National Pollutant Discharge Elimination System (NPDES) Permit Program

F A C T S H E E T (Revised)

Regarding an NPDES Permit To Discharge to Waters of the State of Ohio
for DuPont, Circleville Plant

Public Notice No.: 15-03-005
Public Notice Date: March 3, 2015
Comment Period Ends: April 3, 2015

Ohio EPA Permit No.: **4IF00001*MD**
Application No.: **OH0006327**

Name and Address of Applicant:
E.I. du Pont de Nemours & Company
1007 Market Street
Wilmington, DE 19898

Name and Address of Facility Where Discharge Occurs:
DuPont, Circleville Plant
800 DuPont Road
Circleville, Ohio 43113
Pickaway County

Receiving Water:
Scioto River

Subsequent Stream Network:
Ohio River

Introduction

Development of a fact sheet for NPDES permits is mandated by Title 40 of the Code of Federal Regulations (CFR), 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, Chapter 6111 of the Ohio Revised Code (ORC). Decisions to award variances to water quality standards (WQS) 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 the United States Environmental Protection Agency (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 (WLAs) 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 WLA for a pollutant to a measure of the effluent quality. The measure of effluent quality is called projected effluent quality (PEQ). 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

Outfall 4IF00001001
The effluent limits and monitoring requirements proposed for the following parameters are the same as in the current permit: biochemical oxygen demand, 5 day (BOD_5), chemical oxygen demand (COD), pH, total suspended solids (TSS), total residual oxidants, anthracene, fluoranthene, hexachlorobenzene, flow rate, ammonium perfluoroctanoate and 1,4-dioxane.

New monitoring requirements are proposed for copper and ammonia, based on WLA results.

Outfall 4IF00001602
Current monitoring requirements for lead are being removed because the DuPont Circleville plant (DuPont) does not use lead in process operations and there have been no detections of lead at this outfall in over five years.

New limits for chlorobenzene have been added to be consistent with the Federal Effluent Guidelines (FEG) for wastewater from the manufacturing of organic chemicals, plastics and synthetic fibers (OCPSF).

Monitoring for COD, copper, iron and flow rate are proposed to continue from the existing permit.

Lower concentration limits are needed at this outfall. In the existing permit, FEG limits were multiplied by 82%. In the proposed permit, FEG have been multiplied by 61.2%, which is the proportion of OCPSF wastewater flow discharging through this outfall.

Loading limits are proposed to remain the same or are slightly lower than in the existing permit for all parameters except BOD_5, TSS and oil and grease which are proposed to increase because total flow through outfall 601 has increased.

Outfalls 4IF00001603 and 4IF00001604
The effluent limits and monitoring requirements are the same as in the existing permit at outfalls 4IF00001603 and 4IF00001604.

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List of Acronyms

Acronym	Definition of Acronym
BAT	Best available technology
BOD_5	Biochemical oxygen demand, 5 day
BPJ	Best professional judgment
COD	Chemical oxygen demand
CFR	Code of Federal Regulations
EPA	Environmental Protection Agency
FEG	Federal effluent guidelines
NPDES	National Pollutant Discharge Elimination System
OAC	Ohio Administrative Code
OCPSF	Organic chemical and plastic synthetic fibers
ORC	Ohio Revised Code
PEL	Preliminary effluent limit
PEQ	Projected effluent quality
PMF	Plastics molding and forming
SIC	Standard industrial classification code
SBR	Sequencing batch reactor
TU_a	Acute toxicity unit
TU_c	Chronic toxicity unit
TSS	Total suspended solids
WET	Whole effluent toxicity
WLA	Wasteload allocation
WQBEL	Water quality based effluent limit
WQS	Water quality standards
WWH	Warmwater habitat
WWTP	Wastewater treatment plant

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 Processing Unit
P.O. Box 1049
Columbus, Ohio 43216-1049

The Ohio EPA 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 Ashley Ward by phone at (614) 644-4852 or by email at ashley.ward@epa.ohio.gov.

Information Regarding Certain Water Quality Based Effluent Limits

This draft permit may contain proposed water quality based effluent limitations (WQBELs) for parameters that **are not** priority pollutants. (See the following link for a list of the priority pollutants: http://epa.ohio.gov/portals/35/pretreatment/Pretreatment_Program_Priority_Pollutant_Detection_Limits.pdf .) In accordance with ORC Section 6111.03(J)(3), the Director established these water quality based effluent limits after considering, to the extent consistent with the Federal Water Pollution Control Act,

evidence relating to the technical feasibility and economic reasonableness of removing the polluting properties from those wastes and to evidence relating to conditions calculated to result from that action and their relation to benefits to the people of the state and to accomplishment of the purposes of this chapter. This determination was made based on data and information available at the time the permit was drafted, which included the contents of the timely submitted NPDES permit renewal application, along with any and all pertinent information available to the Director.

This public notice allows the permittee to provide to the Director for consideration during this public comment period additional site-specific pertinent and factual information with respect to the technical feasibility and economic reasonableness for achieving compliance with the proposed final effluent limitations for these parameters. The permittee shall deliver or mail this information to:

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

Should the applicant need additional time to review, obtain or develop site-specific pertinent and factual information with respect to the technical feasibility and economic reasonableness of achieving compliance with these limitations, written notification for any additional time shall be sent to the above address no later than 30 days after the Public Notice Date on Page 1.

Should the applicant determine that compliance with the proposed WQBELs for parameters other than the priority pollutants is technically and/or economically unattainable, the permittee may submit an application for a variance to the applicable WQS(s) used to develop the proposed effluent limitation in accordance with the terms and conditions set forth in Ohio Administrative Code (OAC) Rule 3745-33-07(D). The permittee shall submit this application to the above address no later than 30 days after the Public Notice Date.

Alternately, the applicant may propose the development of site-specific WQS(s) pursuant to OAC Rule 3745-1-35. The permittee shall submit written notification regarding their intent to develop site specific WQS for parameters that are not priority pollutants to the above address no later than 30 days after the Public Notice Date.

Location of Discharge/Receiving Water Use Classification

DuPont discharges to Scioto River at river mile 95.5. Figure 1 shows the approximate location of the facility.

This segment of the Scioto River is described by Ohio EPA River Code: 02-001B, U.S. EPA River Reach #: 05060002-085, County: Pickaway, Ecoregion: Eastern Corn Belt Plains. The Scioto River is designated for the following uses under Ohio's WQS (OAC 3745-1-09): Warmwater Habitat (WWH), Agricultural Water Supply, Industrial Water Supply, and Class A Primary Contact Recreation.

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 WQS 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 cannot meet the Clean Water Act goals because of human-caused conditions that cannot 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

DuPont converts chemical intermediates into synthetic resin and film products, a portion of which are coated and/or treated for various end use applications. The products are polyimide and fluoropolymer based. Plant processes are based on recovery and recycle of process solvents and reaction compounds, including recoverable process solvents from other DuPont locations.

Production of polyimide film, fluorocarbon film and polyimide resins involve polymerization and are included under the standard industrial classification code (SIC) 2821 for plastic materials and synthetic resins. Production of polyvinyl fluoride plastic film is included under SIC 3081, Plastics Molding and Forming (PMF).

After being treated to remove iron, water from production wells is distributed within the plant for several different uses. Treated water is used in all the production processes, with the wastewater sent to aerated lagoons for biological treatment. A sequencing batch reactor (SBR) system provides pretreatment for the wastewater from the polyimide resin production process and is monitored at internal station 604 prior to being discharged into the aerated lagoons.

The aerated lagoons also receive wastewater from the iron removal water treatment process and the powerhouse boiler blowdown. When wastewater is discharged from the lagoons, it is monitored at internal station 602. Flows from the aerated lagoons, air stripper treatment system, non-contact cooling water and storm water are all combined prior to being discharged to the Scioto Rover through outfall 001. The draft permit contains the following outfalls:

- 001: Non-contact cooling water, storm water, air stripper treatment effluent and aerated lagoons effluent are discharged to the Scioto River.
- 602: Aerated lagoon effluent to outfall 001. Influent wastestreams to 602 include process wastewaters, boiler blowdown and water treatment effluent.
- 603: Groundwater treated with the air stripper is discharged to outfall 001.
- 604: Process wastewater from polyimide resin production is discharged to outfall 602.

Figure 2 shows a schematic of well-wastewater flow at DuPont. Sanitary waste goes to the Circleville WWTP.

Description of Existing Discharge

Consistent with 40 CFR 122.45(h), the current permit includes monitoring and limits at internal station 4IF00001602. Effluent guideline limits are applied at this outfall to ensure that these treatment standards are met prior to combining with other waste streams. If monitoring was not done at this location, it would not be possible to verify compliance with these standards due to dilution. Federal rules at 40 CFR 125.3(f) prohibit attaining these standards by dilution.

