

National Pollutant Discharge Elimination System (NPDES) Permit Program

F A C T S H E E T

Regarding a Modification to an NPDES Permit To Discharge to Waters of the State of Ohio
for the Elyria Wastewater Treatment Plant

Public Notice No.: 11-04-020
Public Notice Date: April 12, 2011
Comment Period Ends: May 12, 2011

OEPA Permit No.: 3PD00034*LD
Application No.: OH0025003

Name and Address of Applicant:

City of Elyria
328 Broad Street
Elyria, Ohio 44035

Name and Address of Facility Where
Discharge Occurs:

Elyria Wastewater Pollution Control
1194 Gulf Road
Elyria, Ohio

Receiving Water: Black River

Subsequent
Stream Network: 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.

In accordance with the antidegradation rule, OAC 3745-1-05, the Director has determined that a lowering of water quality in the Black River is necessary. Provision (F)(2)(d) was applied to this application in regards to mercury. This provision excludes the need for the submittal and subsequent review of technical alternatives and social and economic issues related to the degradation. Other rule provisions, however, including public participation and appropriate intergovernmental coordination were required and considered prior to reaching this decision.

Procedures for Participation in the Formulation of Final Determinations

The proposed modification is tentative but shall become final on the effective date unless (1) an adjudication hearing is requested, (2) the Director withdraws and revises the proposed modification after consideration of the record of a public meeting or written comments, or (3) upon disapproval by the Administrator of the U.S. Environmental Protection Agency.

Within thirty (30) days of publication of this notice, any person may submit written comments, a statement as to why the proposed modification should be changed, and/or a request for notice of further actions concerning the modification.

A public hearing on this modification is scheduled at 6:30 p.m., Thursday, May 12, 2011 at the Elyria City Hall, 131 Court Street, Elyria, Ohio, 44035. All communications timely received will be considered in the final formulation of the modification.

Within thirty (30) days of the issuance of the proposed modification any officer of an agency of the state or of a political subdivision, acting in his representative capacity or any person aggrieved or adversely affected by issuance of it may request an adjudication hearing by submitting a written objection in accordance with Ohio Revised Code Section 3745.07. Since all other conditions of the permit remain in effect, a hearing may not be requested on any issues other than the proposed modification. If an adjudication hearing is requested, the existing NPDES permit will remain in effect until the hearing is resolved. Following the finalization of the modification by the Director, any person who was a party to an adjudication hearing may appeal to the Environmental Review Appeals Commission.

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
Lazarus Government Center
P.O. Box 1049
Columbus, Ohio 43216-1049**

Interested persons are invited to submit written comments upon the proposed modification. 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
Lazarus Government Center
P.O. Box 1049
Columbus, Ohio 43216-1049**

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

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

For additional information about this fact sheet or the draft permit, contact Gary Stuhlfauth, (614) 644-2016, Gary.Stuhlfauth@epa.ohio.gov .

Location of Discharge/Receiving Water Use Classification

The Elyria wastewater treatment plant discharges at river mile 10.6 to the Black River, which flows into Lake Erie. The Black River is designated for the following uses under Ohio's Water Quality Standards (OAC 3745-1-27): Warmwater Habitat, Seasonal Salmonid Habitat, Agricultural Water Supply, Industrial Water Supply, and Primary Contact Recreation. This section of the Black River is designated by Ohio EPA River Code 20-002 and by USEPA River Reach number 04110001-004. Figure 1 shows the approximate location of this facility.

Facility Description

The Elyria wastewater plant is an advanced treatment facility with an average daily design flow of 13.0 MGD (million gallons per day). Wet stream processes are screening, grit and scum removal, ferric chloride addition for phosphorus removal, primary settling, biological treatment with trickling filters and activated sludge aeration, secondary clarification, disinfection by chlorination, dechlorination and post aeration. Solid stream processes include anaerobic digestion, dewatering by belt filter press, and sludge disposal at the PPG Lime Lakes Reclamation Facility.

Elyria implements an Ohio EPA-approved industrial pretreatment program. Based on information in the 2010 annual program report, four categorical industrial users and five significant noncategorical industrial users discharge to the wastewater plant.

Elyria's collection system is approximately 94 percent separate sanitary sewers and 6 percent combined sewers. Twenty seven (27) CSOs (combined sewer overflows) are authorized in the City's NPDES permit. A 1.6 million gallon wet weather storage tank is available at the Elyria plant to store flows greater than 30 MGD for subsequent treatment. The operating practice at the plant includes automatic diversion of any flow greater than 30 MGD to the wet weather storage tank, with bypass to the stream through station 003 occurring if the tank becomes full.

The City's current NPDES permit included a compliance schedule for the City to address both CSOs and SSOs in a comprehensive, system wide study. The City has submitted all of the documents and reports required under the schedule, and they are currently under review.

Description of Existing Discharge

Table 1 presents a summary of unaltered Discharge Monitoring Report (DMR) data for outfall 3PD00034001. Data are presented for the period January 2006 through December 2010.

Table 2 summarizes the results of chronic whole effluent toxicity tests of the final effluent.

