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 **Lima Wastewater Treatment Plant**

Public Notice No.: 11-05-038
Public Notice Date: May 16, 2011
Comment Period Ends: June 16, 2011

OEPA Permit No.: **2PE00000*MD**
Application No.: **OH0026069**

Name and Address of Applicant:

City of Lima
1200 Fort Amanda Road
Lima, Ohio 45804

Name and Address of Facility Where Discharge Occurs:

Lima WWTP
1200 Fort Amanda Road
Lima, Ohio 45804
Allen County

Receiving Water: **Ottawa River**

Subsequent Stream Network: **Auglaize River to to Maumee River to Lake Erie**

Introduction

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

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

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 limits and monitoring requirements for basic operating parameters for the treatment plant would continue in this permit. This includes 5-day carbonaceous oxygen demand, total suspended solids, dissolved oxygen, ammonia and phosphorus.

Ohio EPA is also proposing to renew the mercury variance limits for the plant. Lima has reduced the mercury discharge slightly, as measured by the PEQavg. statistic, but still has not been able to achieve the 1.3 ng/l water quality standard. Ohio EPA is continuing the current variance limit because the City has not had a full 5 years under the variance, and because the level of reduction is not great enough to warrant changing the limit at this time.

Monitoring requirements for antimony, selenium and bis(2-ethylhexyl)phthalate have been added because effluent concentrations approach WQS, and monitoring is required by OAC Rule 3745-33-07(A)(2). Current monitoring requirements for strontium and alpha-BHC are being removed from the permit because these pollutants do not have the reasonable potential to contribute to exceedances of WQS.

Ohio EPA would also reduce the monitoring required for effluent toxicity by reducing the fathead minnow toxicity testing from once per quarter to once per year. While the WWTP effluent has not shown toxicity to minnows in the last permit cycle, the permit needs to contain an annual requirement for chronic toxicity testing to meet the requirements of U.S. EPA's application rule for POTWs. This rule requires that at least four toxicity tests be submitted with the NPDES application, or that equivalent toxicity test data be collected as a permit condition. Ohio EPA has been implementing this requirement as a permit condition to spread out the testing costs, and obtain data more reliably than through an application requirement. Chronic testing, rather than acute testing is being required because the toxicity allocation shows that chronic effects could affect the river even if acute toxicity is not present (acute-to-chronic ratio of 1:1). Quarterly toxicity testing of the water flea Ceriodaphnia dubia would remain in 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 Tom Poffenbarger at (419) 373-3008 (tom.poffenbarger@epa.ohio.gov) or Eric Nygaard at (614) 644-2024 (eric.nygaard@epa.ohio.gov).

Location of Discharge/Receiving Water Use Classification

The Lima WWTP discharges to Ottawa River at River Mile (RM) 37.6. The approximate location of the facility is shown in Figure 1.

This segment of the Ottawa River is described by Ohio EPA River Code: 04-200, U.S. EPA River Reach #: 04100007-018, County: Allen, Ecoregion: Eastern Corn Belt Plains. The Ottawa River is designated for the following uses under Ohio's Water Quality Standards (OAC 3745-1-11): Warmwater Habitat (WWH), Agricultural Water Supply (AWS), Industrial Water Supply (IWS), and Primary Contact Recreation (PCR – Class A).

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 Lima wastewater plant is an advanced treatment facility with an average daily design flow of 18.5 million gallons per day (MGD) and a hydraulic capacity of 45 MGD. Wet stream processes include screening and grit removal, phosphorus removal using ferrous chloride and polymer addition, primary settling, activated sludge aeration, secondary clarification, nitrification using trickling filters, disinfection by chlorination, and dechlorination. Solid stream processes are sludge thickening, stabilization by anaerobic digestion, dewatering by belt filter press, alkaline stabilization, and sludge disposal at a land fill and by marketing.

Lima's treatment plant has three bypasses: Outfall 057 is a bypass of the entire plant; Outfall 602 is a bypass of the secondary treatment system; Outfall 603 is a bypass of tertiary treatment (nitrification process). Outfalls 602 and 603 are in-plant outfalls that are blended with the fully treated effluent (outfall

604) prior to discharge. Lima monitors treatment-system control parameters (CBOD, suspended solids, ammonia-nitrogen and phosphorus) at outfall 604. Treatment technology limits are imposed at this outfall. Water quality based limits for these parameters and metals are also applied at this point because this outfall represents the final discharge during low-flow conditions. Outfall 001 represents the final discharge of the fully treated effluent and the in-plant bypasses. All flows at Outfall 001 receive disinfection. Water quality based limits for bacteria parameters and chlorine are applied at this location.

During the last five years the plant bypass has not been used. The secondary bypass was used 19 times with an average duration of 5.5 hours per month. The tertiary system was bypassed 384 times for an average of 10 hours per month.

Lima's collection system is comprised of combined sewers (approximately 80 percent) and separate sanitary sewers. There are 19 overflows on the combined portion of the system, 5 of which are mechanically controlled by a computer system to maximize in-line storage. All of the CSOs are regulated under this NPDES permit. In July 1999, Ohio EPA approved a revised operational plan that addressed implementation of the nine minimum controls. In December 1999, Ohio EPA accepted the long-term control plan that the City submitted in July 1998.

The separate portion of the system includes 27 lift stations and 42 sanitary sewer overflows (SSOs) none of which are mechanically controlled or metered. The SSOs were the subject of Director's Final Findings and Orders issued in February 1994 and a general plan for elimination that was approved on January 1996. The City completed phases 1 and 2 of the general plan, eliminating 9 SSOs.

Lima implements an Ohio EPA approved industrial pretreatment program. Based on the 2009 annual program report, eight categorical industrial users and two significant non-categorical industrial users discharge to the Lima plant.

Description of Existing Discharge

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

Table 3 presents a summary of unaltered Discharge Monitoring Report (DMR) data for outfalls 2PE00000001 and 2PE00000604. Data are presented for the period July 2005 to July 2010, and current permit limits are provided for comparison.

Tables 4 and 5 summarize the results of acute and chronic 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 results of the most recent Ohio EPA biological and water quality survey are included in the report *Biological and Water Quality Study of the Ottawa River Basin, 1996. Allen and Putnam Counties, Ohio.* (Ohio EPA, 1997). This report is available at http://www.epa.state.oh.us/dsw/document_index/psdindx.html .

Table 1 is a summary of the information for the watershed assessment unit that includes the Ottawa River in the vicinity of Lima. They are from the *Ohio 2010 Integrated Water Quality Monitoring and Assessment Report* .

The report shows that the watershed is considered to be impaired based on historical data and an assessment of changes to the watershed since the last evaluation. Ohio EPA does not believe that the Ottawa River mainstem downstream from the major dischargers has improved enough to attain WQS.

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.

The Lima WWTP discharge is considered to be interactive with Premcor Lima Refinery, PCS Nitrogen

Table 1. Division of Surface Water Watershed Assessment Unit Summary

Overview Information

Assessment Unit Name: Lima Reservoir – Ottawa River
Hydrologic Unit Code: 04100007 03 06
Assessment Unit Size: 27.4 square miles
Priority Points: 2
Monitoring Scheduled: 2010
TMDL Scheduled: 2013

Land Use Statistics

Developed	Forest	Grass/Pasture	Row Crops	Other
53.2%	9.9%	8.7%	27.5%	0.7%

Aquatic Life Use Assessment

Reporting Category: 5hx
Aquatic Life Uses: WWH, MWH-C
Sampling Years: 1996, 2001
Watershed Score: 15.0

Causes of Impairment:
- ► organic enrichment/D.O.
- ► priority organics
- ► un-ionized ammonia

Sources of Impairment:
- ► combined sewer overflows
- ► municipal point source
- ► industrial point source
- ► urban runoff/storm sewers

Comments: Available assessment data exceed 10 years in age; assessment unit will remain Category 5 until TMDLs are developed for all pollutants impairing all beneficial uses.

