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 **Columbus Southern Power – Waterford Energy Facility**

Public Notice No.: 12-01-034
Public Notice Date: January 12, 2012
Comment Period Ends: February 11, 2012

OEPA Permit No.: **0IB00027*DD**
Application No.: **OH0127825**

Name and Address of Applicant:

Columbus Southern Power Company
1 Riverside Plaza
Columbus, Ohio 43215-2376

Name and Address of Facility Where Discharge Occurs:

Waterford Energy Facility
201 Righteous Road
Waterford Township, Ohio 45786
Washington County

Receiving Water: **Muskingum River**
Unnamed tributary of Wolf Creek

Subsequent Stream Network: **Wolf Creek to Muskingum River to Ohio River**

Introduction

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

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

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

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

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

Summary of Permit Conditions

Temperature limits have been revised in this permit to reflect a re-assessment of the smaller thermal discharges on the Muskingum River, such as Waterford Energy. Limits would be less restrictive for Waterford Energy because it is a smaller thermal load than the one large source in this river segment.

For the main outfall (001/091), limits for total suspended solids, pH and chlorine/oxidants are proposed to continue from the current permit. The basis for these limits has not changed since the last permit was issued.

Current monitoring requirements for $CBOD_5$, oil&grease, nitrogen parameters, phosphorus, copper, zinc and acute toxicity are being removed from the permit because these parameters do not have the reasonable potential to contribute to exceedances of water quality standards.

Current monitoring requirements for COD, total dissolved solids and mercury would remain in the permit to track concentrations of these pollutants.

Limits and monitoring requirements for internal outfall 601 (low volume wastewater) would remain the same in the new version of the permit.

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Procedures for Participation in the Formulation of Final Determinations

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

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

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

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

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

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

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

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

For additional information about this fact sheet or the draft permit, contact Steve Wells at (740) 380-5434 (steve.wells@epa.ohio.gov) or Eric Nygaard at (614) 644-2024 (eric.nygaard@epa.ohio.gov).

Location of Discharge/Receiving Water Use Classification

Waterford Energy discharges to Muskingum River at River Mile (RM) 33.8 (Outfall 001/091). The plant also discharges storm water to the Muskingum River from three outfalls near this point (Outfalls 002-004). The plant also discharges storm water to an unnamed tributary of Wolf Creek (Outfalls 005-007). The approximate location of the facility is shown in Figure 1.

This segment of the Muskingum River is described by Ohio EPA River Code: 17-001, U.S. EPA River Reach #: 05040004-011, County: Washington, Ecoregion: Western Allegheny Plateau. The Muskingum River is designated for the following uses under Ohio's Water Quality Standards (OAC 3745-1-24): Warmwater Habitat (WWH), Agricultural Water Supply (AWS), Industrial Water Supply (IWS), and Class A Primary Contact Recreation (PCR).

This segment of Wolf Creek is described by Ohio EPA River Code: 17-001, U.S. EPA River Reach #: 05040004-065, County: Washington, Ecoregion: Western Allegheny Plateau. Wolf Creek is designated for the following uses under Ohio's Water Quality Standards (OAC 3745-1-24): Exceptional Warmwater Habitat (EWH), Agricultural Water Supply (AWS), Industrial Water Supply (IWS), and Class B Primary Contact Recreation (PCR).

The unnamed tributary of Wolf Creek is not designated in the Ohio WQS. The WQS apply WWH criteria and non-drinking water human health criteria to undesignated waters.

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

Use designations for aquatic life protection include habitats for coldwater fish and macroinvertebrates, warmwater aquatic life and waters with exceptional communities of warmwater organisms. These uses all meet the goals of the federal Clean Water Act. Ohio WQS also include aquatic life use designations for waterbodies which 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

The Waterford Energy Plant is a natural gas-fired steam-electric generating station, with a capacity of 850 Megawatts. The plant's processes generate wastewaters that are regulated by the federal effluent guidelines listed in 40 CFR Part 423, Steam Electric Power Generating Point Source Category. The process oprations at this facility are also defined by the standard industrial classification (SIC) category 4911 – Electric Services.

Description of Existing Discharge

The Waterford Energy Plant has one continuous outfall (001/091)that discharges to the Muskingum River. This outfall includes:

- Cooling tower blowdown;
- Regenerating the demineralizer water treatment system used for boiler water;
- Boiler blowdown;
- Water plant filter press supernatant;
- The oil/water separator servicing the plant floor drains and equipment systems; and
- The combustion turbine evaporative cooling system.

Outfall 001/091 is one outfall with different reporting requirements depending on the length of time that chlorine/bromine compounds are discharged. Limits for Outfall 001 apply when chlorination/ bromination lasts less than 2 hours per day; Outfall 091 limits apply when these chemicals are discharged for more than 2 hours per day.

Table 1. Waterford Energy Outfalls and Treatment Systems

Outfall #	Type of Wastewater	Treatment System Used	Discharge Point	Avg. Discharge (in MGD)
001/091	Cooling tower blowdown, boiler blowdown, outfall 601 wastewaters	Dechlorination, multimedia filtration	Muskingum River	1.14 MGD
601	Floor drains, evaporative cooler blowdown, demineralizer regeneration wastewater	Oil/water separation (floor drains), neutralization	Outfall 001	0.16 MGD
002-004	Storm water	None	Precipitation-related	Muskingum River
005-007	Storm water	None	Precipitation-related	Unnamed tributary of Wolf Creek

Consistent with 40 CFR 122.45(h), the current permit includes monitoring and limits at internal station 0IB00031601 to measure compliance with effluent guideline limits for low volume wastewaters. Effluent guideline limits are applied at this outfall to ensure that these treatment standards are met prior to combining with other waste streams. If monitoring was not done at this location, it would not be possible to verify compliance with these standards due to dilution. Federal rules at 40 CFR 125.3(f) prohibit attaining these standards by dilution.

The Waterford Energy Plant obtains the water for its process operations from the Muskingum River. From the Muskingum River intake, the water is first chlorinated and then sent to a clarifier. Lime and a coagulant are then added to the clarifier to improve the precipitation of suspended solids. After leaving the clarifier water flows to the cooling tower and other locations in the plant. Solids from the clarifier are sent through a sludge thickener and then two sludge filter presses prior to being trucked off-site for disposal in a solid waste landfill.

