

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

**Tinkers Creek Watershed Wastewater Treatment Plant (WWTP) Dischargers:**

1. **Aurora Westerly WWTP**
2. **Bedford WWTP**
3. **Bedford Heights WWTP**
4. **Portage County Streetsboro-Hudson WWTP**
5. **Solon Water Reclamation Facility**
6. **Twinsburg WWTP**

OEPA Permit No.:

1. **3PD00046 (Aurora Westerly)**
2. **3PD00005 (Bedford)**
3. **3PD00006 (Bedford Hts.)**
4. **3PK00014 (Portage Co. Streetsboro)**
5. **3PD00019 (Solon)**
6. **3PD00039 (Twinsburg)**

Application No.:

1. **OH0098043 (Aurora Westerly)**
2. **OH0024040 (Bedford)**
3. **OH0024058 (Bedford Hts.)**
4. **OH0090131 (Portage Co. Streetsboro)**
5. **OH0027430 (Solon)**
6. **OH0027863 (Twinsburg)**

Public Notice No.:

1. **14-05-088 (Aurora Westerly)**
2. **14-05-069 (Bedford)**
3. **14-05-068 (Bedford Heights)**
4. **14-05-080 (Portage C. Streetsboro)**
5. **14-05-081 (Solon)**
6. **14-05-087 (Twinsburg)**

Public Notice Date: May 28, 2014

Comment Period Ends: June 27, 2014

Name and Address of Applicant:

**City of Aurora  
Department of Public Service  
158 West Pioneer Trail  
Aurora, Ohio 44202**

Receiving Water: **Pond Brook via  
Unnamed Tributary**

Name and Address of Applicant:

**City of Bedford  
165 Center Road  
Bedford, Ohio 44146**

Receiving Water: **Wood Creek**

Name and Address of Applicant:

**City of Bedford Heights  
25301 Solon Road  
Bedford Heights, Ohio 44146**

Receiving Water: **Hawthorne Creek via  
Unnamed Tributary**

Name and Address of Applicant:

**Portage County Water Resources  
449 South Meridian Street  
Ravenna, Ohio 44266**

Receiving Water: **Tinkers Creek**

Name and Address of Facility Where  
Discharge Occurs: \_\_\_\_\_

**Aurora Westerly WWTP  
1230 W Garfield Rd  
Aurora, Ohio 44202  
Portage County**

Subsequent  
Stream Network: **Tinkers Creek – Cuyahoga  
River – Lake Erie**

Name and Address of Facility Where  
Discharge Occurs: \_\_\_\_\_

**Bedford WWTP  
705 W Glendale St  
Bedford, Ohio 44146  
Cuyahoga County**

Subsequent  
Stream Network: **Tinkers Creek – Cuyahoga  
River – Lake Erie**

Name and Address of Facility Where  
Discharge Occurs: \_\_\_\_\_

**Bedford WWTP  
25301 Solon Road  
Bedford Heights, Ohio 44146  
Cuyahoga County**

Subsequent  
Stream Network: **Tinkers Creek – Cuyahoga  
River – Lake Erie**

Name and Address of Facility Where  
Discharge Occurs: \_\_\_\_\_

**Streetsboro-Hudson WWTP  
9501 Jefferson St  
Streetsboro, Ohio 44241  
Portage County**

Subsequent  
Stream Network: **Cuyahoga River – Lake Erie**

Name and Address of Applicant:

**City of Solon  
34200 Bainbridge Road  
Solon, Ohio 44139**

Receiving Water: **Beaver Meadow Run**

Name and Address of Facility Where  
Discharge Occurs:

**Solon Central WRF  
6951 Cochran Road  
Solon, Ohio 44139  
Cuyahoga County**

Subsequent  
Stream Network: **Tinkers Creek – Cuyahoga  
River – Lake Erie**

Name and Address of Applicant:

**City of Twinsburg  
10075 Ravenna Road  
Aurora, Ohio 44087**

Receiving Water: **Tinkers Creek**

Name and Address of Facility Where  
Discharge Occurs:

**Twinsburg WWTP  
10231 Ravenna Road  
Twinsburg, Ohio 44087  
Summit County**

Subsequent  
Stream Network: **Cuyahoga River – Lake Erie**

### 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.

A combined fact sheet is generated here to be consistent with the watershed-based approach currently utilized for addressing impairments identified in Tinkers Creek. The approved TMDL for the Lower Cuyahoga River recommended that a stressor identification study be completed for Tinkers Creek. This fact sheet is prepared in consideration of ongoing work with the stressor study.

## Procedures for Participation in the Formulation of Final Determinations

*Permit Renewals – Aurora Shores, Aurora Westerly, Bedford, Bedford Heights, Solon, Streetsboro-Hudson, Twinsburg*

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.

### *Permit Renewals*

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.

## Information Regarding Certain Water Quality Based Effluent Limits

This draft permit may contain proposed water quality based effluent limitations for parameters that **are not** priority pollutants. (See the following link for a list of the priority pollutants: [http://epa.ohio.gov/portals/35/pretreatment/Pretreatment\\_Program\\_Priority\\_Pollutant\\_Detection](http://epa.ohio.gov/portals/35/pretreatment/Pretreatment_Program_Priority_Pollutant_Detection))

[Limits.pdf](#) ). In accordance with Ohio Revised Code Section 6111.03(J)(3), the Director established these water quality based effluent limits after considering, to the extent consistent with the Federal Water Pollution Control Act, evidence relating to the technical feasibility and economic reasonableness of removing the polluting properties from those wastes and to evidence relating to conditions calculated to result from that action and their relation to benefits to the people of the state and to accomplishment of the purposes of this chapter. This determination was made based on data and information available at the time the permit was drafted, which included the contents of the timely submitted National Pollutant Discharge Elimination System (NDPES) permit renewal application, along with any and all pertinent information available to the Director.

This public notice allows the permittee to provide to the Director for consideration during this public comment period additional site-specific pertinent and factual information with respect to the technical feasibility and economic reasonableness for achieving compliance with the proposed final effluent limitations for these parameters. The permittee shall deliver or mail this information to:

**Ohio Environmental Protection Agency  
Attention: Division of Surface Water  
Permits Processing Unit  
P.O. Box 1049  
Columbus, Ohio 43216-1049**

Should the applicant need additional time to review, obtain or develop site-specific pertinent and factual information with respect to the technical feasibility and economic reasonableness of achieving compliance with these limitations, written notification for any additional time shall be sent to the above address no later than 30 days after the Public Notice Date on Page 1.

Should the applicant determine that compliance with the proposed water quality based effluent limitations for parameters other than the priority pollutants is technically and/or economically unattainable, the permittee may submit an application for a variance to the applicable water quality standard(s) used to develop the proposed effluent limitation in accordance with the terms and conditions set forth in Ohio Administrative Code (OAC) Rule 3745-33-07(D). The permittee shall submit this application to the above address no later than 30 days after the Public Notice Date.

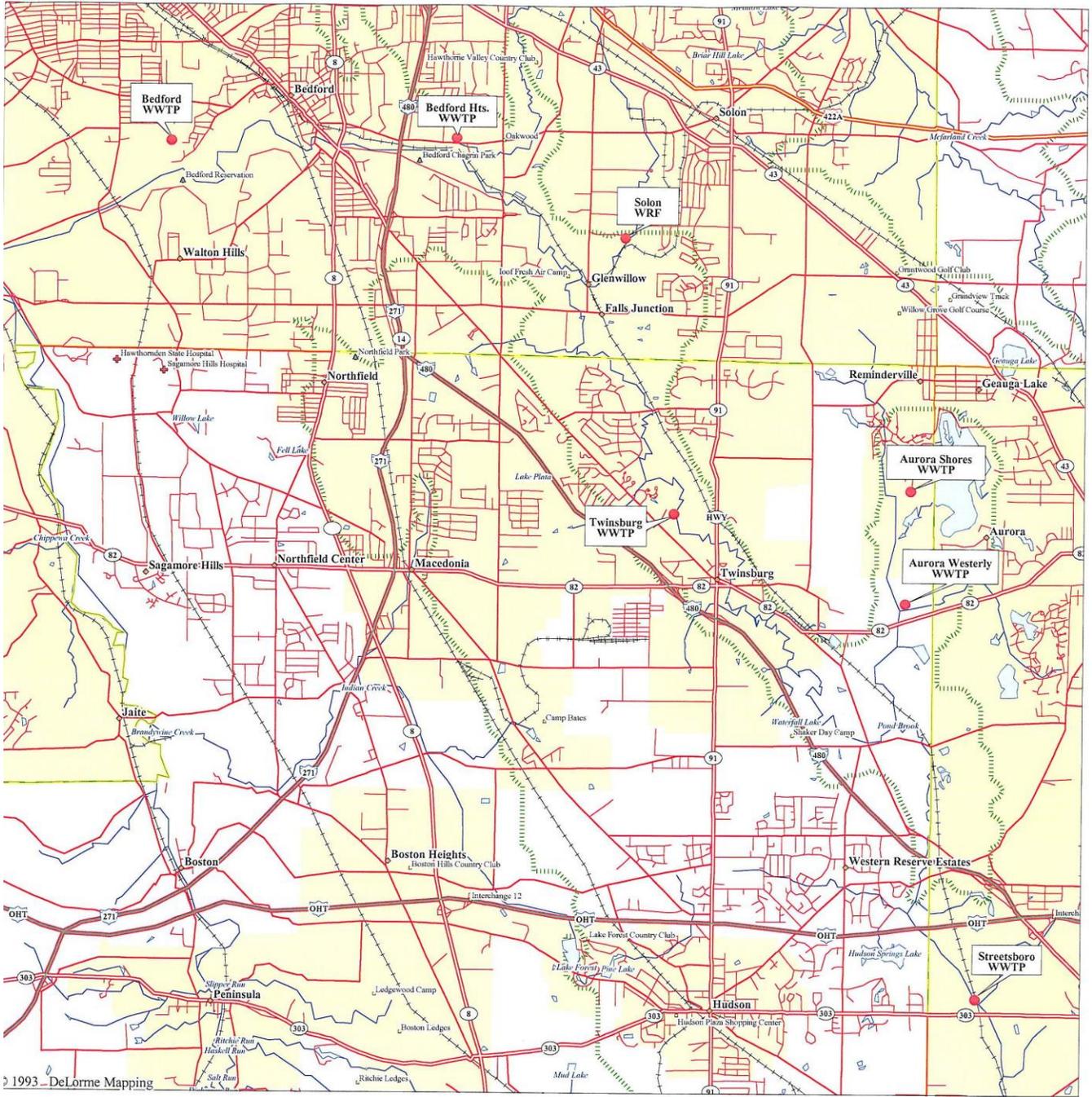
Alternately, the applicant may propose the development of site-specific water quality standard(s) pursuant to OAC Rule 3745-1-35. The permittee shall submit written notification regarding their intent to develop site specific water quality standards for parameters that are not priority pollutants to the above address no later than 30 days after the Public Notice Date.

Location of Discharge/Receiving Water Use Classification

Table 1 includes a list of NPDES dischargers and discharge points along with appropriate stream descriptions. The approximate location of the dischargers is shown in Figure 1. A stream diagram is shown in Figure 2.

<b>Table 1. Discharge locations for Tinkers Creek watershed WWTPs</b>					
<b>Discharger</b>	<b>Receiving Stream (River Mile)</b>	<b>Ohio EPA River Code</b>	<b>HUC 12</b>	<b>Ecoregion</b>	<b>Use Designations</b>
Aurora Westerly	Pond Brook via unnamed tributary (0.55)	19-008 (Pond Brook)	04110002-05-01	EOLP	MWH, AWS, IWS, PCR
Bedford	Wood Creek (1.27)	19-043	04110002-05-04	EOLP	WWH, AWS, IWS, PCR

Bedford Heights	Hawthorne Creek via unnamed tributary (0.04)	19-064 (Hawthorne Creek)	04110002-05-04	EOLP	WWH, AWS, IWS, PCR
Portage County Streetsboro	Tinkers Creek (26.2)	19-007	04110002-05-02	EOLP	WWH, AWS, IWS, PCR
Solon	Beaver Meadow Run (1.1)	19-046	04110002-05-04	EOLP	WWH, AWS, IWS, PCR
Summit County Aurora Shores	Pond Brook (3.7)	19-008	04110002-05-01	EOLP	MWH, AWS, IWS, PCR
Twinsburg	Tinkers Creek (15.65)	19-007	04110002-05-04	EOLP	WWH, AWS, IWS, PCR



**Figure 1- Tinkers Creek watershed discharger location map**

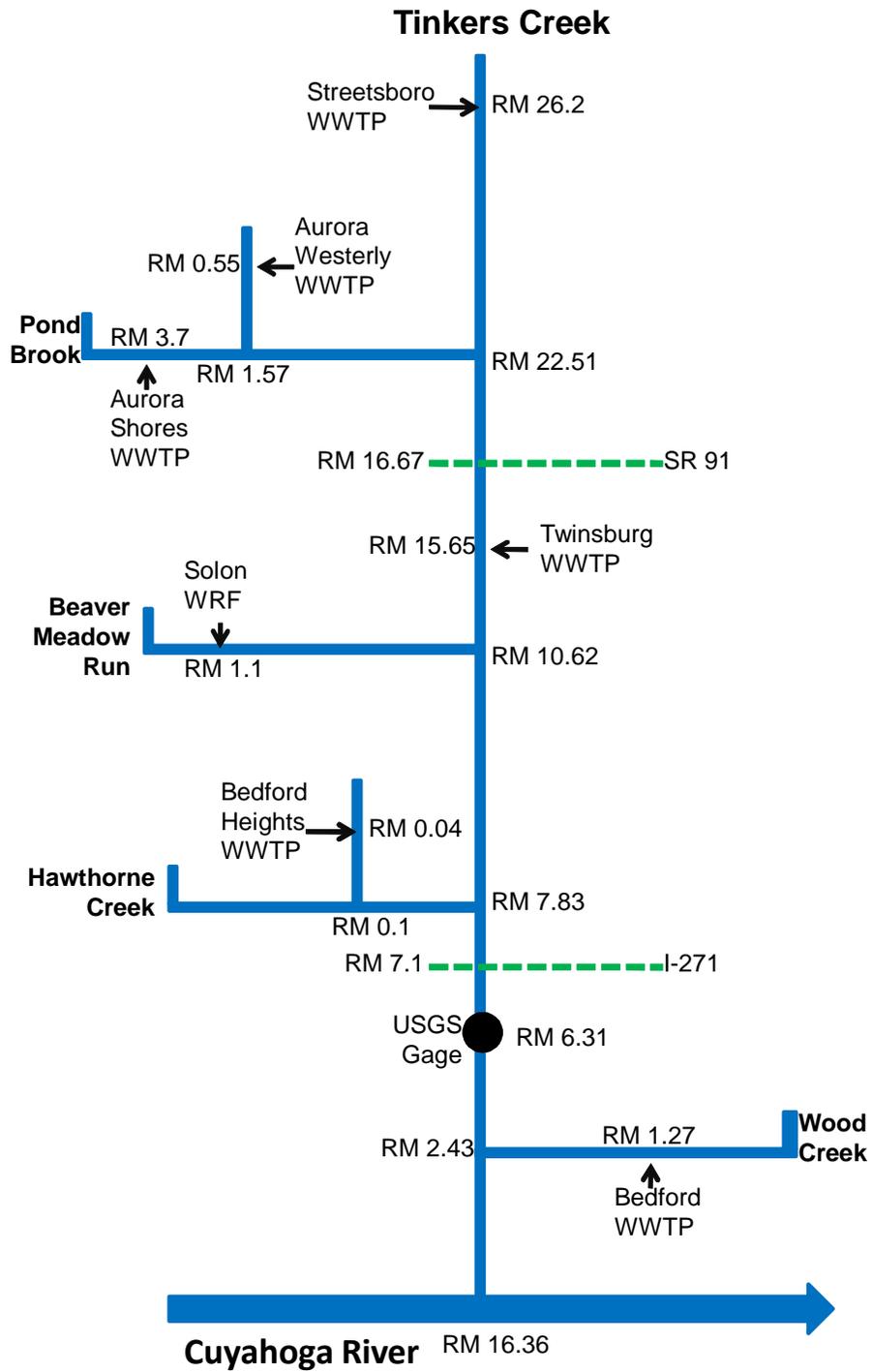


Figure 2 - Tinkers Creek watershed stream diagram

## Facility Descriptions (from upstream to downstream)

The **Portage County Streetsboro-Hudson WWTP** (wastewater treatment plant) was originally constructed in 1985. The average daily design flow was upgraded from 2.5 MGD to 4.0 MGD (million gallons per day) in 2001 with a peak hydraulic capacity of 10.0 MGD. Wet stream processes include influent screening, comminution, grit removal, scum removal, contact stabilization, clarification, nitrification, sand filtration, and chlorination/dechlorination. Sludge is aerobically digested, dewatered using a belt filter press and centrifuge. A sludge dryer was also installed as part of a 2009 permit to install upgrading the system to produce EQ sludge. Sludge is ultimately disposed of by land application. The Streetsboro sewerage system is 100 percent separate.

The program elements for the Portage County industrial pretreatment program were approved September 7, 2012, and are incorporated for the first time in this renewal permit. There is currently one Ohio EPA permitted industrial user tributary to the plant, International Paper (fka Inland Paperboard and Packaging), OEPA #3DP00015, that will be incorporated into the Portage County pretreatment program.

The **City of Aurora Westerly WWTP** was replaced by a new plant in 1988-89 and the last major modification was in 1999. The facility has a design flow of 1.4 MGD. The current system includes bar screening, grit removal, oxidation ditch, final clarification, phosphorus reduction, rapid sand filtration, ultraviolet disinfection, and post aeration. Sludge handling facilities include aerobic sludge digestion, and sludge drying beds. The Aurora Westerly WWTP collection system is 100 percent separate sewers. To minimize inflow and infiltration annual sewer inspections are performed on the system. No significant industrial users of this WWTP have been identified; therefore no pretreatment program is required.

The **Summit County Aurora Shores WWTP** was originally constructed in 1985. The average daily design flow was upgraded from 0.25 MGD to 0.5 MGD in a 1996 PTI. Wet stream processes include influent screening, comminution, extended aeration, secondary clarification, tertiary sand filtration, and ultraviolet disinfection. Sludge is aerobically digested and dewatered using a belt filter press. Sludge is ultimately disposed of by land application. The Aurora Shores sewerage system is 100 percent separate.

