

National Pollutant Discharge Elimination System (NPDES) Permit Program

F A C T S H E E T

Regarding an NPDES Permit to Discharge to Waters of the State of Ohio
for the **Village of South Point WWTP**

Public Notice No.: 12-05-006
Public Notice Date: May 2, 2012
Comment Period Ends: June 2, 2012

OEPA Permit No.: **OPD00025*GD**
Application No.: **OH0021814**

Name and Address of Applicant:

Village of South Point
408 2nd Street West
South Point, Ohio 45680

Name and Address of Facility Where
Discharge Occurs:

Village of South Point WWTP
408 2nd Street West
South Point, Ohio 45680
Lawrence County

Receiving Water: **Ohio River**

Subsequent
Stream Network: **N/A**

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

The Ohio EPA risk assessment places mercury and copper in group 5. Copper limits from the current permit are proposed to continue. New limits for mercury have been included. The facility has indicated they will be able to comply with the new limits.

Limits for pH, oil and grease, and fecal coliform are proposed to continue based on water quality standards. Limits for CBOD₅ and TSS are proposed to continue and are technology-based treatment standards included in 40 CFR Part 133, Secondary Treatment Regulation.

The plant's effluent does not currently pose a toxicity problem. Annual toxicity testing is proposed consistent with the minimum monitoring requirements at OAC 3754-33-07(B)(11). The proposed monitoring will adequately characterize toxicity in the plant's effluent.

Current permit limits for lead are being removed because effluent data shows that they no longer have the reasonable potential to contribute to exceedances of water quality standards.

This permit renewal is proposed for a term of approximately **5 years**, expiring on **January 31, 2017**. This schedule will allow the South Point wastewater treatment plant permit to be on a similar schedule with the other facilities within the same watershed basin.

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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 draft permit, contact Steve Wells by phone at (740) 380-5434 or by email at steve.wells@epa.state.oh.us.

Location of Discharge/Receiving Water Use Classification

The South Point wastewater treatment plant discharges to the Ohio River at River Mile (RM) 663.7. The approximate location of the facility is shown in Figure 1.

This segment of the Ohio River is described by Ohio EPA River Code: 25-300, U.S. EPA River Reach #: 05090103-038, County: Lawrence, Ecoregion: Western Allegheny Plateau. The Ohio River is designated for the following uses under Ohio's Water Quality Standards (OAC 3745-1-32): Warmwater Habitat (WWH), Agricultural Water Supply (AWS), Industrial Water Supply (IWS), Public Water Supply (PWS), and Bathing 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 South Point WWTP currently has an average design flow of 1.8 MGD and was upgraded most recently in 1987. Wet stream processes are screening, primary settling, trickling filters, secondary clarification, chlorination and dechlorination. Solid stream processes are aerobic digestion, belt press thickening and landfill disposal

Wastewater is diverted to a bypass at the head of the plant when the influent flow exceeds approximately 2.5 MGD. The capacity of the clarifiers is currently the limiting factor in the treatment system determining the amount of flow which can be processed. Bypassed flow is discharged directly to the Ohio River without treatment.

The plant serves the Village of South Point as well as portions of Fayette and Perry Townships in Lawrence County, for a total estimated service population of 11,047. The collection system consists of 100 percent separate sanitary sewers, and the inflow and infiltration rate is estimated to be 200,00 gallons per day (gpd). The water supply sources for the service area are ground water wells.

Description of Existing Discharge

Table 1 presents a summary of permit limit violations from 2007 through November 2011.

Table 2 presents chemical specific data compiled from the NPDES renewal application, data reported in annual pretreatment reports, and data collected by the Ohio EPA.

Outfall 002 was added to the permit in the last renewal to monitor internal bypassing at the plant. Since the renewal, only one bypass occurrence on 10/4/2008 has been reported.

Table 3 presents a summary of unaltered Discharge Monitoring Report (DMR) data for outfall OPD00025001. Data are presented for the period October 2006 through September 2011 and current permit limits are provided for comparison.

Table 4 summarizes the chemical specific data for outfall OPD00025001 by presenting the average and maximum Projected Effluent Quality (PEQ) values.

Table 5 summarizes the results of acute whole effluent toxicity tests of the final effluent.

Under the provisions of 40 CFR 122.21(j), the Director has waived the requirement for submittal of expanded effluent testing data as part of the NPDES renewal application. Ohio EPA has access to substantially identical information through the submission of annual pretreatment program reports and/or from effluent testing conducted by the Agency.

Assessment of Impact on Receiving Waters

The 2010 305(b) report for the Ohio River, *Biennial Assessment of Ohio River Water Quality Conditions* (ORSANCO), uses two approaches to assess aquatic life use in the Ohio River. The first is a pollutant assessment of both metal and nonmetal parameters. If a given pollutant exceeds the water quality criterion for aquatic life use in no more than ten percent of the samples, it's considered to be "Fully Supporting" for aquatic life use. If a pollutant is exceeding in more than ten percent of the samples but less than twenty-five percent, it's considered to be "Partially Supporting" the aquatic life use and impaired. Pollutants that exceed the water quality criterion for aquatic life use more than twenty-five percent of the time are considered to be "Not Supporting" the aquatic life use and impaired.