The sanitary wastewater treatment system for the plant is a mound system which is an on-site subsurface waste treatment system. The wastewater is percolated into the unsaturated soil. This system has no wastewater discharge to surface water, and is not subject to NPDES requirements.

Waterford Energy has six storm water outfalls. All of these are currently covered by the storm water pollution prevention and monitoring requirements of the permit.

Table 2 presents chemical specific data compiled from the NPDES renewal application.

Table 3 presents a summary of unaltered Discharge Monitoring Report (DMR) data for outfall 0IB00031001/091 and 0IB00031601. Data are presented for the period January 2006-June 2011, and current permit limits are provided for comparison.

Table 4 summarizes the results of acute whole effluent toxicity tests of the final effluent.

Assessment of Impact on Receiving Waters

Ohio EPA conducted biological sampling in the Muskingum River during the summer of 2006. Sites immediately upstream and downstream of the discharge location for Waterford Energy were found to be in attainment of the warmwater habitat use designation, with good to very good fish and macroinvertebrate communities (see Table 5). The complete report can be found on the Agency web site: http://www.epa.state.oh.us/dsw/document_index/psdindx.aspx.

Development of Water-Quality-Based Effluent Limits

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

Parameter Selection Effluent data for the Waterford Energy were used to determine what parameters should undergo wasteload allocation. The parameters discharged are identified by the data available to Ohio EPA - Discharge Monitoring Report (DMR) data submitted by the permittee, compliance sampling

data collected by Ohio EPA, and any other data submitted by the permittee, such as priority pollutant scans required by the NPDES application or by pretreatment, or other special conditions in the NPDES permit. The sources of effluent data used in this evaluation are as follows:

Self-monitoring data (DMR)	January 2006 through June 2011
NPDES Application data	2011

Some of the DMR data appears to have been reported with incorrect units; data for metals is assumed to be mg/l, even though the reporting codes are listed as ug/l. The effluent data was evaluated for outliers and the following values were removed from the data set: total dissolved solids (5550 mg/l, 6890 mg/l), copper (0.118 ug/l or mg/l), chlorine (0.28 mg/l) and nitrate/nitrite-nitrogen (0.161 mg/l).

This data is evaluated statistically, and Projected Effluent Quality (PEQ) values are calculated for each pollutant. Average PEQ (PEQ_{avg}) values represent the 95th percentile of monthly average data, and maximum PEQ (PEQ_{max}) values represent the 95th percentile of all data points. The average and maximum PEQ values are presented in Table 6.

The PEQ values are used according to Ohio rules to compare to applicable water quality standards (WQS) and allowable wasteload allocation (WLA) values for each pollutant evaluated. Initially, PEQ values are compared to the applicable average and maximum WQS. If both PEQ values are less than 25 percent of the applicable WQS, the pollutant does not have the reasonable potential to cause or contribute to exceedances of WQS, and no wasteload allocation is done for that parameter. If either PEQ_{avg} or PEQ_{max} is greater than 25 percent of the applicable WQS, a wasteload allocation is conducted to determine whether the parameter exhibits reasonable potential and needs to have a limit or if monitoring is required. See Table 10 for a summary of the screening results.

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

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

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

Allocations are developed using a percentage of stream design flow as specified in Table 8, and allocations cannot exceed the Inside Mixing Zone Maximum criteria.

Ohio's water quality standard implementation rules [OAC 3745-2-05(A)(2)(d)(iv)] required a phase out of mixing zones for bioaccumulative chemicals of concern (BCCs) as of November 15, 2010. This rule applied statewide. Mercury is a BCC. The mixing zone phase-out means that as of November 15, 2010 all dischargers requiring mercury limits in their NPDES permit must meet water quality standards at the end-of-pipe (12 ng/l in the Ohio River basin; 1.3 ng/l in the Lake Erie basin).

The data used in the WLA are listed in Tables 7 and 8. The wasteload allocation results to maintain all applicable criteria are presented in Table 9. The discharge concentrations of ammonia have been evaluated using the wasteload allocation procedures and are protective of water quality standards.

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

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

The wasteload allocation calculations for WET are similar to those for aquatic life criteria - using the chronic toxicity unit (TU_c) and 7Q10 flow for the average and the acute toxicity unit (TU_a) and 1Q10 flow for the maximum. These values are the levels of effluent toxicity that should not cause instream toxicity during critical low-flow conditions. For Waterford Energy, the wasteload allocation values are 1.0 TU_a and 67 TU_c.

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

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

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

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

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

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

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

<u>Reasonable Potential/ Effluent Limits/Hazard Management Decisions</u>

After appropriate effluent limits are calculated, the reasonable potential of the discharger to violate the water quality standards must be determined. Each parameter is examined and placed in a defined "group". Parameters that do not have a water quality standard or do not require a wasteload allocation based on the initial screening are assigned to either group 1 or 2. For the allocated parameters, the preliminary effluent limits (PEL) based on the most restrictive average and maximum wasteload allocations are selected from Table 7. The average PEL (PEL_{avg}) is compared to the average PEQ (PEQ_{avg}) from Table 4, and the PEL_{max} is compared to the PEQ_{max}. Based on the calculated percentage of the allocated value [($PEQ_{avg} \div PEL_{avg}$) X 100, or ($PEQ_{max} \div PEL_{max}$) X 100)], the parameters are assigned to group 3, 4, or 5. The groupings are listed in Table 10.

The final effluent limits are determined by evaluating the groupings in conjunction with other applicable rules and regulations. Tables 11-13 present the final effluent limits and monitoring requirements proposed for Waterford Energy outfalls 0IB00027001/091 and 0IB00027601 and the basis for their recommendation.

Outfall 001/091 Requirements
The proposed effluent limits for this outfall contain treatment technology limits for Total Suspended Solids; they also contain water quality-based limits for chlorine and bromine discharges, and for temperature.

The proposed limits for TSS are New Source Performance Standards (NSPS) for the Steam Electric Generating Point Source Category. Loadings are based on the flow reported on the facility's original application. The company has not requested additional loading with the current application.

The NSPS requirements for polychlorinated biphenyl compounds (PCBs) and cooling tower maintenance chemicals are in Part II of the permit. NSPS require that PCBs not be discharged from plant operations, and that cooling tower maintenance chemicals be free from priority pollutants other than chromium and zinc. Based on BPJ, Ohio EPA has extended the "free from priority pollutants" requirement to include chromium and zinc.

