

What Goes Around Comes Around

**How Ohio EPA Uses
What You Report**

1972 Clean Water Act: Objective

To restore and maintain the chemical, physical, and biological integrity of the Nation's waters

- “fishable/swimmable” goals

Important CWA Principles

- 1. Discharge of pollutants is not a right**
- 2. Point sources may not discharge pollutants to surface waters without a permit (e.g. NPDES permit)**

Important CWA Principles

- 3. Point sources must employ best available technology economically achievable, regardless of receiving water condition**
- 4. More stringent water quality-based limits may be imposed if technology limits do not protect water quality**

NPDES Permits Regulatory Framework

- **Authorized by Clean Water Act Section 402,
Ohio Revised Code 6111**
- **Regulated under 40 CFR , OAC 3745**

INDIVIDUAL PERMIT DEVELOPMENT

Process Steps

1. Receive Application
2. Completeness Review
3. Develop TBELs
4. Develop WQBELs
5. Apply Requirements
6. Develop Monitoring & Reporting Requirements
7. Develop Special Conditions
8. Incorporate Standard Conditions
9. Complete Fact Sheet
10. Public Notice Permit
11. Respond to Public and EPA Comments
12. Issue Final Permit

Your Application - Deadline

- **New Discharge: Minimum 180 days before discharge starts**
 - More time required if AD project
- **Existing Discharge: 180 days before current permit expiration date**

Individual Application Types

- **Form 1: General Information**
- **Form 2A: POTWs**
- **Form 2B: CAFOs**
- **Form 2C: Existing Manufacturing, Commercial, Mining and Silvicultural**
- **Form 2D: New Manufacturing, Commercial, Mining and Silvicultural**
- **Form 2E: Non-process Manufacturing, Commercial, Mining and Silvicultural**
- **Form 2F: Industrial Storm Water**
- **Form 2S: Sewage Sludge**

POTW Application - Contents

- **Form 1**
- **Form 2A**
- **Form 2F (if applicable)**
- **Form 2S**
- **Antidegradation Addendum**

Ohio EPA Review of Your Application

- **Completeness Review**
 - Correct Forms and **CHECK?**
 - Authorized Signatory (40 CFR 122.22/OAC 3745-33-03)
 - Includes Flow and Discharge Data?
 - Calculations and Diagrams Correct?
 - Any New Pollutants?
 - **Confidential Information**

Ohio EPA Review of Your Application

- **Antidegradation?**
- **Facility Site Visit**
 - Inspect treatment processes/effluent quality
 - Bypasses/Overflows, CSOs, SSOs - Frequency of use?
NFA?
 - May involve sampling by Ohio EPA
 - Pretreatment program review
 - Review laboratory procedures/data quality
 - Important to ask questions/resolve uncertainties

It's all about the....

FACT SHEET

Fact Sheets are Required

40 CFR 124.8

- **Details which facilities must have a Fact Sheet**
 - Includes POTWs \geq 1MGD
- **Requires the Fact Sheet include the principal facts, legal, methodological and policy questions**
- **Details additional requirements for the Fact Sheet**
- **Descriptive Facts**

40 CFR 124.56

- **Derivation calculations for specific effluent limits**
- **Limits for toxic pollutants**
- **Limits on internal waste streams**
- **Limits on indicator pollutants**
- **Site specific limits**

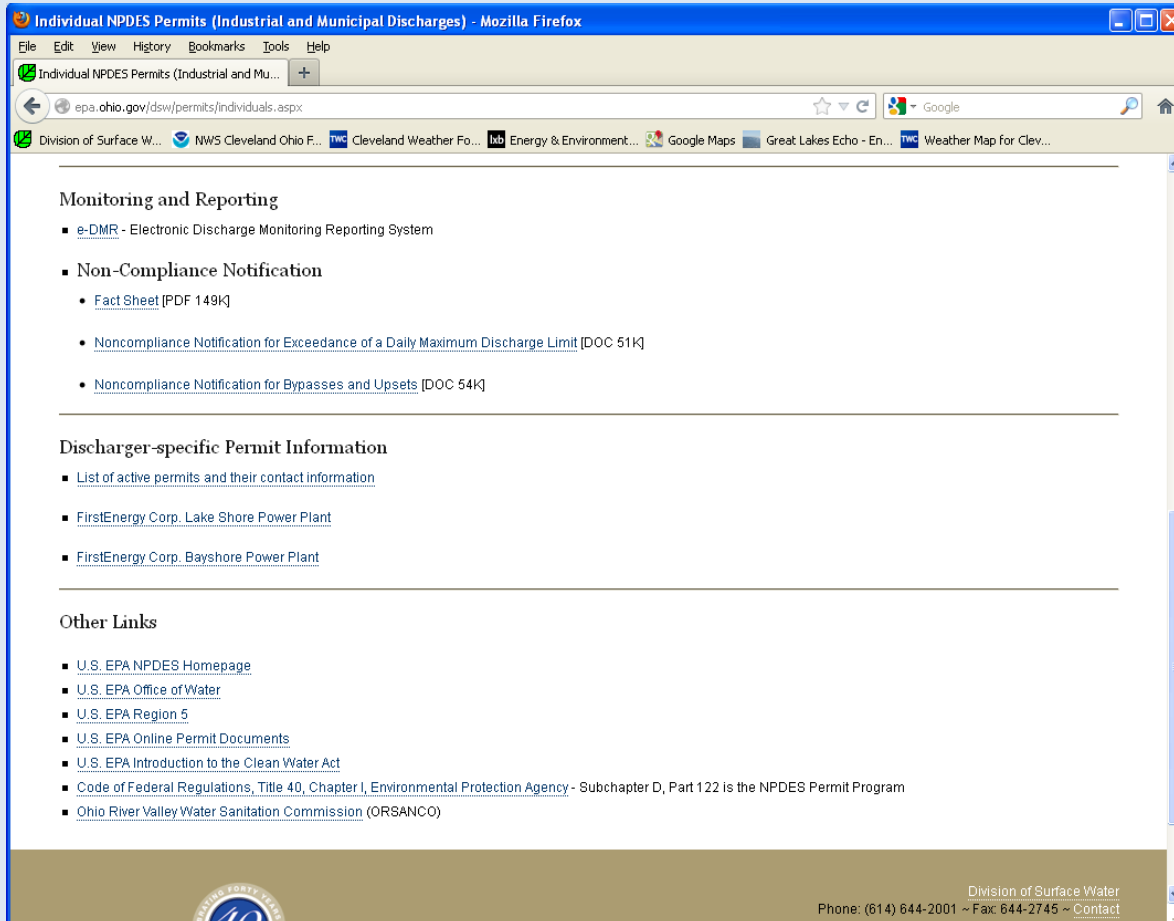
What about minor facilities

- **Includes POTWs < 1 MGD**
 - No Fact Sheet
 - All other permitting criteria apply

Where is my Fact Sheet?



Where is my Fact Sheet?