DuPont is subject to the following FEGs listed in 40 CFR 414, OCPSF and 40 CFR 463, PMF Point Source Category:

- 40 CFR 414.91. Toxic pollutant effluent limitations and standards for direct discharge point sources that use end-of-pipe. Applicable to process wastewater discharges resulting from the manufacture of OCPSF.
- 40 CFR 414.41. Thermoplastic Resins: Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT). Applicable to OCPSF process wastewater from DuPont.
- 40 CFR 463.14. Contact Cooling and heating Water Subcategory: New source performance standards (NSPS). Applicable to process wastewater discharges resulting from PMF.

Appendix 1 details the FEG calculations.

Table 1 presents chemical specific data compiled from the NPDES renewal application and data collected by Ohio EPA.

Table 2 presents a summary of unaltered discharge monitoring report (DMR) data for outfalls 4IF00001001 and 4IF00001602. Data are presented for the period June 2009 through July 2014 and current permit limits are provided for comparison.

Table 3 summarizes the results of acute whole effluent toxicity (WET) tests of the final effluent.

Assessment of Impact on Receiving Waters

An assessment of the impact of a permitted point source on the immediate receiving waters includes an evaluation of the available chemical/physical, biological, and habitat data which have been collected by Ohio EPA pursuant to the Five-Year Basin Approach for Monitoring and NPDES Reissuance. Other data may be used provided it was collected in accordance with Ohio EPA methods and protocols as specified by the Ohio WQS and Ohio EPA guidance documents. Other information which may be evaluated includes, but is not limited to: NPDES permittee self-monitoring data; effluent and mixing zone bioassays conducted by Ohio EPA, the permittee, or U.S. EPA.

In evaluating this data, Ohio EPA attempts to link environmental stresses and measured pollutant exposure to the health and diversity of biological communities. Stresses can include pollutant discharges (permitted and unpermitted), land use effects, and habitat modifications. Indicators of exposure to these stresses include WET tests, fish tissue chemical data, and fish health biomarkers (for example, fish blood tests).

Use attainment is a term which describes the degree to which environmental indicators are either above or below criteria specified by the Ohio WQS (WQS; OAC 3745-1). Assessing use attainment status for

aquatic life uses primarily relies on the Ohio EPA biological criteria (OAC 3745-1-07; Table 7-15). These criteria apply to rivers and streams outside of mixing zones. Numerical biological criteria are based on measuring several characteristics of the fish and macroinvertebrate communities; these characteristics are combined into multimetric biological indices including the Index of Biotic Integrity (IBI) and modified Index of Well-Being (MIwb), which indicate the response of the fish community, and the Invertebrate Community Index (ICI), which indicates the response of the macroinvertebrate community. Numerical criteria are broken down by ecoregion, use designation, and stream or river size. Ohio has five ecoregions defined by common topography, land use, potential vegetation and soil type.

Three attainment status results are possible at each sampling location -full, partial, or non-attainment. Full attainment means that all of the applicable indices meet the biocriteria. Partial attainment means that one or more of the applicable indices fails meet the biocriteria. Nonattainment means that either none of the applicable indices meet the biocriteria or one of the organism groups indicates poor or very poor performance. An aquatic life use attainment table (see Table 4) is constructed based on the sampling results and is arranged from upstream to downstream and includes the sampling locations indicated by river mile, the applicable biological indices, the use attainment status (i.e., full, partial, or non), the Qualitative Habitat Evaluation Index (QHEI), and comments and observations for each sampling location.

The Scioto River upstream and downstream of DuPont is in full attainment for WWH criteria. For more information, please see the *Biological Water Quality Study of the Middle Scioto River and Select Tributaries, 2010* located at: http://epa.ohio.gov/Portals/35/documents/MiddleSciotoTSD2010.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 DuPont were used to determine what parameters should undergo WLA. The parameters discharged are identified by the data available to Ohio EPA - 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)	July 2009 through June 2014
NPDES Application data	2014
Ohio EPA compliance sampling data	2012

This data is evaluated statistically, and 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 Tables 1 and 2.

The PEQ values are used according to Ohio rules to compare to applicable WQS and allowable 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 WLA is done for that parameter. If either PEQ_{avg} or PEQ_{max} is greater than 25 percent of the applicable WQS, a WLA is conducted to determine whether the parameter exhibits reasonable potential and needs to have a limit or if monitoring is required. See Tables 5 and 5A for a summary of the screening results.

WLA 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 WQS (OAC 3745-1). Most pollutants are allocated by a mass-balance method because they do not degrade in the receiving water. WLAs 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 assimilative capacity of the Scioto River was distributed between the Circleville Wastewater Treatment Plant (WWTP) and DuPont because the two facilities are close enough together that the pollutants discharged by the two facilities are interactive. The WLA has been done in two parts; one part for common parameters of both Circleville WWTP and DuPont and the other part for parameters only of DuPont.

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

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

Allocations are developed using a percentage of stream design flow as specified in Table 6, and allocations cannot exceed the Inside Mixing Zone Maximum criteria. Background water quality for OCPSF parameter was assumed to be 0.

The data used in the WLA are listed in Tables 6 and 7. The WLA results to maintain all applicable criteria are presented in Table 8.

WET WLA 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.

WQS 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). WLAs can then be calculated using TUs as if they were water quality criteria.

The WLA 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 DuPont, the WLA values are 5.1 TU_a and 17.81 TU_c.

The 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/geometric mean of No Observed Effect Concentration and Lowest Observed Effect Concentration

The 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 WQS must be determined. Each parameter is examined and placed in a defined "group". Parameters that do not have a WQS or do not require a WLA 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 WLAs are selected from Table 8. The average PEL (PEL_{avg}) is compared to the average PEQ (PEQ_{avg}) from Tables 1 and 2, 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 Tables 5 (for parameters unique to DuPont) and 5A (for parameters interactive with Circleville WWTP).

The final effluent limits are determined by evaluating the groupings in conjunction with other applicable rules and regulations. Tables 9-001, 9-602, 9-603 and 9-604 present the final effluent limits and monitoring requirements proposed for DuPont outfalls 4IF00001001, 4IF00001602, 4IF00001603 and 4IF00001604 and the basis for their recommendation. Appendix 1 summarizes the effluent guideline calculations for outfall 4IF0000602.

Outfall 4IF00001001

Anthracene, Fluoranthene and Hexachlorobenzene
Limits and monitoring are proposed at outfall 001 for anthracene, fluoranthene and hexachlorobenzene. The water quality-based effluent limits (WQBELs) calculated for these parameters at the final outfall are more stringent than the corresponding limits at outfall 602. Since limits at an internal outfall cannot authorize the discharge of pollutants at levels greater than the WQBELs, which are calculated to protect water quality, the WQBELs have been included at outfall 001.

pH
The limits for pH are proposed to continue from the existing permit and are based on WQS.

BOD_5. COD, TSS, Total Residual Oxidants, Flow Rate, Ammonium Perfluoroctanoate and 1,4-Dioxane
Monitoring for BOD_5 COD, TSS, total residual oxidants, flow rate, ammonium perfluoroctanoate and 1,4-dioxane are proposed to continue from the existing permit based on best engineering judgment and the nature of the wastewaters to ensure that the stream water quality will be protected.

Ammonia
The Ohio EPA risk assessment (Tables 5 and 5A) places ammonia in group 5, which recommends limits to protect water quality. Using the discretion allowed the Director under OAC 3745-33-07(A)(5), we are proposing monitoring, rather than limits, for this pollutant. The PEQ values calculated for ammonia (Table 1) may not be representative of its actual levels in the plant effluent they were based on two data

points. The purpose of the proposed monitoring is to collect additional data on the frequency of occurrence and variability of these pollutants in the plant's effluent.

Copper
Ohio EPA risk assessment (Tables 5 and 5A) places copper in group 4. This placement as well as the supporting data 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).

Arsenic, Barium, Fluoride, Iron, Methylene chloride, Nickel, Nitrite + Nitrate, Strontium, Total Filterable Residue and Zinc
Ohio EPA risk assessment (Tables 5 and 5A) places arsenic, barium, fluoride, iron, methylene chloride, nickel, nitrite + nitrate, strontium, total filterable residue and zinc in groups 2 and 3. This placement as well as the supporting data support that these parameters do not have the reasonable potential to contribute to WQS exceedances, and limits are not necessary to protect water quality.

Outfall 4IF00001602

FEG Parameters – Metals and Cyanide
The FEG for OCPSF manufacturing facilities require limits for chromium, copper, lead, nickel, zinc and cyanide, unless the facility's processes do not use any of these metals or cyanide. In the case of DuPont, these metals and cyanide are not used in process operations. As a result, limits are not necessary for these metals. Based on best engineering judgment, monitoring is proposed to continue for copper and iron. Monitoring for lead is being removed from the permit because there have been no detections of lead during the past five years.

FEG Parameters – Organics
All of the concentration limits for the organic chemicals have been included in the draft permit in accordance with the requirements of 40 CFR 414.91. The best available technology (BAT) concentrations for these parameters have been adjusted by the proportion of OCPSF flow versus total flow. According to the application, OCPSF flow accounts for 61.2 percent of the total flow, resulting in decreased concentration limits in the draft permit.