Limits proposed for pH are based on Water Quality Standards (OAC 3745-1-07).

Permit limits for residual chlorine, residual oxidants and the duration of chlorine/bromine discharges are being continued. Limits for residual chlorine are required because chlorine is an NSPS parameter under the federal effluent regulations for steam electric power facilities. Limits on total residual oxidants reflects the use of bromine and bromine/chlorine mixtures for control of biofouling in the cooling system. The analytical method for these pollutants does not easily distinguish between bromine and chlorine, and limits are set for the total measurement (residual oxidants) as a result. Waterford Energy reports results for residual chlorine when only chlorine is used as a biocide, and reports residual oxidants when bromine or bromine/chlorine mixtures are used.

The chlorine limit is based on an analysis of the inside-mixing-zone maximum WQS when discharges of chlorine are limited to two hours per day. This information indicates that WQS can be significantly higher for a two hour per day exposure than when organisms are exposed for 48- to 96-hours, as is typical of most acute aquatic toxicity tests. The 120 minute limit on chlorine/bromine duration regulates the exposure time so that chlorine levels will not exceed WQS. These limits are more restrictive than NSPS.

The limit for residual oxidants is based on data submitted by the Chemical Manufacturers Association to U.S. EPA Region V that shows bromine being approximately four times as toxic as chlorine. The discharge limit for residual oxidants is therefore set at ¼ of the chlorine limit.

Outfall 091 is a set of alternate limits for Outfall 001. These limits apply in unusual cases when the Waterford Plant needs to use chlorine or bromine for more than two hours per day. The limits for total residual chlorine and total residual oxidants are based on the wasteload allocation for chlorine and the Region V guidance on bromine discharges.

Temperature limits for Outfall 001/091 have been revised to match the limits in the Duke Energy Washington County permit (0IB00028). As part of the review for the Duke permit, Ohio EPA reviewed a request to revise the temperature limits. The Agency found that while the discharge does have the reasonable potential to contribute to temperature exceedances in this river segment, the river temperature is not as sensitive to the Duke Energy effluent temperatures as it is to the AEP Muskingum River Plant effluent temperatures. This is primarily because Duke Energy's discharge flows are much smaller than the AEP Muskingum River Plant's flows.

The discharge flows and thermal loads for the Waterford Energy Plant are similar to those of Duke Energy. As a result, we have proposed the same temperature limits for both plants.

The Ohio EPA risk assessment (Table 10) places no parameters in group 5. None of the allocated parameters have the reasonable potential to exceed WQS. Similarly, the risk assessment places no parameters in group 4, which requires monitoring.

Ohio EPA risk assessment (Table 10) places barium, bis(2-ethylhexyl)phthalate, free cyanide, total dissolved solids, fluoride and mercury in group 3. This placement as well as the data in Tables 2, 3 and 5 support that these parameters do not have the reasonable potential to contribute to WQS exceedances, and limits are not necessary to protect water quality. Monitoring for mercury at a low frequency is proposed to document that these pollutants continue to remain at low levels. Monitoring for total dissolved solids is proposed to continue at 1/week as it is one of the parameters that controls cooling water cycles and the potential toxicity of the discharge. Monitoring for the remaining parameters is not being required because they do not have the reasonable potential to contribute to exceedances of WQS.

Internal Outfall 601
This outfall contains NSPS treatment technology limits for total suspended solids, oil&grease and pH. Loadings are based on the flow reported on the facility's original application. The company has not requested additional loading with the current application.

Whole Effluent Toxicity Reasonable Potential
Based on evaluating the whole effluent toxicity data presented in Table 4 and other pertinent data under the provisions of OAC 3745-33-07(B), the Waterford Energy 001/091 discharge is placed in Category 4 with respect to whole effluent toxicity. None of the 33 acute toxicity tests showed any acute effects. Chronic tests were not conducted because the wasteload allocation for toxicity (1.0 TUa and 67 TUc) shows that the acute allocation is more limiting on this discharge. Effluents with chronic toxicities greater than 18 TUc have a high probability of exceeding 1.0 TUa.

Based on this information, Ohio EPA is proposing to remove the acute toxicity monitoring requirement in this permit.

Other Requirements

Storm Water Compliance
This plant discharges storm water to the Muskingum River through outfalls 002-007. Waterford Energy has filed a No-Exposure Certification with their renewal application, certifying that industrial materials are not exposed to storm water discharged through these outfalls. Ohio EPA would propose to accept this certificate, and would remove the storm water pollution prevention requirements and annual monitoring requirements from the permit.

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

Section 316(b) Compliance
The cooling water intake structure being constructed at the facility meets the requirements for minimizing impingement and entrainment, as required by U.S. EPA's Phase I 316(b) rules [40 CFR 125, Subpart I]. The cooling water intake and screens are designed to meet an intake velocity of 0.5 feet per second, and are therefore Best Technology Available. Also, the system will be operated as a recirculating system with a cooling tower to minimize the need for intake water.