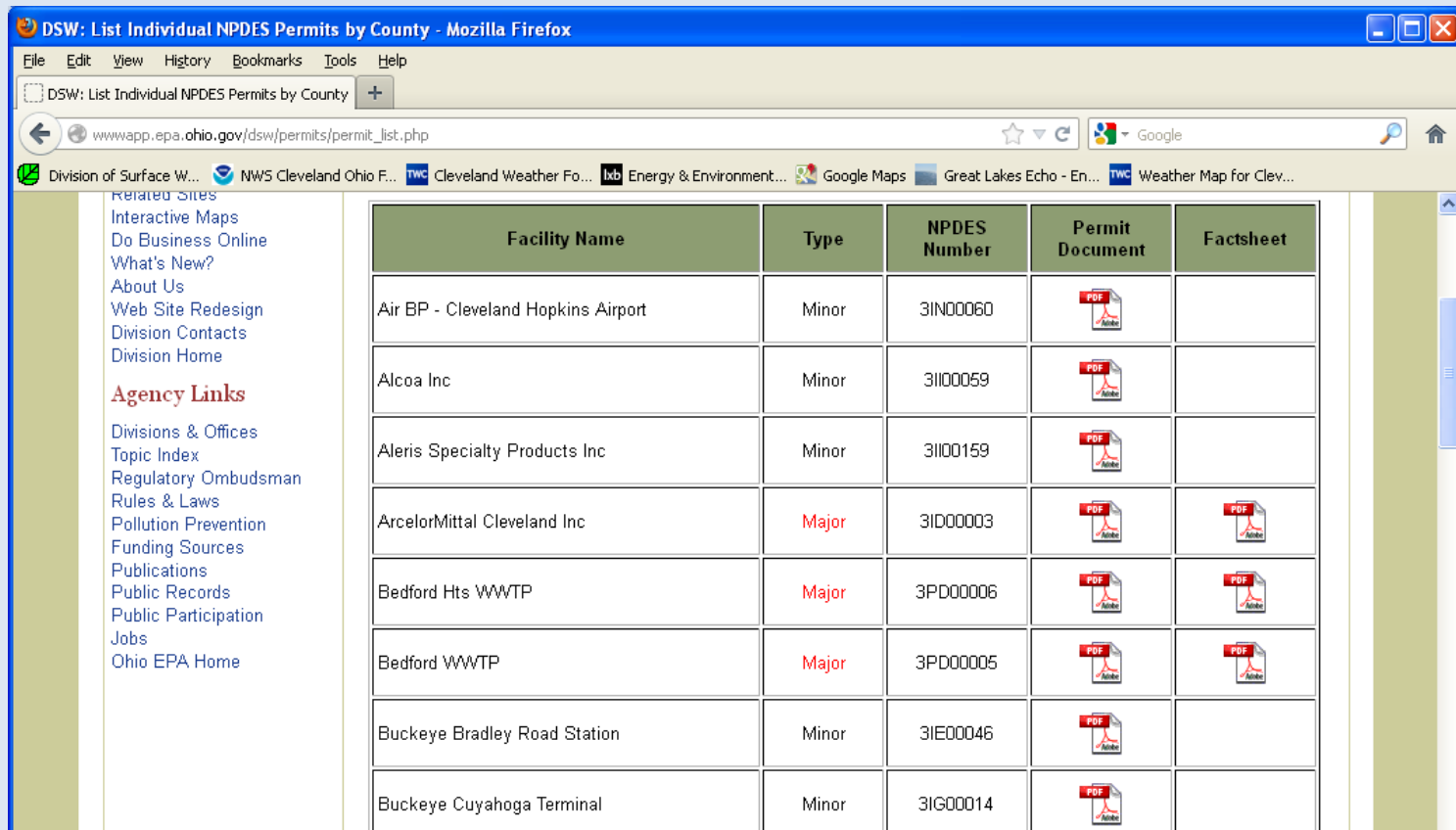


The screenshot shows a Mozilla Firefox browser window displaying the EPA website page titled "Individual NPDES Permits (Industrial and Municipal Discharges)". The page content is organized into three main sections:












- Monitoring and Reporting**
 - e-DMR - Electronic Discharge Monitoring Reporting System
 - **Non-Compliance Notification**
 - [Fact Sheet \[PDF 149K\]](#)
 - [Noncompliance Notification for Exceedance of a Daily Maximum Discharge Limit \[DOC 51K\]](#)
 - [Noncompliance Notification for Bypasses and Upsets \[DOC 54K\]](#)
- Discharger-specific Permit Information**
 - [List of active permits and their contact information](#)
 - [FirstEnergy Corp. Lake Shore Power Plant](#)
 - [FirstEnergy Corp. Bayshore Power Plant](#)
- Other Links**
 - [U.S. EPA NPDES Homepage](#)
 - [U.S. EPA Office of Water](#)
 - [U.S. EPA Region 5](#)
 - [U.S. EPA Online Permit Documents](#)
 - [U.S. EPA Introduction to the Clean Water Act](#)
 - [Code of Federal Regulations, Title 40, Chapter I, Environmental Protection Agency - Subchapter D, Part 122 is the NPDES Permit Program](#)
 - [Ohio River Valley Water Sanitation Commission \(ORSANCO\)](#)

At the bottom of the page, there is a footer with the text: "Division of Surface Water" and "Phone: (614) 644-2001 ~ Fax: 644-2745 ~ [Contact](#)".

Where is my Fact Sheet?



The screenshot shows a Mozilla Firefox browser window displaying the 'DSW: List Individual NPDES Permits by County' page. The browser's address bar shows the URL 'wwwapp.epa.ohio.gov/dsw/permits/permit_list.php'. The page features a table with five columns: Facility Name, Type, NPDES Number, Permit Document, and Factsheet. The table lists several facilities, including Air BP - Cleveland Hopkins Airport, Alcoa Inc, Aleris Specialty Products Inc, ArcelorMittal Cleveland Inc, Bedford Hts WWTP, Bedford WWTP, Buckeye Bradley Road Station, and Buckeye Cuyahoga Terminal. The 'Type' column indicates whether the permit is 'Minor' or 'Major'. The 'Permit Document' and 'Factsheet' columns contain PDF icons, indicating the location of these documents.

Facility Name	Type	NPDES Number	Permit Document	Factsheet
Air BP - Cleveland Hopkins Airport	Minor	31N00060		
Alcoa Inc	Minor	31I00059		
Aleris Specialty Products Inc	Minor	31I00159		
ArcelorMittal Cleveland Inc	Major	31D00003		
Bedford Hts WWTP	Major	3PD00006		
Bedford WWTP	Major	3PD00005		
Buckeye Bradley Road Station	Minor	31E00046		
Buckeye Cuyahoga Terminal	Minor	31G00014		

What's in My Fact Sheet?

- **Location of Discharge**
- **Facility Description**
- **Description of Existing Discharge**
- **Assessment of Impact on Receiving Waters**
- **Development of Water Quality Based Effluent Limits**
- **Reasonable Potential/Effluent Limits/Hazard Management Decisions**
- **Other Requirements**

Location, Location, Location

- **Location of Discharge**
- **Receiving Water Use Designation**
 - OAC 3745-1-08 through -32
 - Aquatic life protection, recreation use and water supply use
- **Water Quality Standards**
- **Other site specific concerns**
 - TMDLs

Facility Description

- **Design Flow**
- **Processes – Wet Stream and Solids Handling**
 - Preliminary Treatment
 - Primary Treatment
 - Secondary Treatment
 - Activated Sludge
 - Trickling Filter
 - Other
 - Tertiary Treatment
 - Anaerobic/Aerobic Digestion
- **Bypasses and Overflows**
 - 002s
 - 003s

Description of Existing Discharge (The Devil in the Details)

- **Annual Pretreatment Report Data**
- **DMR data**
- **WET data**
- **Projected Effluent Quality (PEQ)**

DMR Data

Table 2. Effluent Characterization Using Self-Monitoring Data

Summary of current permit limits and unaltered discharge monitoring report data for Southerly outfall 3PF00002001 (April 2006 – March 2011). All values are based on annual records unless otherwise indicated. * = For minimum pH, 5th percentile shown in place of 50th percentile; ** = For dissolved oxygen, 5th percentile shown in place of 95th percentile; a = weekly average.

Parameter	Season	Units	Current Permit Limits		# Obs.	Percentiles		Data Range
			30 day	Daily		50 th	95 th	
Water Temperature	Annual	C	Monitor		1826	17.6	24.3	8-25.5
Dissolved Oxygen	Summer	mg/l		5.0	920	7.5	8.6	5.4-9.5
Dissolved Oxygen	Winter	mg/l		5.0	906	9.3	10.9	5.6-12.1
Residue, Total Dissolved	Annual	mg/l	Monitor		1804	705	1230	295-2070
Total Suspended Solids	Annual	mg/l	16	24 ^a	1815	2	5	0-18
Oil and Grease, Hexane	Annual	mg/l		10	130	0	3.11	0-3.7
Nitrogen, Ammonia (NH3)	Summer	mg/l	1.7	2.6	913	0.16	0.5	0.03-1.28
Nitrogen, Ammonia (NH3)	Winter	mg/l	5.0/8.0 [#]	7.5/12 [#]	874	0.1	0.603	0-3.28
Nitrite Plus Nitrate, Total	Annual	mg/l	Monitor		1788	15	19.8	4.5-23
Phosphorus, Total (P)	Annual	mg/l	1.0	1.5 ^a	1787	0.53	0.94	0.06-1.36
Cyanide, Free	Annual	mg/l	0.0057	0.027	127	0.0015	0.00284	0-0.0045
Nickel, Total Recoverable	Annual	ug/l	Monitor		273	12.5	22	4.6-31.3
Zinc, Total Recoverable	Annual	ug/l	Monitor		273	36	49.8	13.1-66.3
Cadmium, Total Recoverable	Annual	ug/l	Monitor		273	0	0.2	0-0.7
Lead, Total Recoverable	Annual	ug/l	Monitor		273	0	0.64	0-6.1
Chromium, Total Recoverable	Annual	ug/l	Monitor		273	2	3.22	0-6.1
Copper, Total Recoverable	Annual	ug/l	23	43	273	11.8	18.6	3.7-30
Chromium, Dissolved Hexavalent	Annual	ug/l	Monitor		130	0	4.96	0-5.46
Fecal Coliform	Annual	#/100 ml	1000	2000 ^a	915	32	746	0-21400
Flow Rate	Summer	MGD	Monitor		920	90.7	190	66.6-343
Flow Rate	Winter	MGD	Monitor		906	115	253	70.5-381
Flow Rate	Annual	MGD	Monitor		1826	101	233	66.6-381
Chlorine, Total Residual	Annual	mg/l		0.021	943	0	0	0-0.123
pH, Maximum	Annual	S.U.		9.0	1826	7	7.3	6.6-8.3
pH, Minimum	Annual	S.U.		6.5	1826	6.8	7.1	6.5-7.4
Mercury, Total Recoverable	Annual	ug/l	Monitor		60	0.002	0.005	0.001-0.0059
CBOD 5 day	Summer	mg/l	10	15 ^a	913	0	3	0-13
CBOD 5 day	Winter	mg/l	16	24 ^a	878	0	4	0-12.9

Winter ammonia limit months – March, April, Nov/Dec, Jan, Feb

Annual Pretreatment Report Data

Table 1. Effluent Characterization Using Ohio EPA and Pretreatment Data

Summary of analytical results for Southerly outfall 3PF00002001. Units ug/l unless otherwise noted; PT = data from pretreatment program reports; ND = not detected (detection limit); j = estimated value, greater than MDL but less than PQL; MDL = method detection limit; PQL = practical quantification level.