BOD_5 and TSS
Limits for BOD_5 and TSS have been calculated by summing the following:

- The standards found in 40 CFR 414.41 for OCPSF flow, multiplied by 0.612.
- The standards found in 40 CFR 463.14 for PMF flow, multiplied by 0.106
- 40 mg/L daily max and 20 mg/L monthly average for utility wastewater, multiplied by 0.282.

Due to increased flow at station 602, loading limits for these parameters have increased.

Oil and Grease
Based on best engineering judgment, the limit for oil and grease is proposed to continue from the existing permit.

Outfall 4IF00001603

The groundwater remediation aeration column at DuPont has been taken out of service. DuPont currently engages in an approved monitored natural attenuation program. However, USEPA requires that the

aeration column be available if the monitored natural attenuation program does not meet expectations. Monitoring for flow rate is proposed to continue from the existing permit. Limits for 1,1-dichloroethylene are proposed to continue from the existing permit and are based on 40 CFR 414, Subpart J.

WET Reasonable Potential

Based on evaluating the WET data presented in Table 3 and other pertinent data under the provisions of OAC 3745-33-07(B), DuPont is placed in Category 4 with respect to WET and no monitoring is required.

Other Requirements

Outfall Signage
Part II of the permit includes requirements for the permittee to place a sign at each outfall to the Scioto River providing information about the discharge. Signage at outfalls is required pursuant to OAC 3745-33-08(A).

Storm Water
Parts IV, V and VI have been included in the draft permit to address storm water discharges.

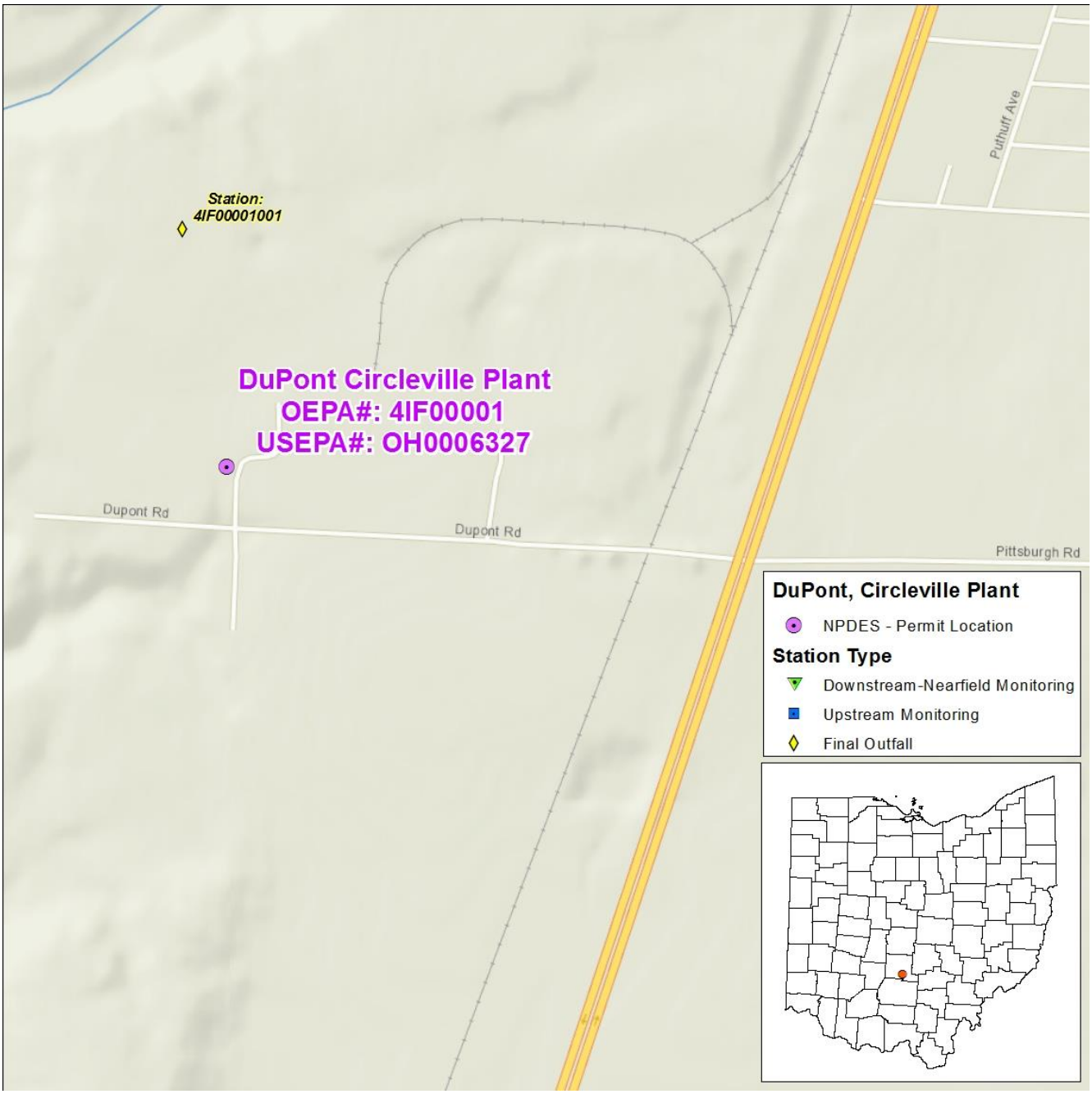

Figure 1. Location of DuPont, Circleville Plant.

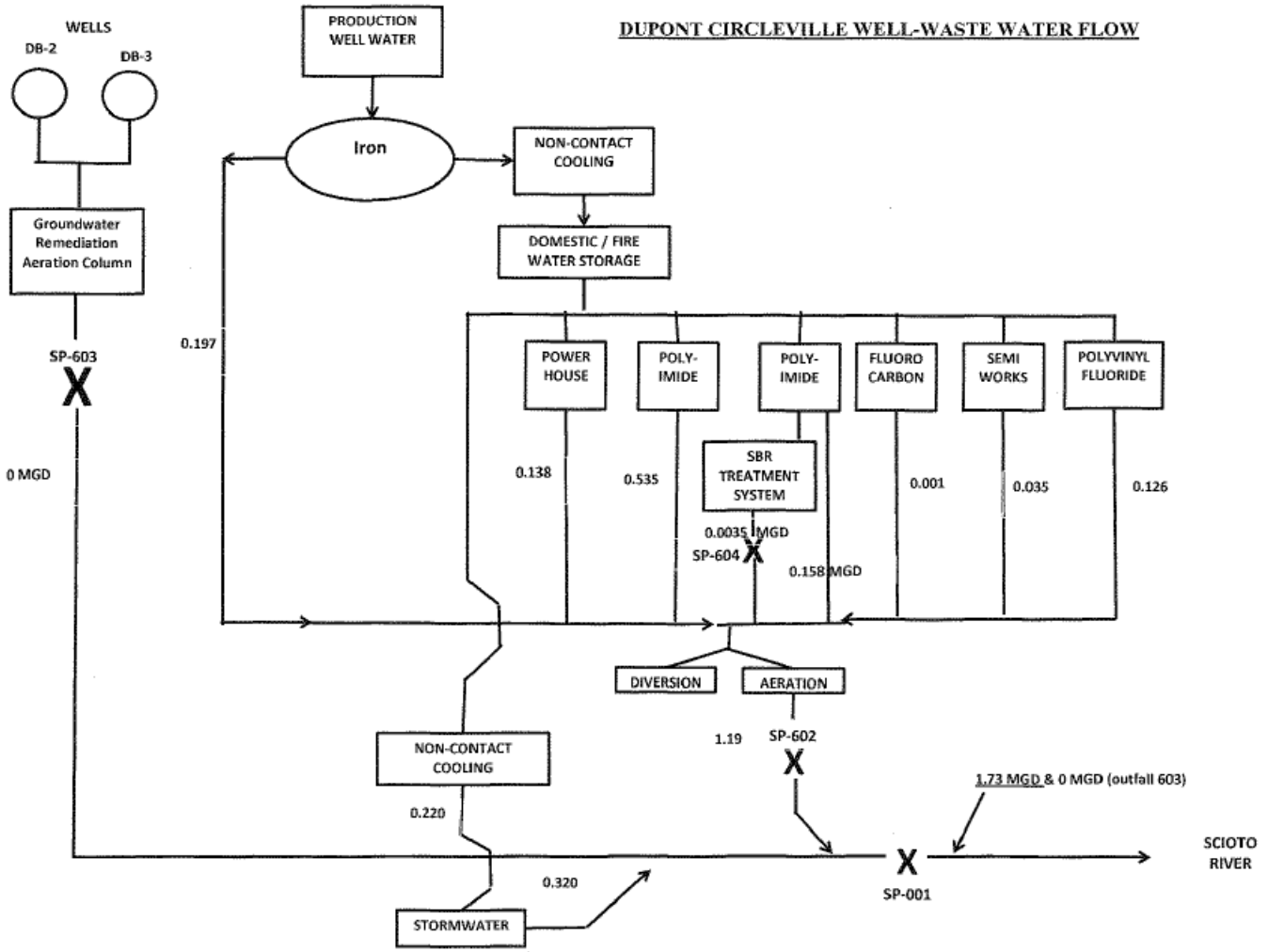

Figure 2. Flow Schematic of DuPont, Circleville Plant.