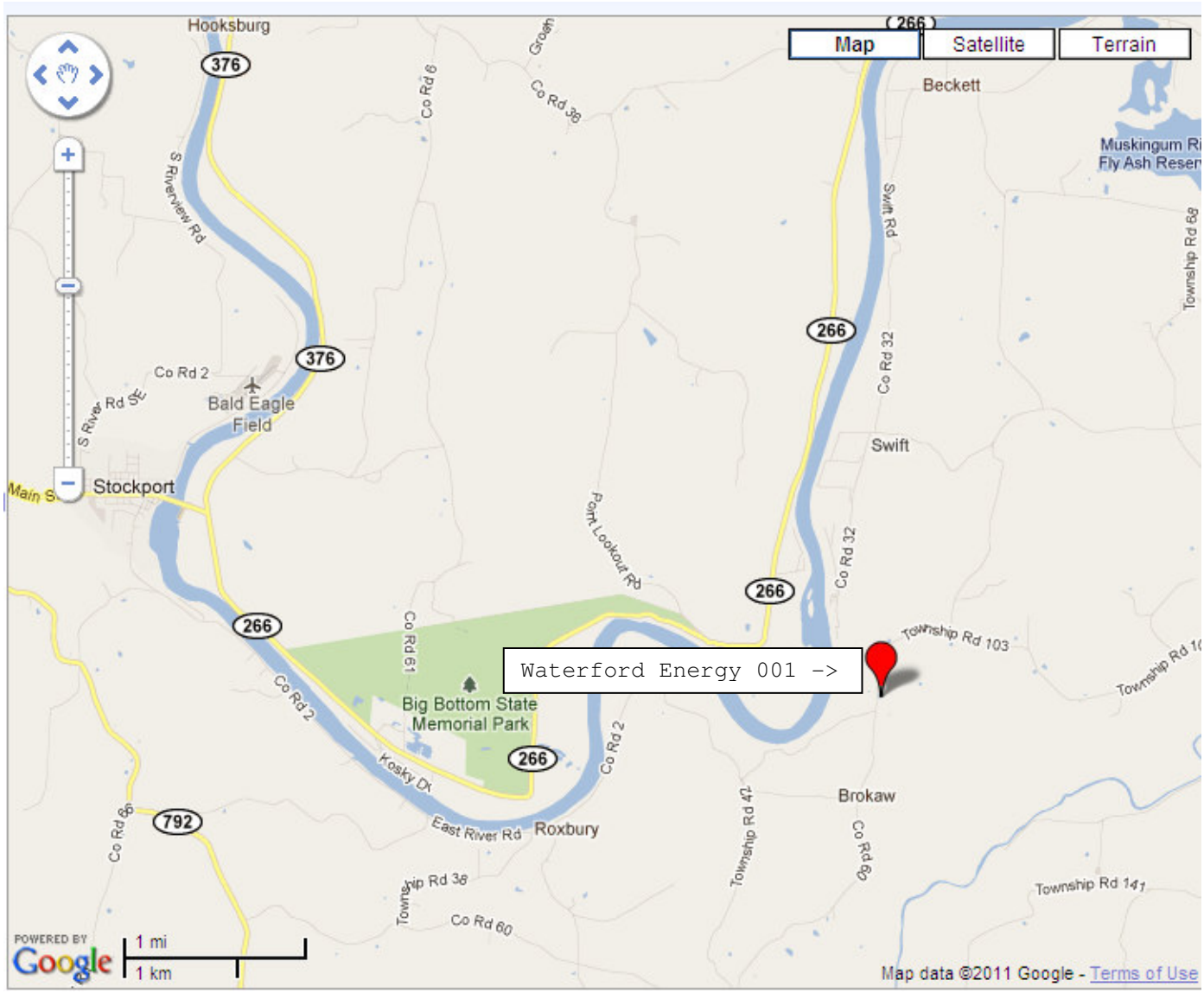

Figure 1. Approximate location of the Waterford Energy.

Table 2. Effluent Characterization Using Application Form 2C Data

Summary of analytical results for Waterford Energy outfall 0IB00027001. All values are in ug/l unless otherwise indicated. ND = below detection (detection limit); NA = not analyzed. Decision Criteria: PEQ_{avg} = monthly averages; PEQ_{max} = daily maximum analytical results.

	2011 Application Form 2C Data			DECISION CRITERIA	
PARAMETER	N	mean	maximum	PEQ_{avg}	PEQ_{max}
BOD5 mg/l	46	0.5	4.98		
COD mg/l	46	8.51	37.7		
Organic C mg/l	3	8.19	12.8		
Suspended Solids mg/l	140	0.41	22.5		
Temp. Summer ^{o}C	539	20.8	30.5		
Temp. Winter ^{o}C	305	8.1	17.9		
Chlorine, TR mg/l	844	0.01	0.3	0.013	0.018
Fluoride mg/l	3	0.18	0.54	1.18	1.62
Ammonia-N mg/l	3	0.35	0.72		
Nitrate/Nitrite-N mg/l 16	2.02	4.5	6.28	10.9	
Organic N mg/l	3	0.41	0.52	2.31	4.08
Phosphorus mg/l	16	1.82	3.46	3.79	5.19
Sulfate mg/l	3	268	386	845	1158
Barium	3	50	70	153	210
Boron	3	310	430	942	1290
Iron	3	240	270	591	810
Magnesium mg/l	3	35.6	51.7	113	155
Mercury ng/l	14	1.3	2.5	3.3	5.7
Chloroform	5	7.6	12.3	20.6	28.3
Bis(2-ethylhexyl)phthalate	3	2.05	6.16	13.5	18.5

Table 3. Effluent Characterization Using Self-Monitoring Data

Summary of current permit limits and unaltered monthly operating report (MOR) data for Waterford Energy outfalls 0IB00027001/091 and 0IB00027601. All values are based on annual records unless otherwise indicated. N = Number of Analyses. * = For pH, 5th percentile shown in place of 50th percentile. Decision Criteria: PEQ_{avg} = monthly average; 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 001											
Water Temperature	Annual	F	**	**	335	63.3	76.6	33-79.7			
Thermal Discharge	Annual	Million BTU/Hr	Monitor		335	0	0	8.6-0			
Chemical Oxygen Demand (Low Level)	Annual	mg/l	Monitor		19	0	26.6	0-57.2	19	58.46	80.08
Chemical Oxygen Demand (Low Level)	Annual	kg/day	--	--	19	0	141	0-303			
pH	Annual	S.U.	6.5 to 9.0		333	7.81	8.49	6.7-8.9			
Residue, Total Dissolved	Annual	mg/l	Monitor		54	461	1030	210-1320	54	860	1181
Residue, Total Dissolved	Annual	kg/day	--	--	54	2440	5460	1110-6990			
Total Suspended Solids	Annual	mg/l	30	100	54	0	8.35	0-12	54	6.6309	10.582
Total Suspended Solids	Annual	kg/day	165	549	54	0	44.2	0-63.6			
Oil and Grease, Total	Annual	mg/l	Monitor		54	0	0	0-0	54	--	--
Oil and Grease, Total	Annual	kg/day	--	--	54	0	0	0-0			
Nitrogen, Ammonia (NH3)	Summer	mg/l	--	--	10	0.169	0.35	0-0.394	6	0.4553	0.6237
Nitrogen, Ammonia (NH3)	Winter	mg/l	--	--	9	0.148	0.436	0-0.541	4	0.4346	0.5954
Nitrogen, Ammonia (NH3)	Summer	kg/day	--	--	10	0.896	1.86	0-2.09			
Nitrogen, Ammonia (NH3)	Winter	kg/day	--	--	9	0.784	2.31	0-2.87			
Cyanide, Free	Annual	mg/l	--	--	19	0	0.0216	0-0.0227	19	0.0232	0.03178
Cyanide, Free	Annual	kg/day	--	--	19	0	0.115	0-0.12			