The second way aquatic life use is assessed is through a biological assessment using the Modified Ohio River Fish Index (MORFI). This assessment develops a score based on evaluating 13 metrics such as number of species, number of pollutant tolerant species and percent of top piscivores in the fish community. Each pool on the Ohio River created by the high lift dams is assessed at multiple locations and then the overall pool biological condition as a whole is given a rating.

The overall pool biological condition for the Greenup pool, in which the facility discharges into, was rated as fair. Individual biological site assessments performed downstream of the facility at mile points 323.5 and 332.5 were rated as poor and good, respectively. The pollutant assessment at the Greenup monitoring station (river mile 341) did not indicate any impairment.

The 2010 305(b) report for the Ohio River, *Biennial Assessment of Ohio River Water Quality Conditions* (ORSANCO) is available at this ORSANCO Web page:

<http://www.orsanco.org/images/stories/files/publications/305b/docs/2010%20ohio%20river%20305b%20report%20final.pdf>

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 (APPLICANT) were used to determine what parameters should undergo wasteload allocation. The parameters discharged are identified by the data available to the 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)	October 2006 through September 2011
NPDES Application data	2011
OEPA compliance sampling data	March 2010

One high outlier was eliminated from each of the following: nitrite + nitrate, cadmium, and lead. One low outlier was eliminated for total phosphorus, and 2 high outliers were eliminated for copper.

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 PEQ_{avg} and PEQ_{max} values are presented in Table 4.

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 9 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

Agricultural Water Supply
Human Health (nondrinking)

Winter 30Q10
Harmonic mean flow
Harmonic mean flow

Allocations are developed using a percentage of stream design flow as specified in Table 7, 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, which is 12 ng/l in the Ohio River Basin.

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.

Whole Effluent Toxicity WLA

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

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

The wasteload allocation calculations for WET are similar to those for aquatic life criteria - using the chronic toxicity unit (TU_c) and 7Q10 flow for the average and the acute toxicity unit (TU_a) and 1Q10 flow for the maximum. These values are the levels of effluent toxicity that should not cause instream toxicity during critical low-flow conditions. For the South Point wastewater plant, the wasteload allocation values are 1.0 TU_a and 360.7 TU_c .

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

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

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

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

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

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

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

Reasonable Potential/ Effluent Limits/Hazard Management Decisions

After appropriate effluent limits are calculated, the reasonable potential of the discharger to violate the water quality standards must be determined. Each parameter is examined and placed in a defined "group". Parameters that do not have a water quality standard or do not require a wasteload allocation based on the initial screening are assigned to either group 1 or 2. For the allocated parameters, the preliminary effluent limits (PEL) based on the most restrictive average and maximum wasteload allocations are selected from Table 8. 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 [$(PEQ_{avg} \div PEL_{avg}) \times 100$, or $(PEQ_{max} \div PEL_{max}) \times 100$], the parameters are assigned to group 3, 4, or 5. The groupings are listed in Table 9.

The final effluent limits are determined by evaluating the groupings in conjunction with other applicable rules and regulations. Table 10 presents the final effluent limits and monitoring requirements proposed for the South Point WWTP outfall OPD00025001 and the basis for their recommendation.

The limits recommended for suspended solids and $CBOD_5$ are technology-based treatment standards included in 40 CFR Part 133, Secondary Treatment Regulation. Secondary treatment is defined by the Best Practicable Waste Treatment Technology criteria, which are required of all publicly owned treatment works discharging to effluent limited stream segments (with respect to conventional pollutants). For a facility required to meet secondary treatment standards, monitoring of ammonia-N and dissolved oxygen is appropriate and is proposed.

Limits proposed for oil and grease and pH are based on Water Quality Standards (OAC 3745-1-07) and are a continuation of existing permit limits. Monitoring for these parameters as well as dissolved oxygen is proposed to continue. Summer fecal limits are based on ORSANCO standards and winter fecal limits are based on the anti-backsliding and ORSANCO standards.

The proposed limit for total residual chlorine is based on wasteload allocation as limited by the inside mixing zone maximum (IMZM). The IMZM is a value calculated to avoid rapidly lethal conditions in the effluent mixing zone.

The Ohio EPA risk assessment (Table 9) places Copper and Mercury in group 5. This placement as well as the data in Tables 2, 3 and 4 indicate that the reasonable potential to exceed WQS exists and limits are necessary to protect water quality. For these parameters PEQ is greater than 100 percent of the wasteload allocation. Pollutants that meet this requirement must have permit limits under OAC Rule 3745-33-07(A)(1). The daily maximum limit for copper is based on the inside mixing zone maximum. The thirty day average limit for Mercury is based on the outside mixing zone average criteria for human health. The daily maximum for mercury is based on the inside mixing zone maximum.