Recreation Use Assessment
Reporting Category: 3
Assessment Unit Score: not calculated

Public Drinking Water Supply Assessment
Reporting Category: 3i
Cause of Impairment: None
Nitrate Watch List: Yes
Pesticide Watch List: No

Fish Tissue Assessment
Reporting Category: 1
Causes of Impairment: None
Mercury Concentration: 317 ppb

and the Shawnee #2 WWTP. The CONSWLA model was used to distribute the loads of those conservative parameters requiring allocations. The loads were distributed so that each discharge received the same discharge concentration. The study area is depicted in Figure 2.

Parameter Selection Effluent data for the Lima WWTP were used to determine what parameters should undergo wasteload allocation. The sources of effluent data are as follows:

Self-monitoring data (LEAPS)	January 2005 through August 2010
Exc. Copper	January 2005 through September 2012
Pretreatment program	2005 through 2009
Ohio EPA data (compliance, survey)	2008

The effluent data were checked for outliers and the following values were removed: two values for chromium^{+6} of 42.2 and 47.0 µg/l, one value for strontium of 0.6 µg/l, and one value for chlorine, tot. res. of 180. µg/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 wasteload allocation (WLA), the results are based on the uses assigned to the receiving waterbody in OAC 3745-1. 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-N	Average	Summer/winter 30Q10
Agricultural Water Supply		Harmonic mean flow
Human Health (nondrinking)		Harmonic mean flow
Wildlife Protection		Annual 90Q10

Allocations are developed using a percentage of stream design flow (as specified in Table 3), and allocations cannot exceed the Inside Mixing Zone Maximum criteria.

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 current ammonia limits have been evaluated using the wasteload allocation procedures and are protective of water quality standards.

A dissolved metals translator (DMT) is the factor used to convert a dissolved metal aquatic life criterion to an effective total recoverable aquatic life criterion with which a total recoverable aquatic life allocation can be calculated as required in the NPDES permit process. Currently, a DMT is based on site- or area-specific field data; each field data sample consists of a total recoverable measurement paired with a dissolved metal measurement. For the Ottawa River, there were 5 such paired samples available applicable to cadmium, chromium, copper, lead, nickel, selenium, and zinc. To account for the limited quantity of data, the DMT for each of these metals was determined as the lower end of the 95% confidence interval (1-tail) about the geometric mean of the total recoverable-to-dissolved ratios of the sample pairs. A DMT for selenium could not be determined due to shortcomings in the data. A DMT for cadmium was not determined because all the samples were below the detection level. Each DMT is metal-specific and is applied by multiplying the dissolved criteria by the DMT, resulting in total effective recoverable criteria which can be used in the wasteload allocation procedures.

In some cases, it is possible that the use of a DMT may result in instream concentrations of metals that may increase the risk of non-attainment of the use designation. This was evaluated for the Lima WWTP. The application of the dissolved metal translators resulted in effective total recoverable criteria that were higher than the total recoverable criteria listed in OAC 3745-1. Biological sampling conducted in 1996 showed that the Ottawa River near the Lima WWTP was not attaining its designated use; however, the non-attainment could not be attributed to metals from outfall 001/604. Elevated concentrations of metals in sediments have been partly attributed to discharges from Lima's Combined Sewer Overflows 002-006. The Lima WWTP has not requested any increase in permitted load. Therefore, the facility can receive permit limits up to their current permit limits without undergoing any further review to ensure that the limits for the metals will protect the biological criteria.

The DMTs used in the modeling for the Ottawa River are based on sample data collected in 1996 and may no longer be representative of current instream conditions. Should Lima WWTP wish to continue using DMTs for future wasteload allocations (beyond the 2010 permit), a new DMT analysis or study must be completed prior to the next permit renewal and submitted with the renewal application. See paragraphs F and G in rule 3745-2-04 of the Ohio Administrative Code for requirements in developing a DMT study.

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 Lima WWTP, the wasteload allocation values are 0.31TU_a and 1.02 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.

When the acute wasteload allocation is less than 1.0 TU_a, it may be defined as:

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

The acute wasteload allocation for the Lima WWTP is 30 percent mortality in 100 percent effluent based on the dilution ratio of 1 to 1.

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 9. The average PEL (PEL_{avg}) is compared to the average PEQ (PEQ_{avg}) from Table 6, 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 and 12 present the final effluent limits and monitoring requirements proposed for Lima outfall 2PE0000001 and 2PE00000604 and the basis for their recommendation.

Consistent with 40 CFR 122.45(h), monitoring and limits are proposed at internal station 2PE00000604. Limits for CBOD and Total Suspended Solids 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.

Water-quality based limits for ammonia-nitrogen and metal parameters are also included at Outfall 604 because this outfall represents the final discharge under low-flow conditions; WQBELs are included for bacteria, pH and residual chlorine at Outfall 001 (after the in-plant bypass) to ensure that the entire treatment plant discharge is disinfected.

Outfall 001 conditions –
Limits proposed for pH, and e. coliform are based on Water Quality Standards (OAC 3745-1-07). The e. coli. limits replace the existing fecal coliform limits, and are based on new water quality standards that go into effect on March 15, 2010. The limits are based on the standards for Primary Contact Recreation Class A waters. Ohio EPA implements the seasonal average standard as a 30-day limit; the single sample maximum standard is implemented as a 7-day average permit limit. Ohio EPA used U.S. EPA's permit derivation techniques to translate the maximum WQS to a 7-day average (from "Technical Support Document for Water Quality-Based Toxics Control" (EPA-505-2-90-001, March 1991).

Limits for residual chlorine are based on the existing permit. This limit is the same as the current wasteload allocation for chlorine.

Monitoring requirements for dissolved oxygen, ammonia, phosphorus, total suspended solids and 5-day carbonaceous biochemical oxygen demand ($CBOD_5$) would be continued from the current permit. Monitoring of these parameters is necessary to determine the total pollutant load being discharged.

Outfall 604 conditions -
The limits proposed for dissolved oxygen, ammonia-nitrogen and 5-day carbonaceous biochemical oxygen demand ($CBOD_5$) are all based on a 1988 wasteload allocation model. These limits are protective of water quality standards. Limits for total suspended solids are treatment technology limits derived from the WLA limits. They represent the level of suspended solids removal that can be expected for a treatment plant that is designed to meet the CBOD and ammonia limits in the permit.

Loading limits are based on the hydraulic capacity of the treatment plant, rather than the average design flow, as an incentive to run as much flow through the treatment plant as possible. Using this flow does not significantly affect concentration limits because the background flows are so low that limits are set at concentrations very close to WQS.

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

Phosphorus is limited based on provisions of OAC 3745-33-06(C). This rule requirement applies to all major public treatment works in the Lake Erie drainage basin.

The Ohio EPA risk assessment (Table 10) places mercury in group 5. This placement as well as the data in Tables 2, 3 and 6 indicate that the reasonable potential to exceed WQS exists and limits are necessary to protect water quality. For these parameters PEQ is greater than 75 percent of the wasteload allocation. Pollutants that meet this requirement must have permit limits under OAC Rule 3745-33-07(A)(1).

Mercury Reasonable Potential and Mercury Variance The limits for mercury are based upon the mixing zone phase out which applies to this bioaccumulative chemical of concern (BCC). Ohio EPA may not grant mixing zones for BCCs after November 15, 2010. Mercury is a BCC, and the limits are therefore based on WQS at the discharge point.

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

Ohio EPA has reviewed the mercury variance application and has determined that it meets the requirements of the Ohio Administrative Code. Items EE and FF in Part II of the draft NPDES permit list the provisions of the mercury variance, and includes the following requirements:

- A variance-based monthly average effluent limit of 7.6 ng/l, which was developed from sampling data submitted by the permittee;
- A requirement that the permittee make reasonable progress to meet the water-quality-based effluent limit for mercury by implementing the plan of study, which has been developed as part of the Pollutant Minimization Program (PMP);
- Low-level mercury monitoring of the plant's influent and effluent;
- A requirement that the annual average mercury effluent concentration is less than or equal to 12 ng/l as specified in the plan of study;
- A summary of the elements of the plan of study;
- A requirement to submit an annual report on implementation of the PMP; and
- A requirement for submittal of a certification stating that all permit conditions related to implementing the plan of study and the PMP have been satisfied, but that compliance with the monthly average water quality-based effluent limit for mercury has not been achieved.