Zinc, Total Recoverable	Annual	ug/l		Monitor	54	0	0.0294	0-0.0528	54	0.019	0.029
Zinc, Total Recoverable	Annual	kg/day	--	--	54	0	0.000156	0-0.00028			
Lead, Total Recoverable	Annual	ug/l	--	--	21	0	0	0-0	21	--	--
Lead, Total Recoverable	Annual	kg/day	--	--	21	0	0	0-0			
Chromium, Total Recoverable	Annual	ug/l	--	--	21	0	0	0-0.021	21	0.01993	0.0273
Chromium, Total Recoverable	Annual	kg/day	--	--	21	0	0	0-0.000111			
Copper, Total Recoverable	Annual	ug/l		Monitor	54	0	0	0-0.118	54	--	--
Copper, Total Recoverable	Annual	kg/day	--	--	54	0	0	0-0.000625			
Flow Rate	Annual	MGD		Monitor	364	1.4	1.4	0-1.4			
Chlorine, Total Residual	Annual	mg/l	--	0.2	333	0.01	0.03	0-0.2	325	0.01533	0.021
Chlorine, Total Residual	Annual	kg/day	--	--	333	0.053	0.159	0-1.06			
Acute Toxicity, Ceriodaphnia dubia	Annual	TUa		Monitor	19	0	0	0-0			
Acute Toxicity, Pimephales promelas	Annual	TUa	--	--	19	0	0	0-0			
Mercury, Total Recoverable	Annual	ug/l		Monitor	19	0	0	0-0	19	--	--
Mercury, Total Recoverable	Annual	kg/day	--	--	19	0	0	0-0			
Chlorination/Bromination Duration	Annual	Minutes	--	120	355	1440	1440	0-1440			
CBOD 5 day	Summer	mg/l		Monitor	10	0	3.38	0-3.6	6	5.519	7.56
CBOD 5 day	Winter	mg/l		Monitor	9	0	24.9	0-30.3	3	7.884	10.8
CBOD 5 day	Summer	kg/day	--	--	10	0	17.9	0-19.1			
CBOD 5 day	Winter	kg/day	--	--	9	0	132	0-161			

Outfall 091

Water Temperature	Annual	F	**	**	1004	61.4	78.5	34.3-86.9			
Thermal Discharge	Annual	Million BTU/Hr		Monitor	1004	0	4.14	0-7.85			
Chemical Oxygen Demand (Low Level)	Annual	mg/l		Monitor	53	0	31.8	0-80.9	72	30.223	47.014
Chemical Oxygen Demand (Low Level)	Annual	kg/day	--	--	53	0	167	0-294			
pH	Annual	S.U.		6.5 to 9.0	1002	7.55	8.11	6.6-8.93			

Residue, Total Dissolved	Annual	mg/l		Monitor	162	532	1220	212-6890	214	861	1181
Residue, Total Dissolved	Annual	kg/day	--	--	162	2370	5600	495-33800			
Total Suspended Solids	Annual	mg/l	30	100	164	0	5	0-22.5	218	4.8218	6.702
Total Suspended Solids	Annual	kg/day	165	549	164	0	20.2	0-137			
Oil and Grease, Hexane Extr Method	Annual	mg/l		Monitor	164	0	0	0-0	164	--	--
Oil and Grease, Hexane Extr Method	Annual	kg/day	--	--	164	0	0	0-0			
Nitrogen Kjeldahl, Total	Annual	mg/l		Monitor	16	0.835	2.43	0.204-2.62	16	2.3051	4.0808
Nitrogen Kjeldahl, Total	Annual	kg/day	--	--	16	3.58	10	0.726-13.9			
Nitrite Plus Nitrate, Total	Annual	mg/l		Monitor	16	2.1	6.42	0.161-6.58	15	6.2801	10.865
Nitrite Plus Nitrate, Total	Annual	kg/day	--	--	16	11.3	20.9	0.835-23.1			
Phosphorus, Total (P)	Annual	mg/l		Monitor	16	2.15	3.09	0-3.46	16	3.789	5.19
Phosphorus, Total (P)	Annual	kg/day	--	--	16	8.73	14	0-18.3			
Zinc, Total Recoverable	Annual	ug/l		Monitor	53	0	0	0-0.0229	107	0.019	0.029
Zinc, Total Recoverable	Annual	kg/day	--	--	53	0	0	0-0.0000832			
Copper, Total Recoverable	Annual	ug/l		Monitor	16	0	0	0-0	69	--	--
Copper, Total Recoverable	Annual	kg/day	--	--	16	0	0	0-0			
Flow Rate	Annual	MGD		Monitor	1004	1.38	1.64	0.001-1.82			
Chlorine, Total Residual	Annual	mg/l	--	0.038	1004	0.01	0.02	0-0.28	1003	0.01314	0.018
Chlorine, Total Residual	Annual	kg/day	--	--	1004	0.0503	0.0959	0-0.689			
Mercury, Total (Low Level)	Annual	ng/l		Monitor	16	1.45	2.95	0-4.3	16	3.329	5.6536
Mercury, Total (Low Level)	Annual	kg/day	--	--	16	5.68E-06	0.000013	0-0.0000146			
Acute Toxicity, Ceriodaphnia dubia	Annual	TUa		Monitor	16	0	0	0-0			
Chlorination/Bromination Duration	Annual	Minutes		Monitor	1004	1440	1440	0-1440			
CBOD 5 day	Summer	mg/l		Monitor	28	0	4.43	0-4.98	20	5.079	6.958
CBOD 5 day	Winter	mg/l		Monitor	25	0	0	0-3.06	13	--	--
CBOD 5 day	Summer	kg/day	--	--	28	0	18.1	0-22.4			
CBOD 5 day	Winter	kg/day	--	--	25	0	0	0-18.3			

Outfall 601

pH	Annual	S.U.	6.0 to 9.0		1319	7.46	8.06	5.38-8.81
Total Suspended Solids	Annual	mg/l	30	100	218	0	5.5	0-63
Total Suspended Solids	Annual	kg/day	14.9	49.6	217	0	0.261	0-6.36
Oil and Grease, Total	Annual	mg/l	15	20	62	0	0	0-0
Oil and Grease, Total	Annual	kg/day	7.4	9.9	61	0	0	0-0
Oil and Grease, Hexane Extr Method	Annual	mg/l	15	20	155	0	0	0-0
Oil and Grease, Hexane Extr Method	Annual	kg/day	7.4	9.9	155	0	0	0-0
Flow Rate	Annual	MGD	Monitor		1346	0.01	0.0858	0-91

** Temperature limits for Outfall 001/091:

Month	Monthly	Maximum
Jan.-Feb.	45	50
March	53	58
April	62	67
May	70	76
June	81	87
July –Aug.	85	89
September	83	87
October	70	75
November	62	67
December	47	52

Table 4. Summary of effluent acute toxicity test results.