PARAMETER	PT 07/27/10	PT 08/03/09	PT 01/06/08	PT 01/08/08	PT 01/10/08	PT 08/28/07	PT 08/09/06	OEPA 05/03/11
Antimony	1.39	1.86	ND(10)	1.5(j)	0.6(j)	ND(10)	ND(10)	NA
Arsenic	2.44	3.01	ND(20)	1.4(j)	1.7(j)	ND(20)	ND(20)	3.0
Barium	NA	NA	NA	NA	NA	NA	NA	21
Cadmium	0.09	ND(0.15)	ND(1.0)	0.2(j)	ND(0.2)	ND(1.0)	ND(1.0)	ND(0.20)
Chromium	1.24	1.41	ND(10)	1.6(j)	1.7(j)	ND(10)	ND(10)	2.2
Copper	6.11	4.25	ND(10)	6.8	5.9	ND(10)	ND(10)	6.3
Dissolved solids, total (mg/l)	NA	NA	NA	NA	NA	NA	NA	588
Iron	NA	NA	NA	NA	NA	NA	NA	90
Nickel	8.59	9.98	9.97	20.7	11.3	21	29.6	7.6
Selenium	1.52	1.94	ND(10)	2.6(j)	2.8(j)	ND(10)	ND(10)	ND(2.0)
Strontium	NA	NA	NA	NA	NA	NA	NA	247

Projected Effluent Quality (PEQ)

- Uses past discharge data to project / anticipate what future discharge will contain
- Conservative (high) values to ensure water quality is protected
- Uses *Your DMR Data* (and other relevant Ohio EPA Data)

PEQs

Table 3. Projected Effluent Quality Values

Parameter	units	# samples	# >MDL	PEQ average	PEQ maximum
<u>Self-monitoring (DMR) data:</u>					
Ammonia (summer)	mg/L	607	607	0.248	0.518
Ammonia (winter)	mg/L	429	429	0.190	0.440
Cadmium, TR	µg/L	273	118	0.358	0.490
Chlorine, total residual	mg/L	943	7	0.00045	0.00062
Chromium, TR	µg/L	273	271	2.62	3.40
Chromium ⁶⁺ , Dissolved	µg/L	130	64	3.189	4.368
Copper, TR	µg/L	273	273	15.2	19.4
Cyanide, free	mg/L	127	125	0.00259	0.00373
Dissolved Solids	mg/L	1804	1804	809	1141
Lead, TR	µg/L	272	33	0.430	0.684
Mercury, TR	ng/L	60	60	3.07	4.28
Nickel, TR	µg/L	273	273	17.55	23.41
Nitrate+Nitrite-N	mg/L	1788	1788	10.08	13.81
Suspended Solids	mg/L	1815	1789	2.91	5.18
Phosphorus, total	mg/L	1787	1787	0.596	0.816
Zinc, TR	µg/L	273	273	43.7	53.7
<u>Ohio EPA, Pretreatment and NEORS D</u>					
<u>data:</u>					
Antimony	µg/L	2	2	5.16	7.07
Arsenic, TR	µg/L	3	3	6.59	9.03
Barium, TR	µg/L	1	1	95	130
Bromodichloromethane ^A	µg/L	1	1	6.4	8.7
Bromomethane	µg/L	1	1	6.9	9.4
Chloroform ^A	µg/L	8	2	7.7	10.6
Dibromochloromethane ^A	µg/L	1	1	2.4	3.3
Iron, TR	µg/L	1	1	407	558
Selenium, TR*	µg/L	274	274	3.5	4.8
Strontium, TR	µg/L	1	1	1118	1531
Thallium, TR*	µg/L	252	252	7.0	9.6
Toluene	µg/L	8	1	6.9	9.5

^A Carcinogen

TR=total recoverable

* = NEORS D data

PEQs: It's Math not Magic!!



PEQs

- **OAC 3745-2-04**
- **Ohio EPA Modeling Guidance 1**
- **Two methods to calculate PEQ**
 - Method A
 - Method B
- **Case-specific**
- **Pollutant specific**

PEQs

- **Methods based on statistics**
- **“Conservative”**
 - Highest potential value
 - Potential based on uncertainty
- **Less data → More uncertainty → Higher potential value**

PEQs: Method A

- Data set has less than 10 observations
- Data set has less than 5 observations that equal or exceed the analytical detection limit
- **Max PEQ = (maximum daily concentration) * F**
- **Average PEQ = Max PEQ * 0.73**
 - F = safety/uncertainty factor

N	1	2	3	4	5	8	14	49
F	6.2	3.8	3.0	2.6	2.3	1.9	1.5	1.0

PEQs: Method B

- **Method B**

- Data set has 10 or more observations
- Data set has 5 or more observations that equal or exceed the detection limit
- Log normal calculations resulting in 90% confidence interval around the 95th percentile

PEQs: Method B

- **Maximum PEQ = $\exp(LM + k * LS)$**
- **Average PEQ for $m < 10 = \exp(LMA + k * LSA)$**
- **Average PEQ for $m \geq 10 = EX + k * \text{sqrt}(VX/m)$**

– Where:

PEQs: Method B

m = number of effluent observations per month

n = total number of effluent observations

LM = mean of the natural logs of the daily effluent data

LS = Standard Deviation of the natural logs of the daily effluent data

LMA = estimated mean of the natural logs of the monthly averages of the effluent data

PEQs: Method B

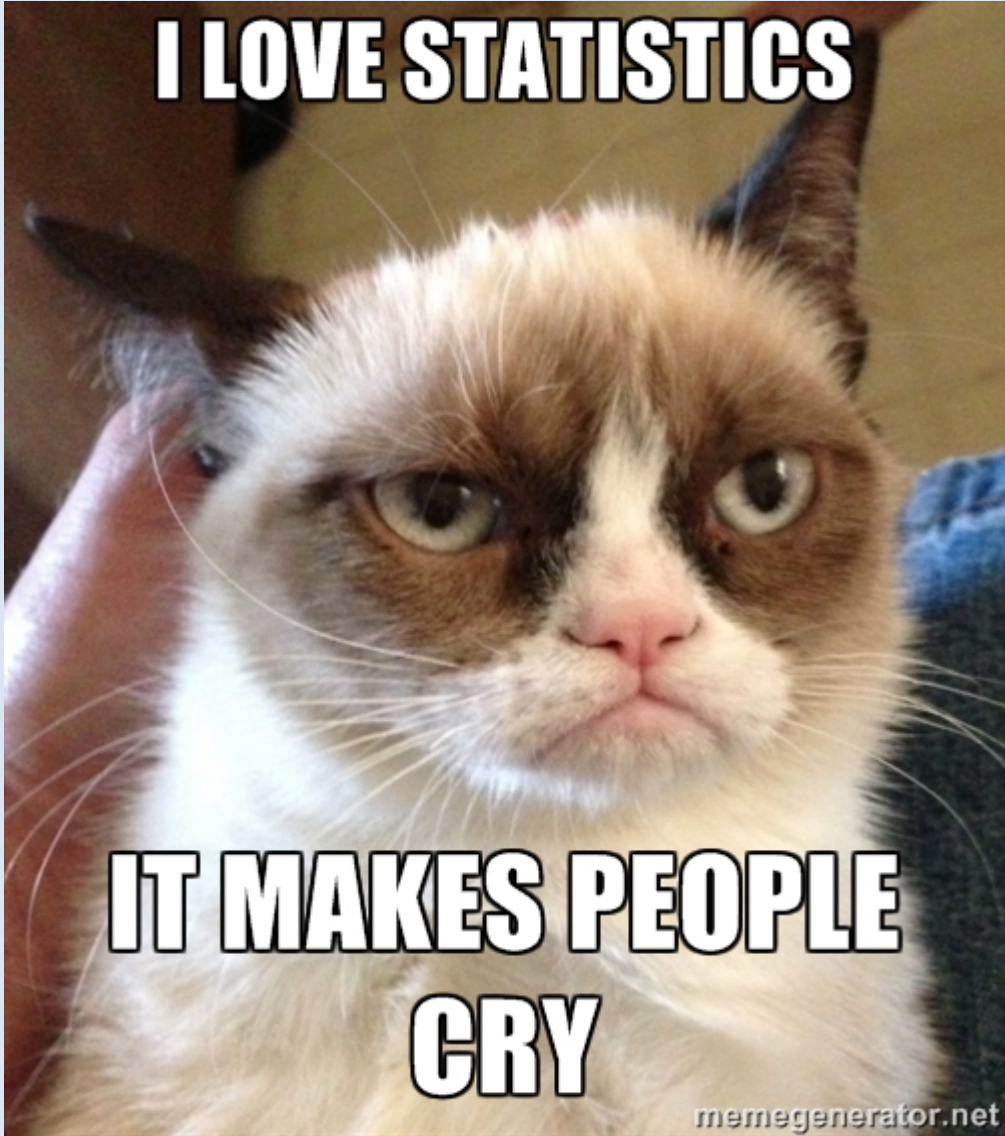
LSA = Estimated standard deviation of the natural logs of the monthly averages of the effluent data