Table 1. Effluent Characterization Using Ohio EPA and Application Form 2C Data.

		Ohio EPA		Form 2C	Decision Criteria	
Parameter	**Units**	**4/17/2012**	**9/11/2012**	**1/1/2014**	**PEQ_{ave}**	**PEQ_{max}**
Ammonia	mg/L	3.24	0.495	<0.1	7.096	9.72
Arsenic	µg/L	4.9	7.6	<10	21.08	28.88
Barium	µg/L	117	109	101	256.2	351
Copper	µg/L	3.9	6	16	35.04	48
Fluoride	mg/L	NT	NT	0.23	1.041	1.426
Iron	µg/L	2210	2580	959	5650	7740
Magnesium	mg/L	45	42	85	186.2	255
Manganese	µg/L	82	105	<30	230	315
Methylene Chloride	µg/L	<0.50	<0.50	0.80	1.752	2.4
Nickel	µg/L	3.6	4.6	<10	12.76	17.48
Nitrate plus Nitrite	mg/L	0.58	2.7	1.3	5.891	8.07
Strontium	µg/L	723	662.0	NT	2006	2747
Total Filterable Residue	mg/L	756	834	NT	2314	3169
Zinc	µg/L	76	25	24	166.4	228

Definitions: NT = Not tested;
PEQ = Projected effluent quality.

Table 2. Effluent Characterization Using Self-Monitoring Data.
Summary of current permit limits and unaltered discharge monitoring report data for Dupont outfalls 4IF00001001 and 4IF00001602 (July 2009 – June 2014). All values are based on annual records unless otherwise indicated. * = For minimum pH, 5th percentile shown in place of 50th percentile.

Parameter	Season	Units	Current Permit Limits		# Obs.	Percentiles		Data Range	Decision Criteria		
			30 day	Daily		50th	95th		# Obs.	PEQ_{ave}	PEQ_{max}
Outfall 001											
BOD, 5 Day	Summer	mg/L	Monitor		261	3	10	0-22.4	172	6.0796	11.198
BOD, 5 Day	Winter	mg/L	Monitor		257	4	13.4	0-42.9	126	9.7501	18.115
Chemical Oxygen Demand	Annual	mg/L	Monitor		521	19.9	44.1	0-123	521	32.05	54.624
pH	Annual	S.U.	6.5 Min	9.0 Max	1826	7.6	8.1	5.75-9.18			
Total Suspended Solids	Annual	mg/L	Monitor		522	5	16	0-220	522	11.276	20.516
Oxidants, Total Residual	Annual	mg/L	Monitor		61	0	0.08	0-0.17	61	0.11649	0.16363
Anthracene, General Organic	Annual	µg/L	--	0.35	9	0	0	0-0	9	--	--
Fluoranthene	Annual	µg/L	--	7.4	9	0	0	0-0	9	--	--
Hexachlorobenzene	Annual	µg/L	0.0077	--	9	0	0	0-0	9	--	--
Flow Rate	Annual	MGD	Monitor		1826	2.05	2.96	0.44-4.15			
Ammonium Perfluoroctanoate	Annual	µg/L	Monitor		13	0.02	0.0392	0-0.053	13	0.038	0.061177
1,4-Dioxane	Annual	mg/L	Monitor		12	0	0	0-0	12	--	--
Outfall 602											
BOD, 5 Day	Summer	mg/L	23	60	261	3.3	11.6	0-54	172	6.3694	11.445
BOD, 5 Day	Winter	mg/L	23	60	256	4	15.7	0-36.9	126	10.574	19.66
Chemical Oxygen Demand	Annual	mg/L	Monitor		520	22.9	58	0-307	520	39.89	68.875
Total Suspended Solids	Annual	mg/L	36	114	521	5	15	0-54	521	10.111	18.026
Oil and Grease	Annual	mg/L	--	10	101	0	0	0-7.27	101	4.776	6.543
Copper, Total	Annual	µg/L	Monitor		11	12	68.2	0-112	11	107.93	209.08
Iron, Total	Annual	µg/L	Monitor		11	904	2450	300-2720	11	2976.8	5560
Lead, Total	Annual	µg/L	Monitor		11	0	0	0-0	11	--	--
Carbon Tetrachloride	Annual	µg/L	15	31	10	0	0	0-0	10	--	--
Chloroform	Annual	µg/L	17	38	10	0	0	0-0	10	--	--

Table 2. Effluent Characterization Using Self-Monitoring Data – Continued.

Parameter	Season	Units	Current Permit Limits		# Obs.	Percentiles		Data Range	Decision Criteria		
			30 day	Daily		50th	95th		# Obs.	PEQ_{ave}	PEQ_{max}
Toluene	Annual	µg/L	31	66	10	0	0	0-0	10	--	--
Benzene	Annual	µg/L	30	112	10	0	0	0-0	10	--	--
Acenaphthylene	Annual	µg/L	18	48	10	0	0	0-0	10	--	--
Acenaphthene	Annual	µg/L	18	48	10	0	0	0-0	10	--	--
Acrylonitrile	Annual	µg/L	79	198	10	0	0	0-0	10	--	--
Anthracene, General Organic	Annual	µg/L	18	48	10	0	0	0-0	10	--	--
3,4-BenzoFluoranthene	Annual	µg/L	19	50	10	0	0	0-0	10	--	--
Benzo(k)Fluoranthene	Annual	µg/L	18	48	10	0	0	0-0	10	--	--
Benzo-A-Pyrene	Annual	µg/L	19	50	10	0	0	0-0	10	--	--
Chloroethane	Annual	µg/L	85	220	10	0	0	0-0	10	--	--
Chrysene	Annual	µg/L	18	48	10	0	0	0-0	10	--	--
Diethyl phthalate	Annual	µg/L	66	166	10	0	0	0-0	10	--	--
Dimethyl phthalate	Annual	µg/L	16	39	10	0	0	0-0	10	--	--
Ethylbenzene	Annual	µg/L	26	89	10	0	0	0-0	10	--	--
Fluoranthene	Annual	µg/L	21	56	10	0	0	0-0	10	--	--
Fluorene	Annual	µg/L	18	48	10	0	0	0-0	10	--	--
Hexachloroethane	Annual	µg/L	17	44	10	0	0	0-0	10	--	--
Methyl Chloride	Annual	µg/L	71	156	10	0	0	0-0	10	--	--
Methylene Chloride	Annual	µg/L	33	73	10	0	0	0-0	10	--	--
Nitrobenzene	Annual	µg/L	22	56	10	0	0	0-0	10	--	--
Phenanthrene	Annual	µg/L	18	48	10	0	0	0-0	10	--	--
Pyrene	Annual	µg/L	21	55	10	0	0	0-0	10	--	--
Tetrachloroethylene	Annual	µg/L	18	46	10	0	0	0-0	10	--	--
1,1-Dichloroethane	Annual	µg/L	18	48	10	0	0	0-0	10	--	--
1,1-Dichloroethylene	Annual	µg/L	13	21	10	0	0	0-0	10	--	--
1,1,1-Trichloroethane	Annual	µg/L	17	44	10	0	0	0-0	10	--	--
1,1,2-Trichloroethane	Annual	µg/L	17	44	10	0	0	0-0	10	--	--
Benzo(A)Anthracene	Annual	µg/L	18	48	10	0	0	0-0	10	--	--
1,2-Dichloroethane	Annual	µg/L	56	173	10	0	0	0-0	10	--	--
1,2-Dichlorobenzene	Annual	µg/L	63	134	10	0	0	0-0	10	--	--

Table 2. Effluent Characterization Using Self-Monitoring Data – Continued.

