United States
Environmental Protection
Agency

Office of Water
(4203)

EPA 833-B-97-001
January 1997

EPA U.S. EPA NPDES Permit Writers' Course

Workbook

Printed on recycled paper

TABLE OF CONTENTS

MODULE # 1

TITLE: **Overview of the Clean Water Act and the National Pollutant Discharge Elimination System (NPDES) Program**

OVERALL OBJECTIVES:

- Identify the objective of the Clean Water Act
- Discuss major provisions of the Clean Water Act
- State of the purpose of the NPDES Program
- Illustrate the scope/size of the program in number of permittees
- Discuss the history and evolution of the NPDES program
- Explain future direction of the NPDES program

LOGISTICS:

Presentation Format: Lecture
Approximate Presentation Time: 60 minutes
Review Questions/Exercise: None
Applicable Statutory/Regulatory Citations:

Clean Water Act (CWA)	33 U.S.C. 1251 et seq

Overview of the Clean Water Act and the National Pollutant Discharge Elimination System (NPDES) Program

Statutory Evolution of the NPDES Program

1800's - 1970 → 1972 → 1976 → 1977 → 1979 → 1987

- Federal Water Pollution Control Act Amendments (Clean Water Act)
  - Established NPDES, pretreatment, and construction grants programs
    - Permits are a privilege – not a right
    - Effluent limits must be both technology- and water quality-based
    - Maximum duration is 5 years

Statutory Evolution of the NPDES Program

1800's - 1970 → 1972 → 1976 → 1977 → 1979 → 1987

- Federal Water Pollution Control Act Amendments (Clean Water Act) (Cont'd)
  - Established compliance dates
  - Provided for state programs
  - Indicated permit compliance is shield
  - Established significant penalties for permit violations

Statutory Evolution of the NPDES Program

1800's - 1970 → 1972 → 1976 → $\boxed{1977}$ → 1979 → 1987

- Clean Water Act Amendments
  - Adopted provisions of NRDC Consent Decree
  - Clarified that Federal facilities are subject to State programs
  - Pretreatment program delegation
    - Authorized EPA to approve local pretreatment program
    - Required NPDES states to modify programs to include pretreatment oversight

Statutory Evolution of the NPDES Program

1800's - 1970 → 1972 → 1976 → 1977 → 1979 → $\boxed{1987}$

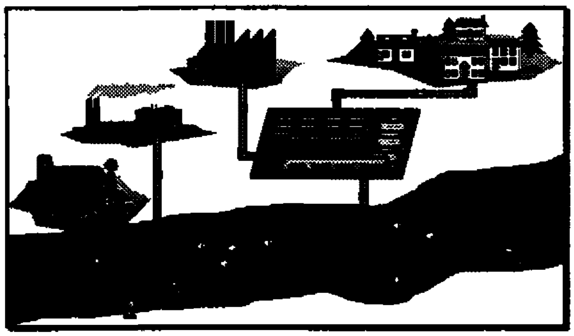
- Water Quality Act
  - Specifies storm water permitting requirements
  - Designates that Indian tribes be considered "States"
  - Creates Federal sludge management program
  - Increased penalties for noncompliance
  - Renewed emphasis of surface water toxics control

NPDES Statutory Framework

- All "point" sources
- "Discharging pollutants"
- Into "waters of the U.S."

⇨ Must obtain an NPDES permit from EPA or an approved State

NPDES Permit Program



Distribution of Dischargers*

Majors	Type of Facility	Minors
3,962	Municipal	12,011
3,023	Non-Municipal	44,111
144	Federal	999
7,129	Total	57,121

64,250 Individual Permits
11,642 Applications with Permits Not Issued

* As of 2/95

CWA Classes of Pollutants

- Conventional pollutants
  - BOD
  - TSS
  - Oil and Grease
  - Fecal Coliforms
  - pH
- Toxic pollutants
  - Heavy metals
    - Copper
    - Lead
    - Zinc
    - Nickel
    - Chromium
    - Etc.

CWA Classes of Pollutants (Continued)

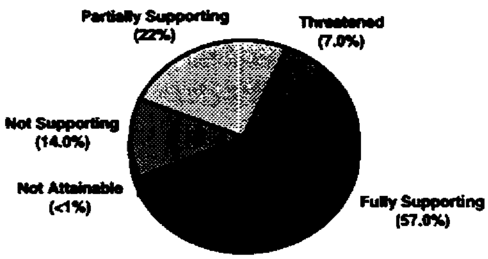
- Toxic pollutants (Cont'd)
  - Organic chemicals
    - Benzene
    - 1, 2 - Dichlorobenzene
    - Carbon tetrachloride
    - Etc.
- Nonconventional pollutants
  - Ammonia
  - Chlorine
  - Toxicity
  - Etc.

NPDES Accomplishments to Date

Since 1972:

- $70 Billion - POTW construction
- Pollutant loads reduced from 7 to 4.3 thousand tons per day
- Water bodies meeting standards increased from 37 to 57 %

Rivers and Streams*



* 643,000 of 3.5 million miles assessed.

Source: 1994 State 305(b) reports

Current NPDES Program Direction

- **Ecosystem Protection**
  - NPDES Watershed Strategy
- **Common Sense Initiative**
  - Industry-specific multimedia protection
- **Pollution Prevention**
- **Control of Wet Weather Discharges**

CLEAN WATER ACT
Key Sections

Title I	**Research and Related Programs** - Section 101 Declaration of Goals and Policy
Title II	**Grants for Construction of Treatment Works**
Title III	**Standards and Enforcement** - Section 301 Effluent Standards - Section 302 Water Quality-Related Effluent Limitations - Section 303 Water Quality Standards and Implementation Plans - Section 304 Information and Guidelines [Effluent] - Section 305 Water Quality Inventory - Section 307 Toxic and Pretreatment Effluent Standards
Title IV	**Permits and Licenses** - Section 402 National Pollutant Discharge Elimination System - Section 405 Disposal of Sewage Sludge
Title V	**General Provisions** - Section 510 State Authority - Section 518 Indian Tribes
Title VI	**State Water Pollution Control Revolving Funds**

MODULE # 2

TITLE: **Scope and Regulatory Framework of the NPDES Program**

OVERALL OBJECTIVES:

- Identify the general NPDES Program areas
- Provide an overview of the Code of Federal Regulations
- Identify NPDES program regulatory framework (Part 122)
- List and explain essential sections of Part 122
- Define essential terminology (e.g., point source, pollutant)
- Explain the roles of Federal and State authorities
- Provide authorization status of states

LOGISTICS:

Presentation Format: Lecture
Approximate Presentation Time: 30 minutes
Review Questions/Exercise: None
Applicable Statutory/Regulatory Citations:

CWA Section 402	National Pollutant Discharge Elimination System
CWA Section 405	Disposal of Sewage Sludge
40 CFR Part 122	EPA Administered Permits Programs: The National Pollutant Discharge Elimination System
40 CFR Part 125	Criteria and Standards for the National Pollutant Discharge Elimination System

Scope and Regulatory Framework of the NPDES Program

Learning Objectives

- Define scope of NPDES program
- Describe NPDES regulatory framework
- Explain role of EPA and State/Tribal Authorities
- Provide program status

NPDES Regulation

- Code of Federal Regulations (CFR)
  - Where regulations promulgated in FR are published annually
  - Title 40: Protection of Environment

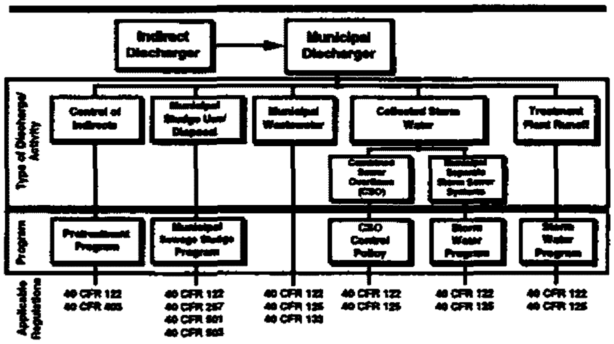
NPDES Regulations (Continued)

- **Federal Register (FR)**
  - Where rules are first proposed and then promulgated
  - Includes background information (i.e., preamble)
  - Published daily

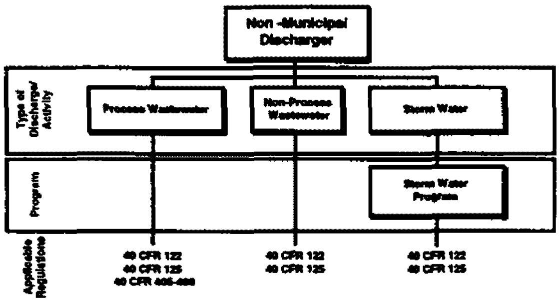
Key NPDES Regulations

40 CFR Part	Description
121	State Certification of Activities Requiring a Federal License or Permit
122	EPA Administered Permit Programs: The National Pollutant Discharge Elimination System
123	State Program Requirements
124	Procedures for Decisionmaking
125	Criteria and Standards for the National Pollutant Discharge Elimination System
129	Toxic Pollutant Effluent Standards
130	Water Quality Planning and Management
131	Water Quality Standards
133	Secondary Treatment Regulation
136	Guidelines for Establishing Test Procedures for the Analysis of Pollutants
401	General Provisions
403	General Pretreatment Regulations
405-499	Effluent Limitations Guidelines and Standards

Scope of NPDES Program (Continued)



Scope of NPDES Program (Continued)



NPDES Implementation

- Before State/Tribal program approval:
  - EPA issues permits
  - EPA conducts compliance and monitoring activities
  - EPA enforces
- After State/Tribal program approval:
  - States implement as above
  - EPA role = oversight
    - Grants
    - Administrative, technical and legal support and training
    - Enforcement as necessary

Types of NPDES Authorization

1. Basic Municipal and Industrial Permit Program
2. Pretreatment Program
3. Federal Facilities Program
4. General Permit Program
5. Sludge Permit Program

FEDERAL NPDES REGULATIONS
(40 CFR Part 122)

Subpart A - Definitions and General Program Requirements
122.1 Purpose and Scope of NPDES Program
122.2 Definitions
122.3 Exclusions
122.4 Prohibitions
122.5 Effect of a Permit
122.6 Continuation of Expired Permits
122.7 Confidentiality of Information

Subpart B - Permit Application and Special NPDES Program Requirements
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122.22 Signatures Requirements for Applications
122.23 Animal Feeding Operations
122.24 Aquatic Animal Production
122.25 Aquaculture
122.26 Storm Water Discharges
122.27 Silviculture
122.28 General Permits
122.29 New Sources and New Discharges

Subpart C - Permit Conditions
122.41 Standard Conditions
122.42 Standard Conditions Applicable to Specified Categories
122.43 Permit Conditions
122.44 Permit Limitations
- (a) Technology Basis
- (b) Other Basis (not WQ)
- (c) Reopeners
- (d) Water Quality Basis
- (e) Priority Pollutants
- (f) Notification Levels
- (g) 24 Hour Reporting
- (h) Duration of Permits
- (i) Monitoring
- (j) Pretreatment Program
- (k) Best Management Practices
- (l) Antibacksliding
- (m) Private Treatment Works
- (n) Grants
- (o) Sludge
- (p) Coast Guard
- (q) Navigation

122.45 Calculating Limitations
- (a) Discharge Points
- (b) Production Basis
- (c) Metals
- (d) Continuous Discharges
- (e) Non-continuous Discharges
- (f) Mass Based Limits
- (g) Intake Water Pollutants
- (h) Internal Waste Streams
- (i) Discharge into Wells

122.46 Duration of Permits
122.47 Schedules of Compliance
122.48 Reporting
122.49 Consideration of Other Federal Laws
122.50 Disposal to Other Points

Subpart D - Transfer, Modification, Revocation and Reissuance, and Termination of Permit
122.61 Transfer of Permits
122.62 Modification or Revocation and Reissuance of Permits
122.63 Minor Modifications of Permits
122.64 Termination of Permits

United States Environmental Protection Agency
Office of Wastewater Management

September 1996

PIPES

Point Source Information Provision Exchange System

WHAT IS PIPES

The Point Source Information Provision Exchange System (PIPES) is a free, public, electronic Bulletin Board System (BBS) and internet site (WWW compatible!) designed to facilitate the exchange of Office of Water-related information among EPA, states, municipalities, industry, and the public.

PIPES was created by the Office of Wastewater Management (OWM) and is intended solely to further the mission and goals of the U.S. Environmental Protection Agency and its point source permitting programs. PIPES operates virtually 24 hours a day (shutting down for about 10 minutes every night at 3:00 a.m. EST for maintenance activities).

WHAT TO DO ON PIPES

PIPES allows users to:

- Exchange public information with hundreds of environmental professionals
- Select and download any file, or read text files online, including policy documents and guidance manuals
- Send and receive E-Mail to and from PIPES and non-PIPES users **NEW!**
- Search full text by keyword or multiple words; or manually search menus and file directories for specific files
- View and add upcoming water-related conferences, meetings, etc. to a calendar of events **NEW!**
- Download computer program utilities.

TYPES OF INFORMATION ON PIPES

The PIPES BBS includes numerous individual forum areas containing message centers and downloadable files on:

Pretreatment	Wet Weather
Storm Water	Watersheds
NPDES	Mining
Combined Sewer Overflows	Federal Advisory Committees
Sanitary Sewer Overflows	General Water Information
Sewage Sludge	BBS/WWW Utilities.

HOW TO CONTACT PIPES

Modem BBS: **(703) 749-9216**

NEW! WWW address:
http://pipes.ehsg.saic.com
telnet: pipes.ehsg.saic.com

WHO TO CONTACT FOR HELP:

Technical Support: **(703) 821-4697**

NEW! Sysop E-mail: **brad_maguire@cpqm.saic.com**

PIPES users are strongly encouraged to download (from the Utilities directory on PIPES) and install "client2.exe" which provides an interface for operating PIPES in a Windows-based environment either through modem or the internet. Non-internet and non-Windows users should download and install "riptm154.zip" which provides a graphical interface using Ripterm telecommunication software.

For more information on PIPES, please contact:

Tony Smith
U.S. EPA/OWM
401 M Street, SW
Washington, DC 20460
Telephone: (202) 260-1017
Fax: (202) 260-1156
PIPES User ID: Tony Smith

EQUIPMENT NEEDED TO CONNECT TO PIPES

To use the PIPES BBS, users need a computer, a modem (the faster the better) and any necessary cables and telephone jacks to connect the modem to the computer and to the telephone system, and a communications software program.

To access PIPES via the internet, users must have access to the internet (either via a dial-up service or a direct connection). PIPES can be accessed via the internet through a client/server mode (e.g., telnet or rlogin) or WWW navigational software (e.g., Mosaic).

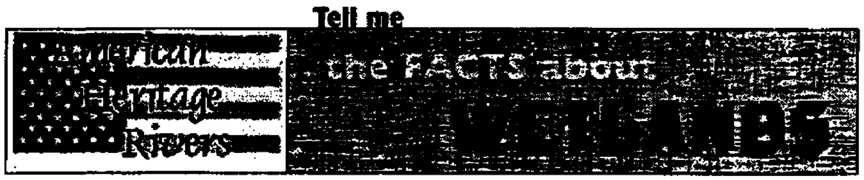
The "Utilities" directory on PIPES contains several freeware communication software programs available for downloading that provide a user friendly interface to the PIPES BBS and are highly recommended.

TEXT

EPA

- WHAT'S NEW
- WATER TOPICS
- PUBLICATIONS
- INFORMATION
- DATA & TOOLS
- REGULATIONS
- POLICY/GUIDANCE
- LEGISLATION
- EVENTS
- YOU & CLEAN WATER
- KID'S STUFF
- OTHER LINKS
- EPA HOME

FEBRUARY 1997



WATER PROGRAMS | SURF YOUR WATERSHED

SEARCH/COMMENTS

Environmental Protection Agency's Office of Water
Email: OW-General@epamail.epa.gov

URL: http://www.epa.gov/ow
OW Web Statistics

WATER

U.S. environmental protection agency — February 1997

There is also a **graphical version** of this homepage available.

America's Water Resources-Information on the value and quality of our Nation's water resources.
Water Topics-EPA programs and partnerships at work to protect and restore America's water resources.
Regulations - Information on Federal regulations that affect America's water resources.
Policy Guidance
Legislation
You And Clean Water-Information to raise public awareness and encourage involvement in water quality issues.
Water Events- A listing of national Water Conferences in your area
Volunteer Monitoring- Take part in Monitoring the Health of America's Waters
Information -Hotlines, periodicals, bulletin boards, and workshop training opportunities.
Publications
Data & Tools

What's New?
Office of Water

- **Office of Wetlands, Oceans, and Watersheds** (text-version)
- **American Indian Environmental Office**
- **Office of Ground Water and Drinking Water**
- **Office of Science and Technology**
- **Office of Wastewater Management**
- **Regions**

Kid's Stuff Homepage -Learn about Water and the Environment the *FUN* way!

Other Servers- Go to other places to find related information.
Search-What subjects interest you?
Your comments are welcome.

EPA HOME

OW Retrieval Statistics

URL:http://www.epa.gov/OW/text.html

WATER

U.S. environmental protection agency

February 1997

WATER PROGRAMS

- Wetlands, Oceans, & Watersheds
- Scientific Resources
- Wastewater
- Groundwater & Drinking Water
- American Indian Issues
- Regions

EPA HOME ?

text version
office of water
EPA

Office of Wastewater Management

U.S. environmental protection agency

WHO WE ARE
Organization Chart

WHAT WE DO
Vision/Mission
Financial Assistance
Pollution Prevention
Technical Assistance
Permits (NPDES)
Wet Weather Programs
Pretreatment Programs
Sewage Sludge/Biosolids
CW Needs Survey
Mexican Border Programs

PUBLICATIONS
Selected Documents
Catalog of PUBS
Ordering Publications

LAWS/REGS/ POLICY GUIDANCE
Clean Water SRF
NPDES

FREQUENTLY ASKED QUESTIONS
About Permitting
About Financing

GENERAL Public information

WHAT'S NEW
New Meetings and Pubs
Future Products

CALENDAR OF EVENTS
Upcoming Meetings
Workshops
Training Courses

INFORMATION RESOURCES
Point Source Information Provision and Exchange System (PIPES)

REINVENTION
Streamlining NPDES Permits

INNOVATIVE TECHNOLOGY

This page has been accessed 0844 *times since February 4, 1997.*
http://www.epa.gov/owm/index.html

Please direct any comments about this page to smith.tony@epamail.epa.gov

MODULE # 3

TITLE: **NPDES Permits: Types, Components, and Issuance Process**

OVERALL OBJECTIVES:

- Explain the various types of NPDES permits
- Introduce and discuss the major components of an NPDES permit
- Introduce the decision-making process for effluent limits
- Explain the permit development process
- Identify process differences for new permits vs. permit renewals vs. re-opened or modified permits

LOGISTICS:

Presentation Format: Lecture
Approximate Presentation Time: 30 minutes
Review Questions/Exercise: None
Applicable Statutory/Regulatory Citations:

CWA Section 402	National Pollutant Discharge Elimination System
CWA Section 405	Disposal of Sewage Sludge
40 CFR Part 122	EPA Administered Permits Programs: The National Pollutant Discharge Elimination System
40 CFR Part 125	Criteria and Standards for the National Pollutant Discharge Elimination System

NPDES Permits: Types, Components, and Issuance Process

167D-3-1

Learning Objectives

- Describe NPDES permit types
- Discuss major components of NPDES permit
- Describe the overall permit issuance process

167D-3-2

What is a Permit?

- It is a license . . .
  - Issued by the government to persons conducting business in the United States
  - Granting permission to do something which would be illegal in the absence of the permit
- There is no right to a permit and it is revocable for cause (noncompliance)
- For our purposes, NPDES permit is license to discharge

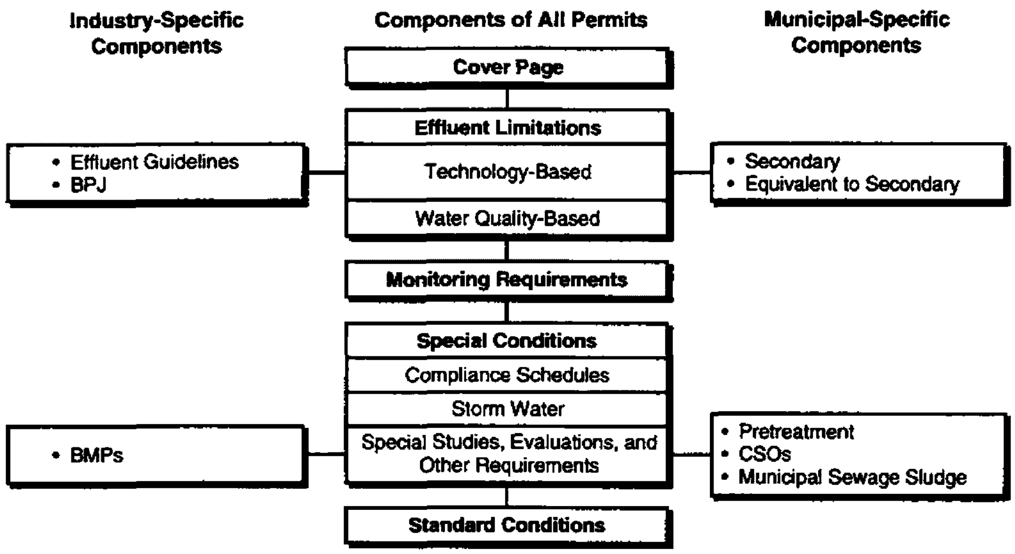
1670-3-3

Types of NPDES Permits

- Individual
  - 1 application submitted → 1 permit issued
- General
  - 1 permit issued → many applications submitted
  - Issued on an area-wide (State, watershed, etc.) basis
  - Available when:
    - Same or similar operations
    - Discharge same wastes

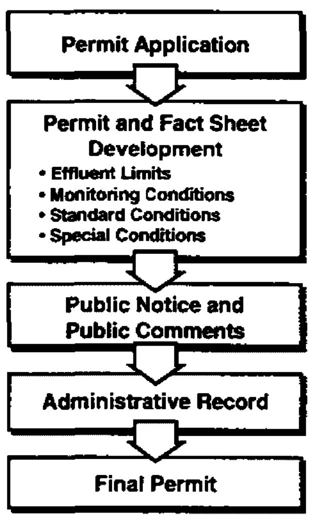
1670-3-4

Permit Components



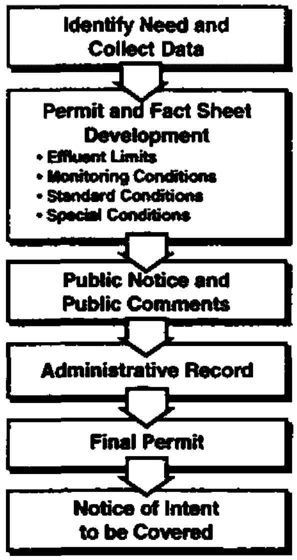
167D-3-5

Individual Permit Issuance Process



167D-3-6

General Permit Issuance Process



MODULE # 4

TITLE: The Permit Application Process

OVERALL OBJECTIVES:

- Identify parties responsible for submitting a permit application
- List and provide description of NPDES permit application forms
- Define the terms "existing discharger," "new discharger," and "new source"
- Distinguish between requirements for new and existing dischargers
- Discuss application submittal deadlines
- Identify pollutants and parameters to be sampled and reported on the application
- Explain the process of reviewing applications
- Identify common mistakes and omissions for obtaining additional information
- Highlight permit writer's options and omissions for obtaining additional information
- Provide a practical exercise for reviewing permit applications

LOGISTICS:

Presentation Format: Lecture, exercise
Approximate Presentation Time: 30 minutes
Review Questions/Exercise: 30 minutes
Applicable Statutory/Regulatory Citations:

40 CFR §122.21	Application for Permit
40 CFR §122.22	Signatories to Permit Applications and Reports
40 CFR §122.26	Storm Water Discharges
40 CFR §122.29	New Sources and New Discharges
40 CFR §122, Appendix D	NPDES Permit Application Testing Requirements
40 CFR §123.25	Requirements for Permitting

The Permit Application Process

Learning Objectives

- Who must submit permit applications?
- When are applications due?
- What forms and information are required for permit applications?
- What are the responsibilities of the permit writer?

Who Must Apply for a Permit

- Anyone who discharges pollutants or proposes to discharge pollutants to waters of the U.S.
  - Operator vs. owner?
- Exceptions include:
  - Dredged or fill materials
  - Some marine vessel discharges (e.g., laundry, shower, etc.)
  - Non-point source runoff
  - Indirect dischargers to POTWs

When to Apply

Type of Permit	Type of Discharger		Schedule*
Individual	New	Discharger Source	180 days before date of discharge commencement
	Existing		180 days before expiration of existing permit
General	New		Specified in general permit
	Existing		X number of days following issuance of general permit

* Authorized States may use more stringent deadlines.

Type of Discharger: Key Definitions

- **New Discharger – Any building, structure, facility, or installation:**
  - From which there is or may be a discharge of pollutants
  - That did not commence discharge at the site prior to August 13, 1979
  - Which is not a "new source"
  - Which has never received a finally-effective NPDES permit

Type of Discharger: Key Definitions
(Continued)

- **New Source – Any building, structure, facility, or installation from which there is or may be a discharge of pollutants, the construction of which commenced:**
  - After promulgation of effluent limitations guidelines and standards applicable to such source, or
  - After proposal of effluent limitations guidelines and standards, but only if the standards are promulgated within 120 days of proposal

Additional New Source Determination Criteria

- Constructed at a site at which no other source is located; or
- Totally replaces the process causing the discharge from an existing source; or
- Processes are substantially independent of an existing source at the same site; and
- A new source performance standard is independently applicable to the discharge

Specific Requirements for New Sources

- Where EPA issues permit and finds the permit to be a major Federal action under the National Environmental Policy Act (NEPA)
  - EPA determines whether an environmental impact statement (EIS) is required pursuant to NEPA
  - EIS includes recommendation to issue or deny the permit
- Discharger must meet applicable new source performance standards

Type of Discharger: Key Definitions
(Continued)

- Existing Source – Any building, structure, facility, or installation from which there is or may be a discharge of pollutants which is not a new discharger or new source

EPA Application Forms for NPDES Individual Permits

Form	Title/Applicabilit	Regulation Cite
1	General Information	122.21(f)
A	New and existing major POTWs	122.21(j) reserved
A Short	New and existing minor POTWs	122.21(j) reserved
2B	New and existing animal feeding operations and aquatic animal production facilities	122.21(i)
2C	Existing manufacturing, commercial, mining, and silvicultural discharges	122.21(g)
2D	New manufacturing, commercial, mining, and silvicultural discharges	122.21(k)

EPA Application Forms for NPDES Individual Permits (Continued)

Form	Title/Applicability	Regulation Cite
2E	Manufacturing, commercial, mining, and silvicultural facilities that discharge only non-process wastewater	122.21(h)
2F	Stormwater discharges associated with industrial activities	122.26(c)
None	Stormwater discharges from municipal separate storm sewers serving a population of greater than 100,000	122.26(d)

Major Components of Form 2C

I. Outfall location
II. Flow, sources of pollution, treatment technologies
III. Production information (if applicable)
IV. Improvements (if applicable)
V. Intake and effluent characteristics
VI. Potential discharges not covered by analysis
VII. Biological testing data
VIII. Contract analysis information
IX. Certification/signature

Intake and Effluent Characteristics Form 2C, Section V

- "Part A" conventional and non-conventional pollutants including BOD, COD, TOC, TSS, NH3, flow, temperature, pH
- "Part B" conventional and non-conventional pollutants (e.g., oil and grease, radioactivity, color, etc.)

Intake and Effluent Characteristics Form 2C, Section V (Continued)

- "Part C" Priority Pollutants
  - Metals, total cyanide, and total phenols
  - 2, 3, 7, 8-TCDD (dioxin)
  - Toxic Organic Pollutants
    - Volatile compounds
    - Acid compounds
    - Base/neutral compounds
    - Pesticides

Primary Industries and Required GC/MS Fractions

Industry Category	GC/MS Fraction			
	Volatile	Acid	Base/Neutral	Pesticide
Adhesives and sealants	X	X	X	–
Aluminum forming	X	X	X	–
Auto and other laundries	X	X	X	X
Battery manufacturing	X	–	X	–
Coal mining	–	–	–	–
Coil coating	X	X	X	–
Copper forming	X	X	X	–
Electric and electronic compounds	X	X	X	X
Electroplating	X	X	X	–
Explosives manufacturing	–	X	X	–
Foundries	X	X	X	–
Gum and wood (all subparts except D and F)	X	X	X	X
Subpart D - tall oil rosin	X	X	X	–
Subpart F - rosin-based derivations	X	X	X	–
Inorganic chemicals manufacturing	X	X	X	–
Iron and steel manufacturing	X	X	X	–
Leather tanning and finishing	X	X	X	X
Mechanical products manufacturing	X	X	X	–
Nonferrous metals manufacturing	X	X	X	X

Primary Industries and Required GC/MS Fractions (Continued)

Industry Category	GC/MS Fraction			
	Volatile	Acid	Base/Neutral	Pesticide
Ore mining (applies to the base and precious metals/Subpart B)	–	X	–	–
Organic chemicals manufacturing	X	X	X	–
Paint and ink formulation	X	X	X	X
Pesticides	X	X	X	X
Petroleum refining	X	–	–	–
Pharmaceutical preparations	X	X	X	–
Photographic equipment and supplies	X	X	X	X
Plastic and synthetic materials manufacturing	X	X	X	X
Plastic processing	X	–	–	–
Porcelain enameling	–	–	–	–
Printing and publishing	X	X	X	X
Pulp and paperboard mills (see footnote 2)	X	X	X	X
Rubber processing	X	X	X	–
Soap and detergent manufacturing	X	X	X	–
Steam electric power plants	X	X	X	–
Textile mills (Subpart C-Greige Mills are exempt)	X	X	X	X
Timber products processing	X	X	X	X

Responsibility of Permit Writer

- Verify completeness of application
- Verify accuracy of application

Reviewing Permit Applications

- Are all spaces filled in, including N/A where appropriate?
- Do the concentration, mass and flow values accurately characterize the discharge?
- Are the reported values consistent with historical information?
- Do concentration values correspond with analytical detection limits?
- Are signatory and certification requirements fulfilled (40 CFR §122.22)

Common Omissions

- Map required in Form 1
- Flow diagram required in Form 2C
- POTWs* omit whole effluent toxicity (WET) testing

* POTWs > 1MGD or with an approved pretreatment program are required to submit results of WET

Other Omissions

- Required metals
- Required GC/MS fractions
- Expected toxics and other pollutants
- Production rates

Most Common Mistakes

- Missing guideline production and flow rates
- Failure to provide long term average, and daily maximum values
- Decimal point errors
- Wrong concentration units
- Reported values are below known detection limits

Other Useful Information

- Review DMRs, STORET or PCS data
- Review previous applications or inspection reports
- Review development documents, EPA Treatability Manual, State Water Quality Standards
- Look for information on other permits (e.g., RCRA hazardous waste or air permits)

Obtaining Additional Information

- Telephone or letter can be used to obtain required or supplemental information
- Applicant may wish to file a new application, or address deficiencies in original application

PRACTICAL EXERCISE

Review of NPDES Permit Applications

GIVEN: NPDES Application Forms 1 and 2C from Luster Glass Inc.

REQUIREMENT: Review the permit applications from Luster Glass Inc. and answer the questions below.

QUESTIONS:

(1) Is this facility a POTW or does it have a concentrated animal feeding operation? ______
____

(2) Who is Mr. Ceccarelli? ______________________________

(3) What does Luster Glass Inc. make? ______________________________

(4) Did the proper official sign the application form? ______________________________
How do you know? ______________________________

(5) To what body of water does Luster Glass Inc. discharge its process water?
____

(6) How many outfalls are there at Luster Glass? ______________________________

(7) Has the company collected any data on the toxicity of its wastewater?
____

(8) Does Luster Glass Inc. have its own analytical laboratory for the analysis of priority pollutants? ______________________________

(9) Based on your cursory review of the application, which pollutants would you limit in a permit for Luster Glass Inc.?

______________ ______________
______________ ______________
______________ ______________

(10) Based on the water flow schematic included in the permit application, what wastewaters are treated at Luster Glass Inc.? What is the total treated wastewater flow?__________
____
____
____

(11) What is the wastewater flow after treatment shown on the water flow schematic?

____

(12) Does wastewater flow into treatment equal wastewater flow out of treatment on the water flow schematic?

____

Please print or type in the unshaded areas only (fill-in areas are spaced for elite type, i.e., 12 characters/inch).

Form Approved. OMB No. 2040-0086 Approval expires 7-31-88

FORM 1 GENERAL

U.S. ENVIRONMENTAL PROTECTION AGENCY

EPA

GENERAL INFORMATION

Consolidated Permits Program

(Read the "General Instructions" before starting.)

I. EPA I.D. NUMBER

F

D

LABEL ITEMS

I. EPA I.D. NUMBER

III. FACILITY NAME

V. FACILITY MAILING ADDRESS

PLEASE PLACE LABEL IN THIS SPACE

VI. FACILITY LOCATION

GENERAL INSTRUCTIONS

If a preprinted label has been provided, affix it in the designated space. Review the information carefully; if any of it is incorrect, cross through it and enter the correct data in the appropriate fill-in area below. Also, if any of the preprinted data is absent (the area to the left of the label space lists the information that should appear), please provide it in the proper fill-in area(s) below. If the label is complete and correct, you need not complete Items I, III, V, and VI (except VI-B which must be completed regardless). Complete all items if no label has been provided. Refer to the instructions for detailed item descriptions and for the legal authorizations under which this data is collected.

II. POLLUTANT CHARACTERISTICS

INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of bold-faced terms.

SPECIFIC QUESTIONS	YES	NO	FORM ATTACHED	SPECIFIC QUESTIONS	YES	NO	FORM ATTACHED
A. Is this facility a publicly owned treatment works which results in a discharge to waters of the U.S.? (FORM 2A)		X		B. Does or will this facility (either existing or proposed) include a concentrated animal feeding operation or aquatic animal production facility which results in a discharge to waters of the U.S.? (FORM 2B)		X	
C. Is this a facility which currently results in discharges to waters of the U.S. other than those described in A or B above? (FORM 2C)	X		X	D. Is this a proposed facility (other than those described in A or B above) which will result in a discharge to waters of the U.S.? (FORM 2D)		X	
E. Does or will this facility treat, store, or dispose of hazardous wastes? (FORM 3)		X		F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)		X	
G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)		X		H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)		X	
I. Is this facility a proposed stationary source which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X		J. Is this facility a proposed stationary source which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X	

III. NAME OF FACILITY

1 SKIP LUSTER GLASS INC.

IV. FACILITY CONTACT

A. NAME & TITLE (last, first, & title)	B. PHONE (area code & no.)		
2 CECCARELLI IVO ENV. COORD.	312	834	4536

V. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX

3 PO BOX 319

B. CITY OR TOWN	C. STATE	D. ZIP CODE
4 MORRIS	IL	60123

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER

5 RIVER RIDGE DRIVE

B. COUNTY NAME

COOK

C. CITY OR TOWN	D. STATE	E. ZIP CODE	F. COUNTY CODE (if known)
6 MORRIS	IL	60123	

EPA Form 3510-1 (Rev. 10-80)

CONTINUE ON REVERSE

CONTINUED FROM THE FRONT

VII. SIC CODES (4-digit, in order of priority)

A. FIRST		B. SECOND	
7 3211	(specify) GLASS MANUFACTURING	7	(specify)
C. THIRD		**D. FOURTH**	
7	(specify)	7	(specify)

VIII. OPERATOR INFORMATION

A. NAME

8 LUSTER GLASS INC.

B. Is the name listed in Item VIII-A also the owner? ☒ YES ☐ NO

C. STATUS OF OPERATOR (Enter the appropriate letter into the answer box; if "Other", specify.)

F = FEDERAL
S = STATE
P = PRIVATE
M = PUBLIC (other than federal or state)
O = OTHER (specify)

(specify)

D. PHONE (area code & no.)

A 312 834 4536

E. STREET OR P.O. BOX

PO BOX 319

F. CITY OR TOWN	G. STATE	H. ZIP CODE
8 MORRIS	IL	60123

IX. INDIAN LAND

Is the facility located on Indian lands? ☐ YES ☒ NO

X. EXISTING ENVIRONMENTAL PERMITS

A. NPDES (Discharges to Surface Water)	D. PSD (Air Emissions from Proposed Sources)
9 N IL0065432	9 P
B. UIC (Underground Injection of Fluids)	**E. OTHER (specify)**
9 U	9 (specify)
C. RCRA (Hazardous Wastes)	**E. OTHER (specify)**
9 R	9 (specify)

XI. MAP

Attach to this application a topographic map of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in the map area. See instructions for precise requirements.