The **City of Twinsburg WWTP** is an advanced treatment facility. The plant is designed to treat an average daily hydraulic flow of 5.8 MGD, with a peak hydraulic capacity of 10.2 MGD. Current wet stream processes at the facility include aerated flow equalization, aeration, screening and grit removal, primary settling, phosphorus removal, activated sludge biological treatment process, secondary clarification, tertiary treatment using micro-strainers, disinfection by chlorination, and dechlorination by sodium bisulfite. Solid stream processes are sludge stabilization using anaerobic digestion, dewatering using a filter press, sludge storage, and sludge disposal in accordance with an approved sludge management plan. The Twinsburg WWTP collection system is 100 percent separate.

The City has an approved pretreatment program, with four categorical industrial users and five noncategorical industrial users discharging to the WWTP.

The **City of Solon Water Reclamation Facility** is designed to serve a population of approximately 26,000 people. Originally constructed in 1962, the facility has undergone a number of upgrades over the years, with the most recent being modifications to the anaerobic digestion process in 2013. The plant design capacity is 5.8 MGD with a hydraulic capacity of 9.6 MGD. The Solon sewer system is 100 percent separate.

The wet stream treatment processes consist of flow equalization, mechanical bar screens, grit

removal, primary settling, trickling filters, activated sludge biological treatment process, secondary settling, rapid sand filters, ultraviolet disinfection, and post aeration. Phosphorus removal is achieved through the addition of ferric chloride. The treatment facility includes two locations where flows may be bypassed and/or diverted around treatment operations. The bypasses involve the diversion located at the headworks (Outfall 002) and after secondary settling prior to the rapid sand filters (tertiary bypass Station 602).

Primary sludge is anaerobically digested before combining with waste activated sludge from the gravity thickener. The combined sludge is dewatered by a belt filter press and hauled to a landfill for proper disposal.

The City implements an approved industrial pretreatment program. Seven categorical industrial users and sixteen non-categorical significant industrial users discharge to the Solon WWTP. Among these are food processors, hair care product manufacturers, commercial laundries, bakeries, and metal plating facilities.

The **City of Bedford Heights WWTP** was built in 1958, with the last major plant modification occurring in 1984. The average design flow for this facility is 3.6 MGD while the peak hydraulic flow is 6.0 MGD. The plant serves parts of Bedford Heights, City of Solon, City of Warrensville Heights, and the Villages of Oakwood and Glenwillow. The total population served is estimated to be 21,400. The collection system for Bedford Heights is 100 percent separate sanitary sewers. The inflow/infiltration rate for the collection system is estimated to be 0.8 MGD.

The wet stream processes include the preliminary treatment of the influent through the use of bar screens, grit removal and preaeration. This is followed by primary settling, activated sludge biological treatment process, phosphorus removal (via chemical addition), final settling, rapid sand filtration, and chlorination/dechlorination. Wet-weather flows exceeding the capacity of the biological treatment process are bypassed and monitored at Station 602; bypass flows around the tertiary sand filters are recorded under station 603.

Primary and secondary sludge is combined and treated through the use of a primary tank, three final tanks, and a belt press. The dewatered sludge is currently transported to a landfill for disposal.

The pretreatment program was approved on August 21, 1984. There are four significant industrial users that contribute to plant influent. Two of these facilities are categorical, accounting for 0.032 MGD of flow and one is non-categorical accounting for 0.014 MGD of flow. Another industrial user transports sludge for landfill.

The **City of Bedford WWTP** was originally constructed in 1937, and its last major modification was in 2012. The average daily design flow is 3.2 MGD. Wet stream processes include influent screening, grit removal, flow equalization, primary clarification, trickling filters, phosphorus removal (via chemical addition), rapid sand filtration, and UV disinfection. Sludge is aerobically digested and dewatered using a belt filter press. Class B sludge is ultimately disposed of at the PPG Lime Lakes Reclamation site. The Bedford sewerage system is 100 percent separate. Wet-weather flows exceeding the capacity of the biological treatment process are bypassed and monitored at Station 602; bypass flows around the tertiary sand filters are recorded under station 603.

The City does not have an approved pretreatment program. There are three Ohio EPA permitted industrial users that discharge to the plant. All three are categorical industrial users and contribute 0.300 MGD to the average daily flow of effluent from Bedford WWTP.

## Description of Existing Discharge

Appendix A (a-g) presents monthly and maximum projected effluent quality values ( $PEQ_{avg}$  and  $PEQ_{max}$ ) for the Tinkers Creek Watershed wastewater treatment plants.

## Receiving Water Quality/Environmental Hazard Assessment

An assessment of the impact of a permitted point source on the immediate receiving waters includes an evaluation of the available chemical/physical (water column, effluents, sediment, flows), biological (fish and macroinvertebrate assemblages), and habitat data which have been collected by Ohio EPA. 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 and effluent and mixing zone bioassays conducted by Ohio EPA, the permittee, or U.S. EPA.

Ohio EPA relies on a tiered approach in attempting to link administrative activity indicators (*i.e.*, permitting, grants, enforcement) with true environmental indicators (*i.e.*, stressor, exposure, and response indicators). Stressor indicators generally include activities which have the potential to degrade the aquatic environment such as pollutant discharges (permitted and unpermitted), land use effects, and habitat modifications. Exposure indicators include whole effluent toxicity tests, tissue residues, and biomarkers, each of which provides evidence of biological exposure to stressor or bioaccumulative agents. Response indicators include the more direct measures of community and population response and are represented here by the biological indices which comprise Ohio EPA's biological criteria. The key is in using the different types of indicators within the roles which are the most appropriate for each. Describing the causes and sources associated with observed impairments relies on an interpretation of multiple lines of evidence including the water chemistry data, sediment data, habitat data, effluent data, biomonitoring results, land use data, and biological response signatures within the biological data itself. Thus the assignment of principal causes and sources of impairment represents the association of impairments (defined by response indicators) with stressor and exposure indicators.

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 Chapter 3745-1), applicable Water Quality Criteria are presented in Appendix B (a-g). Assessing use attainment status for aquatic life uses involves a primary reliance on the Ohio EPA biological criteria (OAC Rule 3745-1-07; Table 7-14). These are confined to ambient assessments and apply to rivers and streams outside of mixing zones. Numerical biological criteria are based on multimetric biological indices which include 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 (IC), which indicates the response of the macroinvertebrate community. Numerical endpoints are stratified by ecoregion, use designation, and stream or river size. 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 at least one organism group does not meet the biocriteria, and is not below a narrative rating of "fair" and the other group meets the biocriteria. Non attainment is determined when neither organism group meets the biocriteria or one of the organism groups reflects poor or very poor performance. An aquatic life use attainment table (Table 2) 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.

Wood Creek was determined to be in attainment of its aquatic life use in 2000 and in non attainment in the 2006-2007 survey. The aquatic life use designation of the stream in place for the 2000 survey, Limited Resource Water, was changed to Warm Water Habitat in 2007. Our current evaluation indicates non attainment, although the biological communities remain relatively unchanged between sampling events.

Table 2. Aquatic life use attainment status for the Tinkers Creek watershed based on data collected in 2000 and 2006-2008. Attainment status is based on the biocriteria for the Erie/Ontario Lake Plain ecoregion of Ohio (OAC 3745-1-07, Table 7-17).

<b>2000</b>						
<b>Tinkers Creek (19-007) - WWH Use Designation</b>						
<b>Fish/Invert.</b>	<b>IBI</b>	<b>MIwb</b>	<b>ICI</b>	<b>QHEI</b>	<b>Status</b>	<b>Comment</b>
29.1 <sup>w</sup> /28.3	32*	--	48	52.5	PARTIAL	Seasons Road
25.0 <sup>w</sup> /25.2	<u>24*</u>	--	46	34.5	<b>NON</b>	Hudson-Aurora Road
17.5 <sup>w</sup> /18.0	<u>25*</u>	<u>5.3*</u>	40	50.0	<b>NON</b>	At Whitlach Development
14.3 <sup>w</sup> /14.3	28*	6.4*	40	56.0	PARTIAL	Adj. East Idlewood
8.5 <sup>w</sup> /8.5	<u>21*</u>	<u>5.5*</u>	44	76.5	<b>NON</b>	Dst. Inland Reclamation
6.9 <sup>w</sup> /7.2	28*	7.5 <sup>ns</sup>	G	71.0	PARTIAL	Dst. Hawthorn Creek
0.1 <sup>w</sup> /0.1	32*	6.1*	36	78.0	<b>NON</b>	At mouth
<b>Pond Brook (19-008) - MWH Use Designation</b>						
<b>Fish/Invert.</b>	<b>IBI</b>	<b>MIwb</b>	<b>ICI</b>	<b>QHEI</b>	<b>Status<sup>b</sup></b>	<b>Comment</b>
3.8 <sup>H</sup> /3.8	36	--	F	44.0	FULL	Ust. Aurora Shores WWTP
-/1.4	--	--	28	--	(FULL)	SR 82 (wetland area)
<b>Beaver Meadow Run (19-046) - WWH Use Designation</b>						
<b>Fish/Invert.</b>	<b>IBI</b>	<b>MIwb</b>	<b>ICI</b>	<b>QHEI</b>	<b>Status</b>	<b>Comment</b>
1.2 <sup>H</sup> /1.2	34*	--	F*	57.0	<b>NON</b>	Ust. Solon WWTP
0.2 <sup>H</sup> /0.2	38 <sup>ns</sup>	--	F*	70.5	PARTIAL	Old Cochran Road
<b>Hawthorne Creek (19-064) - WWH Use Designation</b>						
<b>Fish/Invert.</b>	<b>IBI</b>	<b>MIwb</b>	<b>ICI</b>	<b>QHEI</b>	<b>Status</b>	<b>Comment</b>
0.7 <sup>H</sup> /0.7	32*	--	MG	60.0	PARTIAL	Richmond Road
<b>Wood Creek (19-043) - LRW Use Designation</b>						
<b>Fish/Invert.</b>	<b>IBI</b>	<b>MIwb</b>	<b>ICI</b>	<b>QHEI</b>	<b>Status</b>	<b>Comment</b>
0.2 <sup>H</sup> /0.1	<u>20*</u>	--	F	62.5	FULL	At mouth

Table 2. (Continued)

<b>2006-2007</b>						
<b>Tinkers Creek (19-007) - WWH Use Designation</b>						
<b>Fish/Invert.</b>	<b>IBI</b>	<b>MIwb</b>	<b>ICI</b>	<b>QHEI</b>	<b>Status<sup>b</sup></b>	<b>Comment</b>
28.8 <sup>H</sup> /-	34 <sup>ns</sup>			53.0	(FULL)	Seasons Road
24.4 <sup>H</sup> /-	26*			63.0	(NON)	Ust. Ravenna Road
16.7 <sup>W</sup> /-	30*	6.6*		55.0	(NON)	Ust. SR 91
14.3 <sup>W</sup> /-	29*	6.8*		70.5	(NON)	Adj. East Idlewood
11.0 <sup>W</sup> /-	<u>26*</u>	<u>5.3*</u>		73.5	(NON)	Pettibone Road
10.1 <sup>W</sup> /-	28*	6.6*			(NON)	In Glenwood at power line crossing
6.4 <sup>W</sup> /-	<u>20*</u>	6.3*		88.5	(NON)	Ust. SR 8
2.2 <sup>W</sup> /-	38	7.6		76.0	(FULL)	Ust. Dunham Road and Wood Creek confluence
0.1 <sup>W</sup> /-	40	8.3		78.0	(FULL)	At mouth
0.1 <sup>W</sup> /- (2008)	37	9.2	42		FULL	At mouth
<b>Pond Brook (19-008) - MWH Use Designation</b>						
<b>Fish/Invert.</b>	<b>IBI</b>	<b>MIwb</b>	<b>ICI</b>	<b>QHEI</b>	<b>Status<sup>b</sup></b>	<b>Comment</b>
4.3 <sup>H</sup> /-	38			44.5	(FULL)	Ust. Glenwood Blvd.
0.9 <sup>H</sup> /-	30			28.0	(FULL)	Dst. SR 82
<b>Beaver Meadow Run (19-046) - WWH Use Designation</b>						
<b>Fish/Invert.</b>	<b>IBI</b>	<b>MIwb</b>	<b>ICI</b>	<b>QHEI</b>	<b>Status<sup>b</sup></b>	<b>Comment</b>
1.2 <sup>H</sup> /-	28*			77.0	(NON)	Ust. WWTP discharge
0.1 <sup>H</sup> /-	<u>24*</u>			77.0	(NON)	At mouth
<b>Hawthorne Creek (19-064) - WWH Use Designation</b>						
<b>Fish/Invert.</b>	<b>IBI</b>	<b>MIwb</b>	<b>ICI</b>	<b>QHEI</b>	<b>Status<sup>b</sup></b>	<b>Comment</b>
0.8 <sup>H</sup> /-	30*			70.5	(NON)	Richmond Road
0.1 <sup>H</sup> /-	<u>24*</u>			67.0	(NON)	At mouth
<b>Wood Creek (19-043) - WWH Use Designation</b>						
<b>Fish/Invert.</b>	<b>IBI</b>	<b>MIwb</b>	<b>ICI</b>	<b>QHEI</b>	<b>Status<sup>b</sup></b>	<b>Comment</b>
1.3 <sup>H</sup> /-	<u>20*</u>			62.0	(NON)	Ust. WWTP discharge
0.1 <sup>H</sup> /-	<u>12*</u>				(NON)	At mouth above waterfall

**Ecoregion Biocriteria:** Erie/Ontario Lake Plain (EOLP)

<b>INDEX - Site Type</b>	<b>WWH</b>	<b>MWH</b>
IBI - Headwaters	40	24.0
IBI - Wading	38	24.0
IBI - Boat	40	24.0
Mod. Iwb - Wading	7.9	6.2
Mod. Iwb - Boat	8.7	5.8
ICI	34	22.0

\* = Indicates significant departure from applicable biocriteria (&gt;4 IBI or ICI units, or &gt;0.5 MIwb units).

Underlined scores are in the Poor or Very Poor range.

ns = Nonsignificant departure from biocriteria (&lt;4 IBI or ICI units, or &lt;0.5 MIwb units).

b = Use attainment status based on one organism group is parenthetically expressed.

H = Headwater site type

W = Wading method

## 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. In addition, antidegradation and whole effluent toxicity issues must be addressed.

Effluent data for the seven treatment facilities was used to determine what parameters should undergo a wasteload allocation. The major source of effluent data was the self-monitoring data reported by the facilities from January 2008 through February 2013. Additional samples collected by Ohio EPA and from pretreatment program reporting were also used. The effluent data was screened for outliers. The following outliers were removed:

Aurora Shores	One mercury value of 15.4 ng/l.
Bedford Heights	One NH <sub>3</sub> -N value (S) of 16.5 mg/l, one mercury value of 54.8 ng/l, and zinc values of 304 and 202 µg/l .

This data is evaluated statistically, and Projected Effluent Quality (PEQ) values are calculated for each pollutant. Average PEQ (PEQ<sub>avg</sub>) values represent the 95<sup>th</sup> percentile of monthly average data, and maximum PEQ (PEQ<sub>max</sub>) values represent the 95<sup>th</sup> percentile of all data points. The PEQ values for the facilities are presented in Appendix A.

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<sub>avg</sub> or PEQ<sub>max</sub> 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.

For those parameters that required a wasteload allocation (WLA), the results were based on the applicable Outside Mixing Zone criteria for Warmwater Habitat, Human Health (nondrinking), Agricultural Water Supply, and the Inside Mixing Zone Maximum Criteria. The data used in the WLAs are listed in Appendices B and C. The WLA results to maintain all the applicable criteria are presented in Appendix D.

## Lower Cuyahoga River TMDL

The Total Maximum Daily Load (TMDL) process, as established by the Clean Water Act (CWA), is a method for identifying and restoring impaired waterbodies. The CWA Section 303(d) and Chapter 40 of the Code of Federal Regulations Section 130.7 direct each State to identify and prioritize water quality limited segments for which pollution controls required by local, State or Federal authority are not stringent enough to achieve applicable water quality standards (WQS). Further, TMDLs for pollutants that prevent the identified segments from attaining WQS must be established. TMDLs are quantitative assessments of water quality problems contributing to the impairment of these segments.

The lower Cuyahoga River watershed has been identified as a priority impaired water on Ohio's 303(d) list. Biological and chemical stream surveys indicate that organic enrichment, low dissolved oxygen, nutrients, and flow alteration are the primary causes of impairment in the watershed. The *Total Maximum Daily Loads for the Lower Cuyahoga River* was approved by

U.S. EPA on September 26, 2003. It includes Tinkers Creek. The goal of the TMDL is full attainment of Ohio's WQS. The complete report is available at this Ohio EPA Web page: [http://epa.ohio.gov/portals/35/tmdl/Cuyahoga\\_lower\\_final\\_report.pdf](http://epa.ohio.gov/portals/35/tmdl/Cuyahoga_lower_final_report.pdf) .

As part of the TMDL, a stressor identification study was recommended for the Tinkers Creek watershed. The reasons for this recommendation are to identify current unknown sources of impairment and to present a methodology for addressing them. The study is ongoing. To date, a number of sources and causes have been explored including: elevated nutrients, elevated water column turbidity, and PPCPs (pharmaceuticals and personal care products).

The approved TMDL assigned a phosphorus load to the major dischargers in Tinkers Creek of 59 lbs/day (26.76 kg/day) to meet the Lower Cuyahoga River nutrient target. The major dischargers in Tinkers Creek (Aurora Shores is excluded), have a combined permitted discharge volume of 26.85 MGD and a current weekly maximum permitted phosphorus load of 336.5 lbs/day (152.64 kg/day). Based on the TMDL assigned load, a weekly maximum permit limit of 0.26 mg/l would need to be assigned to the dischargers. A corresponding monthly permit average of 0.17 mg/l would also need to be assigned. The stressor study has indicated that nutrient elimination alone will not be adequate to address impairments in Tinkers Creek. Recent evaluations of the Bedford Heights WWTP have resulted in a decrease in the hydraulic permitted volume from 7.5 MGD to 3.6 MGD, for a total WWTP flow of 23.8 MGD (majors only).