Parameter	Season	Units	Current Permit Limits		# Obs.	Percentiles		Data Range	Decision Criteria		
			30 day	Daily		50th	95th		# Obs.	PEQ_{ave}	PEQ_{max}
1,2-Dichloropropane	Annual	µg/L	125	189	10	0	0	0-0	10	--	--
1,2-trans-Dichloroethylene	Annual	µg/L	17	44	10	0	0	0-0	10	--	--
1,2,4-Trichlorobenzene	Annual	µg/L	56	115	10	0	0	0-0	10	--	--
1,3-Dichlorobenzene	Annual	µg/L	25	36	10	0	0	0-0	10	--	--
1,4-Dichlorobenzene	Annual	µg/L	12	23	10	0	0	0-0	10	--	--
2-Chlorophenol	Annual	µg/L	25	80	10	0	0	0-0	10	--	--
2-Nitrophenol	Annual	µg/L	34	57	10	0	0	0-0	10	--	--
2,4-Dichlorophenol	Annual	µg/L	32	92	10	0	0	0-0	10	--	--
2,4-Dimethylphenol	Annual	µg/L	15	30	10	0	0	0-0	10	--	--
2,4-Dinitrotoluene	Annual	µg/L	93	234	10	0	0	0-0	10	--	--
2,4-Dinitrophenol	Annual	µg/L	58	101	10	0	0	0-0	10	--	--
2,6-Dinitrotoluene	Annual	µg/L	209	526	10	0	0	0-0	10	--	--
4-Nitrophenol	Annual	µg/L	59	102	10	0	0	0-0	10	--	--
4,6-Dinitro-o-cresol	Annual	µg/L	64	227	10	0	0	0-0	10	--	--
Phenol	Annual	µg/L	12	21	10	0	0	0-0	10	--	--
Naphthalene	Annual	µg/L	18	48	10	0	0	0-0	10	--	--
Bis(2-ethylhexyl) Phthalate	Annual	µg/L	84	229	10	0	11	0-20	10	24.82	34
Di-N-Butylphthalate	Annual	µg/L	22	47	10	0	0	0-0	10	--	--
Vinyl Chloride	Annual	µg/L	85	220	10	0	0	0-0	10	--	--
Trichloroethylene	Annual	µg/L	17	44	10	0	0	0-0	10	--	--
Hexachlorobenzene	Annual	µg/L	12	23	10	0	0	0-0	10	--	--
Hexachlorobutadiene	Annual	µg/L	16	40	10	0	0	0-0	10	--	--
Chlorobenzene	Annual	µg/L	12	23	10	0	0	0-0	10	--	--
Flow Rate	Annual	MGD	Monitor		1798	1.43	2.2	0.034-2.85		--	--
1,3-Dichloropropylene	Annual	µg/L	24	36	10	0	0	0-0	10	--	--

Definitions: BOD = Biochemical oxygen demand;
PEQ = Projected effluent quality.

Table 3. Summary of Acute Toxicity Results Reported by Ohio EPA.

Collection Date	*Ceriodaphnia dubia*									
	24 Hours					48 Hours				
	UP	C	%M	CMZ	AMZ	UP	C	%M	CMZ	AMZ
4/17/2012	0	5	0	0	0	0	5	0	0	0
4/18/2012	ND	0	0	ND	ND	ND	0	0	ND	ND
4/17/12-4/18/12[a]	ND	ND	0	ND	ND	ND	ND	0	ND	ND
9/11/2012	0	0	0	0	0	0	0	10	0	0
9/12/2012	ND	0	0	ND	ND	ND	0	0	ND	ND
9/11/12-9/12/12[a]	ND	ND	0	ND	ND	ND	ND	10	ND	ND
Collection Date	*Pimephales promelas*									
	24 Hours					48 Hours				
	UP	C	%M	CMZ	AMZ	UP	C	%M	CMZ	AMZ
4/17/2012	0	0	0	0	0	0	0	0	0	0
4/18/2012	ND	0	0	ND	ND	ND	0	0	ND	ND
4/17/12-4/18/12[a]	ND	ND	5	ND	ND	ND	ND	5	ND	ND
9/11/2012	0	0	0	0	0	0	0	0	0	0
9/12/2012	ND	0	0	ND	ND	ND	0	0	ND	ND
9/11/12-9/12/12[a]	ND	ND	0	ND	ND	ND	ND	0	ND	ND

[a] = 24 hour composite sample

Definitions: AMZ = Acute mixing zone;
C = Laboratory control water;
CMZ = Chronic mixing zone;
%M Percent mortality in 100% effluent;
ND Not determined;
UP Percent mortality in upstream control.

Table 4. Aquatic Life Use Attainment for the Scioto River Between Big Darby Creek and Deer Creek, 2011.

The index of Biotic Integrity (IBI), Modified Index of Well-being (MIwb), and Invertebrate Community Index (ICI) scores are based on the performance of the biological community. Qualitative Habitat Evaluation Index (QHEI) reflects the ability to support a biological community. The Scioto River watershed is located in the Eastern Corn Belt Plains ecoregion and streams are currently designated Warmwater Habitat (WWH) waterbody.

Stream River Mile Fish/Benthos	IBI	MIwb	ICI	QHEI	Attainment
99.8/100.1 (Upstream)	47	10.6	54	84.8	FULL
97.8/97.9 (Upstream)	49	10.9	48	84.8	FULL
94.2/95.3 (Downstream)	47	10.8	48	86.5	FULL
89.5 (Downstream)	46	10.5	46	87.0	FULL

Ecoregion Biocriteria: Eastern Corn Belt Plains

Index-Site Type	WWH	EWH	MWH
IBI: Wading/Boat	40/42	50/48	24
Mlwb: Wading/Boat	8.3/8.5	9.4/9.6	6.2/5.8
ICI	34	46	22

Definitions: EWH = Exceptional warmwater habitat;
MWH = Modified warmwater habitat.

Table 5. Parameter Assessment for DuPont (Parameter Unique to DuPont).

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

Acenaphthylene	1,1-Dichloroethane

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

Acenaphthene	Acrylonitrile	Anthracene
Benzene	Benzo(a)anthracene	Benzo(a)pyrene
Benzo(b)fluoranthene	Benzo(k)fluoranthene	Carbon tetrachloride
Chlorobenzene	Chloroform (Trichloromethane)	2-Chlorophenol
Chrysene	Di-n-butyl phthalate	1,2-Dichlorobenzene
1,3-Dichlorobenzene	1,4-Dichlorobenzene	1,2-Dichloroethane
1,1-Dichloroethylene	trans-1,2-Dichloroethylene	2,4-Dichlorophenol
1,2-Dichloropropane	1,3-Dichloropropene	Diethyl phthalate
2,4-Dimethylphenol	Dimethyl phthalate	4,6-Dinitro-o-cresol (4,6-Dinitro-2-methylphenol)
Dinitrophenols	2,4-Dinitrotoluene	2,6-Dinitrotoluene
Ethylbenzene	Fluoranthene	Fluorene
Hexachlorobenzene (BCC)	Hexachlorobutadiene (BCC)	Hexachloroethane
Methylene chloride (Dichloromethane)	Naphthalene	Nitrobenzene
2-Nitrophenol	Phenanthrene	Phenol
Pyrene	Tetrachloroethylene	Toluene
1,2,4-Trichlorobenzene	1,1,1-Trichloroethane	1,1,2-Trichloroethane
Trichloroethylene	Vinyl chloride	
Lead		

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

Bis(2-ethylhexyl)phthalate

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

None.

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

None.

Table 5A. Parameter Assessment for DuPont/Circleville (Interactive Parameters).

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

Magnesium

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

Arsenic	Nickel	Nitrate + Nitrite
Strontium		

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

Barium	Total Filterable Residue	Iron
Zinc		

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

Copper

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

Limits to Protect Numeric Water Quality Criteria

Parameter	Units	Recommended Effluent Limits Average	Maximum
Ammonia (Summer)	mg/l	5.8	--

Definitions: PEL = Preliminary effluent limit;
PEQ = Projected effluent quality;
WLA = Wasteload allocation;
WQS = Water quality standards.

Table 6. Instream Conditions and Discharger Flow.

Parameter	Units	Season	Value	Basis
Stream Flows				
1Q10	cfs	annual	172.1	USGS 03231500
7Q10	cfs	annual	180.5	USGS 03231500
30Q10	cfs	summer	204	USGS 03231500
		winter	360.3	USGS 03231500
Harmonic Mean	cfs	annual	774.7	USGS 03231500
Mixing Assumption	%	average	90.1474537	
	%	maximum	90.1474537	
Hardness	mg/L	annual	307	Circleville 901, N = 22
pH	S.U.	summer	8.4	Circleville 901, N = 21
		winter	8.2	Circleville 901, N = 17
Temperature	°C	summer	24	Circleville 901, N = 21
		winter	5.1	Circleville 901, N = 17
DuPont flow	cfs	annual	4.32	95th percentile of monthly average flows.
DuPont/Circleville flow	cfs	annual	10.5	Sum of Circleville WWTP and DuPont flows.
Background Water Quality				
Fluoride	mg/L		0	No representative data available.
Methylene chloride (Dichloromethane)	µg/L		0	No representative data available.
Ammonia, Summer	mg/L		0.115	Circleville; 2009-14; N=22; 1<MDL; Station 801, Median value
Ammonia, Winter	mg/L		0.14	Circleville; 2009-14; N=16; 3<MDL; Station 801, Median value
Arsenic	µg/L		2.45	OEPA; 2011-12; N=14; 2<MDL; Station 600960, RM 99.82
Barium	µg/L		66	OEPA; 2011-12; N=14; 0<MDL; Station 600960, RM 99.82
Copper	µg/L		3.25	OEPA; 2011-12; N=14; 0<MDL; Station 600960, RM 99.82
Total Filterable Residue	mg/L		410	OEPA; 2011-12; N=14; 0<MDL; Station 600960, RM 99.82

Table 6. Instream Conditions and Discharger Flow – Continued.