The Ohio EPA risk assessment (Table 10) places antimony, bis-2EHP and selenium in group 5 which recommends limits to protect water quality. However, all of these pollutants were evaluated on a limited data set, meaning that PEQ values for these chemicals may not be representative of the discharge. Using the discretion allowed the Director under OAC 3745-33-07(A)(5), we are proposing monitoring, rather than limits, for these pollutants

Ohio EPA risk assessment (Table 10) places chromium, hexavalent chromium, copper and total dissolved solids in group 4. This placement, as well as the data in Tables 2, 3 and 6, 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).

The current permits for Lima, Lima Refining and PCS Nitrogen are based on a reallocation of total dissolved solids. In drafting this round of major permits for the Ottawa River dischargers, Ohio EPA has re-allocated the dissolved solids loading among the dischargers. In the original allocation, all four of the dischargers were allocated an equal concentration of 1512 mg/l. When allocating multiple sources in a stream segment, the director may distribute the loading among the discharges using any appropriate method, based on site-specific considerations [OAC 3745-2-05(A)(8)]. A summary of this TDS wasteload allocation is shown below:

Discharger	TDS wasteload	PEQ
Lima WWTP	1512 mg/l	825 mg/l
Lima Refining	1512 mg/l	1544 mg/l
PCS Nitrogen	1512 mg/l	1537 mg/l
Allen Co. Shawnee WWTP	1512 mg/l	701 mg/l

Lima Refining and PCS Nitrogen do not currently meet these allocations.

TDS is not a parameter that is easily treatable on an industrial scale. Dischargers needing to meet water-quality-based TDS standards rely on adding dilution to prevent TDS-related toxicity in the discharge. In this case, Lima is providing dilution to the industries.

Based on this information, Ohio EPA is proposing to allocate more of the TDS load to the industrial facilities and less to the Lima WWTP. We can not reallocate from the Shawnee WWTP for the industries because that would shift load upstream, creating a modeled exceedance of WQS between the industries and the Shawnee WWTP. This reallocation does not affect basic reasonable potential decisions - in any case the industrial discharges need limits for dissolved solids and Lima will only be required to monitor. This reallocation ensures that dischargers will be in compliance with effluent limits, as well as ensuring that the Ottawa River meets TDS standards. Lima still has room for growth in their allocation, based on comparing measured TDS effluent values against the wasteload allocation. We have also proposed changes to the water quality reopener clauses in each of these permits to allow further re-allocations if the City of Lima proposes to accept an industrial user discharging TDS.

For this permit cycle we have used a similar re-allocation method as we used for the last permits. In this round, we have taken the PEQmaximum effluent values for Lima Refining and PCS Nitrogen and added 15% to derive the new allocation. The remaining assimilative capacity is allocated to the Lima WWTP. Because of improvements in the two industrial discharges, this results in lower allocations for the two industrial facilities, and a slightly higher allocation for the Lima WWTP.

The reallocation is summarized in the following table:

Discharger	WLA Concentration	WLA Load	Reas. Pot. Group (PEQ as % of WLA)
Lima WWTP	1144 mg/l	80,106 kg/day	Group 4
Lima Refining Refinery	2431 mg/l	50, 520 kg/day	Group 4
PCS Nitrogen	1956 mg/l	32,060 kg/day	Group 4
Allen Co. Shawnee WWTP	1512 mg/l	11,446 kg/day	Group 3

Selenium has also been re-allocated between Lima Refining and the Lima WWTP, similar to what was done for TDS. Lima Refining currently has limits for selenium; while the Lima WWTP has not detected selenium in the past, the data for this past permit cycle shows one detection in seven sample results. The Lima WWTP is given an allocation for selenium because Ohio EPA allocates selenium and several other metals to publicly-owned treatment works that have approved pretreatment programs. The detection of selenium shows that it is occasionally present in the WWTP discharge.

Lima Refining installed treatment at their crude oil desalting unit to treat the most concentrated source of selenium in the plant. This allowed the refinery to meet the reduced monthly average permit limit of 12 ug/l.

In their current application Lima Refining requested to raise the selenium limit from 12 ug/l to 20.7 ug/l, based on modeling and biological studies submitted to Ohio EPA. This would allow the company to eliminate or curtail the use of the Siemens iron co-precipitation treatment system for selenium. Shutting down this treatment system would save Lima Refining approximately $6 million dollars per year. Lima Refining evaluated a total recycle system for the plant wastewater; the cost estimate of $38 million dollars that the company judged prohibitively expensive.

Based on this cost assessment, Lima Refining did water sampling of selenium in the Ottawa River and recalculated the wasteload allocation based on those data. By using draft low-level methods for selenium, the company found upstream concentrations averaging below the analytical detection limit of 0.24 ug/l. They set both the Ottawa River background concentration and the Lima WWTP discharge to this background level, which allows an average discharge concentration of 20.7 ug/l.

In the draft permits for these discharges, we are proposing to continue the 12 ug/l limit for Lima Refining. Ohio EPA is not convinced that a higher limit for the refinery will allow WQS to be met; the Agency is also not comfortable in reducing Lima's WLA to nearly zero. Continuing the limit at 12 ug/l means that the allocation for the Lima WWTP would be reduced from 5 ug/l to 3 ug/l. Lima retains some capacity for growth, comparing the non-detections in the effluent to the wasteload allocation. As with TDS, the water quality reopener clause in these permits allows the selenium wasteload to be re-allocated again if Lima proposes to accept a new industrial user discharging selenium.

Ohio EPA is soliciting comment on other alternatives to the proposals by the Agency and by Lima Refining. We are specifically looking for comments on other re-allocations between the WWTP and the

Refinery, or an extended compliance schedule for Lima Refinery to reach zero discharge, considering that Lima's Long-Term Control Plan for CSOs will take an extended period to fully implement.

Ohio EPA risk assessment (Table 10) places cadmium, free cyanide, lead, nickel, silver and zinc in groups 2/3. This placement as well as the data in Tables 2, 3 and 6 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 at a low frequency 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 the following management practices are based on OAC 3745-40: land application, removal to sanitary landfill or transfer to another facility with an NPDES permit

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.

Whole Effluent Toxicity Reasonable Potential

Effluent toxicity in the Lake Erie Basin is evaluated using the provisions of 40 CFR Part 132, Appendix F, Procedure 6. In this case, Ohio EPA can not calculate PEQ values because the representative toxicity test results show no toxicity. Table 4 shows that all 17 acute toxicity tests showed non-toxic results. Table 5 shows that out of 15 chronic tests only one test result showed chronic toxicity (3.5 TUc for *Ceriodaphnia*). Ohio EPA is eliminating this result from the data base as unrepresentative of the discharge because none of the other results showed any toxic effect. Because PEQs can not be calculated for this discharge, the discharge does not have the reasonable potential to contribute to exceedances of toxicity WQS. Ohio EPA is proposing to continue quarterly chronic toxicity for *Ceriodaphnia* to track any spikes of toxicity that may occur; OEPA would reduce the monitoring frequency for fathead minnows to annual testing needed to fulfill application requirements. The proposed monitoring will provide four tests conducted over the term of the permit and will provide data that is consistent with the NPDES application requirements at 40 CFR 122.21.

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.

Compliance Schedule
The draft permit contains a schedule for the implementation of two sewer project – 1) replacement of the sewer leading from the Baxter Pump Station, which will decrease the frequency of CSOs at the pump station; and 2) construction of the Allentown Road Basin Project to relieve SSOs.

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 Lima WWTP to have a Class IV wastewater treatment plant operator in charge of the sewage treatment plant operations discharging through outfall 604/001 .

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 Lima WWTP 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 Lima WWTP 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 Ottawa River, providing information about the discharge. Signage at outfalls is required pursuant to Ohio Administrative Code 3745-33-08(A).