EX = Estimated long-term mean of the daily effluent data

VX = Estimated long-term variance of the daily effluent data

$$k = \text{TINV}(p, df, nc) / \text{sqrt}(n)$$

TINV = inverse noncentral t-distribution function



PEQ using Method A

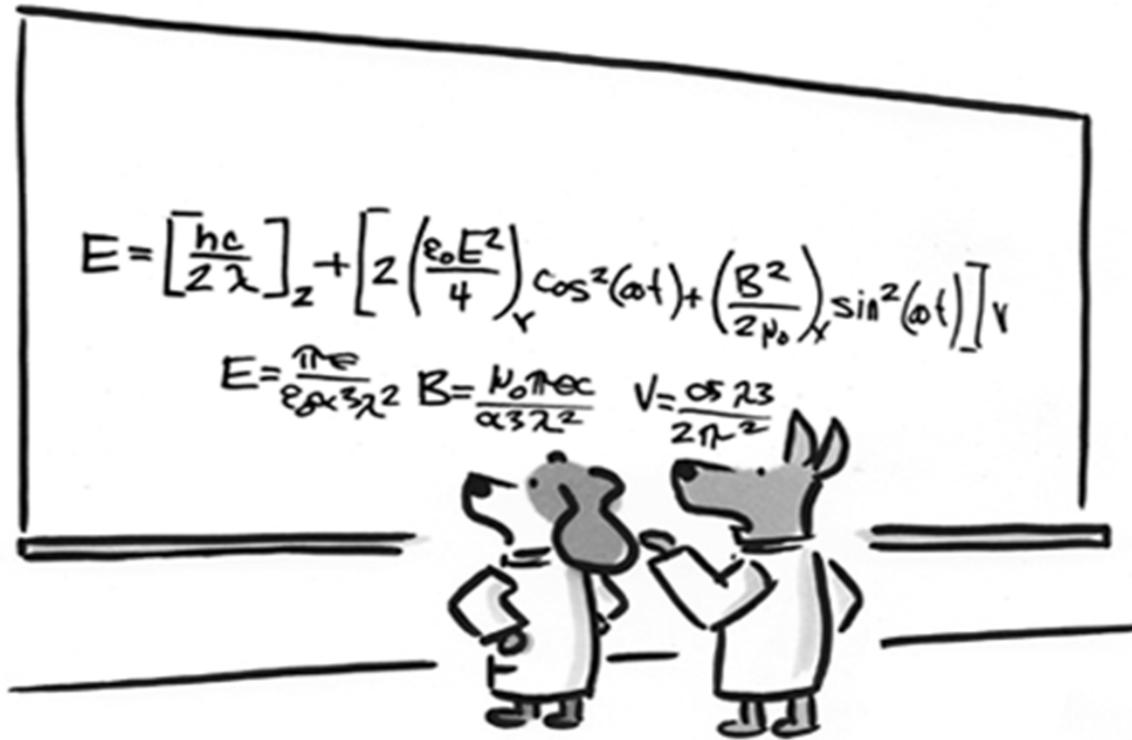
AA	20	AA	AA	AA	AA	AA	AA
AA	AA	AA	30	21	AA	AA	AH
AA	AA	AA	AA	AA	AA	AA	AA

- $n = 23$ (<5 values greater than MDL)
- $\text{Max PEQ} = (\text{maximum daily concentration}) * F$
- $\text{Max PEQ} = (30) * 1.3 = 39$
- $\text{Average PEQ} = \text{Max PEQ} * 0.73$
- $\text{Average PEQ} = (39) * 0.73 = 28.47$

PEQ using Method B: Got a Good Computer Program?

© MARK ANDERSON

WWW.ANDERTOONS.COM



"There it is. You forgot to convert to dog years."

PEQ using Method B

AA	20	AA	AA	AA	10	10	10
AA	AA	AA	30	21	10	10	10
AA	AA	AA	AA	10	10	10	10

- $n = 24$ (>5 values greater than MDL)
- Max PEQ = 28.13
- Average PEQ = 17.64

What Goes Around Comes Around:

NPDES PERMIT LIMITS

**BASED ON APPLICATION OF THE MOST
STRINGENT TBEL OR WQBEL**

Effluent Limits: TBELS

- **Technology Based Effluent Limits**
- **Represent the minimum national treatment requirements**
 - Secondary Treatment Limits
 - Treatment equivalent to secondary
- **Developed based on readily available technology**
- **Consistent limits for each regulated sector**
- **Takes economics into consideration**

POTW Secondary Treatment Regulations

- **40 CFR Part 133**
- **BOD₅/(CBOD₅)**
 - 30-day average shall not exceed 30 mg/L (25 mg/L)
 - 7-day average shall not exceed 45 mg/L (40 mg/L)
 - 30-day % removal shall not be less than 85
- **TSS**
 - 30-day average shall not exceed 30 mg/L
 - 7-day average shall not exceed 45 mg/L
 - 30-day % removal shall not be less than 85
- **pH**
 - 6.0 – 9.0

Ohio Best Available and Demonstrated Control Technology (BADCT)

- **Applies to new or expanded WWTPs(*)**
- **10 mg/L CBOD₅ (30-day average)**
- **12 mg/L TSS (30-day average)**
- **1.0 mg/L (S)/3.0 mg/L (W) NH₃-N (30-day avg.)**
- **126/100 ml E. coli (30-day average)**
- **6.0 mg/L D.O. (Min.)**
- **0.038 mg/L Chlorine (Max.)**

Effluent Limits: WQBELS

- Water Quality Based Effluent Limits
- Can be site or water body specific
- Developed to protect water quality standards
- Can not take economics into consideration
 - Well, there are always exceptions
 - Variances

Development of Water Quality Based Effluent Limits

- **Pollutant by Pollutant Basis**
- **Wasteload Allocation (WLA) Process**
- **Assimilative capacity (i.e. Available Stream Dilution)**

Water Quality Standards

- **Human health**
 - Drinking water supply
 - Nondrinking water supply
- **Wildlife**
- **Agriculture**

Water Quality Standards

- **Aquatic Life**

- IMZM – inside mixing zone maximum
- OMZM – outside mixing zone maximum
- OMZA – outside mixing zone average

Fact Sheet: Water Quality Criteria

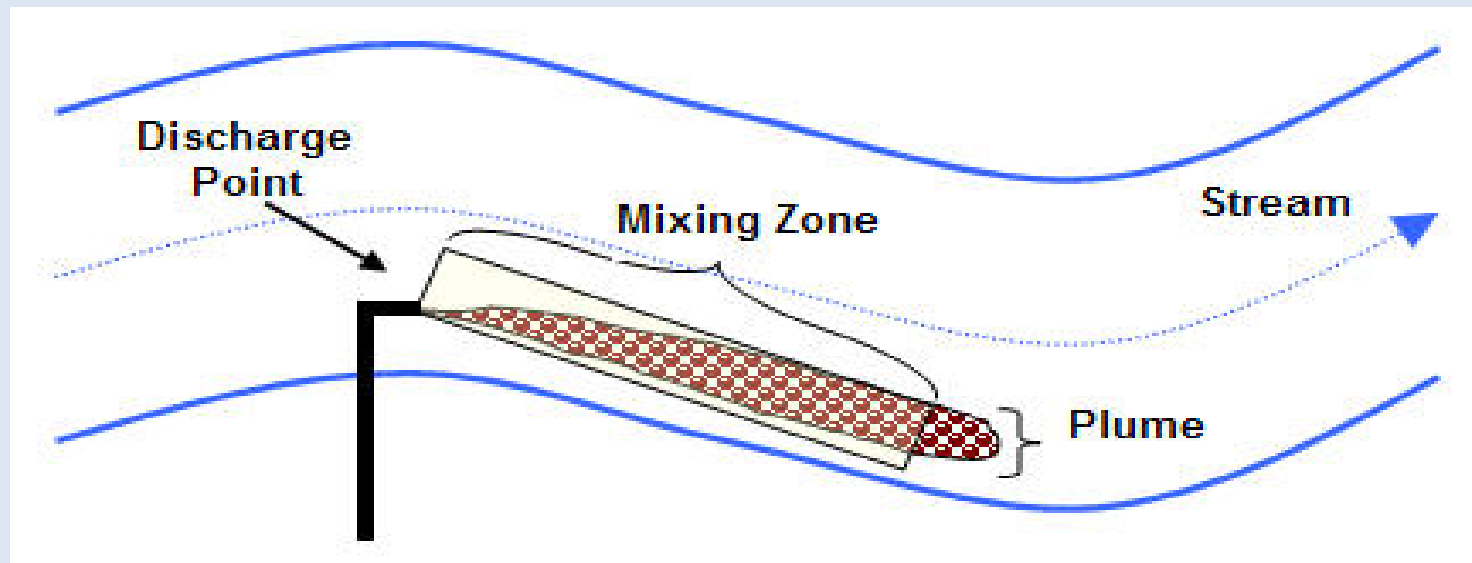
Parameter	Units	Outside Mixing Zone Criteria				Inside Mixing Zone Maximum
		Average			Maximum Aquatic Life	
		Human Health	Agri-culture	Aquatic Life		
Arsenic	µg/L	580.	100.	150.	340.	680.
Bis(2-ethylhexyl)phthalate ^c	µg/L	32	--	8.4	1100.	2100.
Cadmium	µg/L	730.	50.	3.3	7.0	14
Chlorine	mg/L	--	--	0.011	0.019	0.038
Chromium	µg/L	14000.	100.	120.	2500.	5000.
Chromium VI	µg/L	14000.	--	11	16	31
Copper	µg/L	64000.	500.	13	20.	41
Cyanide - free	mg/L	48.	--	0.0052	0.022	0.044
Lead	µg/L	--	100.	11	200.	400.
Mercury ^{AB}	ng/L	3.1	10000.	910.	1700.	3400.
Molybdenum	µg/L	10000.	--	20000.	190000.	370000.
Nickel	µg/L	43000.	200.	73	650.	1300.
Nitrate + Nitrite	mg/L	--	100.	--	--	--
Selenium	µg/L	3100.	50.	5	--	
Silver	µg/L	11000.	--	1.3	3.1	6.3
Total Filterable Residue	mg/L	--	--	1500.	--	--
Zinc	µg/L	35000.	25000.	170.	170.	330.