XII. NATURE OF BUSINESS (provide a brief description)

AUTO TEMPERED AND AUTO LAMINATED GLASS MANUFACTURED

XIII. CERTIFICATION (see instructions)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

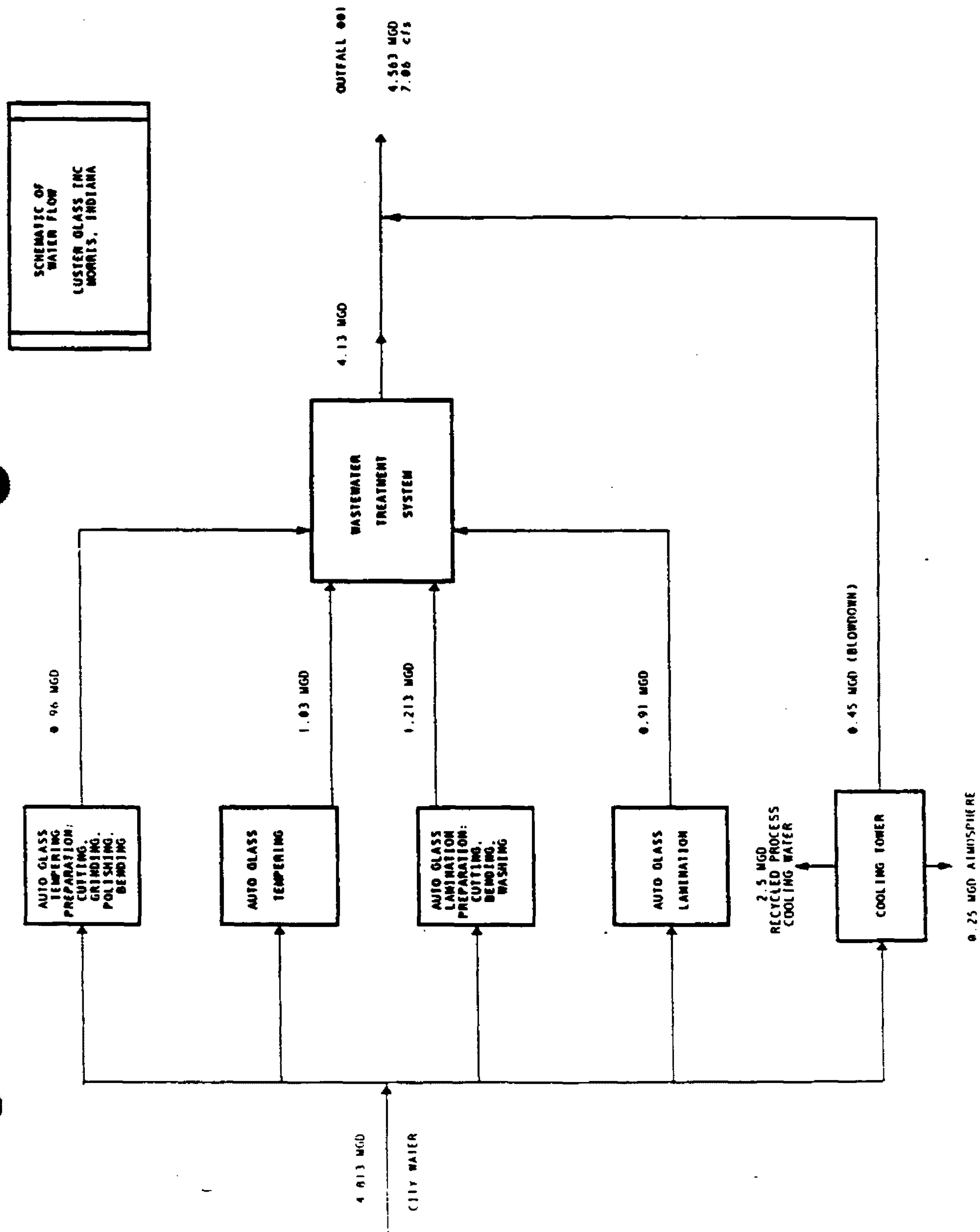
A. NAME & OFFICIAL TITLE (type or print)	B. SIGNATURE	C. DATE SIGNED
JOHN BAKER VICE PRESIDENT	John Baker	2/2/89

COMMENTS FOR OFFICIAL USE ONLY

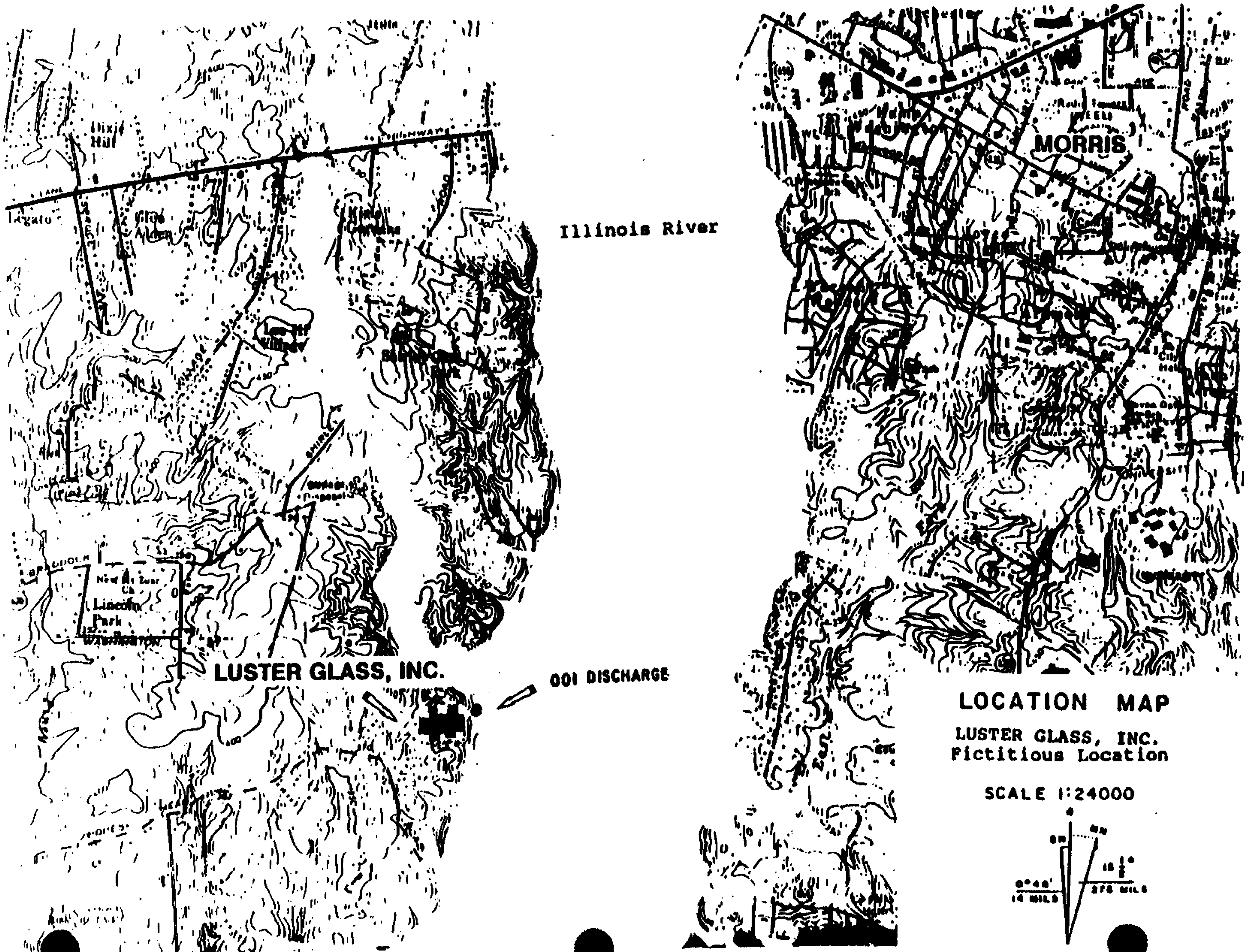
C

EPA Form 3510-1 (Rev. 10-80) Reverse

U.S. Government Printing Office



SCHEMATIC OF WATER FLOW
CUSTER GLASS INC NORRIS, INDIANA
CITY WATER
4.613 MGD
AUTO GLASS TEMPERING PREPARATION: CUTTING, GRINDING, POLISHING, BENDING
AUTO GLASS TEMPERING
AUTO GLASS LAMINATION PREPARATION: CUTTING, BENDING, WASHING
AUTO GLASS LAMINATION
COOLING TOWER
2.5 MGD RECYCLED PROCESS COOLING WATER
0.25 MGD ATMOSPHERE
0.96 MGD
1.03 MGD
1.213 MGD
0.91 MGD
0.45 MGD (BLOWDOWN)
WASTEWATER TREATMENT SYSTEM
4.13 MGD
OUTFALL 001
4.563 MGD
7.06 cfs



LOCATION MAP

LUSTER GLASS, INC.
Fictitious Location

SCALE 1:24000

Please print or type in the unshaded areas only. Approval expires 7-31-88

FORM 2C NPDES **EPA** U.S. ENVIRONMENTAL PROTECTION AGENCY
APPLICATION FOR PERMIT TO DISCHARGE WASTEWATER
EXISTING MANUFACTURING, COMMERCIAL, MINING AND SILVICULTURAL OPERATIONS
Consolidated Permits Program

I. OUTFALL LOCATION

For each outfall, list the latitude and longitude of its location to the nearest 15 seconds and the name of the receiving water.

A. OUTFALL NUMBER (list)	B. LATITUDE			C. LONGITUDE			D. RECEIVING WATER (name)
	1. DEG.	2. MIN.	3. SEC.	1. DEG.	2. MIN.	3. SEC.	
001	42	36		98	30		ILLINOIS RIVER

II. FLOWS, SOURCES OF POLLUTION, AND TREATMENT TECHNOLOGIES

A. Attach a line drawing showing the water flow through the facility. Indicate sources of intake water, operations contributing wastewater to the effluent, and treatment units labeled to correspond to the more detailed descriptions in Item B. Construct a water balance on the line drawing by showing average flows between intakes, operations, treatment units, and outfalls. If a water balance cannot be determined (*e.g., for certain mining activities*), provide a pictorial description of the nature and amount of any sources of water and any collection or treatment measures.

B. For each outfall, provide a description of: (1) All operations contributing wastewater to the effluent, including process wastewater, sanitary wastewater, cooling water, and storm water runoff; (2) The average flow contributed by each operation; and (3) The treatment received by the wastewater. Continue on additional sheets if necessary.

1. OUT-FALL NO (list)	2. OPERATION(S) CONTRIBUTING FLOW		3. TREATMENT	
	a. OPERATION (list)	b. AVERAGE FLOW (include units)	a. DESCRIPTION	b. LIST CODES FROM TABLE 2C-1
001	PROCESS FLOWS	4.115 Mgd	Oil/Water Separator	
			Settling Basins	1-U
	Cooling Tower Blowdown	0.45 MGD	MIXING WITH OTHER STREAMS	1-0

OFFICIAL USE ONLY (*effluent guidelines sub-categories*)

CONTINUED FROM THE FRONT

C. Except for storm runoff, leaks, or spills, are any of the discharges described in Items II-A or B intermittent or seasonal?

☐ YES (complete the following table) ☐ NO (go to Section III)

1. OUTFALL NUMBER (list)	2. OPERATION(s) CONTRIBUTING FLOW (list)	3. FREQUENCY a. DAYS PER WEEK (specify average)	3. FREQUENCY b. MONTHS PER YEAR (specify average)	4. FLOW a. FLOW RATE (in mgd) 1. LONG TERM AVERAGE	4. FLOW a. FLOW RATE (in mgd) 2. MAXIMUM DAILY	4. FLOW b. TOTAL VOLUME (specify with units) 1. LONG TERM AVERAGE	4. FLOW b. TOTAL VOLUME (specify with units) 2. MAXIMUM DAILY	C. DURATION (in days)
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

III. PRODUCTION

A. Does an effluent guideline limitation promulgated by EPA under Section 304 of the Clean Water Act apply to your facility?

X YES (complete Item III-B) ☐ NO (go to Section IV)

B. Are the limitations in the applicable effluent guideline expressed in terms of production (or other measure of operation)?

☐ YES (complete Item III-C) X NO (go to Section IV)

C. If you answered "yes" to Item III-B, list the quantity which represents an actual measurement of your level of production, expressed in the terms and units used in the applicable effluent guideline, and indicate the affected outfalls.

1. AVERAGE DAILY PRODUCTION a. QUANTITY PER DAY	b. UNITS OF MEASURE	c. OPERATION, PRODUCT, MATERIAL, ETC. (specify)	2. AFFECTED OUTFALLS (list outfall numbers)
40,000	Ft^2/DAY	AUTO TEMPERED GLASS	001
275,000	Ft^2/DAY	AUTO LAMINATED GLASS	001

IV. IMPROVEMENTS

A. Are you now required by any Federal, State or local authority to meet any implementation schedule for the construction, upgrading or operation of wastewater treatment equipment or practices or any other environmental programs which may affect the discharges described in this application? This includes, but is not limited to, permit conditions, administrative or enforcement orders, enforcement compliance schedule letters, stipulations, court orders, and grant or loan conditions.

☐ YES (complete the following table) X NO (go to Item IV-B)

1. IDENTIFICATION OF CONDITION, AGREEMENT, ETC.	2. AFFECTED OUTFALLS a. NO.	2. AFFECTED OUTFALLS b. SOURCE OF DISCHARGE	3. BRIEF DESCRIPTION OF PROJECT	4. FINAL COMPLIANCE DATE a. REQUIRED	4. FINAL COMPLIANCE DATE b. PROJECTED

B. OPTIONAL: You may attach additional sheets describing any additional water pollution control programs (or other environmental projects which may affect your discharges) you now have underway or which you plan. Indicate whether each program is now underway or planned, and indicate your actual or planned schedules for construction. ☐ MARK "X" IF DESCRIPTION OF ADDITIONAL CONTROL PROGRAMS IS ATTACHED

 CONTINUE ON PAGE 3

CONTINUED FROM PAGE 2

EPA I.D. NUMBER (copy from Item 1 of Form 1)

Form Approved.
OMB No. 2040-0086
Approval expires 7-31-88

V. INTAKE AND EFFLUENT CHARACTERISTICS

A, B, & C: See instructions before proceeding — Complete one set of tables for each outfall — Annotate the outfall number in the space provided.
NOTE: Tables V-A, V-B, and V-C are included on separate sheets numbered V-1 through V-9.

D. Use the space below to list any of the pollutants listed in Table 2c-3 of the instructions, which you know or have reason to believe is discharged or may be discharged from any outfall. For every pollutant you list, briefly describe the reasons you believe it to be present and report any analytical data in your possession.

1. POLLUTANT	2. SOURCE	1. POLLUTANT	2. SOURCE
N/A	N/A	N/A	N/A

VI. POTENTIAL DISCHARGES NOT COVERED BY ANALYSIS

Is any pollutant listed in Item V-C a substance or a component of a substance which you currently use or manufacture as an intermediate or final product or byproduct?

X YES (list all such pollutants below) NO (go to Item VI-B)

ZINC

CONTINUED FROM THE FRONT

VII. BIOLOGICAL TOXICITY TESTING DATA

Do you have any knowledge or reason to believe that any biological test for acute or chronic toxicity has been made on any of your discharges or on a receiving water in relation to your discharge within the last 3 years?

[X] YES *(identify the test(s) and describe their purposes below)*   [ ] NO *(go to Section VIII)*

Whole Effluent Toxicity -

Acute and chronic Whole Effluent Toxicity tests were conducted to satisfy an NPDES permit requirement for biomonitoring. Initially, in February 1988, a sample was analyzed for acute and chronic toxicity using both Ceriodaphnia dubia and Pimephales promelas (Fathead minnows). The results indicated that Fathead minnows were the more sensitive of the two species and were used in subsequent tests. Chronic toxicity to Fathead minnows varied from 1.3% to 3.5% Acute toxicity varies from 6.3 to 24.8%. A total of 12 monthly samples were analyzed for acute and chronic toxicity over the course of one year. Results are presented in Table 3.

VIII. CONTRACT ANALYSIS INFORMATION

Were any of the analyses reported in Item V performed by a contract laboratory or consulting firm?

[X] YES *(list the name, address, and telephone number of, and pollutants analyzed by, each such laboratory or firm below)*   [ ] NO *(go to Section IX)*

A. NAME	B. ADDRESS	C. TELEPHONE (area code & no.)	D. POLLUTANTS ANALYZED (list)
MEASUREMENT LABS	113 RIVER PARKWAY CHICAGO, IL 60020	312-684-2121	129 PRIORITY POLLUTANTS BOD, TOC, COD, TSS, ZN, CU, PHOSPHORUS, CADMIUM, LEAD

IX. CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

A. NAME & OFFICIAL TITLE (type or print)	B. PHONE NO. (area code & no.)
JOHN BAKER, VICE PRESIDENT	312-834-4536
C. SIGNATURE	**D. DATE SIGNED**
John Baker	2/2/89

PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY. You may report some or all of this information on separate sheets (use the same format) instead of completing these pages.
SEE INSTRUCTIONS

EPA I.D. NUMBER (copy from Item 1 of Form 1): IL0654321

Form Approved
OMB No. 2040-0086
Approval expires 7-31-88

OUTFALL NO: 001

V. INTAKE AND EFFLUENT CHARACTERISTICS (continued from page 3 of Form 2-C)

PART A - You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

1. POLLUTANT	2. EFFLUENT: a. MAXIMUM DAILY VALUE (1) CONCENTRATION	a. (2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	b. (2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	c. (2) MASS	d. NO. OF ANALYSES	3. UNITS (specify if blank) a. CONCENTRATION	b. MASS	4. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	a. (2) MASS	b. NO. OF ANALYSES
a. Biochemical Oxygen Demand (BOD)	40.0	590.0	---	---	25.0	237.0	4	mg/l	LBS	---	---	---
b. Chemical Oxygen Demand (COD)	50.0	199.7	---	---	---	---	1	mg/l	LBS	---	---	---
c. Total Organic Carbon (TOC)	65.0	221.1	---	---	---	---	1	mg/l	LBS	---	---	---
d. Total Suspended Solids (TSS)	50.0	429.3	---	---	18.8	290.9	52	mg/l	LBS	---	---	---
e. Ammonia (as N)	<0.11	<0.44	---	---	---	---	1	mg/l	LBS	---	---	---
f. Flow	VALUE 4.591		VALUE ---		VALUE 4.563		52	MGD	---	VALUE		52
g. Temperature (winter)	VALUE 12		VALUE ---		VALUE ---		1	°C		VALUE		---
h. Temperature (summer)	VALUE 28		VALUE ---		VALUE ---		1	°C		VALUE		---
i. pH	MINIMUM 6.6	MAXIMUM 9.0	MINIMUM 6.9	MAXIMUM 7.6				STANDARD UNITS				

PART B - Mark "X" in column 2-a for each pollutant you know or have reason to believe is present. Mark "X" in column 2-b for each pollutant you believe to be absent. If you mark column 2a for any pollutant which is limited either directly, or indirectly but expressly, in an effluent limitations guideline, you must provide the results of at least one analysis for that pollutant. For other pollutants for which you mark column 2a, you must provide quantitative data or an explanation of their presence in your discharge. Complete one table for each outfall. See the instructions for additional details and requirements.

1. POLLUTANT AND CAS NO. (if available)	2. MARK "X" a. BELIEVED PRESENT	b. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	a. (2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	b. (2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	c. (2) MASS	d. NO. OF ANALYSES	4. UNITS a. CONCENTRATION	b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	a. (2) MASS	b. NO. OF ANALYSES
a. Bromide (24959-67-9)		X												
b. Chlorine, Total Residual		X												
c. Color		X												
d. Fecal Coliform		X												
e. Fluoride (16984-48-8)		X												
f. Nitrate-Nitrite (as N)		X												

CONTINUE ON REVERSE

EPA Form 3510-2C (Rev. 2-86)

ITEM V B CONTINUED FROM FRONT

1. POLLUTANT AND CAS NO. (if available)	2. MARK 'X'		3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. BELIEVED PRESENT	b. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
			(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
g. Nitrogen, Total Organic (as N)		X												
h. Oil and Grease	X		22	88			12	39	4	mg/l	lb/d			
i. Phosphorus (as P), Total (7723-14-0)	X			29				19	4		lb/d			
j. Radioactivity														
(1) Alpha, Total		X												
(2) Beta, Total		X												
(3) Radium, Total		X												
(4) Radium 226, Total		X												
k. Sulfate (as SO_4) (14808-79-8)		X												
l. Sulfide (as S)		X												
m. Sulfite (as SO_3) (14265-45-3)		X												
n. Surfactants		X												
o. Aluminum, Total (7429-90-5)		X												
p. Barium, Total (7440-39-3)		X												
q. Boron, Total (7440-42-8)		X												
r. Cobalt, Total (7440-48-4)		X												
s. Iron, Total (7439-89-6)		X												
t. Magnesium, Total (7439-95-4)		X												
u. Molybdenum, Total (7439-98-7)		X												
v. Manganese, Total (7439-96-5)		X												
w. Tin, Total (7440-31-5)		X												
x. Titanium, Total (7440-32-6)		X												

EPA Form 3510-2C (Rev. 2-85)

CONTINUE ON PAGE V-3

CONTINUED FROM PAGE 3 OF FORM 2-C

EPA I.D. NUMBER *(copy from Item 1 of Form 1)*	OUTFALL NUMBER
IL0654321	001

Form Approved
OMB No. 2040-0086
Approval expires 7-31-88

PART C - If you are a primary industry and this outfall contains process wastewater, refer to Table 2c-2 in the instructions to determine which of the GC/MS fractions you must test for. Mark "X" in column 2-a for all such GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols. If you are not required to mark column 2-a *(secondary industries, nonprocess wastewater outfalls, and nonrequired GC/MS fractions)*, mark "X" in column 2-b for each pollutant you know or have reason to believe is present. Mark "X" in column 2-c for each pollutant you believe is absent. If you mark column 2a for any pollutant, you must provide the results of at least one analysis for that pollutant. If you mark column 2b for any pollutant, you must provide the results of at least one analysis for that pollutant if you know or have reason to believe it will be discharged in concentrations of 10 ppb or greater. If you mark column 2b for acrolein, acrylonitrile, 2,4 dinitrophenol, or 2-methyl-4, 6 dinitrophenol, you must provide the results of at least one analysis for each of these pollutants which you know or have reason to believe that you discharge in concentrations of 100ppb or greater. Otherwise, for pollutants for which you mark column 2b, you must either submit at least one analysis or briefly describe the reasons the pollutant is expected to be discharged. Note that there are 7 pages to this part; please review each carefully. Complete one table *(all 7 pages)* for each outfall. See instructions for additional details and requirements.

1. POLLUTANT AND CAS NUMBER *(if available)*	2. MARK "X": a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	3. EFFLUENT: a. MAXIMUM DAILY VALUE (1) CONCENTRATION	(2) MASS	b. MAXIMUM 30 DAY VALUE *(if available)* (1) CONCENTRATION	(2) MASS	c. LONG TERM AVRG. VALUE *(if available)* (1) CONCENTRATION	(2) MASS	d. NO. OF ANALYSES	4. UNITS: a. CONCENTRATION	b. MASS	5. INTAKE *(optional)*: a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	(2) MASS	b. NO. OF ANALYSES
METALS, CYANIDE, AND TOTAL PHENOLS															
1M. Antimony, Total (7440-36-0)			X												
2M. Arsenic, Total (7440-38-2)			X												
3M. Beryllium, Total, 7440-41-7)			X												
4M. Cadmium, Total (7440-43-9)			X												
5M. Chromium, Total (7440-47-3)			X												
6M. Copper, Total (7440-50-8)			X												
7M. Lead, Total (7439-92-1)		X		0.024				0.018		4	mg/l				
8M. Mercury, Total (7439-97-6)			X												
9M. Nickel, Total (7440-02-0)			X												
10M. Selenium, Total (7782-49-2)			X												
11M. Silver, Total (7440-22-4)			X												
12M. Thallium, Total (7440-28-0)			X												
13M. Zinc, Total (7440-66-6)	X			0.07				0.036		4	mg/l				
14M. Cyanide, Total (57-12-5)			X												
15M. Phenols, Total			X												
DIOXIN															
2,3,7,8-Tetrachlorodibenzo-P-Dioxin (1764-01-6)			X	DESCRIBE RESULTS											

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – VOLATILE COMPOUNDS															
1V. Acrolein (107-02-8)			X												
2V. Acrylonitrile (107-13-1)			X												
3V. Benzene (71-43-2)			X												
4V. Bis (Chloromethyl) Ether (542-88-1)			X												
5V. Bromoform (75-25-2)			X												
6V. Carbon Tetrachloride (56-23-5)			X												
7V. Chlorobenzene (108-90-7)			X												
8V. Chlorodibromomethane (124-48-1)			X												
9V. Chloroethane (75-00-3)			X												
10V. 2-Chloroethylvinyl Ether (110-75-8)			X												
11V. Chloroform (67-66-3)			X												
12V. Dichlorobromomethane (75-27-4)			X												
13V. Dichlorodifluoromethane (75-71-8)			X												
14V. 1,1-Dichloroethane (75-34-3)			X												
15V. 1,2-Dichloroethane (107-06-2)			X												
16V. 1,1-Dichloroethylene (75-35-4)			X												
17V. 1,2-Dichloropropane (78-87-5)			X												
18V. 1,3-Dichloropropylene (542-75-6)			X												
19V. Ethylbenzene (100-41-4)			X												
20V. Methyl Bromide (74-83-9)			X												
21V. Methyl Chloride (74-87-3)			X												

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OUTFALL NUMBER: 001

Form Approved
OMB No. 2040-0086
Approval expires 7-31-88

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X' a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	(2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	(2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	(2) MASS	d. NO. OF ANALYSES	4. UNITS a. CONCENTRATION	b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	(2) MASS	b. NO. OF ANALYSES
GC/MS FRACTION – VOLATILE COMPOUNDS (continued)															
22V. Methylene Chloride (75-09-2)			X												
23V. 1,1,2,2-Tetrachloroethane (79-34-5)			X												
24V. Tetrachloroethylene (127-18-4)			X												
25V. Toluene (108-88-3)			X												
26V. 1,2-Trans-Dichloroethylene (156-60-5)			X												
27V. 1,1,1-Trichloroethane (71-55-6)			X												
28V. 1,1,2-Trichloroethane (79-00-5)			X												
29V. Trichloroethylene (79-01-6)			X												
30V. Trichlorofluoromethane (75-69-4)			X												
31V. Vinyl Chloride (75-01-4)			X												
C/MS FRACTION – ACID COMPOUNDS															
A. 2-Chlorophenol (95-57-8)			X												
2A. 2,4-Dichlorophenol (120-83-2)			X												
3A. 2,4-Dimethylphenol (105-67-9)			X												
4A. 4,6-Dinitro-O-Cresol (534-52-1)			X												
5A. 2,4-Dinitrophenol (51-28-5)			X												
6A. 2-Nitrophenol (88-75-5)			X												
7A. 4-Nitrophenol (100-02-7)			X												
8A. P-Chloro-M-Cresol (59-50-7)			X												
9A. Pentachlorophenol (87-86-5)			X												
10A. Phenol (108-95-2)			X												
11A. 2,4,6-Trichlorophenol															

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS-NUMBER (if available)	2. MARK "X" a. testing required	b. believed present	c. believed absent	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) concentration	(2) mass	b. MAXIMUM 30 DAY VALUE (if available) (1) concentration	(2) mass	c. LONG TERM AVRG. VALUE (if available) (1) concentration	(2) mass	d. NO. OF ANALYSES	4. UNITS a. CONCENTRATION	b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) concentration	(2) mass	b. NO. OF ANALYSES
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS															
1B. Acenaphthene (83-32-9)			X												
2B. Acenaphtylene (208-96-8)			X												
3B. Anthracene (120-12-7)			X												
4B. Benzidine (92-87-5)			X												
5B. Benzo (a) Anthracene (56-55-3)			X												
6B. Benzo (a) Pyrene (50-32-8)			X												
7B. 3,4-Benzo fluoranthene (205-99-2)			X												
8B. Benzo (ghi) Perylene (191-24-2)			X												
9B. Benzo (k) Fluoranthene (207-08-9)			X												
10B. Bis (2-Chloroethoxy) Methane (111-91-1)			X												
1B. Bis (2-Chloroethyl) Ether (111-44-4)			X												
2B. Bis (2-Chloroisopropyl) Ether (102-60-1)			X												
13B. Bis (2-Ethylhexyl) Phthalate (117-81-7)			X												
14B. 4-Bromophenyl Phenyl Ether (101-55-3)			X												
15B. Butyl Benzyl Phthalate (85-68-7)			X												
16B. 2-Chloronaphthalene (91-58-7)			X												
17B. 4-Chlorophenyl Phenyl Ether (7005-72-3)			X												
18B. Chrysene (218-01-9)			X												
19B. Dibenzo (a,h) Anthracene (53-70-3)			X												
20B. 1,2-Dichlorobenzene (95-50-1)			X												
21B. 1,3-Dichlorobenzene (541-73-1)			X												

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Approval expires 7-31-88

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1L0654321	001

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1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X": a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	3. EFFLUENT: a. MAXIMUM DAILY VALUE (1) CONCENTRATION	(2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	(2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	(2) MASS	d. NO. OF ANALYSES	4. UNITS: a. CONCENTRATION	b. MASS	5. INTAKE (optional): a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	(2) MASS	b. NO. OF ANALYSES
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS (continued)															
22B. 1,4-Dichlorobenzene (106-46-7)			X												
23B. 3,3'-Dichlorobenzidine (91-94-1)			X												
24B. Diethyl Phthalate (84-66-2)			X												
25B. Dimethyl Phthalate (131-11-3)			X												
26B. Di-N-Butyl Phthalate (84-74-2)			X												
27B. 2,4-Dinitrotoluene (121-14-2)			X												
28B. 2,6-Dinitrotoluene (606-20-2)			X												
29B. Di-N-Octyl Phthalate (117-84-0)			X												
30B. 1,2-Diphenylhydrazine (as Azobenzene) (122-66-7)			X												
31B. Fluoranthene 206-44-0)			X												
32B. Fluorene (86-73-7)			X												
33B. Hexachlorobenzene (118-74-1)			X												
34B. Hexachlorobutadiene (87-68-3)			X												
35B. Hexachlorocyclopentadiene (77-47-4)			X												
36B. Hexachloroethane (67-72-1)			X												
37B. Indeno (1,2,3-cd) Pyrene (193-39-5)			X												
38B. Isophorone (78-59-1)			X												
39B. Naphthalene (91-20-3)			X												
40B. Nitrobenzene (98-95-3)			X												
41B. N-Nitrosodimethylamine (62-75-9)			X												
42B. N-Nitrosodi-n-Propylamine [illegible]			X												

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE (1) CONCENTRATION	a. MAXIMUM DAILY VALUE (2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	b. MAXIMUM 30 DAY VALUE (if available) (2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	c. LONG TERM AVRG. VALUE (if available) (2) MASS	d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	a. LONG TERM AVERAGE VALUE (2) MASS	b. NO. OF ANALYSES
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS (continued)															
43B. N-Nitrosodiphenylamine (86-30-6)			X												
44B. Phenanthrene (85-01-8)			X												
45B. Pyrene (129-00-0)			X												
46B. 1,2,4-Trichlorobenzene (120-82-1)			X												
GC/MS FRACTION – PESTICIDES															
1P. Aldrin (309-00-2)			X												
2P. α-BHC (319-84-6)			X												
3P. β-BHC (319-85-7)			X												
4P. γ-BHC (58-89-9)			X												
5P. δ-BHC (319-86-8)			X												
P. Chlordane (57-74-9)			X												
P. 4,4'-DDT (50-29-3)			X												
8P. 4,4'-DDE (72-55-9)			X												
9P. 4,4'-DDD (72-54-8)			X												
10P. Dieldrin (60-57-1)			X												
11P. α-Endosulfan (115-29-7)			X												
12P. β-Endosulfan (115-29-7)			X												
13P. Endosulfan Sulfate (1031-07-8)			X												
14P. Endrin (72-20-8)			X												
15P. Endrin Aldehyde (7421-93-4)			X												
16P. Heptachlor (76-44-8)			X												

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110654321	001

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1. POLLUTANT AND CAS NUMBER *(if available)*	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE *(optional)*		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE *(if available)*		c. LONG TERM AVRG. VALUE *(if available)*		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – PESTICIDES *(continued)*															
17P. Heptachlor Epoxide (1024-57-3)			X												
18P. PCB-1242 (53469-21-9)			X												
19P. PCB-1254 (11097-69-1)			X												
20P. PCB-1221 (11104-28-2)			X												
21P. PCB-1232 (11141-16-5)			X												
22P. PCB-1248 (12672-29-6)			X												
23P. PCB-1260 (11096-82-5)			X												
24P. PCB-1016 (12674-11-2)			X												
25P. Toxaphene (8001-35-2)			X												

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MODULE 4 - SUGGESTED REFERENCE MATERIALS

Application Form 1 - General Information, Consolidated Permits Program (EPA Form 3510-1), EPA, Office of Enforcement, October 1980.

Standard Form A - Municipal (EPA Form 7550-22), EPA July 1973.

Application Form 2B - Concentrated Animal Feed Operations and Aquatic Animal Production Facilities (EPA Form 3510-2B), EPA, Office of Enforcement, February 1985.

Application Form 2C - Wastewater Discharge Information, Consolidated Permits Program, Existing Manufacturing, Commercial, Mining, and Silvicultural Operations (EPA Form 3510-2C), EPA, Office of Enforcement, February 1985.

Application Form 2D - Wastewater Discharge Information, Consolidated Permits Program, New Manufacturing, Commercial Mining, and Silvicultural Operations (EPA Form 3510-2D), EPA Office of Enforcement, February 1985.

Application Form 2E - Facilities Which Do Not Discharge Process Wastewater (EPA Form 3510-2E), EPA, Office of Water enforcement and Permits, September 1986.

Industrial User Permitting Guidance Manual. Appendix E. Example IU Permit Application. EPA. September 1989.

Guidance Manual for the Preparation of NPDES Permit Applications for Storm Water Discharges Associated with Industrial Activity (EPA-505/8-01-002), EPA. Office of Water, April 1991.

Guidance Manual for the Preparation of Part 1 of the NPDES Permit Application for Discharges from Municipal Separate Storm Sewer Systems (EPA-505-8-91-003A), EPA, Office of Water, April 1991.

MODULE # 5

TITLE: **Technology-Based Effluent Limits**

OVERALL OBJECTIVES:

- Explain the purpose of technology-based requirements for NPDES permits
- Define the general types of technology requirements for pollutant categories (conventional, nonconventional, and toxic)
- Provide brief statutory history of technology-based performance standards
- Explain the general concept of use of best professional judgement to supplement effluent guidelines (for non-municipal)

LOGISTICS:

Presentation Format: Lecture
Approximate Presentation Time: 30 minutes
Review Questions/Exercise: None
Applicable Statutory/Regulatory Citations:

CWA Section 301	Effluent Limitations
CWA Section 304	Information and Guidelines
CWA Section 306	National Standards of Performance
CWA Section 307	Toxic and Pretreatment Effluent Standards
40 CFR §122.44(a)	Technology-based effluent limitations and standards
40 CFR §122.45	Calculating NPDES permit conditions
40 CFR §125.3	Technology-based treatment requirements in permits

Technology-Based Effluent Limits

Learning Objectives

- Explain the purpose of technology-based requirements
- Describe the types of technology-based requirements

Technology-Based Requirements

- Purpose
  - Establish minimum level of pollutant controls for all point source dischargers
    - Conventional pollutants
    - Non-conventional pollutants
    - Toxic pollutants
  - Provide equity among dischargers within categories

Technology-Based Requirements

- **Technology-based requirements implemented through NPDES permits**
- **National technology-based standards are available**
  - **Effluent guidelines for non-municipal**
  - **Secondary treatment standards for municipal**
- **In the absence of National standards**
  - **Technology-based requirements developed on a case-by-case basis**

MODULE # 5A

TITLE: **Secondary Treatment Standards for Municipal Point-Source Dischargers**

OVERALL OBJECTIVES:

- Define secondary treatment standards
- Explain exceptions/alternatives to secondary treatment standards

LOGISTICS:

Presentation Format: Lecture, practical exercise
Approximate Presentation Time: 30 minutes
Review Questions/Exercise: 30 minutes
Applicable Statutory/Regulatory Citations:

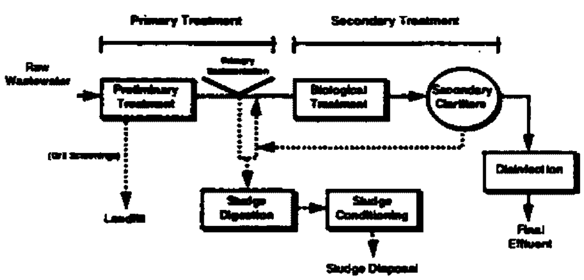
CWA Section 301(b)(1)(b)	Effluent limitations compliance dates
CWA Section 304(d)	Application of secondary treatment standards
40 CFR §122.45(b)(1)	Production-based limitations
40 CFR §125.3(a)(1)	Technology-based treatment requirements in permits (for POTWs)
40 CFR Part 133	Secondary Treatment Regulation

Technology-Based Effluent Limits for Municipal Dischargers

Learning Objectives

- **Describe secondary treatment regulations**
- **Explain equivalent to secondary requirements**

Flow Diagram of a Wastewater Treatment Plant



Technology-Based Requirements for Municipal Dischargers Secondary Treatment

	30 Day Average	7 Day Average
5-Day BOD	30 mg/l	45 mg/l
TSS	30 mg/l	45 mg/l
pH	6 – 9	—
Removal	85% BOD_5 and TSS	—

(40 CFR Part 133)

Note: Compliance Deadline = 7/1/88

Calculation of Permit Limits

- **Must be concentration-based (40 CFR § 122.45 (f)(1)(ii))**
- **May also be mass-based (40 CFR § 122.45 (f)(2))**
  - **If mass-based, use design flow of the treatment plant (40 CFR § 122.45 (b))**

Calculation of Permit Limits (Continued)

Example calculation:

5 day BOD: 30 day average = 30 mg/L

POTW Design Flow = 5.0 mgd

BOD Limit = (5 mgd)(30 mg/L)(8.34*) = 1,251 lbs/day

* 8.34 is the conversion factor

What if:

POTW Actual Flow = 7 mgd ?

POTW Actual Flow = 2.5 mgd ?

