IF YOU ARE SEEING THIS PAGE, PLEASE NOTE:

As of June 2010, all permits having a fact sheet that are going through a modification will have posted in pdf format any modification fact sheet attached to the front of the previous renewal/modification fact sheet.

FACT SHEETS ARE ON NEXT PAGE

If you have any questions regarding this, please contact the NPDES or PPU sections in the Division of Surface Water.

Attached are:

3ID00017*ID & 3ID00017*KD

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 **Millennium Inorganic Chemicals Inc. - Ashtabula Plant II**

Public Notice No.: 11-05-072
Public Notice Date: May 25, 2011
Comment Period Ends: August 1, 2011

OEPA Permit No.: **3IE00017*KD**
Application No.: (OH #) **OH0000493**

Name and Address of Applicant:

Millennium Inorganic Chemicals, Inc.
2426 Middle Road
Ashtabula, Ohio 44004

Name and Address of Facility Where Discharge Occurs:

Millennium Inorganic Chemicals, Inc.
Ashtabula Plant II
2426 Middle Road
Ashtabula, Ohio 44004
Ashtabula County

Receiving Water: **Lake Erie**

Subsequent Stream Network: **not applicable**

Introduction

Development of a Fact Sheet for NPDES permits is required 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 and other treatment-technology based standards, existing effluent quality, instream biological, chemical and physical conditions, and the allocations of pollutants to meet Ohio Water Quality Standards. This Fact Sheet details the discretionary decision-making process empowered to the director by the Clean Water Act and Ohio Water Pollution Control Law (ORC 6111). Decisions to award variances to Water Quality Standards or promulgated effluent guidelines for economic or technological reasons will also be justified in the Fact Sheet where necessary.

Effluent limits based on available treatment technologies are required by Section 301(b) of the Clean Water Act. Many of these have already been established by U.S. EPA in the effluent guideline regulations (a.k.a. categorical regulations) for industry categories in 40 CFR Parts 405-499. Technology-based regulations for publicly-owned treatment works are listed in the Secondary Treatment Regulations

(40 CFR Part 133). If regulations have not been established for a category of dischargers, the director may establish technology-based limits based on best professional judgment (BPJ).

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

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

Summary of Proposed Permit Conditions

This permit modification involves separating storm water run-off and non-contact cooling water from the remaining wastewater in order to improve the operation of the treatment system which is currently hydraulically overloaded. Storm water run-off and non-contact cooling water is proposed to be discharged into polishing ponds, then sent to final outfall 003. A new internal station (604) is proposed to monitor these wastestreams prior to discharge into the north and south settling ponds.

Finally, two changes are being proposed at outfall 003 which are not related to the basis for this modification. First, 7-day average limits for *E. coli* have been added to the effluent table for outfall 003 in order to be consistent with all NPDES permits requiring bacteria limits, and to be consistent with limits developed to implement the water quality standards for *E. coli* which became effective in March 2010. Secondly, monitoring for total residual chlorine has been added to the effluent table at outfall 003 to correct an oversight from the previous permit modification (3IE00017*JD).

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Procedures for Participation in the Formulation of Final Determinations

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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 proposed modification, contact John Schmidt [phone: (330) 963-1175; email: john.schmidt@epa.state.oh.us] in Ohio EPA's Northeast District Office.

Location of Discharge/Receiving Water Use Classification

Flow from both the Ashtabula Plant I and Ashtabula Plant II facilities, owned by Millennium Inorganic Chemicals, Inc. combines with the non-contact cooling water discharge from First Energy's Ashtabula Power Plant prior to entering the Ashtabula Power Plant's discharge channel which flows to Lake Erie. (See Figure 1 for the approximate location of Millennium Plant II.)

Lake Erie has the following designated uses: Exceptional Warmwater Habitat (EWH), Superior High Quality Water (SHQW), Public Water Supply (PWS), Agricultural Water Supply (AWS), Industrial Water Supply, and Bathing Waters (BW). This section of Lake Erie is identified by Ohio EPA River Code 24-800 and U.S. EPA River Reach number 04120101-011, and is located in the Erie/Ontario Drift and Lake Plain ecoregion.

Use designations define the goals and expectations for a waterbody. These goals are set for aquatic life protection, recreation use and water supply use, and are defined in the Ohio Water Quality Standards, or the Ohio Administrative Code (OAC 3745-1-07). The use designations for individual waterbodies are listed in rules -08 through -32 of the OAC. Once the goals are set, numeric water quality standards are developed to protect these uses; higher quality uses typically have more protective water quality criteria.

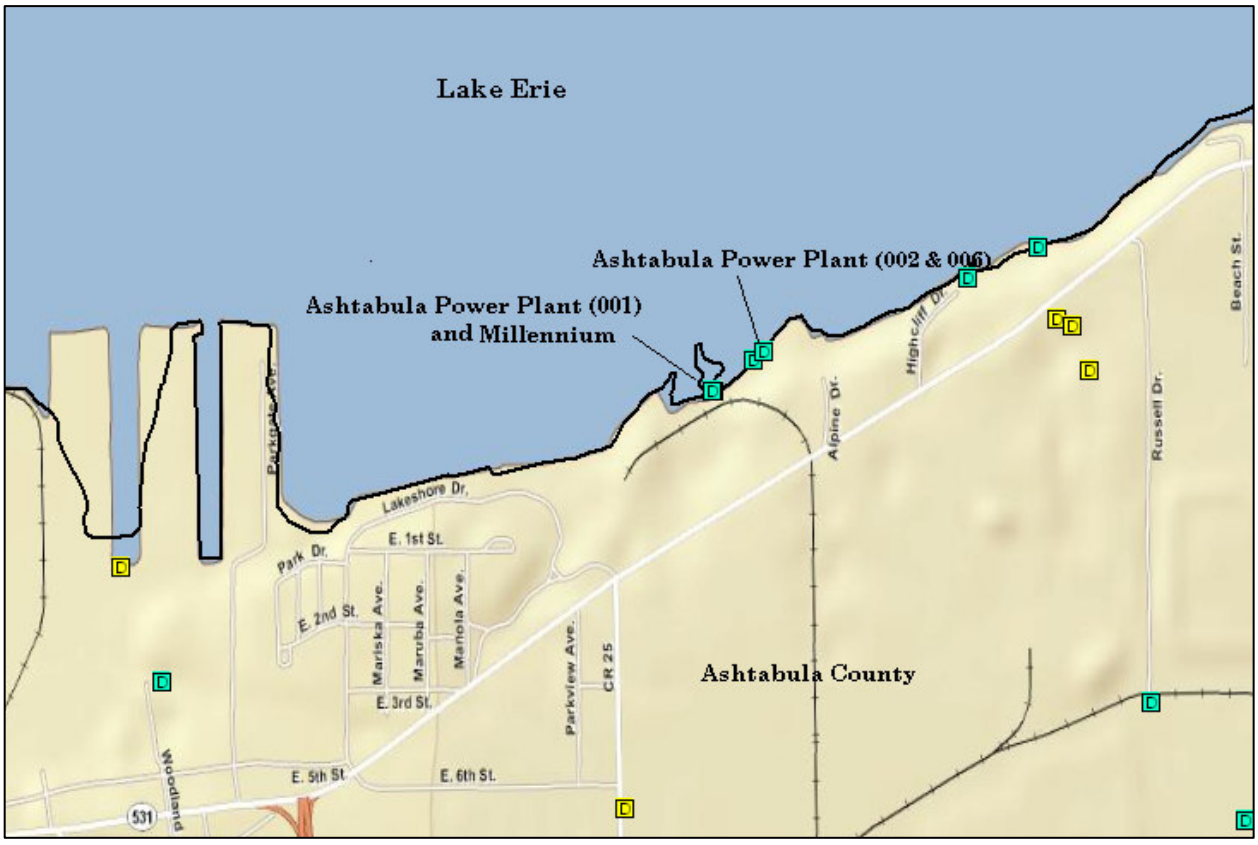

Figure 1. Location of Millennium Plant II

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

Recreation uses are defined by the depth of the waterbody and the potential for wading or swimming. Uses are defined for bathing waters, swimming/canoeing (Primary Contact) and wading only (Secondary Contact - generally waters too shallow for swimming or canoeing). Water supply uses are defined by the actual or potential use of the waterbody. Public Water Supply designations apply near existing water intakes so that waters are safe to drink with standard treatment. Most other waters are designated for agricultural and industrial water supply.

Facility Description

Millennium Plant II manufactures titanium dioxide and titanium tetrachloride from titantium-bearing ore. The ore is chlorinated and the resultant titantium tetrachloride is separated from the rest of the ore while in a vapor phase, and then oxidized to form titanium dioxide.

This plant is classified under the Standard Industrial Classification Code (SIC) 2816 which is identified as "Inorganic Pigments." The process wastestreams generated by this facility are regulated by Chapter 40 of the Code of Federal Regulations, Parts 415.222(b) and 415.223(b), "Titanium Dioxide-Chloride Process." The approximate location of the facility is shown in Figure 2.

Discharges from Millennium's Ashtabula Plant II

Millennium Plant II discharges from one external outfall (003) which flows into the Ashtabula Power Plant Discharge Channel. (See Table 1 for a listing of the Plant II outfalls.) Process wastewaters at the

Table 1. Description of Millennium Plant II Outfalls

Outfall #	Type of Wastewater	Treatment System Used	Discharge Point	Ave. Discharge (in MGD) *
003	- Process wastewater - Sanitary wastewater	none	Ashtabula Power Plant Open Discharge Channel	4.35
601	- Sanitary wastewater	- Extended aeration	Outfall 003	0.01
602	- Sanitary wastewater	- Trickling filter	Outfall 003	0.01

Table 1. Description of Millennium Plant II Outfalls

Outfall #	Type of Wastewater	Treatment System Used	Discharge Point	Ave. Discharge (in MGD) *
603	- Storm water - Wastewater collected in interceptor system	- Settling - oil/water separator - filtration - activated carbon	Polishing ponds to Outfall 003	0.216

* Average discharges based upon 2007 NPDES renewal application.

facility are treated by neutralization and chemical precipitation, settling, and pH adjustment prior to discharging at outfall 003.