Mixing Zone

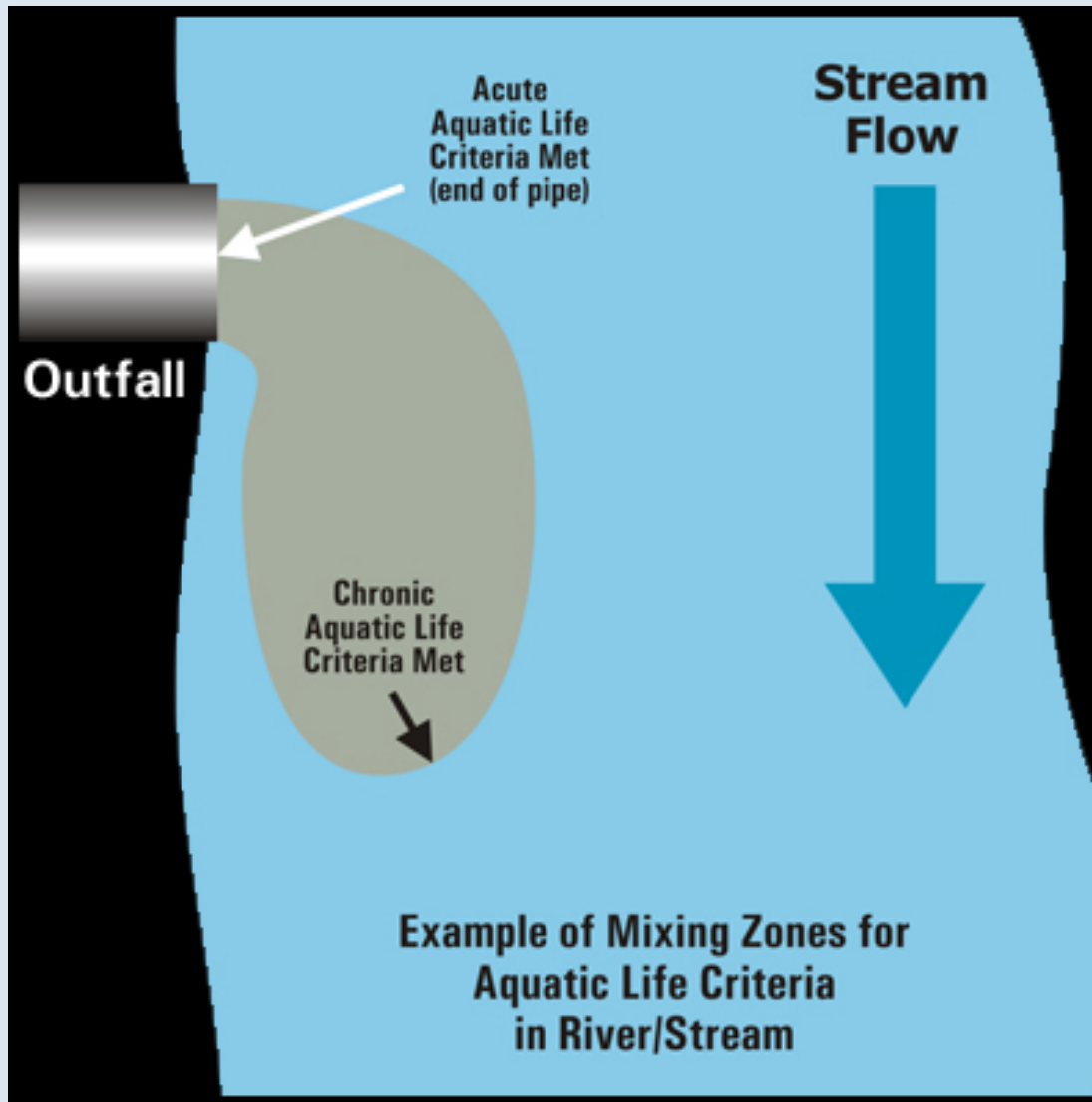
- **Where wastewater enters and initially mixes with the stream or water body (dilution area)**
- **Does not apply to BCCs, e.g. Hg**

Mixing Zone:

- Must be as small as feasible
- WQ criteria met at edge/boundary of mixing zone
- Cannot exceed IMZM



Mixing Zone: Example



Wasteload Allocations

- **WLA is the effluent limitation calculated for your facility discharge under specified flow conditions**
 - Your facility's effluent will not cause a water quality violation if below that value
- **“WLA” = “Preliminary Effluent Limit” = “PEL”**

Wasteload Allocation Inputs

- **WQC = Water Quality Criterion**
- **Q_{eff} = Effluent Flow**
- **Q_{up} = % of Stream Design Flow**
 - % defined in OAC 3745-2-05
- **WQ_{up} = Background Water Quality**

WLA: Streams vs. Lakes

Flowing Waters

$$\frac{WQC (Q_{eff} + Q_{up}) - Q_{up} (WQ_{up})}{Q_{eff}}$$

Non-flowing Waters

$$11(WQC) - 10(BACK)$$

Wasteload Allocations

- **Flowing Waters (aka Streams)**

$$\frac{\text{WQC (Q}_{\text{eff}} + \text{Q}_{\text{up}}) - \text{Q}_{\text{up}} (\text{WQ}_{\text{up}})}{\text{Q}_{\text{eff}}}$$

$$\frac{13.0 (7.74 + 8.5) - 8.5 (1.0)}{7.74}$$

- **WLA = PEL = 26.2**

Wasteload Allocations

- Non-flowing waters (aka Lakes)

11(WQC) – 10(BACK)

11(13) – 10 (1.0)

- WLA = PEL = 133

Fact Sheet: WLA Table

Parameter	Units	Outside Mixing Zone Criteria				Inside Mixing Zone Maximum
		Average			Maximum Aquatic Life	
		Human Health	Agri-culture	Aquatic Life		
Arsenic ^B	µg/L	1362 ^A	231	209	758 ^A	680
Bis(2-ethylhexyl)phthalate	µg/L	75	--	12	2465 ^A	2100
Cadmium ^B	µg/L	1719 ^A	118 ^A	4.8	16 ^A	14
Chlorine	mg/L	--	--	0.021	0.076 ^A	0.038
Chromium ^B	µg/L	32980 ^A	236	176	5769 ^A	5000
Chromium VI ^B	µg/L	32970 ^A	--	14	30	31
Copper	µg/L	150700 ^A	1172 ^A	17	42 ^A	41
Cyanide – free ^B	mg/L	113 ^A	--	0.007	0.048 ^A	0.044
Lead	µg/L	--	234	16	479 ^A	400
Mercury ^{CD}	ng/L	3.1	10000 ^A	910	1700	3400
Molybdenum ^B	µg/L	23550	--	28030	414700 ^A	370000
Nickel ^B	µg/L	101300 ^A	471	106	1497 ^A	1300
Nitrate + Nitrite	mg/L	--	384	--	--	--
Selenium ^B	µg/L	7302	118	7	--	--
Silver ^B	µg/L	25910 ^A	--	1.8	7.5 ^A	6.3
Total Filterable Residue ^B	mg/L	--	--	2102	--	--
Zinc	µg/L	82430 ^A	58880 ^A	244	391 ^A	330