Exceptions/Alternatives to Secondary Treatment Requirements

- Substitution of $CBOD_5$ for BOD_5 [133.102(a)(4)]
- Adjustments to reflect:
  - Combined sewers [133.103(a)]
  - Industrial wastes [133.103(b)]
  - Waste stabilization ponds [133.103(c)]
  - Less concentrated influent for separate sewers [133.103(d)]
  - Less concentrated influent for combined sewers [133.103(e)]
- Substitution of COD or TOC for BOD_5 [133.104(b)]

Exceptions/Alternatives to Secondary Treatment Requirements

- Treatment equivalent to secondary
- Waiver from secondary treatment for marine discharges

Equivalent to Secondary

- Must be trickling filter or waste stabilization pond (lagoon)
- Biological treatment = 51 + % of treatment
- Plant exceeds 30/30 with proper O&M
- Water quality not adversely affected
- Equivalent to secondary limits:
  - Up to 45 mg/l (30 day average)
  - Up to 65 mg/l (7 day average)
  - Not less than 65% removal
- Guidance distributed December 1985

Conditions to Consider in Applying Equivalent to Secondary Effluent Limitations

- Treatment works operating beyond the design hydraulic capacity or organic loading limit are not considered eligible for equivalent to secondary limitations
- New facilities

Conditions to Consider in Applying Equivalent to Secondary Effluent Limitations (Continued)

- Calculation of equivalent to secondary limitations
- Combination of biological treatment processes employed at a facility
- Alternative State Requirements (ASRs)

Sources of Facility Information

- Application Form 1 and Form A (2A)
- Supplemental information (sludge, toxicity, CSOs, pretreatment)
- Discharge Monitoring Reports (DMRs)
- Pretreatment program submissions
- Annual pretreatment reports
- Pretreatment audits

PRACTICAL EXERCISE

Developing Technology-Based Effluent Limitations for Publicly Owned Treatment Works

SITUATION:

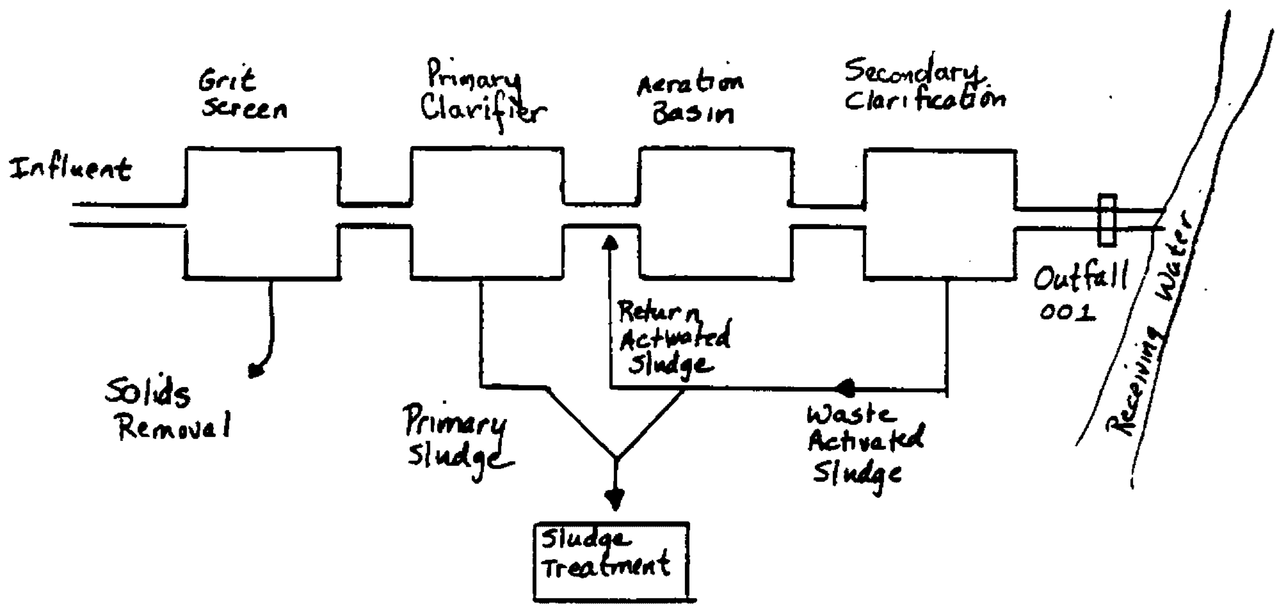
You are a permit writer responsible for drafting effluent limitations for a wastewater treatment plant that provides secondary treatment of municipal wastewater.

GIVEN:

Summary of permit application data:

Average Flow:	7.4 million gallons per day (MGD)
Maximum Flow:	8.5 MGD
Design Flow:	10.0 MGD
Population Served:	50,000
Sewer System Type:	100% Separate
Major Industrial Contributors:	Dairy; Poultry processor; Pulp and paper mill

Schematic of treatment plant:



QUESTIONS:

(1) What effluent limitations would you establish for 5-day Biochemical Oxygen demand (BOD_5), Total Suspended Solids (TSS), and pH for Outfall 001? ______________________

(2) Are there any other permit limitations or requirements that would be necessary in order to comply with secondary treatment requirements? If yes, describe. ______________________

MODULE # 5B

TITLE: **Effluent Limitations Guidelines for Non-Municipal Dischargers**

OVERALL OBJECTIVES:

- Explain the general process for developing effluent guidelines
- Define treatment standards for point sources (i.e., BPT, BCT, BAT, NSPS)
- Explain considerations in applying effluent guidelines
- Explain distinctions between mass- vs concentration-based effluent guidelines
- Define point-of-compliance for technology-based effluent limits
- Describe concept and considerations for integrated facilities

LOGISTICS:

Presentation Format: Lecture, practical exercise
Approximate Presentation Time: 45 minutes
Review Questions/Exercise: 30 minutes
Applicable Statutory/Regulatory Citations:

CWA Section 301(b)	Effluent limitations compliance dates
CWA Section 304(b)	Guidelines for effluent limitations
CWA Section 304(m)	Schedule for review of guidelines
CWA Section 306	National Standards of Performance
CWA Section 307(a)	Effluent standards for toxic pollutants
40 CFR §122.44(a)	Technology-based effluent limitations and standards
40 CFR §122.45(b)(2)	Production-based limitations
40 CFR §125.3(a)(2)	Technology-based treatment requirements in permits (for non-POTWs)

Effluent Limitations Guidelines for Non-Municipal Dischargers

Learning Objectives

- Describe process used in developing effluent limitations guidelines
- Discuss considerations in applying effluent guidelines
- Explain application of effluent guidelines

Effluent Limitations Guidelines

- Definition
  - Effluent limitations guidelines are National standards prescribing allowable discharges of pollutants from industrial point source categories corresponding to various levels of treatment or control technologies
- Scope
  - Guidelines are established for most primary and some secondary industries

CWA Technology-Based Control Matrix

Technology-Based Control Level	Type of Discharger	Conventional	Non-Conventional	Toxic
Best Practicable Control Technology Currently Available (BPT)	Direct	X	X	X
Best Conventional Pollutant Control Technology (BCT)	Direct	X		
Best Available Control Technology Economically Achievable (BAT)	Direct		X	X
New Source Performance Standards	Direct	X	X	X
Pretreatment Standards for Existing Sources (PSES)	Indirect	X	X	X
Pretreatment Standards for New Sources (PSNS)	Indirect	X	X	X

Statutory Compliance Deadlines for Technology-Based Requirements

Pollutant Category	Level of Treatment	Compliance Deadline
Conventional	BPT	July 1, 1977
Conventional	BCT	March 31, 1989
Non-conventional	BPT	July 1 1977
Non-conventional	BAT	March 31, 1989
Toxic	BPT	July 1, 1977
Toxic	BAT	March 31, 1989

Effluent Limitations Guidelines (Continued)

- **CWA Section 304(m)**
  - Guidelines may be developed for new or additional industries, such as:
    - Centralized waste treatment
    - Transportation equipment cleaning
    - Industrial laundries
    - Metal products and machinery manufacturers

§304(m) Schedule - 10/7/96 (61 FR 52582)

Category	Proposed	Final
Pulp, Paper, and Paperboard	12/17/93 (58 FR 66078)	N/A
Pesticide Formulating, Packaging and Repackaging	4/14/94 (59 FR 17850)	11/6/96 (61 FR 57548)
Centralized Waste Treatment	1/27/95 (60 FR 5464)	3/97 (1)
Coastal Oil and Gas Extraction	2/17/95 (60 FR 9428)	12/16/96 (61 FR 66123)
Pharmaceutical Manufacturing	5/2/95 (60 FR 21592)	3/97 (1)
Metal Products and Machinery, Phase 1	5/30/95 (60 FR 28209)	3/97 (1,2)
Industrial Laundries	3/97 (1)	12/98 (1)
Transportation Equipment Cleaning	3/97 (1)	12/98 (1)
Landfills and Incinerators	3/97 (1)	2/99 (1)
Metal Products and Machinery, Phase 2	12/97 (1)	12/99 (1,2)

(1) EPA is discussing extensions to Consent Decree dates with NRDC.
(2) EPA is considering merging Phase 1 and Phase 2 of the MP&M rule.

Implementing Effluent Guidelines

- Effluent guidelines
  - Implemented and enforced through NPDES permits
  - Serve as the basis for technology-based limits

Considerations Involved in Use of Effluent Guidelines

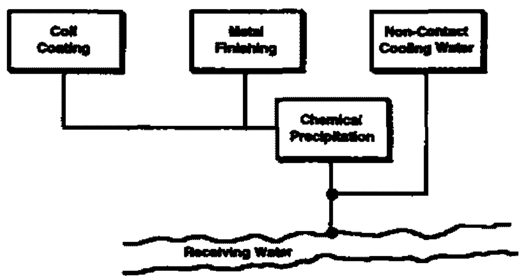
- Determination of proper category and subcategory
  - Applicability section in regulation
  - Preamble to regulation
  - SIC Code(s) (e.g., Copper Forming = SIC Code 3351)
  - Development documents

Considerations Involved in Use of Effluent Guidelines (Continued)

- **Classification of plants that fall under more than one category**
  - Must apply all applicable effluent guidelines
  - Some guidelines supercede others
  - Considerations for common treatment systems
    - BPJ for non-regulated pollutants
    - Account for dilution from non-regulated wastestreams
  - Inconsistent limits expressions (units)
  - Use internal outfalls

Considerations Involved in Use of Effluent Guidelines (Continued)

Example 1:



Considerations Involved in Use of Effluent Guidelines (Continued)

Example 2:

Coil Coating	mg/m^2
Metal Finishing:	mg/L
Ferroalloy Manufacturing:	kg/mwh

Considerations Involved in Use of Effluent Guidelines (Continued)

- Determination of appropriate measures of production and flow
  - Use reasonable measure of actual production and flow rate
  - Long-term average expected during the term of permit
  - Account for planned changes
  - Time period of measurement
    - Daily maximum production/flow → Daily maximum limit
    - Average monthly production/flow → Monthly average limit

Considerations Involved in Use of Effluent Guidelines (Continued)

- Use of alternative or tiered limits
  - To account for variability of production/flow (e.g., seasonal)
  - Significant = > 20%
  - Requires careful examination of production data
  - Requires special reporting requirements
    - Notification of changed production/flow
    - Reporting of production data

Considerations Involved in Use of Effluent Guidelines (Continued)

- Application of effluent guidelines in permits
  - Include all regulated pollutants
  - Parameters considered by effluent guideline but not regulated by effluent guideline
  - Include both daily maximum and monthly average limits
  - Express as mass limits unless guideline allows, or parameter requires concentration-based limit

including the 65 "priority" toxic pollutants and classes of pollutants.

Under the Act, the EPA is required to establish several different kinds of effluent limitations guidelines and standards. They are summarized briefly below:

1. Best Practicable Control Technology Currently Available (BPT)

BPT effluent limitations guidelines are generally based on the average of the best existing performance by plants of various sizes, ages, and unit processes within the category or subcategory for control of familiar (i.e., conventional) pollutants.

In establishing BPT effluent limitations guidelines, EPA considers the total cost in relation to the effluent reduction benefits, the age of equipment and facilities involved, the processes employed, process changes required, engineering aspects of the control technologies, and non-water quality environmental impacts (including energy requirements). The Agency considers the category-wide or subcategory-wide cost of applying the technology in relation to the effluent reduction benefits.

2. Best Available Technology Economically Achievable (BAT)

BAT effluent limitations guidelines, in general, represent the best existing performance in the category or subcategory. The Act establishes BAT as the principal national means of controlling the direct discharge of toxic and nonconventional pollutants to navigable waters.

In establishing BAT, the Agency considers the age of equipment and facilities involved, the processes employed, the engineering aspects of the control technologies, process changes, the cost of achieving such effluent reduction, and non-water quality environmental impacts.

3. Best Conventional Pollutant Control Technology (BCT)

The 1977 Amendments to the Clean Water Act added section 301(b)(2)(E), establishing "best conventional pollutant control technology" (BCT) for the discharge of conventional pollutants from existing industrial point sources. Section 304(a)(4) designated the following as conventional pollutants: BOD, TSS, fecal coliform, pH, and any additional pollutants defined by the Administrator as conventional. The Administrator designated oil and grease a conventional pollutant on July 30, 1979 (44 FR 44501).

BCT is not an additional limitation but replaces BAT for the control of conventional pollutants. BAT remains in effect for the toxic and nonconventional pollutants. In addition to other factors specified in section 304(b)(4)(B), the Act requires that the BCT effluent limitations guidelines be assessed in light of a two part "cost-reasonableness" test. *American Paper Institute* v. *EPA*, 660 F.2d 954 (4th Cir. 1981). The first test compares the cost for private industry to reduce its discharge of conventional pollutants with the cost to publicly owned treatment works for similar levels of reduction in their discharge of these pollutants. The second test examines the cost-effectiveness of additional industrial treatment beyond BPT. EPA must find that limitations are "reasonable" under both tests before establishing them as BCT. In no case may BCT be less stringent than BPT.

EPA has promulgated a methodology for establishing BCT effluent limitations guidelines (51 FR 24974, July 9, 1986).

4. New Source Performance Standards (NSPS)

NSPS are based on the performance of the best available demonstrated technology. New plants have the opportunity to install the best and most efficient production processes and wastewater treatment technologies. As a result, NSPS should represent the most stringent numerical values attainable through the application of best available demonstrated control technology for all pollutants (toxic, conventional and nonconventional).

5. Pretreatment Standards for Existing Sources (PSES)

PSES are designed to prevent the discharge of pollutants that pass through, interfere with, or are otherwise incompatible with the operation of publicly owned treatment works (POTWs). The Clean Water Act requires pretreatment standards for pollutants that pass through POTWs or interfere with POTWs' treatment processes or sludge disposal methods. The legislative history of the 1977 Act indicates that pretreatment standards are to be technology-based and analogous to the BAT effluent limitations guidelines for removal of toxic pollutants. For the purpose of determining whether to promulgate national category-wide pretreatment standards, EPA generally determines that there is pass through of a pollutant and thus a need for categorical standards if the nation-wide average percentage of a pollutant removed by well-operated POTWs achieving secondary treatment is less than the percent removed by the BAT model treatment system. The General Pretreatment Regulations, which set forth the framework for categorical pretreatment standards, are found at 40 CFR Part 403. (Those regulations contain a definition of pass through that addresses localized rather than national instances of pass through and does not use the percent removal comparison test described above. See 52 FR 1586, January 14, 1987.)

6. Pretreatment Standards for New Sources (PSNS)

Like PSES, PSNS are designed to prevent the discharge of pollutants that pass through, interfere with, or are otherwise incompatible with the operation of a POTW. PSNS are to be issued at the same time as NSPS. New indirect dischargers, like new direct dischargers, have the opportunity to incorporate in their plant the best available demonstrated technologies. The Agency considers the same factors in promulgating PSNS as it considers in promulgating NSPS.

B. Overview of the Industry

The OCPSF industry is large and diverse, and many plants in the industry are highly complex. This industry manufactures over 25,000 different organic chemicals, plastics, and synthetic fibers. However, less than half of these products are produced in excess of 1,000 pounds per year. The industry includes approximately 750 facilities whose principal or primary production activities are covered under the OCPSF SIC groups. There are approximately 200 other plants which are secondary producers of OCPSF products, i.e., OCPSF production is ancillary to their primary production activities. (As discussed above in this preamble, this regulation covers OCPSF discharges from secondary producers, with certain exceptions.) Thus the total number of plants to be regulated totally or in part by the OCPSF industry regulation is approximately 1,000. Secondary OCPSF plants may be part of other chemical producing industries such as the petroleum refining, inorganic chemicals, pharmaceuticals, and pesticides industries as well as chemical formulation industries such as the adhesives and sealants, the paint and ink, and the plastics molding and forming industries.

Some plants produce chemicals in large volumes while others produce only small volumes of "specialty" chemicals. Large volume production tends to use continuous processes. Continuous processes are generally more efficient than batch processes in minimizing

XIII. Variances and Modifications

Once the OCPSF regulation is in effect, the numerical effluent limitations for the appropriate subcategory must be applied in all Federal and State NPDES permits thereafter issued to OCPSF direct dischargers. The pretreatment standards are directly applicable to indirect dischargers and become effective as discussed in § 414.12 of the regulation.

For the BPT effluent limitations, the only exception to the limitations contained in the regulation is EPA's "fundamentally different factors" variance. See *E. I. duPont de Nemours and Co.* v. *Train*, 430 U.S. 112 (1977); *Weyerhaeuser Co.* v. *Costle, supra*. This variance recognizes factors concerning a particular discharger that are fundamentally different from the factors considered in this rulemaking. However, the economic ability of the individual operator to meet the compliance cost for BPT standards is not a consideration for granting a variance. See *National Crushed Stone Association* v. *EPA*, 449 U.S. 64 (1980). Although this variance clause was originally set forth in EPA's 1973–1976 categorical industry regulations, it is now included in the general NPDES regulations and will not be included in the OCPSF or other specific industry regulations. See 40 CFR Part 125, Subpart D.

The BAT limitations in this regulation also are subject to EPA's "fundamentally different factors" variance. However, section 306 of the Water Quality Act of 1987 added a new section 301(n) to the Act which somewhat limits the availability of FDF variances from BAT effluent limitations guidelines. An FDF application must be based solely on information and supporting data submitted to EPA during the rulemaking establishing the limitations that discussed the fundamentally different factors, or on information and supporting data that the applicant did not have a reasonable opportunity to submit during the rulemaking. The alternative requirement must be no less stringent than justified by the fundamental difference and must not result in markedly more adverse non-water quality environmental impacts than those considered by EPA in establishing the guideline.

Indirect dischargers subject to PSES are also eligible for the "fundamentally different factors" variance. See 40 CFR 403.13. They are subject to essentially the same new statutory provisions for FDF variances as discussed above for BAT.

Readers should note that EPA has not yet amended its FDF variance regulation to conform to the provisions of the Water Quality Act of 1987. The regulation promulgated today refers to the existing regulatory sections. However, EPA recognizes that the new section 301(n) of the Act overrides the existing FDF regulation to the extent of any inconsistency, and EPA does intend to modify the FDF regulation to conform to the new statutory requirements.

Indirect dischargers subject to PSES and PSNS are eligible for credits for toxic pollutants removed by a POTW. See section 307(b) of the CWA and 40 CFR 403.7. The removal credits regulation was remanded to EPA in *Natural Resources Defense Council* v. *EPA*, 790 F.2d 289 (3rd Cir. 1986). The court held that some of the means by which EPA considered local POTW removal efficiencies were not sufficiently stringent and that credits for POTW removals may not be authorized until comprehensive regulations for the use and disposal of sludge are promulgated under section 405(d) of the CWA. However, it should be noted that pretreatment standards for the OCPSF industry, like other categorical pretreatment standards, have been promulgated based upon the assumptions that indirect dischargers will be required to comply with the standards without removal credits, and thus that they are subject to the full costs of complying with PSES.

XIV. Implementation of Limitations and Standards

A. Flow Basis

The limitations promulgated today are concentration-based and thus do not regulate flow. The permit writer must use a reasonable estimate of process wastewater flows and the concentration limitations to develop mass limitations for the NPDES permit. Process wastewater discharge is defined in the regulation (40 CFR 401.11) to include wastewaters resulting from manufacture of OCPSF products that come in direct contact with raw materials, intermediate products, or final products, and surface runoff from the immediate process area that has the potential to become contaminated. Noncontact cooling waters, utility wastewaters, general site surface runoff, ground waters, and other nonprocess waters generated on site are specifically excluded from the definition of process wastewater discharges. In cases where the process wastewater flow claimed by industry may be excessive, the permit writer may develop a more appropriate process wastewater flow for use in computing the mass effluent or internal plant limitations. The following items should be considered in developing the more appropriate process wastewater flow:

1. A review of the component flows to insure that the claimed flows are, in fact, process wastewater flows as defined by the regulation;

2. A review of plant operations to insure that sound water conservation practices are being followed. Examples are: minimization of process water uses; cascading or countercurrent washes or rinses, where possible; reuse or recycle of intermediate process waters or treated wastewaters at the process area and in wastewater treatment operations (pump seals, equipment and area washdowns, etc.).

3. A review of barometric condenser use at the process level. Often, barometric condensers will generate relatively large volumes of water contaminated at low levels. Replacement of barometric condensers with surface condensers can reduce wastewater volumes significantly and result in collection of condensates that may be returned to the process.

The final NPDES permit limitations will be the sum of the mass effluent limitations derived as described above and any mass effluent limitations developed on a case-by-case basis using best professional judgment by the permit writer to take into account nonprocess wastewater discharges.

B. Relationship to NPDES Permits

The BPT and BAT limitations and NSPS in this regulation will be applied to individual OCPSF plants through NPDES permits issued by EPA or approved state agencies under section 402 of the Act. As discussed in the preceding section of this preamble, these limitations must be applied in all new, modified and reissued Federal and State NPDES permits except to the extent that variances are expressly authorized. Other aspects of the interaction between these limitations and NPDES permits are discussed below.

One subject that has received different judicial rulings is the scope of NPDES permit proceedings when effluent limitations and standards do not exist. Under current EPA regulations, States and EPA regions that issue NPDES permits before regulations are promulgated must establish effluent limitations on a case-by-case basis. This regulation provides a technical and legal base for new or modified or reissued permits.

One issue that warrants consideration is the effect of this regulation on the powers of NPDES permit-issuing authorities. EPA has developed the limitations and standards in this

Example of Concentration-Based Effluent Guideline Calculations (Maximum Daily Limit)
Organic Chemicals, Plastics, and Synthetic Fibers
40 CFR Parts 414 and 416

Component	**Reported Average Flow (mgd)**
Ground Water	0.60
Process Water	2.40 (1.10 mgd for metal bearing wastestream)
Cooling Towers	0.30
Total	**3.30**

BAT Calculation for Nitrobenzene:

Since the effluent guidelines state that only process water should be used in the calculation, the allowable mass discharge is calculated as follows:

(68 ug/l)*(2.40mgd)*(8.34)*(.001mg/ug) = 1.36 lb/day

BAT Calculation for Lead:

Since the effluent guidelines state that only the flow from "metal bearing" wastestreams be used for calculation of allowable mass discharge, the limit is calculated as follows:

(690 ug/l)*(1.10mgd)*(8.34)*(.001mg/ug) = 6.33 lb/day

Subpart I—Direct Discharge Point Sources That Use End-of-Pipe Biological Treatment

§ 414.90 Applicability; description of the subcategory of direct discharge point sources that use end-of-pipe biological treatment.

The provisions of this subpart are applicable to the process wastewater discharges resulting from the manufacture of the OCPSF products and product groups defined by § 414.11 from any point source that uses end-of-pipe biological treatment or installs end-of-pipe biological treatment to comply with BPT effluent limitations.

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

(a) Any point source subject to this subpart must achieve discharges not exceeding the quantity (mass) determined by multiplying the process wastewater flow subject to this subpart times the concentrations in the following table.

(b) In the case of chromium, copper, lead, nickel, zinc, and total cyanide, the discharge quantity (mass) shall be determined by multiplying the concentrations listed in the following table for these pollutants times the flow from metal-bearing waste streams for the metals and times the flow from cyanide-bearing waste streams for total cyanide. Metal-bearing waste streams and cyanide-bearing waste streams are defined as those waste streams listed in Appendix A of this part, plus any additional process wastewater streams identified by the permitting authority on a case-by-case basis as metal or cyanide bearing based upon a determination—

(1) That such streams contain significant amounts of the pollutants identified above and that

(2) The combination of such streams, prior to treatment, with the Appendix A waste streams will result in substantial reduction of these pollutants.

This determination must be based upon a review of relevant engineering, production, and sampling and analysis information.

Effluent characteristics	Effluent limitations BAT and NSPS [1]	
	Maximum for any one day	Maximum for monthly average
Acenaphthene	59	22
Acrylonitrile	242	96
Benzene	136	37
Carbon Tetrachloride	38	18
Chlorobenzene	28	15
1,2,4-Trichlorobenzene	140	68
Hexachlorobenzene	28	15
1,2-Dichloroethane	211	68
1,1,1-Trichloroethane	54	21
Hexachloroethane	54	21
1,1-Dichloroethane	59	22
1,1,2-Trichloroethane	54	21
Chloroethane	268	104
Chloroform	46	21
2-Chlorophenol	98	31
1,2-Dichlorobenzene	163	77
1,3-Dichlorobenzene	44	31
1,4-Dichlorobenzene	28	15
1,1-Dichloroethylene	25	16
1,2-trans-Dichloroethylene	54	21
2,4-Dichlorophenol	112	39
1,2-Dichloropropane	230	153
1,3-Dichloropropylene	44	29
2,4-Dimethylphenol	36	18
2,4-Dinitrotoluene	285	113
2,6-Dinitrotoluene	641	255
Ethylbenzene	108	32
Fluoranthene	68	25
Methylene Chloride	89	40
Methyl Chloride	190	86
Hexachlorobutadiene	49	20
Naphthalene	59	22
Nitrobenzene	68	27
2-Nitrophenol	69	41
4-Nitrophenol	124	72
2,4-Dinitrophenol	123	71
4,6-Dinitro-o-cresol	277	78
Phenol	26	15
Bis(2-ethylhexyl) phthalate	279	103
Di-n-butyl phthalate	57	27
Diethyl phthalate	203	81
Dimethyl phthalate	47	19
Benzo(a)anthracene	59	22
Benzo(a)pyrene	61	23
3,4-Benzofluoranthene	61	23
Benzo(k)fluoranthene	59	22
Chrysene	59	22
Acenaphthylene	59	22
Anthracene	59	22
Fluorene	59	22
Phenanthrene	59	22
Pyrene	67	25
Tetrachloroethylene	56	22
Toluene	80	26
Trichloroethylene	54	21
Vinyl Chloride	268	104
Total Chromium	2,770	1,110
Total Copper	3,380	1,450
Total Cyanide	1,200	420
Total Lead	690	320
Total Nickel	3,980	1,690

Effluent characteristics	Effluent limitations BAT and NSPS [1]	
	Maximum for any one day	Maximum for monthly average
Total Zinc[2]	2,610	1,050

[1] All units are micrograms per liter.

[2] Total Zinc for Rayon Fiber Manufacture that uses the viscose process and Acrylic Fiber Manufacture that uses the zinc chloride/solvent process is 6,796 μg/l and 3,325 μg/l for maximum for any one day and maximum for monthly average, respectively.

[52 FR 42568, Nov. 5, 1987, as amended at 54 FR 27352, June 29, 1989]

Subpart J—Direct Discharge Point Sources That Do Not Use End-of-Pipe Biological Treatment

§ 414.100 Applicability; description of the subcategory of direct discharge point sources that do not use end-of-pipe biological treatment.

The provisions of this subpart are applicable to the process wastewater discharges resulting from the manufacture of the OCPSF products and product groups defined by § 414.11 from any point source that does not use end-of-pipe biological treatment and does not install end-of-pipe biological treatment to comply with BPT effluent limitations.

§ 414.101 Toxic pollutant effluent limitations and standards for direct discharge point sources that do not use end-of-pipe biological treatment.

(a) Any point source subject to this subpart must achieve discharges not exceeding the quantity (mass) determined by multiplying the process wastewater flow subject to this subpart times the concentrations in the following table.

(b) In the case of chromium, copper, lead, nickel, zinc, and total cyanide, the discharge quantity (mass) shall be determined by multiplying the concentrations listed in the following table for these pollutants times the flow from metal-bearing waste streams for the metals and times the cyanide-bearing waste streams for total cyanide. Metal-bearing waste streams and cyanide-bearing waste streams are defined as those waste streams listed in Appendix A of this part, plus any additional process wastewater streams identified by the permitting authority on a case-by-case basis as metal or cyanide bearing based upon a determination—

(1) That such streams contain significant amounts of the pollutants identified above and

(2) That the combination of such streams, prior to treatment, with the Appendix A waste streams would result in substantial reduction of these pollutants.

This determination must be based upon a review of relevant engineering, production, and sampling and analysis information.

Effluent characteristics	BAT effluent limitations and NSPS [1]	
	Maximum for any one day	Maximum for monthly average
Acrylonitrile	232	94
Benzene	134	57
Carbon Tetrachloride	380	142
Chlorobenzene	380	142
1,2,4-Trichlorobenzene	794	196
Hexachlorobenzene	794	196
1,2-Dichloroethane	574	180
1,1,1-Trichloroethane	59	22
Hexachloroethane	794	196
1,1-Dichloroethane	59	22
1,1,2-Trichloroethane	127	32
Chloroethane	295	110
Chloroform	325	111
1,2-Dichlorobenzene	794	196
1,3-Dichlorobenzene	380	142
1,4-Dichlorobenzene	380	142
1,1-Dichloroethylene	60	22
1,2-trans-Dichloroethylene	66	25
1,2-Dichloropropane	794	196
1,3-Dichloropropylene	794	196
Ethylbenzene	380	142
Methylene Chloride	170	36
Methyl Chloride	295	110
Hexachlorobutadiene	380	142
Nitrobenzene	6,402	2,237
2-Nitrophenol	231	65
4-Nitrophenol	576	162
2,4-Dinitrophenol	4,291	1,207
4,6-Dinitro-o-cresol	277	78
Tetrachloroethylene	164	52
Toluene	74	28
Trichloroethylene	69	26
Vinyl Chloride	172	97
Total Chromium	2,770	1,110
Total Copper	3,380	1,450
Total Cyanide	1,200	420
Total Lead	690	320
Total Nickel	3,980	1,690

Effluent characteristics	BAT effluent limitations and NSPS [1]	
	Maximum for any one day	Maximum for monthly average
Total Zinc [2]	2,610	1,050

[1] All units are micrograms per liter.

[2] Total Zinc for Rayon Fiber Manufacture that uses the viscose process and Acrylic Fibers Manufacture that uses the zinc chloride/solvent process is 6,796 μg/l and 3,325 μg/l for maximum for any one day and maximum for monthly average, respectively.

[52 FR 42568, Nov. 5, 1987, as amended at 54 FR 27352, June 29, 1989; 55 FR 26692, June 29, 1990]

Appendix A to Part 414—Non-Complexed Metal-Bearing Waste Streams and Cyanide-Bearing Waste Streams

Chromium

Methylhydroabietate/Esterification of hydroabietic acid (rosin) with methanol
Acrylic acid/Oxidation of propylene via acrolein
N-butyl alcohol/Hydrogenation of n-Butyraldehyde, Oxo process
Cyclohexanone/From phenol via cyclohexanol by hydrogenation-dehydrogenation
Fatty amines/Hydrogenation of fatty nitriles (batch)
Helioptropin/Oxidation of isosafrole, chromium catalyst
Isobutanol/Hydrogenation of isobutyraldehyde, Oxo process
Cyclohexyl Mercaptan/Cyclohexanol + Hydrogen sulfide
Ethyl Mercaptan/Ethanol + Hydrogen sulfide
Methanol/H.P. Synthesis from natural gas via synthetic gas
Oxo Alcohols, C7-C11/Carbonation & hydrogenation of C6-C10 Olefins
Polyoxypropylene diamine/Polypropylene glycol + Ammonia
n-Propyl alcohol/Hydrogenation of propionaldehyde, Oxo process
SAN resin/Suspension polymerization
Styrene/Dehydrogenation of ethylbenzene
Styrene/Dehydration of methyl benzyl alcohol (coproduct of propylene oxide)
1-Tetralol, 1-Tetralone mix/Oxidation of tetralin (1,2,3,4-Tetrahydronaphthalene)
3,3,3-Trifluoropropene/Catalyzed hydrogen fluoride exchange with chlorinated propane
Vinyl toluene/Dehydrogenation (thermal) of ethyltoluene

Copper

Methylhydroabietate/Esterification of hydroabietic acid (rosin) with methanol
Acetaldehyde/Oxidation of ethylene with cupric chloride catalyst
Acetic acid/Catalytic oxidation of butane
Acetone/Dehydrogenation of isopropanol
Acrylamide/Catalytic hydration of acrylonitrile
Acrylic acid/Oxidation of propylene via acrolein
Acrylonitrile/Propylene ammoxidation
Adipic acid/Oxidation of cyclohexanol-cyclohexanone mixture
Adipic acid/Oxidation of cyclohexane via cyclohexanol-cyclohexanone mixture
Allynitrile/Allychloride + sodium cyanide
Aniline/Hydrogenation of nitrobenzene
Benzofurans, 2,3-Dihydro-2,2-dimethyl-7-benzofuranol/ from o-Nitrophenol + Methallyl chloride
n-Butyl alcohol/Hydrogenation of n-Butyraldehyde, Oxo process
1,4-Butanediol/Hydrogenation of 1,4-butynediol
Butryolactone/Dehydrogenation of 1,4-butanediol
Caprolactam/From cyclohexane via cyclohexanone and its oxime
Lilian (hydroxydihydrocitronellal)/Hydration and oxidation of citronellol
1,2-Dichloroethane/Oxyhydrochlorination of ethylene
Dialkyldithiocarbamates, metal salts/Dialkylamines + carbon disulfide
2-Ethylhexanol/from n-Butyraldehyde by Aldo condensation and hydrogenation
Fatty amines/Hydrogenation of fatty nitriles (batch)
Geraniol/B-Myrcene + Hydrogen chloride, esterification of geranyl chloride, hydrolysis of geranyl acetate
Furfuryl alcohol/Hydrogenation of furfural
Geranial (Citral)/Oxidation of geraniol (copper catalyst)
Glyoxal/Oxidation of ethylene glycol
Isobutanol/Hydrogenation of isobutyraldehyde, Oxo process
Isopropanol/Catalytic hydrogenation of acetone
2-Mercaptobenzothiazoles, copper salt/2-Mercaptobenzothiazole + copper salt
Methanol/High pressure synthesis from natural gas via synthetic gas
Methanol/Low pressure synthesis from natural gas via synthetic gas
Methyl ethyl ketone/Dehydrogenation of sec-Butanol
Oxo alcohols, C7-C11/Carbonation & hydrogenation of C6-C10 olefins
Phenol/Liquid phase oxidation of benzoic acid
Polyoxyalkylene amines/Polyoxyalkylene glycol + ammonia

Example of Production-Based Effluent Guideline Calculations (Daily Maximum)
Non-Ferrous Metals Manufacturing
40 CFR Part 421

Given:

Facility is subject to 40 CFR Part 421, Subpart J (Primary Tungsten). The facility utilizes a Tungstic Acid Rinse, an Acid Leach Wet Air Pollution Control system, and an Alkali Leach Wash in its manufacturing process.

Long-term Average Production Rate:	4.7 million pounds per day of Tungstic Acid 3.5 million pounds per day of Sodium Tungstate

BPT Calculation for Lead (§ 421.102):

a) Tungstic Acid Rinse

(4.7 million lbs/day)*(17.230 lbs/million lbs) = 80.918 lbs/day

b) Acid Leach Wet Air Pollution Control

(4.7 million lbs/day)*(15.040 lbs/million lbs) = 70.688 lbs/day

c) Alkali Leach Wash

(3.5 million lbs/day)*(0.000 lbs/million lbs) = 0.000 lbs/day

d) Total Allowable Discharge = 80.918 + 70.688 + 0.000 = **151.669 lb/day**

BAT Calculation for Lead (§ 421.103):

a) Tungstic Acid Rinse

(4.7 million lbs/day)*(11.490 lbs/million lbs) = 54.003 lbs/day

b) Acid Leach Wet Air Pollution Control

(4.7 million lbs/day)*(1.003 lbs/million lbs) = 4.714 lbs/day

c) Alkali Leach Wash

(3.5 million lbs/day)*(0.000 lbs/million lbs) = 0.000 lbs/day

d) Total Allowable Discharge = 54.003 + 4.714 + 0.000 = **58.717 lb/day**

Subpart J—Primary Tungsten Subcategory

§ 421.100 Applicability: Description of the primary tungsten subcategory.

The provisions of this subpart are applicable to discharges resulting from the production of tungsten at primary tungsten facilities.

[49 FR 8812, Mar. 8, 1984]

§ 421.101 Specialized definitions.

For the purpose of this subpart the general information, abbreviations, and methods of analysis set forth in 40 CFR part 401 shall apply to this subpart.

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

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart shall achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable technology currently available:

(a) Subpart J—Tungstic Acid Rinse.

BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (pounds per million pounds) of tungstic acid (as W) produced	
Lead	17.230	8.205
Zinc	59.900	25.030
Ammonia (as N)	5,469.000	2,404.00
Total suspended solids	1,682.000	800.000
pH	(1)	(1)

1 Within the range of 7.0 to 10.0 at all times.

(b) Subpart J—Acid Leach Wet Air Pollution Control.

BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (pounds per million pounds) of tungstic acid (as W) produced	
Lead	15.040	7.162
Zinc	52.280	21.840
Ammonia (as N)	4,773.000	2,098.000
Total suspended solids	1,468.000	698.300
pH	(1)	(1)

1 Within the range of 7.0 to 10.0 at all times.

(c) Subpart J—Alkali Leach Wash.

BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (pounds per million pounds) of sodium tungstate (as W) produced	
Lead	0.000	0.000
Zinc	0.000	0.000

§ 421.103 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart shall achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable:

(a) Subpart J—Tungstic Acid Rinse.

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (pounds per million pounds) of tungstic acid (as W) produced	
Lead	11.490	5.333
Zinc	41.850	17.230
Ammonia (as N)	5,469.000	2,404.000

(b) Subpart J—Acid Leach Wet Air Pollution Control.

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (pounds per million pounds) of tungstic acid (as W) produced	
Lead	1.003	0.468
Zinc	3.653	1.504
Ammonia (as N)	477.400	209.800

(c) Subpart J—Alkali Leach Wash.