Parameter	Units	Season	Value	Basis
Iron	µg/L		764	OEPA; 2011-12; N=14; 0<MDL; Station 600960, RM 99.82
Magnesium	mg/L		22.5	OEPA; 2011-12; N=14; 0<MDL; Station 600960, RM 99.82
Nickel	µg/L		4.75	OEPA; 2011-12; N=14; 0<MDL; Station 600960, RM 99.82
Nitrate + Nitrite	mg/L		3.285	OEPA; 2011-12; N=14; 0<MDL; Station 600960, RM 99.82
Zinc	µg/L		14	OEPA; 2011-12; N=14; 0<MDL; Station 600960, RM 99.82
Strontium	µg/L		1565	OEPA; 2011-12; N=14; 0<MDL; Station 600960, RM 99.82

Definitions: MDL = Minimum detection level;
N = Number of samples;
OEPA = Ohio Environmental Protection Agency;
RM = River mile;
USGS = United States Geological Survey;
WWTP = Wastewater treatment plant.

Table 7. Water Quality Criteria in the Study Area.

Parameter	Units	Outside Mixing Zone Criteria: Average: Human Health	Outside Mixing Zone Criteria: Average: Agri-culture	Outside Mixing Zone Criteria: Aquatic Life	Outside Mixing Zone Criteria: Maximum Aquatic Life	Inside Mixing Zone Maximum
DuPont only Parameters						
Acenaphthene	ug/l	2700	--	15	19	38
Acenaphthylene	ug/l	--	--	--	--	--
Acrylonitrile	ug/l	6.6[c]	--	78	650	1300
Anthracene	ug/l	110000	--	0.02	0.18	0.35
Benzene	ug/l	710[c]	--	160	700	1400
Benzo(a)anthracene	ug/l	0.49[c]	--	--	--	--
Benzo(a)pyrene	ug/l	0.49[c]	--	--	--	--
Benzo(b)fluoranthene	ug/l	0.49[c]	--	--	--	--
Benzo(k)fluoranthene	ug/l	0.49[c]	--	--	--	--
Bis(2-ethylhexyl)phthalate	ug/l	59[c]	--	8.4	1100	2100
Carbon tetrachloride	ug/l	44[c]	--	240	2200	4400
Chlorobenzene	ug/l	21000	--	47	420	850
Chloroform (Trichloromethane)	ug/l	4700[c]	--	140	1300	2600
2-Chlorophenol	ug/l	400	--	32	290	580
Chrysene	ug/l	0.49[c]	--	--	--	--
Di-n-butyl phthalate	ug/l	12000	--	--	--	--
1,2-Dichlorobenzene	ug/l	17000	--	23	130	260
1,3-Dichlorobenzene	ug/l	2600	--	22	79	160
1,4-Dichlorobenzene	ug/l	2600	--	9.4	57	110
1,1-Dichloroethane	ug/l	--	--	--	--	--
1,2-Dichloroethane	ug/l	990[c]	--	2000	9600	19000
1,1-Dichloroethylene	ug/l	32[c]	--	210	1900	3800
trans-1,2-Dichloroethylene	ug/l	140000	--	--	--	--
2,4-Dichlorophenol	ug/l	790	--	11	110	210
1,2-Dichloropropane	ug/l	390[c]	--	520	3300	6500
1,3-Dichloropropene	ug/l	1700	--	1.7	15	30
Diethyl phthalate	ug/l	120000	--	220	980	2000
2,4-Dimethylphenol	ug/l	2300	--	15	140	280
Dimethyl phthalate	ug/l	2900000	--	1100	3200	6400
4,6-Dinitro-o-cresol (4,6-Dinitro-2-methylphenol)	ug/l	770	--	--	--	--
Dinitrophenols	ug/l	14000	--	--	--	--
2,4-Dinitrotoluene	ug/l	91[c]	--	44	390	790
2,6-Dinitrotoluene	ug/l	--	--	81	730	1500
Ethylbenzene	ug/l	29000	--	61	550	1100
Fluoranthene	ug/l	370	--	0.8	3.7	7.4
Fluorene	ug/l	14000	--	19	110	220
Fluoride	mg/L	--	2	--	--	--
Hexachlorobenzene	ug/l	0.0077[c]	--	--	--	--
Hexachlorobutadiene	ug/l	500[c]	--	--	--	--
Hexachloroethane	ug/l	89[c]	--	--	--	--

Table 7. Water Quality Criteria in the Study Area - Continued

		Outside Mixing Zone Criteria				Inside Mixing Zone Maximum
		Average			Maximum	
Parameter	Units	Human Health	Agri-culture	Aquatic Life	Aquatic Life	
Methylene chloride (Dichloromethane)	ug/l	16000[c]	--	1900	11000	22000
Naphthalene	ug/l	--	--	21	170	340
Nitrobenzene	ug/l	1900	--	380	2000	4000
2-Nitrophenol	ug/l	--	--	73	650	1300
Phenanthrene	ug/l	--	--	2.3	31	61
Phenol	ug/l	4600000	--	400	4700	9400
Pyrene	ug/l	11000	--	4.6	42	83
Tetrachloroethylene	ug/l	89[c]	--	53	430	850
Toluene	ug/l	200000	--	62	560	1100
1,2,4-Trichlorobenzene	ug/l	940	--	--	--	--
1,1,1-Trichloroethane	ug/l	--	--	76	690	1400
1,1,2-Trichloroethane	ug/l	420[c]	--	740	3300	6600
Trichloroethylene	ug/l	810[c]	--	220	2000	4000
Vinyl chloride	ug/l	5300[c]	--	930	8400	17000
Lead	ug/l	--	100	--	--	--
Parameters Common to DuPont and Circleville WWTP						
Ammonia, Summer	mg/L	--	--	0.4	--	--
Ammonia, Winter	mg/L	--	--	2.3	--	--
Arsenic	µg/L	--	100	150	340	680
Barium	µg/L	--	--	220	2000	4000
Copper	µg/L	1300	500	24	40	81
Total Filterable Residue	mg/L	--	--	1500	--	--
Iron	µg/L	--	5000	--	--	--
Nickel	µg/L	4600	200	130	1200	2400
Nitrate + Nitrite	mg/L	--	100	--	--	--
Zinc	µg/L	69000	25000	310	310	620
Strontium	µg/L	--	--	21000	40000	81000

[c] = Carcinogen.

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

		Outside Mixing Zone Criteria				Inside
		Average			Maximum	Mixing
Parameter	Units	Human Health	Agri-culture	Aquatic Life	Aquatic Life	Zone Maximum
DuPont only Parameters						
Acenaphthene	ug/l	439183	--	580	701	38
Acenaphthylene	ug/l	--	--	--	--	--
Acrylonitrile	ug/l	1074	--	3016	23993	1300
Anthracene	ug/l	17892629	--	0.77	6.6	0.35
Benzene	ug/l	115489	--	6187	25839	1400
Benzo(a)anthracene	ug/l	80	--	--	--	--
Benzo(a)pyrene	ug/l	80	--	--	--	--
Benzo(b)fluoranthene	ug/l	80	--	--	--	--
Benzo(k)fluoranthene	ug/l	80	--	--	--	--
Bis(2-ethylhexyl)phthalate	ug/l	9597	--	325	40604	2100
Carbon tetrachloride	ug/l	7157	--	9280	81208	4400
Chlorobenzene	ug/l	3415865	--	1817	15503	850
Chloroform (Trichloromethane)	ug/l	764503	--	5413	47987	2600
2-Chlorophenol	ug/l	65064	--	1237	10705	580
Chrysene	ug/l	80	--	--	--	--
Di-n-butyl phthalate	ug/l	1951923	--	--	--	--
1,2-Dichlorobenzene	ug/l	2765224	--	889	4799	260
1,3-Dichlorobenzene	ug/l	422917	--	851	2916	160
1,4-Dichlorobenzene	ug/l	422917	--	363	2104	110
1,1-Dichloroethane	ug/l	--	--	--	--	--
1,2-Dichloroethane	ug/l	161034	--	77332	354364	19000
1,1-Dichloroethylene	ug/l	5205	--	8120	70135	3800
trans-1,2-Dichloroethylene	ug/l	22772436	--	--	--	--
2,4-Dichlorophenol	ug/l	128502	--	425	4060	210
1,2-Dichloropropane	ug/l	63438	--	20106	121813	6500
1,3-Dichloropropene	ug/l	276522	--	66	554	30
Diethyl phthalate	ug/l	19519231	--	8506	36175	2000
2,4-Dimethylphenol	ug/l	374119	--	580	5168	280
Dimethyl phthalate	ug/l	471714754	--	42532	118121	6400
4,6-Dinitro-o-cresol (4,6-Dinitro-2-methylphenol)	ug/l	125248	--	--	--	--
Dinitrophenols	ug/l	2277244	--	--	--	--
2,4-Dinitrotoluene	ug/l	14802	--	1701	14396	790
2,6-Dinitrotoluene	ug/l	--	--	3132	26946	1500
Ethylbenzene	ug/l	4717148	--	2359	20302	1100
Fluoranthene	ug/l	60184	--	31	137	7.4
Fluorene	ug/l	2277244	--	735	4060	220
Fluoride	mg/L	--	325	--	--	--
Hexachlorobenzene	ug/l	0.0077	--	--	--	--
Hexachlorobutadiene	ug/l	500	--	--	--	--
Hexachloroethane	ug/l	14477	--	--	--	--