The Ohio EPA risk assessment (Table 9) places free cyanide and zinc in group 4. This placement as well as the data in Tables 2, 3 and 4 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 Group 4 pollutants (where PEQ exceeds 50 percent of the WLA) is required by OAC Rule 3745-33-07(A)(2).

Ohio EPA risk assessment (Table 9) places cadmium, chromium, dissolved hexavalent chromium, lead and nitrate+nitrite in groups 2 and 3. This placement as well as the data in Tables 2, 3 and 4 support that these parameters do not have the reasonable potential to contribute to WQS exceedances, and limits are not necessary to protect water quality. Limits for lead are proposed to be removed with monitoring maintained.

Monitoring at a reduced frequency for cadmium, chromium, and dissolved hexavalent chromium is proposed to document that these pollutants continue to remain at low levels.

Limits and monitoring requirements proposed for the disposal of sewage sludge by removal to a sanitary landfill are based on OAC 3745-40.

Monitoring for total Kjeldahl nitrogen, total phosphorus, and total orthophosphate is being continued from the existing permit in order to provide more comprehensive nutrient data for the South Point discharge and loadings to the Ohio River. Additional monitoring requirements proposed at the final effluent, influent and upstream/downstream stations are included for all facilities in Ohio and vary according to the type and size of the discharge. In addition to permit compliance, this data is used to assist in the evaluation of effluent quality and treatment plant performance and for designing plant improvements and conducting future stream studies.

The monitoring table for outfall 002 to monitor bypassing at the plant is proposed to continue.

Whole Effluent Toxicity Reasonable Potential

Annual acute toxicity monitoring is proposed for the life of the permit. Evaluating the toxicity data presented in Table 5 and other pertinent data under the provisions of OAC 3745-33-07(B) placed the South Point wastewater plant in Category 3 with respect to whole effluent toxicity. Semi-annual toxicity testing is proposed to continue from the existing permit to adequately characterize toxicity in the plant's effluent.

Other Requirements

Sanitary Sewer Overflow Reporting

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

Operator Certification

Operator certification requirements have been included in Part II, Item A of the permit in accordance with rules adopted in December 2006. These rules require the South Point wastewater plant to have a Class III wastewater treatment plant operator in charge of the sewage treatment plant operations discharging through outfall OPD00025001.

Operator of Record

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

Storm Water Compliance

Parts IV, V, and VI have been included with the draft permit in order to ensure that any storm water flows from the facility site are properly regulated and managed. As an alternative to complying with Parts IV, V, and VI, the South Point wastewater plant may seek permit coverage under the general permit for industrial stormwater (permit # OHR000004) or submit a “No Exposure Certification.” Parts IV, V, and VI will be

removed from the final permit if: 1) the Village of South Point submits a Notice of Intent (NOI) for coverage under the general permit for industrial stormwater or submits a No Exposure Certification, 2) Ohio EPA determines that the facility is eligible for coverage under the general permit or meets the requirements for a No Exposure Certification, and 3) the determination by Ohio EPA can be made prior to the issuance of the final permit.

Outfall Signage

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

Public Water Supply Notification

An addition to rule 3745-33-08 of the Ohio Administrative Code requires that permittees discharging wastewater within ten miles of a downstream public water supply intake located on the same waterway, must develop spill (or bypass) notification procedures in conjunction with the downstream public water supply operator. Since the City of Ashland, Kentucky operates a public water supply intake less than ten miles downstream from the South Point wastewater plant, Part II, Item Z of the draft permit requires the development of notification procedures within six months after the effective date of the permit.