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	mg/kg (pounds per million pounds) of sodium tungstate (as W) produced	
Lead	0.000	0.000
Zinc	0.000	0.000
Ammonia (as N)	0.000	0.000

United States Environmental Protection Agency
Engineering and Analysis Division (4303) Washington, DC 20460
Phone (202) 260-7120 Fax (202) 260-7185
September 1996

EPA

Industrial Wastewater Contacts in the Effluent Guidelines Program

Industry/Subject	Regulation	Person	Phone (Area Code 202)
Aluminum Forming	40 CFR 467	George Jett	260-7151
Analytical Methods Support	40 CFR 136	Bill Telliard Ben Honaker	260-7134 260-2272
Asbestos Manufacturing	40 CFR 427	Ron Kirby	260-7168
Asphalt - *see Paving and Roofing Materials*			
Battery Manufacturing	40 CFR 461	George Jett	260-7151
Canmaking - *see Coil Coating*			
Carbon Black Manufacturing	40 CFR 458	George Jett	260-7151
Cement Manufacturing	40 CFR 411	Ron Kirby	260-7168
Centralized Waste Treatment (Hazardous & Non-Hazardous)	proposed	Jan Matuszko Ed Terry	260-9126 260-7128
Chemicals - *see Gum & Wood, Inorganic, Organic, Pesticides*			
Cluster Rule - *see Pulp, Paper, and Paperboard*			
Coal Mining *(also Coal Remining, Coal Slurry Pipelines)*	40 CFR 434	Bill Telliard Joe Vitalis	260-7134 260-7172
Coil Coating *(includes Canmaking)*	40 CFR 465	George Jett	260-7151
Copper Forming	40 CFR 468	George Jett	260-7151
Dairy Products Processing	40 CFR 405	Don Anderson	260-7137
Development Documents (Ordering) - *see Water Resource Center*			
Docket - *see Water Docket*			
Drum Reconditioning		Don Anderson	260-7189

Economic Analysis		Neil Patel	260-5405
Effluent Guidelines Plan (Clean Water Act - Section 304(m))		Eric Strassler	260-7150
Effluent Guidelines Task Force		Beverly Randolph	260-5373
Electrical & Electronic Components	40 CFR 469	George Jett	260-7151
Electroplating	40 CFR 413	Mark Ingle	260-7191
Environmental Monitoring Methods Index (EMMI)		Marion Thompson Ben Honaker	260-7117 260-2272
EPA Water Resource Center (Publications) - *see Water Resource Center*			
Ethanol for Fuel		Bill Telliard	260-7134
Explosives Manufacturing	40 CFR 457	Joe Vitalis	260-7172
Feedlots	40 CFR 412	Don Anderson	260-7189
Ferroalloy Manufacturing	40 CFR 424	George Jett	260-7151
Fertilizer Manufacturing (Nitrogen & Phosphate)	40 CFR 418	Anna Kinney	260-7127
Fish Hatcheries		Don Anderson	260-7137
Foods - *see Dairy, Fruits & Vegetables, Grain Mills, Meat Products, Poultry, Seafood, Sugar*			
Foods and Beverages, Miscellaneous		Don Anderson	260-7137
Foundries - *see Metal Molding & Casting*			
Fruits & Vegetables Processing	40 CFR 407	Don Anderson	260-7137
Glass Manufacturing	40 CFR 426	Wendy Smith	260-7184
Grain Mills	40 CFR 406	Don Anderson	260-7189
"Guidelines and Format for Methods to Be Proposed at 40 CFR Part 136 or Part 141" - *see Streamlining*			
Gum & Wood Chemicals Manufacturing	40 CFR 454	Don Anderson	260-7189
Hospitals	40 CFR 460	Frank Hund	260-7182
Incinerators (Thermal Destruction)		Samantha Hopkins	260-7149
Industrial Laundries		Susan Burris	260-5379
Ink Formulating	40 CFR 447	Don Anderson	260-7189

Inorganic Chemicals	40 CFR 415	Anna Kinney	260-7127
Iron & Steel Manufacturing	40 CFR 420	George Jett	260-7151
Landfill Leachate		John Tinger	260-4992
Leather Tanning & Finishing	40 CFR 425	Don Anderson	260-7189
Low BTU Gasification		Bill Telliard	260-5134
Meat Products	40 CFR 432	Don Anderson	260-7189
Metal Finishing	40 CFR 433	Mark Ingle	260-7191
Metal Molding & Casting (Foundries)	40 CFR 464	George Jett	260-7151
Metal Products and Machinery - Phase I	proposed	Steve Geil	260-9817
Metal Products and Machinery - Phase II		Mark Ingle	260-7191
Mineral Mining & Processing	40 CFR 436	Ron Kirby	260-7168
Mining - *see Coal Mining, Mineral Mining & Processing, Ore Mining & Dressing*			
Nonferrous Metals Forming *(includes Metal Powders)*	40 CFR 471	George Jett	260-7151
Nonferrous Metals Manufacturing	40 CFR 421	George Jett	260-7151
Oil and Gas Extraction	40 CFR 435		
Offshore		Ron Jordan	260-7115
Coastal/Onshore		Chuck White	260-5411
Ore Mining & Dressing	40 CFR 440	Ron Kirby	260-7168
Organic Chemicals, Plastics & Synthetic Fibers	40 CFR 414	George Jett	260-7151
Paint Formulating	40 CFR 446	Don Anderson	260-7189
Paving and Roofing Materials (Tars and Asphalt)	40 CFR 443	Bill Telliard	260-7134
Pesticide Chemicals Manufacturing Formulating/Packaging/Repackaging	40 CFR 455	Shari Zuskin	260-7130
Petroleum Refining	40 CFR 419	Ron Kirby	260-7168
pH Effluent Limitations under Continuous Monitoring	40 CFR 401.17	Henry Kahn	260-5408
Pharmaceutical Manufacturing	40 CFR 439	Frank Hund	260-7182

Phosphate Manufacturing	40 CFR 422	Anna Kinney	260-7127
Photographic (Processing)	40 CFR 459	Joe Daly	260-7186
Plastics Molding & Forming	40 CFR 463	Woody Forsht	260-7190
Porcelain Enameling	40 CFR 466	George Jett	260-7151
Poultry Processing		Don Anderson	260-7137
Pretreatment *(or call Permits Division/Pretreatment Branch: 202-260-7539)*		Joe Vitalis	260-7172
Priority Pollutants *(See 40 CFR 423, Appendix A)*		Bill Telliard	260-7134
Printing & Publishing		Don Anderson	260-7189
Publications - *see EPA/OW - Water Resource Center (WRC)*			
Pulp, Paper and Paperboard	40 CFR 430	Don Anderson	260-7189
Rubber Manufacturing	40 CFR 428	Joe Vitalis	260-7172
Seafood Processing	40 CFR 408	Don Anderson	260-7189
Shipbuilding (MP&M Phase II)		Mark Ingle	260-7191
Soap & Detergent Manufacturing	40 CFR 417	Woody Forsht	260-7190
Solvent Recovery		Woody Forsht	260-7190
Statistical Analysis		Henry Kahn	260-5408
Steam Electric Power Generation	40 CFR 423	Joe Daly	260-7186
Storm Water (Industrial)		Joe Vitalis	260-7172
Streamlining (and Method Flexibility)	40 CFR 136, 141	Bill Telliard Marion Thompson	260-7134 260-7117
Sugar Processing	40 CFR 409	Don Anderson	260-7189
Superfund Sites - Discharges to POTWs (Guidance Document)		Woody Forsht	260-7190
Textile Mills	40 CFR 410	Hugh Wise	260-7177
Timber Products Processing	40 CFR 429	Don Anderson	260-7189
Transportation Equipment Cleaning		Gina Matthews Jan Goodwin	260-6036 260-7152
Toxic Pollutant List	40 CFR 401.15	Bill Telliard	260-7134

Used Oil Reclamation	Ron Kirby	260-7168
Waste Treatment - *see Centralized Waste Treatment, Incinerators, Landfill Leachate*		
Water Docket (Rm. 2616)	Colleen Campbell	260-3027
Water Resource Center (WRC) - Publications (Rm. 2615)	Mary Conway	260-2814
Automated Document Ordering		260-7786
Water Supply	Don Anderson	260-7189

PRACTICAL EXERCISE

Developing Technology-Based Effluent Limitations Using Effluent Limitations Guidelines and Standards

SITUATION:

You are a permit writer responsible for drafting a permit for a facility involved in leather tanning operations. There is one outfall from the facility that contains all the treated process wastewater. You must determine the technology-based effluent limits for the facility.

GIVEN:

The facility is subject to the Leather Tanning and Finishing Point Source Category effluent guidelines, 40 CFR Part 425 (which are attached to the exercise).

The tannery processes cattle hides into finished leather by the following process:

Hair save unhairing → Chrome tanning → Retan-wet finishing

The long-term production rate is 500 pounds of raw material (hides) per day, and the long-term average process flow is 40,000 gallons per day.

QUESTIONS:

(1) What Subpart(s) of the Leather Tanning and Finishing Point Source Category effluent guidelines is (are) applicable to this facility?______________________

____

____

____

(2) What parameters are limited by the effluent guidelines? ______________________

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____

____

(3) What are the BPT effluent limits that you would impose at the outfall?

____

____

____

____

____

(4) What are the BCT effluent limits that you would impose at the outfall? ______________

(5) What are the BAT effluent limits that you would impose at the outfall? ______________

SUBCHAPTER N—EFFLUENT GUIDELINES AND STANDARDS

PART 425—LEATHER TANNING AND FINISHING POINT SOURCE CATEGORY

GENERAL PROVISIONS

Subpart E—No Beamhouse Subcategory

Subpart F—Through-the-Blue Subcategory

Subpart G—Shearling Subcategory

Subpart H—Pigskin Subcategory

Subpart I—Retan-Wet Finish-Splits Subcategory

AUTHORITY: Secs. 301, 304(b), (c), (e), and (g), 306(b) and (c), 307(b) and (c), 308 and 501 of the Clean Water Act (the Federal Water Pollution Control Act Amendments of 1972, as amended by the Clean Water Act of 1977) (the "Act"); 33 U.S.C. 1311, 1314(b), (c), (e), and (g), 1316(b) and (c), 1317(b) and (c), 1318, and 1361; 86 Stat. 816, Pub. L. 92-500; 91 Stat. 1567, Pub. L. 95-217.

SOURCE: 47 FR 52870, Nov. 23, 1982, unless otherwise noted.

GENERAL PROVISIONS

§ 425.01 Applicability.

This part applies to any leather tanning and finishing facility which discharges or may discharge process wastewater pollutants to the waters of the United States, or which introduces or may introduce process wastewater pollutants into a publicly owned treatment works.

§ 425.02 General definitions.

In addition to the definitions set forth in 40 CFR Part 401, the following definitions apply to this part:

(a) "Sulfide" shall mean total sulfide as measured by the potassium ferricyanide titration method described in Appendix A or the modified Monier-Williams method described in Appendix B.

(b) "Hide" means any animal pelt or skin as received by a tannery as raw material to be processed.

(c) "Retan-wet finish" means the final processing steps performed on a tanned hide including, but not limited to, the following wet processes: retan, bleach, color, and fatliquor.

(d) "Hair pulp" means the removal of hair by chemical dissolution.

(e) "Hair save" means the physical or mechanical removal of hair which has not been chemically dissolved, and either selling the hair as a by-product or disposing of it as a solid waste.

(f) "Chrome tan" means the process of converting hide into leather using a form of chromium.

(g) "Vegetable tan" means the process of converting hides into leather using chemicals either derived from vegetable matter or synthesized to produce effects similar to those chemicals.

(h) "Raw material" means the hides received by the tannery except for facilities covered by Subpart D and Subpart I where "raw material" means the hide or split in the condition in which it is first placed into a wet process.

(i) "Monthly average" means the arithmetic average of eight (8) individual data points from effluent sampling and analysis during any calendar month.

(j) "Interference" means the discharge of sulfides in quantities which can result in human health hazards and/or risks to human life, and an inhibition or disruption of POTW as defined in 40 CFR 403.3(i).

[47 FR 52870, Nov. 23, 1982, as amended at 53 FR 9181, Mar. 21, 1988]

§ 425.03 Sulfide analytical methods and applicability.

(a) The potassium ferricyanide titration method described in Appendix A to Part 425 shall be used whenever practicable for the determination of sulfide in wastewaters discharged by plants operating in all subcategories except the hair save or pulp, non-chrome tan, retan-wet finish subcategory (Subpart C, *see* § 425.30). In all other cases, the modified Monier-Williams method as described in Appendix B to Part 425 shall be used as an alternative to the potassium ferricyanide titration method for the determination of sulfide in wastewaters discharged by plants operating in all subcategories except Subpart C.

(b) The modified Monier-Williams method as described in Appendix B to Part 425 shall be used for the determination of sulfide in wastewaters discharged by plants operating in the hair save or pulp, non-chrome tan, retan-wet finish subcategory (Subpart C, *see* § 425.30).

[53 FR 9181, Mar. 21, 1988]

§ 425.04 Applicability of sulfide pretreatment standards.

(a) A POTW receiving wastewater from a facility subject to this part may require more stringent pretreatment standards for sulfide than those established by this part without EPA approval.

(b) The pretreatment standards for sulfide established by this part will not apply if the POTW receiving wastewater from a facility subject to this part certifies in writing with explanation of relevant factors considered, in accordance with the provisions of paragraph (c) of this section, that the discharge of sulfide from the facility does not interfere with the operation of the POTW. In making this determination, the POTW shall consider all relevant factors including but not limited to the following:

(1) The presence and characteristics, of other industrial wastewaters which can increase or decrease sulfide concentrations, pH, or both.

(2) The characteristics of the sewer/interceptor collection system which either minimize or enhance opportunities for release of hydrogen sulfide gas.

(3) The characteristics of the receiving POTWs headworks, preliminary and primary treatment systems, and sludge holding and dewatering facilities which either minimize or enhance opportunities for release of hydrogen sulfide gas.

(4) The occurrence of any prior sulfide related interference as defined in § 425.02(j).

(c)(1) On October 13, 1983, a POTW which intends to certify that the sulfide pretreatment standard should not apply must publish, in a local newspaper with the largest circulation, a notice that presents the findings supporting this determination consistent with paragraph (a) of this section. Allowance for public hearing of these findings also must be provided. The POTW shall identify all existing facilities to which the sulfide pretreatment standard otherwise established by this part would not apply.

(2) On January 11, 1984, a POTW which intends to certify that the sulfide pretreatment standard should not apply must file a written certification with the Regional Water Management Division Director, Environmental Protection Agency, in the appropriate Regional Office. This certification shall include the findings supporting this determination and the results of public comments, and public hearing(s) if held.

(3) On February 10, 1984, EPA shall acknowledge to the POTW receipt of any certification submitted under paragraphs (c) (1) and (2) of this section, and shall indicate to the POTW the adequacy of the submission based upon a review of the factors set forth in paragraph (b) of this section.

(4) Within 30 days of the date of receipt of adequate submissions under paragraphs (c) (1), (2), and (3) of this section, EPA shall publish a notice in the FEDERAL REGISTER identifying those facilities to which the sulfide pretreatment standards of this part shall not apply.

(5) A POTW may certify that the sulfide pretreatment standards of this part should not apply to a new source planning to discharge into the POTW. This certification must be submitted prior to the commencement of discharge, and must conform at a minimum with criteria in paragraph (b) of this section and the general procedures and intervals of time contained in paragraphs (c) (1), (2), (3), and (4) of this section.

(d) (1) If, after EPA and the POTW have determined in accordance with this section that the sulfide pretreatment standards of this Part are not applicable to specified facilities, a POTW then determines that there have been changed circumstances (including but not limited to changes in the factors specified in paragraph (b) of this section) which justify application of the sulfide pretreatment standards, the POTW shall revoke the certification submitted under paragraph (c) of this section. The POTW and EPA shall then adhere to the general procedures and time intervals contained in paragraph (c) of this section in order to determine whether the sulfide pretreatment standards contained in this Part are applicable.

(2) If pursuant to paragraph (d)(1) of this section, the sulfide pretreatment standards of this Part are appli-

cable to a specified facility, the indirect discharger shall comply with the sulfide pretreatment standards no later than 18 months from the date of publication of the FEDERAL REGISTER notice identifying the facility.

(e) At any time after October 13, 1983, if a POTW determines that there have been changed circumstances (including but not limited to changes in the factors specified in paragraph (b) of this section), it may initiate proceedings contained in paragraph (c) of this section to determine that the sulfide pretreatment standards of this Part shall not be applicable. The POTW and EPA shall follow the procedures and time intervals contained in paragraph (c) of this section to make this determination. A final determination that the sulfide pretreatment standards are not applicable must be made prior to the discharge of sulfide not in accordance with the standards set forth in this Part.

(The information collection and reporting requirements contained in paragraphs (b) and (c) were approved by the Office of Management and Budget under control number 2040-0032)

[47 FR 52870, Nov. 23, 1982; 48 FR 30117, June 30, 1983; 48 FR 31404, July 8, 1983; 48 FR 32346, July 15, 1983; 48 FR 35649, Aug. 5, 1983; 53 FR 9181, Mar. 21, 1988]

§ 425.05 Compliance dates.

The compliance date for new source performance standards (NSPS) and pretreatment standards for new sources (PSES) is the date the new source commences discharge. The compliance date for BPT effluent limitations and guidelines and pretreatment standards for existing sources to no later than March 31, 1989.

[53 FR 9182, Mar. 21, 1988]

§ 425.06 Monitoring requirements.

Compliance with monthly average discharge limitations is required regardless of the number of samples analyzed and averaged.

Subpart A—Hair Pulp, Chrome Tan, Retan-Wet Finish Subcategory

§ 425.10 Applicability; description of the hair pulp, chrome tan, retan-wet finishing subcategory.

The provisions of this subpart are applicable to process wastewater discharges resulting from any tannery which, either exclusively or in addition to other unhairing and tanning operation, processes raw or cured cattle or cattle-like hides into finished leather by chemically dissolving the hide hair, chrome tanning, and retan-wet finishing.

§ 425.11 Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT):

Pollutant or pollutant property	BPT limitations	
	Maximum for any 1 day	Maximum for monthly average
	kg/kkg (or pounds per 1,000 pounds of raw material	
BOD5	9.3	4.2
TSS	13.4	6.1
Oil & Grease	3.9	1.7
Total Chromium	0.24	0.09
pH	(1)	(1)

1 Within the range of 6.0 to 9.0

[53 FR 9182, Mar. 21, 1988]

§ 425.12 Effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT): The effluent limitations are those for BOD5, TSS, Oil and Grease, and pH contained in § 425.11.

§ 425.13 Effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT): The effluent limitations are those for Total Chromium contained in § 425.11.

§ 425.14 New source performance standards (NSPS).

Any new source subject to this subpart must achieve the following new source performance standards (NSPS):

Pollutant or pollutant property	NSPS	
	Maximum for any 1 day	Maximum for monthly average
	Kg/kkg (or 1b/1,000 lb) of raw material	
BOD_5	6.0	2.7
TSS	8.7	4.0
Oil and grease	2.5	1.1
Total chromium	0.16	0.06
pH	(¹)	(¹)

¹ Within the range 6.0 to 9.0.

[47 FR 52870, Nov. 23, 1982; 48 FR 30116, June 30, 1983]

§ 425.15 Pretreatment standards for existing sources (PSES).

(a) Except as provided in § 425.04 and 40 CFR 403.7 and 403.13, any existing source subject to this subpart which introduces process wastewater pollutants into a publicly owned treatment works must comply with 40 CFR Part 403, and achieve the following pretreatment standards:

Pollutant or pollutant property	PSES	
	Maximum for any 1 day	Maximum for monthly average
	Milligrams per liter (mg/l)	
Sulfide	24	
Total chromium	12	8
pH	(¹)	(¹)

¹ Within the range 7.0 to 10.0.

(b) Any existing source subject to this subpart which processes less than 275 hides/day shall comply with § 425.15(a), except that the total chromium limitations contained in § 425.15(a) do not apply.

[47 FR 52870, Nov. 23, 1982; 48 FR 30116, June 30, 1983, as amended at 53 FR 9182, Mar. 21, 1988]

§ 425.16 Pretreatment standards for new sources (PSNS).

Except as provided in 40 CFR 403.7 and 425.04, any new source subject to this subpart that introduces process wastewater pollutants into a publicly owned treatment works must comply with 40 CFR Part 403, and achieve the pretreatment standards contained in § 425.15.

Subpart B—Hair Save, Chrome Tan, Retan-Wet Finish Subcategory

§ 425.20 Applicability; description of the hair save, chrome tan, retan-wet finish subcategory.

The provisions of this subpart are applicable to process wastewater discharges resulting from any tannery which processes raw or cured cattle or cattle-like hides into finished leather by hair save unhairing, chrome tanning, and retan-wet finishing.

§ 425.21 Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT):

Pollutant or pollutant property	BPT limitations	
	Maximum for any 1 day	Maximum for monthly average
	Kg/kkg (or pound per 1,000 lb) of raw material	
BOD5	8.2	3.7
TSS	11.8	5.4
Oil and grease	3.4	1.5
Total chromium	0.21	0.08
pH	(1)	(1)

[1] Within the range 6.0 to 9.0.

§ 425.22 Effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT): The effluent limitations are those for BOD5, TSS, Oil and Grease, and pH contained in § 425.21.

§ 425.23 Effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT): The effluent limitations are those for Total Chromium contained in § 425.21.

§ 425.24 New source performance standards (NSPS).

Any new source subject to this subpart must achieve the following new source performance standards (NSPS):

Pollutant or pollutant property	NSPS	
	Maximum for any 1 day	Maximum for monthly average
	Kg/kkg (or pound per 1,000 lb) of raw material	
BOD5	6.9	3.1
TSS	9.9	4.5
Oil and grease	2.9	1.3
Total chromium	0.18	0.06
pH	(1)	(1)

[1] Within the range 6.0 to 9.0

§ 425.25 Pretreatment standards for existing sources (PSES).

Except as provided in § 425.04 and 40 CFR 403.7 and 403.13, any existing source subject to this subpart that introduces process wastewater pollutants into a publicly owned treatment works must comply with 40 CFR Part 403, and achieve the following pretreatment standards:

Pollutant or pollutant property	PSES	
	Maximum for any 1 day	Maximum for monthly average
	Milligrams per liter (mg/l)	
Sulfide	24	
Total Chromium	12	8
pH	(1)	(1)

[1] Within the range 7.0 to 10.0

§ 425.26 Pretreatment standards for new sources (PSNS)

Except as provided in 40 CFR 403.7 and 425.04, any new source subject to this subpart that introduces process wastewater pollutants into a publicly owned treatment works must comply with 40 CFR Part 403, and achieve the pretreatment standards contained in § 425.25.

Subpart C—Hair Save or Pulp, Non-Chrome Tan, Retan-Wet Finish Subcategory

§ 425.30 Applicability; description of the hair save or pulp, non-chrome tan, retan-wet finish subcategory.

The provisions of this subpart are applicable to process wastewater discharges resulting from any tannery which processes raw or cured cattle or cattle-like hides into finished leather by hair save or pulp unhairing, vegetable tanning or alum, syntans, oils and other agents for tanning, and retan-wet finishing.

§ 425.31 Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT):

Pollutant or pollutant property	BPT limitations	
	Maximum for any 1 day	Maximum for monthly average
	kg/kkg (or pounds per 1,000 pounds) of raw material	
BOD5	6.7	3.0
TSS	9.7	4.4
Oil & Grease	2.8	1.3
Total Chromium	0.17	0.06
pH	(1)	(1)

[1] Within the range of 6.0 to 9.0

[47 FR 52870, Nov. 23, 1982, as amended at 53 FR 9182, Mar. 21, 1988]

§ 425.32 Effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT): The effluent limitations are those for BOD5, TSS, Oil and Grease, and pH contained in § 425.31.

§ 425.33 Effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT): The effluent limitations are those for Total Chromium contained in § 425.31.

§ 425.34 New source performance standards (NSPS).

Any new source subject to this subpart must achieve the following new source performance standards (NSPS):

Pollutant or pollutant property	NSPS	
	Maximum for any 1 day	Maximum for monthly average
	Kg/kkg (or pound per 1,000 lb) of raw material	
BOD5	5.9	2.7
TSS	8.5	3.9
Oil and grease	2.4	1.1
Total chromium	0.15	0.06
pH	(1)	(1)

[1] Within the range 6.0 to 9.0.

§ 425.35 Pretreatment standards for existing sources (PSES).

(a) Except as provided in § 425.04 and 40 CFR 403.7 and 403.13, any existing sources subject to this subpart that introduces process wastewater pollutants into a publicly owned treatment works must comply with 40 CFR Part 403, and achieve the following pretreatment standards:

Pollutant or pollutant property	PSES limitations	
	Maximum for any 1 day	Maximum for monthly average
	Milligrams per liter (mg/l)	
Sulfide	24	--
Total Chromium	12	8
pH	[1]	[1]

[1] Not less than 7.0.

(b) Any existing source subject to this subpart which processes less than 350 hides/day shall comply with § 425.35(a), except that the Total Chromium limitations contained in § 425.35(a) do not apply.

[47 FR 52870, Nov. 23, 1982; 48 FR 36116, June 30, 1983, as amended at 53 FR 9182, Mar. 21, 1988]

§ 425.36 Pretreatment standards for new sources (PSNS).

Except as provided in 40 CFR 403.7 and 425.04, any new source subject to this subpart that introduces process wastewater pollutants into a publicly owned treatment works must comply with 40 CFR Part 403, and achieve the pretreatment standards contained in § 425.35.

Subpart D—Retan-Wet Finish-Sides Subcategory

§ 425.40 Applicability; description of the retan-wet finish-sides subcategory.

The provisions of this subpart are applicable to process wastewater discharges resulting from any tannery which processes previously tanned hides and skins (grain side only) into finished leather by retan-wet finishing.

§ 425.41 Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT):

Pollutant or pollutant property	BPT limitations	
	Maximum for any 1 day	Maximum for monthly average
	kg/kkg (or pounds per 1,000 pounds) of raw material	
BOD5	8.9	4.0
TSS	12.8	5.8
Oil & Grease	3.7	1.7
Total Chromium	0.23	0.08
pH	[1]	[1]

[1] Within the range of 6.0 to 9.0.

[47 FR 52870, Nov. 23, 1982, as amended at 53 FR 9182, Mar. 21, 1988]

§ 425.42 Effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT): The effluent limitations are those for BOD5, TSS, Oil and Grease, and pH contained in § 425.41.

§ 425.43 Effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT): The effluent limitations are those for Total Chromium contained in § 425.41.

§ 425.44 New source performance standards (NSPS).

Any new source subject to this subpart must achieve the following new source performance standards (NSPS):

Pollutant or pollutant property	NSPS	
	Maximum for any 1 day	Maximum for monthly average
	kg/kkg (or pounds per 1,000 pounds) of raw material	
BOD5	6.5	2.9
TSS	9.3	4.3
Oil & Grease	2.7	1.2
Total Chromium	0.17	0.06
pH	(1)	(1)

[1] Within the range of 6.0 to 9.0.

[47 FR 52870, Nov. 23, 1982, as amended at 53 FR 9182, Mar. 21, 1988]

§ 425.45 Pretreatment standards for existing sources (PSES).

Except as provided in 40 CFR 403.7 and 403.13, any existing source subject to this subpart that introduces process wastewater pollutants into a publicly owned treatment works must comply with 40 CFR Part 403, and achieve the following pretreatment standards:

Pollutant or pollutant property	PSES	
	Maximum for any 1 day	Maximum for monthly average
	Milligrams per liter (mg/l)	
Total Chromium	19	12
pH	(1)	(1)

[1] Within the range 6.0 to 10.0.

§ 425.46 Pretreatment standards for new sources (PSNS).

Except as provided in 40 CFR 403.7, any new source subject to this subpart that introduces process wastewater pollutants into a publicly owned treatment works must comply with 40 CFR Part 403, and achieve the pretreatment standards contained in § 425.45.

Subpart E—No Beamhouse Subcategory

§ 425.50 Applicability; description of the no beamhouse subcategory.

The provisions of this subpart are applicable to process wastewater discharges resulting from any tannery which processes cattle hides, sheepskins, or splits (hair previously removed and pickled) into finished leather by chrome or non-chrome tanning, and retan-wet finishing.

§ 425.51 Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT):

Pollutant or pollutant property	BPT limitations	
	Maximum for any 1 day	Maximum for monthly average
	kg/kkg (or pounds per 1,000 pounds) of raw material	
BOD5	8.0	3.6
TSS	11.6	5.3
Oil & Grease	3.4	1.5
Total Chromium	0.21	0.08
pH	(1)	(1)

[1] Within the range of 6.0 to 9.0.

[47 FR 52870, Nov. 23, 1982, as amended at 53 FR 9182, Mar. 21, 1988]

§ 425.52 Effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional control technology (BCT): The effluent limitations are those for BOD5, TSS, Oil and Grease, and pH contained in § 425.51.

§ 425.53 Effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT): The effluent limitations are those for Total Chromium contained in § 425.51

§ 425.54 New source performance standards (NSPS).

Any new source subject to this subpart must achieve the following new source performance standards (NSPS):

Pollutant or pollutant property	NSPS	
	Maximum for any 1 day	Maximum for monthly average
	kg/kkg (or pounds per 1,000 lb) of raw material	
BOD5	5.3	2.4
TSS	7.7	3.5
Oil & Grease	2.2	1.0
Total Chromium	0.14	0.05
pH	(1)	(1)

[1] Within the range 6.0 to 9.0.

§ 425.55 Pretreatment standards for existing sources (PSES).

Except as provided in 40 CFR 403.7 and 403.13, any existing source subject to this subpart that introduces process wastewater pollutants into a publicly owned treatment works must comply with 40 CFR Part 403, and achieve the following pretreatment standards:

Pollutant or pollutant property	PSES	
	Maximum for any 1 day	Maximum for monthly average
	Milligrams per liter (mg/l)	
Total chromium	19	12
pH	(1)	(1)

[1] Within the range 6.0 to 10.0.

§ 425.56 Pretreatment standards for new sources (PSNS).

Except as provided in 40 CFR 403.7, any new source subject to this subpart that introduces process wastewater pollutants into a publicly owned treatment works must comply with 40 CFR Part 403, and achieve the pretreatment standards contained in § 425.55.

Subpart F—Through-the-Blue Subcategory

§ 425.60 Applicability; description of the through-the-blue subcategory.

The provisions of this subpart are applicable to process wastewater discharges resulting from any tannery which processes raw or cured cattle or cattle-like hides through the blue tanned state by hair pulp unhairing and chrome tanning; no retan-wet finishing is performed.

§ 425.61 Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT):

Pollutant or pollutant property	BPT limitations	
	Maximum for any 1 day	Maximum for monthly average
	kg/kkg (or pounds per 1,000 pounds) of raw material	
BOD5	3.2	1.5
TSS	4.7	2.1
Oil & Grease	1.4	0.61
Total Chromium	0.08	0.03

Pollutant or pollutant property	BPT limitations	
	Maximum for any 1 day	Maximum for monthly average
pH	(1)	(1)

[1] Within the range of 6.0 to 9.0.

[47 FR 52870, Nov. 23, 1982, as amended at 53 FR 9183, Mar. 21, 1988]

§ 425.62 Effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT): The effluent limitations are those for BOD5, TSS, Oil and Grease, and pH contained in § 425.61.

§ 425.63 Effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT): The effluent limitations are those for Total Chromium contained in § 425.61.

§ 425.64 New source performance standards (NSPS).

Any new source subject to this subpart must achieve the following new source performance standards (NSPS):

Pollutant or pollutant property	BPT limitations	
	Maximum for any 1 day	Maximum for monthly average
	kg/kkg (or pounds per 1,000 pounds) of raw material	
BOD5	3.2	1.5
TSS	4.7	2.1
Oil & Grease	1.4	0.61
Total Chromium	0.08	0.03
pH	(1)	(1)

[1] Within the range of 6.0 to 9.0.

[47 FR 52870, Nov. 23, 1982, as amended at 53 FR 9183, Mar. 21, 1988]

§ 425.65 Pretreatment standards for existing sources (PSES).

Except as provided in § 425.04 and 40 CFR 403.7 and 403.13, any existing source subject to this subpart that introduces process wastewater pollutants into a publicly owned treatment works must comply with 40 CFR Part 403, and achieve the following pretreatment standards:

Pollutant or pollutant property	PSES	
	Maximum for any 1 day	Maximum for monthly average
	Milligrams per liter (mg/l)	
Sulfide	24	
Total chromium	12	8
pH	(1)	(1)

[1] Within the range 7.0 to 10.0.

§ 425.66 Pretreatment standards for new sources (PSNS).

Except as provided in 40 CFR 403.7 and 425.04, any new source subject to this subpart that introduces process wastewater pollutants into a publicly owned treatment must comply with 40 CFR Part 403, and must achieve the pretreatment standards contained in § 425.65.

Subpart G—Shearling Subcategory

§ 425.70 Applicability; description of the shearling subcategory.

The provisions of this subpart are applicable to process wastewater discharges resulting from any tannery which processes raw or cured sheep or sheep-like skins with the wool or hair retained into finished leather by chrome tanning, and retan-wet finishing.

§ 425.71 Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT):

Pollutant or pollutant property	NSPS	
	Maximum for any 1 day	Maximum for monthly average
	kg/kkg (or pounds per 1,000 pounds) of raw material	
BOD5	3.0	1.3
TSS	4.3	1.9
Oil & Grease	1.2	0.55
Total Chromium	0.08	0.03
pH	(1)	(1)

[1] Within the range of 6.0 to 9.0.

[47 FR 52870, Nov. 23, 1982, as amended at 53 FR 9183, Mar. 21, 1988]

§ 425.72 Effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT): The effluent limitations are those for BOD5, TSS, Oil and Grease, and pH contained in § 425.71.

§ 425.73 Effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT): The effluent limitations are those for Total Chromium contained in § 425.71.

§ 425.74 New source performance standards (NSPS).

Any new source subject to this subpart must achieve the following new source performance standards (NSPS):

Pollutant or pollutant property	NSPS	
	Maximum for any 1 day	Maximum for monthly average
	Kg/kkg (or pound per 1,000 lb) of raw material	
BOD5	13.2	5.9
TSS	19.1	8.7
Oil and grease	5.6	2.5
Total chromium	0.34	0.12
pH	(1)	(1)

[1] Within the range 6.0 to 9.0.

§ 425.75 Pretreatment standards for existing sources (PSES).

Except as provided in 40 CFR 403.7 and 403.13, any existing source subject to this subpart that introduces process wastewater pollutants into a publicly owned treatment works must comply with 40 CFR Part 403, and achieve the following pretreatment standards:

Pollutant or pollutant property	PSES	
	Maximum for any 1 day	Maximum for monthly average
	Milligrams per liter (mg/l)	
Total chromium	19	12
pH	(¹)	(¹)

¹ Within the range 6.0 to 10.0.

§ 425.76 Pretreatment standards for new sources (PSNS).

Except as provided in 40 CFR 403.7, any new source subject to this subpart that introduces process wastewater pollutants into a publicly owned treatment works must comply with 40 CFR Part 403, and must achieve the pretreatment standards contained in § 425.75.

Subpart H—Pigskin Subcategory

§ 425.80 Applicability; description of the pigskin subcategory.

The provisions of this subpart are applicable to process wastewater discharges resulting from any tannery which processes raw or cured pigskins into finished leather by chemically dissolving or pulping the hair and tanning with chrome, then retan-wet finishing.

§ 425.81 Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT):

Pollutant or pollutant property	BPT limitations	
	Maximum for any 1 day	Maximum for monthly average
	kg/kkg (or pounds per 1,000 lb) of raw material	
BOD5	7.0	3.2
TSS	10.1	4.6
Oil and grease	3.0	1.3
Total chromium	0.18	0.07
pH	(¹)	(¹)

¹ Within the range 6.0 to 9.0.

[47 FR 52870, Nov. 23, 1982; 48 FR 30117, June 30, 1983]

§ 425.82 Effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT): The effluent limitations are those for BOD5, TSS, Oil and Grease and pH contained in § 425.81.

§ 425.83 Effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT): The effluent limitations are those for Total Chromium contained in § 425.81.

§ 425.84 New source performance standards (NSPS).

Any new source subject to this subpart must achieve the following new source performance standards (NSPS):

Pollutant or pollutant property	NSPS	
	Maximum for any 1 day	Maximum for monthly average
	kg/kkg (or pounds per 1,000 lb) of raw material	
BOD5	5.8	2.6
TSS	8.3	3.8
Oil and grease	2.4	1.1
Total chromium	0.15	0.05
pH	(1)	(1)

[1] Within the range 6.0 to 9.0.

§ 425.85 Pretreatment standards for existing sources (PSES).

Except as provided in § 425.04 and 40 CFR 403.7 and 403.13, any existing source subject to this subpart that introduces process wastewater pollutants into a publicly owned treatment works must comply with 40 CFR Part 403, and achieve the following pretreatment standards:

Pollutant or pollutant property	PSES	
	Maximum for any 1 day	Maximum for monthly average
	Milligrams per liter (mg/l)	
Sulfide	24	
Total chromium	12	8
pH	(1)	(1)

[1] Within the range 7.0 to 10.0.

§ 425.86 Pretreatment standards for new sources (PSNS).

Except as provided in 40 CFR 403.7 and 425.04, any new source subject to this subpart that introduces process wastewater pollutants into a publicly owned treatment works must comply with 40 CFR Part 403, and achieve the pretreatment standards contained in § 425.85.

Subpart I—Retan-Wet Finish-Splits Subcategory

§ 425.90 Applicability; description of the retan-wet finish-splits subcategory.

The provisions of this subpart are applicable to process wastewater discharges resulting from any tannery which processes previously unhaired and tanned splits into finished leather by retan-wet finishing.

§ 425.91 Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT):

Pollutant or pollutant property	BPT limitations	
	Maximum for any 1 day	Maximum for monthly average
	kg/kkg (or pounds per 1,000 pounds) of raw material	
BOD5	5.8	2.6
TSS	8.3	3.8
Oil & Grease	2.4	1.1
Total Chromium	0.15	0.05
pH	(1)	(1)

[1] Within the range of 6.0 to 9.0.

[47 FR 52870, Nov. 23, 1982, as amended at 53 FR 9183, Mar. 21, 1988]

§ 425.92 Effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT): The effluent limitations are those for BOD5, TSS, Oil and Grease, and pH contained in § 425.91.

§ 425.93 Effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT): The effluent limitations are those for Total Chromium contained in § 425.91.

§ 425.94 New source performance standards (NSPS).

Any new source subject to this subpart must achieve the following new source performance standards (NSPS):

Pollutant or pollutant property	NSPS	
	Maximum for any 1 day	Maximum for monthly average
	kg/kkg (or pounds per 1,000 lb) of raw material	
BOD5	3.5	1.6
TSS	5.1	2.3
Oil & Grease	1.5	0.68
Total Chromium	0.09	0.03
pH	[1]	[1]

[1] Within the range 6.0 to 9.0.

§ 425.95 Pretreatment standards for existing sources (PSES).