Basis of the Modification

General Mercury Variance

The City of Elyria 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 nanograms per liter (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. As a result, Ohio EPA is proposing a modification to the NPDES permit. Mercury variance provisions are being added as Items DD, EE and FF of the NPDES permit. The following requirements have been included in the draft modification:

- A variance-based monthly average effluent limit of 8.5 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.

Individual Variance for Total Dissolved Solids

Under rule 3745-33-07(D) of the Ohio Administrative Code, in February 2010, the City of Elyria applied for a variance from Ohio's Outside Mixing Zone Average water quality standard for total dissolved solids (TDS). The basis cited for variance is that "controls more stringent than those required by sections 301(b) and 306 of the act would result in substantial and widespread economic and social impact."

It is not technically feasible to modify the Elyria wastewater plant's treatment system so that it can meet the water quality-based effluent limit of 1551 mg/l (monthly average). Influent and effluent data demonstrate that TDS passes through the plant with little reduction. To meet the limit, the City would have to reduce the TDS load to the plant by setting new local limits on its industrial users, several of which are significant sources.

In October 2008 the City submitted a local limit justification to Ohio EPA that included a new local limit for TDS of 9473 mg/l. In June 2009, the Agency issued a public notice of its intent to approve changes to the City's Sewer Use Ordinance, which included the new local limits. Three of the industrial users that are primary sources of TDS submitted comments on the proposed approval, which has not been issued as a final action.

Based on information in a July 2010 status report from the City, four industrial users have been consistently discharging TDS at levels two to six times higher than the proposed local limit. The report states that one of these industrial users has gone out of business due to the current market and economic situation. Collection system sampling has not identified any other concentrated TDS sources in the City's industrial area.

Attachment 1 is a "Facility Specific Standard Variance Data Sheet" (U.S. EPA Region 5). Ohio EPA believes this form provides a useful template for presenting pertinent information about the variance request including: basis for the variance; discharge location, flow and TDS concentration; derivation of variance-based limit; aquatic life and environmental impact information; ambient TDS concentrations; economic impact and treatment feasibility information; industrial user information; and information on alternatives for meeting limits, current activities to reduce the TDS discharge and requirements under the variance.

After reviewing the City's variance application and other pertinent information, the Agency is proposing to grant the variance based on consideration of the following:

- It is not technically feasible to modify the treatment process of the Elyria wastewater plant to meet the water quality- based TDS limit.
- Using flow augmentation to reduce the TDS concentration in the plant's effluent is not technically feasible.
- Reducing the TDS load to the treatment plant by establishing pretreatment requirements for its industrial users is the most appropriate means for the Elyria wastewater plant to meet water quality standards.
- Data show that industrial users would have to achieve two to six-fold reductions in their TDS discharges to allow the Elyria wastewater plant to meet water quality standards. These are substantial reductions requiring adequate time for identifying alternatives, evaluating technical feasibility, determining costs, cost effectiveness and affordability.
- A more thorough analysis is necessary to determine if the financial impact is substantial once an industrial user identifies an alternative to reduce TDS to the level necessary for the Elyria wastewater plant to meet water quality standards.
- A more thorough analysis that encompasses all of the industrial users is necessary to determine if the socioeconomic impacts to the surrounding community of reducing TDS to the levels necessary for the Elyria wastewater plant to meet water quality standards are widespread.
- Granting a variance maintains the existing water quality standard while allowing the City and its industrial users to conduct a more thorough analysis of the financial and socioeconomic impacts of meeting the TDS water quality standard.

The following requirements are included in the draft modification:

- A variance-based monthly average effluent limit of 2860 mg/l, which was developed from sampling data submitted by the permittee; and
- A requirement that the permittee make reasonable progress to meet the water-quality-based effluent limit for total dissolved solids by: 1) requiring its industrial users to evaluate the technical and economic feasibility of modifying their manufacturing and/or treatment systems to reduce the TDS in their discharges to a level that would allow the Elyria wastewater plant to meet water quality standards; 2) requiring its industrial users to evaluate whether or not reducing the TDS in their discharges to a level that would allow the Elyria wastewater plant to meet water quality standards results in substantial financial impacts; and 3) demonstrating that there will be widespread adverse impacts on the community and surrounding area if its industrial users must reduce the TDS in their discharges to a level that would allow the Elyria wastewater treatment plant to meet water quality standards.

Whole Effluent Toxicity

Under the terms of its existing permit, the City has been conducting quarterly definitive chronic toxicity tests with the determination of acute end points using *Ceriodaphnia dubia*. The permit included a trigger for the imposition of final toxicity limits and for the City to conduct a toxicity reduction evaluation.

For chronic toxicity tests conducted from August 2007 through August 2009, the mean number of young produced per female in the upstream samples was typically greater than 30; going as high as 39.4. These are not typical results. Under known, nontoxic conditions, *C. dubia* typically average 23 young per female.

Using the upstream samples as primary controls, effluent toxicity ranging from 1.0 - 2.0 TUc was reported. If the laboratory water samples, which ranged from 16.6 - 29.2 number of young per female, had been used as the primary controls, the incidence of chronic toxicity would have been lower. Acute toxicity has not been observed in the Elyria effluent.