Test Date(a)	*Ceriodaphnia dubia 48 hours*						*Fathead Minnows 96 hour*					
	UP[b]	C[c]	LC_{50}[d]	%M[e]	TUa[f]	NF[g]	UP[b]	C[c]	LC_{50}[d]	%M[e]	TUa[f]	NF[g]
01/13/06 (E)	0	NR	>100	0	<1.0	NT	0	NR	>100	0	<1.0	NT
03/16/06 (E)	10	NR	>100	0	<1.0	NT	0	NR	>100	0	<1.0	NT
04/06/06 (E)	0	NR	>100	0	<1.0	NT	0	NR	>100	0	<1.0	NT
05/04/06 (E)	0	NR	>100	0	<1.0	NT	0	NR	>100	0	<1.0	NT
06/16/06 (E)	0	NR	>100	0	<1.0	NT	0	NR	>100	0	<1.0	NT
07/13/06 (E)	0	NR	>100	0	<1.0	NT	5	NR	>100	0	<1.0	NT
08/10/06 (E)	5	NR	>100	0	<1.0	NT	5	NR	>100	0	<1.0	NT
09/07/06 (E)	0	NR	>100	0	<1.0	NT	0	NR	>100	0	<1.0	NT
10/05/06 (E)	0	NR	>100	0	<1.0	NT	10	NR	>100	0	<1.0	NT
11/12/06 (E)	0	NR	>100	0	<1.0	NT	0	NR	>100	0	<1.0	NT
12/05/06 (E)	5	NR	>100	0	<1.0	NT	0	NR	>100	0	<1.0	NT
01/18/07 (E)	0	NR	>100	0	<1.0	NT	5	NR	>100	0	<1.0	NT

[a] O = EPA test; E = entity test
[b] UP = upstream control water
[c] C = laboratory water control
[d] LC_{50} = median lethal concentration
[e] %M = percent mortality in 100% effluent
[f] TUa = acute toxicity units
[g] NF = near field sample in N/A
NR = not reported in OEPA database
NT = not tested

Table 4. Summary of effluent acute toxicity test results - continued.

Test Date(a)	*Ceriodaphnia dubia 48 hours*						*Fathead Minnows 96 hour*					
	UP[b]	C[c]	LC_{50}[d]	%M[e]	TUa[f]	NF[g]	UP[b]	C[c]	LC_{50}[d]	%M[e]	TUa[f]	NF[g]
02/01/07 (E)	0	NR	>100	0	<1.0	NT	10	NR	>100	0	<1.0	NT
03/02/07 (E)	0	NR	>100	0	<1.0	NT	10	NR	>100	0	<1.0	NT
04/17/07 (E)	0	NR	>100	0	<1.0	NT	0	NR	>100	0	<1.0	NT
05/04/07 (E)	0	NR	>100	0	<1.0	NT	0	NR	>100	0	<1.0	NT
06/07/07 (E)	0	NR	>100	0	<1.0	NT	0	NR	>100	0	<1.0	NT
07/12/07 (E)	0	NR	>100	0	<1.0	NT	10	NR	>100	0	<1.0	NT
08/02/07 (E)	0	NR	>100	0	<1.0	NT	NT	NT	NT	NT	NT	NT
12/03/07 (E)	0	NR	>100	0	<1.0	NT	NT	NT	NT	NT	NT	NT
03/05/08 (E)	0	NR	>100	0	<1.0	NT	NT	NT	NT	NT	NT	NT
06/05/08 (E)	0	NR	>100	0	<1.0	NT	NT	NT	NT	NT	NT	NT
08/20/08 (E)	0	NR	>100	0	<1.0	NT	NT	NT	NT	NT	NT	NT
12/10/08 (E)	0	NR	>100	0	<1.0	NT	NT	NT	NT	NT	NT	NT

[a] O = EPA test; E = entity test
[b] UP = upstream control water
[c] C = laboratory water control
[d] LC_{50} = median lethal concentration
[e] %M = percent mortality in 100% effluent
[f] TUa = acute toxicity units
[g] NF = near field sample in N/A
NR = not reported in OEPA database
NT = not tested

Table 4. Summary of effluent acute toxicity test results - continued.

Test Date(a)	*Ceriodaphnia dubia 48 hours*						*Fathead Minnows 96 hour*					
	UP[b]	C[c]	LC_{50}[d]	%M[e]	TUa[f]	NF[g]	UP[b]	C[c]	LC_{50}[d]	%M[e]	TUa[f]	NF[g]
03/13/09 (E)	0	NR	>100	0	<1.0	NT	NT	NT	NT	NT	NT	NT
06/05/09 (E)	0	NR	>100	0	<1.0	NT	NT	NT	NT	NT	NT	NT
08/14/09 (E)	0	NR	>100	0	<1.0	NT	NT	NT	NT	NT	NT	NT
12/10/09 (E)	0	NR	>100	0	<1.0	NT	NT	NT	NT	NT	NT	NT
03/05/10 (E)	0	NR	>100	0	<1.0	NT	NT	NT	NT	NT	NT	NT
06/17/10 (E)	0	NR	>100	0	<1.0	NT	NT	NT	NT	NT	NT	NT
08/27/10 (E)	0	NR	>100	0	<1.0	NT	NT	NT	NT	NT	NT	NT
12/02/10 (E)	0	NR	>100	0	<1.0	NT	NT	NT	NT	NT	NT	NT
03/03/11 (E)	0	NR	>100	0	<1.0	NT	NT	NT	NT	NT	NT	NT
06/02/11 (E)	0	NR	>100	0	<1.0	NT	NT	NT	NT	NT	NT	NT

[a] O = EPA test; E = entity test
[b] UP = upstream control water
[c] C = laboratory water control
[d] LC_{50} = median lethal concentration
[e] %M = percent mortality in 100% effluent
[f] TUa = acute toxicity units
[g] NF = near field sample in N/A
NR = not reported in OEPA database
NT = not tested

Table 5. Biological Survey Results and Biocriteria. Summary of the aquatic life use attainment status for the warmwater habitat use designation in the Muskingum River based on data collected by the Ohio EPA from June through September, 2006.

