
Summer		13.	19.d	245.	368.d	EP
Winter		14.	22.d	272.	409.d	EP
Ammonia-N	mg/l					
Summer		1.0	1.7d	20.4	31.3d	EP
Winter		4.0	6.5d	81.7	123.d	EP
Phosphorus	mg/l	1.0	1.5	18.925	28.38	TMDL
TKN		- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M
Oil and Grease	mg/l	- - - - - -	Not to exceed 7.2 at any time	- - - - - -		
pH	S.U.	- - - - - - - - - - - - -	6.5 to 9.0	- - - - - - - - - - - - -		WQS
E.Coli	#/100ml					
Summer		161	362.	–	–	WQS
Mercury, T.	ng/l	10.	845.	0.00019	0.016	EP/BPJ
Nickel, T. R.	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M
NO2+NO3	mg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M
Chromium, T. R.	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M
Zinc, T. R.	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		RP
Bis(2-ethylhexyl) phthalate	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - -		
Cadmium, T. R.	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M
Lead, T. R.	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M
Copper, T. R.	µg/l	18.	28.5	0.34	0.54	EP/ABS
Selenium	ug.l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - -		BPJ
TDS	ug/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - -		BPJ
Whole Effluent Toxicity						
Acute	Tua	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		WET[1]
Chronic	TUc	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		WET[1]

[a] Effluent loadings based on average design discharge flow of 5.0 MGD

[b] Definitions: ABS = Antibacksliding Rule (OAC 3745-33-05(E) and 40 CFR Part 122.44(l)); AD = Antidegradation (OAC 3745-1-05); BADCT = Best Available Demonstrated Control Technology (OAC 3745-1-05); BPJ = Best Professional Judgment; BPT =

Best Practicable Waste Treatment Technology, 40 CFR Part 133, Secondary Treatment Regulation; EP = Existing Permit; M = Monitoring; PD = Plant Design Criteria; RP = Reasonable Potential for requiring water quality-based effluent limits and monitoring requirements in NPDES permits (3745-33-07(A)); WET = Whole Effluent Toxicity (OAC 3745-33-07(B)) ; WET[1] = Whole Effluent Toxicity (OAC 3745-33-07 (B) (10));WLA = Wasteload Allocation procedures (OAC 3745-2); WLA/IMZM = Wasteload Allocation limited by Inside Mixing Zone Maximum; WQS = Ohio Water Quality Standards (OAC 3745-1); TMDL=Tuscarawas Watershed TMDL (Total Maximum Daily Load) report.

[c] Monitoring of flow and other indicator parameters is specified to assist in the evaluation of effluent quality and treatment plant performance.

[d] 7 day average limit.

Table A **Effluent Data for Wadsworth WWTP**

Parameter	Season	Units	Current Permit Limits		# Obs.	Percentiles		Data Range
			30 day	Daily		50th	95th	
Outfall 001								
Water Temperature	Annual	C	-	-	2131	16	21	6-23
Dissolved Oxygen	Summer	mg/l	5.3 Min.		1104	7.6	8.9	4.9-11.3
Dissolved Oxygen	Winter	mg/l	5.3 Min.		1027	7.9	10.2	4.2-12.2
Total Suspended Solids	Summer	mg/l	13	19[d]	1154	8	18	0-30
Oil and Grease, Hexane Extr Method	Annual	mg/l	-	7.2	141	0	7	0-11
Nitrogen, Ammonia (NH3)	Summer	mg/l	1.0	1.7[d]	470	0.1	5.92	0-14.7
Nitrogen, Ammonia (NH3)	Winter	mg/l	4.0	6.5[d]	438	0.1	3.31	0-10.7
Nitrogen Kjeldahl, Total	Annual	mg/l	-	-	51	1.78	9.84	0-15
Nitrite Plus Nitrate, Total	Annual	mg/l	-	-	70	8.09	19.1	0-25
Phosphorus, Total (P)	Annual	mg/l	-	-	206	2.45	4.08	0-2540
Cyanide, Free	Annual	mg/l	-	-	70	0	0	0-0
Nickel, Total Recoverable	Annual	ug/l	-	-	70	0	9.1	0-107
Zinc, Total Recoverable	Annual	ug/l	-	-	70	90	156	0-760
Cadmium, Total Recoverable	Annual	ug/l	-	-	70	0	0	0-0
Lead, Total Recoverable	Annual	ug/l	-	-	70	0	0	0-0
Chromium, Total Recoverable	Annual	ug/l	-	-	70	0	0	0-20
Copper, Total Recoverable	Annual	ug/l	18	28.5	86	13	46.8	0-55
Chromium, Dissolved Hexavalent	Annual	ug/l	-	-	70	0	0	0-0
Fecal Coliform	Annual	#/100 ml	1000	2000[d]	451	72	780	0-3500
Bis(2-ethylhexyl) Phthalate	Annual	ug/l	6.9	886	70	0	3.24	0-12.8
Flow Rate	Summer	MGD	-	-	1104	2.59	4.76	2.04-10.2
Flow Rate	Winter	MGD	-	-	1026	3.42	7.37	1.2-12.2
Flow Rate	Annual	MGD	-	-	2130	2.93	6.1	1.2-12.2
Chlorine, Total Residual	Annual	mg/l	-	-	551	0	0	0-0
Mercury, Total (Low Level, PQL=1000)	Annual	ng/l	10	845	51	4.4	17.9	0-85.5
Acute Toxicity, Ceriodaphnia dubia	Annual	TUa	-	-	9	0	0.56	0-0.8