This fact sheet recommends continuing the staged approach to addressing the phosphorus target set in the TMDL. First, it recommends that permit renewals include a maximum weekly effluent limit of 0.7 mg/l. This limit represents a permitted load reduction of 53.3 percent to 157.04 lbs/day (71.23 kg/day). Two changes have occurred, which further reduce the permitted load. The Twinsburg WWTP had its flow volume increased from 4.95 MGD to 5.8 MGD to reflect actual design capacity. With this increase in volume the phosphorus concentration was decreased to 0.6 mg/l. The current permitted phosphorus load is 60.9 kg/d. A review of effluent data for the time period January 2008 thru February 2013 indicated that at median flow and concentration for each plant the combined phosphorus load is 20.1 kg/d. Using the 75% for flow and concentration for each plant the combined phosphorus load is 33.18 kg/d.

Second, it recommends that the permits also include language requiring the establishment of a nutrient trading program pursuant to Ohio's Water Quality Trading rules, OAC 3745-5. The intent of the trading program will be to further reduce phosphorus loading from non-point sources to the watershed, with the goal of providing an additional load reduction of 34.14 kg/day to meet the phosphorus target of 26.76 kg/day established in the TMDL. Implementation actions such as riparian restoration/protection and wetland restoration/protection as well as improved storm water management will also reduce water column turbidity in addition to nutrient reduction.

### 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 Appendix D. The average PEL ( $PEL_{avg}$ ) is compared to the average PEQ ( $PEQ_{avg}$ ) from Appendix A, and the  $PEL_{max}$  is compared to the  $PEQ_{max}$ . Based on the calculated percentage of the allocated value [ $(PEQ_{avg} \div PEL_{avg}) \times 100$ , or  $(PEQ_{max} \div PEL_{max}) \times 100$ ], the parameters are assigned to group 3, 4, or 5 as follows:

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

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

Group 3: PEQ<sub>max</sub> < 50% of maximum PEL and PEQ<sub>avg</sub> < 50% of average PEL. No limit recommended, monitoring optional.

Group 4: PEQ<sub>max</sub> ≥ 50% but <100% of the maximum PEL or PEQ<sub>avg</sub> ≥ 50% but < 100% of the average PEL. Monitoring is appropriate.

Group 5: Maximum PEQ ≥ 100% of the maximum PEL or average PEQ ≥ 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.

Final effluent limits are determined by evaluating the groupings in conjunction with other applicable rules and regulations, the TMDL and existing permit limits. Table 8 (a – g) presents the final effluent limits and monitoring requirements proposed for each of the seven wastewater plants included in this combined fact sheet and the basis for their recommendation.

Limits proposed for oil and grease, pH, and fecal coliform are based on Water Quality Standards (OAC 3745-1-07).

Proposed limits for total suspended solids (TSS), ammonia-nitrogen (NH<sub>3</sub>-N), 5-day carbonaceous biochemical oxygen demand (CBOD<sub>5</sub>), phosphorus, and dissolved oxygen (D.O.) are all based on plant design, the lower Cuyahoga River TMDL and the wasteload allocations (Appendix D).

The proposed limits for total residual chlorine is based on wasteload allocation to meet in-stream water quality standards as limited by the inside mixing zone maximum (IMZM). The IMZM is a value calculated to avoid rapidly lethal conditions in the effluent mixing zone. The effluent limits for chlorine are less than the quantification level of 0.050 mg/l. However, pollutant minimization programs are not required because the dosing rate of dechlorination chemicals ensures that the water quality based effluent limits are being met.

The Ohio EPA risk assessment places the parameters listed in Table 4 in Group 5. This placement indicates that an environmental hazard exists and limits are necessary to protect water quality. Limits proposed for these parameters are based on wasteload allocation (Appendix D). When existing permit limits are lower than the wasteload allocation, the existing limits are retained.

<b>Table 4. Group 5 parameters and limits (average/maximum)</b>							
<b>Parameter (concentration)</b>	<b>Streetsboro-Hudson WWTP</b>	<b>Aurora Shores WWTP</b>	<b>Aurora Westerly WWTP</b>	<b>Twinsburg WWTP</b>	<b>Solon WWTP</b>	<b>Bedford Heights WWTP</b>	<b>Bedford WWTP</b>
1,2- Dichloro-benzene (µg/l)				<b>28 / 210</b>			
2,4,6-Trichlorophenol					<b>5 / 40</b>		
Bis(2-ethylhexyl) phthalate (ug/l)				<b>10 / 1781</b>	<b>8.5 / 1141</b>		

Parameter	Streetsboro-Hudson WWTP	Aurora Shores WWTP	Aurora Westerly WWTP	Twinsburg WWTP	Solon WWTP	Bedford Heights WWTP	Bedford WWTP
Chlorine (ug/l)						<b>11 / 19 (summer)</b>	
Chromium <sup>+6</sup>		<b>11 / 17</b>					
Copper (ug/l)	<b>26 / 43</b>	<b>18 / 29</b>			<b>21 / 34</b>	<b>19 / 30</b>	<b>16 / 26</b>
Cyanide,free (ug/l)					<b>5.3 / 23</b>	<b>5.2 / 22</b>	
Mercury, (ug/l)	<b>0.0013 / 1.7</b>	<b>0.0013 / 1.7</b>	<b>0.0013 / 1.7</b>	<b>0.0013 / 1.7</b>	<b>0.0013 / 1.7</b>	<b>0.0013 / 1.7</b>	<b>0.0013 / 1.7</b>
Silver (ug/l)						<b>1.3 / 6.5</b>	
TDS (mg/l)					<b>1515</b>		
Zinc (ug/l)		<b>227 / 230</b>					

The Ohio EPA risk assessment places the parameters listed in Table 5 in Group 4. This placement indicates that these parameters do not have the reasonable potential to contribute to WQS exceedances, and limits are not necessary to protect water quality. Monitoring for Group 4 pollutants is required by OAC Rule 3745-33-07(A)(2).

Parameter	Streetsboro-Hudson WWTP	Aurora Shores WWTP	Aurora Westerly WWTP	Twinsburg WWTP	Solon WWTP	Bedford Heights WWTP	Bedford WWTP
Copper				<b>Monitor</b>			
Iron					<b>Monitor</b>		
Lead		<b>Monitor</b>					
TDS				<b>Monitor</b>		<b>Monitor</b>	
Selenium					<b>Monitor</b>		
Zinc					<b>Monitor</b>		<b>Monitor</b>

Ohio EPA risk assessment places the parameters listed in Tables 6 and 7 in Groups 2 and 3. This placement supports that these parameters should not pose an environmental hazard and limits are not necessary to protect water quality. Monitoring at a reduced frequency may be proposed to document that these pollutants continue to remain at low levels.

Parameter	Streetsboro-Hudson WWTP	Aurora Shores WWTP	Aurora Westerly WWTP	Twinsburg WWTP	Solon WWTP	Bedford Heights WWTP	Bedford WWTP
NO3+NO2	<b>Monitor</b>	<b>Monitor</b>		<b>Monitor</b>			
Zinc	<b>Monitor</b>		<b>Monitor</b>	<b>Monitor</b>			
Nickel	<b>Monitor</b>						

Barium				<b>Monitor</b>	<b>Monitor</b>		
Chlorine	<b>Monitor</b>						
Ammonia – W							<b>Monitor</b>

Additional monitoring requirements proposed at the final effluent, influent, upstream/downstream 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 and for designing plant improvements and conducting future stream studies.

<b>Parameter</b>	<b>Streetsboro-Hudson WWTP</b>	<b>Aurora Shores WWTP</b>	<b>Aurora Westerly WWTP</b>	<b>Twinsburg WWTP</b>	<b>Solon WWTP</b>	<b>Bedford Heights WWTP</b>	<b>Bedford WWTP</b>
Aluminum				<b>Monitor</b>			
Ammonia – S							<b>Monitor</b>
Antimony					<b>Monitor</b>		
Arsenic	<b>Monitor</b>	<b>Monitor</b>	<b>Monitor</b>	<b>Monitor</b>	<b>Monitor</b>	<b>Monitor</b>	<b>Monitor</b>
Beryllium					<b>Monitor</b>		
Bromomethane				<b>Monitor</b>			
Cadmium	<b>Monitor</b>	<b>Monitor</b>	<b>Monitor</b>	<b>Monitor</b>	<b>Monitor</b>		<b>Monitor</b>
Chlorine				<b>Monitor</b>			<b>Monitor</b>
Chloroform				<b>Monitor</b>	<b>Monitor</b>	<b>Monitor</b>	
Chromium	<b>Monitor</b>	<b>Monitor</b>	<b>Monitor</b>	<b>Monitor</b>	<b>Monitor</b>	<b>Monitor</b>	<b>Monitor</b>
Chromium <sup>+6</sup>	<b>Monitor</b>		<b>Monitor</b>	<b>Monitor</b>	<b>Monitor</b>	<b>Monitor</b>	<b>Monitor</b>
Copper			<b>Monitor</b>				
Cyanide, free	<b>Monitor</b>	<b>Monitor</b>	<b>Monitor</b>	<b>Monitor</b>		<b>Monitor</b>	<b>Monitor</b>
DimethylPhthalate						<b>Monitor</b>	
Dichlorobromo-methane					<b>Monitor</b>		
Iron				<b>Monitor</b>			
Lead	<b>Monitor</b>		<b>Monitor</b>	<b>Monitor</b>	<b>Monitor</b>	<b>Monitor</b>	<b>Monitor</b>
Manganese				<b>Monitor</b>	<b>Monitor</b>		
Methyl Bromide					<b>Monitor</b>		
Molybdenum	<b>Monitor</b>	<b>Monitor</b>	<b>Monitor</b>	<b>Monitor</b>	<b>Monitor</b>	<b>Monitor</b>	<b>Monitor</b>
Nickel		<b>Monitor</b>	<b>Monitor</b>	<b>Monitor</b>	<b>Monitor</b>		<b>Monitor</b>

<b>Parameter</b>	<b>Streetsboro-Hudson WWTP</b>	<b>Aurora Shores WWTP</b>	<b>Aurora Westerly WWTP</b>	<b>Twinsburg WWTP</b>	<b>Solon WWTP</b>	<b>Bedford Heights WWTP</b>	<b>Bedford WWTP</b>
NO3+NO2			<b>Monitor</b>		<b>Monitor</b>		<b>Monitor</b>
Pentachlorophenol				<b>Monitor</b>			
Selenium	<b>Monitor</b>	<b>Monitor</b>	<b>Monitor</b>	<b>Monitor</b>		<b>Monitor</b>	<b>Monitor</b>
Silver	<b>Monitor</b>	<b>Monitor</b>	<b>Monitor</b>	<b>Monitor</b>	<b>Monitor</b>		<b>Monitor</b>
Strontium				<b>Monitor</b>	<b>Monitor</b>		<b>Monitor</b>

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.

WQS 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). WLAs can then be calculated using TUs as if they were water quality criteria.

The WLA calculations for WET are similar to those for aquatic life criteria - using the chronic toxicity unit (TUc) and 7Q10 flow for the average and the acute toxicity unit (TUa) 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.

The chronic toxicity unit (TUc) is defined as 100 divided by the estimate of the effluent concentration which causes a 25% reduction in growth or reproduction of test organisms (IC25):

$$TUc = 100/IC25$$

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):

$$TUc = 100/\text{geometric mean of No Observed Effect Concentration and Lowest Observed Effect Concentration}$$

The acute toxicity unit (TUa) is defined as 100 divided by the concentration in water having 50% chance of causing death to aquatic life (LC50) for the most sensitive test species:

$$TUa = 100/LC50$$

This equation applies outside the mixing zone for warmwater, modified warmwater, exceptional warmwater, coldwater, and seasonal salmonid use designations. When the acute WLA is less than 1.0 TUa, it may be 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

*Aurora Shores WWTP*

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<sub>c</sub>) and 7Q10 for average and the acute toxicity unit (TU<sub>a</sub>) and 1Q10 for maximum). For the Aurora Shores WWTP, the AET values are 0.32 TU<sub>a</sub> and 1.04 TU<sub>c</sub>.

*Aurora Westerly WWTP*

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<sub>c</sub>) and 7Q10 for average and the acute toxicity unit (TU<sub>a</sub>) and 1Q10 for maximum). For the Aurora Westerly WWTP, the AET values are 0.31 TU<sub>a</sub> and 1.02 TU<sub>c</sub>.

A summary of toxicity tests reported by the facility indicates that there have been instances of effluent toxicity:

Test Date	<i>Ceriodaphnia dubia</i> 48 hours	<i>Fathead Minnows</i> 96	<i>Ceriodaphnia dubia</i> 7 days	<i>Fathead Minnows</i> 7 days
	TU <sub>a</sub>	TU <sub>a</sub>	TU <sub>c</sub>	TU <sub>c</sub>
8/23/2009	BD	BD	1.4	BD
8/10/2010	BD	BD	BD	BD
8/2/2011	BD	0.2	1.15	BD
8/7/2012	BD	0.2	BD	BD
8/6/2013	BD	BD	BD	BD

BD = Below Detection

TU<sub>a</sub> = acute toxicity units, TU<sub>c</sub> = chronic toxicity units

Because chronic toxicity data points for *Ceriodaphnia dubia* have been above the WLA of 1.0 TU<sub>c</sub> twice in the previous 5 tests, limits will be required. Consistent with Procedure 6 and OAC 3745-33-07(B)(10), a limit of 1.0 TU<sub>c</sub> and 1.0 TU<sub>a</sub> for *Ceriodaphnia dubia* are proposed. It is proposed that the final effluent limits become effective 51 months from the effective date of the permit. Chronic toxicity monitoring with acute endpoints will be required semi-annually for *Ceriodaphnia dubia*. If the toxicity tests performed during the first 36 months consistently show that toxicity is not present at the plant, the facility may request a permit modification that would allow for a reduction in toxicity testing frequency.

There will be no proposed limits for *Pimephales promelas* because reasonable potential was not demonstrated. Therefore, it is recommended that annual chronic toxicity monitoring with acute endpoints be required for *Pimephales promelas*.

*Bedford WWTP*

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<sub>c</sub>) and 7Q10 for average and the acute toxicity unit (TU<sub>a</sub>) and 1Q10 for maximum). For the Bedford WWTP, the AET values are 0.31 TU<sub>a</sub> and 1.01 TU<sub>c</sub>.

A summary of toxicity tests reported by the facility indicates that there have been instances of effluent toxicity:

Test Date	<i>Ceriodaphnia dubia</i> 48 hours TU <sub>a</sub>	<i>Fathead Minnows</i> 96 TU <sub>a</sub>	<i>Ceriodaphnia dubia</i> 7 days TU <sub>c</sub>	<i>Fathead Minnows</i> 7 days TU <sub>c</sub>
9/16/08	BD	BD	BD	BD
5/19/09	BD	BD	BD	BD
7/21/09	BD	BD	BD	BD
11/17/09	BD	BD	BD	BD
2/9/10	BD	BD	BD	BD
5/18/10	BD	0.3	BD	1.4
7/6/10	BD	BD	BD	BD
10/23/10	BD	BD	BD	BD
2/22/11	BD	BD	BD	BD
5/24/11	BD	0.6	1.25	3.4
7/19/11	BD	BD	BD	BD
10/8/11	BD	BD	BD	BD

BD = Below Detection

TU<sub>a</sub> = acute toxicity units, TU<sub>c</sub> = chronic toxicity units

Evaluating the acute and chronic toxicity results for *Pimephales promelas* in under the provisions of 40 CFR Part 132, Appendix F, Procedure 6 gives an acute PEQ value of 0.92 TU<sub>a</sub> and a chronic PEQ value of 5.23 TU<sub>c</sub>. Reasonable potential for toxicity is demonstrated since the chronic toxicity value for *Pimephales promelas* exceeds the WLA value of 1.0 TU<sub>c</sub>.

Because chronic toxicity data points for *Pimephales promelas* have been above the WLA of 1.0 TU<sub>c</sub> twice in the previous 12 tests, limits will be required. Consistent with Procedure 6 and OAC 3745-33-07(B)(10), a limit of 1.0 TU<sub>c</sub> and 1.0 TU<sub>a</sub> for *Pimephales promelas* are proposed. It is proposed that the final effluent limits become effective 51 months from the effective date of the permit. Chronic toxicity monitoring with acute endpoints will be required semi-annually for *Pimephales promelas*. If the toxicity tests performed during the first 36 months consistently show that toxicity is not present at the plant, Bedford WWTP may request a permit modification that would allow for a reduction in toxicity testing frequency.

There will be no proposed limits for *Ceriodaphnia dubia* because reasonable potential was not demonstrated. Through twelve tests, only one test registered above the detection level. The value of this test was 1.25. Ohio EPA does not believe that this singular test is representative of the typical effluent quality. Therefore reasonable potential was not demonstrated. Therefore, it is recommended that annual chronic toxicity monitoring with acute endpoints be required for *Ceriodaphnia dubia*.

#### *Bedford Hts. WWTP*

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<sub>c</sub>) and 7Q10 for average and the acute toxicity unit (TU<sub>a</sub>) and 1Q10 for maximum). For the Bedford Heights WWTP, the AET values are 0.3 TU<sub>a</sub> and 1.0 TU<sub>c</sub>.

A summary of toxicity tests reported by the facility indicates that there have been instances of effluent toxicity:

Test Date	<i>Ceriodaphnia dubia</i> 48 hours	<i>Fathead Minnows</i> 96 hours	<i>Ceriodaphnia dubia</i> 7 days	<i>Fathead Minnows</i> 7 days
	TU <sub>a</sub>	TU <sub>a</sub>	TU <sub>c</sub>	TU <sub>c</sub>
8/25/09	BD	BD	BD	BD
8/10/10	BD	0.8	1.41	AH
8/23/11	BD	BD	BD	2.26
8/21/12	BD	NT	1.41	NT
9/25/12	NT	BD	NT	BD

AH = Test not valid because the IC<sub>25</sub> was not bracketed NT = No Test  
TU<sub>a</sub> = acute toxicity units, TU<sub>c</sub> = chronic toxicity units

However, the facility has submitted documentation supporting that atypical operation of the plant had taken place during this testing. Bedford Heights WWTP had excessive leachate discharges at the facility which may have caused increased toxicity. Also, U.S. EPA guidance recommends at least 10 tests conducted over several years to determine if limits and other provisions are needed to address toxicity.