Ohio EPA is proposing that the determination of reasonable potential for whole effluent toxicity be based on tests where laboratory water is used as the primary control. To date, there are five such tests (see Table 2). An additional five tests will be available at permit renewal, providing an adequate number of tests for evaluating reasonable potential and determining the need for toxicity limits and a toxicity reduction evaluation.

New quarterly toxicity monitoring (definitive chronic with acute endpoints) is proposed in the interim table which is in effect until December 1, 2011. Quarterly chronic testing continues in the final table, though references to final toxicity limits and a toxicity reduction evaluation are being removed. The determination of acute endpoints from the chronic tests is proposed in the final table. The biomonitoring program requirements in Part II, Item BB will be revised accordingly.

Other Changes

Upstream Station 801

- Added monthly monitoring to total dissolved solids.
- Added whole effluent toxicity “percent affected” parameters for the upstream control samples.

Downstream Station 901

- Added monthly monitoring for total dissolved solids.

Compliance Schedule

A new 1 month compliance schedule is proposed for the City to submit a technical justification for either revising its local industrial user limits or retaining its existing local limits for total dissolved solids (residue) and selenium. If revisions to local limits are required, the City must also submit a pretreatment program modification request.

- Updated schedule by marking items that the City has completed.

Operator Certification and Minimum Staffing

Updated operator certification requirements have been included in Part II, Item A of the permit to be consistent with rules adopted in December 2006. These rules require the Ashtabula wastewater treatment plant to have a Class IV operator in charge of the sewage treatment plant operations discharging through outfall 001 .

Operator of Record

In December 2006, Ohio Administrative Code rule revisions became effective that affect the requirements for certified operators for sewage collection systems and treatment works regulated under NPDES permits. Part II, Item A of this NPDES permit has been updated to be consistent with rule 3745-7-02 of the Ohio Administrative Code (OAC). It requires the permittee to designate one or more operator of record to oversee the technical operation of the treatment works.

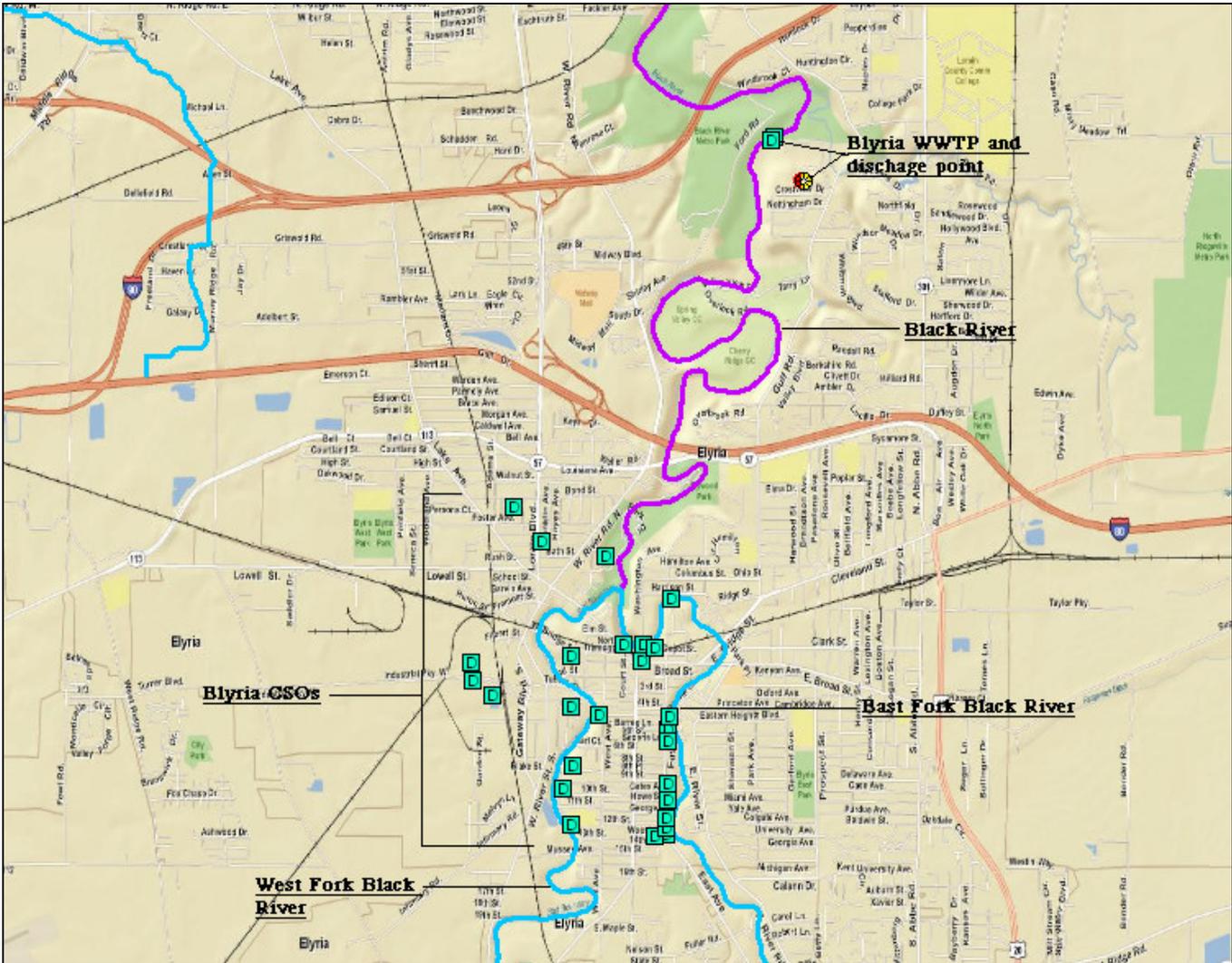


Figure 1. Location of the Elyria wastewater treatment plant.