Chronic Toxicity, Ceriodaphnia dubia	Annual	TUc	-	-	9	0	1.5	0-1.7
Acute Toxicity, Pimephales promelas	Annual	TUa	-	-	9	0	0.3	0-0.5
Chronic Toxicity, Pimephales promelas	Annual	TUc	-	-	9	0	0.74	0-1.1
pH, Maximum	Annual	S.U.	9.0 Max.		2131	7.1	7.5	6.6-9.5
pH, Minimum	Annual	S.U.	6.5 Min.		2131	7	7.2	6.5-7.5
Mercury, Total Recoverable	Annual	ug/l	10	845	19	0	0.21	0-2.1
CBOD 5 day	Summer	mg/l	11	16[d]	600	2.78	8.05	0-19
CBOD 5 day	Winter	mg/l	11	16[d]	551	4	8	0.2-26

[d] = weekly limit

Table B

Concentrations of Chemicals Found in Effluent (Wadsworth WWTP) 3PD00022

Annual Pretreatment Priority Pollutant Scans plus OEPA Bioassay Chemistry Data

Units are in ug/l unless otherwise stated

Parameter	2005	2006	OEPA (9/08)	OEPA (10/08)
Antimony	ND (20)	ND (2.0)	NA	NA
Arsenic	ND (20)	3.6 (1.0)	<2.0	<2.0
Beryllium	ND (4)	ND (0.2)	NA	NA
Cadmium	ND (5)	ND (0.5)	<2.0	<2.0
Chromium	ND (20)	ND (2.0)	<2.0	<2.0
Copper	25 (20)	20 (2.0)	8.1	7.7
Lead	ND (40)	ND (2.0)	<2.0	<2.0
Mercury	ND (0.2)	ND (0.2)	<0.2	<0.2
Nickel	ND (20)	ND (0.2)	6.8	5.3
Selenium	ND (20)	7.1 (1.0)	<2.0	<2.0
Silver	ND (20)	ND (0.2)	NA	NA
Thallium	ND (20)	ND (2.0)	NA	NA
Zinc	15 (20)	27 (4.0)	81	89
Dichlorobromomethane	ND (5)	1.1 (1.0)	<0.5	<0.5
Bis (2-EHP)	15 (10)	ND (2.5)	<10.1	<10.4
Cyanide, total	14 (10)	ND (10)	<10.0	<10.0
Barium	NA	NA	<15	16
Calcium, mg/l	NA	NA	65	68
Magnesium, mg/l	NA	NA	23	22
Potassium, mg/l	NA	NA	13	11
Sodium, mg/l	NA	NA	103	92
Strontium	NA	NA	253	258
TDS, mg/l	NA	NA	634	608
Chloride, mg/l	NA	NA	143	132
Nitrate+Nitrite, mg/l	NA	NA	17.9	17.5
TKN, mg/l	NA	NA	1.11	1.06
Total Phosphorus, mg/l	NA	NA	3.75	2.93