Sanitary wastes at the facility are treated by a small extended aeration package plant and a small trickling filter. The sanitary wastewater treatment plants are monitored at internal outfalls 601 and 602 prior to being discharged at outfall 003. (See Figure 2 for a schematic of the wastewater flows at the facility.)

In September 2007 during Fields Brook remediation activities, four seeps of Therminol (which is composed of polychlorinated biphenyls, or PCBs) were discovered. Millennium has installed a treatment system to treat this wastewater as well as associated stormwater, and the effluent is discharged and monitored at outfall 603.

Table 4 presents a summary of unaltered monthly operation report data for the period August 2008 through March 2011, as well as current permit limits.

Basis for Permit Modification

Millennium's wastewater treatment system at Plant 2 is currently hydraulically overloaded. Evidence of this situation can be seen by examining the flow rate data found in Table 2. Even the 50th percentile flows for each year shown exceed the average design flow of 4.4 MGD except for 2010.

Table 2. Flow Rates for Outfall 003: August 2008 – March 2011

Year	Flow Rate (in MGD)		
	50th percentile	95th percentile	Maximum
2008	4.42	5.04	5.76
2009	4.43	5.07	7.47
2010	4.23	4.97	6.14
2011	5.00	5.55	8.63

In order to address the problem of overloading, Millennium is proposing to remove two wastestreams from the treatment system: 1) non-contact cooling water from the chlorinator shell water; and 2) discharges from the East Pond, which consists of primarily storm water. With this proposed change, these two wastestreams will be monitored at a new internal station (604) prior to flowing into the North and South settling ponds. (See Figure 3 on page 9.)

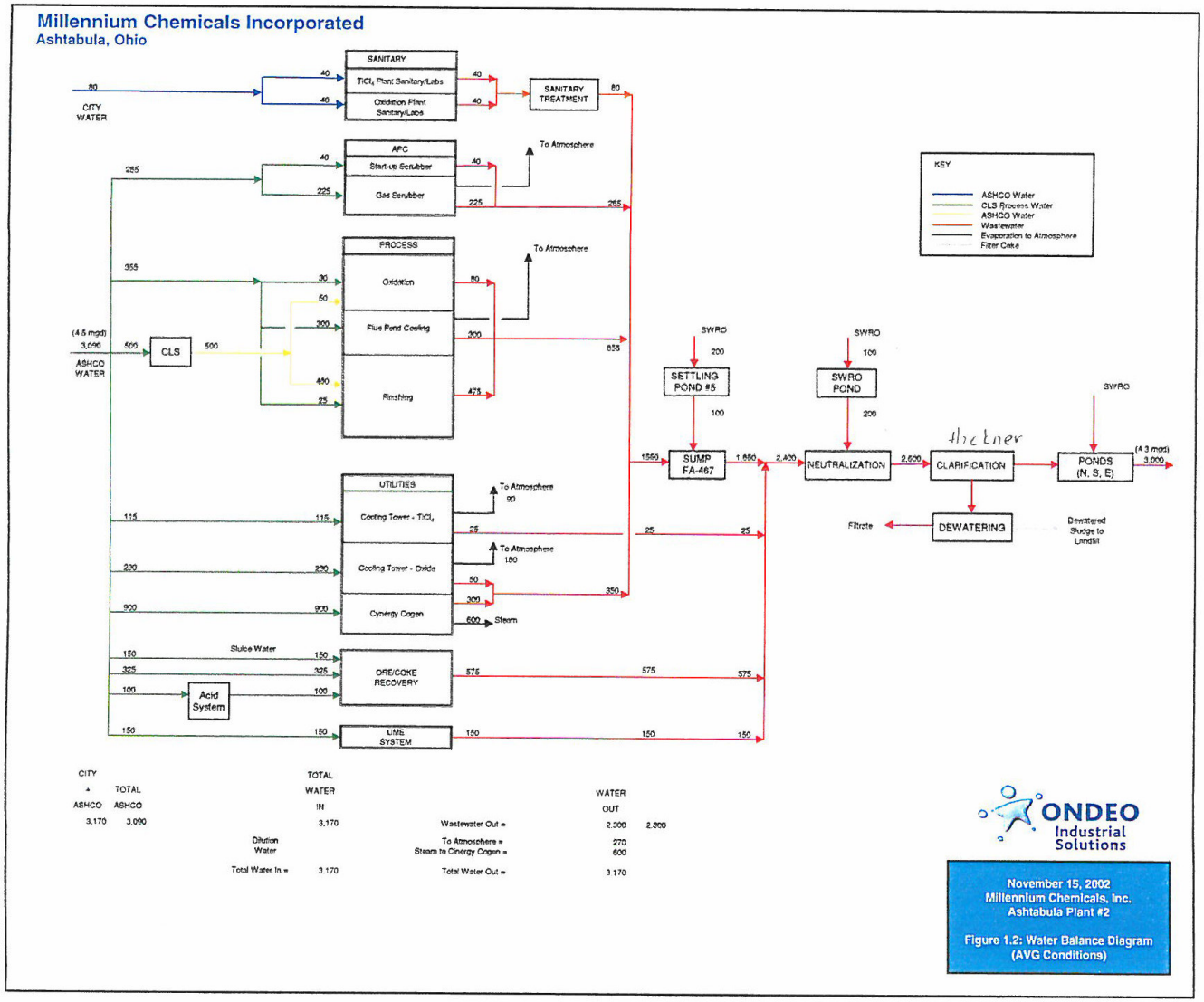

Figure 2. Wastewater Flow Schematic

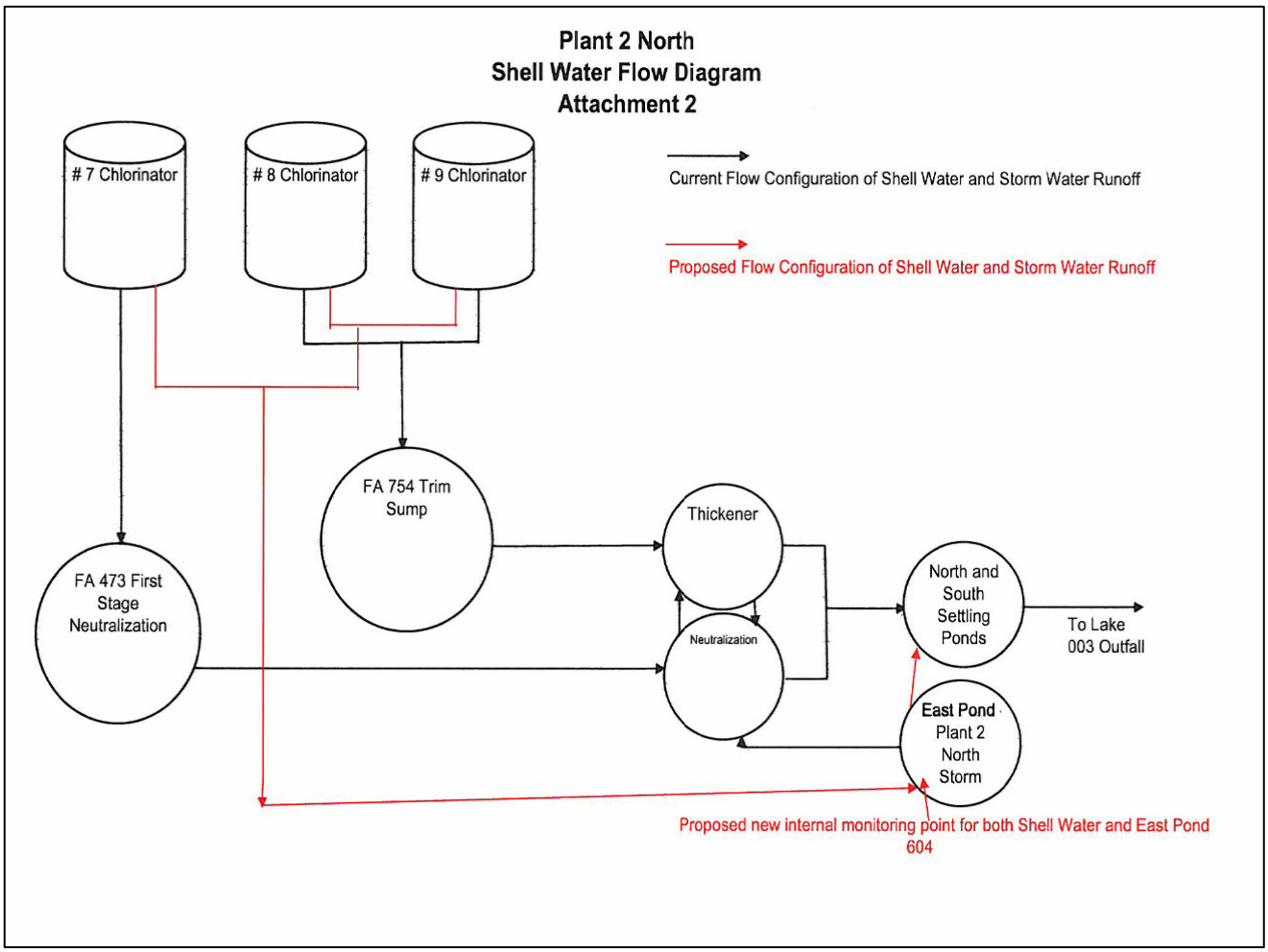

Figure 3. Proposed Re-routing of Wastestreams

Sampling data provided by Millennium shows that some of the East Pond discharge concentrations are higher than the average discharge concentration at outfall 003 for total suspended solids, nickel, zinc, and total chromium. (See Table 3 on the following page.) However, none of the samples taken at the East Pond discharge exceeded permit limits and/or the applicable wasteload allocation. In addition, the non-contact cooling water should only contain negligible amounts of these pollutants by definition. Based upon the sampling data from the East Pond and because the non-contact cooling water is not expected to contain pollutants at levels of concern, Ohio EPA has concluded that removing the two proposed wastestreams from the treatment system will not increase the pollutant concentrations discharged at outfall 003. The proposed monitoring requirements at internal station 604 are shown in Table 5, and are based upon best engineering judgement.