Table 1. Effluent Characterization Using Self-Monitoring Data

Summary of discharge monitoring report data for Elyria outfall 3PD00034001 (January 2006 - December 2010). All values are based on annual records unless otherwise indicated.

Parameter	Season	Units	# Obs.	Percentiles		Data Range
				50 th	95 th	
Water Temperature	Annual	C	1709	16	23.8	6-26
Dissolved Oxygen	Summer	mg/l	920	8.9	10.1	5.3-11
Dissolved Oxygen	Winter	mg/l	906	10.7	12.8	6.7-14.4
Residue, Total Dissolved	Annual	mg/l	121	2250	2960	674-4440
Total Suspended Solids	Annual	mg/l	1232	4	20	1-76
Oil and Grease, Total	Annual	mg/l	83	0	1.77	0-3.1
Oil and Grease, Hexane	Annual	mg/l	37	1.6	2.42	0-5.3
Nitrogen, Ammonia (NH ₃)	Summer	mg/l	627	0.16	1.63	0-13.5
Nitrogen, Ammonia (NH ₃)	Winter	mg/l	605	0.14	6.97	0-25.6
Nitrite Plus Nitrate, Total	Annual	mg/l	130	39.6	63.5	8.6-72.2
Phosphorus, Total (P)	Annual	mg/l	646	0.69	1.6	0.11-2.68
Cyanide, Free	Annual	mg/l	60	0	0.005	0-0.018
Selenium, Total Recoverable	Annual	ug/l	119	4.2	7.8	0-10.2
Barium, Total Recoverable	Annual	ug/l	38	8.3	13.8	3.9-15.4
Nickel, Total Recoverable	Annual	ug/l	79	5.6	9.31	1.2-13.4
Zinc, Total Recoverable	Annual	ug/l	79	18.2	33.6	6.4-95.3
Cadmium, Total Recoverable	Annual	ug/l	79	0	1.21	0-6.6
Lead, Total Recoverable	Annual	ug/l	79	0	0	0-2.6
Chromium, Total Recoverable	Annual	ug/l	79	2.6	12.2	0-43.6
Copper, Total Recoverable	Annual	ug/l	119	4.8	9.86	0-38.3
Chromium, Dissolved Hexavalent	Annual	ug/l	60	0	0	0-0
Antimony, Total Recoverable	Annual	ug/l	38	3.8	11.2	0-29.6
Fecal Coliform	Annual	#/100 ml	638	51	4830	3-590000
Bis(2-ethylhexyl) Phthalate	Annual	ug/l	20	0	1.39	0-27.8
Flow Rate	Summer	MGD	916	5.59	12.8	3.39-30.2
Flow Rate	Winter	MGD	902	7.63	19.7	4.08-29.9
Flow Rate	Annual	MGD	1818	6.59	16.7	3.39-30.2
Chlorine, Total Residual	Annual	mg/l	929	0	0	0-0.307
Mercury, Total (Low Level)	Annual	ng/l	43	3.59	8	0.98-21.5
pH, Maximum	Annual	S.U.	1826	7.4	7.8	6.9-9
pH, Minimum	Annual	S.U.	1826	7.2	7.6	6.4-8
Mercury, Total Recoverable	Annual	ug/l	21	0.0046	0.015	0.0012-0.0163
CBOD 5 day	Summer	mg/l	620	2	4	0-10
CBOD 5 day	Winter	mg/l	596	2	6	1-16

Table 2. Summary of Chronic Toxicity Test Results

Test Date (a)	<i>Ceriodaphnia dubia</i> 7-Day											<i>Mean # Young</i>	
	UP ^b	C ^c	IC ₂₅ ^d	TU _c ^e	Survival			Reproduction			FF ⁱ	UP ^b	C ^c
					LOEC ^f	NOEC ^g	TU _c ^h	LOEC ^f	NOEC ^g	TU _c ^h			
11/09/10(E)	0	0*	99.7	1.0	>100	100	BD	>100	100	BD	NT	34.6	23.6*
08/17/10(E)	0	0*	>100	BD	>100	100	BD	>100	100	BD	NT	34.4	26.2*
05/11/10(E)	0	0**	>100	BD	>100	100	BD	>100	100	BD	NT	28.8	10.2**
02/09/10(E)	0	0*	85.9	1.2	>100	100	BD	100	80	1.1	NT	35.8	30.0*
11/03/09(E)	0	0**	>100	BD	>100	100	BD	ND	100	BD	NT	35.2	6.8**

^aO = EPA test; E = entity test

^bUP = upstream control water

^cC = laboratory water control

^dIC₂₅ = inhibition concentration twenty-five

^eTU_c = chronic toxicity units based on IC₂₅

^fLOEC = lowest observed effects concentration

^gNOEC = no observed effects concentration

^hTU_c = chronic toxicity units based on LOEC and NOEC

ⁱFF = far-field effect

BD = below detection

NT = not tested

* = primary control

** = unacceptable reproduction in primary control, comparisons to secondary control

Table 3. Modified effluent limits and monitoring requirements for Elyria outfall 3PD00034001 and the basis for their recommendation.