Reasonable Potential: aka “Can you meet the limit”

- **Average = average PEQ
average PEL**
- **Maximum = maximum PEQ
maximum PEL**

Reasonable Potential

- **PEQ**
 - Method A = 28.47
 - Method B = 17.64
- **WLA/PEL = Preliminary Effluent Limit (PEL)**
 - Flowing Water = 26.2
 - Non-flowing Water = 133

Reasonable Potential

- PEQ from Method A
- PEL from Flowing Water
- Average = $\frac{\text{average PEQ}}{\text{average PEL}}$
- Flowing Water = $28.47/26.2 = 109\%$

Reasonable Potential

- PEQ from Method B
- PEL from Flowing Water
- Average = $\frac{\text{average PEQ}}{\text{average PEL}}$
- Flowing Water = $17.64/26.2 = 67\%$

Groupings

- **Group 1: No criteria**
- **Group 2: PEQ < 25%**
- **Group 3: PEQmax < 50% of maximum PEL and PEQavg < 50% of average PEL**
- **Group 4: PEQmax \geq 50% of PELmax or PEQavg \geq 50% of PELavg**
- **Group 5: PEQmax \geq 100% of the PEL**

Limits

- **Group 1: No limit**
- **Group 2: No limit recommended, monitoring optional**
- **Group 3: No limit recommended, monitoring optional**
- **Group 4: Monitoring is appropriate**
- **Group 5: Limit recommended**

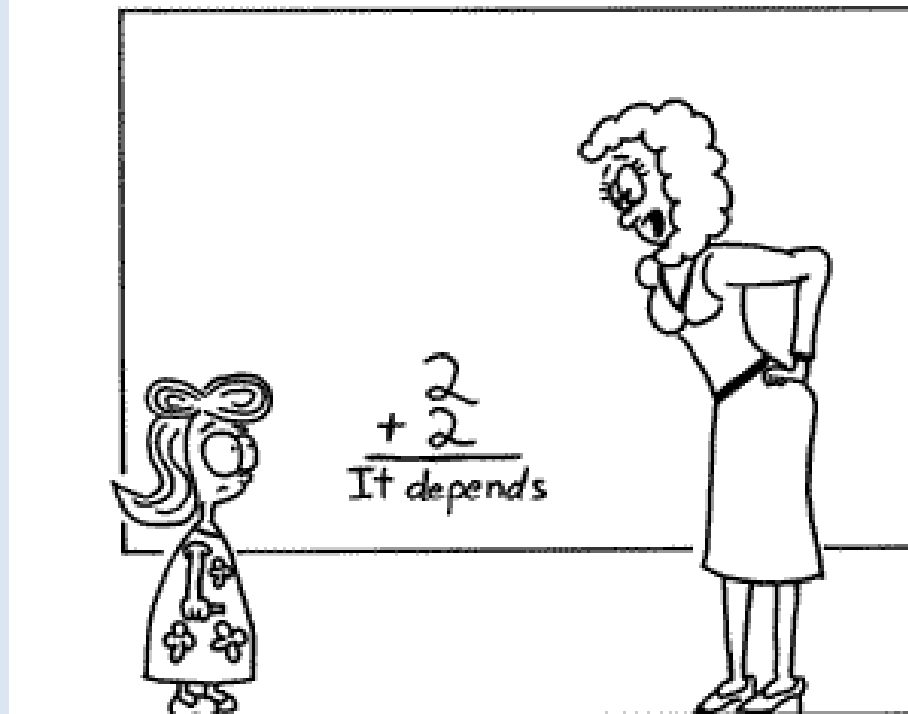
Reasonable Potential

PEQ Method A

- $n = 23, 3 > DL$
- $PEQ = 28.77$
- $PEL = 26.2$
- $RP = 109\%$
- Group 5
- **Limit Required**

PEQ Method B

- $n = 24, 13 > DL$
- $PEQ = 17.64$
- $PEL = 26.2$
- $RP = 67\%$
- Group 4
- **Monitoring Only**



"Suzie, this is math, not the law."

To Summarize:

- **The higher the Group, the more monitoring you will have to do**
- **The data you submit is used to determine the Group**
- **Less “real” data increases the probability of a high Group and permit limit**



"Your Honor, I would have concentrated on the facts, but they weren't in my favor!"

INTERMISSION

So you have a Fact Sheet:



- Now What?

NPDES Permit – 5 Main Sections

- **Title Page – Permittee name and location, permit period, authorizing statement, discharge location.**
- **Effluent Limits - applicable technology-based and water quality-based standards.**
- **Monitoring and Reporting Requirements**

NPDES Permit - 5 Main Sections

- **Other (Special) Conditions**
- **Standard Conditions (aka “Boilerplate”) - Legal, administrative, and procedural requirements of the permit.**

Application No. OH0024651

Issue Date: June 28, 2012

Effective Date: August 1, 2012

Expiration Date: January 31, 2017

Ohio Environmental Protection Agency
Authorization to Discharge Under the
National Pollutant Discharge Elimination System

In compliance with the provisions of the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et. seq., hereinafter referred to as the "Act"), and the Ohio Water Pollution Control Act (Ohio Revised Code Section 6111),

Northeast Ohio Regional Sewer District

is authorized by the Ohio Environmental Protection Agency, hereinafter referred to as "Ohio EPA," to discharge from the Southerly Wastewater Treatment Center located at 6000 Canal Road, Cuyahoga Heights, Ohio, Cuyahoga County and discharging to the Cuyahoga River in accordance with the conditions specified in Parts I, II, and III of this permit.

This permit is conditioned upon payment of applicable fees as required by Section 3745.11 of the Ohio Revised Code.

This permit and the authorization to discharge shall expire at midnight on the expiration date shown above. In order to receive authorization to discharge beyond the above date of expiration, the permittee shall submit such information and forms as are required by the Ohio EPA no later than 180 days prior to the above date of expiration.

Scott J. Nally
Director

Total Pages: 50

NPDES Permit Sections: Part I, A.

- **Outfall Limit Tables(s)**
- **001 – discharge to waters of the state**
- **002, 003... - other direct discharges**
- **001:**
 - Initial
 - Interim
 - Final

Determining Permit Limits

- CBOD, TSS, pH – always
- O&G, E. coli
- P (1.0 mg/l - Lake Erie basin)
- NH₃, DO – Design/Modeled
- Which other parameters to include:



- PEQ > 50% but < 100% of WLA, Monitoring
- PEQ > 100% of WLA, Limit

Monitoring Tables

- **Header: effective dates**
- **Parameters (Permit Guidance 1)**
- **Reporting Codes**
- **Limits**
- **Monitoring frequencies**
- **Monitoring months**
- **Sample type (grab, composite, 24 hour composite...)**
- **Footnotes**

Effluent Characteristic Parameter	Discharge Limitations							Monitoring Requirements		
	Concentration Specified Units				Loading* kg/day			Measuring Frequency	Sampling Type	Monitoring Months
	Maximum	Minimum	Weekly	Monthly	Daily	Weekly	Monthly			
01220 - Chromium, Dissolved Hexavalent - ug/l	-	-	-	-	-	-	-	1/Month	Grab	All
31648 - E. coli - #/100 ml	-	-	284	126	-	-	-	1/Day	Grab	Summer
50050 - Flow Rate - MGD	-	-	-	-	-	-	-	1/Day	Continuous	All
50060 - Chlorine, Total Residual - mg/l	0.021	-	-	-	-	-	-	1/Day	Multiple Grab	Summer
50060 - Chlorine, Total Residual - mg/l	0.021	-	-	-	-	-	-	When Disch.	Multiple Grab	Winter
50092 - Mercury, Total (Low Level) - ng/l	1700	-	-	3.1	1.13	-	0.00205	1 / 2 Weeks	Grab	All
61425 - Acute Toxicity, Ceriodaphnia dubia - TUa	-	-	-	-	-	-	-	2/Year	24hr Composite	June and Oct.
61426 - Chronic Toxicity, Ceriodaphnia dubia - TUc	-	-	-	-	-	-	-	2/Year	24hr Composite	June and Oct.
61427 - Acute Toxicity, Pimephales promelas - TUa	-	-	-	-	-	-	-	2/Year	24hr Composite	June and Oct.
61428 - Chronic Toxicity, Pimephales promelas - TUc	-	-	-	-	-	-	-	2/Year	24hr Composite	June and Oct.
61941 - pH, Maximum - S.U.	9.0	-	-	-	-	-	-	1/Day	Continuous	All
61942 - pH, Minimum - S.U.	-	6.0	-	-	-	-	-	1/Day	Continuous	All
70300 - Residue, Total Filterable - mg/l	-	-	-	-	-	-	-	1/Week	24hr Composite	All
80082 - CBOD 5 day - mg/l	-	-	15	10	-	9936	6620	5/Week	24hr Composite	Summer
80082 - CBOD 5 day - mg/l	-	-	24	16	-	15897	10598	5/Week	24hr Composite	Winter

Notes for Station Number 3PF00002001:

* Effluent loadings based on average design flow of 175 MGD.