Table 3. Comparison of East Pond and Outfall 003 Discharges

Parameter	East Pond		Outfall 003*
	# of Samples	Range of Sample Results	
Total Suspended Solids	6	11 to 55 mg/l	9.59 mg/l
Nickel	6	7 to 32 ug/l	1.21 ug/l
Zinc	6	7 to 25 ug/l	10.3 ug/l
Total Chromium	6	12 to 87 ug/l	15.2 ug/l
Total Dissolved Solids	6	269 to 868 mg/l	9590 mg/l
pH	6	7.2 to 8.2 S.U.	6.5 to 9.7 S.U.
PCBs	3	Non-detect	--

* The values in this column represent the average concentration for August 2008 through March 2011, except pH for which the range of standard units is displayed.

Table 4. **Effluent Characterization: August 2008 – March 2011**

Summary of analytical results for Outfalls 003, 601, 602, and 603.

Parameter	Season	Units	Current Permit Limits		# Obs.	Percentiles		Data Range
			30 day	Daily		50th	95th	
Outfall 003								
Total Suspended Solids	Annual	mg/l	25	62	138	9	19.3	2-29
Total Suspended Solids	Annual	kg/day	417	1034	138	152	351	22.5-516
Nickel, Total Recoverable	Annual	ug/l	Monitor only		138	0	9.15	0-29
Nickel, Total Recoverable	Annual	kg/day			138	0	0.163	0-0.583
Zinc, Total Recoverable	Annual	ug/l	Monitor only		138	6	39.2	0-45
Zinc, Total Recoverable	Annual	kg/day			138	0.104	0.64	0-0.838
Chromium, Total Recoverable	Annual	ug/l	221	406	138	12	42.8	0-60
Chromium, Total Recoverable	Annual	kg/day	3.69	6.77	138	0.198	0.713	0-1.05
E. coli	Annual	#/100 ml	126	--	14	4.5	62.9	0-70
Oxidants, Total Residual	Annual	mg/l	Monitor only		6	0.15	0.2	0.05-0.2
Oxidants, Total Residual	Annual	kg/day			6	2.37	3.56	0.867-3.63
Flow Rate	Summer	MGD			460	4.53	5.12	1.52-7.47
Flow Rate	Winter	MGD			513	4.23	5.17	2.25-8.63
Flow Rate	Annual	MGD	Monitor only		973	4.39	5.15	1.52-8.63
Mercury, Total (Low Level)	Annual	ng/l	Monitor only		32	0	1.34	0-597
Mercury, Total (Low Level)	Annual	kg/day			32	0	2.21E-05	0-0.00792
Acute Toxicity, Ceriodaphnia dubia	Annual	TUa	Monitor only		5	4.6	6.75	3.6-7.2
Acute Toxicity, Pimephales promelas	Annual	TUa	Monitor only		5	2.5	3.29	1.5-3.39
pH, Maximum	Annual	S.U.	Not more than 9.0		973	8	8.3	7.2-9.7
pH, Minimum	Annual	S.U.	Not less than 6.5		973	7.6	8.1	6.5-8.3
Residue, Total Filterable	Annual	mg/l	Monitor only		138	10200	13400	564-13800
Residue, Total Filterable	Annual	kg/day			138	166000	228000	8330-261000

Table 4. **Effluent Characterization: August 2008 – March 2011**

Summary of analytical results for Outfalls 003, 601, 602, and 603.

Parameter	Season	Units	Current Permit Limits		# Obs.	Percentiles		Data Range
			30 day	Daily		50th	95th	
Outfall 601								
Color, Severity	Annual	Units	Monitor only		973	1	1	1-1
Total Suspended Solids	Annual	mg/l	30	45	33	8	22.6	0-38
Total Suspended Solids	Annual	kg/day			33	0.0757	0.377	0-0.59
Odor, Severity	Annual	Units	Monitor only		973	1	1	1-2
Turbidity, Severity	Annual	Units	Monitor only		973	1	1	1-1
Flow Rate	Summer	MGD			460	0.002	0.009	0-0.021
Flow Rate	Winter	MGD			508	0.002	0.012	0-0.075
Flow Rate	Annual	MGD	Monitor only		968	0.002	0.01	0-0.075
CBOD 5 day	Summer	mg/l	25	40	15	0	5.1	0-10
CBOD 5 day	Winter	mg/l	25	40	17	0	21.8	0-25
CBOD 5 day	Summer	kg/day			15	0	0.0386	0-0.0757
CBOD 5 day	Winter	kg/day			17	0	0.101	0-0.189
Outfall 602								
Color, Severity	Annual	Units	Monitor only		971	1	1	1-4
Total Suspended Solids	Annual	mg/l	30	45	35	11	34.1	0-55
Total Suspended Solids	Annual	kg/day			35	0.0681	0.294	0-0.871
Odor, Severity	Annual	Units	Monitor only		971	1	1	1-3
Turbidity, Severity	Annual	Units	Monitor only		971	1	1	1-2
Flow Rate	Summer	MGD			452	0.003	0.008	0-0.037
Flow Rate	Winter	MGD			491	0.002	0.003	0-0.006
Flow Rate	Annual	MGD	Monitor only		943	0.002	0.006	0-0.037

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Parameter	Season	Units	Current Permit Limits		# Obs.	Percentiles		Data Range
			30 day	Daily		50th	95th	
CBOD 5 day	Summer	mg/l	25	40	16	0	29.8	0-35
CBOD 5 day	Winter	mg/l	25	40	21	14	30	0-90
CBOD 5 day	Summer	kg/day			16	0	0.139	0-0.159
CBOD 5 day	Winter	kg/day			21	0.0795	0.273	0-0.341
Outfall 603								
pH	Annual	S.U.	Monitor only		184	7.23	8.1	6.4-9.23
Total Suspended Solids	Annual	mg/l	Monitor only		186	0	4	0-8
Total Suspended Solids	Annual	kg/day			186	0	0.908	0-1.51
Trichloroethylene	Annual	ug/l	Monitor only		173	0	0	0-2
Trichloroethylene	Annual	kg/day			173	0	0	0-0.000151
PCBS	Annual	ug/l	Monitor only		173	0	0	0-0
PCBS	Annual	kg/day			173	0	0	0-0
Cis-1,2-Dichloroethylene, Total	Annual	ug/l	Monitor only		173	0	0	0-0
Cis-1,2-Dichloroethylene, Total	Annual	kg/day			173	0	0	0-0
Flow Rate	Summer	MGD			82	0.04	0.0695	0.01-0.08
Flow Rate	Winter	MGD			104	0.04	0.0639	0.015-0.085
Flow Rate	Annual	MGD	Monitor only		186	0.04	0.064	0.01-0.085

Table 5. Final Effluent Limits and Monitoring Requirements for Internal Station 604

		Effluent Limits				
		Concentration		Loading (kg/day)		
Parameter	Units	30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	Basis
Water temperature	° F.	- - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		BEJ
pH	S.U.	- - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		BEJ
Total suspended solids	mg/l	- - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		BEJ
Nickel	ug/l	- - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		BEJ
Zinc	ug/l	- - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		BEJ
Chromium, Tot. Rec.	ug/l	- - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		BEJ
PCBs	ug/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - -		BEJ
Flow rate	MGD	- - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		BEJ
Residue, Total Filterable	mg/l	- - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		BEJ

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Public Notice Date: May 5, 2008
Comment Period Ends: June 5, 2008

OEPA Permit No.: **3IE00017*ID**
Application No.: (OH #) **OH0000493**

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Ashtabula, Ohio 44004

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Effluent limits based on available treatment technologies are required by Section 301(b) of the Clean Water Act. Many of these have already been established by U.S. EPA in the effluent guideline regulations (a.k.a. categorical regulations) for industry categories in 40 CFR Parts 405-499. Technology-based regulations for publicly-owned treatment works are listed in the Secondary Treatment Regulations

(40 CFR Part 133). If regulations have not been established for a category of dischargers, the director may establish technology-based limits based on best professional judgment (BPJ).

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Summary of Proposed Permit Conditions

Limits and monitoring requirements for the Millennium Plant II permit are proposed to continue from the existing permit for outfalls 003, 601, and 602. In addition, limits have been added for acute toxicity for *Ceriodaphnia dubia*, and chronic toxicity monitoring has been added for both *Ceriodaphnia dubia* and fathead minnows.

Outfall 603 has been added to the permit in order to monitor the discharge of polychlorinated biphenyls (or PCBs) from treatment systems installed to treat wastewater collected from remediation activities, stormwater, and an interceptor trench system on the plant property. Part II of the permit also requires the placement of signs at all final outfalls.

This permit renewal is proposed for a term of approximately **four and one-half years**, expiring on **January 31, 2013**. This schedule will allow the Millennium permit to be on a similar schedule with the other facilities within the same watershed basin.

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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.