RIVER MILE	IBI	Mod. Iwb	ICI	QHEI	Use Attain-ment Status	Comments
56.4	44	8.9	38	75.5	FULL	Rokeby dam tailwaters
52.1	44	9.6	G	61.0	FULL	McConnelsville dam pool
48.8	50	9.8	44	81.0	FULL	McConnelsville dam tailwaters
43.2	38ns	8.5ns	44	63.5	FULL	Stockport dam pool
39.5	46	9.4	48	84.5	FULL	Stockport dam tailwaters
36.2	44	8.7	40	63.5	FULL	Luke Chute dam pool
33.5	47	9.8	44	84.0	FULL	Luke Chute dam tailwaters
29.2	48	10.2	50	64.0	FULL	Upstream Muskingum River EGS
26.2	44	9.3	46	64.5	FULL	Downstream Muskingum River EGS
24.7	48	9.8	48	85.5	FULL	Beverly dam tailwaters

Ecoregion Biocriteria: Western Alleghany Plateau (WAP)		
Index (site type)	WWH	EWH
IBI (boat)	40	48
MIwb (boat)	8.6	9.6
ICI	36	46

ns Nonsignificant departure from biocriterion (<4 IBI or ICI units; <0.5 MIwb units).
a Narrative evaluation used in lieu of ICI (E=Exceptional; G=Good).

Table 6. Effluent Data for the Waterford Energy

Parameter	Units	Number of Samples	Number > MDL	PEQ Average	PEQ Maximum
Barium	ug/l	3	3	153.3	210
Bis(2-ethylhexyl)phthalate	ug/l	3	1	13.4904	18.48
Boron	ug/l	3	3	941.7	1290
Chlorine (wwh,ewh, mwh,cwh) - TRes	mg/l	1003	880	0.01314	0.018
Chloroform (Trichloromethane)	ug/l	5	3	20.6517	28.29
Chromium - TR	ug/l	21	1	19.929	27.3
Copper - TR	ug/l	69	0	--	--
Cyanide - free (wwh,ewh,mwh)	mg/l	19	3	0.0231994	0.03178
Dissolved solids	mg/l	214	214	860	1181
Fluoride	mg/l	3	1	1.1826	1.62
Iron - TR	ug/l	3	3	591.3	810
Lead - TR	ug/l	21	0	--	--
Magnesium	mg/l	3	2	113.223	155.1
Mercury - TR (BCC)	ng/l	16	14	3.3	5.7
Nitrate-N + Nitrite-N	mg/l	15	15	6.28	10.9
Phosphorus	mg/l	16	13	3.7887	5.19
Sulfates	mg/l	3	3	845.34	1158
TKN	mg/l	16	16	2.31	4.08
Zinc - TR	ug/l	107	8	19	29

Table 7. **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	
Barium	ug/l	--	--	220	2000	4000
Bis(2-ethylhexyl)phthalate	ug/l	59c	--	8.4	1100	2100
Boron	ug/l	--	--	3900	33000	65000
Chlorine - TRes	mg/l	--	--	0.011	0.019	0.038
Chloroform (Trichloromethane)	ug/l	4700c	--	140	1300	2600
Chromium - TR	ug/l	--	100	180	3800	7500
Copper - TR	ug/l	1300	500	20	33	65
Cyanide - free	mg/l	220	--	0.012	0.046	0.092
Dissolved solids	mg/l	--	--	1500	--	--
Fluoride	mg/l	--	2	--	--	--
Iron - TR	ug/l	--	5000	--	--	--
Lead - TR	ug/l	--	100	20	390	770
Magnesium	mg/l	--	--	--	--	--
Mercury - TR (BCC)	ng/l	12	10000	910	1700	3400
Nitrate-N + Nitrite-N	mg/l	--	100	--	--	--
Phosphorus	mg/l	--	--	--	--	--
Sulfates	mg/l	--	--	--	--	--
TKN	mg/l	--	--	--	--	--
Zinc - TR	ug/l	69000	25000	260	260	510

C = carcinogen

Table 8. **Instream Conditions and Discharger Flow**

Parameter	Units	Season	Value	Basis
Stream Flows				
1Q10	cfs	annual	520	USGS 03150000
7Q10	cfs	annual	627	USGS 03150000
Harmonic Mean	cfs	annual	2864	USGS 03150000
Mixing Assumption	%	average	25	
	%	maximum	25	
Hardness	mg/l	annual	246	STORET N=5
Waterford Energy flow	cfs	annual	2.37	Co. Application max, 30-day flow
Background Water Quality				
Barium	ug/l		52.2	STORET; 2006; n=5; 0<MDL; mean value - Stockport
Bis(2-ethylhexyl)phthalate	ug/l		0	No representative data available.
Boron	ug/l		0	No representative data available.
Chlorine - TRes	mg/l		0	No representative data available.
Chloroform (Trichloromethane)	ug/l		0	No representative data available.
Chromium - TR	ug/l		0	STORET; 2006; n=5; 5<MDL; All values less than MDL
Copper - TR	ug/l		0	STORET; 2006; n=5; 5<MDL; All values less than

			MDL
Cyanide - free	mg/l	0	No representative data available.
Dissolved solids	mg/l	371	STORET; 2006; n=5; 0<MDL; mean value - Stockport
Fluoride	mg/l	0	No representative data available.
Iron - TR	ug/l	692	STORET; 2006; n=5; 0<MDL; mean value - Stockport
Lead - TR	ug/l	0	STORET; 2006; n=5; 5<MDL; All values less than MDL
Magnesium	mg/l	20.2	STORET; 2006; n=5; 0<MDL; mean value - Stockport
Mercury - TR (BCC)	ng/l	1.35	AEP; 2007-11; n=16; 2<MDL; median value
Nitrate-N + Nitrite-N	mg/l	1.52	AEP; 2007-11; n=16; 0<MDL; median value
Phosphorus	mg/l	0.05	AEP; 2007-11; n=16; 9<MDL; 1/2 MDL
Sulfates	mg/l	95.56	STORET; 2006; n=5; 0<MDL; mean value - Stockport
TKN	mg/l	0.46	STORET; 2006; n=5; 0<MDL; mean value - Stockport
Zinc - TR	ug/l	0	STORET; 2006; n=5; 5<MDL; All values less than MDL