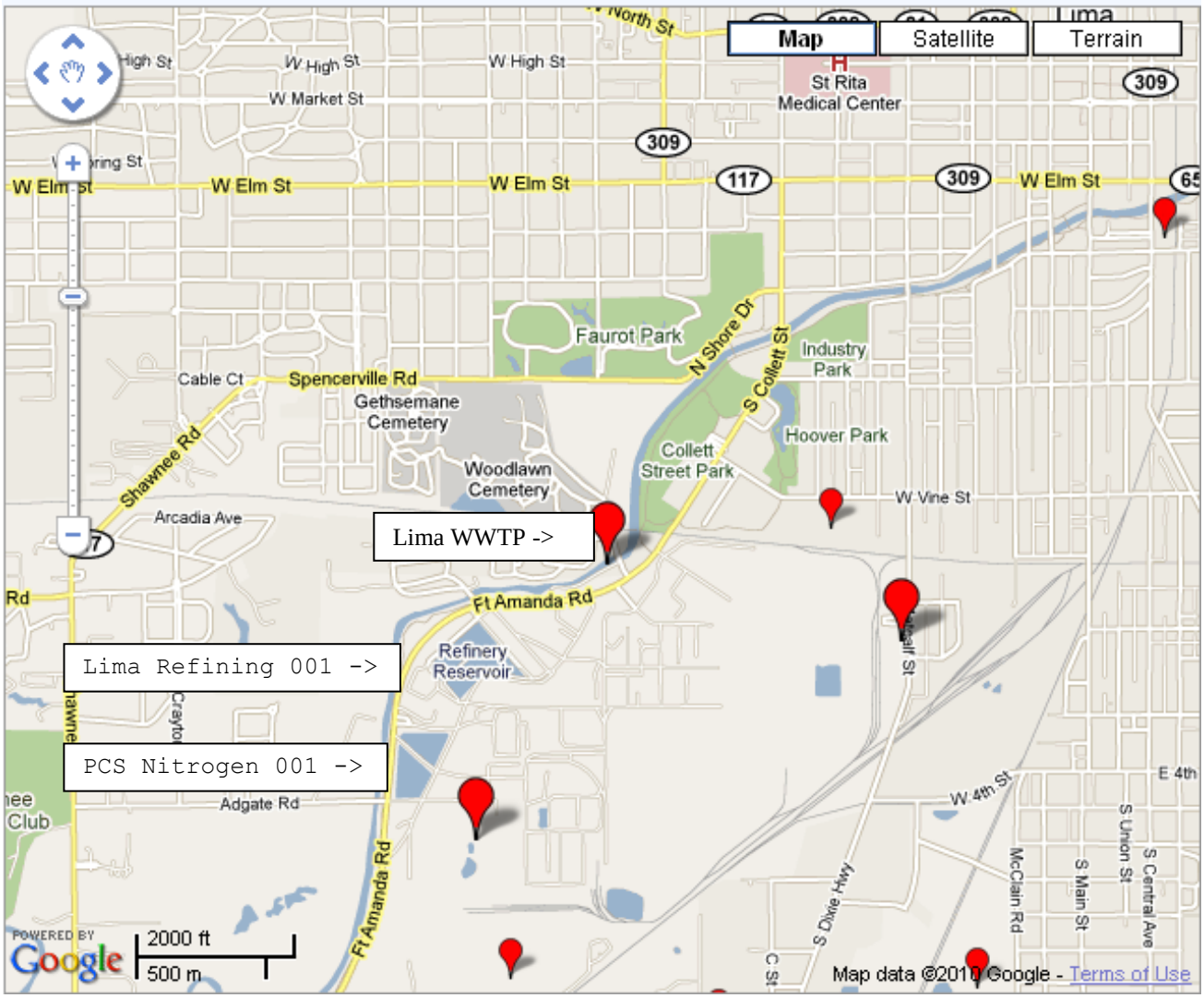

Figure 1. Approximate location of the Lima WWTP. Balloons indicate NPDES permitted discharges. Large balloons are major dischargers.

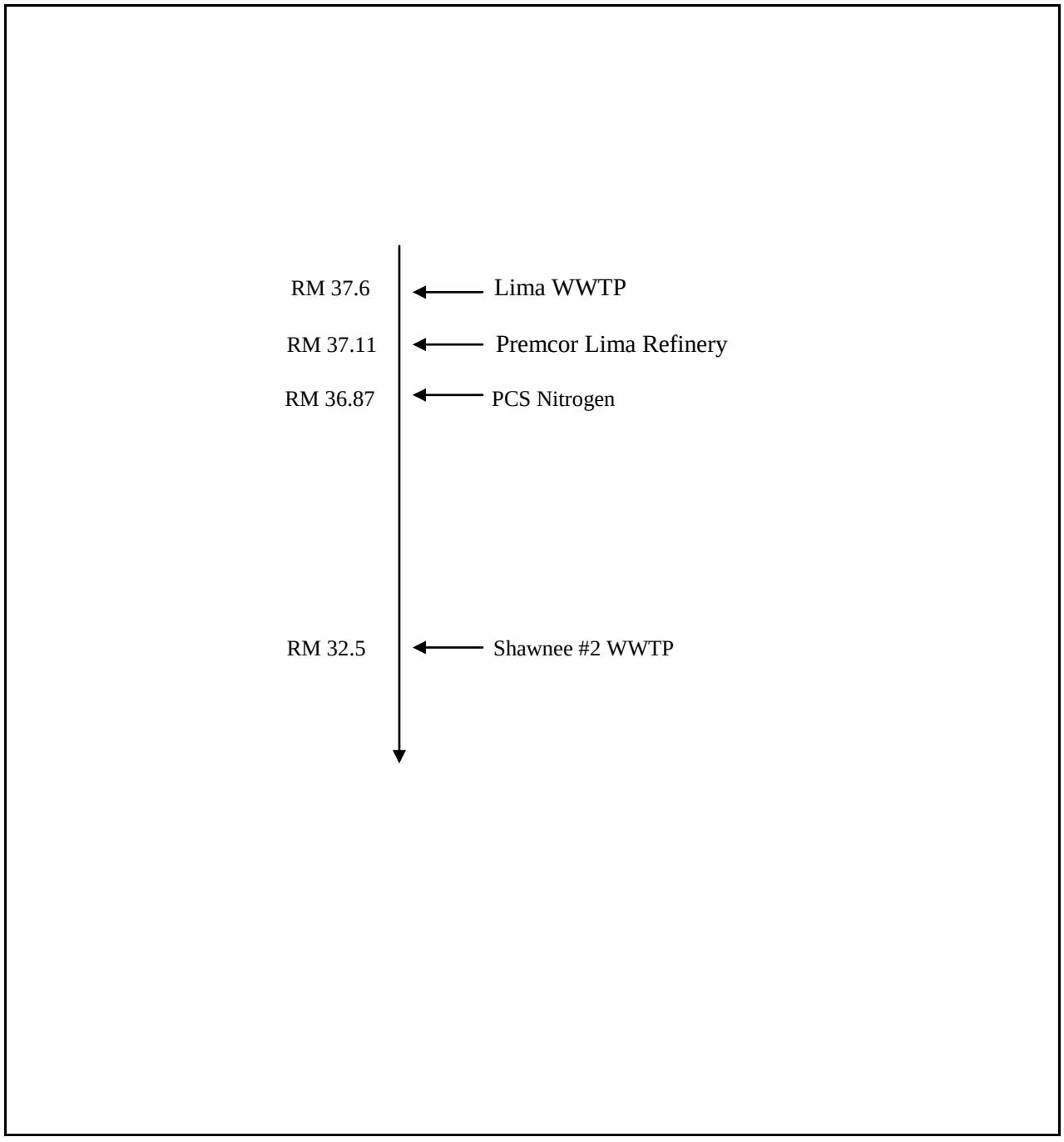

Figure 2. Ottawa River Study Area.