The application, fact sheet, public notice, permit including effluent limitations, special conditions, comments received and other documents are available for inspection and may be copied at a cost of 25 cents per page at the Ohio Environmental Protection Agency at the address shown above any time between the hours of 8:00 a.m. and 5:00 p.m., Monday through Friday. Copies of the Public Notice are available at no charge at the same address.

Location of Discharge/Receiving Water Use Classification

Flow from both the Ashtabula Plant I and Ashtabula Plant II facilities, owned by Millennium Inorganic Chemicals, Inc. combines with the non-contact cooling water discharge from First Energy's Ashtabula Power Plant prior to entering the Ashtabula Power Plant's discharge channel which flows to Lake Erie. (See Figure 1 for the approximate location of Millennium Plant II.)

Lake Erie has the following designated uses: Exceptional Warmwater Habitat (EWH), Superior High Quality Water (SHQW), Public Water Supply (PWS), Agricultural Water Supply (AWS), Industrial Water Supply, and Bathing Waters (BW). This section of Lake Erie is identified by Ohio EPA River Code 24-800 and U.S. EPA River Reach number 04120101-011, and is located in the Erie/Ontario Drift and Lake Plain ecoregion.

Use designations define the goals and expectations for a waterbody. These goals are set for aquatic life protection, recreation use and water supply use, and are defined in the Ohio Water Quality Standards, or the Ohio Administrative Code (OAC 3745-1-07). The use designations for individual waterbodies are listed in rules -08 through -32 of the OAC. Once the goals are set, numeric water quality standards are developed to protect these uses; higher quality uses typically have more protective water quality criteria.

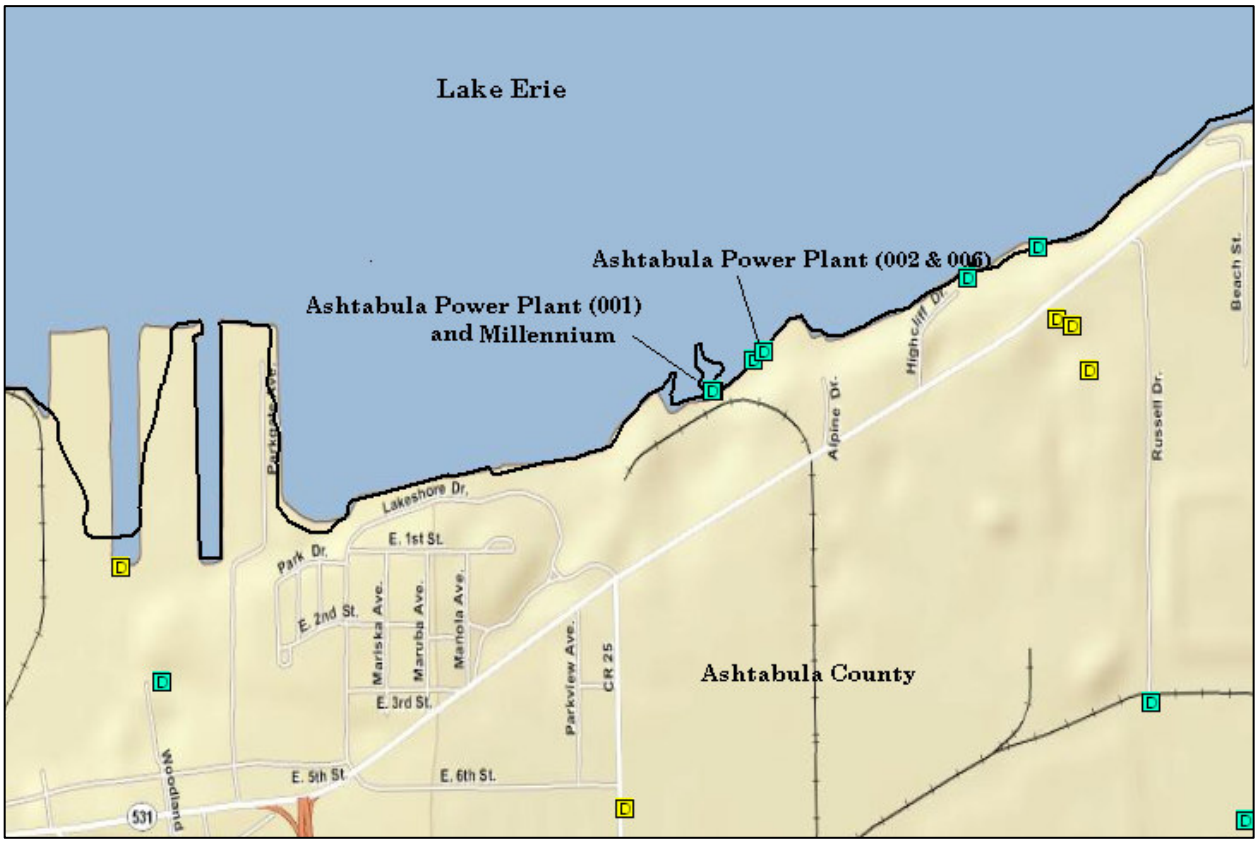

Figure 1. Location of Millennium Plant II

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

Recreation uses are defined by the depth of the waterbody and the potential for wading or swimming. Uses are defined for bathing waters, swimming/canoeing (Primary Contact) and wading only (Secondary Contact - generally waters too shallow for swimming or canoeing). Water supply uses are defined by the actual or potential use of the waterbody. Public Water Supply designations apply near existing water intakes so that waters are safe to drink with standard treatment. Most other waters are designated for agricultural and industrial water supply.

Facility Description

Millennium Plant II manufactures titanium dioxide and titanium tetrachloride from titantium-bearing ore. The ore is chlorinated and the resultant titantium tetrachloride is separated from the rest of the ore while in a vapor phase, and then oxidized to form titanium dioxide.

This plant is classified under the Standard Industrial Classification Code (SIC) 2816 which is identified as "Inorganic Pigments." The process wastestreams generated by this facility are regulated by Chapter 40 of the Code of Federal Regulations, Parts 415.222(b) and 415.223(b), "Titanium Dioxide-Chloride Process." The approximate location of the facility is shown in Figure 2.

Discharges from Millennium's Ashtabula Plant II

Millennium Plant II discharges from one external outfall (003) which flows into the Ashtabula Power Plant Discharge Channel. (See Table 1 for a listing of the Plant II outfalls.) Process wastewaters at the

Table 1. Description of Millennium Plant II Outfalls

Outfall #	Type of Wastewater	Treatment System Used	Discharge Point	Ave. Discharge (in MGD) *
003	- Process wastewater - Sanitary wastewater	none	Ashtabula Power Plant Open Discharge Channel	4.35
601	- Sanitary wastewater	- Extended aeration	Outfall 003	0.01
602	- Sanitary wastewater	- Trickling filter	Outfall 003	0.01

Table 1.	Description of Millennium Plant II Outfalls			
Outfall #	**Type of Wastewater**	**Treatment System Used**	**Discharge Point**	**Ave. Discharge (in MGD) ***
603	- Storm water - Wastewater collected in interceptor system	- Settling - oil/water separator - filtration - activated carbon	Polishing ponds to Outfall 003	0.216

* Average discharges based upon NPDES application.

facility are treated by neutralization and chemical precipitation, settling, and pH adjustment prior to discharging at outfall 003. The flow rate reported for this outfall has remained relatively constant over the past six years, with the median value ranging from 4.2 MGD in 2003 to 4.62 MGD in 2004.

Sanitary wastes at the facility are treated by a small extended aeration package plant and a small trickling filter. The sanitary wastewater treatment plants are monitored at internal outfalls 601 and 602 prior to being discharged at outfall 003. (See Figure 2 for a schematic of the wastewater flows at the facility.)

In September 2007 during Fields Brook remediation activities, four seeps of Therminol (which is composed of polychlorinated biphenyls, or PCBs) were discovered. Millennium has installed temporary treatment systems to treat this wastewater as well as associated stormwater. In addition, an interceptor trench system is under construction, and the collected wastewater will be routed through a permanent treatment system. The effluent from both the temporary and permanent treatment systems will be discharged and monitored at outfall 603.

Since May 1, 2003, when the existing permit became effective, Millennium Plant II has reported few violations of its permit limits. The limits for total suspended solids were violated once at outfall 003 and three times at outfall 601. CBOD was also violated once at outfall 601. While not necessarily violations, four excursions from the acceptable pH range of 6.5 to 9.0 standards units were reported by the facility.

Table 3 shows concentrations of various pollutants based upon the permit renewal application and effluent samples collected during two Ohio EPA biomonitoring events at the facility. Table 4 presents a summary of unaltered monthly operation report data for the period January 2002 through December 2006, as well as current permit limits, and monthly average projected effluent quality (PEQ_{avg}) and daily maximum projected effluent quality (PEQ_{max}) values.

Assessment of Impact on Receiving Waters

Recent biosurvey data is not available to assess the impact of the facility's discharge on Lake Erie waters.