- Winter-1: November, March and April

- Winter-2: December, January and February

- Total residual chlorine - See Part II, Item J.

- Total residual chlorine, winter months - "When discharging" means monitoring and reporting are required on days when the facility is chlorinating.

- Mercury - See Part II, Items S, W, X and Y.

- Free cyanide - See Part II, Item R.

- Whole effluent toxicity - See Part II, Item U.

- pH minimum - See Part II, Item Q.

Monitoring Table Details

- **Pollutant Parameters**
 - mg/l, $\mu\text{g/l}$, ng/l
 - contract lab may not report in the same units
- **Sample type**
 - Composite is not the same as 24 hour composite

Monitoring Table Details

- **Monitoring months**
 - Reduced monitoring frequencies
- **Footnotes**
 - Monitoring months
 - Bis(2-ethylhexyl) phthalate
 - Free Cyanide
 - Low level mercury
 - **Dissolved P**

To Do List: Read your Draft Permit and Fact Sheet

- **Interim and Final Tables**
 - Note new/different permit limits – explained in fact sheet
 - Coordinate with Compliance Schedule

To Do List: Read your Draft Permit and Fact Sheet

- **New numeric limit?**
 - WLA calculations
 - Was Method A used?
- **Your annual PPS may come back to haunt you**

NPDES Permit Sections: Part I, B.

Other Monitoring Stations

- **601 – WWTP influent**
- **602, 603... - WWTP internal (e.g. bypasses)**
- **300 – sanitary sewer overflows**
- **581, 582,... - sludge**
- **801, 802... - upstream**
- **901, 902... - downstream**

Part I, B. - INFLUENT MONITORING REQUIREMENTS

7. Influent Monitoring. During the period beginning on the effective date of this permit and lasting until the expiration date, the permittee shall monitor the treatment works' influent wastewater at Station Number 3PF00002601, and report to the Ohio EPA in accordance with the following table. Samples of influent used for determination of net values or percent removal must be taken the same day as those samples of effluent used for that determination. See Part II, OTHER REQUIREMENTS, for location of influent sampling.

Table - Influent Monitoring - 601 - Final

Effluent Characteristic Parameter	Discharge Limitations						Monitoring Requirements			
	Concentration Specified		Units				Measuring Frequency	Sampling Type	Monitoring Months	
	Maximum	Minimum	Weekly	Monthly	Daily	Loading* kg/day Weekly				Monthly
00530 - Total Suspended Solids - mg/l	-	-	-	-	-	-	-	5/Week	24hr Composite	All
00720 - Cyanide, Total - mg/l	-	-	-	-	-	-	-	1/Month	Grab	All
00981 - Selenium, Total Recoverable - ug/l	-	-	-	-	-	-	-	1/Month	24hr Composite	All
01074 - Nickel, Total Recoverable - ug/l	-	-	-	-	-	-	-	1/Month	24hr Composite	All
01094 - Zinc, Total Recoverable - ug/l	-	-	-	-	-	-	-	1/Month	24hr Composite	All
01113 - Cadmium, Total Recoverable - ug/l	-	-	-	-	-	-	-	1/Month	24hr Composite	All
01114 - Lead, Total Recoverable - ug/l	-	-	-	-	-	-	-	1/Month	24hr Composite	All
01118 - Chromium, Total Recoverable - ug/l	-	-	-	-	-	-	-	1/Month	24hr Composite	All
01119 - Copper, Total Recoverable - ug/l	-	-	-	-	-	-	-	1/Month	24hr Composite	All
01220 - Chromium, Dissolved Hexavalent - ug/l	-	-	-	-	-	-	-	1/Month	Grab	All
50092 - Mercury, Total (Low Level) - ng/l	-	-	-	-	-	-	-	1/Month	Grab	All
61941 - pH, Maximum - S.U.	-	-	-	-	-	-	-	1/Day	Continuous	All
61942 - pH, Minimum - S.U.	-	-	-	-	-	-	-	1/Day	Continuous	All
80082 - CBOD 5 day - mg/l	-	-	-	-	-	-	-	5/Week	24hr Composite	All

Notes for Station Number 3PF00002601:

- Sampling shall be performed on the same day as Outfall 3PF00002001.
- Mercury - See Part II, Item S.

NPDES Permit Sections: Part I, C.

Compliance Schedules

- **Pretreatment**
- **Construction**
- **Previous permit violations**
- **New limitation imposed (WLA process)**

Part I, C - Schedule of Compliance

A. Municipal Pretreatment Schedule

1. The permittee shall evaluate the adequacy of local industrial user limitations to attain compliance with final table limits. Technical justification for revising local industrial user limitations to attain compliance with final table limits, along with a pretreatment program modification request, or technical justification for retaining existing local industrial user limitations shall be submit to Ohio EPA, Central Office Pretreatment Unit, in duplicate, as soon as possible, but not later than 6 Months from the effective date of this permit. (Event Code 52599)

Technical justification is required for mercury. Technical justification is also required for arsenic, beryllium, cadmium, total chromium, dissolved hexavalent chromium, copper, cyanide, lead, nickel, silver and zinc unless screening of wastewater and sludge indicate these pollutants are not present in significant amounts. Furthermore, technical justification is required for any other pollutants where a local limit may be necessary to protect against pass through and interference.

To demonstrate technical justification for new local industrial user limits or justification for retaining existing limits, the following information must be submitted to Ohio EPA:

- a. Domestic/background and industrial pollutant contributions
 - b. Treatment plant removal efficiencies
 - c. A comparison of maximum allowable headworks loadings based on all applicable criteria. Criteria may include sludge disposal, NPDES permit limits, and interference with biological processes such as activated sludge, sludge digestion, nitrification, etc.
 - d. If revised industrial user discharge limits are proposed, the method of allocating available pollutant loads to industrial users
 - e. Supporting data, assumptions, and methodologies used in establishing the information a through d above
2. If revisions to local industrial user limitations are necessary the permittee shall incorporate revised local industrial user limitations in all industrial user control documents. This shall be completed not later than 4 months after the date of Ohio EPA approval of the modification request. Within 7 days of completing this requirement, the permittee shall notify, in writing, the Ohio EPA Central Office Pretreatment Unit.

Part I, C. Details

- **Compliance milestones → required report to Ohio EPA**
 - Make sure you track those
 - Can lead to SNC
- **Due dates based on NPDES permit effective date**

To Do List: Read your Draft Permit and Fact Sheet

- **Compliance Schedule**
 - Everything in logical order
 - Time allotted for tasks

NPDES Permit Sections: Part II

Other Conditions

- **Operator of Record**
 - Must be designated in writing
- **Description of Outfalls and Monitoring Stations**
 - Verify that these are correct & representative locations (Lat./Long.)

NPDES Permit Sections: Part II

Other Conditions

- **300 Station reporting requirements**
 - 24-hour call followed by 5-day report.
- **Sludge Station(s) Requirements**
 - Annual report (January 31)

Part II Other Requirements

- **Monitoring Table Footnotes**
 - **Bis-2** sample requirements
 - Manual composite in glass
 - Low level mercury methods: EPA 1631, EPA 245.7
 - **Dissolved P** sample requirements
 - Monthly filtered grab sample
 - Senate Bill 1 (Orc 6111.03) - 7/3/2015
 - Renewals/Mods. - POTWs \geq 1MGD

Part II Other Requirements

- **Monitoring Table Footnotes**
 - Free Cyanide: new approved methods, no longer use weak acid dissociable
 - Samples and detention times
- **PQLs (chlorine, etc.)**
- ***You cannot use the monitoring tables correctly without reading Part II***

Part II Other Requirements

- Pretreatment
- Biomonitoring
- Mercury Variance

- **These usually contain compliance milestones or requirements for your next permit renewal**

Part II Pretreatment

- **Program requirements**
 - IU permits, IU monitoring
 - Annual priority pollutant analysis
 - Enforcement, Reporting

To Do List: Read your Draft Permit and Fact Sheet

- **Part II Pretreatment**

- Use WLA in determining local limits
- Verify that WLA values most current information (consistent with Fact Sheet)

4. Local Limits

The permittee shall develop and enforce technically based local limits to prevent the introduction of pollutants into the POTW which will interfere with the operation of the POTW, pass through the treatment works, be incompatible with the treatment works, or limit wastewater or sludge use options.

The permittee shall use the following waste load allocation values when evaluating local limits for the following pollutants for which a final effluent limit has not been established:

Arsenic 140 ug/l
Beryllium 45 ug/l
Cadmium 5.2 ug/l
Chromium, hexavalent 12 ug/l
Chromium, total 141 ug/l
Copper 24 ug/l
Free Cyanide 29 ug/l
Lead 64 ug/l
Nickel 119 ug/l
Selenium 5.5 ug/l
Silver 1.4 ug/l
Thallium 18.5 ug/l
Zinc 263 ug/l

5. Control Mechanisms

The permittee shall issue control mechanisms to all industries determined to be Significant Industrial Users as defined in OAC 3745-3-01(FF). Control mechanisms must meet at least the minimum requirements of OAC-3745-3-03(C)(1)(c).