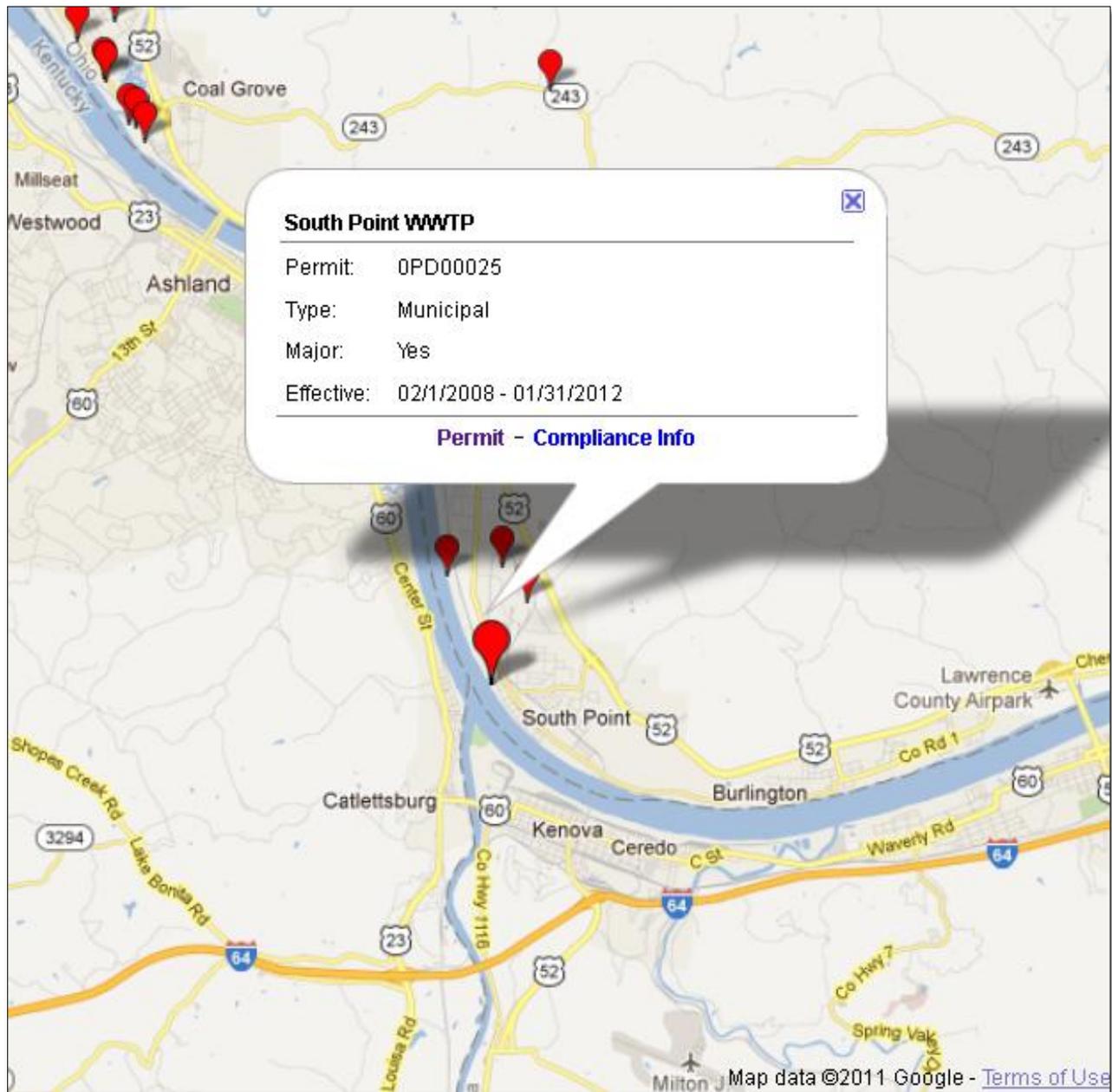


Figure 1. Approximate Location of South Point WWTP

Table 1. Permit Limit Violations: 2007 - November 2011

Parameter	Type of Violation	Year					Total
		2007	2008	2009	2010	2011	
Copper	Concentration	3	3	1	0	5	12
Copper	Loading	2	1	0	0	2	5
Oil & Grease	Concentration	7	2	0	1	0	10
Fecal Coliform	Concentration	1	0	1	0	0	2
CBOD ₅	Concentration	1	1	0	0	0	2
CBOD ₅	Loading	1	0	0	0	0	1

Table 2. Effluent Characterization Based on Ohio EPA Data

Summary of analytical results for the South Point wastewater plant outfall OPD00025001. All values are in µg/l unless otherwise indicated. PT = data from, pretreatment program reports; 2C = Data from application form 2C; OEPA = data from analyses by Ohio EPA; ND = below detection (detection limit); NA = not analyzed.

PARAMETER	OEPA 3/2/2010
CBOD5 (mg/l)	19
TDS (mg/l)	464
TSS (mg/l)	17
Cadmium	ND (0.20)
Chromium	ND (2.0)
Copper	16.3
Lead	26.8
Nickel	2.8
Selenium	ND (2.0)
Barium	22
Iron	263
Magnesium (mg/l)	12
Manganese	88
Zinc	89
Mercury	ND (0.20)
Nitrate+Nitrite (mg/l)	11.1
TKN (mg/l)	13.7
Total Phosphorus (mg/l)	3.30
Hexavalent Chromium	ND (10)
Fecal Coliform (#/100m/l)	500
Oil&Grease (mg/l)	2.0
Free Cyanide	5
Orthophosphate, dissolved (mg/l)	2.27

Table 3. Effluent Characterization Based on Self Monitoring Data

Summary of current permit limits and unaltered monthly operating report (MOR) data for the South Point wastewater plant outfall OPD00025001. All values are based on annual records unless otherwise indicated. N = Number of Analyses. * = For pH, 5th percentile shown in place of 50th percentile; ** = For dissolved oxygen, 5th percentile shown in place of 95th percentile; A = 7 day average.