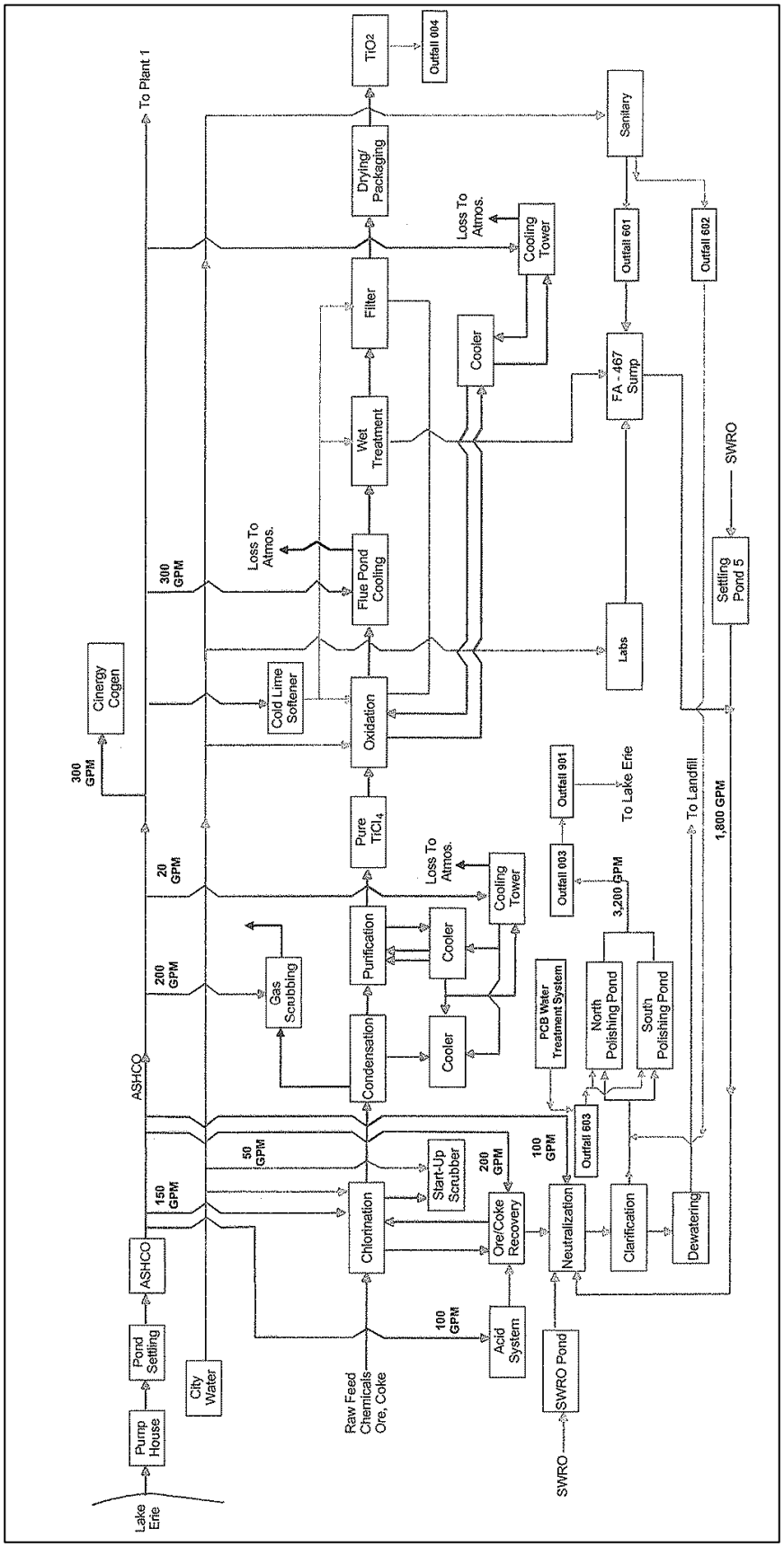

Figure 2. Wastewater Flow Schematic

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 general, this facility is considered to be interactive with Millennium's Ashtabula Plant I, both of which discharge to the non-contact cooling water discharge from the First Energy Ashtabula Power Plant prior to entering First Energy's discharge channel to Lake Erie, and outfalls 002 and 006 from Ashtabula Power Plant. A schematic of the study area is shown in Figure 3.

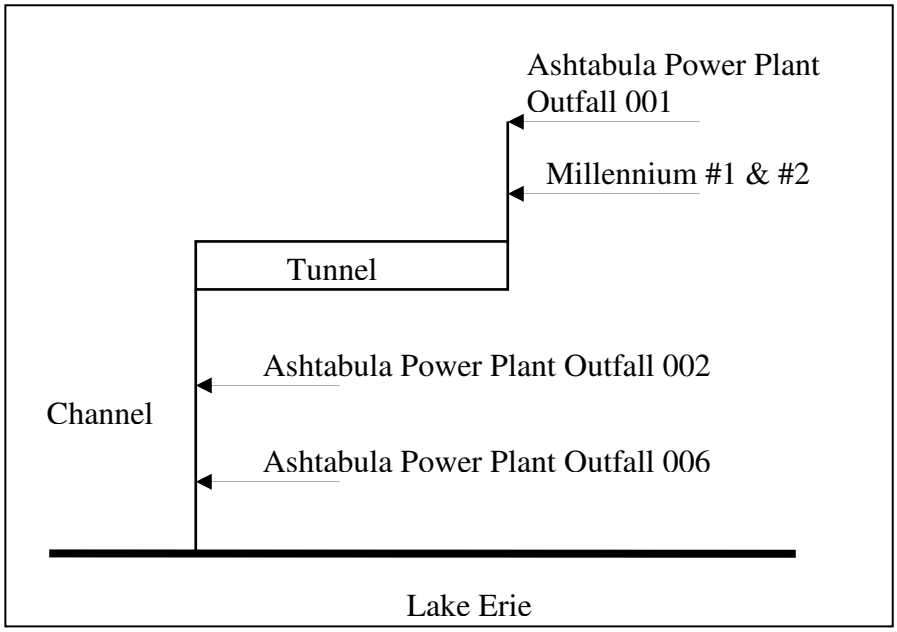

Figure 3. Lake Erie Study Area

Parameter Selection

Effluent data for Millenium Plant II were used to determine what parameters should undergo wasteload allocation. The sources of effluent data are as follows:

Self-monitoring data (DMRs)	January 2002 through December 2006
2.c. Application data	2007
Ohio EPA data (compliance, survey)	2006

The effluent data were checked for outliers and none were found.

The average and maximum projected effluent quality (PEQ) values are presented in Table 5. For a summary of the screening results, refer to the parameter groupings in Table 9 on page 25.

Discharge Configuration: Background and Design

The current discharge configuration for the Millennium outfalls is very unique. In 1995, outfalls 001 and 002 were rerouted and combined to form a new outfall – 003. Outfall 003 exits through a high rate diffuser within the Ashtabula Power Plant cooling water tunnel and combines with Ashtabula Power Plant outfalls 001 approximately 50 feet before the beginning of a 1000 foot-long manmade open channel entering Lake Erie waters. This discharge design was approved by Ohio EPA (DSW/WQM) in 1994

following the submittal of a detailed computer modeling mixing zone study by SCM entitled *Mixing Zone Analysis of the Proposed SCM Discharge, May 20, 1994.* Results from this study were used in the 1995 modified permit. The 1995 modified permit also required a field study to verify the mixing results predicted by the computer modeling. The field study was conducted in July 1996 and findings were reported by SCM[1] in a report entitled *Diffuser Performance and Mixing Zone Evaluation, SCM Chemicals, Inc., November 1996.* Ohio EPA (DSW/WQM) reviewed this report and used its results along with results from the computer modeling to formulate the wasteload allocation (WLA) approach discussed below. Detailed schematics, photographs and scale drawings of the discharge area and components can be found in the above mentioned reports and WQM files. Millennium also completed a field study in August 2002 that further supported the previous mixing modeling and field survey.

Wasteload Allocation

The process discharges from Millennium flow via a diffuser (Millennium outfall 003) to the Ashtabula Power Plant discharge tunnel. The combined flow from Millennium and the Ashtabula Power Plant discharges to the Ashtabula Power Plant Open Discharge Channel, and then to the open waters of Lake Erie.

Two separate approaches have used to develop wasteload allocations, and are distinguished as follows:

- Approach #1 – using the cooling water flow from Ashtabula Power Plant outfall 001 as dilution flow in the power plant discharge tunnel.
- Approach #2 – assuming there is no dilution provided by the cooling water from the Ashtabula Power Plant 001 outfall. Copper has been detected in the Ashtabula Power Plant 001 effluent at concentrations significantly higher than intake concentrations for the Ashtabula Power Plant, and needs a WLA; therefore, the flow from this outfall cannot be considered dilution for purposes of this pollutant. As a result, the discharge of copper has been modeled as a direct discharge to Lake Erie for both Millennium and the Ashtabula Power Plant.

Approach #1 has been used for all other pollutants requiring a wasteload allocation, and is described in more detail in the remainder of this section. The cooling water flow from Ashtabula Power Plant outfall 001 provides the only dilution flow in the tunnel. The following outfalls discharge directly to the open channel: Ashtabula Power Plant outfall 002 (process) and Ashtabula Power Plant outfall 006 (process). All the outfalls discharging to the tunnel and open channel were considered interactive. For WLA modeling purposes, the Ashtabula Power Plant Open Discharge Channel was treated as a free flowing stream with background flow supplied by Ashtabula Power Plant outfall 001.

The WLA model assumes that no water from the open area of Lake Erie is entrained in the open channel. This conservative assumption was used due to the large amounts of dilution available from the Ashtabula Power Plant outfall 001 flow and the uniqueness and uncertainty associated with the discharge configuration. The CONSWLA model was used to calculate WLAs for the interactive discharges. Several inputs to the CONSWLA model were based on results from the computer and field mixing studies. Computer modeling and field study results indicate that an area of initial mixing (AIM) exists between the diffuser and the tunnel exit. A dilution ratio of 10 parts cooling water to 1 part effluent is appropriate for the AIM. Therefore, the inside mixing zone maximum (IMZM) criteria must be met at the end of the tunnel and the maximum effluent concentration for Millennium outfall 003 would equal 10 times IMZM. Based on the demonstrated mixing in the tunnel and in the channel, 50% of the Ashtabula

[1] Millennium was formerly known as SCM.

Power Plant cooling water flow was available to mix with the Millennium outfall 003 flow until a point just beyond the tunnel exit. After this point, the remainder of Ashtabula Power Plant's cooling water flow was available for mixing as and it becomes the background flow for Ashtabula Power Plant outfalls 002 and 006. Standard WLA procedures were used for the remainder of the inputs. Chronic criteria were to be maintained downstream in the area approaching the end of the power plant's Open Discharge Channel near the open waters of Lake Erie.