Quarterly monitoring of chronic toxicity with the determination of acute endpoints is proposed for the life of the permit. After two years of testing (8 tests), Ohio EPA will review the toxicity results. If the toxicity tests consistently show that toxicity is not present at the plant, Bedford Heights may request a permit modification that would allow for a reduction in toxicity testing. Consistent with Procedure 6 and OAC 3745-33-07(B)(10), trigger language is proposed that imposes final effluent limits of 1.0 TU<sub>c</sub> (monthly average) and 1.0 TU<sub>a</sub> (daily maximum) if an evaluation of the monitoring data shows reasonable potential for toxicity. The final effluent limits would become effective 51 months after the effective date of the permit. If final effluent limits are triggered, it is proposed that the City conduct a toxicity reduction evaluation (TRE).

#### *Solon WRF*

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<sub>c</sub>) and 7Q10 for average and the acute toxicity unit (TU<sub>a</sub>) and 1Q10 for maximum). For the Solon WRF, the AET values are 0.31 TU<sub>a</sub> and 1.01 TU<sub>c</sub>.

Test Date	<i>Ceriodaphnia dubia</i> 48 hours	<i>Fathead Minnows</i> 96 hours	<i>Ceriodaphnia dubia</i> 7 days	<i>Fathead Minnows</i> 7 days
	TU <sub>a</sub>	TU <sub>a</sub>	TU <sub>c</sub>	TU <sub>c</sub>
6/16/2009	BD	BD	BD	BD
6/22/2010	BD	BD	BD	BD
6/13/2011	BD	BD	BD	BD
6/17/2012	BD	0.3	BD	BD
6/16/2013	BD	BD	BD	BD

BD = Below Detection

TU<sub>a</sub> = acute toxicity units, TU<sub>c</sub> = chronic toxicity units

Annual chronic toxicity monitoring with the determination of acute endpoints is proposed for the life of the permit. Evaluating the toxicity data under the provisions of 40 CFR Part 132,

Appendix F, Procedure 6 does not show reasonable potential with respect to whole effluent toxicity. While this indicates that the plant's effluent does not currently pose a toxicity problem, annual toxicity testing is proposed consistent with the minimum monitoring requirements at OAC 3754-33-07(B)(11). The proposed monitoring will adequately characterize toxicity in the plant's effluent.

*Streetsboro Hudson*

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<sub>c</sub>) and 7Q10 for average and the acute toxicity unit (TU<sub>a</sub>) and 1Q10 for maximum). For the Streetsboro -Hudson WWTP, the AET values are 0.3 TU<sub>a</sub> and 1.03 TU<sub>c</sub>.

A summary of toxicity tests reported by the facility indicates that there have been instances of effluent toxicity:

Test Date	<i>Ceriodaphnia dubia</i> 48 hours	<i>Fathead Minnows</i> 96 hours	<i>Ceriodaphnia dubia</i> 7 days	<i>Fathead Minnows</i> 7 days
	TU <sub>a</sub>	TU <sub>a</sub>	TU <sub>c</sub>	TU <sub>c</sub>
8/28/2009	BD	BD	1.4	BD
8/22/2010	BD	BD	1.41	BD
8/22/2011	BD	BD	BD	BD
8/20/2012	BD	1.37	BD	8.89
8/12/2013	BD	BD	BD	BD

BD = Below Detection

TU<sub>a</sub> = acute toxicity units, TU<sub>c</sub> = chronic toxicity units

Quarterly monitoring of chronic toxicity with the determination of acute endpoints is proposed for the life of the permit. After two years of testing (8 tests), Ohio EPA will review the toxicity results. If the toxicity tests consistently show that toxicity is not present at the plant, the facility may request a permit modification that would allow for a reduction in toxicity testing. Consistent with Procedure 6 and OAC 3745-33-07(B)(10), trigger language is proposed that imposes final effluent limits of 1.0 TU<sub>c</sub> (monthly average) and 1.0 TU<sub>a</sub> (daily maximum) if an evaluation of the monitoring data shows reasonable potential for toxicity. The final effluent limits would become effective 51 months after the effective date of the permit. If final effluent limits are triggered, it is proposed that the City conduct a toxicity reduction evaluation (TRE).

*Twinsburg*

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<sub>c</sub>) and 7Q10 for average and the acute toxicity unit (TU<sub>a</sub>) and 1Q10 for maximum). For the Twinsburg WWTP, the AET values are 0.49 TU<sub>a</sub> and 1.20 TU<sub>c</sub>.

A summary of toxicity tests reported by the facility for the previous 5 years indicates that there have been instances of effluent toxicity:

Test Date	<i>Ceriodaphnia dubia</i> 48 hours	<i>Fathead Minnows</i> 96	<i>Ceriodaphnia dubia</i> 7 days	<i>Fathead Minnows</i> 7 days
	TU <sub>a</sub>	TU <sub>a</sub>	TU <sub>c</sub>	TU <sub>c</sub>
5/7/2009	0.2	3.5	BD	NT
7/16/2009	BD	BD	BD	3.9
11/12/2009	BD	BD	1.12	BD
2/11/2010	BD	0.7	1.44	BD
5/6/2010	BD	0.9	BD	BD
7/15/2010	BD	BD	BD	BD
11/4/2010	BD	BD	BD	BD
2/3/2011	BD	BD	BD	BD
5/5/2011	BD	BD	BD	BD
7/7/2011	BD	0.4	1.44	BD
11/3/2011	BD	BD	BD	BD
2/9/2012	BD	BD	BD	BD
5/10/2012	BD	BD	BD	BD
7/5/2012	BD	BD	1.02	NT
9/13/2012	NT	BD	BD	BD
11/8/2012	BD	BD	BD	BD
2/7/2013	BD	BD	BD	BD
5/9/2013	BD	BD	BD	BD
7/11/2013	BD	BD	BD	BD

BD = Below Detection

TU<sub>a</sub> = acute toxicity units, TU<sub>c</sub> = chronic toxicity units

However, data for the past 24 months shows no evidence of toxicity. As such, continued quarterly monitoring of chronic toxicity with the determination of acute endpoints is proposed for the life of the permit. Ohio EPA will review the toxicity results to verify that toxicity is not present at the plant. If the evaluation of the monitoring data shows reasonable potential for toxicity, trigger language will be imposed during the next permit requiring the City to conduct a toxicity reduction evaluation (TRE) and final effluent toxicity limits of 1.2 TU<sub>c</sub> (monthly average) and 1.0 TU<sub>a</sub> (daily maximum).

### Mercury

Based on reasonable potential for requiring final effluent limits in NPDES permits [OAC 3745-33-07(A)], water quality based effluent limits are proposed for mercury for all of the Tinkers Creek wastewater treatment plants. This pollutant is included in Group 5 under the risk assessment procedures. Mercury is a bioaccumulative chemical of concern (BCC). As of November 15, 2010 all dischargers requiring mercury limits in their NPDES permit must meet water quality standards, 1.3 ng/l (monthly average) in the Lake Erie basin, at the end-of-pipe.

### *Aurora Westerly*

The proposed monthly average limits are based on wasteload allocation (Appendix D). The proposed daily maximum limits are a continuation of existing permit limits.

### *Streetsboro-Hudson*

To comply with mercury limits, the permittee has applied for coverage under the general mercury variance, Rule 3745-33-07(D)(10) of the Ohio Administrative Code. Based on the results of low-level mercury monitoring, the permittee has determined that its wastewater treatment plant cannot meet the 30-day average water quality-based effluent limit (WQBEL) of 1.3 ng/L. However, the permittee believes that the plant will be able to achieve an annual average mercury effluent concentration of 12 ng/L. The variance application also demonstrated to the satisfaction of Ohio EPA that there is no readily apparent means of complying with the WQBEL without constructing prohibitively expensive end-of-pipe controls for mercury. Based on these factors, the permittee is eligible for coverage under the general mercury variance.

Ohio EPA has reviewed the mercury variance application and has determined that it meets the requirements of the Ohio Administrative Code. The draft NPDES permit lists the provisions of the mercury variance and includes the following requirements:

- A variance-based monthly average effluent limit of 2.08 ng/L, which was developed from sampling data submitted by the permittee;
- A requirement that the permittee make reasonable progress to meet the water-quality-based effluent limit for mercury by implementing the plan of study, which has been developed as part of the Pollutant Minimization Program (PMP);
- Low-level mercury monitoring of the plant's influent and effluent;
- A requirement that the annual average mercury effluent concentration is less than or equal to 12 ng/L as specified in the plan of study;
- A summary of the elements of the plan of study;
- A requirement to submit an annual report on implementation of the PMP; and
- A requirement for submittal of a certification stating that all permit conditions related to implementing the plan of study and the PMP have been satisfied, but that compliance with the monthly average water quality-based effluent limit for mercury has not been achieved.

### *Bedford*

To comply with mercury limits, the permittee originally applied for coverage under the general mercury variance, Rule 3745-33-07(D)(10) of the OAC, Bedford currently has coverage under Ohio's mercury variance rule. The variance-based monthly average limit in the City's existing permit is 11 ng/l.

Based on the results of low-level mercury monitoring, the permittee has requested a renewal of the mercury variance. Ohio EPA has reviewed the permittee's request for renewal of the mercury variance and has determined that it meets the requirements of Rule 3745-33-07(D)(8) of the OAC. The proposed variance-based monthly average limit will be 6.4 ng/l.

### *Bedford Heights*

To comply with mercury limits, the permittee originally applied for coverage under the general mercury variance, Rule 3745-33-07(D)(10) of the OAC, Bedford Heights currently has coverage under Ohio's mercury variance rule. The variance-based monthly average limit in the City's existing permit is 2.3 ng/l.

Based on the results of low-level mercury monitoring, the permittee has requested a renewal of the mercury variance. Ohio EPA has reviewed the permittee's request for renewal of the mercury variance and has determined that it meets the requirements of Rule 3745-33-07(D)(8) of the OAC. The current permit limit of 2.3 ng/l and will be continued in the renewal permit.

### *Twinsburg*

To comply with mercury limits, the permittee originally applied for coverage under the general mercury variance, Rule 3745-33-07(D)(10) of the OAC, Twinsburg currently has coverage under Ohio's mercury variance rule. The variance-based monthly average limit in the City's existing permit is 1.8 ng/l.

Based on the results of low-level mercury monitoring, the permittee has requested a renewal of the mercury variance. Ohio EPA has reviewed the permittee's request for renewal of the mercury variance and has determined that it meets the requirements of Rule 3745-33-07(D)(8) of the OAC. The current permit limit of 1.8 ng/l and will be continued in the renewal permit.

### *Solon*

To comply with mercury limits, the permittee originally applied for coverage under the general mercury variance, Rule 3745-33-07(D)(10) of the OAC, Solon currently has coverage under Ohio's mercury variance rule. The variance-based monthly average limit in the City's existing permit is 16.1 ng/l.

Based on the results of low-level mercury monitoring, the permittee has requested a renewal of the mercury variance. Ohio EPA has reviewed the permittee's request for renewal of the mercury variance and has determined that it meets the requirements of Rule 3745-33-07(D)(8) of the OAC. The proposed variance-based monthly average limit will be 7.04 ng/l.

### Other Requirements

#### **Sanitary Sewer Overflow Reporting**

Provisions for reporting sanitary sewer overflows (SSOs) are also proposed in these permits. 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 of these permits in accordance with rules adopted in December 2006. These rules require that the treatment works maintain their existing classification. The permittees may request a re-classification of their treatment works at any time by submitting a request for a permit modification.

These facilities are required to meet the minimum staffing requirements specified in OAC 3745-7-04(C)(1). The permittees may submit an operating plan for their facility as part of an application for a staffing reduction.

#### **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 of these NPDES permits include language necessary to implement rule 3745-7-02 of the Ohio Administrative Code (OAC) and require the permittee to designate one or more operator of record to oversee the technical operation of the treatment works.

#### **Storm Water Compliance**

In accordance with rule 3745-39-04, wastewater treatment plants with a design flow of 1.0 mgd or more are required to obtain NPDES permit coverage for any "Storm water discharge

associated with industrial activity”. The term applies to storm water discharges from any conveyance that is used for collecting and conveying storm water and that is directly related to manufacturing, processing or raw materials storage areas at a wastewater treatment plant.

*Aurora Westerly, Streetsboro-Hudson, Twinsburg, Solon, Bedford and Bedford Heights*

Parts IV, V, and VI have been included in the draft permits to ensure that any storm water flows from the facility sites are properly regulated and managed. As an alternative to complying with Parts IV, V, and VI, the Cities 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 permittee 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 permits includes a requirement to place signs at each outfall to the respective receiving waters that provide information about the discharge. Signage at outfalls is required pursuant to Ohio Administrative Code 3745-33-08(A).

**Table 8a. Final effluent limits and monitoring requirements for the Aurora Westerly WWTP outfall 3PD00046001 and the basis for their recommendation.**

Parameter	Units	Concentration		Loading (kg/d) <sup>a</sup>		Basis <sup>b</sup>
		30 Day Average	Daily Max	30 Day Average	Daily Max	
Temperature	°C	Monitor				M
Dissolved oxygen	mg/l		5.0 (minimum)			WQS
Total Suspended Solids	mg/l	12	18 <sup>d</sup>	63.6	95.4 <sup>d</sup>	PD
Oil and Grease	mg/l		10 <sup>d</sup>			WQS
Ammonia, Summer	mg/l	1.5	2.3 <sup>d</sup>	7.95	12.2 <sup>d</sup>	EP,WLA
Ammonia, Winter	mg/l	7.5	11.3 <sup>d</sup>	39.8	59.9 <sup>d</sup>	EP,WLA
Nitrite plus Nitrate	mg/l	Monitor				M
Phosphorus	mg/l	0.7	0.7 <sup>d</sup>	3.71	3.71 <sup>d</sup>	TMDL
Cyanide, Free	mg/l	0.0052	0.022	0.0276	0.117	EP
Nickel, TR	µg/l	Monitor				M
Zinc, TR	µg/l	Monitor				M
Cadmium, TR	µg/l	Monitor				M
Lead, TR	µg/l	Monitor				M
Chromium, TR	µg/l	Monitor				M
Copper, TR	µg/l	20	32	0.106	0.17	EP,WLA
Chromium, Hexavalent	µg/l	Monitor				M
<i>E. coli</i>	#/100 ml	161	362 <sup>d</sup>			WQS
Flow Rate	MGD	Monitor				M
Mercury	ng/l	1.3	1200	0.000007	0.00636	EP,WLA
Acute Toxicity, <i>Ceriodaphnia</i>	TUa	1.0				WET
Acute Toxicity, <i>Pimephales</i>	TUa	Monitor				WET
Chronic Toxicity, <i>Ceriodaphnia</i>	TUc	1.0				WET
Chronic Toxicity, <i>Pimephales</i>	TUc	Monitor				WET
pH, Maximum	S.U.		9.0			WQS
pH, Minimum	S.U.		6.5 (min)			WQS
CBOD 5 day	mg/l	10	15 <sup>d</sup>	53	79.5 <sup>d</sup>	PD

a. Effluent loadings based on average design discharge flow of 1.4 MGD.

b. Definitions: BEJ = Best Engineering Judgment; EP = Existing Permit; M = BEJ of Permit Guidance 1: Monitoring Frequency Requirements for Sanitary Discharges; PD = Plant Design Criteria; RP = Reasonable Potential for requiring water quality-based effluent limits and monitoring requirements in NPDES permits (3745-33-07(A)); TMDL = *Total Maximum Daily Loads for the Lower Cuyahoga River, Final Report* (Approved by U.S. EPA September 26, 2003); 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).

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 8b. Final effluent limits and monitoring requirements for the Bedford WWTP outfall 3PD00005001 and the basis for their recommendation.**

Parameter	Units	Concentration		Loading (kg/d) <sup>a</sup>		Basis <sup>b</sup>
		30 Day Average	Daily Max	30 Day Average	Daily Max	
Temperature	°C	Monitor				M
Dissolved oxygen	mg/l		5.0 (min)			WQS
Total Suspended Solids	mg/l	12	18 <sup>d</sup>	145	218 <sup>d</sup>	PD
Oil and Grease	mg/l		10			WQS
Ammonia, Summer	mg/l	1.2	1.8 <sup>d</sup>	14.5	21.8 <sup>d</sup>	EP,WLA
Ammonia, Winter	mg/l	4	15 <sup>d</sup>	48.4	182 <sup>d</sup>	EP,WLA
Nitrite plus Nitrate	mg/l	Monitor				M
Phosphorus	mg/l	0.7	0.7 <sup>d</sup>	8.48	8.48 <sup>d</sup>	TMDL
Nickel, TR	µg/l	Monitor				M
Strontium, TR	µg/l	Monitor				M
Zinc, TR	µg/l	Monitor				M
Cadmium, TR	µg/l	Monitor				M
Lead, TR	µg/l	Monitor				M
Chromium, TR	µg/l	Monitor				M
Copper, TR	µg/l	16	25	0.194	0.303	WLA/ABS/EP
Chromium, Hexavalent	µg/l	Monitor				M
<i>E. coli</i>	#/100 ml	126	284 <sup>d</sup>			WQS
Flow	MGD	Monitor				M
Chlorine	mg/l		0.02			EP
Mercury	ng/l	7.0	1200	0.00013	0.015	VAR
Acute Toxicity, <i>Ceriodaphnia</i>	TUa	Monitor				WET
Acute Toxicity, <i>Pimephales</i>	TUa	1.0				WET
Chronic Toxicity, <i>Ceriodaphnia</i>	TUc	Monitor				WET
Chronic Toxicity, <i>Pimephales</i>	TUc	1.0				WET
pH, Maximum	S.U.		9.0			WQS
pH, Minimum	S.U.		6.5			WQS
CBOD 5 day	mg/l	10	15 <sup>d</sup>	121	182 <sup>d</sup>	PD

a. Effluent loadings based on average design discharge flow of 3.2 MGD.

b. Definitions: BEJ = Best Engineering Judgment; EP = Existing Permit; M = BEJ of Permit Guidance 1: Monitoring Frequency Requirements for Sanitary Discharges; PD = Plant Design Criteria; RP = Reasonable Potential for requiring water quality-based effluent limits and monitoring requirements in NPDES permits (3745-33-07(A)); TMDL = *Total Maximum Daily Loads for the Lower Cuyahoga River, Final Report* (Approved by U.S. EPA September 26, 2003); WET = Requiring water quality-based effluent limits and monitoring requirements for whole effluent toxicity in NPDES permits [40 CFR Part 132, Appendix F, Procedure 6 and OAC 3745-33-07(B)]; WLA = Wasteload Allocation procedures (OAC 3745-2); 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).