Table 2. Effluent Characterization and Decision Criteria

Summary of analytical results for the Lima WWTP outfall 2PE00000001. All values are in ug/l unless otherwise indicated. PT = data from, pretreatment program reports; OEPA = data from analyses by Ohio EPA; ND = below detection (detection limit); NA = not analyzed. Decision Criteria: PEQ_{avg} = monthly averages; PEQ_{max} = daily maximum analytical results.

PARAMETER	Ohio EPA 10/21/08	Ohio EPA 09/23/08	PT 09/17/09	PT 09/30/08	PT 09/18/07	PT 09/26/06	PT 09/14/05	DECISION CRITERIA PEQ_{avg}	DECISION CRITERIA PEQ_{max}
COD mg/l	17	10	NA	NA	NA	NA	NA		
Dissolved Solids mg/l 656	732	NA	NA	NA	NA	NA	825	1028	
Chloride mg/l	172	20.7	NA	NA	NA	NA	NA	477	654
Ammonia-N mg/l	<0.05	0.154	NA	NA	NA	NA	NA	0.316	0.776
Nitrate/Nitrite-N mg/l 15.5	22.6	NA	NA	NA	NA	NA	16.97	25.1	
Total Kjeldahl N mg/l 1.22	1.56	NA	NA	NA	NA	NA			
Phosphorus mg/l	0.269	0.253	NA	NA	NA	NA	NA	0.511	0.866
Hardness mg/l	221	229	NA	NA	NA	NA	NA		
Antimony	NA	NA	<2.0	<5	<5	<5	125	210	287
Arsenic	<2.0	<2.0	<2.0	<3	<5	<5	<1.0		
Barium	<15	15	NA	NA	NA	NA	NA	42	57
Copper	4.1	3.9	8	<5	<5	<5	5	19	23.9
Iron	200	394	NA	NA	NA	NA	NA	1093	1497
Manganese	35	124	NA	NA	NA	NA	NA	344	471
Nickel	16.1	15.0	<0.2	14.8	39.6	5.3	<0.2	30	45
Potassium mg/l	11	12	NA	NA	NA	NA	NA	33	46
Selenium	<2.0	<2.0	<1.0	<5	<5	<5	8.1	12	16
Strontium	947	1070	NA	NA	NA	NA	NA	1081	1443
Zinc	15	17	45	17.1	28.1	22.8	17	46	67
Benzene	<0.5	<0.5	<1.0	<2.0	<2.0	<2	4.6	6.7	9.2

Bromomethane	<0.5	0.84	<2.0	<2.0	<2.0	<2	<7.0	2.3	3.2
Bromodichloromethane	3.33	1.02	<1.0	<2.0	<2.0	4.4	3.6	6.4	8.8
Bromoform	<0.5	<0.5	<1.0	<2.0	<2.0	2.9	<1.0	4.2	5.8
Chloroform	5.64	3.07	1.1	4.6	<2.0	9.2	<1.6	13.4	18.4
Dibromochloromethane	0.90	<0.5	<1.0	<2.0	<2.0	4.5	<1.0	6.6	9.0
Ethylbenzene	<0.5	<0.5	<1.0	<2.0	<2.0	<2	1.1	2.1	2.9
Tetrachloroethylene	<0.5	<0.5	<2.0	5.0	<2.0	<2	<4.1	7.3	10
Bis(2-ethylhexyl)phthalate	<10.9	<10.3	2.7	<10	19	12	<2.5	28	38

Table 3. Effluent Characterization and Decision Criteria

Summary of current permit limits and unaltered monthly operating report (MOR) data for Lima WWTP outfalls 2PE00000001 and 2PE00000604. 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. 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											
Dissolved Oxygen	Summer	mg/l		Monitor	899	8.8	10.4	6.5-14.1			
Dissolved Oxygen	Winter	mg/l		Monitor	906	10.6	12	6.9-12.8			
pH, Maximum	Annual	S.U.	--	9.0	152	8	8.3	7.1-8.6			
pH, Maximum	Annual	S.U.	--	9.0	1704	8	8.3	7.1-8.9			
pH, Minimum	Annual	S.U.	--	6.5	153	7.7	7.9	6-8			
pH, Minimum	Annual	S.U.	--	6.5	1704	7.7	8	6.5-8.3			
Total Suspended Solids	Annual	mg/l		Monitor	1849	0	7.2	0-78			
Nitrogen, Ammonia (NH3)	Summer	mg/l		Monitor	941	0.055	1.05	0.01-7.6	694	0.316	0.776
Nitrogen, Ammonia (NH3)	Winter	mg/l		Monitor	902	0.052	0.453	0-2.37	508	0.171	0.418
Phosphorus, Total (P)	Annual	mg/l		Monitor	501	0.25	0.721	0-1.04	556	0.511	0.866
Fecal Coliform	Annual	#/100 ml	1000	2000[A]	940	25	201	0-57000			
Flow Rate	Annual	MGD		Monitor	1854	11.4	33	6.81-45.1			
Chlorine, Total Residual	Annual	mg/l	--	0.020	941	0	0	0-0.3	1032	0.079	0.108
CBOD 5 day	Summer	mg/l		Monitor	924	0	2.98	0-84			
CBOD 5 day	Winter	mg/l		Monitor	871	0	2.95	0-43			

Outfall 604

Water Temperature	Annual	C		Monitor		1820	16.3	24.9	5.8-31.2			
Dissolved Oxygen	Summer	mg/l	--		5.0	920	9.1	12.2	5.5-20			
Dissolved Oxygen	Winter	mg/l	--		5.0	906	11.3	12.6	6.7-13.9			
Residue, Total Dissolved	Annual	mg/l		Monitor		60	625	1020	316-1480	63	825	1028
Total Suspended Solids	Annual	mg/l	14		20[A]	1824	0	9.58	0-82			
Oil and Grease, Hexane Extr Method	Annual	mg/l	--		10	117	0	5	0-20			
Nitrogen, Ammonia (NH3)	Summer	mg/l	2.0		4.0[A]	907	0.051	0.855	0.002-7.5	694	0.316	0.776
Nitrogen, Ammonia (NH3)	Winter	mg/l	4.0		8.0[A]	896	0.0545	0.43	0.008-2.38	508	0.171	0.418
Nitrogen Kjeldahl, Total	Annual	mg/l		Monitor		55	0.75	2.9	0-11.3			
Nitrite Plus Nitrate, Total	Annual	mg/l		Monitor		59	9.29	17.5	2.7-20.5	69	16.97	25.1
Phosphorus, Total (P)	Annual	mg/l	1.0		1.5[A]	496	0.26	0.757	0-1.38	556	0.511	0.866
Cyanide, Free	Annual	mg/l		Monitor		55	0	0	0-0			
Nickel, Total Recoverable	Annual	ug/l		Monitor		61	6.4	30.9	0-39.7	75	30	45
Silver, Total Recoverable	Annual	ug/l	--		--	5	0	0	0-0			
Strontium, Total Recoverable	Annual	ug/l		Monitor		56	668	1510	0.6-2490	58	1081	1443
Zinc, Total Recoverable	Annual	ug/l		Monitor		61	23.4	63	4-87	751	46	67
Cadmium, Total Recoverable	Annual	ug/l		Monitor		61	0	0	0-0.8	67	0.6	0.8
Lead, Total Recoverable	Annual	ug/l		Monitor		61	0	0	0-0			
Chromium, Total Recoverable	Annual	ug/l		Monitor		61	0	0	0-84	68	61	84
Copper, Total Recoverable	Annual	ug/l		Monitor		61	0	16	0-45	74	19	23.9
Chromium, Dissolved Hexavalent	Annual	ug/l		Monitor		76	0	5.15	0-47	81	7.9	10.8
Alpha BHC	Annual	ug/l		Monitor		17	0	0	0-0			
Flow Rate	Annual	MGD		Monitor		1823	11.3	26.1	6.51-40.6			
Mercury, Total (Low Level)	Annual	ng/l	7.6		1800	32	2.77	7.56	0.75-13.3	33	6.0	9.2
Mercury, Total (Low Level, PQL=1000)	Annual	ng/l	--		--	24	1.78	7.55	0.63-8.2			

Acute Toxicity, Ceriodaphnia dubia	Annual	TUa		Monitor	14	0	0	0-0
Chronic Toxicity, Ceriodaphnia dubia	Annual	TUc		Monitor	14	0	1.23	0-3.5
Acute Toxicity, Pimephales promelas	Annual	TUa		Monitor	14	0	0	0-0
Chronic Toxicity, Pimephales promelas	Annual	TUc		Monitor	14	0	0.35	0-1
CBOD 5 day	Summer	mg/l	7	10 [A]	888	0	3	0-67.5
CBOD 5 day	Winter	mg/l	7	10 [A]	873	0	3.24	0-23.7
Mercury, Total	Annual	ug/l	--	--	5	0.0031	0.0152	0-0.016
Cyanide, Free	Annual	mg/l	--	--	5	0	0	0-0

Table 4. Summary of acute toxicity test results on the Lima wastewater treatment plant effluent.