Parameter	Season	Units	Current Permit Limits		# Obs.	Percentiles		Data Range
			30 day	Daily		50 th	95 th	
<u>Outfall 001</u>								
Water Temperature	Annual	C	Monitor		1297	17	24	8-25
Dissolved Oxygen	Summer	mg/l	Monitor		652	6.5	5**	0.4-9.1
Dissolved Oxygen	Winter	mg/l	Monitor		645	8.5	7.4**	1.2-16
Total Suspended Solids	Annual	mg/l	30	45 ^A	782	13	25	5-55
Oil and Grease,	Annual	mg/l	-	10	239	0	13	0-256
Nitrogen, Ammonia (NH ₃)	Summer	mg/l	Monitor		392	4.9	18	1.1-27.7
Nitrogen, Ammonia (NH ₃)	Winter	mg/l	Monitor		389	7.8	19.3	2.4-90.4
Nitrogen Kjeldahl, Total	Annual	mg/l	Monitor		60	10.4	26	1-102
Nitrite Plus Nitrate, Total	Annual	mg/l	Monitor		62	7.4	13.8	1.8-76
Ortho Phospate, Total	Annual	mg/l	Monitor		44	3.13	3.88	0.42-4.29
Phosphorus, Total (P)	Annual	mg/l	Monitor		44	3.51	4.49	1.56-5.35
Cyanide, Free	Annual	mg/l	Monitor		44	0	0	0-0.024
Nickel, Total Recoverable	Annual	ug/l	Monitor		60	0	10	0-39
Zinc, Total Recoverable	Annual	ug/l	Monitor		60	77	146	0-215
Cadmium, Total Recoverable	Annual	ug/l	Monitor		60	0	5	0-97
Lead, Total Recoverable	Annual	ug/l	7.8	184	60	0	5	0-5
Chromium, Total Recoverable	Annual	ug/l	Monitor		60	0	10	0-10
Copper, Total Recoverable	Annual	ug/l	32	-	60	25.5	49.2	0-340
Chromium, Dissolved Hex	Annual	ug/l	Monitor		59	0	10	0-10
Fecal Coliform	Annual	#/100 ml	--	--	782	139	619	7-3100
Fecal Coliform	Summer	#/100 ml	200	400 ^A	393	120	340	8-620
Fecal Coliform	Winter	#/100 ml	1000	2000 ^A	389	180	785	7-3100
Flow Rate	Summer	MGD	Monitor		920	1.07	1.65	0.478-2.99
Flow Rate	Winter	MGD	Monitor		906	1.11	1.75	0.216-2.81
Flow Rate	Annual	MGD	Monitor		1826	1.09	1.71	0.216-2.99
Chlorine, Total Residual	Annual	mg/l	-	0.038	1297	0.02	0.03	0.001-0.03
Mercury, Total	Annual	ng/l	Monitor		13	8.86	29.9	1.96-33.7
Mercury, Total (Low Level)	Annual	ng/l	Monitor		1	6.18	6.18	6.18-6.18
Acute Toxicity, C. dubia	Annual	TUa	Monitor		7	0	0.014	0-0.02
Acute Toxicity, P. promelas	Annual	TUa	Monitor		10	0.1	1.4	0-1.5
pH, Maximum	Annual	S.U.	6.5 to 9.0		1297	7*	7.6	6.7-8.3
pH, Minimum	Annual	S.U.	6.5 to 9.0		1296	6.9*	7.5	6.6-8.2
Mercury, Total Recoverable	Annual	ug/l	Monitor		16	0.2	0.345	0-0.78
CBOD 5 day	Summer	mg/l	25	40 ^A	393	13	25.4	1-40
CBOD 5 day	Winter	mg/l	25	40 ^A	389	17	29	2-41
<u>Outfall 300</u>								
Overflow Occurrence	Annual	No./Month	Monitor		16	1	1.25	1-2

Parameter	Season	Units	Current Permit Limits		# Obs.	Percentiles		Data Range
			30 day	Daily		50 th	95 th	
<u>Outfall 586</u>								
Sludge Fee Weight	Annual	dry tons	Monitor		3	166	231	162-238
<u>Outfall 588</u>								
Sludge Weight	Annual	Dry Tons	Monitor		320	1.13	1.64	0.28-3.15
Sludge Solids, Percent Total	Annual	%	Monitor		320	2.2	2.8	1.4-3.2
<u>Outfall 801</u>								
48-Hr. Acute Toxicity C. dubia	Annual	% Affect	Monitor		27	21	21	0-22
96-Hr. Acute Toxicity P.promela	Annual	% Affect	Monitor		39	0	5.5	0-25
<u>Outfall 901</u>								
96-Hr. Acute Toxicity Pimephales promela	Annual	% Affect	Monitor		3	0	13.5	0-15
<u>Outfall 002</u>								
Bypass Occurrence	Annual	No./Day	Monitor		1	1	1	1-1
Bypass Total Hours Per Day	Annual	Hrs/Day	Monitor		1	18	18	18-18
Bypass Volume	Annual	MGAL	Monitor		1	0.5	0.5	0.5-0.5