Parameter	Units	Effluent Limits				Basis ^b
		Concentration		Loading (kg/day) ^a		
		30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	
Mercury, T. (Interim and Final)	ng/l	8.5	1700 ^c	0.000418	0.0837 ^c	MVAR
Dissolved Solids, T. (Final)	mg/l	2860	--	140741	--	IVAR
Whole Effluent Toxicity (Interim and Final)						
Chronic	TUc	----- Monitor -----				BEJ
Acute	TUa	----- Monitor -----				BEJ

^a Effluent loadings based on average design discharge flow of 13.0 MGD.

^b Definitions: BEJ = Best Engineering Judgment; IVAR = Individual variance, Rule 3745-33-07(D) of the Ohio Administrative Code; MVAR = General mercury variance, Rule 3745-33-07(D)(10) of the Ohio Administrative Code

^c No change from current permit.

Attachment
Facility Specific Standard Variance Data Sheet (U.S. EPA Region 5)
For
Elyria Total Dissolved Solids Variance

Facility Specific Standard Variance Data Sheet

Directions: Please complete this form electronically. Record information in the space provided. Select checkboxes by double clicking on them. Do not delete or alter any fields. For citations, include page number and section if applicable. Please ensure that all data requested are included and as complete as possible. Attach additional sheets if needed.

Section I: General Information

Name of Permittee:	City of Elyria		
Facility Name:	Elyria Wastewater Pollution Control		
Submitted by:	David Burchmore, Squier, Sanders & Dempsey, Attorney		
State: <u>Ohio</u>	Substance: <u>Total dissolved solids</u>	Date completed: <u>2/19/10</u>	
Permit #: <u>3PD00034 (Ohio)/OH0025003 (USEPA)</u>	WQSTS #: <u>N/A</u>		
Duration of Variance	Start Date: <u>Effective date of NPDES mod</u>	End Date: <u>Permit expiration date – 6/30/12</u>	
Is this permit a:	<input checked="" type="checkbox"/> First time submittal for variance. <input type="checkbox"/> Renewal of a previous submittal for variance. <i>(Complete Section IX)</i>		
Description of proposed variance: Replace current monthly average WQBEL (water quality based effluent limit) of 1551 mg/l with a variance-based limit of 2860 mg/l. The basis for granting the variance is “substantial and widespread economic and social impact.”			
List names of all who assisted in the compilation of data for this form, including the completion date of their contribution: Gary Stuhlfauth, Ohio EPA, Division of Surface Water			

Section II: Criteria and Variance Information

Water Quality Standard from which variance is sought: <u>Total dissolved solids Outside Mixing Zone Average = 1500 mg/l</u>	
List other criteria likely to be affected by variance: <u>Whole effluent toxicity – a level of 1.0 TUc applies outside the mixing zone.</u>	
Source of substance: Besides domestic background, four industrial users are the primary sources of the TDS in the wastewater plant’s effluent.	
Ambient substance concentration: <u>See below</u>	<input checked="" type="checkbox"/> Measured <input type="checkbox"/> Estimated <input type="checkbox"/> Default <input type="checkbox"/> Unknown
If measured or estimated, what was the basis? Include citation. Ambient sampling by Ohio EPA at STORET station 501510 @ River Mile (RM) 9.8 on Black River (WWTP @ RM 10.6). Period of record: 2000 – 2010 (this is the period that there is TDS effluent data for Elyria) n = 89, Range = 236 – 1450 mg/l, Mean = 645 mg/l, Median = 542 mg/l, 95 th percentile = 1120 mg/l, 99 th percentile = 1370 mg/l	
Average effluent discharge rate: <u>8.300 MGD</u>	Maximum effluent discharge rate: <u>41.389 MGD</u>
Effluent substance concentration: <u>See below</u>	<input checked="" type="checkbox"/> Measured <input type="checkbox"/> Estimated <input type="checkbox"/> Default <input type="checkbox"/> Unknown
If measured or estimated, what was the basis? Include citation. DMR data reported by Elyria for outfall 001. Period of record 2000 – 2010 For flow: n = 3857, Range = 3.393 – 41.389 MGD, Median = 6.992 MGD, 95 th percentile = 17.203 MGD, 99 th percentile = 26.512 MGD (Average daily design flow of Elyria WWTP = 13.0 MGD) For TDS: n = 251, Range = 524 - 4440 mg/l, Median = 1960 mg/l, 95 th percentile = 2775 mg/l, 99 th percentile = 3050 mg/l	
Level currently achievable (LCA): <u>2860 mg/l</u>	Variance Limit: <u>2860 mg/l</u>
Target value(s):	
What data were used to calculate the LCA, and how was the LCA derived? <i>Immediate compliance with LCA is required.</i> DMR data reported by Elyria for outfall 001. Period of record = 6/2005 – 3/2010. Used Ohio EPA’s average Projected Effluent Quality (PEQ) calculation to determine LCA. n = 122, Range = 674 – 4440 mg/l The average PEQ is the upper bound of the 90% confidence interval about the 95 th percentile of the projected distribution of the monthly averages of the effluent data.	
Explain the basis used to determine the variance limit (which must be \leq LCA). Include citation. The variance-based limit is set equal to the LCA. OAC 3745-33-07(D)(6) requires compliance with an effluent limit which, at the time the variance is granted, represents the level currently achievable by the permittee.	
Select all applicable factors applicable as the basis for the variance as provided for by 40 CFR 131.10(g). Summarize justification below: <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input checked="" type="checkbox"/> 6	
Controls more stringent than those required by sections 301(b) and 306 of the Clean Water Act would result in substantial and widespread economic and social impact. Influent/effluent data demonstrates that TDS passes through the WWTP with no removal. The City investigated using flow augmentation – wells or potable water – for TDS compliance. Due to geology (low well yields) and required volume (potable), this was not technically feasible. The other control option is source control – pretreatment program local limits on industrial TDS sources (4 primary). Local limits necessary to meet the WQBEL would	