Test Date(a)	*Ceriodaphnia dubia 48 hours*						*Fathead Minnows 96 hour*					
	UP[b]	C[c]	LC_{50}[d]	%M[g]	TUa[h]	NF[i]	UP[b]	C[c]	LC_{50}[d]	%M[g]	TUa[h]	NF[i]
03/13/06 (E)	0	NR	>100	0	<1.0	NT	0	NR	>100	0	<1.0	NT
06/19/06 (E)	0	NR	>100	0	<1.0	NT	0	NR	>100	0	<1.0	NT
08/14/06 (E)	0	NR	>100	0	<1.0	NT	2.5	NR	>100	0	<1.0	NT
12/4/06 (E)	0	NR	>100	0	<1.0	NT	0	NR	>100	0	<1.0	NT
03/05/07 (E)	0	NR	>100	0	<1.0	NT	2.5	NR	>100	0	<1.0	NT
06/04/07 (E)	0	NR	>100	0	<1.0	NT	0	NR	>100	0	<1.0	NT
08/06/07 (E)	0	NR	>100	0	<1.0	NT	0	NR	>100	0	<1.0	NT
12/3/07 (E)	0	NR	>100	0	<1.0	NT	0	NR	>100	0	<1.0	NT
3/17/08 (E)	0	NR	>100	0	<1.0	NT	0	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
ND = not determined
NT = not tested
[g] %M = percent mortality in 100% effluent
[h] TUa = acute toxicity units
[i] NF = near field sample in the Ottawa River
NR = not reported in Ohio EPA database
BD = below detection

Table 4. continued.

Test Date(a)	*Ceriodaphnia dubia 48 hours*						*Fathead Minnows 96 hour*					
	UP[b]	C[c]	LC_{50}[d]	%M[g]	TUa[h]	NF[i]	UP[b]	C[c]	LC_{50}[d]	%M[g]	TUa[h]	NF[i]
06/13/08 (E)	0	NR	>100	0	<1.0	NT	0	NR	>100	0	<1.0	NT
8/15/08 (E)	0	NR	>100	0	<1.0	NT	0	NR	>100	0	<1.0	NT
09/23/08 (O)	0	0	>100	0	<1.0	0	0	0	>100	0-5	<1.0	0
10/21/08 (O)	0	5	>100	0-5	<1.0	0	0	0	>100	0-10	<1.0	0
12/6/08 (E)	NT	NR	>100	0	<1.0	NT	NT	NR	>100	0	<1.0	NT
03/1/10 (E)	NT	NR	>100	0	<1.0	NT	NT	NR	>100	0	<1.0	NT
6/14/10 (E)	NT	NR	>100	0	<1.0	NT	NT	NR	>100	0	<1.0	NT
8/31/10 (E)	NT	NR	>100	0	<1.0	NT	NT	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
ND = not determined
NT = not tested
[g] %M = percent mortality in 100% effluent
[h] TUa = acute toxicity units
[i] NF = near field sample in the Ottawa River
NR = not reported in Ohio EPA database
BD = below detection

Table 5. Summary of chronic toxicity test results on the Lima wastewater treatment plant effluent.

Test Date (a)	*Ceriodaphnia dubia 7-Day*											*Fathead Minnows 7-Day*				
	UP[b]	C[c]	IC_{25}[d]	TU_c[e]	Survival			Reproduction			FF[i]	UP[b]	C[c]	IC_{25}[d]	TU_c[e]	FF[i]
					LOEC[f]	NOEC[g]	TU_c[h]	LOEC[f]	NOEC[g]	TU_c[h]						
03/13/06 (E)	0	NR	>100	<1.0	>100	100	<1.0	>100	100	<1.0	0	0	NR	>100	<1.0	5
06/19/06 (E)	0	NR	>100	<1.0	>100	100	<1.0	>100	100	<1.0	0	0	NR	>100	<1.0	0
08/14/06 (E)	0	NR	>100	<1.0	>100	100	<1.0	>100	100	<1.0	10	2.5	NR	>100	<1.0	2.5
12/4/06 (E)	0	NR	>100	<1.0	>100	100	<1.0	>100	100	<1.0	0	2.5	NR	100	1.0	2.5
03/05/07 (E)	0	NR	>100	<1.0	>100	100	<1.0	>100	100	<1.0	0	2.5	NR	>100	<1.0	2.5
06/04/07 (E)	100	NR	>100	<1.0	>100	100	<1.0	>100	100	<1.0	100	0	NR	>100	<1.0	5
08/06/07 (E)	0	NR	>100	<1.0	>100	100	<1.0	>100	100	<1.0	0	0	NR	>100	<1.0	0
12/3/07 (E)	0	NR	>100	<1.0	>100	100	<1.0	>100	100	<1.0	10	0	NR	>100	<1.0	0
3/17/08 (E)	0	NR	>100	<1.0	>100	100	<1.0	>100	100	<1.0	0	0	NR	>100	<1.0	0
06/13/08 (E)	0	NR	28.5	3.5	NR	NR	3.5	NR	NR	3.5	0	2.5	NR	>100	<1.0	10
8/15/08 (E)	0	NR	>100	<1.0	>100	100	<1.0	>100	100	<1.0	0	0	NR	>100	<1.0	2.5
12/6/08 (E)	90	NR	>100	<1.0	>100	100	<1.0	>100	100	<1.0	20	0	NR	>100	<1.0	2.5
03/1/10 (E)	NT	NR	>100	<1.0	>100	100	<1.0	>100	100	<1.0	NT	NT	NR	>100	<1.0	NT
6/14/10 (E)	NT	NR	>100	<1.0	>100	100	<1.0	>100	100	<1.0	NT	NT	NR	>100	<1.0	NT
08/31/10 (E)	NT	NR	>100	<1.0	>100	100	<1.0	>100	100	<1.0	NT	NT	NR	>100	<1.0	NT

Table 5 . continued.

[a]O = EPA test; E = entity test
[b]UP = upstream control water
[c]C = laboratory water control
[d]IC_{25} = inhibition concentration twenty-five
[e]TU_c = chronic toxicity units based on IC_{25}
[f]LOEC = lowest observed effects concentration
[g]NOEC = no observed effects concentration
[h]TU_c = chronic toxicity units based on LOEC and NOEC
[i]FF = far-field effect
[j]STU_c = TUc based on LOEC and NOEC for survival
[k]GTU_c = TUc based on LOEC and NOEC for growth
BD = below detection
NT = not tested