6. Industrial Compliance Monitoring

The permittee shall sample and inspect industrial users in accordance with the approved program or approved modifications, including inspection and sampling of all significant industrial users at least annually. Sample collection, preservation and analysis must be performed in accordance with procedures in 40 CFR 136 and with sufficient care to produce evidence admissible in judicial enforcement proceedings.

The permittee shall also require, receive, and review self-monitoring and other industrial user reports when necessary to determine compliance with pretreatment standards and requirements. If the permittee performs sampling and analysis in lieu of an industrial user's self-monitoring, the permittee shall perform repeat sampling and analysis within 30 days of becoming aware of a permit violation, unless the permittee notifies the user of the violation and requires the user to perform the repeat analysis and reporting.

Part II Biomonitoring

- **1/year bioassay (minimum if \geq 1MGD)**
- **Important to coordinate with other sampling**

Part II General Mercury Variance

- **Verify that Hg variance limit is appropriate WLA**
- **Must demonstrate POS implementation**
- **Must request variance in writing with each permit renewal**
- **Annual Hg PMP report**

Part III General Conditions

- **32 standard conditions**
- **“Boilerplate” but**
- **Important for compliance**

Part III Includes:

- **Sampling/Analytical Methods**
 - 40 CFR 136 approved methods
 - 40 CFR ≠ Standard Methods
 - Not all EPA methods are EPA approved
- **Permitee is responsible for all data, including contract lab data**
- **Reporting**
 - Must have delegation to PIN eDMR/ Lab personnel

Part III Includes:

- **Facility operation requirements**
- **Records retention**
 - 3 years (Sludge – 5 years) unless directed otherwise
- **Non-compliance notification**
 - 24-hour notification (email preferred)
- **Upsets and bypasses**

Public Notice

- **30 Day Public Notice Period**
 - Plus 15 days to publish
- **Notice Given to**
 - Applicant
 - US EPA
 - Interested Parties
 - Newspaper of Largest Circulation
 - Weekly Review
 - Ohio EPA Web

To Do List: Comment in writing before Public Comment Period ends

- **Letter to Central Office**
 - Courtesy copy to district contact
- **Ask for extension before the last day**

Comments and Responses

- **Public Notice lists where to send comments**
- **Ohio EPA Response to Comments**
- **Public Hearing Request**
 - Significant Public Interest
 - Comment Period Extended

National Pollutant Discharge Elimination System (NPDES) Permit Program**PUBLIC NOTICE****NPDES Permit to Discharge to State Waters**

Ohio Environmental Protection Agency
Permits Section
50 West Town St., Suite 700
P. O. Box 1049
Columbus, Ohio 43216-1049
(614) 644-2001

Public Notice No.:	OEPA 11-09-009 DFT
Date of Issue of Public Notice:	Sep-05-2011
Name and Address of Applicant:	Northeast Ohio Regional Sewer District, 3900 Euclid Avenue, Cleveland, OH, 44115
Name and Address of Facility Where Discharge Occurs:	Easterly STP, 14021 Lakeshore Blvd, Cleveland, OH, 44110, Cuyahoga County
Outfall Flow and Location List:	001 155,000,000 GPD 41N 34' 15" 81W 35' 22"
Receiving Stream:	Lake Erie
Nature of Business:	Wastewater Collection and Treatment
Key parameters to be limited in the permit are as follows:	CBOD 5 day, Chlorine, Total Residual, Acute Toxicity, Ceriodaphnia dubia, Chronic Toxicity, Ceriodaphnia dubia, E. coli, Fecal Coliform, Mercury, Total (Low Level), Nitrogen, Ammonia (NH3), Oil and Grease, Hexane Extr Method, pH, Maximum, pH, Minimum, Phosphorus, Total (P), Total Suspended Solids

On the basis of preliminary staff review and application of standards and regulations, the director of the Ohio Environmental Protection Agency will issue a permit for the discharge subject to certain effluent conditions and special conditions. The draft permit will 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. Any person may submit written comments on the draft permit and administrative record and may request a public hearing. A request for public hearing shall be in writing and shall state the nature of the issues to be raised. In appropriate cases, including cases where there is significant public interest, the director may hold a public hearing on a draft permit or permits prior to final issuance of the permit or permits. Following final action by the director, any aggrieved party has the right to appeal to the Environmental Review Appeals Commission.

Issue Final Permit

- **Draft Permit normally includes proposed Effective Date**
- **Effective Beginning of Month**

To Do List: After final permit issued

- **Note changes**
- **Significant changes from Draft discussed in written response**

To Do List

- **Note all reporting requirements**
 - Infrequent, unusual samples
 - Part I., C. Schedule of Compliance
 - Part II

To Do List

- **Monitoring months**
- **Sample type**
- **Special sample requirements**
- **Reporting units**
 - mg/l, μ g/l, ng/l

To Do List

- **Sample early in the month**
 - Sampling problems
 - Result violates monthly average

To Do List

- **Coordinate WET, TDS, metals, ammonia**
- **WET common causes:**
 - TDS (*c. dubia*)
 - Ammonia

To Do List

- **Make sure you have NPDES permit limits and WLA values available for easy reference**
 - WLA Table from Fact Sheet
 - “Summary of Effluent Limits to Maintain Applicable Water Quality Criteria”
 - Don’t forget WET WLA

To Do List

- **Pay attention to how results are reported**
 - Contract lab may not report in same units as NPDES permit
 - MDL vs. PQL

MDL vs. PQL

- **MDL = Method Detection Level**
 - Value where 99% certain pollutant is present
 - Uncertain actual concentration
- **PQL = Practical Quantification Level**
 - Certain actual concentration
 - Usually 3 to 5 times MDL
- **MDL required by NPDES Permit**
- **PQL > Limit or WLA**

To Do List

- **Compare your sample results to WLA table values**
 - Result > NPDES Permit Limit
 - Result > WLA
 - Detection level \geq WLA

“AA” isn’t Enough

- What is the MDL?
- MDL > Permit Limit → Maybe it isn’t a violation of the permit limit, but maybe it is; you can’t prove your discharge was below the limit
- Cadmium Permit Limit is 3.2 µg/l, your result is AA, MDL = 5.0 µg/l

“AA” isn’t Enough

- What is the MDL?
- MDL > WLA → Maybe your discharge didn’t violate water quality standards, but maybe it did
- Cadmium WLA is 3.2 $\mu\text{g}/\text{l}$, your result is AA, MDL = 5.0 $\mu\text{g}/\text{l}$

Problem Parameters

- **Cadmium, TR**
 - OMZA 2.5 – 7.3 $\mu\text{g/l}$
- **Lead, TR**
 - OMZA 6.4 – 37 $\mu\text{g/l}$
- **Hexavalent Chromium, Dissolved**
 - OMZA 11 $\mu\text{g/l}$

Problem Parameters

- **Selenium, TR**
 - OMZA 5.0 $\mu\text{g/l}$
- **Silver, TR**
 - OMZA 1.3 $\mu\text{g/l}$
- **Bis(2-ethylhexyl)phthalate**
 - OMZA 8.4 $\mu\text{g/l}$

Low Level Mercury

- **Investigate high results, esp. for effluent**
 - Unusual sample conditions?
 - Include test blanks and get results
 - Grab = “snapshot in time”

Question Anything Questionable

- **Check computations**
- **Ask about lab operations**
 - Recent equipment failure/calibration/maintenance?
 - Sample collection and handling?
- **Did the sample appear different?**

To Do List

- **If results reported incorrectly, notify us in writing/email**
- **If sampling performed incorrectly, notify us in writing/email**

To Do List

- **Always submit corrected DMRs**
- **If POTW operations change significantly, notify us in writing/email**

Next Renewal

- **DMR, PPS data used for NPDES permit renewal**
 - Previous 5 years unless good reason to use different time period

Next Renewal

- **High sample results reported**
 - Reporting error by you or lab
 - Contaminated sample
 - Sample not representative

- **NPDES permit limit**

Next Renewal

- **High detection levels**
 - Skew the data set in Method B
 - Result in high PEQ in Method A

Next Renewal

- **If the DL > WLA, there will be additional monitoring in the new NPDES permit**
 - Part II language specifying detection level

(BTW, you've wasted five years of sampling and analysis costs)

Don't Forget

- **Part 1,C commitments**
 - Local limits
 - Other compliance schedule items
- **Mercury variance requirements**
- **Required reports**

Detection Levels Info

- **PP Form Recommended Detection Levels**

Division of Surface Water -> Quick Link

“Pretreatment Program” -> Approved

**Pretreatment Programs -> Forms for Approved
programs -> Recommended Detection Levels
for Priority Pollutant Scans**

Detection Levels Info

- “Limits Below Quantification Level” Permit Guidance 9

http://www.epa.state.oh.us/Portals/35/guidance/permit_9.pdf

REMEMBER:

**Ohio EPA uses *your data* to
develop the NPDES Permit**

**What goes around comes
around**

Questions?

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