(a) Except as provided in 40 CFR 403.7 and 403.13, any existing source subject to this subpart that introduces process wastewater pollutants into a publicly owned treatment works must comply with 40 CFR Part 403, and must achieve the following pretreatment standards:

Pollutant or pollutant property	PSES	
	Maximum for any 1 day	Maximum for monthly average
	Milligrams per liter (mg/l)	
Total Chromium	19	12
pH	[1]	[1]

[1] Within the range 6.0 to 10.0.

(b) Any existing source subject to this subpart which processes less than 3,600 splits/day shall comply with § 425.95(a), except that the total chromium limitations contained in § 425.95(a) do not apply.

[47 FR 52870, Nov. 23, 1982; 48 FR 30117, June 30, 1983, as amended at 53 FR 9183, Mar. 21, 1988]

§ 425.96 Pretreatment standards for new sources (PSNS).

Except as provided in 40 CFR 403.7, any new source subject to this subpart that introduces process wastewater pollutants into a publicly owned treatment works must comply with 40 CFR Part 403, and achieve the pretreatment standards contained in § 425.95.

MODULE # 5C

TITLE: **Best Professional Judgement-Based Permit Limits**

OVERALL OBJECTIVES:

- Provide overview of when to use BPJ limits
- Identify the circumstances for the application of BPJ
  - Industrial discharges
  - Combined sewer overflows
  - Storm water
- Discuss necessary considerations when using BPJ to develop permit limits
- List tools and resources available for developing limits using BPJ
- Provide overview of economic considerations when developing effluent limits using BPJ

LOGISTICS:

Presentation Format: Lecture, practical exercise
Approximate Presentation Time: 45 minutes
Review Questions/Exercise: 30 minutes
Applicable Statutory/Regulatory Citations:

CWA Section 402(a)(1)	NPDES authority
40 CFR §122.44(a)	Technology-based effluent limitations and standards
40 CFR §122.45(b)(2)	Production-based limitations
40 CFR §125.3(a)(2)	Technology-based treatment requirements in permits (for non-POTWs)

Best Professional Judgment-Based Permit Limits

Learning Objectives

- Provide overview of BPJ derived limits
- Describe examples of BPJ application
- Discuss BPJ technical and economic considerations
- Present BPJ tools and resources

BPJ is the Permit Writer's Opinion

- Technology-based NPDES permit conditions, developed using all reasonable available and relevant data
- Why? Technology-based effluent limits must be established for all pollutants regulated in a permit
- When? On a case-by-case basis in the absence of effluent guidelines and standards for a facility or pollutant

Hypothetical Situation for Use of BPJ

Pollutants to be Regulated in Permit	Considered/Regulated by Effluent Guidelines and Standards?	BPJ Effluent Limit Needed?
Copper	Yes	No
Zinc	Yes	No
Benzene	No	Yes
Aluminum	No	Yes

BPJ Application Examples

- Combined sewer overflows
- Hazardous waste treaters
- Equipment manufacturers
- Waste oil reclaimers
- Industrial laundries
- Paint and ink facilities
- Pharmaceuticals
- Barrel reclaimers
- Transportation facilities
- Mining operations
- Water treatment plants
- Petroleum industry

BPJ Considerations

- For BPT requirements:
  - Total cost of technology in relation to the effluent reduction benefits to be achieved from such application
  - Age of equipment and facilities involved
  - Process(es) employed
  - Engineering aspects of the application of various types of control techniques
  - Process changes
  - Non-water quality environmental impact including energy requirements

BPJ Considerations

- **For BCT requirements:**
  - Reasonableness of the relationship between costs of attaining reduction in effluent and the derived effluent reduction benefits
  - Age of equipment and facilities involved
  - Process(es) employed
  - Engineering aspects of the application of various types of control techniques
  - Non-water quality environmental impact including energy requirements
  - Comparison of the cost and level of reduction of such pollutants from a class or category of industrial sources

BPJ Considerations

- **For BAT requirements:**
  - Age of equipment and facilities involved
  - Process(es) employed
  - Engineering aspects of the application of various types of control techniques
  - Process changes
  - Cost of achieving effluent reduction
  - Non-water quality environmental impact including energy requirements

Cost Considerations

Proposed Treatment Option →	A	B	C
Influent Concentration	10	10	10
Effluent Concentration	5	8	6
Lbs Removed	150	75	100
Treatment Cost ($)	600	750	200
BPT ($/lb)	4	10	2
BAT (Economically Achievable?)	Yes	No	Yes

BPJ Defensibility

- Defensibility depends on reasonableness
- Reasonableness demonstrated by documentation
- Documentation should include:
  - What is being imposed?
  - Why is it being imposed?
  - How it was developed?

BPJ Tools and Resources

- Abstracts of Industrial NPDES permits
- Treatability Manual and Database
- NPDES Best Management Practices Guidance Document
- Technical Support Document for the Development of Water Quality-Based Permit Limitations for Toxic Pollutants
- Economic achievability protocol

BPJ Tools and Resources (Continued)

- Effluent guideline data/information
  - Development documents
  - Proposed regulations
- Other sources information
  - Model permits
  - General permits information exchange database
  - Discharge monitoring reports
  - Compliance inspection reports
  - Industry teams/national experts

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF RESEARCH AND DEVELOPMENT
RISK REDUCTION ENGINEERING LABORATORY
CINCINNATI. OHIO 45268

March 17, 1995

Dear Colleague:

As requested, enclosed is a copy of Version 5.0 of the "RREL Treatability Data Base." The purpose of the data base is to provide a review of the removal/destruction of chemicals in various types of media, including water, soil, debris, sludge and sediment. The program contains physical/chemical properties for each compound, as well as treatability data. The treatability data summarizes the types of treatment used to treat the specific compound; the type of waste/wastewater treated; the size of the study/plant; and the treatment levels achieved.

The requirements to operate the program are as follows: IBM personal computer, or compatible; 8 megabyte hard disk storage; 640K RAM memory; DOS Version 2.0 or higher; and a 12-pitch printer.

To load the program, insert the diskette into the 3-1/2" disk drive and type A:install or B:install, whichever disk drive is assigned for 3-1/2" disks. The installation program will create a subdirectory on your hard drive entitled "TDB5". You will have the opportunity to customize the installation if you so choose. If you have any questions regarding installation of this software, please review the file entitled, "read.me" prior to installation. To start the data base program, enter the subdirectory and type "MAIN."

Some users have reported that they have gotten an error message "Not Enough Memory" after typing in "MAIN" to start the data base. If you get a "Not Enough Memory" error message, please type in this command: **"SET CLIPPER=F55; \\E:2000"** before you type in the command "MAIN" to start the data base program. The "SET CLIPPER" (as seen above) command sets up the runtime variable to open enough file handles and buffers. It also takes advantage of expanded memory (if the PC has any memory above the 640KB). This command "SET CLIPPER=F55; \\E:2000" can be added to the autoexec.bat file or you can put both commands ("MAIN", "SET CLIPPER=F55; \\E:2000") into a batch file.

Beyond these suggestions, we may not be able to solve all the operational problems with the multitude of hardware and software configurations in existence. Please contact your local computer support group for additional help in problem solving your exact set up.

If you have any technical questions and/or comments about this data base, please call Glenn Shaul at (513) 569-7408; FAX: (513) 569-7787. For any computer questions, please call Jerry Waterman at (513) 569-7834; FAX: (513) 569-7787.

I hope this improved version will assist you and I would be interested in your comments after you have had an opportunity to use the data base for a while.

Sincerely yours,

Glenn M. Shaul

Glenn M. Shaul
Chief
Chemical Engineering Section
Toxics Control Branch
Water and Hazardous Waste Treatment
Research Division

Enclosure

RREL TREATABILITY DATABASE

The Risk Reduction Engineering Laboratory (RREL) has developed and is continuing to expand a database on the removal/destruction of chemicals in various types of media, including water, wastewater, soil, debris, sludge, and sediment. This activity is being conducted under the direction of Mr. Glenn M. Shaul.

The following editing rules are being used to evaluate the data prior to entry into the database:

- Only primary references will be used.
- Bench-top and pilot-plant data from aqueous biological treatment processes must be acclimated systems.
- Only matched pairs of influent and effluent data will be used.
- Data will be from continous flow processes in equilibrium unless noted by a "(B)" in the "Technology" column for the "Aqueous" data file or by a "(B)" in the "Scale" column for the "Solids" data file.

The compound name used in the database will be labeled as a "Primary Name" in the "Compound Name List". Other chemical names are synonyms for the "Primary Name". Even if treatability data are not available, only information related to chemical and physical properties, environmental data and possibly adsorption data will be given.

If you have any questions/comments concerning this database, please contact:

Mr. Glenn M. Shaul
Risk Reduction Engineering Laboratory
Environmental Protection Agency
26 W. Martin Luther King Drive
Cincinnati, Ohio 45268

(513) 569-7408
(513) 569-7787 (Fax No.)

Disclaimer: The data collected herein are a tabulation from many sources and are presented for review by the user for informational purposes only. The data presented herein does not represent a total listing of the technologies capable of treating the target chemical compound and should not be viewed as solely reliable for treatability system design and should be thoroughly reviewed to support regulatory guidelines. Therefore, the conclusions and opinions drawn are solely those of the user and are not necesarily the views of the agency. Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

The RREL Treatability Database is also available through the Alternative Technology Treatment Information Center (ATTIC). ATTIC is a comprehensive information network providing up-to-date information on innovative treatment technologies. ATTIC provides the information needed to make effective decisions on hazardous waste clean-up alternatives. It can be accessed with a PC and modem 24 hours a day, and there are no user fees. For further information on ATTIC please call the ATTIC System Hotline at (301) 670-6294.

MERCURY

CAS NO.: 7439-97-6

COMPOUND TYPE: INORGANIC,ELEMENT

FORMULA: HG

CHEMICAL AND PHYSICAL PROPERTIES	REFERENCE
MOLECULAR WEIGHT: 200.59	333A
MELTING POINT (C): -38.87	333A
BOILING POINT (C): 356.58	333A
VAPOR PRESSURE @ T(C), TORR: 1.2 E-3 @ 20	462A
SOLUBILITY IN WATER @ T(C), MG/L: 0.056 @ 25	2028A
LOG OCTANOL/WATER PARTITION COEFFICIENT:	NA
HENRY'S LAW CONSTANT, ATM x M3 MOLE-1: 1.14 E-2 (C)	1018A

ENVIRONMENTAL DATA	REFERENCE
CHRONIC NONCARCINOGENIC SYSTEMIC TOXICITY	NA
RISK ESTIMATES FOR CARCINOGENS	NA
DRINKING WATER HEALTH ADVISORIES/STANDARDS	349B
WATER QUALITY CRITERIA	345B
AQUATIC TOXICITY DATABASE	5B

FREUNDLICH ISOTHERM DATA

ADSORBENT	MATRIX	K	1/N	Ce UNITS	X/M UNITS	REF.
FILTRASORB 400	C (HG2+	20	0.46	mg/L	mg/gm	72E

MERCURY

INFLUENT CONCENTRATION - 0-100 ug/L

TECHNOLOGY	MATRIX	SIC CODE	SCALE	EFFLUENT CONCENTRATION (ug/L)	PERCENT REMOVAL	REFERENCE
AL	D		F11	0.01 (5)	89	86B -S-
AL	D		F18	0.01 (5)	92.3	86B -S-
AL	D		F1	0.05 (1)	38	255B -S-
AL	D		F2	<0.03 (1)	>83	255B -S-
AL	D		F3	<0.02 (1)	>75	255B -S-
AL	D		F4	0.10 (1)	33	255B -S-
AS	D		F12	<0.2 (6)	>62	1B -S-
AS	D		F27	<0.22 (6)	>64	1B -S-
AS	D		F19	<0.23 (6)	>62	1B -S-
AS	D		F51	<1.0 (6)	>41	1B -S-
AS	D		F37	<0.23 (6)	>58	1B -S-
AS	D		F18	0.23 (6)	56	1B -S-
AS	D		F28	<0.3 (6)	>52	1B -S-
AS	D		F	<0.3 (19)	>35	201B -S-
AS	D		F25	<0.22 (6)	>63	1B -S-
AS	D		F57	<1.2 (6)	>76	1B -S-
AS	D		F6	0.23 (6)	92.8	1B -S-
AS	D		F17	<0.2 (6)	>43	1B -S-
AS	D		F20	<0.2 (6)	>74	1B -S-
AS	D		F1	0.40 (7)	0	1B -S-
AS	D		F4	0.45 (6)	62	1B -S-
AS	D		F38	<0.2 (6)	>78	1B -S-
AS	D		F59	<0.13 (6)	>68	1B -S-
AS	D		F2a	<0.24 (14)	>66	67B ---
AS	D		F2b	<0.23 (24)	>54	67B ---
AS	D		F1	<1 (30)	>67	35E -S-
AS	D		F1b	<0.21 (19)	>48	67B ---
AS	D		F7	<1 (2)	>0	35E -S-
AS	D		F6	<1 (2)	>0	35E -S-
AS	D		F4	5 (3)	0	35E -S-
AS	D		F	0.16	69	59E ---
AS	D		F1a	<0.20 (20)	>33	67B ---
AS	D		F2	<1 (4)	>50	35E -S-
AS	D		F1	0.02 (6)	80	86B -S-
AS	D		F2	0.03 (10)	81	86B -S-
AS	D		F3	0.04 (11)	86	86B -S-
AS	D		F30	0.02 (11)	95.6	86B -S-
AS	D		F12	0.02 (10)	93.1	86B -S-
AS	D		F10	0.01 (13)	96.7	86B -S-
AS	D		F26	0.02 (5)	60	86B -S-
AS	D		F19	0.02 (5)	90.0	86B -S-
AS	D		F29	0.02 (11)	92.0	86B -S-
AS	D		F27	0.04 (5)	81	86B -S-
AS	D		F31	0.05 (10)	89	86B -S-
AS	D		F22	0.02 (10)	86	86B -S-
AS	D		F21	0.01 (5)	96.7	86B -S-
AS	D		F13	0.01 (10)	90.9	86B -S-
AS	D		F15	0.08 (10)	70	86B -S-
AS	D		F16	0.03 (6)	89	86B -S-
AS	D		F7	0.03 (10)	90.6	86B -S-
AS	D		F34	0.03 (6)	81	86B -S-
AS	D		F37	0.03 (5)	91.9	86B -S-
AS	D		F23	0.03 (10)	88	86B -S-
AS	D		F14	0.05 (12)	88	86B -S-
AS	D		F35	0.01 (5)	93.8	86B -S-
AS	D		F32	0.02 (5)	93.5	86B -S-
AS	D		F9	0.01 (5)	98.8	86B -S-
AS	D		F5	0.01 (5)	95.8	86B -S-
AS	D		F33	0.02 (11)	91.7	86B -S-
AS	D		F6	0.10 (9)	86	86B -S-
AS	D		F5	0.5 (14)	17	140B -S-
AS	D		F10	<0.03 (1)	>91.7	255B -S-
AS	D		F12	0.05 (1)	81	255B -S-
AS	D		F13	0.03 (1)	77	255B -S-
AS	D		F14	<0.03 (1)	>70	255B -S-
AS	D		F15	0.05 (1)	82	255B -S-

MERCURY

INFLUENT CONCENTRATION - 0-100 ug/L

TECHNOLOGY	MATRIX	SIC CODE	SCALE	EFFLUENT CONCENTRATION (ug/L)	PERCENT REMOVAL	REFERENCE
AL	D		F11	0.01 (5)	89	86B -S-
AL	D		F18	0.01 (5)	92.3	86B -S-
AL	D		F1	0.05 (1)	38	255B -S-
AL	D		F2	<0.03 (1)	>83	255B -S-
AL	D		F3	<0.02 (1)	>75	255B -S-
AL	D		F4	0.10 (1)	33	255B -S-
AS	D		F12	<0.2 (6)	>62	1B -S-
AS	D		F27	<0.22 (6)	>64	1B -S-
AS	D		F19	<0.23 (6)	>62	1B -S-
AS	D		F51	<1.0 (6)	>41	1B -S-
AS	D		F37	<0.23 (6)	>58	1B -S-
AS	D		F18	0.23 (6)	56	1B -S-
AS	D		F28	<0.3 (6)	>52	1B -S-
AS	D		F	<0.3 (19)	>35	201B -S-
AS	D		F25	<0.22 (6)	>63	1B -S-
AS	D		F57	<1.2 (6)	>76	1B -S-
AS	D		F6	0.23 (6)	92.8	1B -S-
AS	D		F17	<0.2 (6)	>43	1B -S-
AS	D		F20	<0.2 (6)	>74	1B -S-
AS	D		F1	0.40 (7)	0	1B -S-
AS	D		F4	0.45 (6)	62	1B -S-
AS	D		F38	<0.2 (6)	>78	1B -S-
AS	D		F59	<0.13 (6)	>68	1B -S-
AS	D		F2a	<0.24 (14)	>66	67B ---
AS	D		F2b	<0.23 (24)	>54	67B ---
AS	D		F1	<1 (30)	>67	35E -S-
AS	D		F1b	<0.21 (19)	>48	67B ---
AS	D		F7	<1 (2)	>0	35E -S-
AS	D		F6	<1 (2)	>0	35E -S-
AS	D		F4	5 (3)	0	35E -S-
AS	D		F	0.16	69	59E ---
AS	D		F1a	<0.20 (20)	>33	67B ---
AS	D		F2	<1 (4)	>50	35E -S-
AS	D		F1	0.02 (6)	80	86B -S-
AS	D		F2	0.03 (10)	81	86B -S-
AS	D		F3	0.04 (11)	86	86B -S-
AS	D		F30	0.02 (11)	95.6	86B -S-
AS	D		F12	0.02 (10)	93.1	86B -S-
AS	D		F10	0.01 (13)	96.7	86B -S-
AS	D		F26	0.02 (5)	60	86B -S-
AS	D		F19	0.02 (5)	90.0	86B -S-
AS	D		F29	0.02 (11)	92.0	86B -S-
AS	D		F27	0.04 (5)	81	86B -S-
AS	D		F31	0.05 (10)	89	86B -S-
AS	D		F22	0.02 (10)	86	86B -S-
AS	D		F21	0.01 (5)	96.7	86B -S-
AS	D		F13	0.01 (10)	90.9	86B -S-
AS	D		F15	0.08 (10)	70	86B -S-
AS	D		F16	0.03 (6)	89	86B -S-
AS	D		F7	0.03 (10)	90.6	86B -S-
AS	D		F34	0.03 (6)	81	86B -S-
AS	D		F37	0.03 (5)	91.9	86B -S-
AS	D		F23	0.03 (10)	88	86B -S-
AS	D		F14	0.05 (12)	88	86B -S-
AS	D		F35	0.01 (5)	93.8	86B -S-
AS	D		F32	0.02 (5)	93.5	86B -S-
AS	D		F9	0.01 (5)	98.8	86B -S-
AS	D		F5	0.01 (5)	95.8	86B -S-
AS	D		F33	0.02 (11)	91.7	86B -S-
AS	D		F6	0.10 (9)	86	86B -S-
AS	D		F5	0.5 (14)	17	140B -S-
AS	D		F10	<0.03 (1)	>91.7	255B -S-
AS	D		F12	0.05 (1)	81	255B -S-
AS	D		F13	0.03 (1)	77	255B -S-
AS	D		F14	<0.03 (1)	>70	255B -S-
AS	D		F15	0.05 (1)	82	255B -S-

AS	D		F16	0.11 (1)	31	255B -S-
AS	D		F17	0.05 (1)	54	255B -S-
AS	D		F18	<0.05 (1)	>90.0	255B -S-
AS	D		F19	0.15 (1)	98.5	255B -S-
AS	D		F20	0.15 (1)	92.5	255B -S-
AS+Fil	D		F3a	<0.20 (20)	>82	67B ---
AS+Fil	D		F3b	<0.20 (16)	>87	67B ---
CAC	D		F	<0.5 (2)	>33	15B ---
ChPt	D		P3	2	90	55E ---
ChPt	D		P	0.93	0	47B ---
ChPt	D		F	1.2 (74)	70	1830B ---
Fil	D		F	0.13	19	59E ---
PACT	D		P	1.8 (2)	81	173E ---
RBC	D		F17	0.03 (10)	79	86B -S-
RO	D		P	0.1	0	144A ---
Sed	D		F2	2 (4)	67	35E -S-
Sed	D		F1	3 (30)	57	35E -S-
Sed	D		F3	4 (3)	0	35E -S-
Sed	D		F7	1 (2)	0	35E -S-
Sed	D		F6	1 (2)	0	35E -S-
Sed	D		F4	0.04 (8)	69	86B -S-
Sed	D		F8	0.06 (5)	38	86B -S-
Sed	D		F20	0.08 (5)	43	86B -S-
Sed	D		F25	0.10 (5)	44	86B -S-
Sed	D		F36	0.01 (5)	92.9	86B -S-
Sed	D		F24	0.10 (6)	82	86B -S-
Sed	D		F28	0.09 (5)	74	86B -S-
Sed	D		F1	0.6 (14)	54	140B -S-
Sed	D		F2	0.6 (14)	25	140B -S-
Sed	D		F3	0.7 (14)	12	140B -S-
Sed	D		F6	1.6 (14)	36	140B -S-
Sed	D		F6	0.06 (1)	33	255B -S-
Sed	D		F7	0.08 (1)	85	255B -S-
Sed	D		F8	<0.05 (1)	>38	255B -S-
TF	D		F27	0.43 (6)	31	1B -S-
TF	D		F37	0.30 (6)	46	1B -S-
TF	D		F29	0.65 (6)	0	1B -S-
TF	D		F10	<0.2 (6)	>68	1B -S-
TF	D		F21	0.27 (6)	60	1B -S-
TF	D		F17	<0.2 (6)	>43	1B -S-
TF	D		F39	0.28 (6)	47	1B -S-
TF	D		F40	0.57 (6)	37	1B -S-
TF	D		F3	4 (3)	0	35E -S-
TF	D		F4	0.8 (14)	47	140B -S-
AL	I	28	F11	<4 (1)	>20	87B ---
AL+Fil	I	28	F29	1.0 (2)	0	87B ---
AS	I	28	F1	<1 (1)	>50	32B ---
AS	I	28	F2	1 (1)	0	32B ---
AS	I	28	F25	<0.2 (1)	>50	87B ---
AS	I	28	F21	3.0 (3)	0	87B ---
AS	I	28	F13	<2 (2)	>17	87B ---
AnFF	I	10	B	<1 (5)	>67	45E ---
CAC	I	28	F	0.09	87	393A ---
CAC (B)	I	49	B2	0.25 (1)	7	638B ---
ChOx(Cl)	I	28	F26	66 (1)	3	87B ---
ChPt	I	33	P	<0.3	>57	53B --$
Fil	I	28	F16	70 (1)	0	87B ---
GAC	I	28	F14	<10 (1)	>23	87B ---
GAC	I	28	F15	70 (1)	0	87B ---
GAC	I	29	P1	0.9 (1)	47	188A ---
PACT	I	29	P2	0.5 (1)	50	188A ---
RA (B) + Fil	I	28	F20	<4 (1)	>85	87B ---
SS+GAC	I	28	F27	10 (3)	85	87B ---
Sed	I	31	F8	<1 (1)	>9	31B ---
Sed+AS	I	28	F28	1.0 (2)	0	87B ---
ChPt	ML		F	2.7 (18)	75	36E --$
ChPtwPAC+Fil	RCRA		P4	0.1 (1)	75	265D ---
WOx+Fil (B)	RCRA		B14	11 (1)	0	266B -S-
WOx+Fil (B)	RCRA		B1	8 (1)	0	266B -S-
WOx+Fil (B)	RCRA		B15	4 (1)	0	266B -S-
DAF (B)	SF		B4	<0.2 (2)	>62	1927B ---
GAC	SF		F8	<1.0 (1)	>41	245B ---

MERCURY

INFLUENT CONCENTRATION - >100-1000 ug/L

TECHNOLOGY	MATRIX	SIC CODE	SCALE	EFFLUENT CONCENTRATION (ug/L)	PERCENT REMOVAL	REFERENCE
AlgIE	GW		B	4.1 (13)	99.44	145B ---
AS	I	28	F17	190 (2)	0	87B ---
ChPt	I	10	P1	10 (12)	98.0	51B ---
ChPt (B) + Fil	I	28	F19	26 (1)	89	87B ---
RO	I	10	P2	60 (4)	78	51B ---
SExt	I	28	F8	240 (1)	0	87B ---
ChPtwPAC+Fil	RCRA		P1	2.4 (1)	98.8	265D ---
ChPtwPAC+Fil	RCRA		P2	0.4 (1)	99.922	265D ---
ChPtwPAC+Fil	RCRA		P3	400 (1)	0	265D ---

INFLUENT CONCENTRATION - >1-10 mg/L

TECHNOLOGY	MATRIX	SIC CODE	SCALE	EFFLUENT CONCENTRATION (ug/L)	PERCENT REMOVAL	REFERENCE
RO	D		P3	900 (2)	82	18B ---
RO	D		P4	1,600 (2)	82	18B ---
ChPt (B)	S		B1	2,600 (1)	10	43E ---
ChPt (B)	S		B2	<1 (1)	>99.966	43E ---

PRACTICAL EXERCISE

Best Professional Judgement

SITUATION:

You are the permit writer responsible for drafting a NPDES permit for a printing facility. Processes employed at the facility include lithographic and letterpress printing. Since effluent limitations guidelines and standards have not been promulgated for the printing industry, you must develop technology-based effluent limits based on your best professional judgement. For purposes of this exercise, you must particularly develop limits for copper.

GIVEN:

All process wastewaters generated at the printing facility are directed to a physical/chemical treatment plant (chemical precipitation followed by filtration) prior to discharge via Outfall 001. No other wastewaters from the facility are treated or discharged through Outfall 001. Other characteristics include:

Average influent copper concentration = 110 ug/l
Average effluent copper concentration = 55 ug/l
Average flow = 25,000 gpd

QUESTIONS:

(1) What level of treatment should be reflected in the technology-based limit to be established for copper based on best professional judgement?________________________

____

____

(2) Based on the information contained in the EPA RREL Treatability Data Base (see attached print-outs), is the facility treatment plant achieving the appropriate level of treatment? Explain your answer. ____

____

____

____

(3) Based on information in the EPA RREL Treatability Data Base, what is the expected range of percent removals for copper? Based on this expected removal, what should be the expected effluent concentration from the facility treatment plant? ________________

____

____

____

____

(4) Based on information contained in the NPDES Industrial Permit Abstracts for three facilities that contain effluent limitations for copper (see attached), which of the three could serve as the basis for a technology-based effluent limit for copper for the printing facility? Explain your answer. ______________________________

(5) Based on information contained in the EPA Summary of Available Information on the Levels and Control of Toxic Pollutants Discharges in the Printing and Publishing Point Source Category (see attached), what percent removal would be expected for copper at the printing facility? Explain the rationale for your answer. ______________________________

(6) Of the sources of information reviewed, which do you feel would serve as the most defensible basis for a technology-based effluent limit for copper at the printing facility? Explain your conclusions. ______________________________

COPPER TREATABILITY DATA

FROM THE

EPA RREL TREATABILITY DATA BASE

(Version 5.0)

RREL TREATABILITY DATABASE
TREATMENT TECHNOLOGIES CODE AND ABBREVIATION TABLE

AQUEOUS DATA FILE

Treatment Technologies (Those with data)

AAS -	Activated Alumina Sorption
AFF -	Aerobic Fixed Film
AL -	Aerobic Lagoons
API -	API Oil/Water Separator
AS -	Activated Sludge
AirS -	Air Stripping
AlkHyd -	Alkaline Hydrolysis
AlgIE -	Algal Ion Exchange
AnFF -	Anaerobic Fixed Film
BGAC -	Biological Granular Activated Carbon
CAC -	Chemically Assisted Clarification
ChOx -	Chemical Oxidation (Parantheses shows oxidation chemical (i.e. ChOx(UV) is ultraviolet light, ChOx(Cl) is chlorine, ChOx(Oz) is ozone, ChOx(H2O2) is peroxide, ChOx(ClO2) is chlorine dioxide, and ChOx(Sur) is surfactant)
ChOx/Pt -	Chemical Oxidation/Precipitation
ChPt -	Chemical Precipitation
ChRed -	Chemical Reduction
DAF -	Dissolved Air Flotation
ED -	Electrodialysis
Fil -	Filtration
GAC -	Activated Carbon (Granular)
IE -	Ion Exchange (Parantheses shows resin type ie. (A) is anionic, (C) is cationic, and (M) is mixed)
KPEG -	Dechlorination of Toxics using an Alkoxide (Formed by the reaction of potassium hydroxide with polyethylene glycol (PEG400))
PAC -	Powdered Activated Carbon
PACT -	Powdered Activated Carbon Addition to Activated Sludge
RA -	Resin Adsorption
RBC -	Rotating Biological Contactor
RO -	Reverse Osmosis
SBR -	Sequential Batch Reactor
SCOx -	Super Critical Oxidation
Sed -	Sedimentation
SExt -	Solvent Extraction
Soft -	Water Softening
SS -	Steam Stripping
TF -	Trickling Filter
UF -	Ultrafiltration
WOx -	Wet Air Oxidation

NOTES:

____ + ____ is the first process unit followed in process train by the second ie. AS + Fil - Activated Sludge followed by Filtration.

____ w ____ is the two units together ie. UFwPAC - Ultrafiltration using Powdered Activated Carbon.

____(B) is batch instead of continuous flow.

Scale

B - Bench Top P - Pilot Plant F - Full Scale

Number after letter refers to the plant number in a specific reference (ex. F7 - plant 7 is the seventh full scale plant in the indicated report).

Matrix

C - Clean water (ex. distilled)
D - Domestic wastewater
GW - Groundwater
HL - Hazardous leachate
I - Industrial wastewater
ML - Municipal leachate
RCRA - RCRA listed wastewater
S - Synthetic wastewater
SF - Superfund wastewater
SP - Spill
T - Tap water
TSDF - Commercial treatment, storage and disposal facility - liquids
W - Surface water

SIC (Standard Industrial Classification) Codes

For industrial wastewaters a 2 digit SIC code will be given following the letter designation, i.e. I 22 is a Textile Mill Products wastewater.

If the SIC code is unknown a U will be shown, I U.

10 - Metal mining
12 - Coal mining
13 - Oil and gas extraction
20 - Food and kindered products
22 - Textile mill products
24 - Lumber and wood products
26 - Paper and allied products except computer equipment
27 - Printing and publishing
28 - Chemicals and allied products
29 - Petroleum refining and related
30 - Rubber and misc. plastic products
31 - Leather and leather products
33 - Primary metals industries

34 - Fabricated metal products except machinery & transportation equip.
36 - Electronic and electric equipment
37 - Transportation Equipment
39 - Misc. manufacturing industries
47 - Transportation services
49 - Electric, gas, and sanitary
99 - Nonclassifiable establishments/industries

Effluent Concentration

Effluent concentration will be given as a arithmetic mean to two significant figures. The number of samples used to calculate the mean is given after concentration as (n) (ex. 13 (5) - 13 is the mean of 5 sample values).

% Removal

Percent removal will be calculated on a concentration basis. If data are available, it will also be calculated on a mass basis for physical/chemical systems. Those values calculated on a mass basis will be noted by a (m). An example would be:

% Removal:	99.95	99.95 is based on concentration
	98(m)	98 is based on mass

$$\text{where \% Removal} = \frac{\text{Influent} - \text{Effluent}}{\text{Influent}}$$

Reference Quality Codes

A - Papers in a peer reviewed journal.
B - Government report or database.
C - Reports and/or papers other than in groups A or B not reviewed.
D - Group C papers and/or reports which have been given a "good" quality rating by a selected peer review.
E - Group C papers and /or reports which have been given a "poor" quality rating by a selected peer review. These data will only be used when no other data are available.

Additional Codes Following Reference Codes

V - Volatile emissions data available in Reference
S - Sludge data available in Reference
$ - Costs data available in Reference

COPPER

INFLUENT CONCENTRATION - 0-100 ug/L

TECHNOLOGY	MATRIX	SIC CODE	SCALE	EFFLUENT CONCENTRATION (ug/L)	PERCENT REMOVAL	REFERENCE
AL	D		F	0.12 (36)	36	54E ---
AL	D		F3	10 (1)	50	255B -S-
AL	D		F4	<10 (1)	>67	255B -S-
AS	D		F1	<1 (7)	>98.2	234A ---
AS	D		F	30 (33)	77	198E -S-
AS	D		F2	10	84	243A -S-
AS	D		F	24 (35)	72	201B -S-
AS	D		F2	3	92.3	167E -S-
AS	D		F	10 (14)	86	142A ---
AS	D		F6	<1 (7)	>98.9	234A ---
AS	D		F30	<2 (6)	>90.0	1B -S-
AS	D		F32	44 (6)	56	1B -S-
AS	D		F60	8 (6)	92.0	1B -S-
AS	D		F10	12 (6)	83	1B -S-
AS	D		F2	<1 (7)	>98.7	234A ---
AS	D		F26	8 (6)	92.0	1B -S-
AS	D		F19	15 (6)	85	1B -S-
AS	D		F54	<3 (6)	>86	1B -S-
AS	D		F2	10 (7)	82	1B -S-
AS	D		F4	17 (6)	63	1B -S-
AS	D		F9	26 (6)	63	1B -S-
AS	D		F5	31 (6)	56	1B -S-
AS	D		F	62	33	59E ---
AS	D		F6	30 (2)	67	35E -S-
AS	D		F4	40 (3)	33	35E -S-
AS	D		F7	10 (23)	89	52A ---
AS	D		F3	<10 (1)	>67	31B ---
AS	D		F8	50 (2)	17	35E -S-
AS	D		F5	30 (23)	67	52A ---
AS	D		F9	20 (1)	78	35E -S-
AS	D		F5	70 (2)	12	35E -S-
AS	D		F19	10 (1)	89	86B -S-
AS	D		F13	20 (2)	75	86B -S-
AS	D		F21	10 (1)	83	86B -S-
AS	D		F12	10 (2)	90.0	86B -S-
AS	D		F35	20 (1)	60	86B -S-
AS	D		F27	10 (1)	80	86B -S-
AS	D		F10	20 (1)	75	255B -S-
CAC	D		F2	50 (14)	38	131E -S-
ChPt	D		F2	23 (9)	68	1682B ---
ChPt	D		P	7.7	84	47B ---
Fil	D		F	55	11	59E ---
Fil	D		F	25	56	33D -S-
GAC	D		F1	20 (27)	64	1682B ---
RBC	D		F33	<2 (6)	>94.9	1B -S-
RBC	D		F17	10 (2)	75	86B -S-
RO	D		P1	3.9 (32)	92.6	18B ---
RO	D		P	0.5	72	144A ---
Sed	D		F12	20 (23)	50	52A ---
Sed	D		F10	60 (23)	14	52A ---
Sed	D		F11	50 (23)	0	52A ---
Sed	D		F9	90 (1)	10	35E -S-
Sed	D		F3	60 (3)	33	35E -S-
Sed	D		F4	10 (2)	67	86B -S-
Sed	D		F20	20 (1)	60	86B -S-
Sed	D		F28	30 (1)	70	86B -S-
Sed	D		F25	10 (1)	80	86B -S-
Sed	D		F1	78 (14)	2	131E -S-
Sed	D		F6	85 (14)	12	140B -S-
Sed	D		F6	40 (1)	20	255B -S-
Sed	D		F7	30 (1)	0	255B -S-
Sed	D		F8	50 (1)	50	255B -S-
TF	D		F10	10 (6)	86	1B -S-
TF	D		F52	12 (6)	48	1B -S-
TF	D		F40	30 (6)	48	1B -S-
TF	D		F15	25 (6)	57	1B -S-

TF	D		F9	50 (23)	50	52A ---
TF	D		F3	30 (3)	50	35E -S-
AL	GW		F2	10 (3)	70	87B ---
AnFFwGAC	HL		P1	40	33	154B ---
AnFFwGAC	HL		P2	20	67	154B ---
AL+Fil	I	28	F29	<9 (3)	>76	87B ---
AS	I	31	F5	17 (1)	82	31B ---
AS	I	31	F6	8 (1)	58	31B ---
AS	I	28	F5	18 (1)	0	32B ---
AS	I	28	F1	26 (1)	0	32B ---
AS	I	28	F9	<4 (1)	>33	32B ---
AS	I	31	F2	47 (1)	0	31B ---
AS	I	28	F2	50 (1)	9	32B ---
AS	I	28	F7	20 (1)	50	32B ---
AS	I	28	F25	<8 (3)	>53	87B ---
AS	I	28	F23	<9 (3)	>47	87B ---
AS	I	28	F5	28 (3)	0	87B ---
AS	I	28	F30	72 (3)	0	87B ---
AlkHyd	I	28	F24	34 (3)	0	87B ---
CAC	I	28	F8	13 (1)	86	32B ---
CAC	I	28	F9	6 (1)	93.8	32B ---
CAC	I	28	F2	<8 (3)	>77	261B ---
ChOx(Cl)	I	28	F34	18 (3)	14	87B ---
ChPt	I	37	B14	7 (1)	77	29B --$
ChPt	I	37	B11	22 (1)	27	29B --$
ChPt	I	34	B6	59 (1)	32	29B --$
ChPt	I	34	B21	12 (1)	50	29B --$
ChPt	I	34	B9	36 (1)	59	29B --$
ChPt	I	34	B24	4 (1)	83	29B --$
ChPt	I	34	B64	2 (1)	90.0	29B --$
ChPt	I	34	B56	8 (1)	60	29B --$
ChPt	I	34	B59	1 (1)	95.0	29B --$
ChPt	I	34	B61	7 (1)	65	29B --$
ChPt+Fil	I	37	B15	5 (1)	83	29B --$
ChPt+Fil	I	34	B10	8 (1)	90.8	29B --$
ChPt+Fil	I	37	B13	14 (1)	53	29B --$
ChPt+Fil	I	34	B7	24 (1)	72	29B --$
ChPt+Fil	I	34	B8	14 (1)	84	29B --$
ChPt+Fil	I	37	B12	22 (1)	27	29B --$
ChPt+Fil	I	34	B25	5 (1)	79	29B --$
ChPt+Fil	I	34	B22	8 (1)	67	29B --$
ChPt+Fil	I	34	B23	6 (1)	75	29B --$
ChPt+Fil	I	34	B60	1 (1)	95.0	29B --$
ChPt+Fil	I	34	B65	1 (1)	95.0	29B --$
ChPt+Fil	I	34	B63	4 (1)	80	29B --$
ChPt+Fil	I	34	B57	8 (1)	60	29B --$
ChPt+Fil	I	34	B62	8 (1)	60	29B --$
ChPt+Fil	I	34	B58	3 (1)	85	29B --$
ChPt+Fil (B)	I	10	B	10 (1)	83	176E ---
ChPt+Fil (B)	I	33	B1	<20 (1)	>33	169E ---
ChPt+Fil (B)	I	33	B2	20 (1)	0	169E ---
ChPtwChOx(Cl)	I	10	P2	13	74	139E ---
Fil	I	33	P	78	20	53B --$
GAC	I	28	F1	40 (1)	0	32B ---
GAC	I	28	F14	20 (1)	80	87B ---
GAC	I	28	F5	21 (3)	25	87B ---
GAC	I	28	F4	30 (2)	30	87B ---
GAC	I	28	F9	<6 (2)	>50	87B ---
PACT	I	31	F1	<10 (1)	>76	31B ---
PACT	I	28	F8	34 (1)	0	32B ---
RA	I	28	F4	43 (2)	0	87B ---
RBC	I	31	F7	69 (1)	0	31B ---
SExt	I	28	F8	18 (3)	47	87B ---
SS	I	28	F12	<6 (1)	>25	87B ---
SS	I	28	F22	30 (1)	0	87B ---
SS	I	28	F33	21 (3)	22	87B ---
SS	I	28	F7	10 (1)	0	87B ---
ChPtwPAC+Fil	ML		B1	<5 (1)	>89	265D ---
API	SF		F3	24 (1)	8	245B ---
AS	SF		F6	<26 (5)	>73	245B ---
AirS	SF		F7	30 (4)	0	245B ---
ChPt	SF		B	5 (1)	90.7	91E ---
ChPt (B)	SF		B	<1 (1)	>99.00	182A ---
DAF	SF		F3	37 (1)	0	245B ---
DAF (B)	SF		B4	<2.0 (2)	>94.7	1927B ---
Fil	SF		F6	<18 (5)	>75	245B ---
Fil	SF		F3	18 (1)	51	245B ---
GAC	SF		F4	<4.5 (1)	>10	245B ---
GAC –	SF		F2	<5.7 (1)	>91.6	245B ---
GAC	SF		F3	17 (1)	15	245B ---