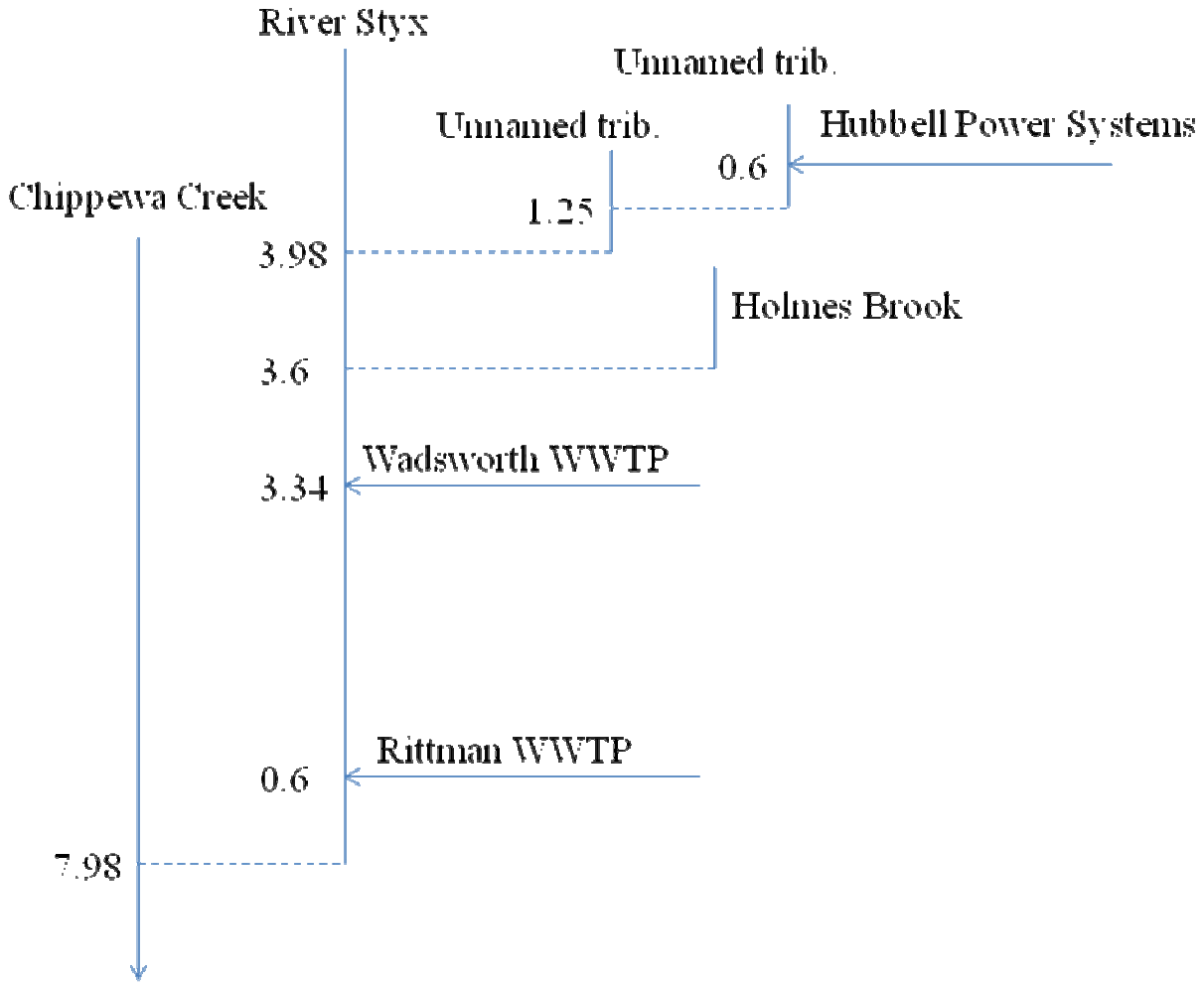
14-Digit HUC	Sub-Watershed	Sub-Watershed Extent (Upper RM-Lower RM)	MS4 entities[1]
020-050	River Styx	Entirety	City of Wadsworth
020-060 partial	Mill Creek	Entirety	Village of Doylestown, Wadsworth Township (Medina County), City of Wadsworth
020-080 partial	Silver Creek	Entirety	Chippewa Township (Wayne County), Village of Doylestown, City of Norton, Wadsworth Township (Medina County), City of Wadsworth

Table 5.17 River Styx water quality data bracketing the Wadsworth WWTP.