require IUs to install treatment with high capital costs, high O&M costs, and that might not be capable of achieving the required reductions. The costs could have negative impacts on the competitiveness and financial viability of the industries, with at least one saying it would have to close or relocate. Additional information below.

Section III: Location Information

Counties in which water quality is potentially impacted: Lorain

Receiving waterbody at discharge point: Black River

Flows into what stream / river? Lake Erie How many miles downstream? 10.6

Coordinates of discharge point (UTM or Latitude and Longitude): Lat: 41 24 36 Long: 82 05 24

What are the designated uses associated with this waterbody? Warmwater Habitat aquatic life, Seasonal Salmonid aquatic life, Agricultural Water Supply, Industrial Water Supply and Primary Contact Recreation (OAC 3745-1-27)

What is the distance from the point of discharge to the point downstream where the concentration of the substance falls to less than or equal to the chronic criterion of the substance for aquatic life protection? Less than 0.8 miles based on ambient monitoring at STORET station 501510 at RM 9.8. Discharge is at RM 10.6. See information in Section II, above.

Provide the equation used to calculate that distance (include definitions of all variables and identify the values used for the clarification, and include citation): The distance is based on observation, not calculation.

Identify all other variance permittees for the same substance which discharge to the same stream, river, or waterbody in a location where the effects of the combined variances would have an additive effect on the waterbody:

None

Please attach a map, photographs, or a simple schematic showing the location of the discharge point as well as all variances for the substance currently draining to this waterbody on a separate sheet.

Is receiving waterbody on CWA 303 (d) list? If yes, please list the impairments below. Yes No Unknown
 Human Health – Impaired (PCBs in fish tissue), TMDL needed.
 Aquatic Life – Impaired. TMDLs for some pollutants impairing aquatic life were approved by USEPA on 8/20/08. Will continue impaired listing until TMDLs are complete for all pollutants impairing aquatic life. (Note: Approved TMDL for nutrients and TSS. Other causes of aquatic life impairment listed are priority organics and unknown toxicity.)

Section IV: Public Notice

Has a public notice been given for this proposed variance? Yes No

If yes, was a public hearing held as well? Yes No

What type of notice was given? Notice of variance included in notice for permit. Separate notice of variance.

Date of public notice: COMPLETE Date of hearing: 5/12/11

Were comments received from the public in regards to this notice or hearing? Yes No

If yes, where can these comments be found? Hearing not yet held. If comments are received during public comment period on NPDES modification, they can be requested from Ohio EPA, Division of Surface Water, NPDES Permit Unit

Section V: Human Health

Is receiving water designated as a Public Water Supply? Yes No

Applicable criteria affected by variance: No human health criteria are affected by the total dissolved solids variance.
Identify any expected impacts that the variance may have upon human health, and include any citations:

None

Section VI: Aquatic Life and Environmental Impact

Aquatic life use designation of receiving water: Warmwater Habitat and Seasonal Salmonid

Applicable criteria affected by variance: Outside Mixing Zone Average criteria for total dissolved solids, 1500 mg/l

Identify any environmental impacts to aquatic life expected to occur with this variance, and include any citations:

Considering the information presented below, we do not expect this variance to result in impacts to aquatic life. The variance-based limit is calculated to represent the plant's current TDS discharge.

Ohio EPA's most recent biological and water quality report on the Black River (1999)* showed partial attainment of aquatic life criteria upstream (RM 11.9/12.3) and downstream (RM 10.3/9.8) of the Elyria wastewater treatment plant discharge (RM 10.6) (See Table 1, page 9). It stated that the downstream impact was due to Elyria's CSOs with some contribution from the wastewater plant. A slight impact ("marginally good") to macroinvertebrates was observed in one of the two sampling passes in the plant's mixing zone (RM 10.6). A "minor and localized" impact to fish was observed downstream of the plant (RM 10.3). (See pages 115 and 125). Aquatic life returned to full attainment at RM 8.5/8.7.