Table 9. Summary of Effluent Limits to Maintain Applicable WQ Criteria

		Outside Mixing Zone Criteria				Inside
		Average			Maximum	Mixing
Parameter	Units	Human Health	Agri-culture	Aquatic Life	Aquatic Life	Zone Maximum
Barium	ug/l	--	--	11318	108841	4000
Bis(2-ethylhexyl)phthalate	ug/l	17883	--	564	61438	2100
Boron	ug/l	--	--	261843	1843127	65000
Chlorine - TRes	mg/l	--	--	0.74	1.1	0.038
Chloroform (Trichloromethane)	ug/l	1424616	--	9399	72608	2600
Chromium - TR	ug/l	--	30311	12085	212239	7500
Copper - TR	ug/l	394043	151555	1343	1843	65
Cyanide - free	mg/l	66684	--	0.81	2.6	0.092
Dissolved solids	mg/l	--	--	76171	--	--
Fluoride	mg/l	--	606	--	--	--
Iron - TR	ug/l	--	1306489	--	--	--
Lead - TR	ug/l	--	30311	1343	21782	770
Magnesium	mg/l	--	--	--	--	--
Mercury - TR (BCC)	ng/l	12	10000	910	1700	3400
Nitrate-N + Nitrite-N	mg/l	--	29852	--	--	--
Phosphorus	mg/l	--	--	--	--	--
Sulfates	mg/l	--	--	--	--	--
TKN	mg/l	--	--	--	--	--
Zinc - TR	ug/l	20914570	7577743	17456	14522	510

Table 10. Parameter Assessment

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

Magnesium	Phosphorus	Sulfates
TKN		

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

Boron	Chloroform (Trichloromethane)	Chromium - TR
Copper - TR	Iron - TR	Lead - TR
Nitrate-N + Nitrite-N	Zinc - TR	

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

Barium	Bis(2-ethylhexyl)phthalate	Chlorine - TRes
Cyanide - free	Dissolved solids	Fluoride
Mercury - TR (BCC)		

Group 4: PEQ_{max} >= 50 percent, but < 100 percent of the maximum PEL or PEQ_{avg} >= 50 percent, but < 100 percent of the average PEL. Monitoring is appropriate.

No parameters fit this group.

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

Limits to Protect Numeric Water Quality Criteria

			Recommended Effluent Limits	
Parameter	Units	Period	Average	Maximum

No parameters fit this group.

Table 11. Final effluent limits and monitoring requirements for Waterford Energy outfall 0IB00027001 and the basis for their recommendation.

		Effluent Limits				
		Concentration		Loading (kg/day)[a]		
		30 Day	Daily	30 Day	Daily	
Parameter	Units	Average	Maximum	Average	Maximum	Basis[b]
Flow	MGD	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Temperature	°F					
May&Oct.		75	80	--	--	BPJ/WLA
June-Sept.		85	90	--	--	BPJ/WLA
Winter		- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Thermal Discharge	MBTU/hr	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
COD	mg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Dissolved Solids	mg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Suspended Solids	mg/l	30	100	165	549	NSPS
pH	S.U.	- - - - - - - - - - - -	6.5 to 9.0	- - - - - - - - - - - - - -		WQS
Chlorine Residual	mg/l	--	0.2	--	--	WLA/IMZM/BPJ
Oxidant Residual	mg/l	--	0.05	--	--	WLA/IMZM/BPJ
Chlorine/Bromine Duration	mins.	--	120	--	--	WLA/IMZM/BPJ
Mercury, T.	ng/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]

[a] Effluent loadings based on average discharge flow of 1.45 MGD.

[b] Definitions: BPJ = Best Professional Judgment; M = Monitoring; NSPS = New Source Performance Standards, 40 CFR Part 423; 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.

Table 12. Final effluent limits and monitoring requirements for Waterford Energy outfall 0IB00027091 and the basis for their recommendation.

		Effluent Limits				
		Concentration		Loading (kg/day)[a]		
		30 Day	Daily	30 Day	Daily	
Parameter	Units	Average	Maximum	Average	Maximum	Basis[b]
Flow	MGD	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Temperature	°F					
May&Oct.		75	80	--	--	BPJ/WLA
June-Sept.		85	90	--	--	BPJ/WLA
Winter		- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Thermal Discharge	MBTU/hr	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
COD	mg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Dissolved Solids	mg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Suspended Solids	mg/l	30	100	165	549	NSPS
pH	S.U.	- - - - - - - - - - - -	6.5 to 9.0	- - - - - - - - - - - - - -		WQS
Chlorine Residual	mg/l	--	0.038	--	--	WLA/IMZM
Oxidant Residual	mg/l	--	0.01	--	--	WLA/IMZM/BPJ
Chlorine/Bromine Duration	mins.	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Mercury, T.	ng/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]

[a] Effluent loadings based on average design discharge flow of 1.45 MGD.

[b] Definitions: BPJ = Best Professional Judgment; M = Monitoring; NSPS = New Source Performance Standards, 40 CFR Part 423; 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.

Table 13. Final effluent limits and monitoring requirements for Waterford Energy outfall 0IB00027601 and the basis for their recommendation.

		Effluent Limits				
		Concentration		Loading (kg/day)[a]		
Parameter	Units	30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	Basis[b]
Flow	MGD	- - - - - - - - - - - - Monitor - - - - - - - - - - - - - - - -				M[c]
Suspended Solids	mg/l	30	100	14.9	49.6	NSPS
Oil and Grease	mg/l	15	20	7.4	9.9	NSPS
pH	S.U.	- - - - - - - - - - - - 6.0 to 9.0 - - - - - - - - - - - - - - -				NSPS

[a] Effluent loadings based on average design discharge flow of 0.131 MGD.

[b] Definitions: M = Monitoring; NSPS = New Source Performance Standards, 40 CFR Part 423.

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