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 8c. Final effluent limits and monitoring requirements for the Bedford Heights WWTP outfall 3PD00006001 and the basis for their recommendation.**

Parameter	Units	Concentration		Loading (kg/d) <sup>a</sup>		Basis <sup>b</sup>
		30 Day Average	Daily Max	30 Day Average	Daily Max	
Temperature	°C	Monitor				M
Specific Conductance	Umho/cm	Monitor				M
Dissolved oxygen	mg/l		5.0 (min)			WQS
Total Suspended Solids	mg/l	12	18 <sup>d</sup>	163.7	245.6 <sup>d</sup>	PD
Oil and Grease	mg/l		10			WQS
Ammonia, Summer	mg/l	1.8	2.9 <sup>d</sup>	24.5	39.6 <sup>d</sup>	EP,WLA
Ammonia, Winter	mg/l	4.9	7.35 <sup>d</sup>	66.8	100.3 <sup>d</sup>	EP,WLA
Nitrite plus Nitrate	mg/l	Monitor				M
Phosphorus	mg/l	0.7	0.7 <sup>d</sup>	9.5	9.5 <sup>d</sup>	TMDL
Cyanide, Free	mg/l	0.0052	0.022	0.071	0.30	WLA
Nickel, TR	µg/l	Monitor				M
Zinc, TR	µg/l	Monitor				M
Cadmium, TR	µg/l	Monitor				M
Lead, TR	µg/l	Monitor				M
Chromium, TR	µg/l	Monitor				M
Copper, TR	µg/l	18	29	0.245	0.396	WLA/ABS/EP
Chromium, Hexavalent	µg/l	Monitor				M
Silver	µg/l	1.3	6.5	0.017	0.088	WLA
Total Dissolved Solids	mg/l	Monitor				M
<i>E. coli</i>	#/100 ml	126	284 <sup>d</sup>			WQS
Flow	MGD	Monitor				M
Chlorine	mg/l	0.011	0.019			WLA, EP
Mercury	ng/l	2.3	1200	0.000032	0.017	VAR
Acute Toxicity, <i>Ceriodaphnia</i>	TUa	1.0				WET
Acute Toxicity, <i>Pimephales</i>	TUa	1.0				WET
Chronic Toxicity, <i>Ceriodaphnia</i>	TUc	1.0				WET
Chronic Toxicity, <i>Pimephales</i>	TUc	1.0				WET
pH, Maximum	S.U.		9.0			WQS
pH, Minimum	S.U.		6.5			WQS
CBOD 5 day	mg/l	10	15 <sup>d</sup>	136.4	204.6 <sup>d</sup>	PD

a. Effluent loadings based on average design discharge flow of 3.6 MGD.

b. Definitions: BEJ = Best Engineering Judgment; EP = Existing Permit; M = BEJ of Permit Guidance 1: Monitoring Frequency Requirements for Sanitary Discharges; PD = Plant Design Criteria; RP = Reasonable Potential for requiring water quality-based effluent limits and monitoring requirements in NPDES permits (3745-33-07(A)); TMDL = *Total Maximum Daily Loads for the Lower Cuyahoga River, Final Report* (Approved by U.S. EPA September 26, 2003); 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).

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 8d. Final effluent limits and monitoring requirements for the Portage County Streetsboro-Hudson WWTP outfall 3PK00014001 and the basis for their recommendation.**

Parameter	Units	Concentration		Loading (kg/d) <sup>a</sup>		Basis <sup>b</sup>
		30 Day Average	Daily Max	30 Day Average	Daily Max	
Temperature	°C	Monitor				M
Dissolved oxygen	mg/l		6.0 (min)			EP
Total Suspended Solids	mg/l	12	18 <sup>d</sup>	182	273 <sup>d</sup>	PD
Oil and Grease	mg/l		10			WQS
Ammonia, Summer	mg/l	1.48	2.22 <sup>d</sup>	22.5	33.7 <sup>d</sup>	EP
Ammonia, Winter	mg/l	2	3 <sup>d</sup>	30.3	45.5 <sup>d</sup>	EP
Nitrite plus Nitrate	mg/l	Monitor				M
Phosphorus	mg/l	0.7	0.7 <sup>d</sup>	10.6	10.6 <sup>d</sup>	TMDL
Cyanide, Free	mg/l	Monitor				M
Nickel, TR	µg/l	Monitor				M
Zinc, TR	µg/l	Monitor				M
Cadmium, TR	µg/l	Monitor				M
Lead, TR	µg/l	Monitor				M
Chromium, TR	µg/l	Monitor				M
Copper, TR	µg/l	25	41	0.379	0.621	WLA
Chromium, Hexavalent	µg/l	Monitor				M
<i>E. coli</i>	#/100 ml	161	362 <sup>d</sup>			WQS
Flow	MGD	Monitor				M
Chlorine	mg/l		0.010			EP
Mercury	ng/l	2.08	858	0.000032	0.013	VAR/EP
Acute Toxicity, <i>Ceriodaphnia</i>	TUa	1.0				WET
Acute Toxicity, <i>Pimephales</i>	TUa	1.0				WET
Chronic Toxicity, <i>Ceriodaphnia</i>	TUc	1.0				WET
Chronic Toxicity, <i>Pimephales</i>	TUc	1.0				WET
pH, Maximum	S.U.		9.0			WQS
pH, Minimum	S.U.		6.5			WQS
CBOD 5 day	mg/l	10	15 <sup>d</sup>	152	228 <sup>d</sup>	PD

a. Effluent loadings based on average design discharge flow of 4.0 MGD.

b. Definitions: BEJ = Best Engineering Judgment; EP = Existing Permit; M = BEJ of Permit Guidance 1: Monitoring Frequency Requirements for Sanitary Discharges; PD = Plant Design Criteria; RP = Reasonable Potential for requiring water quality-based effluent limits and monitoring requirements in NPDES permits (3745-33-07(A)); TMDL = *Total Maximum Daily Loads for the Lower Cuyahoga River, Final Report* (Approved by U.S. EPA September 26, 2003); 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).

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 8e. Final effluent limits and monitoring requirements for the Solon WRF outfall 3PD00019001 and the basis for their recommendation.**

Parameter	Units	Concentration		Loading (kg/d) <sup>a</sup>		Basis <sup>b</sup>
		30 Day Average	Daily Max	30 Day Average	Daily Max	
Temperature	°C	Monitor				M
Specific Conductivity	Uhmo/cm	Monitor				M
Dissolved oxygen	mg/l		5.0 (min)			WQS
Total Suspended Solids	mg/l	12	18 <sup>d</sup>	263.5	395.2 <sup>d</sup>	PD
Oil and Grease	mg/l		10			WQS
Ammonia, Summer	mg/l	1.2	2.3 <sup>d</sup>	26.3	50.5 <sup>d</sup>	EP,WLA
Ammonia, Winter	mg/l	4.1	8.7 <sup>d</sup>	90.01	191 <sup>d</sup>	EP,WLA
Nitrite plus Nitrate	mg/l	Monitor				M
Phosphorus	mg/l	0.7	0.7 <sup>d</sup>	15.4	15.4 <sup>d</sup>	TMDL
Cyanide, Free	mg/l	0.0053	0.023	0.117	0.505	WLA
Arsenic, TR	µg/l	Monitor				M
Selenium, TR	µg/l	Monitor				M
Nickel, TR	µg/l	Monitor				M
Silver, TR	µg/l	Monitor				M
Zinc, TR	µg/l	Monitor				M
Cadmium, TR	µg/l	Monitor				M
Lead, TR	µg/l	Monitor				M
Chromium, TR	µg/l	Monitor				M
Copper, TR	µg/l	18	30	0.395	0.659	ABS
Chromium, Hexavalent	µg/l	Monitor				M
<i>E. coli</i>	#/100 ml	161	362 <sup>d</sup>			WQS
Chloroform	µg/l	Monitor				M
Bis(2-ethylhexyl) Phtalate	µg/l	Monitor				M
2,4,6-Trichlorophenol	µg/l	Monitor				M
Total Dissolved Solids	Mg/l	Monitor				M
Flow	MGD	Monitor				M
Mercury	ng/l	7.04	1200	0.000155	0.026	VAR,WLA
Acute Toxicity, <i>Ceriodaphnia</i>	TUa	Monitor				WET
Acute Toxicity, <i>Pimephales</i>	TUa	Monitor				WET
Chronic Toxicity, <i>Ceriodaphnia</i>	TUc	Monitor				WET
Chronic Toxicity, <i>Pimephales</i>	TUc	Monitor				WET
pH, Maximum	S.U.		9.0			WQS
pH, Minimum	S.U.		6.5			WQS
CBOD 5 day	mg/l	10	15 <sup>d</sup>	219.5	329.3 <sup>d</sup>	PD

a. Effluent loadings based on average design discharge flow of 5.8 MGD.

b. Definitions: BEJ = Best Engineering Judgment; EP = Existing Permit; M = BEJ of Permit Guidance 1: Monitoring Frequency Requirements for Sanitary Discharges; PD = Plant Design Criteria; RP = Reasonable Potential for requiring water quality-based effluent limits and monitoring requirements in NPDES permits (3745-33-07(A)); 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).

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 8f. Final effluent limits and monitoring requirements for the Summit County Aurora Shores WWTP outfall 3PG00030001 and the basis for their recommendation.**

Parameter	Units	Concentration		Loading (kg/d) <sup>a</sup>		Basis <sup>b</sup>
		30 Day Average	Daily Max	30 Day Average	Daily Max	
Temperature	°C	Monitor				M
Dissolved oxygen	mg/l		6.0 (minimum)			EP
Total Suspended Solids	mg/l	6	9 <sup>d</sup>	11	17 <sup>d</sup>	PD
Oil and Grease	mg/l		10			WQS
Ammonia, Summer	mg/l	0.75	1.15 <sup>d</sup>	1.4	2.1 <sup>d</sup>	EP
Ammonia, Winter	mg/l	2	3 <sup>d</sup>	3.79	5.7 <sup>d</sup>	EP
Nitrite plus Nitrate	mg/l	Monitor				M
Phosphorus	mg/l	0.7	0.7 <sup>d</sup>	1.32	1.32 <sup>d</sup>	TMDL
Nickel, TR	µg/l	Monitor				M
Zinc, TR	µg/l	227	230	4.99	5.06	WLA
Cadmium, TR	µg/l	Monitor				M
Lead, TR	µg/l	Monitor				M
Chromium, TR	µg/l	Monitor				M
Copper, TR	µg/l	18	29	0.396	0.637	WLA
Chromium, Hexavalent	µg/l	Monitor				M
<i>E. coli</i>	#/100 ml	161	362 <sup>d</sup>			WQS
Flow	MGD	Monitor				M
Mercury	ng/l	1.3	1700	0.00000246	0.00322	WLA
pH	S.U.	9.0 (max)	6.5(min)			WQS
CBOD 5 day	mg/l	5	7.5 <sup>d</sup>	10	14 <sup>d</sup>	PD

a. Effluent loadings based on average design discharge flow of 0.5 MGD.

b. Definitions: BEJ = Best Engineering Judgment; EP = Existing Permit; M = BEJ of Permit Guidance 1: Monitoring Frequency Requirements for Sanitary Discharges; PD = Plant Design Criteria; RP = Reasonable Potential for requiring water quality-based effluent limits and monitoring requirements in NPDES permits (3745-33-07(A)); TMDL = *Total Maximum Daily Loads for the Lower Cuyahoga River, Final Report* (Approved by U.S. EPA September 26, 2003); 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).

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 8g. Final effluent limits and monitoring requirements for the Twinsburg WWTP outfall 3PD00039001 and the basis for their recommendation.**

Parameter	Units	Concentration		Loading (kg/d) <sup>a</sup>		Basis <sup>b</sup>
		30 Day Average	Daily Max	30 Day Average	Daily Max	
Temperature	°C	Monitor				M
Dissolved oxygen	mg/l		5.5 (min)			EP
Total Dissolved Solids	mg/l	Monitor				M
Total Suspended Solids	mg/l	12	18 <sup>d</sup>	263	395 <sup>d</sup>	PD
Oil and Grease	mg/l		10			WQS
Ammonia, Summer	mg/l	0.99	1.5 <sup>d</sup>	21.7	32.9 <sup>d</sup>	EP
Ammonia, Winter	mg/l	7.1	10.6 <sup>d</sup>	156	233 <sup>d</sup>	EP
Nitrite plus Nitrate	mg/l	Monitor				M
Phosphorus	mg/l	0.6	0.6 <sup>d</sup>	13	13 <sup>d</sup>	TMDL
Cyanide, Free	mg/l	0.0055	0.0235	0.12	0.52	ABS
Nickel, TR	µg/l	Monitor				M
Strontium, TR	µg/l	Monitor				M
Zinc, TR	µg/l	Monitor				M
Aluminum, TR	µg/l	Monitor				M
Cadmium, TR	µg/l	Monitor				M
Lead, TR	µg/l	Monitor				M
Chromium, TR	µg/l	Monitor				M
Copper, TR	µg/l	Monitor				M
Chromium, Hexavalent	µg/l	Monitor				M
<i>E. coli</i>	#/100 ml	161	362 <sup>d</sup>			WQS
Pentachlorophenol	µg/l	Monitor				M
Bis(2-ethylhexyl) Phthalate	µg/l	Monitor				M
1,2-Dichlorobenzene	µg/l	Monitor				M
Flow	MGD	Monitor				M
Chlorine	mg/l		0.02			EP
Mercury	ng/l	1.8	1700	0.000039	0.037	EP, WLA
Acute Toxicity, <i>Ceriodaphnia</i>	TUa	Monitor				WET
Acute Toxicity, <i>Pimephales</i>	TUa	Monitor				WET
Chronic Toxicity, <i>Ceriodaphnia</i>	TUc	Monitor				WET
Chronic Toxicity, <i>Pimephales</i>	TUc	Monitor				WET
pH, Maximum	S.U.		9.0			WQS
pH, Minimum	S.U.		6.5			WQS
CBOD 5 day	mg/l	10	15 <sup>d</sup>	220	329 <sup>d</sup>	PD

a. Effluent loadings based on average design discharge flow of 5.8 MGD.

b. Definitions: BEJ = Best Engineering Judgment; EP = Existing Permit; M = BEJ of Permit Guidance 1: Monitoring Frequency Requirements for Sanitary Discharges; PD = Plant Design Criteria; RP = Reasonable Potential for requiring water quality-based effluent limits and monitoring requirements in NPDES permits (3745-33-07(A)); TMDL = *Total Maximum Daily Loads for the Lower Cuyahoga River, Final Report* (Approved by U.S. EPA September 26, 2003); 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).

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

# APPENDIX A – PEQ Values

## Aurora Shores WWTP

Parameter	Units	# of Samples	# > MDL	Average PEQ	Maximum PEQ
<u>Self-Monitoring (DMR) Data</u>					
Ammonia - Summer	mg/l	88	70	0.789	1.00
Ammonia - Winter	mg/l	70	37	0.357	0.456
NO <sub>3</sub> +NO <sub>2</sub>	mg/l	62	61	28.32	38.80
Phosphorus	mg/l	71	71	4.818	6.60
Nickel	µg/l	20	6	7.995	13.06
Zinc	µg/l	20	20	149.5	236.0
Cadmium	µg/l	20	0	--	--
Lead	µg/l	20	5	9.402	12.88
Chromium, total	µg/l	16	3	4.052	5.55
Copper	µg/l	20	17	27.78	48.75
Chromium <sup>+6</sup> , dissolved	µg/l	20	5	9.243	13.85
Mercury	ng/l	19	16	2.795	4.664

## Aurora Westerly WWTP

Parameter	Units	# of Samples	# > MDL	Average PEQ	Maximum PEQ
<u>Self-Monitoring (DMR) Data</u>					
Ammonia - Summer	mg/l	239	239	0.201	0.435
Ammonia - Winter	mg/l	197	197	0.361	0.724
NO <sub>3</sub> +NO <sub>2</sub>	mg/l	62	62	8.777	12.23
Phosphorus	mg/l	248	248	0.798	1.120
Cyanide, free	µg/l	62	0	--	--
Nickel	µg/l	20	0	--	--
Zinc	µg/l	21	16	57.89	79.30
Cadmium	µg/l	20	0	--	--
Lead	µg/l	21	0	--	--
Chromium, total	µg/l	30	0	--	--
Copper	µg/l	62	0	--	--
Chromium <sup>+6</sup> , dissolved	µg/l	62	0	--	--
Mercury	ng/l	47	12	1.586	2.426

## Bedford WWTP

Parameter	Units	# of Samples	# > MDL	Average PEQ	Maximum PEQ
<u>Self-Monitoring (DMR) Data</u>					
Ammonia - Summer	mg/l	240	240	0.275	0.584
Ammonia - Winter	mg/l	192	192	1.023	2.039
NO <sub>3</sub> +NO <sub>2</sub> - Total	mg/l	201	201	15.65	21.44
Phosphorus - Total	mg/l	744	744	0.648	0.888
Nickel - TR	µg/l	20	0	--	--
Strontium - TR	µg/l	15	14	419.4	574.5
Zinc - TR	µg/l	30	27	107.7	180.4
Cadmium - TR	µg/l	20	0	--	--
Lead - TR	µg/l	20	0	--	--
Chromium - TR	µg/l	20	0	--	--
Copper- TR	µg/l	62	20	19.86	31.20
Chromium <sup>+6</sup> , dissolved	µg/l	15	0	--	--
Chlorine, tot. res.	µg/l	1101	0	--	--
Mercury - Total	ng/l	62	62	6.424	8.8

## Bedford Heights WWTP

Parameter	Units	# of Samples	# > MDL	Average PEQ	Maximum PEQ
<u>Self-Monitoring (DMR) Data</u>					
Total Dissolved Solids	mg/l	15	15	1064.	1304.
Ammonia - Summer	mg/l	339	155	0.263	0.583
Ammonia - Winter	mg/l	282	145	6.132	8.4
NO <sub>3</sub> +NO <sub>2</sub>	mg/l	65	64	30.3	41.5
Phosphorus	mg/l	316	316	0.658	0.992
Cyanide, free	µg/l	62	5	17.68	20.73
Nickel <sup>A</sup>	µg/l	24	11	35.78	49.01
Silver	µg/l	47	8	2.464	2.816
Zinc <sup>A</sup>	µg/l	64	61	65.94	93.03
Cadmium	µg/l	6	2	2.223	3.045
Lead	µg/l	27	6	5.256	7.2
Chromium, total	µg/l	20	0	--	--
Copper <sup>A</sup>	µg/l	73	72	17.85	22.12
Chromium <sup>+6</sup> , dissolved	µg/l	20	0	--	--
Chlorine, tot. res.	µg/l	920	408	11.55	28.27
Mercury	ng/l	67	36	3.146	4.31

### Pretreatment Program Data

Chloroform <sup>C</sup>	µg/l	4	3	14.14	19.37
Dimethyl Phthalate	µg/l	4	1	23.16	31.76
Cyanide, total	µg/l	4	1	98.70	135.2
Molybdenum	µg/l	4	1	40.24	55.12

<sup>A</sup>. Pretreatment data were combined with the DMR data.