Parameter	River Styx upstream Wadsworth WWTP (RM 3.5)		River Styx down-stream Wadsworth WWTP (RM 2.8)	
	Average	Max	Average	Max
Total phosphorus (mg/l)	0.053	0.079	1.55	4.54
Ammonia (mg/l)	0.08	0.126	1.87	8.69
BOD 5-day	<2.	2.	15.05	79.

Figure 3.

Figure 2. River Styx Study Area



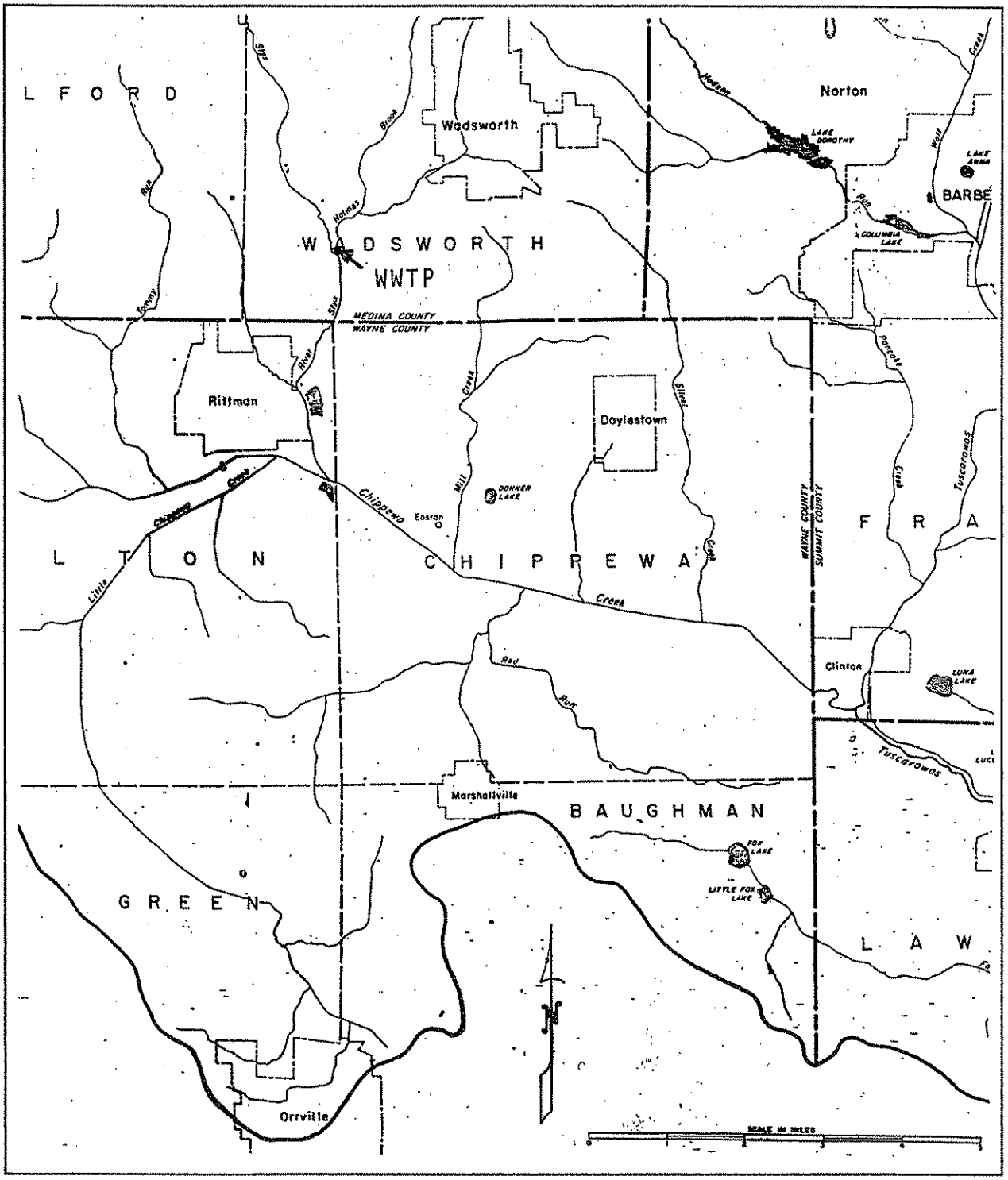


Figure 1. Approximate location of the Wadsworth WWTP.