COPPER

INFLUENT CONCENTRATION - >100-1000 ug/L

TECHNOLOGY	MATRIX	SIC CODE	SCALE	EFFLUENT CONCENTRATION (ug/L)	PERCENT REMOVAL	REFERENCE
AL	D		F55	<13 (6)	>90.7	1B -S-
AL	D		F18	10 (1)	98.1	86B -S-
AL	D		F	240 (12)	76	132D -S-
AS	D		F1	14	89	167E -S-
AS	D		F4	9	93.3	167E -S-
AS	D		F3	5	96.2	167E -S-
AS	D		F1	14	87	243A -S-
AS	D		F3	30 (7)	86	234A ---
AS	D		F12	86 (6)	90.7	1B -S-
AS	D		F18	7 (6)	94.2	1B -S-
AS	D		F57	81 (6)	90.0	1B -S-
AS	D		F38	5 (6)	96.9	1B -S-
AS	D		F20	9 (6)	95.0	1B -S-
AS	D		F14	28 (6)	90.3	1B -S-
AS	D		F5	26 (7)	86	234A ---
AS	D		F31	49 (6)	78	1B -S-
AS	D		F6	47 (6)	93.8	1B -S-
AS	D		F17	35 (6)	81	1B -S-
AS	D		F59	20 (6)	88	1B -S-
AS	D		F36	11 (6)	90.8	1B -S-
AS	D		F27	15 (6)	93.8	1B -S-
AS	D		F55	40 (6)	84	1B -S-
AS	D		F	<20 (3)	>85	15B ---
AS	D		F25	<8 (6)	>92.7	1B -S-
AS	D		F13	28 (6)	77	1B -S-
AS	D		F51	19 (6)	94.2	1B -S-
AS	D		F7	39 (6)	82	1B -S-
AS	D		F37	14 (6)	96.1	1B -S-
AS	D		F1	27 (7)	85	1B -S-
AS	D		P	160 (14)	80	16A -S-
AS	D		F1	160 (23)	70	52A ---
AS	D		F1b	66 (28)	84	67B ---
AS	D		F2	100 (4)	9	35E -S-
AS	D		F2a	58 (15)	89	67B ---
AS	D		F2b	99 (23)	83	67B ---
AS	D		F3	40 (23)	83	52A ---
AS	D		F4	38 (1)	76	31B ---
AS	D		F1a	42 (23)	92.0	67B ---
AS	D		F6	70 (23)	90.0	52A ---
AS	D		F4	20 (23)	86	52A ---
AS	D		F2	20 (23)	88	52A ---
AS	D		F10	70 (3)	60	35E -S-
AS	D		F7	200 (2)	74	35E -S-
AS	D		F1	80 (30)	62	35E -S-
AS	D		F2	140 (2)	66	86B -S-
AS	D		F3	10 (2)	90.9	86B -S-
AS	D		F30	10 (2)	96.3	86B -S-
AS	D		F34	190 (1)	68	86B -S-
AS	D		F10	10 (2)	94.4	86B -S-
AS	D		F14	10 (2)	91.7	86B -S-
AS	D		F31	10 (2)	91.7	86B -S-
AS	D		F29	10 (2)	96.8	86B -S-
AS	D		F32	10 (1)	91.7	86B -S-
AS	D		F6	20 (2)	88	86B -S-
AS	D		F33	10 (2)	92.3	86B -S-
AS	D		F23	20 (1)	94.1	86B -S-
AS	D		F15	20 (2)	90.5	86B -S-
AS	D		F5	67 (14)	60	140B -S-
AS	D		F15	160 (1)	33	255B -S-
AS	D		F16	100 (1)	84	255B -S-
AS	D		F18	<10 (1)	>95.2	255B -S-
AS	D		F19	30 (1)	88	255B -S-
AS	D		F20	20 (1)	97.4	255B -S-
AS+Fil	D		F3a	<19 (22)	>95.3	67B ---
AS+Fil	D		F3b	<18 (15)	>89	67B ---
CAC	D		F	130 (3)	19	15B ---

CAC	D		F4	160 (1)	63	31B ---
ChPt	D		F1	68 (27)	73	1682B ---
ChPt	D		F	88 (101)	69	1830B ---
PACT	D		P	<80 (4)	>84	173E ---
RO	D		P2	70 (4)	92.9	18B ---
Sed	D		F2	110 (4)	58	35E -S-
Sed	D		P	72 (4)	52	44E -S-
Sed	D		F5	80 (2)	77	35E -S-
Sed	D		F1	210 (30)	32	35E -S-
Sed	D		F8	60 (2)	45	35E -S-
Sed	D		F3	30 (1)	90.0	31B ---
Sed	D		F6	90 (2)	40	35E -S-
Sed	D		F36	10 (1)	90.9	86B -S-
Sed	D		F24	20 (1)	82	86B -S-
Sed	D		F1	68 (14)	70	140B -S-
Sed	D		F2	61 (14)	58	140B -S-
Sed	D		F3	75 (14)	28	140B -S-
Sed	D		F9	200 (1)	50	255B -S-
TF	D		F21	150 (6)	56	1B -S-
TF	D		F27	160 (6)	33	1B -S-
TF	D		F11	62 (6)	74	1B -S-
TF	D		F17	12 (6)	93.3	1B -S-
TF	D		F29	68 (6)	38	1B -S-
TF	D		F39	110 (6)	45	1B -S-
TF	D		F37	120 (6)	67	1B -S-
TF	D		F8	110 (23)	8	52A ---
TF	D		F4	47 (14)	65	140B -S-
GAC	GW		F2	30 (1)	71	87B ---
ChPtwPAC+Fil	HL		P7	<80 (1)	>43	265D ---
AL	I	31	F7	60 (1)	73	31B ---
AL	I	28	F11	81 (3)	83	87B ---
AS	I	28	F3	150 (1)	0	32B ---
AS	I	28	F21	560 (3)	0	87B ---
AS	I	28	F13	64 (2)	65	87B ---
AnFF	I	10	B	55 (5)	92.4	45E ---
CAC	I	28	F	130	66	393A ---
CAC	I	31	F6	19 (1)	88	31B ---
CAC	I	31	F2	41 (1)	64	31B ---
CAC	I	31	F7	220 (1)	42	31B ---
CAC	I	31	F1	42 (1)	61	31B ---
CAC (B)	I	49	B1	110 (1)	80	638B ---
CAC (B)	I	49	B3	10 (1)	95.4	638B ---
CAC (B)	I	49	B2	220 (1)	73	638B ---
CAC (B)	I	33	B1	30 (1)	93.9	169E ---
CACwFil	I	36	F	50	70	279E ---
ChOx(Cl)	I	28	F26	160 (3)	0	87B ---
ChOx(Cl) (B)	I	28	F18	220 (3)	0	87B ---
ChPt	I	34	B19	40 (1)	95.0	29B --$
ChPt	I	99	P1	85	87	7E ---
ChPt	I	34	B16	69 (1)	91.4	29B --$
ChPt	I	99	P2	160	71	7E ---
ChPt	I	34	B66	28 (1)	96.9	29B --$
ChPt	I	33	P	98	90.0	53B --$
ChPt	I	34	B69	10 (1)	98.9	29B --$
ChPt + Fil (B)	I	28	B2	20 (1)	92.0	88E ---
ChPt + Fil (B)	I	36	B1	65 (1)	85	88E ---
ChPt+Fil	I	34	B20	24 (1)	97.0	29B --$
ChPt+Fil	I	34	B18	18 (1)	97.8	29B --$
ChPt+Fil	I	34	B17	20 (1)	97.5	29B --$
ChPt+Fil	I	99	P1	26	96.2	7E ---
ChPt+Fil	I	99	P2	41	92.3	7E ---
ChPt+Fil	I	34	B67	28 (1)	96.9	29B --$
ChPt+Fil	I	34	B68	7 (1)	99.22	29B --$
ChPt+Fil	I	34	B70	8 (1)	99.11	29B --$
ChPt+Fil	I	37	F	15 (6)	98.4	137B --$
ChPt+Fil	I	49	F	260	64	194E ---
ChPt+Fil (B)	I	10	B2	<20 (1)	>97.9	66B ---
ChPtwChOx(Cl)	I	10	P2	50	70	139E ---
Fil	I	28	F16	170 (3)	26	87B ---
GAC	I	28	F3	43 (1)	80	32B ---
GAC	I	28	F15	93 (3)	44	87B ---
GAC	I	28	F3	370 (1)	0	87B ---
GAC	I	28	F1	350 (1)	0	87B ---
GAC	I	28	F10	860 (1)	0	87B ---
IE	I	10	P2	170	10	139E ---
RA	I	28	F3	67 (1)	82	87B ---
RA (B) + Fil	I	28	F20	6 (1)	94.6	87B ---
SExt (B)	I	28	F32	200 (2)	0	87B ---
SS	I	28	F6	150 (1)	0	87B ---
SS+GAC	I	28	F27	57 (3)	78	87B ---

Sed	I	31	F8	<30 (1)	>83	31B	---
Sed	I	49	F1	180	56	638B	---
Sed (B)	I	33	B1	<20 (1)	>95.9	169E	---
Sed+AS	I	28	F28	37 (3)	81	87B	---
ChPt	NL		F	87 (20)	86	36E	--$
IE(C)	RCRA		P	130 (7)	74	267B	---
WOx+Fil (B)	RCRA		B1	120 (1)	66	266B	-S-
AS	S		B	100 (5)	13	25A	-S-
AirS	SF		F6	110 (4)	0	245B	---
ChPt	SF		F6	86 (4)	28	245B	---
Fil	SF		F2	140 (1)	7	245B	---
Fil	SF		F8	250 (5)	9	245B	---
GAC	SF		F8	<9 (5)	>94.3	245B	---
IE	W		P	12 (3)	95.0	42A	---

COPPER

INFLUENT CONCENTRATION - >1-10 mg/L

TECHNOLOGY	MATRIX	SIC CODE	SCALE	EFFLUENT CONCENTRATION (ug/L)	PERCENT REMOVAL	REFERENCE
AS	D		F28	130 (6)	92.4	1B -S-
AS	D		F	57	95.0	33D -S-
AS	D		F12	4300 (1)	0	255B -S-
ChPt	D		P1	1,800	19	55E ---
RO	D		P3	180 (7)	93.4	18B ---
RO	D		P4	660 (8)	89.9	18B ---
Sed	D		F7	770 (2)	36	35E -S-
Sed	D		F	1,200	47	33D -S-
AS	I	28	F4	4,800	16	975B --$
AS	I	28	F3	82	97.5	975B --$
AS	I	28	F31	890 (3)	78	87B ---
AS	I	99	B	250 (4)	80	268A -S-
ChPt	I	34	B31	240 (1)	81	29B --$
ChPt	I	36	B4	1,900 (1)	17	29B --$
ChPt	I	36	B1	1,800 (1)	22	29B --$
ChPt	I	10	F	8	99.914	19E --$
ChPt	I	34	B49	60 (1)	97.0	29B --$
ChPt	I	34	B71	860 (1)	22	29B --$
ChPt	I	34	B34	210 (1)	84	29B --$
ChPt	I	10	P1	50 (12)	99.06	51B ---
ChPt	I	33	B39	38 (1)	99.46	29B --$
ChPt	I	34	B54	82 (1)	98.2	29B --$
ChPt	I	34	B46	910 (1)	54	29B --$
ChPt	I	34	B51	140 (1)	97.1	29B --$
ChPt	I	33	B36	39 (1)	99.44	29B --$
ChPt	I	34	B74	13 (1)	98.8	29B --$
ChPt	I	34	F	43 (15)	97.8	89B --$
ChPt (B)	I	49	B5	140 (1)	96.5	24E ---
ChPt (B)	I	49	B6	<500 (1)	>58	24E ---
ChPt (B)	I	34	B1	<40 (1)	>99.60	129E ---
ChPt (B)	I	34	B2	<300 (1)	>85	129E ---
ChPt (B)	I	36	B	110 (5)	96.2	184E ---
ChPt + Fil (B)	I	U	B3	20 (1)	98.7	88E ---
ChPt+Fil	I	36	B5	5 (1)	99.78	29B --$
ChPt+Fil	I	36	B3	67 (1)	97.1	29B --$
ChPt+Fil	I	36	B2	200 (1)	91.3	29B --$
ChPt+Fil	I	34	B32	240 (1)	82	29B --$
ChPt+Fil	I	34	B33	140 (1)	89	29B --$
ChPt+Fil	I	33	B38	14 (1)	99.80	29B --$
ChPt+Fil	I	34	B48	930 (1)	54	29B --$
ChPt+Fil	I	33	B40	6 (1)	99.914	29B --$
ChPt+Fil	I	34	B52	33 (1)	99.30	29B --$
ChPt+Fil	I	34	B50	160 (1)	92.0	29B --$
ChPt+Fil	I	33	B37	14 (1)	99.80	29B --$
ChPt+Fil	I	34	B47	940 (1)	53	29B --$
ChPt+Fil	I	34	B53	3 (1)	99.936	29B --$
ChPt+Fil	I	34	B55	18 (1)	99.62	29B --$
ChPt+Fil	I	34	B73	130 (1)	88	29B --$
ChPt+Fil	I	34	B35	170 (1)	87	29B --$
ChPt+Fil	I	34	B72	850 (1)	23	29B --$
ChPt+Fil	I	34	B75	13 (1)	98.8	29B --$
ChPt+Fil (B)	I	10	B1	<20 (1)	>98.6	66B ---
ChPtwFil	I	34	F2	550 (22)	90.5	62E ---
RO	I	10	P2	10 (4)	99.84	51B ---
AnFF	ML		P	1,500 (8)	74	41A -S-
ChPtwPAC+Fil	ML		P5	1200 (1)	86	265D ---
ChPtwPAC+Fil	ML		P6	600 (1)	93.2	265D ---
IE(A)	RCRA		P	510 (7)	89	267B ---
ChPt (B)	S		B10	100 (1)	99.00	181B ---
ChPt	SF		F2	150 (1)	97.7	245B ---
ChPt	SF		F8	280 (5)	96.1	245B ---
ChPt+Fil (B)	SF		B1	<50 (1)	>97.9	1976D -S$
ChPt+Fil (B)	SF		B2	70 (1)	98.5	1976D -S$

SELECTED ABSTRACTS

FROM THE

NPDES INDUSTRIAL PERMIT ABSTRACTS

Facility Name: Summit Corp of America									Permit Number: CT0001180
Facility Description: Metal finishing									SIC Code: 3471
Limit Basis:	ELGs ✓	WQSs ✓	BPJ -	Monitoring Only ✓	WET Limits ✓	WET Testing Only -	Multiple Categories -	Tiered Limits -	Other -
Special Conditions:	BMRs ✓	Storm Water -	Sediment -	WQ Survey -	Bio Survey -	TRES ✓	MDLs -	Monitoring -	Other ✓

Abstract Information:
Complete; Outfall 001

Outfall: 001 | Receiving Water: Naugatuck River | Treatment: Neut, PF

Amount/Components:
0.376 MGD average, 0.5 MGD daily maximum, of treated metal finishing wastewater.

	Limitations			Monitoring Requirements	
Parameter	Average	Maximum	Other	Frequency	Sample Type
Acute WET	N/A N/A	N/A Report	See below	1/quarter	Composite
Ag	0.027200 kg/d 0.100000 mg/l	0.054400 kg/d 0.500000 mg/l		1/week	Composite
Al	N/A 2.000000 mg/l	N/A 4.000000 mg/l		1/week	Composite
Au	N/A 0.100000 mg/l	N/A 0.500000 mg/l		1/week	Composite
BOD5	N/A N/A	N/A Report		1/month	Composite
Cd	0.025000 kg/d 0.100000 mg/l	0.050000 kg/d 0.500000 mg/l		1/year	Composite
Chronic WET	N/A N/A	N/A Report	See below	1/quarter	Composite
CN (A), Amenable CN	N/A 0.100000 mg/l	N/A 0.200000 mg/l		1/week	grab
CN (T)	0.193060 kg/d 0.220000 mg/l	0.386200 kg/d 0.400000 mg/l		1/week	Grab
Cr (T)	N/A 1.000000 mg/l	N/A 2.000000 mg/l		1/year	Composite
Cu	0.218000 kg/d 1.000000 mg/l	0.436000 kg/d 2.000000 mg/l		1/week	Composite
Fe	N/A 3.000000 mg/l	N/A 5.000000 mg/l		1/week	Composite
Flow	N/A N/A	N/A Report	See below	During discharg	Record
Fluoride	N/A 20.000000 mg/l	N/A 40.000000 mg/l		1/week	composite
NH3	N/A N/A	N/A 10.000000 mg/l		1/week	Composite
Ni	N/A 1.000000 mg/l	N/A 2.000000 mg/l		1/week	Composite
Other	N/A N/A	N/A Report	Indium	1/week	Composite
Pb	0.048300 kg/d 0.100000 mg/l	0.096600 kg/d 0.500000 mg/l		1/month	Composite

Facility Name: Summit Corp of America — Permit Number: CT0001180

Facility Description: Metal finishing — SIC Code: 3

Pd	N/A N/A	N/A Report		1/week	composite
pH	N/A N/A	N/A N/A	Between 6.0 su and 9 .5 su	1/month	Composite
Sn	N/A 2.000000 mg/l	N/A 4.000000 mg/l		1/week	Composite
Temp.	N/A N/A	N/A N/A	See below		
TRC	N/A 0.350000 mg/l	N/A 0.620000 mg/l	See below	1/week	Grab
TSS	N/A 20.000000 mg/l	N/A 30.000000 mg/l		1/week	Composite
TTOs	N/A N/A	N/A 1.000000 mg/l		1/month	Grab
Zn	0.558500 kg/d 1.000000 mg/l	1.117000 kg/d 2.000000 mg/l		1/week	Composite

Limitations/Monitoring Basis:

The limits and monitoring conditions were based on ELGs in 40 CFR Part 433 Section 22a-430-4s(2) and State WQSs. The concentration of the pollutants limited on any grab sample is required to be less than 1.5 times the maximum daily concentrations. The mass-based limitations (Cu, Cd, Pb, Ag, Zn, and CN(T)) become effective two years after permit issuance. The permittee is required at all times to record the total flow and the number ofhours of discharge for each day of sample collection, and/or the instantaneous flow at the time of grab sample collection. In lieu of analyzing for TTO, each monthly report may include a statement certifying compliance with an approved solvent management plan. Compliance with acute WET limit is achieved when the LC50 is greater than 3 times the IWC. Compliance with chronic WET limit is achieved when the LC50 is greater than 20 times the IWC. Acute and chronic WET monitoring are to be conducted following specified EPA guidance, specified dilution water, and a 48 hour test using Daphnia. The mean effluent flow rate may be used to calculate the IWC. TRC is to be monitored during CN sampling. Free residual chlorine is also to be monitored at this time. The temperature of the discharge must not raise the temperature of the receiving stream by more than 4 degrees nor increase the temperature of the receiving stream above 85 degrees Farenheit.

Special Conditions Basis:

On or before 30 days from permit issuance, the permittee is required to retain a qualified PE to perform studies to achieve compliance with mass-based effluent limits. On or before 270 days from permit issuance, the permittee is required to submit a report outlining remedial measures to achieve compliance with mass-based effluent limits, no later than 2 years after permit issuance. Toxicity testing results that indicate less than 90% survival are to be immediately retested. Any violation of the toxicity limit requires a second sample analysis. If two consecutive test results or three test results in a single year exceed the maximum daily toxicity limit, the permittee is required to conduct a TRE. Within 365 days after permit issuance, the permittee is required to verify that spill containment has been provided around all CN plating baths. Quarterly status reports are required to be submitted.

Effective Date: 05/11/93 — Expiration Date: 05/11/98 — Abstract Date: 09/14/93

Facility Name: Bradford Dyeing Assoc., Inc.	Permit Number: RI0000043
Facility Description: Dyes and finishes wool and woven cloth products	SIC Code: 2269

Limit Basis:	ELGs	WQSs	BPJ	Monitoring Only	WET Limits	WET Testing Only	Multiple Categories	Tiered Limits	Other
	✓	✓	-	✓	-	✓	-	✓	✓

Special Conditions:	BMPs	Storm Water	Sediment	WQ Survey	Bio Survey	TRES	MDLs	Monitoring	Other
	-	-	-	-	-	✓	✓	✓	✓

Abstract Information:
Complete; Outfall 002 (created for abstracting purposes), 002A, 002B, 002C, 002D, and 002E.

Outfall: 002 | Receiving Water: Pawcatuck River | Treatment: AL

Amount/Components:
3.4 cfs design flow of wastewaters from manufacturing processes, sanitary, cooling, potable, and storm water.

Parameter	Limitations: Monthly Average	Limitations: Daily Maximum	Limitations: Other	Monitoring Requirements: Frequency	Monitoring Requirements: Sample Type
Acute WET	N/A N/A	N/A N/A	See below	1/quarter	24hr fw composite
Cd (T)	N/A 3.000000 ug/l	N/A 6.000000 ug/l		2/month	24hr fw composite
Coliform (T)	200.000000 N/A	400.000000 N/A	Units: MPN/100 ml	2/month	grab
Cu (T)	N/A 36.000000 ug/l	N/A 36.000000 ug/l		2/month	24hr composite
FC	200.000000 N/A	400.000000 N/A	Units: MPN/100 ml	2/month	grab
Flow	2.300000 MGD N/A	3.600000 MGD N/A		Continuous	recorder
NH3 (T)	N/A N/A	N/A N/A	Monitor in WET testi ng	every 2sp.event	
Other	N/A N/A	N/A Report mg/l	Ortho-phosphorus	1/month	24hr composite
P (T)	N/A N/A	N/A Report mg/l	Monitor 1 year only	1/month	24hr composite
Pb (T)	N/A 1.000000 ug/l	N/A 2.000000 ug/l	< 1 ug/l monthly ave rage	2/month	24hr composite
pH	N/A N/A	N/A N/A	Between 6.0 su and 9 .0 su	1/operating day	grab
Priority pollutan ts	N/A N/A	N/A N/A	See below	2/year	Varies
Sb (T)	N/A 116.000000 ug/l	N/A 232.000000 ug/l		2/month	24hr composite
TOC	N/A N/A	N/A N/A	Monitor in WET testi ng	every 2sp.event	
Zn (T)	N/A 368.000000 ug/l	N/A 406.000000 ug/l		2/month	24hr composite

Limitations/Monitoring Basis:
Outfall 002 was created for abstracting purposes to represent those limitations which are in effect, regardless of varying production. These limits apply in conjunction with Outfalls 002A, 002B, 002C, 002D, and 002E tiered limits. Generally, limitations and monitoring requirements are based on ELGs, State WQSs, State regulations, and BPJ. FC is included and limited due to the sanitary wastewater discharge. Limits are based on State performance standards for secondary treatment. A review of sampling data from the State User Fee Program and DMRs indicated the need to monitor and limit Sb (T), Cd (T), Cu (T), Pb (T), and Zn (T); WQ-based limits were calculated using water quality criteria and minimum database guidelines. Daily max. limits for Sb (T), Pb (T), and Cd (T) were statistically derived from the monthly avg. because the daily max. limit is more than two times themonthly avg. Limits bases for flow and pH were not specifically explained. Monitoring for P nutrients is specified in order to determine nutrient

Facility Name: Springfield Electroplating | Permit Number: VT0000272

Facility Description: Metal finishing/electroplating and electroless plating | SIC Code: 3

Limit Basis:	ELGs	WQSs	BPJ	Monitoring Only	WET Limits	WET Testing Only	Multiple Categories	Tiered Limits	Other
	✓	-	-	-	-	-	-	-	✓

Special Conditions:	BMPs	Storm Water	Sediment	WQ Survey	Bio Survey	TRES	MDLs	Monitoring	Other
	✓	-	-	-	-	-	-	✓	-

Abstract Information:
Complete; 001

Outfall: 001 | Receiving Water: Black River | Treatment: ChPt

Amount/Components:
1500 GPD (max. allowable) treated electroplating wastewater including resin exchange regenerant.

Parameter	Limitations: Average	Limitations: Maximum	Limitations: Other	Monitoring Requirements: Frequency	Monitoring Requirements: Sample Type
Cd	N/A N/A	N/A 0.300000 mg/l		1/batch	Grab
Cd	N/A N/A	N/A 0.300000 mg/l		1/batch	Grab
CN	N/A N/A	N/A 0.300000 mg/l		1/batch	Grab
CN	N/A N/A	N/A 0.300000 mg/l		1/batch	Grab
Cr	N/A N/A	N/A 0.500000 mg/l		1/batch	grab
Cr (T)	N/A N/A	N/A 0.500000 mg/l		1/batch	Grab
Cu	N/A N/A	N/A 0.500000 mg/l		1/batch	Grab
Cu	N/A N/A	N/A 0.500000 mg/l		1/batch	Grab
Flow	N/A N/A	N/A 1500.000000 GPD		1/day	total
Ni	N/A N/A	N/A 1.000000 mg/l		1/batch	Grab
Ni	N/A N/A	N/A 1.000000 mg/l		1/batch	Grab
pH	N/A N/A	N/A N/A	Between 6.5 su and 9 .0 su		Grab
pH	N/A N/A	N/A N/A	Between 6.5 su and 9 .0 su		Grab
TSS	N/A N/A	N/A 30.000000 mg/l		1/batch	Grab
TSS	N/A N/A	N/A 30.000000 mg/l	Metal treatment only	1/batch	Grab
TTOs	N/A N/A	N/A 2.130000 mg/l			Grab
TTOs	N/A N/A	N/A 2.130000 mg/l			Grab
Zn	N/A N/A	N/A 1.480000 mg/l		1/batch	Grab

Facility Name: Springfield Electroplating					Permit Number: VT0000272
Facility Description: Metal finishing/electroplating and electroless plating					SIC Code: 3471
Zn	N/A N/A	N/A 1.480000 mg/l		1/batch	Grab

Limitations/Monitoring Basis: .

Limits for TSS and TTO are based on ELGs (40 CFR Part 433 - Metal Finishing Point Source Category Electroplating and Electroless Plating). Limits for Cd(T), Cr(T), Cu(T), Ni(T), N(T), flow, and pH are based on the antibacksliding clause of the CWA. Limits for Cd(T), Cr(T), Cu(T), Ni(T), Zn(T), CN(T), and TSS apply to samples collected from treatment batches following metals precipitation. Permit specifies that samples are to be collected from each treatment batch at least 30 minutes after the agitator has been shut off. CN limit applies following treatment batches following CN destruction. Neither metals nor CN treatment batches may be discharged unless samples comply with limits. In lieu of TTO limit, the permittee may certify that no toxic organics are discharged and submit a solvents management plan by 3/31/91 and analyze one grab sample for purgeable organics (list provided in permit).

Special Conditions Basis:

See limitations/monitoring basis

Effective Date: 12/18/90 Expiration Date: 09/30/95 Abstract Date: 09/20/93

United States
Environmental Protection
Agency

Effluent Guidelines Division
WH-552
Washington DC 20460

EPA 440/1-83/400
October 1983

Water

EPA

Summary of Available Information on the Levels and Control of Toxic Pollutants Discharges in the

Printing and Publishing

Point Source Category

TABLE VI-1

SUMMARY OF PLANTS WITH TREATMENT SYSTEMS SAMPLED

Plant Code	Products/Processes	Subcategories Covered[1]	Type of Treatment	Wastewater Flow, gpd	Type of Discharge	Remarks
5478	Packaging supplies—flexographic, lithographic, letterpress printing	1,2,4,6,7,8	Chemical Biological	30,000	Direct	Wastewater from photoprocessing, nonmetallic platemaking, and cleanup of water-based ink printing presses.
8190	Magazines, comic books—lithographic and letterpress commercial printing	2,4,6,8	Physical Chemical	39,000	Direct	Wastewater from photoprocessing, platemaking, plant cleanup, and cooling tower blowdown.
6653 & 9012	Newspapers—offset lithographic printing	1,2,4,6	Physical	11,500	Indirect	Wastewater from photoprocessing and nonmetallic platemaking.
5430	Books—lithographic and letterpress printing	2,4,6,8	Physical Chemical	<20,000	Indirect	Wastewater from photoprocessing, nonmetallic platemaking, rag laundering, and ink blending.

[1] Subcategories:
1—Art and copy preparation and composition
2—Photoprocessing
3—Nonmetallic platemaking
4—Metallic platemaking
5—Gravure cylinder preparation
6—Pressroom, nonwater-based inks
7—Pressroom, water-based inks
8—Finishing and binding operations

TABLE VI-2

TOXIC POLLUTANT REMOVAL IN BATCH METALS TREATMENT SYSTEM AT PLANT 5478[1]

Parameter	Influent to Treatment (ug/l)	Effluent From Treatment (ug/l)	Percent Removal
Chromium	109,000	1,690	98
Copper	4,610	771	83
Lead	482,000	3,830	99
Nickel	74	71	4
Zinc	10,700	14,300	
Ethylbenzene	1,780	80	96
Benzene	190	10	95
Chloroform	900	5	99
Arsenic	33	6	82

[1] Flow = 600 gpd from water-based ink press cleaning.

TABLE VI-5

REDUCTION OF TOXIC, CONVENTIONAL, AND NONCONVENTIONAL POLLUTANTS IN PHYSICAL/CHEMICAL TREATMENT SYSTEM AT PLANT 8190[1]

Pollutant	Raw Wastewater	Treated Effluent	Percent Removal
Chromium (ug/l)	1,190	75	94
Copper (ug/l)	52	12	77
Lead (ug/l)	46.1	7.5	84
Silver (ug/l)	8.5	0.5	94
Zinc (ug/l)	395	28	93
BOD_5 (mg/l)	570	<6.0	>98
COD (mg/l)	2,700	31	99
TOC (mg/l)	560	9.0	98
NH_3 as N (mg/l)	8.4	0.4	95
TKN as N (mg/l)	1.2	0.7	42
Total Suspended Solids (mg/l)	40	4.0	90
Total Volatile Solids (mg/l)	360	50	86

[1]Flow approximately 39,000 gpd. Chromium is added as part of cooling water treatment program. Raw wastewater does not include contract hauled pressroom effluent.

TABLE VI-6

REDUCTION OF TOXIC POLLUTANTS IN LIMESTONE FILTER AT PLANT 6653[1,2]

Parameter	Influent (ug/l)	Effluent (ug/l)	Percent Removal
pH[3]	8.4	9.1	
Cadmium	70.5	1.25	98
Chromium	281	11	96
Copper	180	39	78
Lead	22.4	0.6	97
Silver	51.3	29.8	42
Zinc	553	—	
Mercury	11	2.1	81

[1] Wastewater flow is estimated to be 11,500 gpd.
[2] No toxic organic pollutants were detected in either of the screening samples collected.
[3] pH readings from grab samples collected October 13, 1977.

--: Not analyzed.

TABLE VI-7

REDUCTION OF TOXIC POLLUTANTS
IN LIMESTONE FILTER AT PLANT 9012[1,2]

Parameter	Influent (ug/l)	Effluent (ug/l)	Percent Removal
pH[3]	8.8	9.3	
Cadmium	319	8.52	97
Cyanide	560	120	79
Zinc	35.4	40	
Mercury	3.3	1.7	48

[1] No flow data available.
[2] No toxic organic pollutants were detected in either of the screening samples collected.
[3] pH reading from grab samples collected October 13, 1977.

TABLE VI-8

REDUCTION OF TOXIC POLLUTANTS IN
METALS TREATMENT SYSTEM AT PLANT 5430

Parameter	Blended Raw Wastewater (ug/l)	Reactor Effluent (ug/l)	Percent Removal
Bis(2-ethylhexyl)phthalate	9,800	<10	>99
Phenol	500	500	0
Butyl benzyl phthalate	200	<10	>95
Di-n-butyl phthalate	800	<10	>99
Diethyl phthalate	89	<10	>89
Cadmium	50	13	74
Chromium	13,755	3,413	75
Copper	20,950	692	97
Lead	4,200	36	99
Zinc	220,000	685	>99

A maximum of four 3,500 gallon batches are treated per day.

MODULE # 5D

TITLE: Variances to Technology-Based Effluent Limitations

OVERALL OBJECTIVES:

- Describe the role of variances in NPDES permits
- Describe the types of relief granted by variances
- List the types of variances for technology-based effluent limits in NPDES permits
- Explain how variance requests are initiated and who initiates them
- Explain the process to grant/deny variance requests

LOGISTICS:

Presentation Format: Lecture
Approximate Presentation Time: 30 minutes
Review Questions/Exercise: None
Applicable Statutory/Regulatory Citations:

CWA Section 301(c)	Economic variance
CWA Section 301(g)	Water quality variance
CWA Section 301(h)	Secondary treatment variance
CWA Section 301(n)	Fundamentally different factor variance
CWA Section 316(a)	Thermal variance
40 CFR §122.45(g)	Pollutants in intake water
40 CFR Part 125, Subpart D	Criteria and Standards for Determining Fundamentally Different Factors
40 CFR Part 125, Subpart E	Criteria for Granting Economic Variances from Best Available Technology Economically Achievable (Reserved)
40 CFR Part 125, Subpart F	Criteria for Granting Water Quality Related Variances (Reserved)
40 CFR Part 125, Subpart G	Criteria for Modifying the Secondary Treatment Requirements
40 CFR Part 125, Subpart H	Criteria for Determining Alternative Effluent Limitations Under Section 316(b)

Variances to Technology-Based Permit Effluent Limits

Learning Objectives

- Explain role of variances in NPDES permits
- Describe types of variances
- Discuss relief granted by variances
- Describe variance initiation and review processes

Role of Variances in NPDES Permits

- Allows limited relief:
  - effluent limits
  - compliance deadlines
- Address exceptional circumstances
- Provides relief of NPDES program for "unusual" circumstances
- Only granted on rare occasions
- Some may be granted by States, others require EPA approval

Types of Variances

CWA	Type	40 CFR	Approval Authority
301 (c)	Economic Achievability	Part 125, Subpart E (Reserved)	EPA-HQ
301 (g)	Water Quality	Part 125, Subpart F (Reserved)	EPA – Region
301 (h)	Secondary Treatment Water-Ocean Discharge (POTW)	Part 125, Subpart G	EPA – HQ
301 (n)	Fundamentally Different Factors (FDF)	Part 125, Subpart D	EPA - Regions
316 (a)	Thermal Discharges	Part 125, Subpart H	NPDES – State*
–	Intake – Discharge Net Basis (Net/Gross)	§122.45 (g)	NPDES State*

* EPA Region in absence of approved state NPDES program

Initiation of Variance Requests

- Variance applications submitted by the discharger, must be submitted before the close of the public comment period of the permit
- FDF variance requests must be requested by the discharger within 180 days of the guideline promulgation

MODULE 5 - SUGGESTED REFERENCE MATERIALS

Workbook for Determining Economic Achievability for National Pollution Discharge Elimination System Permits, PHB, August 1982.

Treatability Manual, Volumes I-V (EPA-600/8-80-042a-e), EPA, Office of Research and Development, July 1980.

NPDES Industrial Permits Abstracts 1993 (EPA 833-B-93-005), EPA, Office of Water, October 1993.