<sup>C</sup>. Carcinogen

### **Portage County Streetsboro-Hudson WWTP**

Parameter	Units	# of Samples	# > MDL	Average PEQ	Maximum PEQ
<u>Self-Monitoring (DMR) Data</u>					
Ammonia - Summer	mg/l	261	175	0.160	0.346
Ammonia - Winter	mg/l	219	173	0.249	0.552
NO <sub>3</sub> +NO <sub>2</sub>	mg/l	62	62	32.45	42.35
Phosphorus	mg/l	409	302	0.386	0.548
Cyanide, free	µg/l	31	0	--	--
Cadmium	µg/l	20	0	--	--
Copper	µg/l	65	44	24.79	39.12
Lead	µg/l	20	1	2.964	4.06
Nickel	µg/l	36	28	64.80	103.0
Zinc	µg/l	31	30	65.70	90.0
Chromium, total	µg/l	20	0	--	--
Chromium <sup>+6</sup> , dissolved	µg/l	32	0	--	--
Chlorine, tot. res.	µg/l	867	470	4.769	9.957
Mercury	ng/l	60	47	2.081	3.296

### **Solon WRF**

Parameter	Units	# of Samples	# > MDL	Average PEQ	Maximum PEQ
<u>Self-Monitoring (DMR) Data</u>					
Ammonia - Summer	mg/l	261	145	1.975	2.336
Ammonia - Winter	mg/l	228	178	8.375	11.47
NO <sub>3</sub> +NO <sub>2</sub> <sup>A</sup>	mg/l	63	62	15.33	21.0
Phosphorus	mg/l	278	278	0.657	0.912
Cyanide, free	µg/l	47	1	4.738	6.490
Selenium <sup>A</sup>	µg/l	7	1	3.270	4.48
Nickel <sup>A</sup>	µg/l	39	25	8.383	12.34
Silver	µg/l	34	0	--	--
Zinc <sup>A</sup>	µg/l	114	112	96.94	130.4
Cadmium	µg/l	34	0	--	--
Lead <sup>A</sup>	µg/l	39	5	3.593	5.589

Chromium, total	µg/l	17	2	1.329	1.82
Copper <sup>A</sup>	µg/l	132	109	24.85	37.68
Chromium <sup>+6</sup> , dissolved	µg/l	20	0	--	--
Methyl Bromide	µg/l	4	0	--	--
Bis(2-ethylhexyl)phthalate <sup>A C</sup>	µg/l	12	2	6.19	8.48
Mercury	ng/l	91	91	7.04	10.94

**Ohio EPA and Pretreatment Program Data**

Antimony	µg/l	4	1	28.47	39.0
Arsenic	µg/l	5	1	2.519	3.45
Barium	µg/l	1	1	81.47	111.6
Beryllium <sup>C</sup>	µg/l	4	1	2.278	3.12
Iron	µg/l	1	1	3200.	4383.
Magnesium	mg/l	1	1	67.89	93.0
Manganese	µg/l	1	1	357.6	489.8
Strontium	µg/l	1	1	1249.	1711.
Chloroform <sup>C</sup>	µg/l	5	3	3.694	5.06
Dichlorobromomethane <sup>C</sup>	µg/l	4	2	2.847	3.90
Total Dissolved Solids	mg/l	1	1	2960.	4055.
2,4,6-Trichlorophenol <sup>C</sup>	µg/l	5	1	9.235	12.65

<sup>B.</sup> OEPA and Pretreatment data were combined with the DMR data.

<sup>C.</sup> Carcinogen

**Twinsburg WWTP**

Parameter	Units	# of Samples	# > MDL	Average PEQ	Maximum PEQ
<b>Self-Monitoring (DMR) Data</b>					
TDS <sup>A</sup>	mg/l	32	32	950.1	1189.
Ammonia - Summer	mg/l	263	263	0.188	0.372
Ammonia - Winter	mg/l	222	222	0.577	1.271
NO <sub>3</sub> +NO <sub>2</sub> – Total <sup>A</sup>	mg/l	32	32	32.07	44.34
Phosphorus - Total	mg/l	288	288	0.679	0.948
Cyanide, free	µg/l	62	0	--	--
Nickel - TR <sup>A</sup>	µg/l	19	1	5.11	7.0
Strontium - TR <sup>A</sup>	µg/l	27	27	1573.	2282.
Zinc - TR <sup>A</sup>	µg/l	25	25	69.73	89.16
Aluminum - TR	µg/l	16	16	286.3	493.9
Cadmium - TR	µg/l	21	0	--	--
Lead - TR	µg/l	21	0	--	--
Chromium - TR	µg/l	21	0	--	--
Copper- TR <sup>A</sup>	µg/l	35	34	11.68	15.20
Chromium <sup>+6</sup> , dissolved	µg/l	21	0	--	--
Pentachlorophenol	µg/l	16	0	--	--
Bis(2-ethylhexyl) Phthalate <sup>A</sup>	µg/l	20	2	10.63	14.56
Chlorine, tot. res.	µg/l	920	0	--	--

Mercury - Total	ng/l	53	53	1.905	2.604
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Ohio EPA Data and Pretreatment Program Data

Barium	µg/l	1	1	76.94	105.4
Iron	µg/l	1	1	529.5	725.4
Magnesium	mg/l	1	1	67.89	93.0
Manganese	µg/l	1	1	63.36	86.80
Bromomethane	µg/l	1	1	2.716	3.72
Chloroform	µg/l	4	2	2.638	3.614
1,2-Dichlorobenzene	µg/l	4	1	24.48	33.54

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<sup>c</sup>. OEPA and Pretreatment data were combined with the DMR data.

## APPENDIX B – Applicable WQ in Study Area

### Aurora Shores WWTP

#### Water Quality Criteria in the Study Area

Parameter Maximum <sup>A</sup>	Units	Outside Mixing Zone Criteria				Inside Mixing Zone
		Human Health <sup>A</sup>	Average		Maximum Aquatic Life <sup>A</sup>	
			Agri- culture	Aquatic Life <sup>A</sup>		
Arsenic	µg/l	580.	100.	150.	340.	680.
Cadmium	µg/l	730.	50.	4.3	10.	20.
Chromium <sup>+6</sup> , diss.	µg/l	14000.	--	11.	16.	31.
Chromium, total	µg/l	14000.	100.	160.	3300.	6500.
Copper	µg/l	64000.	500.	17.	28.	55.
Cyanide, free	µg/l	48000.	--	5.2	22.	44.
Lead	µg/l	--	100.	16.	310.	610.
Mercury <sup>B,C</sup>	ng/l	3.1	10000.	910.	1700.	3400.
Molybdenum	µg/l	10000.	--	20000. <sup>D</sup>	190000. <sup>D</sup>	370000. <sup>D</sup>
Nickel	µg/l	43000.	200.	96.	860.	1700.
NO <sub>3</sub> +NO <sub>2</sub>	mg/l	--	100.	--	--	--
Selenium	µg/l	3100.	50.	5.0	--	--
Silver	µg/l	11000.	--	1.3	5.5	11.
Zinc	µg/l	35000.	25000.	180.	180.	360.

<sup>A</sup> Human Health and Aquatic Life Criteria are Tier I unless otherwise indicated.

<sup>B</sup> Bioaccumulative Chemical of Concern

<sup>C</sup> Wildlife Criteria = 1.3 ng/l

<sup>D</sup> Tier II Value

### Aurora Westerly WWTP

#### Water Quality Criteria in the Study Area

Parameter Maximum <sup>A</sup>	Units	Outside Mixing Zone Criteria				Inside Mixing Zone
		Human Health <sup>A</sup>	Average		Maximum Aquatic Life <sup>A</sup>	
			Agri- culture	Aquatic Life <sup>A</sup>		
Arsenic	µg/l	580.	100.	150.	340.	680.
Cadmium	µg/l	730.	50.	4.3	10.	20.
Chromium <sup>+6</sup> , diss.	µg/l	14000.	--	11.	16.	31.
Chromium, total	µg/l	14000.	100.	160.	3300.	6500.
Copper	µg/l	64000.	500.	17.	28.	55.
Cyanide, free	µg/l	48000.	--	5.2	22.	44.
Lead	µg/l	--	100.	16.	310.	610.
Mercury <sup>B,C</sup>	ng/l	3.1	10000.	910.	1700.	3400.
Molybdenum	µg/l	10000.	--	20000. <sup>D</sup>	190000. <sup>D</sup>	370000. <sup>D</sup>
Nickel	µg/l	43000.	200.	96.	860.	1700.
NO <sub>3</sub> +NO <sub>2</sub>	mg/l	--	100.	--	--	--

Selenium	µg/l	3100.	50.	5.0	--	--
Silver	µg/l	11000.	--	1.3	5.5	11.
Zinc	µg/l	35000.	25000.	180.	180.	360.

<sup>A</sup> Human Health and Aquatic Life Criteria are Tier I unless otherwise indicated.

<sup>B</sup> Bioaccumulative Chemical of Concern

<sup>C</sup> Wildlife Criteria = 1.3 ng/l

<sup>D</sup> Tier II Value

### Bedford WWTP Water Quality Criteria in the Study Area

Parameter	Units	Outside Mixing Zone Criteria			Maximum Aquatic Life <sup>A</sup>	Inside Mixing Zone Maximum <sup>A</sup>
		Average				
		Human Health <sup>A</sup>	Agri-culture	Aquatic Life <sup>A</sup>		
Ammonia – S	mg/l	--	--	1.3	--	--
Ammonia – W	mg/l	--	--	2.3	--	--
Arsenic	µg/l	580.	100.	150.	340.	680.
Cadmium	µg/l	730.	50.	4.1	9.3	19.
Chromium <sup>+6</sup> , diss.	µg/l	14000.	--	11.	16.	31.
Chromium, total	µg/l	14000.	100.	150.	3000.	6100.
Copper	µg/l	64000.	500.	16.	25. <sup>D</sup>	50. <sup>D</sup>
Cyanide, free	µg/l	48000.	--	5.2	22.	44.
Lead	µg/l	--	100.	26. <sup>D</sup>	500. <sup>D</sup>	1000. <sup>D</sup>
Mercury <sup>B E</sup>	ng/l	3.1	10000.	910.	1700.	3400.
Molybdenum	µg/l	10000.	--	20000.	190000.	370000.
Nickel	µg/l	43000.	200.	90. <sup>D</sup>	820. <sup>D</sup>	1600. <sup>D</sup>
Selenium	µg/l	3100.	50.	6.3 <sup>D</sup>	--	--
Silver	µg/l	11000.	--	1.3	4.8	9.6
Zinc	µg/l	35000.	25000.	210.	210.	410.

<sup>A</sup> Human Health and Aquatic Life Criteria are Tier I unless otherwise indicated.

<sup>B</sup> Bioaccumulative Chemical of Concern

<sup>D</sup> Effective criteria based on application of dissolved metal translator.

<sup>E</sup> Wildlife Criteria = 1.3 ng/l

### Bedford Heights WWTP Water Quality Criteria in the Study Area

Parameter Maximum <sup>A</sup>	Units	Outside Mixing Zone Criteria				Inside Mixing Zone
		Average			Maximum Aquatic Life <sup>A</sup>	
		Human Health <sup>A</sup>	Agri- culture	Aquatic Life <sup>A</sup>		
Arsenic	µg/l	580.	100.	150.	340.	680.
Cadmium	µg/l	730.	50.	4.7	11.	23.
Chlorine, total res.	µg/l	--	--	11.	19.	38.
Chloroform	µg/l	1700.	--	140. <sup>F</sup>	1300. <sup>F</sup>	2600. <sup>F</sup>
Chromium <sup>+6</sup> , diss.	µg/l	14000.	--	11.	16.	31.
Chromium, total	µg/l	14000.	100.	170.	3500.	7000.
Copper	µg/l	64000.	500.	19. <sup>E</sup>	30. <sup>E</sup>	60. <sup>E</sup>
Cyanide, free	µg/l	48000.	--	5.2	22.	44.
Dimethyl Phthalate	µg/l	--	--	1100. <sup>F</sup>	3200. <sup>F</sup>	6400. <sup>F</sup>
Lead	µg/l	--	100.	33. <sup>E</sup>	630. <sup>E</sup>	1300. <sup>E</sup>
Mercury <sup>B C</sup>	ng/l	3.1	10000.	910.	1700.	3400.
Molybdenum	µg/l	10000.	--	20000.	190000.	370000.
Nickel	µg/l	43000.	200.	110. <sup>E</sup>	950. <sup>E</sup>	1900. <sup>E</sup>
NO <sub>3</sub> +NO <sub>2</sub>	mg/l	--	100.	--	--	--
Selenium	µg/l	3100.	50.	6.3 <sup>E</sup>	--	--
Silver	µg/l	11000.	--	1.3	6.5	13.
Total Dissolved Solids	mg/l	--	--	1500.	--	--
Zinc	µg/l	35000.	25000.	240.	240.	480.

<sup>A</sup> Human Health and Aquatic Life Criteria are Tier I unless otherwise indicated.

<sup>B</sup> Bioaccumulative Chemical of Concern

<sup>C</sup> Wildlife Criteria = 1.3 ng/l

<sup>E</sup> Effective criteria based on application of dissolved metal translator.

<sup>F</sup> Tier II Criteria

### Portage County Streetsboro-Hudson WWTP Water Quality Criteria in the Study Area

Parameter Maximum <sup>A</sup>	Units	Outside Mixing Zone Criteria				Inside Mixing Zone
		Average			Maximum Aquatic Life <sup>A</sup>	
		Human Health <sup>A</sup>	Agri- culture	Aquatic Life <sup>A</sup>		
Arsenic	µg/l	580.	100.	150.	340.	680.
Cadmium	µg/l	730.	50.	6.1	17.	34.
Chlorine, total res.	µg/l	--	--	11.	19.	38.
Chromium <sup>+6</sup> , diss.	µg/l	14000.	--	11.	16.	31.
Chromium, total	µg/l	14000.	100.	220.	4700.	9300.
Copper	µg/l	64000.	500.	25. <sup>E</sup>	41. <sup>E</sup>	83. <sup>E</sup>
Cyanide, free	µg/l	48000.	--	5.2	22.	44.
Lead	µg/l	--	100.	51. <sup>E</sup>	980. <sup>E</sup>	2000. <sup>E</sup>
Mercury <sup>B C</sup>	ng/l	3.1	10000.	910.	1700.	3400.
Molybdenum	µg/l	10000.	--	20000.	190000.	370000.
Nickel	µg/l	43000.	200.	140. <sup>E</sup>	1300. <sup>E</sup>	2600. <sup>E</sup>
NO <sub>3</sub> +NO <sub>2</sub>	mg/l	--	100.	--	--	--
Selenium	µg/l	3100.	50.	6.3 <sup>E</sup>	--	--

Silver	µg/l	11000.	--	1.3	12.	24.
Zinc	µg/l	35000.	25000.	320.	320.	640.

<sup>A</sup> Human Health and Aquatic Life Criteria are Tier I unless otherwise indicated.

<sup>B</sup> Bioaccumulative Chemical of Concern

<sup>C</sup> Wildlife Criteria = 1.3 ng/l

<sup>E</sup> Effective criteria based on application of dissolved metal translator.

### Solon WRF

#### Water Quality Criteria in the Study Area

Parameter Maximum <sup>A</sup>	Units	Outside Mixing Zone Criteria			Maximum Aquatic Life <sup>A</sup>	Inside Mixing Zone
		Human Health <sup>A</sup>	Average			
			Agri- culture	Aquatic Life <sup>A</sup>		
Antimony	µg/l	780.	--	190. <sup>D</sup>	900. <sup>D</sup>	1800. <sup>D</sup>
Arsenic	µg/l	580.	100.	150.	340.	680.
Barium	µg/l	160000.	--	220. <sup>D</sup>	2000. <sup>D</sup>	4000. <sup>D</sup>
Beryllium	µg/l	130.	100.	39.	330.	660.
Bis (2-ethylhexyl) phthalate	µg/l	32.	--	8.4 <sup>D</sup>	1100. <sup>D</sup>	2100. <sup>D</sup>
Cadmium	µg/l	730.	50.	4.6	11.	22.
Chloroform	µg/l	1700.	--	140. <sup>D</sup>	1300. <sup>D</sup>	2600. <sup>D</sup>
Chromium <sup>+6</sup> , diss.	µg/l	14000.	--	11.	16.	31.
Chromium, total	µg/l	14000.	100.	160.	3400.	6900.
Copper	µg/l	64000.	500.	18.	29.	59.
Cyanide, free	µg/l	48000.	--	5.2	22.	44.
Dichlorobromomethane	µg/l	180.	--	340. <sup>E</sup>	3100. <sup>E</sup>	6200. <sup>E</sup>
Iron	µg/l	--	5000.	--	--	--
Lead	µg/l	--	100.	17.	330.	660.
Manganese	µg/l	61000.	--	--	--	--
Mercury <sup>B,C</sup>	ng/l	3.1	10000.	910.	1700.	3400.
Molybdenum	µg/l	10000.	--	20000. <sup>D</sup>	190000. <sup>D</sup>	370000. <sup>D</sup>
Nickel	µg/l	43000.	200.	100.	910.	1800.
NO <sub>3</sub> +NO <sub>2</sub>	mg/l	--	100.	--	--	--
Selenium	µg/l	3100.	50.	5.0	--	--
Silver	µg/l	11000.	--	1.3	6.2	12.
Strontium	µg/l	1400000.	--	21000. <sup>D</sup>	40000.	81000.
2,4,6-Trichlorophenol	µg/l	190.	--	4.9 <sup>D</sup>	39. <sup>D</sup>	79. <sup>D</sup>
Total Dissolved Solids	mg/l	--	--	1500.	--	--
Zinc	µg/l	35000.	25000.	230.	230.	470.