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

		Outside Mixing Zone Criteria				Inside Mixing Zone Maximum
		Average			Maximum	
Parameter	Units	Human Health	Agri-culture	Aquatic Life	Aquatic Life	
Methylene chloride (Dichloromethane)	ug/l	2602564	--	73465	406042	22000
Naphthalene	ug/l	--	--	812	6275	340
Nitrobenzene	ug/l	309054	--	14693	73826	4000
2-Nitrophenol	ug/l	--	--	2823	23993	1300
Phenanthrene	ug/l	--	--	89	1144	61
Phenol	ug/l	748237197	--	15466	173491	9400
Pyrene	ug/l	1789263	--	178	1550	83
Tetrachloroethylene	ug/l	14477	--	2049	15873	850
Toluene	ug/l	32532052	--	2397	20671	1100
1,2,4-Trichlorobenzene	ug/l	152901	--	--	--	--
1,1,1-Trichloroethane	ug/l	--	--	2939	25470	1400
1,1,2-Trichloroethane	ug/l	68317	--	28613	121813	6600
Trichloroethylene	ug/l	131755	--	8506	73826	4000
Vinyl chloride	ug/l	862099	--	35959	310068	17000
Lead	ug/l	--	16266	--	--	--
Parameters Common to DuPont and Circleville WWTP						
Ammonia, Summer	mg/L	--	--	5.81	--	--
Ammonia, Winter	mg/L	--	--	74.77	--	--
Arsenic	µg/L	--	7137	2630	5749	680
Barium	µg/L	--	--	2808	32993	4000
Copper	µg/L	94843	36334	373	629	81
Total Filterable Residue	mg/L	--	--	19820	--	--
Iron	µg/L	--	310570	--	--	--
Nickel	µg/L	336085	14285	2235	20354	2400
Nitrate + Nitrite	mg/L	--	7077	--	--	--
Zinc	µg/L	5045398	1827399	5285	5053	620
Strontium	µg/L	--	--	347650	655926	81000

Table 9-001. Final effluent limits and monitoring requirements for DuPont Outfall 0IA00002001 and the basis for their recommendation.

Parameter	Units	Effluent Limits				Basis
		Concentration		Loading (kg/day)		
		30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	
Biochemical Oxygen Demand, 5 day	mg/L	Monitor		--	--	EP, BEJ
Chemical Oxygen Demand	mg/L	Monitor		--	--	EP, BEJ
Ammonia, Summer	mg/L	Monitor		--	--	WLA
pH	S.U.	6.5 Min	9.0 Max	--	--	WQS
Total Suspended Solids	mg/L	Monitor		--	--	EP, BEJ
Copper	µg/L	Monitor		--	--	WLA
Oxidants, Total Residual	mg/L	Monitor		--	--	EP, BEJ
Anthracene	µg/L	--	0.35	--	0.0030	WLA
Fluoranthene	µg/L	--	7.4	--	0.063	WLA
Hexachlorobenzene	µg/L	0.0077	--	0.000066	--	WLA
Flow Rate	MGD	Monitor		--	--	EP, BEJ
Ammonium Perfluoroctanoate	µg/L	Monitor		--	--	EP, BEJ
1,4-Dioxane	mg/L	Monitor		--	--	EP, BEJ

[a] Effluent loadings based on average design discharge flow of 2.25 MGD.

[b] Definitions: BEJ = Best Engineering Judgment;
EP = Existing Permit;
WLA = Wasteload Allocation procedures (OAC 3745-2);
WQS = Ohio Water Quality Standards (OAC 3745-1-07).

Table 9-602. Final effluent limits and monitoring requirements for DuPont Outfall 4IF00001602 and the basis for their recommendation.

Parameter	Units	Effluent Limits				Basis
		Concentration		Loading (kg/day)		
		30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	
Biochemical Oxygen Demand, 5 day	mg/L	20	53	161	427	FEG
Chemical Oxygen Demand	mg/L	Monitor		--	--	EP, BEJ
Total Suspended Solids	mg/L	30	93	242	750	FEG
Oil and Grease	mg/L	--	10	--	63	FEG
Copper	µg/L	Monitor		--	--	BEJ
Iron	µg/L	Monitor		--	--	BEJ
Carbon Tetrachloride	µg/L	11	23	0.089	0.19	FEG
Chloroform	µg/L	13	28	0.10	0.23	FEG
Toluene	µg/L	16	49	0.13	0.39	FEG
Benzene	µg/L	23	83	0.18	0.67	FEG
Acenaphthylene	µg/L	13	36	0.11	0.29	FEG
Acenaphthene	µg/L	13	36	0.11	0.29	FEG
Acrylonitrile	µg/L	59	148	0.47	1.19	FEG
Anthracene	µg/L	13	36	0.11	0.29	FEG
3,4-BenzoFluoranthene	µg/L	14	37	0.11	0.30	FEG
Benzo(k)Fluoranthene	µg/L	13	36	0.11	0.29	FEG
Benzo-A-Pyrene	µg/L	14	37	0.11	0.30	FEG
Chlorobenzene	µg/L	9.2	17	0.074	0.14	FEG
Chloroethane	µg/L	64	164	0.51	1.32	FEG
Chrysene	µg/L	13	36	0.11	0.29	FEG
Diethyl phthalate	µg/L	50	124	0.40	1.00	FEG
Dimethyl phthalate	µg/L	12	29	0.109	0.23	FEG
Ethylbenzene	µg/L	20	66	0.16	0.53	FEG
Fluoranthene	µg/L	15	42	0.12	0.34	FEG
Fluorene	µg/L	13	36	0.11	0.29	FEG
Hexachloroethane	µg/L	13	33	0.10	0.27	FEG
Methyl Chloride	µg/L	53	116	0.42	0.94	FEG
Methylene Chloride	µg/L	24	54	0.20	0.44	FEG
Nitrobenzene	µg/L	17	42	0.13	0.34	FEG
Phenanthrene	µg/L	13	36	0.11	0.29	FEG
Pyrene	µg/L	15	41	0.12	0.33	FEG
Tetrachloroethylene	µg/L	13	34	0.11	0.28	FEG
1,1-Dichloroethane	µg/L	13	36	0.11	0.29	FEG
1,1-Dichloroethylene	µg/L	9.8	15	0.079	0.12	FEG
1,1,1-Trichloroethane	µg/L	13	33	0.10	0.27	FEG
1,1,2-Trichloroethane	µg/L	13	33	0.10	0.27	FEG

Table 9-602. Final effluent limits and monitoring requirements for DuPont Outfall 4IF00001602 and the basis for their recommendation - Continued.

Parameter	Units	Effluent Limits				Basis
		Concentration		Loading (kg/day)		
		30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	
Benzo(a)Anthracene	µg/L	13	36	0.11	0.29	FEG
1,2-Dichloroethane	µg/L	42	129	0.34	1.04	FEG
1,2-Dichlorobenzene	µg/L	47	100	0.38	0.80	FEG
1,2-Dichloropropane	µg/L	94	141	0.75	1.13	FEG
1,2-trans-Dichloroethylene	µg/L	13	33	0.10	0.27	FEG
1,2,4-Trichlorobenzene	µg/L	42	86	0.34	0.69	FEG
1,3,-Dichlorobenzene	µg/L	19	27	0.15	0.22	FEG
1,4-Dichlorobenzene	µg/L	9.2	17	0.074	0.14	FEG
2-Chlorophenol	µg/L	19	60	0.15	0.48	FEG
2-Nitrophenol	µg/L	25	42	0.20	0.34	FEG
2,4-Dichlorophenol	µg/L	24	69	0.19	0.55	FEG
2,4-Dimethylphenol	µg/L	11	22	0.089	0.18	FEG
2,4-Dinitrotoluene	µg/L	69	174	0.56	1.41	FEG
2,4-Dinitrophenol	µg/L	43	75	0.35	0.61	FEG
2,6-Dinitrotoluene	µg/L	156	392	1.26	3.16	FEG
4-Nitrophenol	µg/L	44	76	0.36	0.61	FEG
4,6-Dinitro-o-cresol	µg/L	48	170	0.38	1.37	FEG
Phenol	µg/L	9.2	16	0.074	0.13	FEG
Naphthalene	µg/L	13	36	0.11	0.29	FEG
Bis(2-ethylhexyl)Phthalate	µg/L	63	171	0.51	1.38	FEG
Di-N-Butylphthalate	µg/L	17	35	0.14	0.28	FEG
Vinyl Chloride	µg/L	64	164	0.51	1.32	FEG
Trichloroethylene	µg/L	13	33	0.10	0.27	FEG
Hexachlorobenzene	µg/L	9.2	17	0.074	0.14	FEG
Hexachlorobutadiene	µg/L	12	30	0.10	0.24	FEG
Chlorobenzene	µg/L	9.2	17	0.074	0.14	FEG
Flow Rate	MGD	Monitor		--	--	BEJ
1,3-Dichloropropylene	µg/L	18	27	0.14	0.22	FEG

[a] Effluent loadings based on average design discharge flow of 2.13 MGD.