The instream TDS concentrations recorded at RM 9.8 during that field survey (Appendix 1) were similar to the concentrations recorded during 2000 – 2010 at the same location (n = 89, Range = 236 – 1450 mg/l, Mean = 645 mg/l, Median = 542 mg/l). None of the observed concentrations exceeded the TDS aquatic life water quality standard, 1500 mg/l (OMZA).

* Biological and Water Quality Study of the Black River Basin (Ohio EPA; March 31, 1999)

List any Endangered or Threatened species known or likely to occur within the affected area, and include any citations:

The U.S. Fish and Wildlife Service (web page updated January 2011) does not list any federally endangered or threatened species for the area of the Black River around Elyria. Two endangered birds, Kirtland's warbler and the Piping plover are known to migrate along the Lake Erie shore, which is 10.6 river miles downstream.

Section VII: Economic Impact and Feasibility

What modifications would be needed to comply with current limits? Include any citations. Since TDS passes through its wastewater plant (trickling filter/activated sludge) with no removal, and its investigation has shown that flow augmentation is not a feasible alternative to reduce the effluent concentration (see above), the City would have to reduce the TDS load coming from its industrial users. The City implements an approved pretreatment program. The City applied for a modification to its program for a water quality based effluent limit (WQBEL)-based TDS local limit of 9473 mg/l. Significant comments were received from three IUs that are primary sources for TDS, and Ohio EPA has not finalized the program modification.

Information on the four IUs that are primary TDS sources follows:

BASF Catalysts LLC manufactures base metal and precious metal catalysts and specialty inorganic pigments. Has received \$24.6 million grant from federal government to add a facility to produce materials for lithium ion batteries. Has 186 full-time employees, a \$17.6 million payroll, \$342,000 per year property taxes and \$4.4 million per year utility expenses. Estimated cost of TDS removal to meet proposed WQBEL-based local limit is ~\$2.1 million capital costs and \$570,000 - \$1,000,000 annual O&M. These costs would ~ double with expansion for lithium battery production.

3M Company manufactures cellulose sponges. Has 181 employees, a \$9 million payroll, \$131,000 per year property taxes and \$157,000 employee income taxes. Estimated cost of TDS removal to 11,000 mg/l (which is higher than the WQBEL-based local limit) ranges up to \$17 million capital costs and over \$5 million annual O&M (~\$1.20 per pound TDS removed). To achieve WQBEL-based local limit, estimated costs would be 2x – 3x for less than 10% increase in removal.

United Initiators supplies chemicals to the plastics industry. Has 57 employees, a \$4 million payroll, \$39,000 per year property taxes and \$58,000 employee income taxes. Estimated cost of TDS removal to meet proposed local limit is over \$1 million capital costs with high annual O&M costs.

APR Elyria, LLC is a new company that processes PET for recycling back to the bottle and strapping industries. Has 73 employees; planning to add shifts and increase to ~100. Estimated cost of TDS removal to meet local limit is over \$1 million capital costs and over \$400,000 annual O&M. These costs would cause the company to shut down or relocate.

<p>How long would it take to implement these changes? Uncertain, but it could take several years for the companies to conduct detailed process studies, pilot studies, design, financing, construction and bringing systems on line. The complexity of the work and the time needed would vary among the IUs. In some cases, studies might show the required TDS reductions to meet the proposed local limit are not technically feasible.</p>
<p>Estimate the capital cost: See above</p>
<p>Estimate additional O & M cost: See above</p>
<p>Citations: The above information is from the City's variance request and from comments on the City's proposed WQBEL-based local limit filed by the IUs. Additional confidential information was also provided.</p>
<p>Estimate the impact of treatment on the effluent substance concentration, and include any citations: TDS can be reduced by changes in the manufacturing process or by treatment processes such as ultra filtration, reverse osmosis and evaporation. With process evaluations, process and treatment pilot studies, engineering, equipment sizing and enough capital investment and operating money, it might be possible to reduce TDS concentrations to meet the proposed local limit. But, this is not certain. Confidential information submitted to Ohio EPA provides more detailed information on certain manufacturing processes and the technical challenges and uncertainty inherent in being able to meet the required TDS reductions.</p>
<p>Identify any expected environmental impacts that would result from further treatment, and include any citations: Treatment processes such as reverse osmosis and evaporation are energy intensive and would require the combustion of quantities of fossil fuels to generate the electricity. TDS concentrate produced by these processes must be transported offsite for proper disposal resulting in additional fuel emissions. It's possible that process changes and treatment could result in waste disposal issues - solid waste and/or hazardous waste.</p>
<p>Is it technically and economically feasible for this permittee to modify the treatment process to reduce the level of the substance in the discharge? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown</p> <p>Provide the basis for this conclusion, including citations. If treatment is technically infeasible, provide an analysis of the factors that demonstrates technical infeasibility. If treatment is economically infeasible, provide an analysis of the economic cost to ratepayers that demonstrates economic infeasibility. Attach additional sheets if necessary.</p> <p>Elyria WWTP</p> <p>It is not technically feasible to modify the treatment process at Elyria's wastewater treatment plant (trickling filter/activated sludge) to reduce the level of TDS in the discharge. Dissolved solids are not consumed as food and do not undergo reactions as part of the plant's biological processes, and they are not subject to incidental removal during setting. They pass through the treatment plant as demonstrated by examining influent and effluent data.</p> <p>The City investigated using flow augmentation to reduce the effluent concentration of TDS. This was not technically feasible due to the area's geology (low well yields) and the required volume (insufficient potable water supply).</p> <p>Absent a specific source of TDS loading, municipal wastewater plants typically discharge TDS in the range of 500 – 700 mg/l. From 2000 – 2010, the Elyria wastewater plant discharged TDS at higher levels (n = 251; median 1960 mg/l; range = 524 – 4440 mg/l). This indicates there is a specific source(s) of TDS discharging to the plant, which the City must regulate through its pretreatment program.</p> <p>Industrial Users</p> <p>The technical feasibility of the IUs to modify their manufacturing and/or treatment processes to reduce the level of TDS in their discharges to the required level is unknown. At this time, they have conducted preliminary evaluations. The IUs vary in what they produce, raw materials, manufacturing processes, process complexity and the size of the discharge. To determine technical feasibility, the companies must conduct process studies, evaluate alternatives, conduct pilot studies, evaluate design and construction issues and cost-effectiveness. The complexity of this work and the time needed would vary among the IUs. In some cases, studies might show the TDS reductions required to meet the proposed local limit are not technically feasible.</p> <p>The economic feasibility of modifying their manufacturing and/or treatment processes to reduce the level of TDS in their discharges requires a more thorough analysis by each of the industrial users. The City's variance application cited potential capital and O&M costs, number of employees, payroll, property and income tax figures and utility expenses. To demonstrate a substantial and widespread impact, the facilities must develop additional information consistent with Chapters 3 and 4 of U.S. EPA's Interim Economic Guidance Workbook (EPA 823-B-95-002; March 1993).</p>
<p>If treatment is possible, is it possible to comply with the limits on the substance? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown</p> <p>If it is, what prevents this from being done? Include any citations. Treatment for TDS at the Elyria wastewater treatment plant is not technically feasible.</p>