<sup>A</sup> Human Health and Aquatic Life Criteria are Tier I unless otherwise indicated.

<sup>B</sup> Bioaccumulative Chemical of Concern

<sup>C</sup> Wildlife Criteria = 1.3 ng/l

<sup>D</sup> Tier II Value

<sup>E</sup> Screening Value

### Twinsburg WWTP

#### Water Quality Criteria in the Study Area

Parameter	Units	Outside Mixing Zone Criteria			Maximum Aquatic Life <sup>A</sup>	Inside Mixing Zone Maximum <sup>A</sup>
		Average				
		Human Health <sup>A</sup>	Agri- culture	Aquatic Life <sup>A</sup>		
Aluminum	µg/l	4500.	--	--	--	--
Arsenic	µg/l	580.	100.	150.	340.	680.
Barium	µg/l	--	--	220. <sup>F</sup>	2000. <sup>F</sup>	4000. <sup>F</sup>
Bis(2-ethylhexyl) phthalate	µg/l	32. <sup>C</sup>	--	8.4 <sup>F</sup>	1100. <sup>F</sup>	2100. <sup>F</sup>
Bromomethane	µg/l	2600.	--	16. <sup>F</sup>	38. <sup>F</sup>	75. <sup>F</sup>
Cadmium	µg/l	730.	50.	4.6	11.	22.
Chloroform	µg/l	1700. <sup>C</sup>	--	140.	1300.	2600.
Chromium <sup>+6</sup> , diss.	µg/l	14000.	--	11.	16.	31.
Chromium, total	µg/l	14000.	100.	170.	3500.	7000.
Copper	µg/l	64000.	500.	19. <sup>D</sup>	31. <sup>D</sup>	63. <sup>D</sup>
Cyanide, free	µg/l	48000.	--	5.2	22.	44.
1,2-Dichlorobenzene	µg/l	11000.	--	23. <sup>F</sup>	130. <sup>F</sup>	260. <sup>F</sup>
Iron	µg/l	--	5000.	--	--	--
Lead	µg/l	--	100.	32. <sup>D</sup>	620. <sup>D</sup>	1200. <sup>D</sup>
Manganese	µg/l	61000.	--	--	--	--
Mercury <sup>BE</sup>	ng/l	3.1	10000.	910.	1700.	3400.
Molybdenum	µg/l	10000.	--	20000.	190000.	370000.
Nickel	µg/l	43000.	200.	105. <sup>D</sup>	940. <sup>D</sup>	1900. <sup>D</sup>
NO <sub>3</sub> +NO <sub>2</sub>	mg/l	--	100.	--	--	--
Selenium	µg/l	3100.	50.	6.3 <sup>D</sup>	--	--
Silver	µg/l	11000.	--	1.3	6.3	13.
Strontium	µg/l	1400000.	--	21000.	40000.	81000.
Total Dissolved Solids	mg/l	--	--	1500.	--	--
Zinc	µg/l	35000.	25000.	240.	240.	470.

<sup>A</sup> Human Health and Aquatic Life Criteria are Tier I unless otherwise indicated.

<sup>B</sup> Bioaccumulative Chemical of Concern

<sup>C</sup> Based on a carcinogenic endpoint.

<sup>D</sup> Effective criteria based on application of dissolved metal translator.

<sup>E</sup> Wildlife Criteria = 1.3 ng/l

<sup>F</sup> Tier II Criteria

# APPENDIX C – Instream Conditions and Flow

## Aurora Shores WWTP

### Instream Conditions and Discharger Flow

Parameter	Units	Season	Value	Basis
<b>Pond Brook upstream of Aurora Shores WWTP</b>				
7Q10	cfs	annual	0.10	USGS gage #04207200, 1990-2010 data
1Q10	cfs	annual	0.04	USGS gage #04207200, 1990-2010 data
90Q10	cfs	annual	0.48	USGS gage #04207200, 1990-2010 data
Harmonic Mean Flow	cfs	annual	0.94	USGS gage #04207200, 1990-2010 data
<b>Unnamed Tributary to Pond Brook upstream of Aurora Westerly WWTP</b>				
7Q10	cfs	annual	0.14	USGS gage #04207200, 1990-2010 data
1Q10	cfs	annual	0.06	USGS gage #04207200, 1990-2010 data
90Q10	cfs	annual	0.94	USGS gage #04207200, 1990-2010 data
Harmonic Mean Flow	cfs	annual	1.33	USGS gage #04207200, 1990-2010 data
Mixing Assumption	%	average	25	Default
	%	maximum	100	Stream-to-discharge ratio
Hardness	mg/l	annual	206.	Aurora Westerly 901 DMRs; 2009-12, (n=8)
<b>Aurora Westerly WWTP Discharge Flow</b>				
	cfs	design	2.17	DSW
<b>Aurora Shores WWTP Discharge Flow</b>				
	cfs	design	0.77	DSW
<b>Background Water Quality (µg/l)</b>				
Arsenic			2.7	STORET; 3 values, 0<MDL, 2000
Cadmium			0.27	STORET; 3 values, 2<MDL, 2000
Chromium <sup>+6</sup> , diss.			0.	No representative data available.
Chromium, total			32.	STORET; 3 values, 2<MDL, 2000
Copper			0.	STORET; 3 values, 3<MDL, 2000
Cyanide, free			0.	No representative data available.
Lead			2.	STORET; 3 values, 1<MDL, 2000
Molybdenum			0.	No representative data available.
Nickel			0.	STORET; 3 values, 3<MDL, 2000
NO <sub>3</sub> +NO <sub>2</sub> (mg/l)			0.38	STORET; 3 values, 0<MDL, 2000
Selenium			0.	STORET; 3 values, 3<MDL, 2000
Silver			0.	No representative data available.
Zinc			30.7	STORET; 3 values, 0<MDL, 2000

**Aurora Westerly WWTP**  
**Instream Conditions and Discharger Flow**

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Parameter	Units	Season	Value	Basis
<b>Pond Brook upstream of Aurora Shores WWTP</b>				
7Q10	cfs	annual	0.10	USGS gage #04207200, 1990-2010 data
1Q10	cfs	annual	0.04	USGS gage #04207200, 1990-2010 data
90Q10	cfs	annual	0.48	USGS gage #04207200, 1990-2010 data
Harmonic Mean Flow	cfs	annual	0.94	USGS gage #04207200, 1990-2010 data
<b>Unnamed Tributary to Pond Brook upstream of Aurora Westerly WWTP</b>				
7Q10	cfs	annual	0.14	USGS gage #04207200, 1990-2010 data
1Q10	cfs	annual	0.06	USGS gage #04207200, 1990-2010 data
90Q10	cfs	annual	0.94	USGS gage #04207200, 1990-2010 data
Harmonic Mean Flow	cfs	annual	1.33	USGS gage #04207200, 1990-2010 data
Mixing Assumption	%	average	25	Default
	%	maximum	100	Stream-to-discharge ratio
Hardness	mg/l	annual	206.	Aurora Westerly 901 DMRs; 2009-12, (n=8)
<b>Aurora Westerly WWTP Discharge Flow</b>				
	cfs	design	2.17	DSW
<b>Aurora Shores WWTP Discharge Flow</b>				
	cfs	design	0.77	DSW
<b>Background Water Quality (µg/l)</b>				
Arsenic			2.7	STORET; 3 values, 0<MDL, 2000
Cadmium			0.27	STORET; 3 values, 2<MDL, 2000
Chromium <sup>+6</sup> , diss.			0.	No representative data available.
Chromium, total			32.	STORET; 3 values, 2<MDL, 2000
Copper			0.	STORET; 3 values, 3<MDL, 2000
Cyanide, free			0.	No representative data available.
Lead			2.	STORET; 3 values, 1<MDL, 2000
Molybdenum			0.	No representative data available.
Nickel			0.	STORET; 3 values, 3<MDL, 2000
NO <sub>3</sub> +NO <sub>2</sub> (mg/l)			0.38	STORET; 3 values, 0<MDL, 2000
Selenium			0.	STORET; 3 values, 3<MDL, 2000
Silver			0.	No representative data available.
Zinc			30.7	STORET; 3 values, 0<MDL, 2000

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**Bedford WWTP**  
**Instream Conditions and Discharger Flow**

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Parameter	Units	Season	Value	Basis
<b>Wood Creek</b>				
7Q10	cfs	annual	0.20	USGS gage #04207200, 1990-2010 data
1Q10	cfs	annual	0.09	USGS gage #04207200, 1990-2010 data
30Q10	cfs	summer	0.55	USGS gage #04207200, 1990-2010 data
30Q10	cfs	winter	1.41	USGS gage #04207200, 1990-2010 data
90Q10	cfs	annual	1.03	USGS gage #04207200, 1990-2010 data
Harmonic Mean Flow	cfs	annual	1.99	USGS gage #04207200, 1990-2010 data
Mixing Assumption	%	average	25	Default Stream-to-discharge ratio
	%	maximum	100	
Instream Temperature	°C	summer	21.	DMR 901; 20 values, 2008-13
	°C	winter	8.6	DMR 901; 17 values, 2008-13
Instream pH	S.U.	summer	8.0	DMR 901; 20 values, 2008-13
	S.U.	winter	8.2	DMR 901; 17 values, 2008-13
Instream Hardness	mg/l	annual	189.	STORET; 2000, n=3
Bedford WWTP Discharge Flow	cfs	design	4.95	DSW
Background Water Quality (µg/l )				
Ammonia – S (mg/l)			0.02	DMR 801; 20 values, 1<MDL, 2003-07
Ammonia – W (mg/l)			0.03	DMR 801; 17 values, 0<MDL, 2003-07
Arsenic			0.	No representative data available.
Cadmium			0.	STORET; 4 values, 4<MDL, 1984
Chromium, total			0.	STORET; 4 values, 4<MDL, 1984
Chromium <sup>+6</sup> , diss.			0.	No representative data available.
Copper			8.8	STORET; 4 values, 2<MDL, 1984
Cyanide, free			0.	No representative data available.
Lead			0.	STORET; 4 values, 4<MDL, 1984
Molybdenum			0.	No representative data available.
Nickel			0.	STORET; 4 values, 4<MDL, 1984
Selenium			0.	No representative data available.
Silver			0.	No representative data available.
Zinc			7.5	STORET; 4 values, 3<MDL, 1984
Dissolved Metal Translators (µg/l )				
Copper			1.03	OEPA, 6 values, 0<MDL, 1996-97
Lead			2.30	OEPA, 6 values, 1<MDL, 1996-97
Nickel			1.02	OEPA, 6 values, 0<MDL, 1996-97
Selenium			1.38	OEPA, 4 values, 0<MDL, 1996-97

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**Bedford Heights WWTP**  
**Instream Conditions and Discharger Flow**

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Parameter	Units	Season	Value	Basis
7Q10	cfs	annual	0.05	USGS gage #04207200, 1990-2010
1Q10	cfs	annual	0.02	USGS gage #04207200, 1990-2010
90Q10	cfs	annual	0.23	USGS gage #04207200, 1990-2010
30Q10	cfs	summer	0.12	USGS gage #04207200, 1990-2010
	cfs	winter	0.31	USGS gage #04207200, 1990-2010
Harmonic Mean Flow	cfs	annual	0.44	USGS gage #04207200, 1990-2010
Mixing Assumption	%	average	25	Default Stream-to-discharge ratio
	%	maximum	100	
Instream Hardness	mg/l	annual	226.	DMR 901; 2008-13, n=62
Bedford WWTP Discharge Flow	cfs	design	5.57	DSW
Background Water Quality (µg/l)				
Arsenic			1.8	STORET; 6 values, 2<MDL, 2000
Cadmium			0.	STORET; 6 values, 6<MDL, 2000
Chlorine, tot. res.			0.	No representative data available.
Chromium <sup>+6</sup> , diss.			0.	No representative data available.
Chromium, total			26.	STORET; 6 values, 4<MDL, 2000
Copper			0.	STORET; 6 values, 6<MDL, 2000
Cyanide, free			0.	No representative data available.
Lead			1.5	STORET; 6 values, 4<MDL, 2000
Molybdenum			0.	No representative data available.
Nickel			0.	STORET; 6 values, 6<MDL, 2000
NO <sub>3</sub> +NO <sub>2</sub> (mg/l)			0.41	STORET; 6 values, 0<MDL, 2000
Selenium			0.	STORET; 6 values, 6<MDL, 2000
Silver			0.	No representative data available.
TDS (mg/l)			496.	STORET; 6 values, 0<MDL, 2000
Zinc			13.	STORET; 6 values, 3<MDL, 2000
Dissolved Metal Translators (µg/l)				
Copper			1.03	OEPA, 6 values, 0<MDL, 1996-97
Lead			2.30	OEPA, 6 values, 1<MDL, 1996-97
Nickel			1.02	OEPA, 6 values, 0<MDL, 1996-97
Selenium			1.38	OEPA, 4 values, 0<MDL, 1996-97

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**Portage County Streetsboro-Hudson WWTP  
Instream Conditions and Discharger Flow**

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Parameter	Units	Season	Value	Basis
Tinkers Creek Flow Conditions				
7Q10	cfs	annual	0.72	USGS gage #04207200, 1990-2010 data
1Q10	cfs	annual	0.32	USGS gage #04207200, 1990-2010 data
90Q10	cfs	annual	3.65	USGS gage #04207200, 1990-2010 data
Harmonic Mean Flow	cfs	annual	7.07	USGS gage #04207200, 1990-2010 data
Mixing Assumption	%	average	25	Default Stream-to-discharge ratio
	%	maximum	100	
Hardness	mg/l	annual	320.	DMR 901; 15 values, 2009-12
Streetsboro-Hudson WWTP Discharge Flow	cfs	design	6.19	DSW
Background Water Quality (µg/l)				
Arsenic			5.0	STORET; 10 values, 0<MDL, 2000-11
Cadmium			0.	STORET; 10 values, 10<MDL, 2000 -11
Chlorine, tot. res.			0.	No representative data available.
Chromium, total			0.	STORET; 10 values, 10<MDL, 2000 -11
Chromium <sup>+6</sup> , diss.			0.	No representative data available.
Copper			5.0	STORET; 10 values, 8<MDL, 2000 -11
Cyanide, free			0.	No representative data available.
Lead			0.	STORET; 10 values, 10<MDL, 2000 -11
Molybdenum			0.	No representative data available.
Nickel			20.	STORET; 10 values, 7<MDL, 2000 -11
Nitrate+Nitrite (mg/l)			0.05	STORET; 10 values, 7<MDL, 2000 -11
Selenium			0.	STORET; 10 values, 10<MDL, 2000 -11
Silver			0.	No representative data available.
Zinc			5.0	STORET; 10 values, 9<MDL, 2000 -11
Dissolved Metal Translators (µg/l)				
Copper			1.03	OEPA, 6 values, 0<MDL, 1996-97
Lead			2.30	OEPA, 6 values, 1<MDL, 1996-97
Nickel			1.02	OEPA, 6 values, 0<MDL, 1996-97
Selenium			1.38	OEPA, 4 values, 0<MDL, 1996-97

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**Solon WRF**  
**Instream Conditions and Discharger Flow**

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Parameter	Units	Season	Value	Basis
<b>Beaver Meadow Run upstream Zircoa</b>				
7Q10	cfs	annual	0.14	USGS gage #04207200, 1990-2010 data
1Q10	cfs	annual	0.06	USGS gage #04207200, 1990-2010 data
90Q10	cfs	annual	0.71	USGS gage #04207200, 1990-2010 data
Harmonic Mean Flow	cfs	annual	1.39	USGS gage #04207200, 1990-2010 data
<b>Beaver Meadow Run between Zircoa and Solon</b>				
7Q10	cfs	annual	0.18	USGS gage #04207200, 1990-2010 data
1Q10	cfs	annual	0.08	USGS gage #04207200, 1990-2010 data
90Q10	cfs	annual	0.92	USGS gage #04207200, 1990-2010 data
Harmonic Mean Flow	cfs	annual	1.78	USGS gage #04207200, 1990-2010 data
Mixing Assumption	%	average	25	Default
	%	maximum	100	Stream-to-discharge ratio
Hardness	mg/l	annual	219.	901 DMRs; 2008-13, n=62
<b>Solon WRF Discharge Flow</b>				
	cfs	design	8.97	DSW
<b>Zircoa 001 Discharge Flow</b>				
	cfs	avg.	0.192	DMRs
<b>Background Water Quality (µg/l)</b>				
Arsenic			2.3	STORET; 3 values, 0<MDL, 2000
Barium			38.	STORET; 3 values, 0<MDL, 2000
Bis(2EHP)			0.	No representative data available.
Cadmium			0.	STORET; 3 values, 3<MDL, 2000
Chromium <sup>+6</sup> , diss.			0.	No representative data available.
Chromium, total			39.	STORET; 3 values, 2<MDL, 2000
Copper			0.	STORET; 3 values, 3<MDL, 2000
Cyanide, free			0.	No representative data available.
Iron			429.	STORET; 3 values, 0<MDL, 2000
Lead			0.	STORET; 3 values, 3<MDL, 2000
Molybdenum			0.	No representative data available.
Nickel			0.	STORET; 3 values, 3<MDL, 2000
Selenium			0.	STORET; 3 values, 3<MDL, 2000
Silver			0.	No representative data available.
Total Dissolved Solids (mg/l)			451.	STORET; 3 values, 0<MDL, 2000
2,4,6-Trichlorophenol			0.	No representative data available.
Zinc			7.	STORET; 3 values, 2<MDL, 2000

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**Twinsburg WWTP  
Instream Conditions and Discharger Flow**