Table 4. Effluent Data for South Point Wastewater Plant

Parameter	Units	# of Samples	# > MDL	PEQ Average	PEQ Maximum
Ammonia-S	mg/l	262	262	8.0622	14.798
Ammonia-W	mg/l	193	193	12.44	20.638
Barium	ug/l	1	1	99.572	136.4
Cadmium - TR	ug/l	59	0	--	--
Chlorine - TRes	mg/l	1297	1297	0.21442	0.036248
Chromium - TR	ug/l	60	0	--	--
Chromium VI - Diss	ug/l	59	0	--	--
Copper - TR	ug/l	59	57	37.049	50.614
Cyanide - free	mg/l	42	3	0.019272	0.0264
Iron - TR	ug/l	1	1	1190.338	1630.6
Lead - TR	ug/l	61	0	--	--
Magnesium	mg/l	1	1	54.312	74.4
Manganese - TR	ug/l	1	1	398.288	545.6
Mercury - TR (BCC)	ng/l	13	13	32.369	59.972
Methyl bromide	ug/l	1	1	5.29542	7.254
Nickel - TR	ug/l	61	3	28.47	39
Nitrate-N + Nitrite-N	mg/l	62	62	12.48	17.991
Phosphorus	mg/l	45	45	4.3625	5.3494
Strontium	ug/l	1	1	792.05	1085
Toluene	ug/l	1	1	4.84282	6.634
Zinc - TR	ug/l	61	59	114.44	149.35

Table 5. Summary of Acute Toxicity Test Results

Test Date(a)	<i>Ceriodaphnia dubia</i> 48 hours								<i>Fathead Minnows</i> 96 hour							
	UP ^b	C ^c	LC ₅₀ ^d	EC ₅₀ ^e	%A ^f	%M ^g	TUa ^h	NF ⁱ	UP ^b	C ^c	LC ₅₀ ^d	EC ₅₀ ^e	%A ^f	%M ^g	TUa ^h	NF ⁱ
12/1/06(E)	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.2	NT
6/1/07(E)	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	1.5	NT
12/1/07(E)	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	BD	NT
6/1/08(E)	NT	NT	NT	NT	NT	NT	BD	NT	NT	NT	NT	NT	NT	NT	BD	NT
12/1/08(E)	NT	NT	NT	NT	NT	NT	BD	NT	NT	NT	NT	NT	NT	NT	0.8	NT
6/17/09(E)	NT	NT	NT	NT	NT	NT	BD	NT	NT	NT	NT	NT	NT	NT	BD	NT
12/8/09(E)	NT	NT	NT	NT	NT	NT	BD	NT	NT	NT	NT	NT	NT	NT	BD	NT
6/16/10(E)	NT	NT	NT	NT	NT	NT	BD	NT	NT	NT	NT	NT	NT	NT	BD	NT
12/13/10(E)	NT	NT	NT	NT	NT	NT	BD	NT	NT	NT	NT	NT	NT	NT	0.3	NT
6/13/11(E)	NT	NT	NT	NT	NT	NT	0.02	NT	NT	NT	NT	NT	NT	NT	1.27	NT
12/15/10 (E)	0	0	>100%	>100%	10	0	BD	0	0	0	>100%	>100%	15	15	0.3	0
3/2/10 (O)	0	0	>100%	>100%	0	0	ND	NT	0	0	>100%	>100%	15	5	ND	NT