For those parameters that require a wasteload allocation (WLA), the results are based on the uses assigned to the receiving waterbody in OAC 3745-1. The data used in the WLA are listed in Tables 6 and 7. The wasteload allocation results to maintain all applicable criteria are presented in Table 8.

Reasonable Potential

The preliminary effluent limits are the lowest average WLA (average PEL) and the maximum WLA (maximum PEL). To determine the reasonable potential of the discharger to exceed the WLA for each parameter, the facility's effluent quality is compared to the preliminary effluent limits. The average PEQ value (Table 5) is compared to the average PEL, and the maximum PEQ value is compared to the maximum PEL. Based on the calculated percentage of the respective average and maximum comparisons, the parameters are assigned to "groups", as listed in Table 9. Parameters that do not have a water quality standard (WQS) or do not require a WLA based on the initial screening are assigned to either group 1 or 2. Parameters are assigned to group 3, 4, or 5 depending on how close the PEQ value is to the allocated value or PEL. The groupings listed in Table 9 reflect the reasonable potential hazard assessment done according to WLA procedures.

Whole Effluent Toxicity WLA

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

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

AET calculations are similar to aquatic life criteria wasteload allocation calculations. For Millennium Plant II, the AET value for acute toxicity is 21.0 $TU_{a.}$

When the calculated acute AET is less than 1.0 TU_a, Allowable Effluent Toxicity is defined as:

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

The AET is 30 percent effects in 100 percent effluent based on the dilution ratio of 1 to 1.

Effluent Limits/Hazard Management Decisions

The final effluent limits are determined by evaluating the reasonable potential groupings in conjunction with other applicable rules and regulations. Tables 10-003, 10-601, and 10-603 show the draft NPDES permit limits for the Millennium Ashtabula Plant II.

Federal and State laws/regulation require that dischargers meet both treatment-technology-based limits and any more stringent standards needed to comply with state WQS. Permit limits are based on the more restrictive of the two. Treatment-technology-based limits for Ashtabula Plant II, found in 40 CFR Part 415.222(b) and 415.223(b) [Titanium Dioxide Production Subcategory], are based on the daily maximum and 30-day average loadings for pollutants in kilograms per day for every 1,000 kilograms of product produced. Millennium's NPDES permit application estimates daily production at 500 tons.

The limits and monitoring requirements for each outfall are discussed in detail below and the corresponding "Final Effluent Limits" table is referenced.

Outfall 003: Table 10-001

The Ohio EPA risk assessment places a number of pollutants in Groups 2 and 3. However, total recoverable chromium, nickel, zinc, and total dissolved solids (TDS) or total filterable residue are the only pollutants which have been included for continued monitoring based upon the frequency of detection in wastewater samples and the relatively large datasets.

The waste load allocation for TDS includes an average aquatic life value of 19,640 mg/l. The average aquatic life value is based upon the water quality standard of 1500 mg/l for the average aquatic life criterion. The WLA for TDS and its placement in Group 3 is largely dependent upon the performance of Millennium's diffuser and the availability of the dilution water from the Ashtabula Power Plant. (See the discussion on pages 10 and 11.) In order to ensure that the current waste load allocation for TDS remains valid and the placement of TDS in Group 3 is appropriate, a condition has been included in the draft permit which requires Millennium to perform another mixing study of the discharge channel if any of the critical parameters such as diffuser performance, effluent discharge amounts, or conductivity changes in a manner which would result in a decrease of the available dilution rate for Millennium. In addition, Part II of the draft permit includes a requirement for Millennium to notify Ohio EPA in writing whenever the concentration of TDS exceeds the anti-degradation limit of 13,672 mg/l for Plant II, in order to detect any significant changes in the effluent quality and determine if the permit should be modified to include limits for TDS.

The draft permit continues limits and monitoring requirements for total suspended solids, pH, and chromium. Limits for pH are based upon Ohio water quality standards. Loading limits for total

suspended solids are based on treatment plant performance at this facility. Loading limits for chromium are based upon the existing permit and the requirements if anti-backsliding found in Ohio Administrative Code 3745-33-05(E). Concentration limits for chromium were reduced for the previous permit renewal in order to maintain the same loadings at the higher design flow of 4.4 MGD. The concentration limits for TSS are proposed to continue from the existing permit.

Monitoring requirements and a limit have also have included for E. coli since this outfall includes sanitary wastewater and is considered a direct discharge to Lake Erie.[2] The permit allows Millennium three years to comply with the E. coli limits, providing an initial period of data collection in order for the permittee to determine if additional treatment will be needed.

Low level mercury monitoring has been added to the permit in order to ensure that Millennium's discharge complies with the water quality standards for mercury. All discharges must meet water quality standards for bioaccumulative chemicals of concern (BCCs) such as mercury when the use of mixing zones is no longer allowed to calculate wasteload allocations beginning in November 2010.

Biomonitoring at outfall 001 is proposed to continue, and limits for acute toxicity have been added for *Ceriodaphnia dubia*. See the section entitled, "Whole Effluent Toxicity Reasonable Potential" for further discussion of this topic.

Outfalls 601 and 602: Table 10-601

The limits and monitoring requirements for these sanitary outfalls are proposed to continue in the draft permit. Ohio EPA guidance recommends monitoring for these parameters and the limits for total suspended solids and CBOD are based upon secondary treatment standards.

Outfall 603: Table 10-603

This outfall is designed to monitor the discharges from the treatment systems associated with the Fields Brook remediation and the interceptor trench system. The primary pollutant of concern at this outfall is PCBs, however, a number of other parameters have been included for monitoring as well based upon discharges authorized from this outfall under the Temporary Discharge General Permit issued to Millennium in October 2007.

In addition to permit compliance, monitoring 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.

Other Requirements

Operator certification requirements have been included in Part II of the permit in accordance with rules adopted in December 2006. These rules require Millennium to have a Class A wastewater treatment plant operator in charge of the sewage treatment plant operations discharging through outfalls 601 and 602 when the permit is renewed or modified after December 21, 2008.

[2] In December 2004, water quality standards promulgated by U.S EPA under the Beach Act became effective, requiring limits for E. coli for direct discharges of sanitary wastewater into Lake Erie.

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

Whole Effluent Toxicity Reasonable Potential

Millennium conducted 12 acute toxicity tests between June 2002 and November 2007, and Ohio EPA conducted two acute tests in 2006. All of these tests showed evidence of toxicity, with the highest toxicity of 12.33 TU_a reported for *Ceriodaphnia dubia* and 3.65 TU_a reported for fathead minnows. (See Table 2.) Based upon the procedures established in federal rules (40 CFR, Part 132, Appendix F), these results demonstrate that the Millennium Plant II has reasonable potential to: 1) violate acute water quality criteria for toxicity for *Ceriodaphnia dubia*; and 2) violate chronic water quality criteria for toxicity for both *Ceriodaphnia dubia* and fathead minnows. Based upon these test results, acute toxicity limits have been included in the draft permit for *Ceriodaphnia dubia* and monitoring has been required for both acute and chronic toxicity for *Ceriodaphnia dubia* and fathead minnows. Limits for chronic toxicity have not included included since Ohio EPA believes that high total dissolved solids (TDS) is the cause of the toxicity and monitoring data shows that the effluent meets the chronic or average water quality criterion for TDS.

Table 2. Summary of Acute Toxicity Test Results for the Ashtabula Plant II Effluent

Date	Test Conducted by:	Toxicity Units (TU_a)	
		Ceriodaphnia dubia	Fathead minnows
6/18/2002	Millennium	7.73	1.47
10/15/2002	Millennium	5.66	2.05
6/24/2003	Millennium	4.92	1.92
10/21/2003	Millennium	12.33	1.75
6/15/2004	Millennium	6.98	3.16
10/26/2004	Millennium	5.28	2.32
6/12/2005	Millennium	3.83	1.18
10/16/2005	Millennium	6.4	1.74
6/20/2006	Millennium	8.62	3.65
6/20/2006	Ohio EPA	6.1	3.4
8/21/2006	Ohio EPA	5.3	3.0
10/9/2006	Millennium	3.48	1.37
6/11/2007	Millennium	5.8	3.11
10/7/2007	Millennium	3.27	1.0

Table 3. Effluent Data Based Permit Renewal Application and Two Ohio EPA Bioassays

Parameter	NPDES Renewal Application			Ohio EPA Bioassays on:	
	# of samples	Max. Value	Average Value	6/19/2006	8/21/2006
Outfall 003					
Aluminum (ug/l)	2	550.		1750.	1430.
Ammonia (mg/l)	1	1.1		0.38	3.70
Arsenic (ug/l)	2	< 10.		8.5	5.
Barium (ug/l)	2	104.		177.	146.
Bis(2-ethylhexyl) phthalate (ug/l)	2	7.9		< 10.5	< 10.3
Calcium (mg/l)				3170.	3070.
Chloride (mg/l)				6890.	7480.
Chloroform (ug/l)	2	< 5.		2.42	1.54
Chromium (ug/l)	292*	150.	41.	< 30.	43.
Fecal Coliform (#/100 ml)	1	200.			
Fluoride (mg/l)	1	1.6			
Iron (ug/l)	2	1100.		1750.	2640.
Magnesium (mg/l)	2	31.6		39.	33.
Manganese (ug/l)	2	2580.		2950.	2890.
Molybdenum (ug/l)	2	17.			
Nickel (ug/l)	292*	30.	3.2	< 40.	< 40.
Nitrate+Nitrite (mg/l)	1	1.275		0.47	0.25
Nitrogen, Tot. Organic (mg/l)	1	0.90			
Phosphorus (mg/l)	1	< 0.25		< 0.010	0.011
Potassium (mg/l)				14.	13.
Selenium (ug/l)	2			8.	6.2
Sodium (mg/l)				855.	848.
Strontium (ug/l)				2100.	2120.
Sulfate (mg/l)	1	44.			
Surfactants (mg/l)	1	0.024			
Titanium (ug/l)	2	178.			
TKN (mg/l)				0.80	4.72
Total Organic Carbon (mg/l)	1	1.6			
Total Dissolved Solids (mg/l)				11500.	12300.
Total Suspended Solids (mg/l)	295*	34	12.86	14.	15.
Zinc (ug/l)	292*	40.	3.1	< 10.	< 10.
Outfall 603					
Chromium (ug/l)	21	24.	6.		
Nickel (ug/l)	21	34.	7.		
PCB-1242 (ug/l)	28	< 0.10	< 0.10		
PCB-1254 (ug/l)	28	< 0.10	< 0.10		
PCB-1221 (ug/l)	28	< 0.10	< 0.10		
PCB-1232 (ug/l)	28	< 0.10	< 0.10		
PCB-1248 (ug/l)	28	0.60	0.07		