Table 6. Effluent Data for Lima WWTP

Parameter	Units		# of Samples	# > MDL	Average PEQ	Maximum PEQ
Self-Monitoring (LEAPS) Data						
Ammonia	mg/l	S	694	694	0.316	0.776
Ammonia	mg/l	W	508	508	0.171	0.418
Phosphorus	mg/l		556	555	0.511	0.866
Chlorine, tot. res.	µg/l		1032	4	78.84	108.0
Total Dissolved Solids [B]	mg/l		63	63	824.9	1028.
Nitrate+Nitrite [B]	mg/l		69	69	16.97	25.10
Cyanide, free	µg/l		67	0	--	--
Nickel [B]	µg/l		75	49	30.11	45.22
Silver	µg/l		11	0	--	--
Strontium [B]	µg/l		58	58	1081.	1443.
Zinc [B]	µg/l		751	75	46.04	66.96
Cadmium	µg/l		67	1	0.584	0.8
Lead	µg/l		68	1	3.65	5.0
Chromium, tot.	µg/l		68	2	61.32	84.0
Copper [B]	µg/l		93	33	19.0	23.9
$Chromium^{+6}$, diss.	µg/l		81	4	7.884	10.8
alpha BHC [A]	µg/l		18	0	--	--
Mercury	ng/l		33	33	5.967	9.244
Ohio EPA and Pretreatment Data						
Chloride	mg/l		2	2	477.1	653.6
Antimony	µg/l		5	1	209.9	287.5
Barium	µg/l		2	1	41.61	57.0
Iron	µg/l		2	2	1093.	1497.
Manganese	µg/l		2	2	344.0	471.2
Potassium	mg/l		2	2	33.29	45.6
Selenium	µg/l		7	1	11.83	16.2
Benzene [A]	µg/l		7	1	6.716	9.2
Bromomethane	µg/l		7	1	2.33	3.192
Bromodichloromethane [A]	µg/l		7	4	6.424	8.8
Bromoform [A]	µg/l		7	1	4.234	5.8
Chloroform [A]	µg/l		7	5	13.43	18.4
Dibromochloromethane [A]	µg/l		7	2	6.57	9.0
Ethylbenzene	µg/l		7	1	2.088	2.86
Tetrachloroethylene	µg/l		7	1	7.3	10.
Bis(2-ethylhexyl)phthalate [A]	µg/l		7	3	27.74	38.0

[A.] Carcinogen
[B.] Combined LEAPS and Ohio EPA/Pretreatment Data

Table 7. Water Quality Criteria in the Study Area

Parameter		Units	Outside Mixing Zone Criteria: Average: Human Health [C]	Outside Mixing Zone Criteria: Average: Agri-culture	Outside Mixing Zone Criteria: Average: Aquatic Life [C]	Outside Mixing Zone Criteria: Maximum Aquatic Life [C]	Inside Mixing Zone Maximum [C]
Ammonia	S	mg/l	--	--	1.0	--	--
Ammonia	W	mg/l	--	--	3.3	--	--
alpha-BHC		µg/l	0.0053	--	--	--	--
Aluminum		µg/l	4500.	--	--	--	--
Arsenic		µg/l	580.	100.	150.	340.	680.
Antimony		µg/l	780.	--	190.	900.	1800.
Barium		µg/l	160000.	--	220.[A]	2000.[A]	4000.[A]
Benzene		µg/l	310.	--	160.[A]	700.[A]	1400.[A]
Bis(2-ethylhexyl)phthalate		µg/l	32.	--	8.4 [A]	1100.[A]	2100.[A]
Boron		µg/l	200000.	--	3900.[A]	33000.	65000.
Bromodichloromethane		µg/l	180.	--	340.[E]	3100.[E]	6200.[E]
Bromoform		µg/l	890.	--	230.[A]	1100.[A]	2200.[A]
Bromomethane		µg/l	2600.	--	16.[A]	38.[A]	75.[A]
Cadmium		µg/l	730.	50.	5.4	14.	28.
Chlorine, tot. res.		µg/l	--	--	11.	19.	38.
Chloroform		µg/l	1700.	--	140.[A]	1300.[A]	2600.[A]
Chromium^{+6}, diss.		µg/l	14000.	--	11.	16.	31.
Chromium, tot.		µg/l	14000.	100.	400.[D]	3100.[D]	6100.[D]
Copper		µg/l	64000.	500.	28.[D]	45.[D]	90.[D]
Cyanide, free		µg/l	48000.	--	5.2	22.	44.
Cyanide, total		µg/l	48000.	--	--	--	--
Dibromochloromethane		µg/l	150.	--	320.[E]	2900.[E]	5800.[E]
Ethylbenzene		µg/l	8900.	--	61.[A]	550.[A]	1100.[A]
Fluoride		µg/l	--	2000.	--	--	--
Iron		µg/l	--	5000.	--	--	--
Lead		µg/l	--	100.	25.[D]	490.[D]	970.[D]
Manganese		µg/l	61000.	--	--	--	--
Mercury [B]		µg/l	.0031	10.	0.91	1.7	3.4
Molybdenum		µg/l	10000.	--	20000.[A]	190000.[A]	370000.[A]
Nickel		µg/l	43000.	200.	130.[D]	1200.[D]	2400.[D]
Nitrate + Nitrite		mg/l	--	100.	--	--	--
Selenium		µg/l	3100.	50.	5.0	--	--
Strontium		µg/l	1400000.	--	21000.[A]	40000.	81000.
Tetrachloroethylene		µg/l	1800.	--	53.[A]	430.[A]	850.[A]
Total Dissolved Solids		mg/l	--	--	1500.	--	--
Urea		µg/l	--	--	17000.[A]	150000.[A]	300000.[A]
Zinc		µg/l	35000.	25000.	300.[D]	300.[D]	600.[D]

[A] Tier II
[B] Wildlife criteria also apply; 0.0013 µg/l.
[C] Human Health and Aquatic Life criteria are Tier I unless otherwise indicated.
[D] Effective criteria based on application of a dissolved metals translator.
[E] Screening Value.

Table 8. Instream Conditions and Discharger Flow

Parameter	Units		Value	Basis
7Q10	cfs	annual	2.17	USGS gage #03217400, 1961-73 data
1Q10	cfs	annual	1.87	USGS gage #03217400, 1961-73 data
90Q10	cfs	annual	3.45	USGS gage #03217400, 1961-73 data
30Q10	cfs	summer	2.6	USGS gage #03217400, 1961-73 data
30Q10	cfs	winter	4.6	USGS gage #03217400, 1961-73 data
Harmonic Mean Flow	cfs	annual	13.63	USGS gage #03217500, 1926-51 data
Mixing Assumption	%	average	25	Stream-to-discharge ratio
	%	maximum	100	Stream-to-discharge ratio
Instream Hardness	mg/l	annual	274.	Lima LEAPS 901&STORET Combined; 98 values, 2005-2010
Instream Temperature	°C	summer	23.6	Lima LEAPS 901; 28 values, 2005-10
	°C	winter	6.2	Lima LEAPS 901; 21 values, 2005-10
Instream pH	S.U.	summer	8.0	Lima LEAPS 901; 27 values, 2005-10
	S.U.	winter	8.0	Lima LEAPS 901; 21 values, 2005-10
Background Water Quality				
Ammonia	mg/l	summer	0.1	LEAPS 801; 26 values, 0<MDL, 2005-10
	mg/l	winter	0.06	LEAPS 801; 17 values, 0<MDL, 2005-10
Antimony	µg/l	annual	0.	No representative data available
Arsenic	µg/l	annual	2.1	STORET; 20 values, 8<MDL, 2010
Barium	µg/l	annual	50.5	STORET; 20 values, 0<MDL, 2010
Bis(2-EHP)	µg/l	annual	0.	No representative data available
Bromomethane	µg/l	annual	0.	No representative data available
Cadmium	µg/l	annual	0.	STORET; 20 values, 20<MDL, 2010
Chlorine, total res.	µg/l	annual	0.	No representative data available
Chromium^{+6}, diss.	µg/l	annual	0.	No representative data available
Chromium, tot.	µg/l	annual	0.	STORET; 20 values, 20<MDL, 2010
Copper	µg/l	annual	2.45	STORET; 20 values, 1<MDL, 2010
Cyanide, free	µg/l	annual	0.	No representative data available
Fluoride	µg/l	annual	0.	No representative data available
Iron	µg/l	annual	500.5	STORET; 20 values, 0<MDL, 2010
Lead	µg/l	annual	1.0	STORET; 20 values, 19<MDL, 2010
Mercury	µg/l	annual	0.	No representative data available
Molybdenum	µg/l	annual	0.	No representative data available
Nickel	µg/l	annual	4.05	STORET; 20 values, 0<MDL, 2010
Nitrate+Nitrite	mg/l	annual	0.845	STORET; 20 values, 6<MDL, 2010
Selenium	µg/l	annual	1.0	STORET; 20 values, 18<MDL, 2010
Strontium	µg/l	annual	1830.	STORET; 20 values, 0<MDL, 2010
TDS	mg/l	annual	504.	STORET; 24 values, 0<MDL, 2010
Urea	µg/l	annual	0.	No representative data available
Zinc	µg/l	annual	5.0	STORET; 20 values, 14<MDL, 2010

Table 8. Instream Conditions and Discharger Flows – continued.