List any alternatives to current practices that have been considered, and why they have been rejected as a course of action, including any citations: The alternative to current practices is for the City to control the TDS load it receives from its industrial users through its pretreatment program. This has not been rejected. However, it will take time for the IUs to determine the technical feasibility of process changes and/or pretreatment and document whether process changes and/or pretreatment will result in substantial and widespread impacts (see above).

Section VIII: Compliance with Water Quality Standards

Describe all activities that have been, and are being, conducted to reduce the discharge of the substance into the receiving stream. This may include existing treatments and controls, consumer education, promising centralized or remote treatment technologies, planned research, etc. Include any citations. At its wastewater plant, the City has minimized the amount of ferric chloride that it uses for phosphorus removal.

The City proposed a modification to its pretreatment program that included local limits for TDS that it determined were necessary for the plant to meet its water quality based effluent limit for TDS. Several of the City's IUs filed comments on the City's derivation of the local limits. Ohio EPA has not issued the pretreatment program modification as a final action.

It will take time for the City's IUs to conduct the studies and evaluations needed to determine the technical and economic feasibility of reducing TDS to the level needed so that the City's wastewater plant can meet water quality standards.

Describe all actions that the permit requires the permittee to complete during the variance period to ensure reasonable progress towards attainment of the water quality standard. Include any citations. The permit requires the City of Elyria to:

- Use the authority of its industrial pretreatment program to require industrial users who are known sources of total dissolved solids to evaluate the technical and economic feasibility of modifying their manufacturing and/or treatment systems to reduce the TDS in their discharges to a level that would allow the Elyria wastewater treatment plant to meet water quality standards.
- Use the authority of its industrial pretreatment program to require industrial users who are known sources of total dissolved solids to develop the necessary information and use Chapter 3 of U.S. EPA's Interim Economic Guidance Workbook (EPA 823-B-95-002; March 1993) to evaluate whether or not modifying their manufacturing and/or treatment systems to reduce the TDS in their discharges to a level that would allow the Elyria wastewater treatment plant to meet water quality standards results in substantial financial impacts.
- Using the information developed by its industrial users as well as other relevant information, use Chapter 4 of U.S. EPA's Interim Economic Guidance Workbook (EPA 823-B-95-002; March 1993) to demonstrate that there will be widespread adverse impacts on the community and surrounding area if its industrial users must reduce the TDS in their discharges to a level that would allow the Elyria wastewater treatment plant to meet water quality standards.
- The permit establishes new TDS monitoring requirements at stations 801 and 901, which are upstream and downstream of the wastewater plant outfall. This will provide data to evaluate the plant's impact on instream TDS levels and to show if the TDS water quality standard is met at the downstream site.

Section IX: Compliance with Previous Permit (Renewals Only)

Date of previous submittal: _____ Date of EPA approval: _____
 Previous Permit #: _____ Previous WQSTS #: _____
 Effluent substance concentration: _____ Variance Limit: _____
 Target value(s): _____ Achieved? Yes No Partial

For renewals, list previous steps that were to be completed. Show whether these steps have been completed in compliance with the terms of the previous variance permit. Attach additional sheets if necessary.

Condition of previous variance	Compliance	
	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	<input type="checkbox"/> Yes	<input type="checkbox"/> No