Table 3. Effluent Data Based Permit Renewal Application and Two Ohio EPA Bioassays

Parameter	NPDES Renewal Application			Ohio EPA Bioassays on:	
	# of samples	Max. Value	Average Value	6/19/2006	8/21/2006
PCB-1260 (ug/l)	28	< 0.10	< 0.10		
PCB-1016 (ug/l)	28	< 0.10	< 0.10		
Total Suspended Solids (mg/l)	28	11.	1.8		
Trichloroethylene (ug/l)	23	1.8	0.6		
Zinc (ug/l)	21	23.	33.		

* Data for these parameters is based upon DMRs submitted from January 2001 through August 2006.

Table 4. **Effluent Characterization and Decision Criteria: 2002-2006**

Summary of analytical results for Outfalls 003, 588, 601, 602, and 901. Decision Criteria: PEQ_{avg} = monthly averages; PEQ_{max} = daily maximum analytical results.

Parameter	Season	Units	Current Permit Limits		# Obs.	Percentiles		Data Range	Decision Criteria		
			30 day	Daily		50th	95th		# Obs.	PEQ_{ave}	PEQ_{max}
Outfall 003											
pH, Maximum	Annual	S.U.	Not more than 9.0		790	7.8	8.1	7.1-10			
pH, Minimum	Annual	S.U.	Not less than 6.5		790	7.5	7.9	6-8.1			
Total Suspended Solids	Annual	mg/l	25	62	262	11	24	2-32	262	19.7	28.21
Total Suspended Solids	Annual	kg/day	417	1034	262	179	426	30.3-626			
Nickel, Total Recoverable	Annual	ug/l	--	--	147	0	8	0-31	261	6.82	9.17
Nickel, Total Recoverable	Annual	kg/day	--	--	147	0	0.12	0-0.634			
Zinc, Total Recoverable	Annual	ug/l	--	--	257	0	6.2	0-37	257	9.94	10.03
Zinc, Total Recoverable	Annual	kg/day	--	--	257	0	0.117	0-0.604			
Chromium, Total Recoverable	Annual	ug/l	221	406	262	31.5	84.9	0-150	262	64.35	93.49
Chromium, Total Recoverable	Annual	kg/day	3.69	6.77	262	0.527	1.48	0-2.65			
Flow Rate	Summer	MGD			920	4.47	5.24	0.973-8.44			
Flow Rate	Winter	MGD			906	4.33	5.29	1.15-7.66			
Flow Rate	Annual	MGD	--	--	1826	4.41	5.27	0.973-8.44			
Acute Toxicity, Ceriodaphnia dubia	Annual	TUa	--	--	10	6.03	10.7	3.48-12.3			
Acute Toxicity, Pimephales promelas	Annual	TUa	--	--	10	1.84	3.43	1.18-3.65			
pH, Maximum	Annual	S.U.			1065	7.9	8.2	7.1-10			
pH, Minimum	Annual	S.U.			1065	7.7	8	6.5-8.3			
Residue, Total Filterable	Annual	mg/l	--	--	262	9860	12300	1480-13300	261	8764	12006
Residue, Total Filterable	Annual	kg/day	--	--	262	163000	210000	17500-246000			
Nickel, Total Recoverable	Annual	ug/l			114	0	6	0-29			

Table 4. **Effluent Characterization and Decision Criteria: 2002-2006**

Summary of analytical results for Outfalls 003, 588, 601, 602, and 901. Decision Criteria: PEQ_{avg} = monthly averages; PEQ_{max} = daily maximum analytical results.

			Current Permit Limits			Percentiles			Decision Criteria		
Parameter	Season	Units	30 day	Daily	# Obs.	50th	95th	Data Range	# Obs.	PEQ_{ave}	PEQ_{max}
Nickel, Total Recoverable	Annual	kg/day			114	0	0.0951	0-0.485			
Outfall 588											
Sludge Solids, Percent Total	Annual	%			4	0.65	4.4	0-5			
Sludge Volume, Gallons	Annual	Gals			3	6000	24500	2200-26500			
Outfall 601											
Color, Severity	Annual	Units	--	--	1820	1	1	1-3			
Total Suspended Solids	Annual	mg/l	30	45	71	14	36.5	0-54			
Odor, Severity	Annual	Units	--	--	1820	1	1	1-3			
Turbidity, Severity	Annual	Units	--	--	1820	1	1	1-3			
Flow Rate	Summer	MGD			855	0.003	0.008	0-0.02			
Flow Rate	Winter	MGD			890	0.002	0.005	0-0.015			
Flow Rate	Annual	MGD	--	--	1745	0.002	0.006	0-0.02			
CBOD 5 day	Summer	mg/l	25	40	31	0	15	0-18			
CBOD 5 day	Winter	mg/l	25	40	32	0	15.9	0-22			

Table 4. **Effluent Characterization and Decision Criteria: 2002-2006**

Summary of analytical results for Outfalls 003, 588, 601, 602, and 901. Decision Criteria: PEQ_{avg} = monthly averages; PEQ_{max} = daily maximum analytical results.

			Current Permit Limits			Percentiles			Decision Criteria		
Parameter	Season	Units	30 day	Daily	# Obs.	50th	95th	Data Range	# Obs.	PEQ_{ave}	PEQ_{max}
Outfall 602											
Color, Severity	Annual	Units	--	--	1823	1	1	1-1			
Total Suspended Solids	Annual	mg/l	30	45	60	0	22.1	0-29			
Odor, Severity	Annual	Units	--	--	1823	1	2	0-3			
Turbidity, Severity	Annual	Units	--	--	1794	1	1	1-2			
Flow Rate	Summer	MGD			915	0.002	0.009	0-1			
Flow Rate	Winter	MGD			906	0.002	0.003	0-0.006			
Flow Rate	Annual	MGD	--	--	1821	0.002	0.007	0-1			
CBOD 5 day	Summer	mg/l	25	40	30	0	13.3	0-18			
CBOD 5 day	Winter	mg/l	25	40	33	0	19.4	0-30			
Outfall 901											
Water Temperature	Annual	C	--	--	58	18.6	31.2	9-35.1			
Specific Conductance at 25 Degrees C	Annual	Umho/cm	--	--	58	756	2090	109-2910			
Residue, Total Filterable	Annual	mg/l	--	--	58	530	1210	141-1260			

Table 5. Effluent Data for Millenium Plant II

Parameter	Units	# of Samples	# > MDL	Average PEQ	Maximum PEQ
Outfall 003					
Self-Monitoring (Discharge Monitoring Report) Data					
Chromium tot. rec.	µg/l	262	261	64.35	93.49
Nickel	µg/l	261	30	6.82	9.17
Total Dissolved Solids	mg/l	261	261	8764.	12006.
Total Suspended Solids	mg/l	262	262	19.70	28.21
Zinc	µg/	257	16	9.94	10.03
Ohio EPA and 2. C. Application Data					
Aluminum	µg/l	4	4	3321.5	4550.
Arsenic	µg/l	4	3	18.98	26.
Barium	µg/l	4	4	335.9	460.2
Bis(2-ethylhexyl)phthalate	µg/l	2	2	19.93	27.3
Calcium	mg/l	4	2	8793.6	12046.
Chloride	mg/l	2	2	20749.	28424.
Chloroform [C]	µg/l	4	3	6.71	9.2
Fluoride	µg/l	1	1	7240	9920
Iron	µg/l	4	4	5010.7	6864.
Magnesium	mg/l	4	4	74.02	101.4
Manganese	µg/l	4	4	5599.1	7670.
Molybdenum	µg/l	2	2	47.12	64.6
$NO_2 + NO_3$	mg/l	3	3	3.54	4.85
Phosphorus	mg/l	3	1	0.031	0.042
Potassium	mg/l	2	2	38.84	53.2
Selenium	µg/l	2	2	22.19	30.4
Sodium	mg/l	2	2	2371.8	3249.
Strontium	µg/l	2	2	5880.9	8056.
Sulfate	mg/l	1	1	199.14	272.8.
Titanium	µg/l	2	2	493.8	676.4
Total Dissolved Solids	mg/l	2	2	34120.2	46740.