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Parameter	Units	Season	Value	Basis
Tinkers Creek Flow Conditions				
7Q10	cfs	annual	7.14	USGS #04207200, 1990-2010 data
1Q10	cfs	annual	5.55	USGS #04207200, 1990-2010 data
90Q10	cfs	annual	18.67	USGS #04207200, 1990-2010 data
Harmonic Mean Flow	cfs	annual	32.17	USGS #04207200, 1990-2010 data
Mixing Assumption	%	average	25	Default Stream-to-discharge ratio
	%	maximum	100	
Hardness	mg/l	annual	223.	DMRs; 63 values, 2008-13
Twinsburg WWTP Discharge Flow	cfs	design	8.97	DSW
Background Water Quality (µg/l)				
Arsenic			3.8	STORET; 5 values, 0<MDL, 2000
Barium			59.2	STORET; 5 values, 0<MDL, 2000
Bis (2-ethylhexyl) phthalate			0.	No representative data available.
Cadmium			0.	STORET; 5 values, 5<MDL, 2000
Chromium, total			19.	STORET; 5 values, 4<MDL, 2000
Chromium <sup>+6</sup> , diss.			0.	No representative data available.
Copper			0.	STORET; 5 values, 5<MDL, 2000
Cyanide, free			0.	No representative data available.
1,2-Dichlorobenzene			0.	No representative data available.
Lead			1.6	STORET; 5 values, 3<MDL, 2000
Molybdenum			0.	No representative data available.
Nickel			0.	STORET; 5 values, 5<MDL, 2000
Nitrate+Nitrite (mg/l)			2.33	STORET; 5 values, 0<MDL, 2000
Selenium			0.	STORET; 5 values, 5<MDL, 2000
Silver			0.	No representative data available.
Total Dissolved Solids (mg/l)			543.	STORET; 5 values, 0<MDL, 2000
Zinc			16.	STORET; 5 values, 0<MDL, 2000
Dissolved Metal Translators (µg/l)				
Copper			1.093	OEPA & Twinsburg data combined
Lead			2.30	OEPA, 6 values, 1<MDL, 1996-97
Nickel			1.02	OEPA, 6 values, 0<MDL, 1996-97
Selenium			1.38	OEPA, 4 values, 0<MDL, 1996-97

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# APPENDIX D – WLAs to Maintain WQS

## Aurora Shores WWTP

### Summary of Effluent Limits to Maintain Applicable Water Quality Criteria

Parameter	Units	Average			Maximum Aquatic Life	Inside Mixing Zone Maximum
		Human Health	Agri Supply	Aquatic Life		
Arsenic <sup>B</sup>	µg/l	760. <sup>A</sup>	130.	156.	358.	680.
Cadmium <sup>B</sup>	µg/l	957. <sup>A</sup>	66. <sup>A</sup>	4.5	11.	20.
Chromium <sup>+6</sup> , diss.	µg/l	18360. <sup>A</sup>	--	11.	17.	31.
Chromium, tot. <sup>B</sup>	µg/l	18350. <sup>A</sup>	121.	165.	3470.	6500.
Copper	µg/l	83950. <sup>A</sup>	656. <sup>A</sup>	18	29.	55.
Cyanide, free <sup>B</sup>	µg/l	62960. <sup>A</sup>	--	5.4	23.	44.
Lead	µg/l	--	131.	17.	326.	610.
Mercury <sup>C D</sup>	ng/l	3.1	10000. <sup>A</sup>	910.	1700.	3400.
Molybdenum <sup>B</sup>	µg/l	13120.	--	20779.	199870.	370000.
Nickel <sup>B</sup>	µg/l	56400. <sup>A</sup>	262.	100.	905.	1700.
NO <sub>3</sub> +NO <sub>2</sub>	mg/l	--	131.	--	--	--
Selenium <sup>B</sup>	µg/l	4066.	66.	5.2	--	--
Silver <sup>B</sup>	µg/l	14429. <sup>A</sup>	--	1.4	5.8	11.
Zinc	µg/l	45900. <sup>A</sup>	32780. <sup>A</sup>	227.	230.	440.

<sup>A</sup> Allocation must not exceed the Inside Mixing Zone Maximum.

<sup>B</sup> Parameter would not require a WLA based on reasonable potential procedures, but allocation requested by permit writer.

<sup>C</sup> Wildlife Criteria= 1.3 ng/l

<sup>D</sup> 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 exception are met as listed in 3745-2-08(L).

**Aurora Westerly WWTP**

**Summary of Effluent Limits to Maintain Applicable Water Quality Criteria**

Parameter	Units	Average			Maximum Aquatic Life	Inside Mixing Zone Maximum
		Human Health	Agri Supply	Aquatic Life		
Arsenic <sup>B</sup>	µg/l	668.	115.	153.	349.	680.
Cadmium <sup>B</sup>	µg/l	841. <sup>A</sup>	58. <sup>A</sup>	4.4	10.	20.
Chromium <sup>+6</sup> , diss. <sup>B</sup>	µg/l	16130. <sup>A</sup>	--	11.	16.	31.
Chromium, tot. <sup>B</sup>	µg/l	16120. <sup>A</sup>	110	162.	3390.	6500.
Copper <sup>B</sup>	µg/l	73730. <sup>A</sup>	576. <sup>A</sup>	17.	29.	55.
Cyanide, free <sup>B</sup>	µg/l	55300. <sup>A</sup>	--	5.3	23.	44.
Lead <sup>B</sup>	µg/l	--	115.	16.	319.	610.
Mercury <sup>C D</sup>	ng/l	3.1	10000. <sup>A</sup>	910.	1700.	3400.
Molybdenum <sup>B</sup>	µg/l	11520.	--	20369.	195253.	370000.
Nickel <sup>B</sup>	µg/l	49540. <sup>A</sup>	230.	98.	884.	1700.
Selenium <sup>B</sup>	µg/l	3571.	58.	5.1	--	--
Silver <sup>B</sup>	µg/l	12673. <sup>A</sup>	--	1.3	5.7	11.
Zinc	µg/l	40320. <sup>A</sup>	28800. <sup>A</sup>	223.	225.	440.

<sup>A</sup> Allocation must not exceed the Inside Mixing Zone Maximum.

<sup>B</sup> Parameter would not require a WLA based on reasonable potential procedures, but allocation requested by permit writer.

<sup>C</sup> Wildlife Criteria= 1.3 ng/l

<sup>D</sup> 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 exception are met as listed in 3745-2-08(L).

**Bedford WWTP**

**Summary of Effluent Limits to Maintain Applicable Water Quality Criteria**

Parameter	Units	Average			Maximum Aquatic Life	Inside Mixing Zone Maximum
		Human Health	Agri Supply	Aquatic Life		
Ammonia - summer	mg/l	--	--	1.4	--	--
Ammonia - winter	mg/l	--	--	2.9	--	--
Arsenic <sup>B</sup>	µg/l	639.	110.	152.	346.	680.
Cadmium <sup>B</sup>	µg/l	804. <sup>A</sup>	55. <sup>A</sup>	4.1	9.5	19.
Chromium <sup>+6</sup> , diss. <sup>B</sup>	µg/l	15414. <sup>A</sup>	--	11.	16.	31.
Chromium, tot. <sup>B</sup>	µg/l	15414. <sup>A</sup>	110.	152.	3055.	6100.
Copper	µg/l	70464. <sup>A</sup>	550. <sup>A</sup>	16.	26. <sup>E</sup>	50. <sup>E</sup>
Cyanide, free <sup>B</sup>	µg/l	52848. <sup>A</sup>	--	5.3	22.	44.
Lead <sup>B</sup>	µg/l	--	110.	26. <sup>E</sup>	509. <sup>E</sup>	1000. <sup>E</sup>
Mercury <sup>C D</sup>	ng/l	3.1	10000. <sup>A</sup>	910.	1700.	3400.
Molybdenum <sup>B</sup>	µg/l	11010.	--	20202.	193455.	370000.
Nickel <sup>B</sup>	µg/l	47343. <sup>A</sup>	220.	91. <sup>E</sup>	835. <sup>E</sup>	1600. <sup>E</sup>
Selenium <sup>B</sup>	µg/l	3413. <sup>A</sup>	55.	6.4 <sup>E</sup>	--	--
Silver <sup>B</sup>	µg/l	12111. <sup>A</sup>	--	1.3	4.9	9.6
Zinc	µg/l	38535. <sup>A</sup>	27524. <sup>A</sup>	212.	214	410.

<sup>A</sup> Allocation must not exceed the Inside Mixing Zone Maximum.

<sup>B</sup> Parameter would not require a WLA based on reasonable potential procedures, but allocation requested by permit writer.

<sup>C</sup> Wildlife Criteria = 1.3 ng/l

<sup>D</sup> 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 exception are met as listed in 3745-2-08(L).

<sup>E</sup> Based on effective criteria.

**Bedford Heights WWTP**

**Summary of Effluent Limits to Maintain Applicable Water Quality Criteria**

Parameter	Units	Average			Maximum Aquatic Life	Inside Mixing Zone Maximum
		Human Health	Agri Supply	Aquatic Life		
Arsenic <sup>B</sup>	µg/l	583.	100.	150.	341.	680.
Cadmium <sup>B</sup>	µg/l	734. <sup>A</sup>	50. <sup>A</sup>	4.7	11.	23.
Chlorine, tot. res.	µg/l	--	--	11.	19.	38.
Chromium <sup>+6</sup> , diss. <sup>B</sup>	µg/l	14069. <sup>A</sup>	--	11.	16.	31.
Chromium, tot. <sup>B</sup>	µg/l	14069. <sup>A</sup>	100.	170.	3512.	7000.
Copper	µg/l	64316. <sup>A</sup>	502. <sup>A</sup>	19. <sup>E</sup>	30. <sup>E</sup>	60. <sup>E</sup>
Cyanide, free	µg/l	48000. <sup>A</sup>	--	5.2	22.	44.
Lead <sup>B</sup>	µg/l	--	100.	33. <sup>E</sup>	632. <sup>E</sup>	1300. <sup>E</sup>
Mercury <sup>C D</sup>	ng/l	3.1	10000. <sup>A</sup>	910.	1700.	3400.
Molybdenum <sup>B</sup>	µg/l	10049.	--	20045.	190682.	370000.
Nickel <sup>B</sup>	µg/l	43212. <sup>A</sup>	201.	110. <sup>E</sup>	953. <sup>E</sup>	1900. <sup>E</sup>
NO <sub>3</sub> +NO <sub>2</sub>	mg/l	--	100.	--	--	--
Selenium <sup>B</sup>	µg/l	3115.	50.	6.3 <sup>E</sup>	--	--
Silver	µg/l	11054. <sup>A</sup>	--	1.3	6.5	13.
TDS	mg/l	--	--	1502.	--	--
Zinc	µg/l	35173. <sup>A</sup>	25123. <sup>A</sup>	241.	241.	480.

<sup>A</sup> Allocation must not exceed the Inside Mixing Zone Maximum.

<sup>B</sup> Parameter would not require a WLA based on reasonable potential procedures, but allocation requested by permit writer.

<sup>C</sup> Wildlife Criteria; 1.3 ng/l.

<sup>D</sup> 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 exception are met as listed in 3745-2-08(L).

<sup>E</sup> Based on effective criteria.

**Portage County Streetsboro-Hudson WWTP  
Summary of Effluent Limits to Maintain Applicable Water Quality Criteria**

Parameter	Units	Average			Maximum Aquatic Life	Inside Mixing Zone Maximum
		Human Health	Agri Supply	Aquatic Life		
Arsenic <sup>B</sup>	µg/l	744. <sup>A</sup>	127.	154.	357.	680.
Cadmium <sup>B</sup>	µg/l	938. <sup>A</sup>	64. <sup>A</sup>	6.3	18.	34.
Chlorine, tot. res.	µg/l	--	--	11.	20.	38.
Chromium <sup>+6</sup> , diss. <sup>B</sup>	µg/l	17998. <sup>A</sup>	--	11.	17.	31.
Chromium, tot. <sup>B</sup>	µg/l	17998. <sup>A</sup>	129.	226.	4943.	9300.
Copper	µg/l	82273. <sup>A</sup>	641. <sup>A</sup>	26. <sup>E</sup>	43. <sup>E</sup>	83. <sup>E</sup>
Cyanide, free <sup>B</sup>	µg/l	62000. <sup>A</sup>	--	5.4	23.	44.
Lead <sup>B</sup>	µg/l	--	129.	52. <sup>E</sup>	1031. <sup>E</sup>	2000. <sup>E</sup>
Mercury <sup>C D</sup>	ng/l	3.1	10000. <sup>A</sup>	910.	1700.	3400.
Molybdenum <sup>B</sup>	µg/l	12855.	--	20582.	199822.	370000.
Nickel	µg/l	55273. <sup>A</sup>	251.	143. <sup>E</sup>	1366. <sup>E</sup>	2600. <sup>E</sup>
NO <sub>3</sub> + NO <sub>2</sub>	mg/l	--	129.	--	--	--
Selenium <sup>B</sup>	µg/l	3985.	64.	6.5 <sup>E</sup>	--	--
Silver <sup>B</sup>	µg/l	14141. <sup>A</sup>	--	1.3	13.	24.
Zinc	µg/l	44993. <sup>A</sup>	32137. <sup>A</sup>	329.	336.	640.

<sup>A</sup> Allocation must not exceed the Inside Mixing Zone Maximum.

<sup>B</sup> Parameter would not require a WLA based on reasonable potential procedures, but allocation requested by permit writer.

<sup>C</sup> Wildlife Criteria = 1.3 ng/l

<sup>D</sup> 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 exception are met as listed in 3745-2-08(L).

<sup>E</sup> Based on effective criteria.

**Solon WRF**

**Summary of Effluent Limits to Maintain Applicable Water Quality Criteria**

Parameter	Units	Average			Maximum Aquatic Life	Inside Mixing Zone Maximum
		Human Health	Agri Supply	Aquatic Life		
Arsenic <sup>B</sup>	µg/l	634.	109.	152.	352.	680.
Barium	µg/l	174988. <sup>A</sup>	--	223.	2073.	4000.
Bis (2-ethylhexyl) phthalate	µg/l	35.	--	8.5	1141.	2100.
Cadmium <sup>B</sup>	µg/l	798. <sup>A</sup>	55. <sup>A</sup>	4.7	11.	22.
Chromium <sup>+6</sup> , diss. <sup>B</sup>	µg/l	15312. <sup>A</sup>	--	11.	17.	31.
Chromium, tot. <sup>B</sup>	µg/l	15308. <sup>A</sup>	106.	162.	3524.	6900.
Copper	µg/l	69997. <sup>A</sup>	547. <sup>A</sup>	18.	30.	59.
Cyanide, free	µg/l	52000. <sup>A</sup>	--	5.3	23.	44.
Iron	µg/l	--	5428	--	--	--
Lead <sup>B</sup>	µg/l	--	109.	17.	342.	660.
Mercury <sup>C D</sup>	ng/l	3.1	10000. <sup>A</sup>	910.	1700.	3400.
Molybdenum <sup>B</sup>	µg/l	10937.	--	20285.	197032.	370000.
Nickel <sup>B</sup>	µg/l	47029. <sup>A</sup>	219.	101.	944.	1800.
Selenium	µg/l	3390.	55.	5.1	--	--
Silver <sup>B</sup>	µg/l	12031. <sup>A</sup>	--	1.3	6.4	12.
Total Dissolved Solids	mg/l	--	--	1515.	--	--
2,4,6-Trichlorophenol	µg/l	208. <sup>A</sup>	--	5.0	40.	79.
Zinc	µg/l	38279. <sup>A</sup>	27342. <sup>A</sup>	233.	238.	470.

<sup>A</sup> Allocation must not exceed the Inside Mixing Zone Maximum.

<sup>B</sup> Parameter would not require a WLA based on reasonable potential procedures, but allocation requested by permit writer.

<sup>C</sup> Wildlife Criteria= 1.3 ng/l

<sup>D</sup> 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 exception are met as listed in 3745-2-08(L).

**Twinsburg WWTP**  
**Summary of Effluent Limits to Maintain Applicable Water Quality Criteria**

Parameter	Units	Average			Maximum Aquatic Life	Inside Mixing Zone Maximum
		Human Health	Agri Supply	Aquatic Life		
Arsenic <sup>B</sup>	µg/l	1097. <sup>A</sup>	186.	179.	548.	680.
Barium	µg/l	--	--	252.	3201.	4000.
Bis (2-ethylhexyl) phthalate	µg/l	61.	--	10.	1781.	2100.
Cadmium <sup>B</sup>	µg/l	1385. <sup>A</sup>	95. <sup>A</sup>	5.5	18.	22.
Chromium <sup>+6, diss.</sup> <sup>B</sup>	µg/l	26552. <sup>A</sup>	--	13.	26.	31.
Chromium, tot. <sup>B</sup>	µg/l	26535. <sup>A</sup>	173.	200.	5654.	7000.
Copper	µg/l	121382. <sup>A</sup>	948. <sup>A</sup>	23. <sup>E</sup>	50. <sup>E</sup>	63. <sup>E</sup>
Cyanide, free	µg/l	91023. <sup>A</sup>	--	6.2	36.	44.
1,2-Dichlorobenzene	µg/l	20860. <sup>A</sup>	--	28.	210.	260.
Lead <sup>B</sup>	µg/l	--	188.	38. <sup>E</sup>	1003. <sup>E</sup>	1200. <sup>E</sup>
Mercury <sup>C D</sup>	ng/l	3.1	10000. <sup>A</sup>	910.	1700.	3400.
Molybdenum <sup>B</sup>	µg/l	18966.	--	23980.	307559.	370000.
Nickel <sup>B</sup>	µg/l	81554. <sup>A</sup>	379.	120. <sup>E</sup>	1522. <sup>E</sup>	1900. <sup>E</sup>
NO <sub>3</sub> +NO <sub>2</sub>	mg/l	--	188.	--	--	--
Selenium <sup>B</sup>	µg/l	5879.	95.	7.6 <sup>E</sup>	--	--
Silver <sup>B</sup>	µg/l	20863. <sup>A</sup>	--	1.6	10.	13.
TDS	mg/l	--	--	1690.	--	--
Zinc	µg/l	66367. <sup>A</sup>	47401. <sup>A</sup>	285.	379.	470.

<sup>A</sup> Allocation must not exceed the Inside Mixing Zone Maximum.

<sup>B</sup> Parameter would not require a WLA based on reasonable potential procedures, but allocation requested by permit writer.

<sup>C</sup> Wildlife criteria = 1.3 ng/l.

<sup>D</sup> 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 exception are met as listed in 3745-2-08(L).

<sup>E</sup> Based on effective criteria.