Parameter	Units	Value	Basis
Dissolved Metal Translators			
Chromium, tot.		2.36	OEPA; 5 values, 0< MDL, 1996
Copper		1.30	OEPA; 5 values, 0< MDL, 1996
Lead		1.39	OEPA; 5 values, 0< MDL, 1996
Nickel		1.08	OEPA; 5 values, 0< MDL, 1996
Zinc		1.09	OEPA; 5 values, 0< MDL, 1996
Lima WWTP flow	cfs(mgd) design	28.62(18.5)	DSW
Other Interactive Discharger Flows			
Premcor Lima Refinery	cfs(mgd) annual	8.49 (5.49)	DSW
PCS Nitrogen	cfs(mgd) annual	6.7 (4.33)	DSW
Shawnee #2 WWTP	cfs(mgd) design	3.09 (2.0)	DSW

Table 9. Summary of Effluent Limits to Maintain Applicable Water Quality Criteria

Parameter	Units	Average			Maximum	Inside
		Human Health	Agri Supply	Aquatic Life	Aquatic Life	Mixing Zone Maximum
Ammonia - S	mg/l	--	--	1.1	--	--
Ammonia - W	mg/l	--	--	3.6	--	--
Antimony	µg/l	873.	--	194.	959.	1800.
Arsenic [B]	µg/l	649.	112.	153.	362.	680.
Bis(2-ethylhexyl)phthalate	µg/l	35.	--	8.5	1155.	2100.
Cadmium [B]	µg/l	817.[A]	56.[A]	5.5	15.	28.
Chlorine, tot. res.	µg/l	--	--	11.	20.	38.
Chromium^{+6}, dissolved	µg/l	15290.[A]	--	11.	17.	31.
Chromium, tot.	µg/l	15290.[A]	109.	406. [D]	3256. [D]	6100. [D]
Copper	µg/l	68650.[A]	536.[A]	28. [D]	47. [D]	90. [D]
Cyanide, free [B]	µg/l	51740.[A]	--	5.3	23.	44.
Lead [B]	µg/l	--	112.	25. [D]	522. [D]	970. [D]
Mercury [C E]	µg/l	0.0031	10.[A]	0.91	1.7	3.4
Molybdenum [B]	µg/l	11190.	--	20380.	202400.	370000.
Nickel [B]	µg/l	48120.[A]	223.	132. [D]	1278. [D]	2400. [D]
Selenium	µg/l	3341.	54.	5.0	--	--
Total Dissolved Solids	mg/l	--	--	1512.	--	--
Zinc [B]	µg/l	39170.[A]	27980.[A]	306. [D]	319. [D]	600. [D]

[A] Allocation must not exceed the Inside Mixing Zone Maximum.
[B] Parameter would not require a WLA based on reasonable potential procedures, but allocation requested for use in pretreatment program.
[C] Wildlife criteria WLA; 0.0013 µg/l.
[D] WLA based on applicable dissolved metal translator.
[E] Bioaccumulative Chemical of Concern (BCC); no mixing zone allowed after 11/15/2010, WQS must be met at end-of-pipe, unless the requirements for an exclusion are met as listed in 3745-2-08 (L).

Table 10. Parameter Assessment

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

Chloride	Phosphorus	Potassium

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

Alpha- BHC	Ammonia – W	Arsenic
Barium	Benzene	Bromodichloromethane
Bromoform	Bromomethane	Cadmium
Chloroform	Cyanide, free	Dibromochloromethane
Ethylbenzene	Iron	Lead
Manganese	Molybdenum	Nickel
Nitrate+Nitrite	Silver	Strontium
Tetrachloroethylene	Zinc	

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

Ammonia - S

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

$Chromium^{+6}$	Chromium, tot.	Copper
Total Dissolved Solids		

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

Limits to Protect Numeric Water Quality Criteria

Parameter	Units	Appl. Period	Recommended Effluent Limits Average	Maximum
Antimony	µg/l	annual	194.	959.
Bis(2-Ethylhexyl)phthalate	µg/l	annual	8.5	1155.
Chlorine, total res.	µg/l	summer only	11.	20.
Mercury	µg/l	annual	.0013	1.7
Selenium	µg/l	annual	5.0	--

Table 11. Final effluent limits and monitoring requirements for Lima WWTPoutfall 2PE00000001 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]
Dissolved Oxygen	mg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
$CBOD_5$	mg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Suspended Solids	mg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Ammonia-N	mg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Phosphorus	mg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
pH	S.U.	- - - - - - - - - - - -	6.5 to 9.0	- - - - - - - - - - - - - - -		WQS
E. coliform	#/100ml					
Summer		126	284[d]	--	--	WQS
Chlorine Residual	mg/l	--	0.020	--	--	EP/WLA

[a] Effluent loadings based on average design discharge flow of N/A MGD.

[b] Definitions: ABS = Antibacksliding Rule (OAC 3745-33-05(E) and 40 CFR Part 122.44(l)); AD = Antidegradation (OAC 3745-1-05); EP = Existing Permit; M = Monitoring; WLA = Wasteload Allocation procedures (OAC 3745-2); WLA/IMZM = Wasteload Allocation limited by Inside Mixing Zone Maximum; WQS = Ohio Water Quality Standards (OAC 3745-1).

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

[d] 7 day average limit.

Table 12. Final effluent limits and monitoring requirements for Lima WWTP outfall 2PE00000604 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]
Temperature	°C	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Dissolved Oxygen	mg/l	--	5.0 min.	--	--	WQS
$CBOD_5$	mg/l	7	10[d]	1192	1703[d]	EP, 1988 WLA
Dissolved Solids	mg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M/RP[c]
Suspended Solids	mg/l	14	20[d]	2385	3407[d]	BEJ/EP
Ammonia-N	mg/l					
Summer		2.0	4.0[d]	341	681[d]	EP, 1988 WLA
Winter		4.0	8.0[d]	681	1363[d]	EP, 1988 WLA
Nitrate/nitrite-N	mg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Phosphorus	mg/l	1.0	1.5[d]	170	255[d]	OAC
Oil and Grease	mg/l	--	10	--	--	WQS
pH	S.U.	- - - - - - - - - - - -	6.5 to 9.0	- - - - - - - - - - - - - - -		WQS
Cyanide, Free	mg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Antimony, T. R.	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M/RP[c]
Cadmium, T. R.	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Chromium, T. R.	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M/RP[c]
Hex. Chromium (Dissolved)	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M/RP[c]
Copper, T. R.	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M/RP[c]
Lead, T. R.	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Mercury, T.	ng/l	7.6	1700	0.0013	0.29	VAR, WLA
Nickel, T. R.	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Selenium, T. R.	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M/RP[c]
Zinc, T. R.	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Bis(2-ethylhexyl) phthalate	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M/RP[c]
Whole Effluent Toxicity						
Acute	TUa	- - - - - - - -	Monitor (w/o trigger)	- - - - - - - - - -		WET/FAR
Chronic	TUc	- - - - - - - -	Monitor (w/o trigger)	- - - - - - - - - -		WET/FAR

Table 12. Con't.

[a] Effluent loadings based on average design discharge flow of 45 MGD.

[b] Definitions: ABS = Antibacksliding Rule (OAC 3745-33-05(E) and 40 CFR Part 122.44(l)); AD = Antidegradation (OAC 3745-1-05; BEJ = Best Engineering Judgment; EP = Existing Permit; FAR = Federal Application Requirement under 40 CFR 122.21(j); OAC = OAC 3745-33-06; 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); 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.