Guidance for NPDES Permits and Compliance Personnel - Secondary Treatment Redefinition, EPA, Permits Division, December 1985 (Draft)

MODULE # 6

TITLE: Overview of Water Quality Standards and Limitations

OVERALL OBJECTIVES:

- Introduce the standards to permit process
- Provide overview and purpose of water quality standards
- Discuss the components of a water quality standard
  - Designated uses
  - Anti-degradation
  - Water quality criteria
- Explain difference between numeric and narrative criteria/standards
- Explain EPA water quality criteria development process
- Define whole effluent toxicity and describe its role in the standards process
- Discuss new initiatives in criteria development
  - Biological
  - Sediment
  - Wildlife

LOGISTICS:

Presentation Format: Lecture
Approximate Presentation Time: 60 minutes
Review Questions/Exercise: None
Applicable Statutory/Regulatory Citations:

CWA Section 301	Effluent Limitations
40 CFR §122.44(d)	Water quality standards and State requirements
CWA Section 303	Water Quality Standards and Implementation Plans
CWA Section 304(a)(8)	Information on Water Quality Criteria
40 CFR §130.3	Water quality standards
40 CFR Part 131	Water Quality Standards

Overview of Water Quality Standards and Limitations

Learning Objectives

- Provide brief overview/history of water quality-based permitting
- Discuss the relationship between water quality- and technology-based permitting
- Identify the objectives and components of water quality standards

Learning Objectives (Continued)

- Describe the types of water quality criteria
- Explain the relationship between criteria and standards

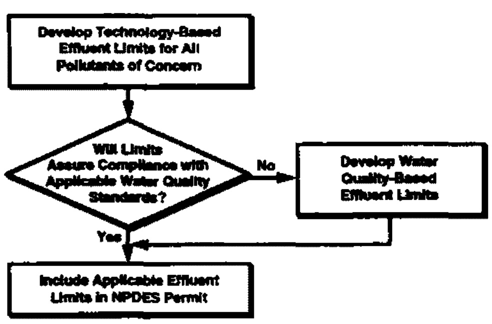
Clean Water Act Requirements

- Section 101(a)(2)
  - Establishes "fishable and swimmable" goal
- Section 301(b)(1)(C)
  - Requires compliance with limits necessary to meet water quality standards
- Section 303(c)
  - Establishes framework for water quality standards program
  - Requires States to establish water quality standards
- Section 304(a)
  - Requires EPA to develop and publish water quality criteria

Water Quality-Based Limits

- Required to achieve statutory requirements to meet water quality standards
- Used to supplement technology-based effluent limits

Developing Effluent Limitations



Water Quality Standards

- A water quality standard defines the water quality goals of a waterbody, or portion thereof, by designating the use or uses to be made of the water and by setting criteria necessary to protect the uses. (40 CFR Part 131)

Establishment of Water Quality Standards

- All "waters of the U.S." have water quality standards
- Water quality standards are adopted for each waterbody in a State
  - Segments of waterbodies
- States are responsible for establishing water quality standards
  - 40 CFR Part 131
  - Revised every 3 years
  - EPA has oversight

Components of a Water Quality Standard

- Designated uses
- Water quality criteria
- Antidegradation policy

Designated Uses

- 40 CFR §131.10
  - Requires that each State specify appropriate uses to be achieved and protected
- Common use categories
  - Public water supply
  - Fish and wildlife propagation
  - Recreation
    - Primary
    - Secondary
  - Agricultural
  - Industrial
  - Navigation

Designated Uses (Continued)

- Question: What if the designated use is not being attained...can it be changed?
- Answer: Depends on the type of use and the basis for the change
  - Designated vs. Existing Use
  - Use Attainability Analysis

State Water Quality Criteria

- Numeric criteria
  - Concentrations of chemicals
  - Aquatic Life
  - Human health
- Narrative criteria
  - Statements that describe the desired water quality goal
  - "Free from..."
    - Toxics in toxic amounts
    - Objectionable color, odor, taste, and turbidity

Types of Numeric Criteria

- **Aquatic Life Criteria**
  - Designed to protect aquatic organisms, including plants and animals
  - Two types
    - acute
    - chronic
  - Considers the magnitude, duration, and frequency of exposure to specific pollutants

Types of Numeric Criteria (Continued)

- **Human Health Criteria**
  - Single expression of the highest pollutant concentration not expected to pose significant long-term risk to human health
    - Based on chronic exposure via consumption of water and/or aquatic life
    - Accounts for bioconcentration/ bioaccumulation

EPA Water Quality Criteria

- **EPA responsible for establishing guidance and procedures**
  - Establish and publish scientifically derived ambient criteria [CWA Section 304(a)]
    - 1968 Green
    - 1973 Blue
    - 1976 Red
    - 1980 Toxics
    - 1986 Gold
  - Establish procedures for deriving criteria

Antidegradation Policy

- Ensures that once a use is achieved it will be maintained
- Each State is required to adopt an antidegradation policy and method of implementation

Components of the Antidegradation Policy

- Three tiers
  - I. Level of quality necessary to protect the existing uses of a water segment
  - II. Protection of actual water quality where water quality exceeds levels necessary to protect fish and wildlife propagation and recreation on and in the water
  - III. Special protection of waters designated as Outstanding National Resource Waters (ONRW)

Outstanding National Resources Water (ONRW)

- Outstanding National Resources Water (ONRW)
  - National and State parks
  - Wildlife refuge
  - Ecologically unique water that need additional protection or are of special significance (i.e., swamps, hotsprings, etc.)

Implementation of Water Quality Standards

- **States must assess compliance with water quality standards for all water bodies**
- **If water quality standards are not being achieved, controls must be developed**
  - **Point sources**
  - **Non-point sources**

MODULE # 6A

TITLE: **Standards to Permits Process**

OVERALL OBJECTIVES

- Introduce Permitting Concepts from the *Technical Support Document for Water Quality-Based Toxics Control* (USEPA, 1991)
- Introduce Total Maximum Daily Loads (TMDL)
- Explain Concept of Wasteload Allocations (WLA)
- Introduce Statistical Approach for Permit Limit Development

LOGISTICS:

Presentation Format: Lecture
Approximate Presentation Time: 30 minutes
Review Questions/Exercise: None
Applicable Statutory/Regulatory Citations:

CWA Section 301	Effluent Limitations
CWA Section 303	Water Quality Standards and Implementation Plans
CWA Section 304(a)(8)	Information on Water Quality Criteria
40 CFR §130.3	Water quality standards
40 CFR Part 131	Water Quality Standards

Standards to Permits Process

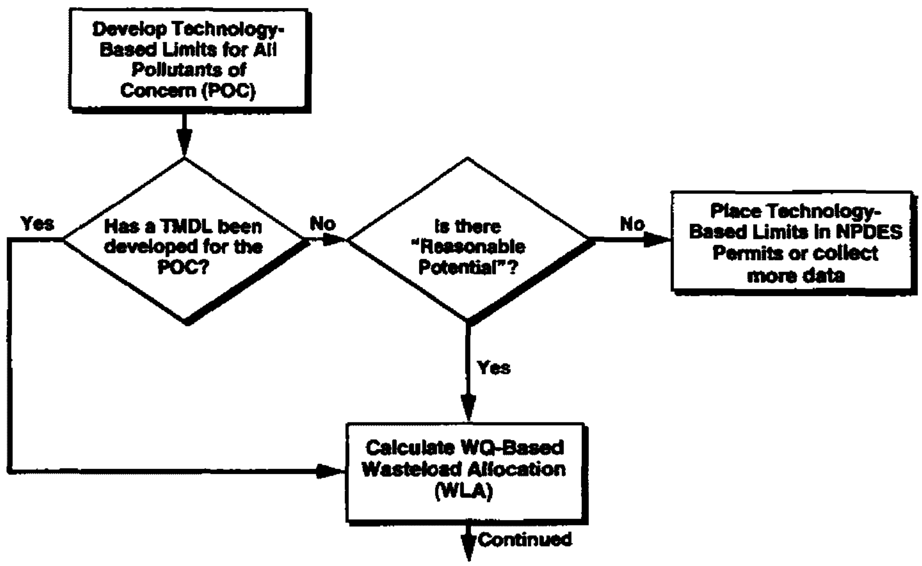
1670-6A-1

Learning Objectives

- **Introduce Total Maximum Daily Loads (TMDL)**
- **Explain concept of Wasteload Allocation (WLA)**
- **Summarize statistical approach to developing water quality-based effluent limitations**

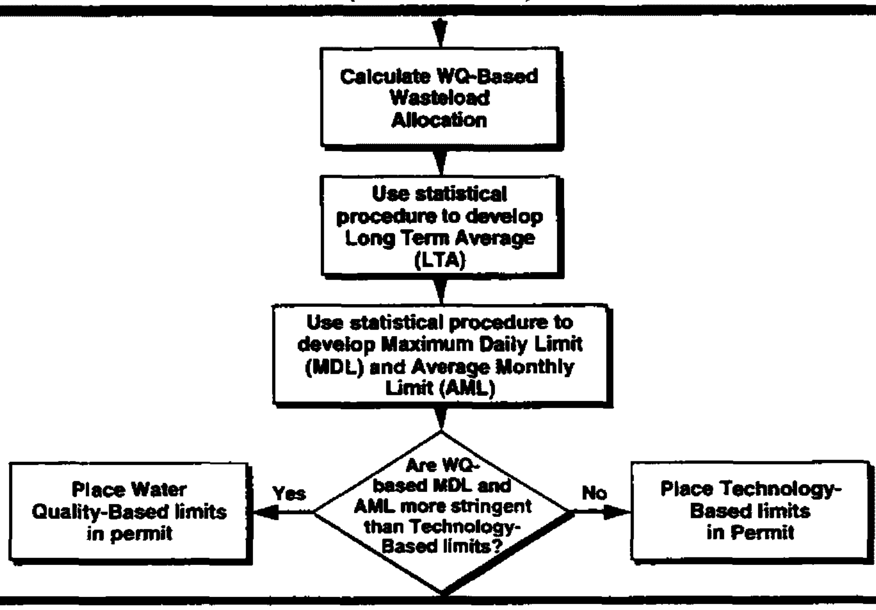
1670-6A-2

Standards-to-Permits Process



1670-6A-3

Standards-to-Permits Process
(Continued)



1670-6C-4

Total Maximum Daily Load (TMDL)

- CWA Section 303(d)(1)
  - Requires States to identify waters that will not achieve water quality standards after implementation of technology-based limits
  - States rank identified waters based on severity of pollution and uses
  - Requires TMDL for priority waters

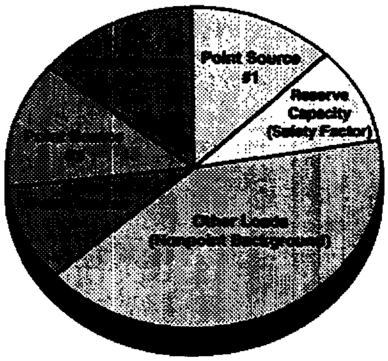
167D-6A-5

Total Maximum Daily Load (TMDL)
(Continued)

- Used as a tool for implementing water quality standards
- Defined as the amount of a pollutant that may be discharged into a waterbody and still meet water quality standard

167D-6A-6

Components of TMDL



- Wasteload allocations (WLAs) are assigned to each point source discharge
- Load allocations (LAs) are assigned to nonpoint sources
- WLAs and LAs are established so that predicted receiving water concentrations do not exceed water quality criteria

167D-6A-7

Use of Water Quality-Based Effluent Limitations

- Water quality-based limitations are used when it has been determined that more <u>stringent</u> limits than technology-based effluent limits must be applied to a discharge in order to protect "designated use" of the receiving waters. (40 CFR §122.44(d)(1))

167D-6A-8

Reasonable Potential
40 CFR §122.44(d)(1)(i)

- **Limitations must control all pollutants or pollutant parameters that are or may be discharged at a level which will cause, have reasonable potential to cause, or contribute to an excursion above any state water quality standard.**

1670-6A-9

Reasonable Potential Decision Criteria

- **Cause**
- **Reasonable Potential to Cause**
- **Contribute**

1670-6A-10

Reasonable Potential Analysis Without Effluent Data

- Effluent Variability
  - Compliance history
  - History of toxic impacts
- Point/nonpoint source controls
  - Existing treatment technology
  - Type of industry or POTW
  - Best Management Practices (BMPs)

167D-6A-11

Reasonable Potential Analysis Without Effluent Data (Continued)

- Species Sensitivity
  - In-stream data
  - Adopted water quality criteria and designated uses
- Dilution
  - Critical receiving water flow
  - Mixing zones

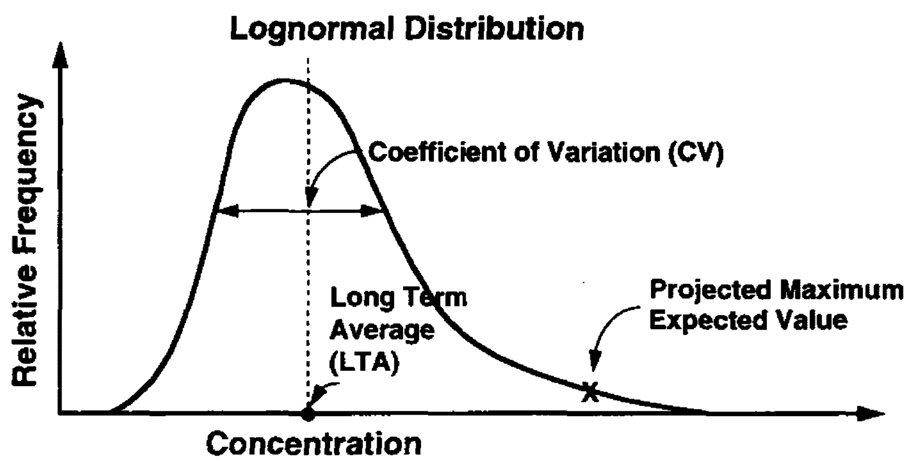
167D-6A-12

Reasonable Potential Analysis With Effluent Monitoring Data

- Must consider uncertainty associated with sparse data sets and effluent variability

167D-6A-13

Reasonable Potential Analysis with Effluent Data



167D-6A-14

Reasonable Potential Analysis

Projected Maximum Effluent Concentration → Water Quality Model → Projected Receiving Water Concentration (Cr)

167D-6A-15

Determining the Need

- If Cr > State WQ criterion, then need to establish a WQ-based limit.
- If Cr ≤ State WQ criterion, then no need to establish a WQ-based limit.

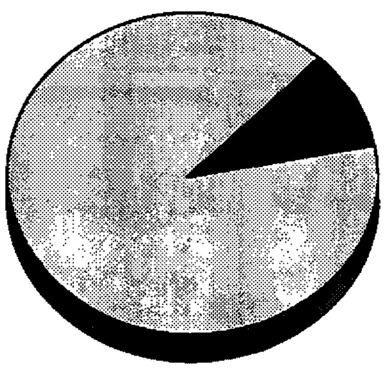
167D-6A-16

Determining the Need for Water Quality-Based Effluent Limits

Criteria	Type of Limit	Regulatory Cite
Chemical-specific	Chemical specific	40 CFR §122.44(d)(1)(iii)
WET numeric	WET	40 CFR §122.44(d)(1)(iv)
Narrative	WET or Chemical specific	40 CFR §122.44(d)(1)(v-vi)

1670-6A-17

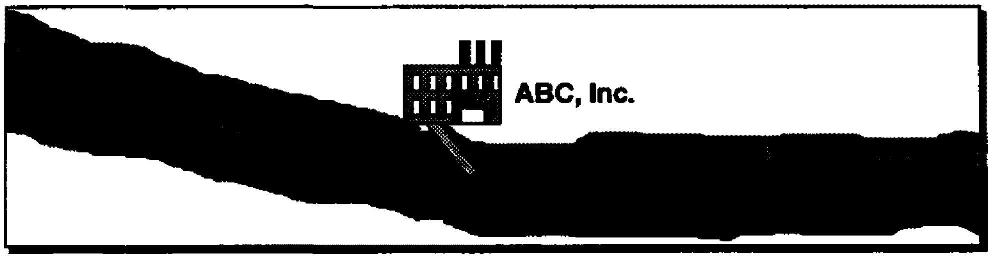
TMDL-Based Wasteload Allocation



WLA = portion of the receiving water's total maximum daily load (TMDL) that is allocated to a specific point source

1670-6A-18

Facility-Specific Wasteload Allocation

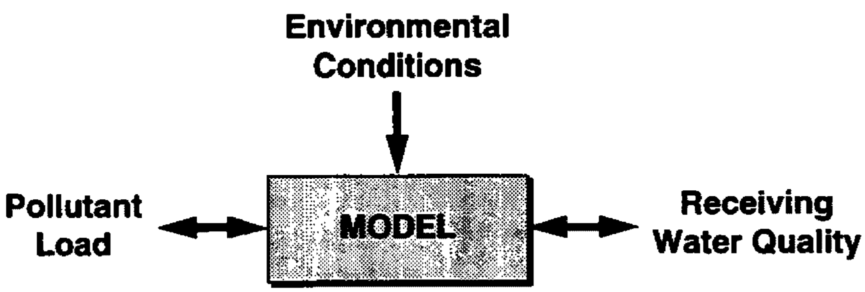


WLA = the maximum allowable pollutant concentration in the effluent from ABC, Inc. which, after accounting for available dilution, will meet water quality standards in-stream

167D-6A-19

Developing Wasteload Allocations

Models can help determine pollutant loadings that will not violate water quality criteria.



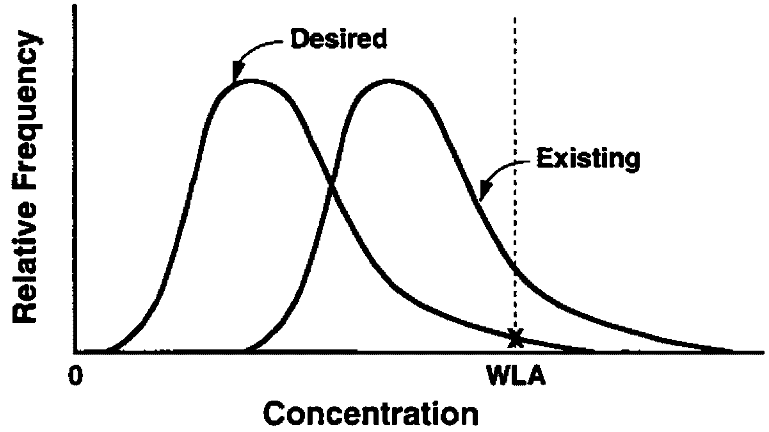
167D-6A-20

Maximum Daily and Average Monthly Limits

- **40 CFR §122.45(d) requires all permit limits (unless impracticable) be expressed as:**
  - **Average weekly and average monthly limits for POTWs (EPA recommends a maximum daily limit rather than an average weekly limit for water quality-based permitting)**
  - **Maximum daily and average monthly limits for other dischargers**
    - **How do we use the wasteload allocation to develop water quality-based effluent limits?**

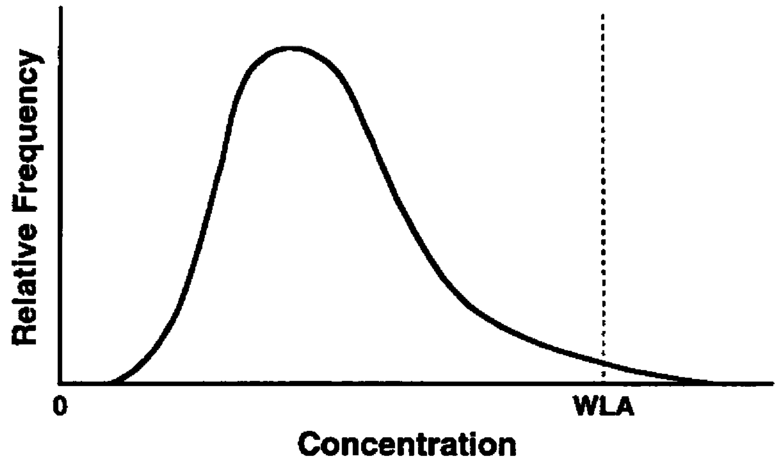
1670-6A-21

Goal is to Reduce Effluent Concentrations to Below the WLA

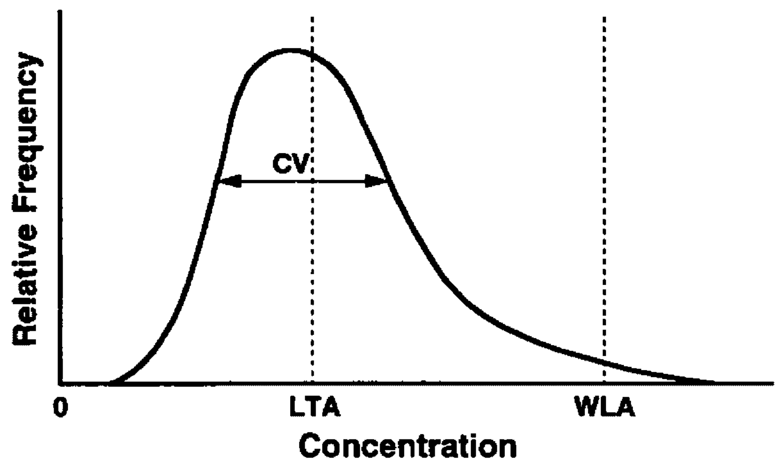


1670-6A-22

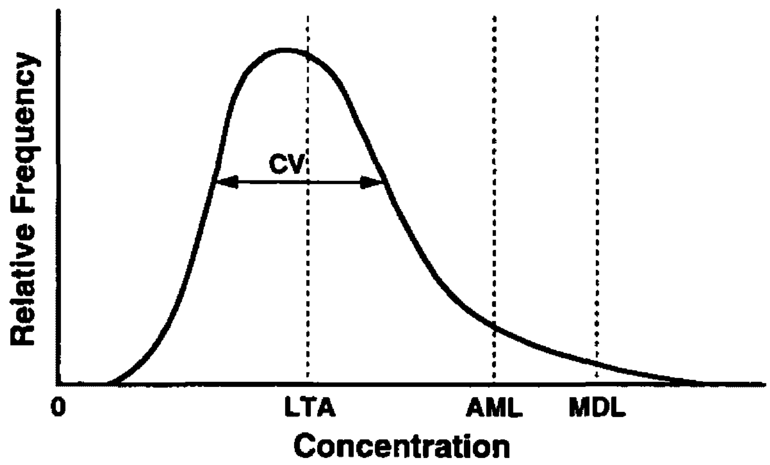
This Distribution Achieves the Goal



We Can Characterize the Desired Distribution by LTA and CV



We Can Determine the Effluent Limits Based Upon the Distribution



1670-6A-25

MODULE # 6B

TITLE: **Introduction to Water Quality Modeling**

OVERALL OBJECTIVES:

- Provide an overview of modeling methods and considerations
- Define mixing zones
- Describe the general considerations for implementing water quality standards
- Describe types and uses of water quality models

LOGISTICS:

Presentation Format: Lecture
Approximate Presentation Time: 60 minutes
Review Questions/Exercise: None
Applicable Statutory/Regulatory Citations:

CWA Section 303(d)	Identification of water quality-limited water bodies
CWA Section 303(e)(3)(A)	Requirement for water quality-based effluent limits
CWA Section 304(l)	Individual Control Strategies for Toxic Pollutants
40 CFR §130.7	Total maximum daily loads (TMDL) and individual water quality-based effluent limitations

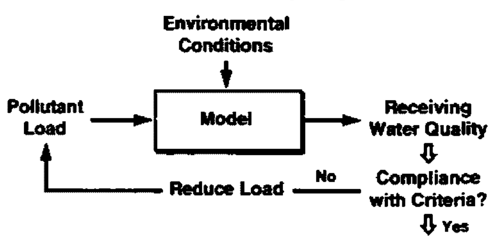
Introduction to Water Quality Modeling

Learning Objectives

- Introduce modeling principles
- Define steady state and dynamic models
- Explain concept of "mixing zone"

Why Use Models?

- Models can help determine pollutant loadings that will not violate water quality criteria



Decision Tree for Model Selection

Does the State allow a mixing zone?

- No → No model necessary
- Yes → Select appropriate model

Decision Tree for Model Selection
(Continued)

Is there rapid and complete mix?

- Yes → Complete mix assessment
  - Are resources available for dynamic modeling?
    - No → Steady state model
    - Yes → Dynamic model
- No → Mixing zone assessment

What is Rapid and Complete Mixing?

- Rapid and complete mixing occurs when lateral variation in concentration in the direct vicinity of the outfall is small (e.g., less than 5 - 25%)
- Potential occurrences include:
  - Effluent dominated systems (effluent flow greater than stream flow);
  - Diffuser located across entire stream width

Steady State Model

- Predicts the magnitude of pollutant concentration for a single set of environmental conditions
- Used when complete data are not available

Steady State Model (Continued)

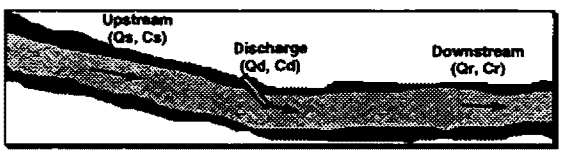
The modeler should choose environmental conditions that reflect the duration and frequency concerns for the applicable criteria

Example: Upstream Dilution Flow

Acute Toxicity:	1Q10 low flow
Chronic Toxicity:	7Q10 low flow
Human Health:	Harmonic mean flow, 30Q5 low flow

- "Worst case" assumptions for flow, pollutant parameter, concentrations, and environmental effects.

Mass-Balance Equation
QdCd + QsCs = QrCr



- Q = Flow (mgd or cfs)
- C = Pollutant concentration (mg/l)
- Mass = [Concentration] [Flow]

Dynamic Model

- Used when adequate data are available to estimate frequency distribution of effluent quality
- Accounts for daily variations of and relationships between effluent, receiving water, and environmental conditions

Dynamic Model (Continued)

- No design conditions
- Variability in all model inputs
- Results are expressed as a probability of exceedance instead of a single value

Types of Dynamic Models

- Continuous simulation
- Monte Carlo simulation
- Log-normal analysis

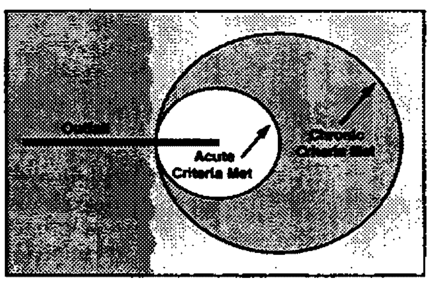
Mixing Zones

- Definition
  - A limited area or volume of water where initial dilution of a discharge takes place and where water quality criteria can be exceeded
- Constraints
  - Cannot impair integrity of the waterbody
  - No significant health risks
  - No lethality to passing organisms

Mixing Zones (Continued)

- CWA does not require attaining water quality criteria at end-of-pipe
- States have discretion to allow mixing zones
- States should specify their mixing zone requirements as part of their water quality standards

Regulatory Mixing Zone



Determination of Mixing Zone Dilution

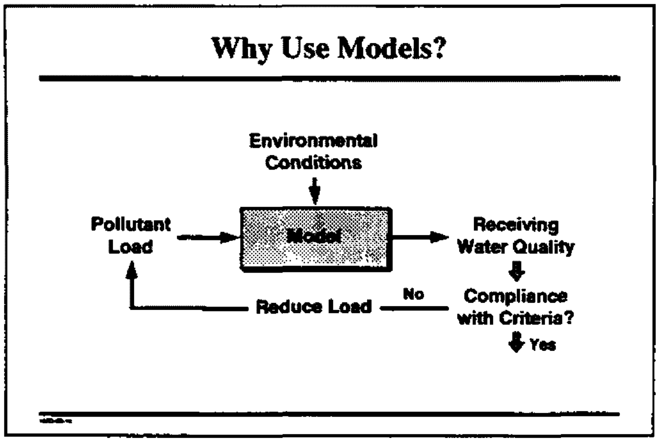
- Field Studies
  - Actual measurement of instream contaminant concentrations
  - Dye studies
- Modeling
  - Calibrated to actual observations
  - Simulate critical conditions

Considerations in Water Quality Modeling

- Applicable water quality standards and implementation procedures
  - Criteria and designated uses
  - Mixing zones
  - Critical low flows/dilution
- Discharge characteristics
  - Flow rate
  - Pollutant concentrations

Considerations in Water Quality Modeling (Continued)

- Receiving water characteristics
  - Pollutant concentrations (i.e., background)
  - Stream flow
- Pollutant characteristics
  - Type of pollutant
    - Non-conservative: mitigated by natural stream dilution and degradation in the receiving stream (e.g., ammonia, bacteria)
    - Conservative: mitigated by natural stream dilution (e.g., heavy metals)
  - Reaction rates


Why Use Models?
Environmental Conditions
Pollutant Load
Model
Receiving Water Quality
Compliance with Criteria?
Reduce Load
No
Yes

MODULE # 6C

TITLE: **Developing Chemical-Specific Water Quality-Based Effluent Limits**

OVERALL OBJECTIVES:

- Define requirements for determining reasonable potential
- Explain the types of calculations required for developing water quality-based effluent limits
- Identify data requirements and considerations when developing limits for specific compounds
- Explain *Technical Support Document* statistical approach to permit limit development

LOGISTICS:

Presentation Format: Lecture, practical exercise
Approximate Presentation Time: 90 minutes
Review Questions/Exercise: 45 minutes
Applicable Statutory/Regulatory Citations:

CWA Section 301(b)(1)(C)	Effluent limitations compliance dates
40 CFR §122.44(d)	Water quality standards and State requirements

Developing Chemical-Specific Water Quality-Based Effluent Limits

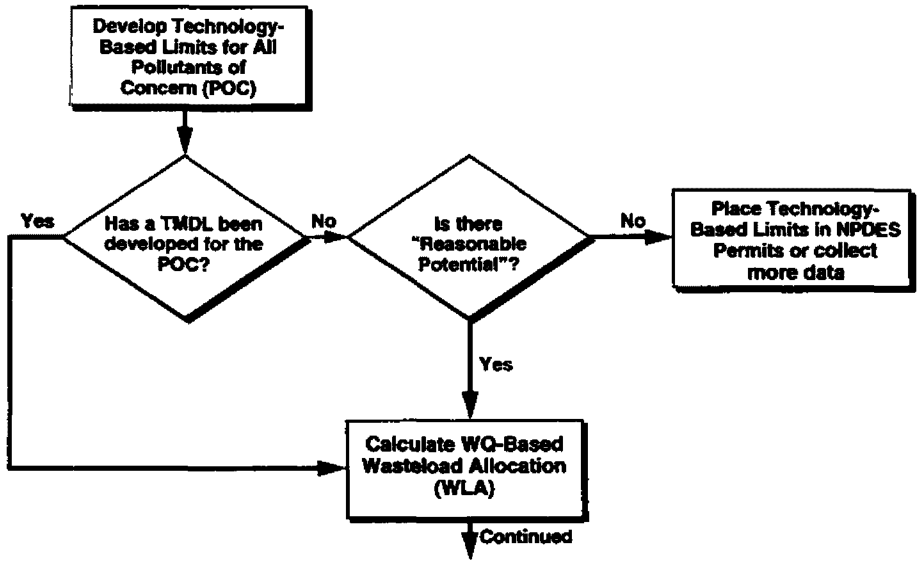
708E-6C-1

Learning Objectives

- Review process for determining "reasonable potential"
- Discuss procedures for calculating wasteload allocations
- Explain steps for translating a wasteload allocation into water quality-based effluent limits

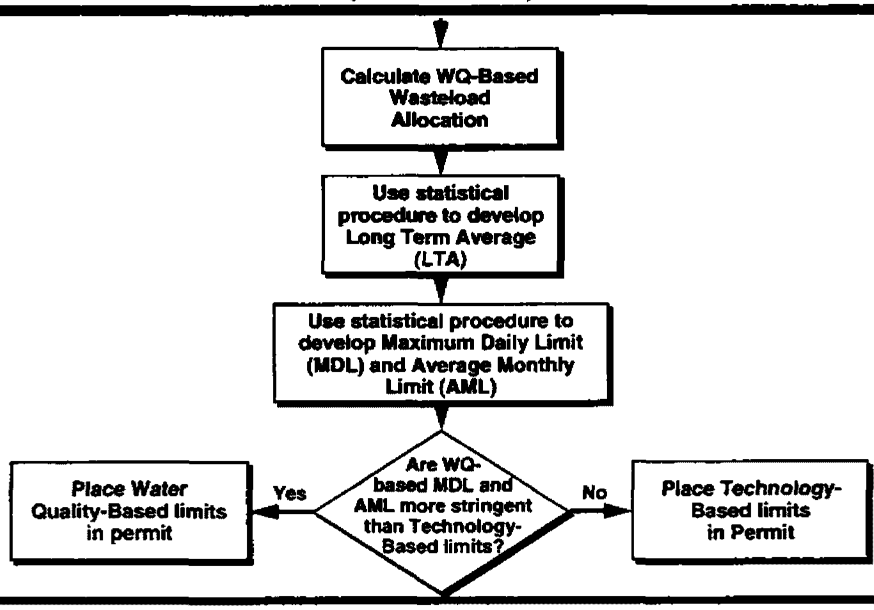
1670-6C-2

Standards-to-Permits Process



1870-6C-3

Standards-to-Permits Process
(Continued)



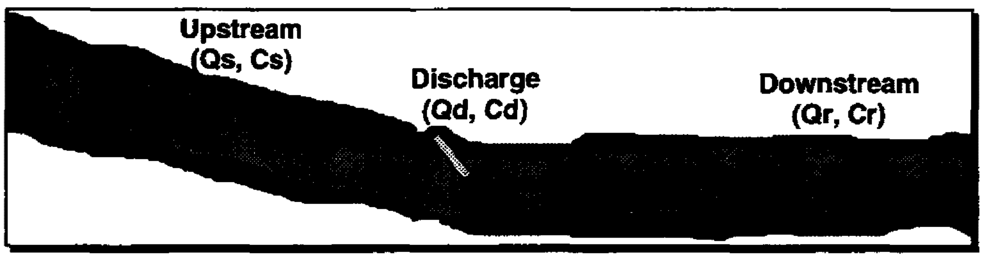
1870-6C-4

Determining the Need for Water Quality-Based Effluent Limits

Criteria	Type of Limit	Regulatory Cite
Chemical-specific	Chemical-specific	40 CFR §122.44(d)(1)(iii)
WET numeric	WET	40 CFR §122.44(d)(1)(iv)
Narrative	WET or Chemical specific	40 CFR §122.44(d)(1)(v-vi)

167D-6C-5

Mass-Balance Equation
QdCd + QsCs = QrCr



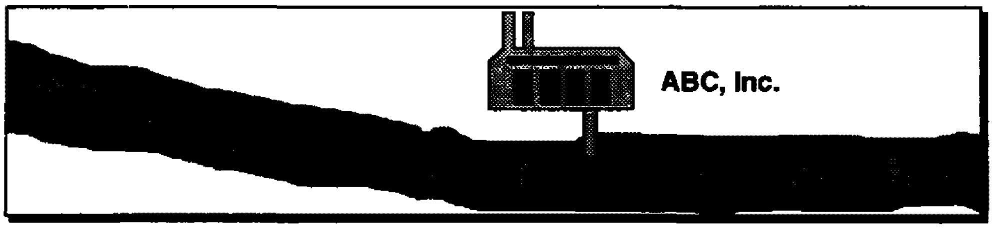
- Q = Flow (mgd or cfs)
- C = Pollutant concentration (mg/l)
- Mass = [Concentration] [Flow]
- QdCd + QsCs = QrCr
- To determine pollutant concentration in the stream:

$$Cr = \frac{QdCd + QsCs}{Qr}$$

Note: Qr = Qs + Qd

167D-6C-6

Is There Reasonable Potential to Exceed Water Quality Standards?



Qs	= Upstream river flow (1Q10)	= 1.2 cfs
Qd	= Discharge flow	= 0.31 cfs
Cs	= Upstream river concentration	= 0.8 mg/l
Cd	= Discharge concentration	= 1.5 mg/l
Water Quality Standard (acute criterion)		= 1.0 mg/l

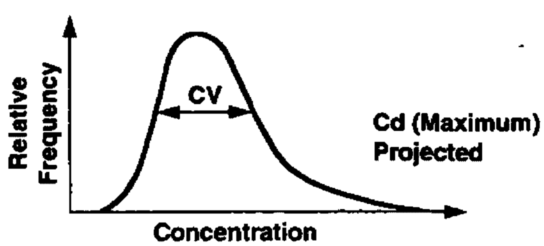
$$Cr = \frac{QdCd + Qs\,Cs}{Qr} = \frac{(0.31)(1.5) + (1.2)(0.8)}{1.2 + 0.31}$$

$$Cr = 0.94 \text{ mg/l}$$

167D-6C-7

Projecting a Maximum Value for Cd

- **We must consider**
  - Effluent variability - defined by the coefficent of variation (CV)
  - Uncertainty due to a limited number of data points
  - Desired upper-bound of the expected lognormal distribution



167D-6C-8

Statistical Approach

- **Confidence Level**
  - **Characterization of the highest measured effluent concentration based on the desired confidence level**
- **Example:**
  - **At the 99% confidence level:**
    - **the largest value of 5 samples is greater than the 40th percentile**
    - **the largest value of 330 samples is greater than the 99th percentile**

1670-6C-9

Statistical Approach (Continued)

- **Selected Percentile**
  - **Characterization of the relationship between the percentile represented by the maximum observed value (based on the number of samples) and the selected upper bound percentile of the lognormal distribution**

1670-6C-10

Projecting a Maximum Value for Cd

- **How do you determine Cd with a 99% confidence level at the 99% upper bound?**
  - **Options:**
    1) **Take the maximum value of 330 or more samples**
    2) **Project a maximum value from existing data using a multiplier**

167D-6C-11

Reasonable Potential Multiplying Factors

(99% Confidence Level and 99% Probability Basis)

Sample Number	Coefficient of Variation									
N	0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0
1	2.5	6.0	13.2	26.5	48.3	81.4	128.0	190.3	269.9	368.3
2	2.0	4.0	7.4	12.7	20.2	30.3	43.0	58.4	76.6	97.5
3	1.9	3.3	5.6	8.9	13.4	19.0	25.7	33.5	42.3	52.0
4	1.7	2.9	4.7	7.2	10.3	14.2	18.6	23.6	29.1	35.1
5	1.7	2.7	4.2	6.2	8.6	11.5	14.8	18.4	22.4	26.5
6	1.6	2.5	3.8	5.5	7.5	9.8	12.4	15.3	18.3	21.5
7	1.6	2.4	3.6	5.0	6.7	8.7	10.8	13.1	15.6	18.2
8	1.5	2.3	3.3	4.6	0.0	7.8	9.6	11.6	13.6	15.8
9	1.5	2.2	3.2	4.3	5.7	7.1	8.7	10.4	12.2	14.0
10	1.5	2.2	3.0	4.1	5.3	6.6	8.0	9.5	11.0	12.6
11	1.4	2.1	2.9	3.9	5.0	6.2	7.4	8.8	10.1	11.5
12	1.4	2.0	2.8	3.7	4.7	5.8	7.0	8.1	9.4	10.6
13	1.4	2.0	2.7	3.6	4.5	5.5	6.5	7.6	8.7	9.9
14	1.4	2.0	2.6	3.4	4.3	5.2	6.2	7.2	8.2	9.2
15	1.4	1.9	2.6	3.3	4.1	5.0	5.9	6.8	7.7	8.7
16	1.4	1.9	2.5	3.2	4.0	4.8	5.6	6.5	7.3	8.2
17	1.4	1.9	2.5	3.1	3.8	4.6	5.4	6.2	7.0	7.8
18	1.4	1.9	2.4	3.0	3.7	4.4	5.2	5.9	6.7	7.4
19	1.4	1.8	2.4	3.0	3.6	4.3	5.0	3.7	6.4	7.1
20	1.3	1.8	2.3	2.9	3.5	4.2	4.8	5.5	6.1	6.8

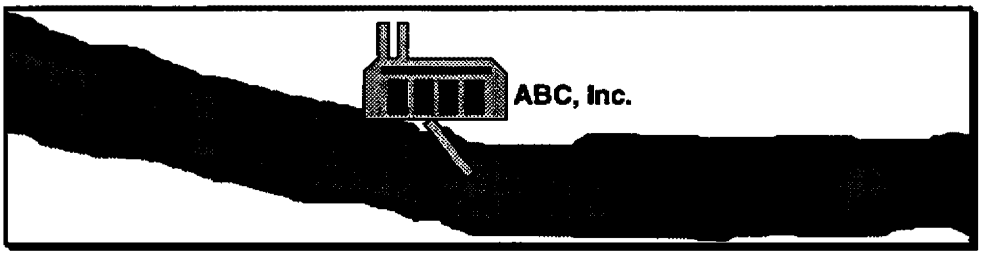
167D-6C-12

Projecting a Maximum Value for Cd

- **Re-examine data for ABC, Inc.**
  - **Number of samples (n) = 8**
  - **CV = 0.6 (default value if n < 10**
  - **Maximum Observed Value of Effluent Concentration (Cd) = 1.5 mg/l**
  - **Projected Maximum Value of Cd = 1.5 mg/l x multiplier**
    = 1.5 mg/l x 3.3
    = 5.0 mg/l

167D-6C-13

Is There Reasonable Potential to Exceed Water Quality Standards?