[b] Definitions: BEJ = Best Engineering Judgment;
EP = Existing Permit;
FEG = Federal effluent guidelines.

Table 9-603. Final effluent limits and monitoring requirements for DuPont Outfall 4IF00001603 and the basis for their recommendation.

Parameter	Units	Effluent Limits				Basis
		Concentration		Loading (kg/day)		
		30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	
1,1-Dichloroethylene	µg/L	22	60	0.10	0.26	FEG
Flow Rate	MGD	Monitor		--	--	BEJ

[a] Effluent loadings based on average design discharge flow of 1.15 MGD.

[b] Definitions: BEJ = Best Engineering Judgment;
FEG = Federal effluent guidelines.

Table 9-604. Final effluent limits and monitoring requirements for DuPont Outfall 4IF00001604 and the basis for their recommendation.

Parameter	Units	Effluent Limits				Basis
		Concentration		Loading (kg/day)		
		30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	
Chemical Oxygen Demand	mg/L	Monitor		--	--	EP, BEJ
Total Suspended Solids	mg/L	Monitor		--	--	EP, BEJ
Flow Rate	MGD	Monitor		--	--	EP, BEJ
Acetone	µg/L	Monitor		--	--	EP, BEJ

[b] Definitions: BEJ = Best Engineering Judgment;
EP = Existing permit.

APPENDIX 1

40 CFR 414 Subpart I - Direct Discharge Point Sources That Use End-of-Pipe Biological Treatment

414.91 Toxic pollutant effluent limitations and standards for direct discharge point sources that use end-of-pipe biological treatment.

	Effluent Limitations BAT and NSPS		Multiplied by 61.2 %	
Parameter	Daily Maximum (µg/L)	Monthly Average (µg/L)	Daily Maximum (µg/L)	Monthly Average (µg/L)
Acenaphthene	59	22	36.11	13.46
Acenaphthylene	59	22	36.11	13.46
Acrylonitrile	242	96	148.10	58.75
Anthracene	59	22	36.11	13.46
Benzene	136	37	83.23	22.64
Benzo(a)anthracene	59	22	36.11	13.46
3,4-Benzofluoranthene	61	23	37.33	14.08
Benzo(k)fluoranthene	59	22	36.11	13.46
Benzo(a)pyrene	61	23	37.33	14.08
Bis(2-ethylhexyl)phthalate	279	103	170.75	63.04
Carbon Tetrachloride	38	18	23.26	11.02
Chlorobenzene	28	15	17.14	9.18
Chloroethane	268	104	164.02	63.65
Chloroform	46	21	28.15	12.85
2-Chlorophenol	98	31	59.98	18.97
Chrysene	59	22	36.11	13.46
Di-n-butyl phthalate	57	27	34.88	16.52
1,2-Dichlorobenzene	163	77	99.76	47.12
1,3-Dichlorobenzene	44	31	26.93	18.97
1,4-Dichlorobenzene	28	15	17.14	9.18
1,1-Dichloroethane	59	22	36.11	13.46
1,2-Dichloroethane	211	68	129.13	41.62
1,1-Dichloroethylene	25	16	15.30	9.79
1,2-trans-Dichloroethylene	54	21	33.05	12.85
2,4-Dichlorophenol	112	39	68.54	23.87
1,2-Dichloropropane	230	153	140.76	93.64
1,3-Dichloropropylene	44	29	26.93	17.75
Diethyl phthalate	203	81	124.24	49.57
2,4-Dimethlyphenol	36	18	22.03	11.02
Dimethyl phthalate	47	19	28.76	11.63
4,6-Dinitro-o-cresol	277	78	169.52	47.74
2,4-Dinitrophenol	123	71	75.28	43.45
2,4-Dinitrotoluene	285	113	174.42	69.16

40 CFR 414.91 Calculations - Continued.

	Effluent Limitations BAT and NSPS		Multiplied by 61.2 %	
Parameter	Daily Maximum (µg/L)	Monthly Average (µg/L)	Daily Maximum (µg/L)	Monthly Average (µg/L)
2,6-Dinitrotoluene	641	255	392.29	156.06
Ethylbenzene	108	32	66.10	19.58
Fluoranthene	68	25	41.62	15.30
Fluorene	59	22	36.11	13.46
Hexachlorobenzene	28	15	17.14	9.18
Hexachlorobutadiene	49	20	29.99	12.24
Hexachloroethane	54	21	33.05	12.85
Methyl Chloride	190	86	116.28	52.63
Methylene Chloride	89	40	54.47	24.48
Naphthalene	59	22	36.11	13.46
Nitrobenzene	68	27	41.62	16.52
2-Nitrophenol	69	41	42.23	25.09
4-Nitrophenol	124	72	75.89	44.06
Phenanthrene	59	22	36.11	13.46
Phenol	26	15	15.91	9.18
Pyrene	67	25	41.00	15.30
Tetrachloroethylene	56	22	34.27	13.46
Toluene	80	26	48.96	15.91
Total Chromium	2770	1110	1695.24	679.32
Total Copper	3380	1450	2068.56	887.40
Total Cyanide	1200	420	734.40	257.04
Total Lead	690	320	422.28	195.84
Total Nickel	3980	1690	2435.76	1034.28
Total Zinc	2610	1050	1597.32	642.60
1,2,4-Trichlorobenzene	140	68	85.68	41.62
1,1,1-Trichloroethane	54	21	33.05	12.85
1,1,2-Trichloroethane	54	21	33.05	12.85
Trichloroethylene	54	21	33.05	12.85
Vinyl Chloride	268	104	164.02	63.65

From the renewal application:
OCPSF process wastewater = 1.04 MGD
PMF process wastewater = 0.18 MGD
Utility wastewater = 0.48 MGD
Total = 1.7 MGD

Percentage of OCPSF process wastewater = 1.04/1.7 = 0.612*100% = 61.2%

Percentage of PMF process wastewater = 0.18/1.7 = 0.106*100% = 10.6%
Percentage of utility wastewater = 0.48/1.7 = 0.282*100% = 28.2%

Outfall 602 BOD_5, TSS and oil and grease

40 CFR 414 Subpart D - Thermoplastic Resins

414.41 Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.

	Effluent Limitations BAT and NSPS		Multiplied by 61.2 %	
Parameter	Daily Maximum (mg/L)	Monthly Average (mg/L)	Daily Maximum (mg/L)	Monthly Average (mg/L)
BOD_5	64	24	39.17	14.69
TSS	130	40	79.56	24.48

40 CFR 463 Subpart A - Contact Cooling and Heating Water Subcategory

463.14 New source performance standards.

	Effluent Limitations NSPS		Multiplied by 10.6 %	
Parameter	Daily Maximum (mg/L)	Monthly Average (mg/L)	Daily Maximum (mg/L)	Monthly Average (mg/L)
BOD_5	26	NA	2.76	NA
TSS	19	NA	2.01	NA
Oil and Grease[1]	29	NA	3.07	NA

[1]Based on best engineering, the limit for oil and grease is 10 mg/L. 3.07 mg/L is below the minimum detection level.

Based on Best Professional Judgment, the estimated BOD_5 and TSS concentrations are used for utility water.

	Estimated concentrations		Multiplied by 28.2 %	
Parameter	Daily Maximum (mg/L)	Monthly Average (mg/L)	Daily Maximum (mg/L)	Monthly Average (mg/L)
BOD_5	40	20	11.28	5.64
TSS	40	20	11.28	5.64

BOD_5 Daily Maximum: 39.17 + 2.76 + 11.28 = 53 mg/L
BOD_5 Monthly Average: 14.69 + 5.64 = 20 mg/L

TSS Daily Maximum: 79.56 + 2.01 + 11.28 = 93 mg/L
TSS Monthly Average: 24.48 + 5.64 = 30 mg/L

Definitions: BAT = Best available technology;
BOD_5 = Biochemical oxygen demand, 5 day;
NSPS = New source performance standards;
OCPSF = Organic chemicals, plastics and synthetic fibers;
PMF = Plastics molding and forming;

TSS = Total suspended solids.

APPENDIX 2

Approved Additives

• Optisperse AP0520	Boiler treatment additive
• Cortrol IS3000	Boiler treatment additive
• Steamate NA2160	Boiler treatment additive
• Solus AP24	Boiler treatment additive
• Flogard MS6201	Water treatment for domestic water supply
• Spectrus NX1100	Treatment additive for the chilled/scrubbed water systems
• Spectrus NX1106	Treatment additive for the chilled/scrubbed water systems
• Steamate NA2140	Treatment additive for the steam condensate system
• Foamtrol AF1660	Additive for site lagoons and cooling towers
• Gengard GN7112	Site cooling tower treatment additive
• Gengard GN8113	Site cooling tower treatment additive
• Spectrus BD1500	Site cooling tower treatment additive
• Spectrus BD1501E	Site cooling tower treatment additive
• Spectrus OX909	Site cooling tower treatment additive
• Spectrus OX103	Site cooling tower treatment additive
• Spectrus OX1202	Site cooling tower treatment additive
• Liquichlor Solution	Site cooling tower treatment additive