^a O = EPA test; E = entity test

^b UP = upstream control water

^c C = laboratory water control

^d LC₅₀ = median lethal concentration

^e EC₅₀ = median effects concentration

NT = not tested

^f %A = percent adversely affected in 100% effluent

^g %M = percent mortality in 100% effluent

^h TUa = acute toxicity units

ⁱ NF = near field sample from 901 station in Ohio River

ND = not determined

BD = below detection

Table 6. Water Quality Criteria in the Study Area

Parameter	Units	Outside Mixing Zone Criteria			Maximum Aquatic Life	Inside Mixing Zone Maximum
		Average		Human Health		
		Agri-culture	Aquatic Life			
Ammonia-S	mg/l	--	--	--	--	--
Ammonia-W	mg/l	--	--	--	--	--
Barium	ug/l	--	--	220	2000	4000
Cadmium - TR	ug/l	--	50	2.8	5.3	11
Chlorine - TRes	mg/l	--	--	0.011	0.019	0.038
Chromium - TR	ug/l	--	100	97	2000	4100
Chromium VI - Diss	ug/l	--	--	11	16	31
Copper - TR	ug/l	1300	500	11	16	32
Cyanide - free	mg/l	0.7	--	0.0052	0.022	0.044
Iron - TR	ug/l	--	5000	--	--	--
Lead - TR	ug/l	--	100	7.8	150	300
Magnesium	mg/l	--	--	--	--	--
Manganese - TR	ug/l	--	--	--	--	--
Mercury - TR (BCC)	ng/l	12	10000	910	1700	3400
Methyl bromide	ug/l	48	--	16	38	75
Nickel - TR	ug/l	610	200	59	530	1100
Nitrate-N + Nitrite-N	mg/l	10	100	--	--	--
Phosphorus	mg/l	--	--	--	--	--
Strontium	ug/l	--	--	21000	40000	81000
Toluene	ug/l	6800	--	62	560	1100
Zinc - TR	ug/l	9100	25000	140	140	270

Table 7. Instream Conditions and Discharger Flow

Parameter	Units	Season	Value	Basis
<i>Stream Flows</i>				
1Q10	cfs	annual	10000	ORSANCO (Big Sandy River to Greenup Dam Segment)
7Q10	cfs	annual	10000	ORSANCO (Big Sandy River to Greenup Dam Segment)
Harmonic Mean	cfs	annual	38400	ORSANCO (Big Sandy River to Greenup Dam Segment)
Mixing Assumption	%	average	10	(***)WLA's for non-carcinogens are developed using 100 percent of the 7Q10.)
	%	maximum	1	
<i>Hardness</i>	mg/l	annual	116	ORSANCO (Big Sandy River to Greenup Dam Segment)
<i>pH</i>	S.U.	summer	0	
		winter	0	
<i>Temperature</i>	C	summer	0	
		winter	0	
<i>South Point WWTP flow</i>	cfs	annual	2.78	
<i>Background Water Quality</i>				
Ammonia-S	mg/l		0.055	ORSANCO; 2003-2011; n=22; 3<MDL; RC Byrd L&D, 50th percentile
Ammonia-W	mg/l		0.045	ORSANCO; 2003-2011; n=24; 1<MDL; RC Byrd L&D, 50th percentile
Barium	ug/l		44	ORSANCO; 1998-2011; n=77; 0<MDL; Clean Metals Study, RC Byrd L&D, 50th percentile
Cadmium - TR	ug/l		0.05	ORSANCO; 1998-2011; n=77; 73<MDL; Clean Metals Study, RC Byrd L&D, 50th percentile
Chlorine - TRes	mg/l			No representative data available.
Chromium - TR	ug/l		1.33	ORSANCO; 1998-2011; n=77; 0<MDL; Clean Metals Study, RC Byrd L&D, 50th percentile

Parameter	Units	Season	Value	Basis
Chromium VI - Diss	ug/l			No representative data available.
Copper - TR	ug/l		2.32	ORSANCO; 1998-2011; n=77; 0<MDL; Clean Metals Study, RC Byrd L&D, 50th percentile
Cyanide - free	mg/l			No representative data available.
Iron - TR	ug/l		670	ORSANCO; 1998-2011; n=77; 4<MDL; Clean Metals Study, RC Byrd L&D, 50th percentile
Lead - TR	ug/l		0.83	ORSANCO; 1998-2011; n=77; 1<MDL; Clean Metals Study, RC Byrd L&D, 50th percentile
Magnesium	mg/l		8.5	ORSANCO; 1998-2011; n=77; 0<MDL; Clean Metals Study, RC Byrd L&D, 50th percentile
Manganese - TR	ug/l		104.41	ORSANCO; 1998-2011; n=77; 0<MDL; Clean Metals Study, RC Byrd L&D, 50th percentile
Mercury - TR (BCC)	ng/l		2.82	ORSANCO; 2001-2011; n=59; 10<MDL; Clean Metals Study, RC Byrd L&D, 50th percentile
Methyl bromide	ug/l			No representative data available.
Nickel - TR	ug/l		2.77	ORSANCO; 1998-2011; n=77; 0<MDL; Clean Metals Study, RC Byrd L&D, 50th percentile
Nitrate + Nitrite	mg/l		0.945	ORSANCO; 2003-2011; n=47; 0<MDL; RC Byrd L&D, 50th percentile
Phosphorus	mg/l		0.082	ORSANCO; 2003-2011; n=48; 0<MDL; RC Byrd L&D, 50th percentile
Strontium	ug/l		694	STORET; 1999-2003; n=1724; 0<MDL; Ecoregion reference sites, statewide, 50th percentile
Toluene	ug/l			No representative data available.
Zinc - TR	ug/l		5.57	ORSANCO; 1998-2011; n=77; 1<MDL; Clean Metals Study, RC Byrd L&D, 50th percentile