[C] Carcinogen

Table 6. Water Quality Criteria in the Study Area

Parameter	Units	Outside Mixing Zone Criteria				Inside Mixing Zone Maximum
		Average			Maximum	
		Human Health	Agri-culture	Aquatic Life	Aquatic Life	
Aluminum	µg/l	4500.	--	--	--	--
Arsenic	µg/l	580.	100.	150.	340.	680.
Barium	µg/l	160000.	--	220.	2000.	4000.
Beryllium	µg/l	130.	100.	19.	160.	320.
Bis (2-ethylhexyl) phthalate	µg/l	32.	--	8.4	1100.	2100.
Boron	µg/l	200000.	--	950.	8500.	17000.
Bromomethane	µg/l	2600.	--	16.	38.	75.
Chlorine, tot. res.	µg/l	--	--	11.	19.	38.
Chloroform	µg/l	1700.	--	140.	1300.	2600.
Chromium , total	µg/l	14000.	100.	110.	2400.	4800.
Cobalt	µg/l	--	--	24.	220.	440.
Copper	µg/l	64000.	500.	12.	19.	38.
Fluoride	µg/l	--	2000.	--	--	--
Iron	µg/l	--	5000.	--	--	--
Manganese	µg/l	61000.	--	--	--	--
Mercury [A, B]	µg/l	0.0031	10.	0.91	1.7	3.4
Methylene Chloride	µg/l	7300.	--	--	--	--
Molybdenum	µg/l	10000.	--	20000.	190000.	370000.
Nickel	µg/l	43000.	200.	69.	620.	1200.
NO_3+NO_2	mg/l	--	100.	--	--	--
Phenol	µg/l	2400.	--	400.	4700.	9400.
Selenium	µg/l	3100.	50.	5.	--	--
Strontium	µg/l	1400000.	--	5300.	48000.	95000.
Total Dissolved Solids	mg/l	--	--	1500.	--	--
Zinc	µg/l	35000.	25000.	160.	160.	320.

[A] Bioaccumulative Chemical of Concern
[B] Wildlife criterion; 0.0013 µg/l

Table 7. Background Water Quality and Discharger Flow

Parameter	Units	Value	Basis
Effluent Flows			
Ashtabula Power Plant 001	cfs	185.64	DSW
Ashtabula Power Plant 002	cfs	0.36	DSW
Ashtabula Power Plant 006	cfs	2.78	DSW
Millenium #1	cfs	4.64DSW	
Millenium #2	cfs	6.8	DSW
Lake Erie Hardness	mg/l	140.	STORET
Background Water Quality (μg/l)			
Aluminum		330.	BWQR; 640 values, 146<MDL
Barium		0.	No representative data available
Beryllium		0.	No representative data available
Bis (2-ethylhexyl) phthalate		0.	No representative data available
Boron		0.	No representative data available
Chlorine		0.	No representative data available
Chromium, total		15.	BWQR; 1641 values, 1388<MDL
Cobalt		0.	No representative data available
Copper		5.	BWQR; 2867 values, 1597<MDL
Fluoride		0.	No representative data available
Iron		650.	BWQR; 3018 values, 15<MDL
Mercury		0.	No representative data available
Nickel		20.	BWQR; 1259 values, 1105<MDL
Phenol		5.	BWQR; 724 values, 375<MDL
Selenium		0.	No representative data available
Strontium		0.	No representative data available
Total Dissolved Solids (mg/l)		382. BWQR; 3755 values, 0 <MDL	
Zinc		15.	BWQR; 2284 values, 1117<MDL

BWQR – Background Water Quality Report

Table 8. Summary of Effluent Limits to Maintain Applicable Water Quality Criteria

Parameter	Units	Average			Maximum	Inside
		Human Health	Agri Supply	Aquatic Life	Aquatic Life	Mixing Zone Maximum
Aluminum [B]	µg/l	43110.	--	--	--	--
Barium	µg/l	1760000.[A]	--	3021.	22000.	40,000.
Bis(2-ethylhexyl)phthalate	µg/l	570.	--	149.7	19606.	21000.
Chromium tot.	µg/l	153900. [A]	950.	1652.	26250.	48000.
Fluoride	µg/l	--	22000.	--	--	--
Iron [B]	µg/l	--	46920.	--	--	--
Selenium	µg/l	34100.	550.	84.	--	--
Strontium	µg/l	1.54E07 [A]	--	91310.	528000.	950000.
Total Dissolved Solids	mg/l	--	--	19640.	--	--

[A] Allocation must not exceed the Inside Mixing Zone Maximum.
[B] No dilution allowed for this parameter; therefore, WQS must be met at end-of-pipe

Table 9. Parameter Assessment for Outfall 003

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

Calcium	Chloride	Magnesium
Phosphorus	Potassium	Sodium
Sulfate	Titanium	TSS

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

Arsenic	Chloroform	Manganese
Molybdenum	Nickel	$NO_2 + NO_3$
Zinc		

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

Aluminum	Barium	Bis(2-ethyhexyl)phthalate
Chromium tot.	Fluoride	Iron
Selenium	Strontium	TDS

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

No parameters meet the criteria of the group.

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

No parameters meet the criteria of the group.

Table 10-003. Final Effluent Limits and Monitoring Requirements for Outfall 003

		Effluent Limits				
		Concentration		Loading (kg/day)[a]		
Parameter	Units	30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	Basis[b]
pH	S.U.	- - - - - - - - - - - - - 6.5 to 9.0 -- - - - - - - - - - - -				WQS
Total suspended solids	mg/l	25	62	417	1034	EP/PD/ABS
Zinc	µg/l	- - - - - - - - - - - - Monitor - - - - - - - - - - - - - - -				BPJ
Chromium, Tot. Rec.	µg/l	221	406	3.69	6.77	EP/ABS
Nickel	µg/l	- - - - - - - - - - - - Monitor - - - - - - - - - - - - - - -				BPJ
PCBs	µg/l	- - - - - - - - - - - - - Monitor - - - - - - - - - - - - -				BPJ
E. coli	#/100 ml	126	--	--	--	WQS
Flow rate	MGD	- - - - - - - - - - - - Monitor - - - - - - - - - - - - - - -				M[c]
Mercury, T.R.	ng/l	- - - - - - - - - - - - Monitor - - - - - - - - - - - - - - -				BPJ
Acute Toxicity	TU_a					
Ceriodaphnia dubia		--	21.0	--	--	WET
Pimephales promelas		- - - - - - - - - - - - Monitor - - - - - - - - - - - - - - -				WET
Chronic Toxicity	TU_c					
Ceriodaphnia dubia		- - - - - - - - - - - - Monitor - - - - - - - - - - - - - - -				WET
Pimephales promelas		- - - - - - - - - - - - Monitor - - - - - - - - - - - - - - -				WET
Residue, Total Filterable	mg/l	- - - - - - - - - - - - Monitor - - - - - - - - - - - - - - -				WLA

[a] Effluent loading limitations based upon a flow of 4.4 MGD.

[b,c] See page 28 for definition of terms and explanation of monitoring requirements.

Table 10-601. Final Effluent Limits and Monitoring Requirements for Outfalls 601 and 602

		Effluent Limits				
		Concentration		Loading (kg/day)[a]		
Parameter	Units	30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	Basis[b]
Flow	MGD	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - -		M[c]
$CBOD_5$	mg/l	25	40	--	--	EP/STS
Suspended Solids	mg/l	30	45	--	--	EP/STS
Color, Severity	UNITS	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - -		EP/M
Odor, Severity	UNITS	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - -		EP/M
Turbidity, Severity	UNITS	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - -		EP/M

[b,c] See page 28 for definition of terms and explanation of monitoring requirements.

Table 10-603. Final Effluent Limits and Monitoring Requirements for Outfall 603

		Effluent Limits				
		Concentration		Loading (kg/day)[a]		
Parameter	Units	30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	Basis[b]
pH	S.U.	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - -		BPJ
Total Suspended Solids	mg/l	--	4	--	--	BPJ
Nickel, T.R.	ug/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - -		BPJ
Zinc, T.R.	ug/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - -		BPJ
Chromium, T.R.	ug/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - -		BPJ
Trichloroethylene	ug/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - -		BPJ
PCBs	ug/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - -		BPJ
Cis-1,2-Dichloroethylene	ug/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - -		BPJ
Flow	MGD	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - -		M[c]
Residue, Total Filterable	mg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - -		BPJ

[b,c] See page 28 for definition of terms and explanation of monitoring requirements.

[b] Definitions:

ABS = Antibacksliding Rule (OAC 3745-33-05(E) and 40 CFR Part 122.44(l));

AD = Antidegradation (OAC 3745-1-05);

BAT = Best Available Technology economically achievable, Federal Effluent Guidelines, 40 CFR Part 415.223;

BPJ = Best Professional Judgment;

BPT = Best Practicable control Technology currently available, Federal Effluent Guidelines, 40 CFR, Part 415.222;

EP = Existing Permit;

M = Division of Surface Water Guidance #2, "National Pollutant Discharge Elimination System: Determination of Sampling Frequency Formula for Industrial Waste Discharges" recommends monitoring for this parameter;

PD = Plant Design Criteria;

RP = Reasonable Potential for exceeding water quality standards, and requiring water quality-based effluent limits and monitoring requirements in NPDES permits (3745-33-07(A));

STS = Secondary Treatment Standards, 40 CFR Part 133;

WET = Whole Effluent Toxicity (OAC 3745-33-07(B)) ;

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.

Attachment A. Federal Effluent Guidelines Applicable to Millennium Plant II

Subpart V – Titanium Dioxide Production Subcategory

40 CFR 415.222(b) Titanium Dioxide – Chloride Process

Best Practicable Control Technology Available (BPT)

Parameter	Daily Maximum (kg/kkg of product)	30-Day Average (kg/kkg of product)
Total Suspended Solids	23	6.4
Chromium	0.057	0.030
pH	within range 6.0 to 9.0	

40 CFR 415.223(b) Titanium Dioxide – Chloride Process

Best Available Technology Economically Achievable (BAT)

Parameter	Daily Maximum (kg/kkg of product)	30-Day Average (kg/kkg of product)
Chromium	0.057	0.030