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

Parameter	Units	Outside Mixing Zone Criteria			Maximum Aquatic Life	Inside Mixing Zone Maximum
		Human Health	Average Agri-culture	Aquatic Life		
Ammonia-S	mg/l	--	--	--	--	--
Ammonia-W	mg/l	--	--	--	--	--
Barium	ug/l	--	--	63529	72360	4000
Cadmium - TR	ug/l	--	69046	992	194	11
Chlorine - TRes	mg/l	--	--	4	0.7	0.038
Chromium - TR	ug/l	--	136392	34511	73895	4100
Chromium VI - Diss	ug/l	--	--	3968	592	31
Copper - TR	ug/l	4669214	687943	3133	508	32
Cyanide - free	mg/l	2519	--	1.9	0.81	0.044
Iron - TR	ug/l	--	5986007	--	--	--
Lead - TR	ug/l	--	137083	2515	5516	300
Magnesium	mg/l	--	--	--	--	--
Manganese - TR	ug/l	--	--	--	--	--
Mercury - TR (BCC)	ng/l	12	10000	910	1700	3400
Methyl bromide	ug/l	172710	--	5771	1405	75
Nickel - TR	ug/l	2184891	272633	20286	19495	1100
Nitrate-N + Nitrite-N	mg/l	32582	136924	--	--	--
Phosphorus	mg/l	--	--	--	--	--
Strontium	ug/l	--	--	7325317	1453885	81000
Toluene	ug/l	24467232	--	22364	20704	1100
Zinc - TR	ug/l	32722877	34549680	48496	4976	270

Table 10. Final Effluent Limits and Monitoring Requirements for Outfall 001

Parameter	Units	Effluent Limits				Basis ^b
		Concentration		Loading (kg/day) ^a		
		30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	
Flow	MGD	----- Monitor -----		-----		M ^c
Temperature	°C	----- Monitor -----		-----		M ^c
Dissolved Oxygen	mg/l	----- Monitor -----		-----		M ^c
CBOD ₅	mg/l	25	40 ^d	170	273 ^d	BPT/AD
Suspended Solids	mg/l	30	45 ^d	204	307 ^d	BPT/AD
Ammonia-N	mg/l	----- Monitor -----		-----		BEJ
Nitrogen, Tot. Kjeldahl	mg/l	----- Monitor -----		-----		BEJ
Nitrate+Nitrite	mg/l	----- Monitor -----		-----		BEJ
Phosphorus	mg/l	----- Monitor -----		-----		BEJ
Orthophosphate	mg/l	----- Monitor -----		-----		BEJ
Oil and Grease	mg/l	--	10	--	--	WQS
pH	S.U.	----- 6.5 to 9.0 -----		-----		WQS
Fecal coliform	#/100ml					
Summer		200	400 ^d	--	--	ORSANCO
Winter		1000	2000 ^d	--	--	ORSANCO/ABS
Chlorine Residual	mg/l	--	0.038	--	--	WQS
Cyanide, Free	mg/l	----- Monitor -----		-----		WLA/BEJ
Cadmium, T. R.	µg/l	----- Monitor -----		-----		BEJ
Chromium, T. R.	µg/l	----- Monitor -----		-----		BEJ
Hex. Chromium (Dissolved)	µg/l	----- Monitor -----		-----		BEJ
Copper, T. R.	µg/l	--	32	--	0.22	WLA
Lead, T. R.	µg/l	----- Monitor -----		-----		BEJ
Mercury, T.	ng/l	12	1700	0.012	0.000082	WLA
Nickel, T. R.	µg/l	----- Monitor -----		-----		BEJ
Zinc, T. R.	µg/l	----- Monitor -----		-----		WLA/BEJ
Whole Effluent Toxicity Acute	TUa	----- Monitor (w/o trigger) -----		-----		WET

Table 10. Continued

- ^a Effluent loadings based on average design discharge flow of 1.8 MGD.
- ^b Definitions: ABS = Antibacksliding Rule (OAC 3745-33-05(E) and 40 CFR Part 122.44(l)); AD = Antidegradation (OAC 3745-1-05); BPJ = Best Professional Judgment; BPT = Best Practicable Waste Treatment Technology, 40 CFR Part 133, Secondary Treatment Regulation; EP = Existing Permit; M = BEJ of Permit Guidance 1: Determination of Sampling Frequency Requirements for Sanitary Discharges; ORSANCO= Ohio River Valley Sanitation Commission; PD = Plant Design Criteria; RP = Reasonable Potential for requiring water quality-based effluent limits and monitoring requirements in NPDES permits (3745-33-07(A)); WET = Whole Effluent Toxicity (OAC 3745-33-07(B)) ; WLA = Wasteload Allocation procedures (OAC 3745-2); WLA/IMZM = Wasteload Allocation limited by Inside Mixing Zone Maximum; WQS = Ohio Water Quality Standards (OAC 3745-1).
- ^c Monitoring of flow and other indicator parameters is specified to assist in the evaluation of effluent quality and treatment plant performance.
- ^d 7 day average limit.