Qs	**=**	**Upstream river flow**	**1Q10 =**	**1.2 cfs**
Qd	**=**	**Discharge flow**	**=**	**0.31 cfs**
Cs	**=**	**Upstream river concentration**	**=**	**0.8 mg/l**
Cd	**=**	***Maximum observed* discharge concentration**	**=**	**1.5 mg/l**
		Water Quality Standard (Acute Criterion)	**=**	**1.0 mg/l**

$$Cr = \frac{QdCd + QsCs}{Qr}$$

167D-6C-14

Is There Reasonable Potential to Exceed Water Quality Standards? (Continued)

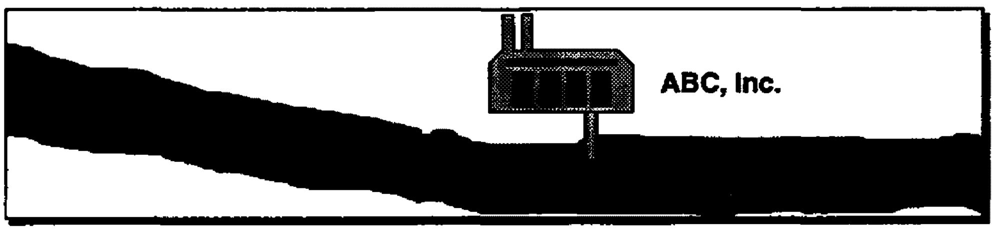
- **Projected maximum Cd** $= 1.5 \text{ mg/l} \times 3.3$
  $= 5.0 \text{ mg/l}$
- **Cr** $= \dfrac{(0.31)(5.0) + (1.2)(0.8)}{1.2 + 0.31}$

  $= 1.7 \text{ mg/l}$

  1.7 mg/l > 1.0 mg/l (WQS - Acute criterion)

1670-6C-15

What is the maximum allowable pollutant concentration in the ABC, Inc. effluent assuming complete mixing?



Qs	=	Upstream river flow	1Q10	= 1.2 cfs
			7Q10	= 3.6 cfs
Qd	=	Discharge flow		= 0.31 cfs
Cs	=	Upstream river conc.		= 0.8 mg/l
Cr	=	Water Quality Criterion		
		Acute		= 1.0 mg/l (applied at 1Q10)
		Chronic		= 0.9 mg/l (applied at 7Q10)

$$Cd = \frac{Cr(Qd + Qs) - CsQs}{Qd}$$

$Cd_{(acute)} = 1.8 \text{ mg/l}$

$Cd_{(chronic)} = 2.1 \text{ mg/l}$

1670-6C-16

Steps in Developing Chemical-Specific Water Quality-Based Effluent Limits

Acute and Chronic Wasteload Allocations (WLAs)

↓

Step 1: Calculate Long-Term Average (LTA) for Both WLAs

↓

Step 2: Select Lowest LTA

↓

Step 3: Calculate Maximum Daily Limit (MDL) and Average Monthly Limit (AML)

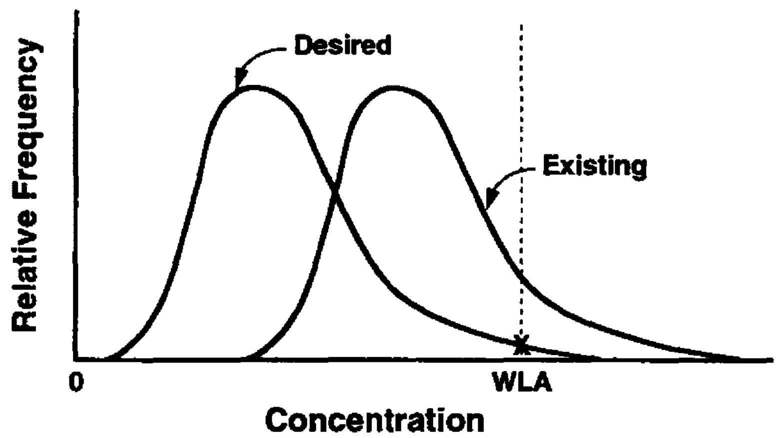
1670-6C-17

Step 1: Calculate LTAs

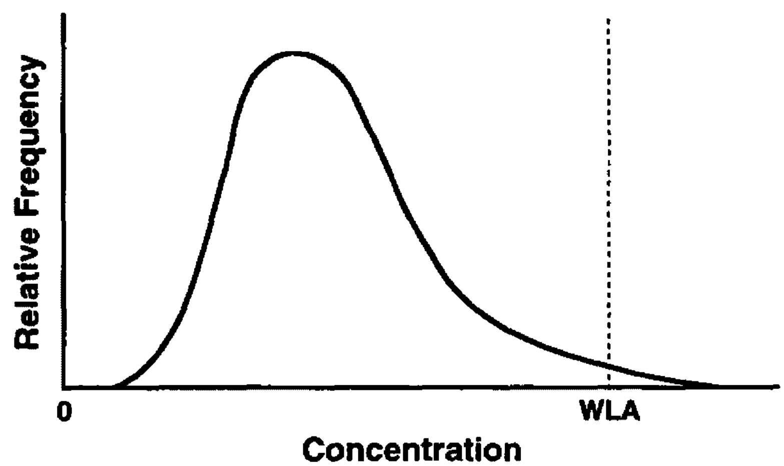
- **Wasteload allocation (WLA) is "never to be exceeded"**
- **Assume a log normal effluent distribution**
- **Characterize "never to be exceeded" by a probability (e.g., WLA is the 99th percentile concentration on the log normal effluent distribution)**

1670-6C-18

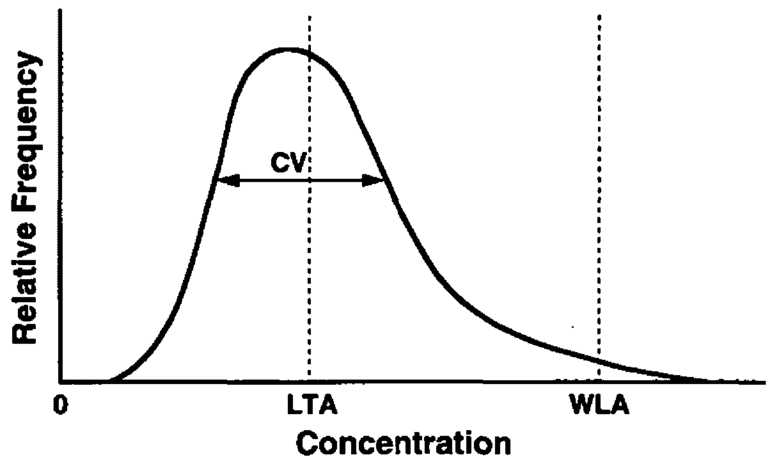
Goal is to Reduce Effluent Concentrations to Below the WLA



This Distribution Achieves the Goal



We Can Characterize the Desired Distribution by LTA and CV



167D-6C-21

CV	WLA multipliers $e^{[0.5\sigma^2 - z\sigma]}$ 95th percentile	99th percentile
0.1	0.853	0.797
0.2	0.736	0.643
0.3	0.644	0.527
0.4	0.571	0.440
0.5	0.514	0.373
0.6	0.468	0.321
0.7	0.432	0.281
0.8	0.403	0.249
0.9	0.379	0.224
1.0	0.360	0.204
1.1	0.344	0.187
1.2	0.330	0.174
1.3	0.319	0.162
1.4	0.310	0.153
1.5	0.302	0.144
1.6	0.296	0.137
1.7	0.290	0.131
1.8	0.285	0.126
1.9	0.281	0.121
2.0	0.277	0.117

Acute

$LTA_{a,c} = WLA_{a,c} \cdot e^{[0.5\sigma^2 - z\sigma]}$

where: $\sigma^2 = \ln[CV^2 + 1]$

$z = 1.645$ for 95th percentile occurrence probability, and

$z = 2.326$ for 99th percentile occurrence probability

167D-6C-22

CV	WLA multipliers $e^{[0.5\sigma_4^2 - z\sigma_4]}$ 95th percentile	WLA multipliers $e^{[0.5\sigma_4^2 - z\sigma_4]}$ 99th percentile
0.1	0.922	0.891
0.2	0.853	0.797
0.3	0.791	0.715
0.4	0.736	0.643
0.5	0.687	0.581
0.6	0.644	0.527
0.7	0.606	0.481
0.8	0.571	0.440
0.9	0.541	0.404
1.0	0.514	0.373
1.1	0.490	0.345
1.2	0.468	0.321
1.3	0.449	0.300
1.4	0.432	0.281
1.5	0.417	0.264
1.6	0.403	0.249
1.7	0.390	0.236
1.8	0.379	0.224
1.9	0.369	0.214
2.0	0.360	0.204

Chronic
(4-day average)

$LTA_c = WLA_c \cdot e^{[0.5\sigma_4^2 - z\sigma_4]}$

where: $\sigma_4^2 = ln[CV^2/4 + 1]$

$z = 1.645$ for 95th percentile occurrence probability, and

$z = 2.326$ for 99th percentile occurrence probability

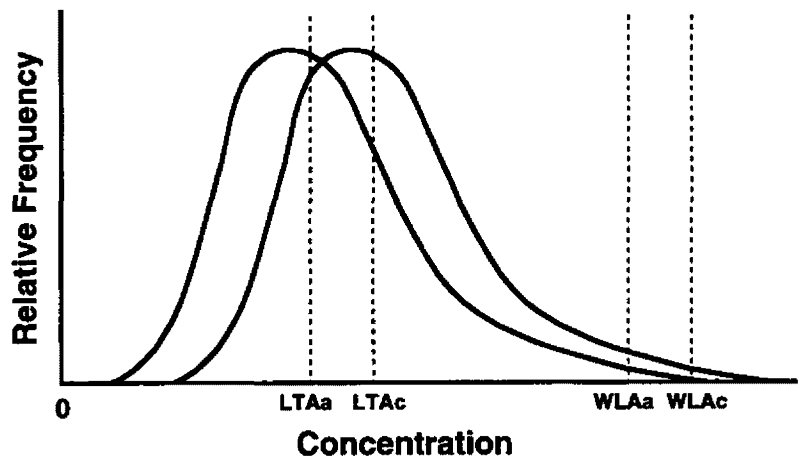
1670-6C-23

Step 2: Select Lowest LTA

- **Protects both WLAs (acute and chronic)**
- **Sets one treatment design basis**

1670-6C-24

Because There Are Two LTAs, We Need to Use the More Stringent



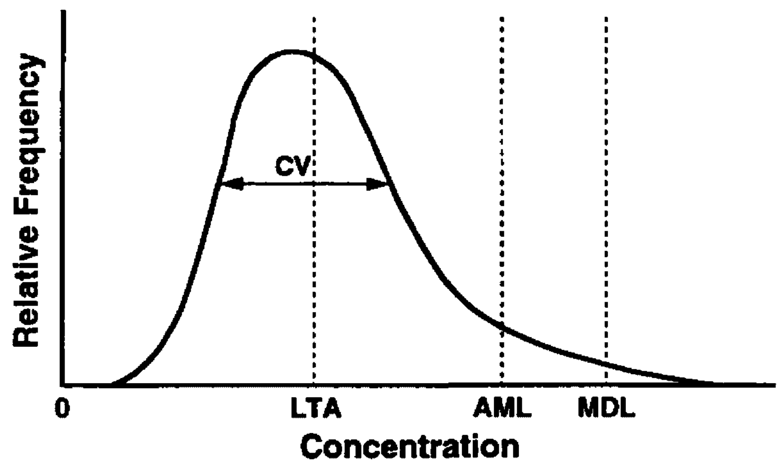
1670-6C-25

Step 3: Calculate MDL and AML

- Allows comparison to technology-based limits
- Uses upper-bound estimates for both MDL and AML
- Ties AML to planned frequency of monitoring

1670-6C-26

We Can Characterize the Upper Bounds of the Effluent from the LTA and CV



1670-6C-27

Maximum Daily Limit (MDL)

$\text{MDL} = \text{LTA} \cdot e^{[z\sigma - 0.5\sigma^2]}$

where: $\sigma^2 = ln[CV^2 + 1]$

$z = 1.645$ for 95th percentile occurrence probability, and

$z = 2.326$ for 99th percentile occurrence probability

CV	LTA multipliers $e^{[z\sigma - 0.5\sigma^2]}$ 95th percentile	LTA multipliers $e^{[z\sigma - 0.5\sigma^2]}$ 99th percentile
0.1	1.17	1.25
0.2	1.36	1.55
0.3	1.55	1.90
0.4	1.75	2.27
0.5	1.95	2.68
0.6	2.13	3.11
0.7	2.31	3.56
0.8	2.48	4.01
0.9	2.64	4.46
1.0	2.78	4.90
1.1	2.91	5.34
1.2	3.03	5.76
1.3	3.13	6.17
1.4	3.23	6.56
1.5	3.31	6.93
1.6	3.38	7.29
1.7	3.45	7.63
1.8	3.51	7.95
1.9	3.56	8.26
2.0	3.60	8.55

1670-6C-28

Average Monthly Limit

AML = LTA . $e^{[z\sigma n\ -\ 0.5\ \sigma n2]}$

where: $\sigma_n^2 = ln[CV^2/n + 1]$.

z = 1.645 for 95th percentile occurrence probability, and

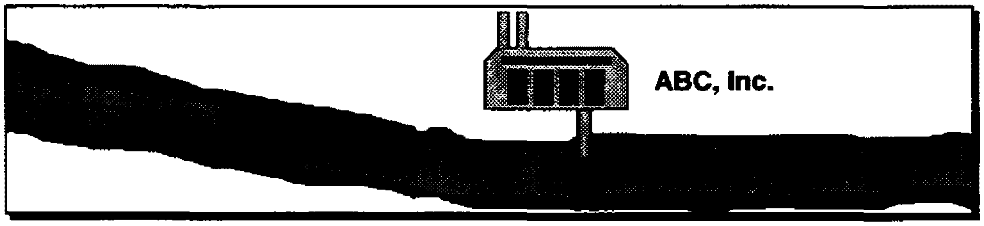
z = 2.326 for 99th percentile occurrence probability

n = number of samples/month.

CV	LTA multipliers $e^{[z\sigma n\ -\ 0.5\ \sigma n2]}$									
	95th percentile					99th percentile				
	n=1	n=2	n=4	n=8	n=30	n=1	n=2	n=4	n=10	n=30
0.1	1.17	1.12	1.08	1.06	1.03	1.25	1.18	1.12	1.08	1.04
0.2	1.36	1.25	1.17	1.12	1.06	1.56	1.37	1.25	1.16	1.08
0.3	1.55	1.38	1.26	1.18	1.09	1.90	1.59	1.40	1.24	1.13
0.4	1.75	1.52	1.36	1.25	1.12	2.27	1.83	1.55	1.33	1.18
0.5	1.96	1.66	1.45	1.31	1.16	2.68	2.09	1.72	1.42	1.23
0.6	2.13	1.80	1.55	1.38	1.19	3.11	2.37	1.90	1.52	1.28
0.7	2.31	1.94	1.65	1.45	1.22	3.56	2.66	2.08	1.62	1.33
0.8	2.48	2.07	1.75	1.52	1.26	4.01	2.96	2.27	1.73	1.39
0.9	2.64	2.20	1.85	1.59	1.29	4.46	3.28	2.48	1.84	1.44
1.0	2.78	2.33	1.95	1.66	1.33	4.90	3.59	2.68	1.96	1.50
1.1	2.91	2.45	2.04	1.73	1.36	5.34	3.91	2.90	2.07	1.56
1.2	3.03	2.56	2.13	1.80	1.39	5.76	4.23	3.11	2.19	1.62
1.3	3.13	2.67	2.23	1.87	1.43	6.17	4.55	3.34	2.32	1.68
1.4	3.23	2.77	2.31	1.94	1.47	6.56	4.86	3.56	2.45	1.74
1.5	3.31	2.86	2.40	2.00	1.50	6.93	5.17	3.78	2.58	1.80
1.6	3.38	2.95	2.48	2.07	1.54	7.29	5.47	4.01	2.71	1.87
1.7	3.45	3.03	2.56	2.14	1.57	7.63	5.77	4.23	2.84	1.93
1.8	3.51	3.10	2.64	2.20	1.61	7.95	6.06	4.46	2.98	2.00
1.9	3.56	3.17	2.71	2.27	1.64	8.26	6.34	4.68	3.12	2.07
2.0	3.60	3.23	2.78	2.33	1.68	8.55	6.61	4.90	3.26	2.14

167D-6C-29

Example



Recall that we calculated the following WLAs:

Cd(acute)	=	1.8 mg/l
Cd(chronic)	=	2.1 mg/l

167D-6C-30

Step 1: Calculate LTAs

CV	WLA multipliers $e^{[0.5\sigma^2 - z\sigma]}$ 95th percentile	WLA multipliers $e^{[0.5\sigma^2 - z\sigma]}$ 99th percentile
0.1	0.853	0.797
0.2	0.736	0.643
0.3	0.644	0.527
0.4	0.571	0.440
0.5	0.514	0.373
0.6	0.468	0.321
0.7	0.432	0.281
0.8	0.403	0.249
0.9	0.379	0.224
1.0	0.360	0.204
1.1	0.344	0.187
1.2	0.330	0.174
1.3	0.319	0.162
1.4	0.310	0.153
1.5	0.302	0.144
1.6	0.296	0.137
1.7	0.290	0.131
1.8	0.285	0.126
1.9	0.281	0.121
2.0	0.277	0.117

Acute

CV = 0.6

WLA(acute) = 1.8 mg/l
= 99th percentile value

LTA(acute) = 1.8 mg/l x 0.321
= 0.58 mg/l

1670-6C-31

Step 1: Calculate LTAs

CV	WLA multipliers $e^{[0.5\sigma_4^2 - z\sigma_4]}$ 95th percentile	WLA multipliers $e^{[0.5\sigma_4^2 - z\sigma_4]}$ 99th percentile
0.1	0.922	0.891
0.2	0.853	0.797
0.3	0.791	0.715
0.4	0.736	0.643
0.5	0.687	0.581
0.6	0.644	0.527
0.7	0.606	0.481
0.8	0.571	0.440
0.9	0.541	0.404
1.0	0.514	0.373
1.1	0.490	0.345
1.2	0.468	0.321
1.3	0.449	0.300
1.4	0.432	0.281
1.5	0.417	0.264
1.6	0.403	0.249
1.7	0.390	0.236
1.8	0.379	0.224
1.9	0.369	0.214
2.0	0.360	0.204

Chronic

CV = 0.6

WLA(chronic) = 2.1 mg/l
= 99th percentile value

LTA(chronic) = 2.1 mg/l x 0.527
= 1.1 mg/l

1670-6C-32

Step 2: Select Lowest LTA

- LTA(acute) = 0.58 mg/l
- LTA(chronic) = 1.1 mg/l
- Select LTA(acute) = 0.58 mg/l

1670-6C-33

Step 3: Calculate MDL and AML

CV	LTA multipliers $e^{[z\sigma - 0.5\sigma^2]}$ 95th percentile	99th percentile
0.1	1.17	1.25
0.2	1.36	1.55
0.3	1.55	1.90
0.4	1.75	2.27
0.5	1.95	2.68
0.6	2.13	3.11
0.7	2.31	3.56
0.8	2.48	4.01
0.9	2.64	4.46
1.0	2.78	4.90
1.1	2.91	5.34
1.2	3.03	5.76
1.3	3.13	6.17
1.4	3.23	6.56
1.5	3.31	6.93
1.6	3.38	7.29
1.7	3.45	7.63
1.8	3.51	7.95
1.9	3.56	8.26
2.0	3.60	8.55

MDL

CV = 0.6

MDL = 99th percentile value

MDL = 0.58 mgl x 3.11
= 1.8 mg/l

1670-6C-34

Step 3: Calculate MDL and AML

(Continued)

LTA multipliers

$e^{[z\sigma n - 0.5 \sigma n^2]}$

CV	95th percentile n=1	n=2	n=4	n=8	n=30	99th percentile n=1	n=2	n=4	n=10	n=30
0.1	1.17	1.12	1.08	1.06	1.03	1.25	1.18	1.12	1.08	1.04
0.2	1.36	1.25	1.17	1.12	1.06	1.56	1.37	1.25	1.16	1.08
0.3	1.55	1.38	1.26	1.18	1.09	1.90	1.59	1.40	1.24	1.13
0.4	1.75	1.52	1.36	1.25	1.12	2.27	1.83	1.55	1.33	1.18
0.5	1.96	1.66	1.45	1.31	1.16	2.68	2.09	1.72	1.42	1.23
0.6	2.13	1.80	1.55	1.38	1.19	3.11	2.37	1.90	1.52	1.28
0.7	2.31	1.94	1.65	1.45	1.22	3.56	2.66	2.08	1.62	1.33
0.8	2.48	2.07	1.75	1.52	1.26	4.01	2.96	2.27	1.73	1.38
0.9	2.64	2.20	1.85	1.58	1.29	4.46	3.28	2.48	1.84	1.44
1.0	2.78	2.33	1.95	1.66	1.33	4.90	3.59	2.68	1.96	1.50
1.1	2.91	2.45	2.04	1.73	1.36	5.34	3.91	2.90	2.07	1.56
1.2	3.03	2.56	2.13	1.80	1.39	5.76	4.23	3.11	2.19	1.62
1.3	3.13	2.67	2.23	1.87	1.43	6.17	4.55	3.34	2.32	1.68
1.4	3.23	2.77	2.31	1.94	1.47	6.56	4.86	3.56	2.45	1.74
1.5	3.31	2.86	2.40	2.00	1.50	6.93	5.17	3.78	2.58	1.80
1.6	3.38	2.95	2.48	2.07	1.54	7.29	5.47	4.01	2.71	1.87
1.7	3.45	3.03	2.56	2.14	1.57	7.63	5.77	4.23	2.84	1.93
1.8	3.51	3.10	2.64	2.20	1.61	7.95	6.06	4.46	2.98	2.00
1.9	3.56	3.17	2.71	2.27	1.64	8.26	6.34	4.68	3.12	2.07
2.0	3.60	3.23	2.78	2.33	1.68	8.55	6.61	4.90	3.26	2.14

1670-6C-36

AML

Number of Samples = 8 (assume twice-weekly sampling)

CV = 0.6

AML = 95th percentile value

AML = 0.58 mg/l x 1.38
= 0.80 mg/l

PRACTICAL EXERCISE

Determining the Need for Chemical-Specific, Water Quality-Based Effluent Limitations

DIRECTIONS:

You are a permit writer and have received a permit renewal application from a manufacturer. The previous permit was issued using effluent limits derived from technology-based effluent limitation guidelines. Since that time, the State has revised its water quality standards to ensure aquatic life protection. Therefore, you must determine whether water quality-based limits are needed.

GIVEN:

$$C_r = \frac{[(C_d)(Q_d) + (C_s)(Q_s)]}{(Q_d + Q_s)}$$

where: C_r = the receiving water concentration,
C_d = the effluent concentration,
Q_d = the effluent flow,
C_s = the receiving water background concentration, and
Q_s = the appropriate receiving water flow.

Water Quality Criteria:

Criteria for Aquatic Life Protection - Zinc

Acute = 120 ug/l [Achieved at the 1-day, 10 year return frequency flow (1Q10)]
Chronic = 110 ug/l [Achieved at the 7-day, 10 year return frequency flow (7Q10)]

Effluent Data (from DMR):

Q_d = 7.06 cfs

Observed Concentrations:

$C_{d(1)}$ = 0.17 mg/l $C_{d(3)}$ = 0.14 mg/l
$C_{d(2)}$ = 0.21 mg/l $C_{d(4)}$ = 0.19 mg/l

CV = 0.6 (default value for < 10 observations)

Receiving Water Data:

Illinois River   1Q10 flow = 23.6 cfs
                  7Q10 flow = 70.9 cfs

Receiving water background concentration (C_s) = 0.07 mg/l

Reasonable Potential Multiplier Table (Table 3-1 from *Technical Support Document*):

Table 3-1. Reasonable Potential Multiplying Factors: 99% Confidence Level and 99% Probability Basis

Number of Samples	Coefficient of Variation																			
	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0
1	1.6	2.5	3.9	6.0	9.0	13.2	18.9	26.5	36.2	48.3	63.3	81.4	102.8	128.0	157.1	190.3	227.8	269.9	316.7	368.3
2	1.4	2.0	2.9	4.0	5.5	7.4	9.8	12.7	16.1	20.2	24.9	30.3	36.3	43.0	50.4	58.4	67.2	76.6	86.7	97.5
3	1.4	1.9	2.5	3.3	4.4	5.6	7.2	8.9	11.0	13.4	16.0	19.0	22.2	25.7	29.4	33.5	37.7	42.3	47.0	52.0
4	1.3	1.7	2.3	2.9	3.8	4.7	5.9	7.2	8.7	10.3	12.2	14.2	16.3	18.6	21.0	23.6	26.3	29.1	32.1	35.1
5	1.3	1.7	2.1	2.7	3.4	4.2	5.1	6.2	7.3	8.6	10.0	11.5	13.1	14.8	16.6	18.4	20.4	22.4	24.5	26.6
6	1.3	1.6	2.0	2.5	3.1	3.8	4.6	5.5	6.4	7.5	8.6	9.8	11.1	12.4	13.8	15.3	16.8	18.3	19.9	21.5
7	1.3	1.6	2.0	2.4	2.9	3.6	4.2	5.0	5.8	6.7	7.7	8.7	9.7	10.8	12.0	13.1	14.4	15.6	16.9	18.2
8	1.2	1.5	1.9	2.3	2.8	3.3	3.9	4.6	5.3	6.1	6.9	7.8	8.7	9.6	10.6	11.6	12.6	13.6	14.7	15.8
9	1.2	1.5	1.8	2.2	2.7	3.2	3.7	4.3	5.0	5.7	6.4	7.1	7.9	8.7	9.6	10.4	11.3	12.2	13.1	14.0
10	1.2	1.5	1.8	2.2	2.6	3.0	3.5	4.1	4.7	5.3	5.9	6.6	7.3	8.0	8.8	9.5	10.3	11.0	11.8	12.6
11	1.2	1.5	1.8	2.1	2.5	2.9	3.4	3.9	4.4	5.0	5.6	6.2	6.8	7.4	8.1	8.8	9.4	10.1	10.8	11.5
12	1.2	1.4	1.7	2.0	2.4	2.8	3.2	3.7	4.2	4.7	5.2	5.8	6.4	7.0	7.5	8.1	8.8	9.4	10.0	10.6
13	1.2	1.4	1.7	2.0	2.3	2.7	3.1	3.6	4.0	4.5	5.0	5.5	6.0	6.5	7.1	7.6	8.2	8.7	9.3	9.9
14	1.2	1.4	1.7	2.0	2.3	2.6	3.0	3.4	3.9	4.3	4.8	5.2	5.7	6.2	6.7	7.2	7.7	8.2	8.7	9.2
15	1.2	1.4	1.6	1.9	2.2	2.6	2.9	3.3	3.7	4.1	4.6	5.0	5.4	5.9	6.4	6.8	7.3	7.7	8.2	8.7
16	1.2	1.4	1.6	1.9	2.2	2.5	2.9	3.2	3.6	4.0	4.4	4.8	5.2	5.6	6.1	6.5	6.9	7.3	7.8	8.2
17	1.2	1.4	1.6	1.9	2.1	2.5	2.8	3.1	3.5	3.8	4.2	4.6	5.0	5.4	5.8	6.2	6.6	7.0	7.4	7.8
18	1.2	1.4	1.6	1.8	2.1	2.4	2.7	3.0	3.4	3.7	4.1	4.4	4.8	5.2	5.6	5.9	6.3	6.7	7.0	7.4
19	1.2	1.4	1.6	1.8	2.1	2.4	2.7	3.0	3.3	3.6	4.0	4.3	4.6	5.0	5.3	5.7	6.0	6.4	6.7	7.1
20	1.2	1.3	1.6	1.8	2.0	2.3	2.6	2.9	3.2	3.5	3.8	4.2	4.5	4.8	5.2	5.5	5.8	6.1	6.5	6.8

(1) Calculate a maximum projected value for the effluent concentration based on the observed values and the TSD "Reasonable Potential Multiplier Table" provided above.

Maximum projected effluent concentration = ________

(2) Calculate the projected receiving water concentrations (C_r) for zinc, using the mass balance equation and data supplied above, for comparison with both acute and chronic criteria.

(a) Zinc (acute) ______ (b) Zinc (chronic) _____

(3) Compare the receiving water concentrations calculated in question (2) with the State Water Quality criteria for aquatic life protection. Which is larger? What does this mean? Do you need to set a water quality-based limit for zinc?____________________________
____
____
____
____
____

(4) What effect would a stream flow (Q_s) of 0 cfs have on the receiving water concentration? What about a stream flow of 1,000 cfs? ________________________________
____
____
____
____

PRACTICAL EXERCISE

Calculating Chemical-Specific Water Quality-Based Effluent Limitations

DIRECTIONS:

You are a permit writer and have received a permit renewal application from a manufacturer. The previous permit was issued using effluent limits derived from technology-based effluent limitation guidelines. Since that time, the State has revised its water quality standards to ensure aquatic life protection. In the previous exercise, you determined that this facility had a "reasonable potential" to exceed State water quality criteria for zinc. Using the data provided below, calculate the effluent limitations for zinc.

GIVEN:

$$C_d = \frac{[C_r(Q_d + Q_s) - (C_s)(Q_s)]}{Q_d}$$

where:
C_d = effluent discharge concentration = wasteload allocation (WLA)
C_r = receiving water concentration,
C_s = receiving water background concentration, and
Q_d = effluent flow,
Q_s = appropriate receiving water flow.

Water Quality Criteria:

Criteria for Aquatic Life Protection - Zinc

Acute = 120 ug/l [Achieved at the 1-day, 10 year return frequency flow (1Q10)]
Chronic = 110 ug/l [Achieved at the 7-day, 10 year return frequency flow (7Q10)]

Effluent Data (from DMR):

Q_d = 7.06 cfs

Receiving Water Data:

Illinois River 1Q10 flow = 23.6 cfs
7Q10 flow = 70.9 cfs

Receiving water background concentration (C_s) = 0.07 mg/l

Tables 5-1 and 5-2 from *Technical Support Document* (TSD):

Table 5-1. Back Calculations of Long-Term Average

CV	WLA Multipliers $e^{[0.5\sigma^2 - z\sigma]}$ 95th Percentile	99th Percentile
0.1	0.853	0.797
0.2	0.736	0.643
0.3	0.644	0.527
0.4	0.571	0.440
0.5	0.514	0.373
0.6	0.468	0.321
0.7	0.432	0.281
0.8	0.403	0.249
0.9	0.379	0.224
1.0	0.360	0.204
1.1	0.344	0.187
1.2	0.330	0.174
1.3	0.319	0.162
1.4	0.310	0.153
1.5	0.302	0.144
1.6	0.296	0.137
1.7	0.290	0.131
1.8	0.285	0.126
1.9	0.281	0.121
2.0	0.277	0.117

Acute

$$LTA_{a,c} = WLA_{a,c} \cdot e^{[0.5\sigma^2 - z\sigma]}$$

where $\sigma^2 = \ln[CV^2 + 1]$,
$z = 1.645$ for 95th percentile occurrence probability, and
$z = 2.326$ for 99th percentile occurrence probability

Chronic
(4-day average)

$$LTA_c = WLA_c \cdot e^{[0.5\sigma_4^2 - z\sigma_4]}$$

where $\sigma_4^2 = \ln[CV^2/4 + 1]$,
$z = 1.645$ for 95th percentile occurrence probability, and
$z = 2.326$ for 99th percentile occurrence probability

CV	WLA Multipliers $e^{[0.5\sigma_4^2 - z\sigma_4]}$ 95th Percentile	99th Percentile
0.1	0.922	0.891
0.2	0.853	0.797
0.3	0.791	0.715
0.4	0.736	0.643
0.5	0.687	0.581
0.6	0.644	0.527
0.7	0.606	0.481
0.8	0.571	0.440
0.9	0.541	0.404
1.0	0.514	0.373
1.1	0.490	0.345
1.2	0.468	0.321
1.3	0.449	0.300
1.4	0.432	0.281
1.5	0.417	0.264
1.6	0.403	0.249
1.7	0.390	0.236
1.8	0.379	0.224
1.9	0.369	0.214
2.0	0.360	0.204

Table 5-2. Calculation of Permit Limits

CV	LTA multipliers $e^{[z\sigma - 0.5\sigma^2]}$ 95th Percentile	LTA multipliers $e^{[z\sigma - 0.5\sigma^2]}$ 99th Percentile
0.1	1.17	1.25
0.2	1.36	1.55
0.3	1.55	1.90
0.4	1.75	2.27
0.5	1.95	2.68
0.6	2.13	3.11
0.7	2.31	3.56
0.8	2.48	4.01
0.9	2.64	4.46
1.0	2.78	4.90
1.1	2.91	5.34
1.2	3.03	5.78
1.3	3.13	6.17
1.4	3.23	6.58
1.5	3.31	6.93
1.6	3.38	7.29
1.7	3.45	7.63
1.8	3.51	7.95
1.9	3.56	8.26
2.0	3.60	8.55

Maximum Daily Limit

$$MDL = LTA \cdot e^{[z\sigma - 0.5\sigma^2]}$$

where $\sigma^2 = ln[CV^2 + 1]$,
$z = 1.645$ for 95th percentile occurrence probability, and
$z = 2.326$ for 99th percentile occurrence probability

Average Monthly Limit

$$AML = LTA \cdot e^{[z\sigma_n - 0.5\sigma_n^2]}$$

where $\sigma_n^2 = ln[CV^2/n + 1]$,
$z = 1.645$ for 95th percentile,
$z = 2.326$ for 99th percentile, and
n = number of samples/month

CV	LTA Multipliers $e^{[z\sigma_n - 0.5\sigma_n^2]}$ 95th Percentile					99th Percentile				
	n=1	n=2	n=4	n= 8	n=30	n=1	n=2	n=4	n=10	n=30
0.1	1.17	1.12	1.08	1.06	1.03	1.25	1.18	1.12	1.08	1.04
0.2	1.36	1.25	1.17	1.12	1.06	1.55	1.37	1.25	1.16	1.09
0.3	1.55	1.38	1.26	1.18	1.09	1.90	1.59	1.40	1.24	1.13
0.4	1.75	1.52	1.36	1.25	1.12	2.27	1.83	1.55	1.33	1.18
0.5	1.95	1.66	1.45	1.31	1.16	2.68	2.09	1.72	1.42	1.23
0.6	2.13	1.80	1.55	1.38	1.19	3.11	2.37	1.90	1.52	1.28
0.7	2.31	1.94	1.65	1.45	1.22	3.56	2.66	2.08	1.62	1.33
0.8	2.48	2.07	1.75	1.52	1.26	4.01	2.96	2.27	1.73	1.39
0.9	2.64	2.20	1.85	1.59	1.29	4.46	3.28	2.48	1.84	1.44
1.0	2.78	2.33	1.95	1.66	1.33	4.90	3.59	2.68	1.96	1.50
1.1	2.91	2.45	2.04	1.73	1.36	5.34	3.91	2.90	2.07	1.56
1.2	3.03	2.58	2.13	1.80	1.39	5.76	4.23	3.11	2.19	1.62
1.3	3.13	2.67	2.23	1.87	1.43	6.17	4.55	3.34	2.32	1.68
1.4	3.23	2.77	2.31	1.94	1.47	6.56	4.86	3.56	2.45	1.74
1.5	3.31	2.86	2.40	2.00	1.50	6.93	5.17	3.78	2.58	1.80
1.6	3.38	2.95	2.48	2.07	1.54	7.29	5.47	4.01	2.71	1.87
1.7	3.45	3.03	2.56	2.14	1.57	7.63	5.77	4.23	2.84	1.93
1.8	3.51	3.10	2.64	2.20	1.61	7.95	6.06	4.46	2.98	2.00
1.9	3.56	3.17	2.71	2.27	1.64	8.26	6.34	4.68	3.12	2.07
2.0	3.60	3.23	2.78	2.33	1.68	8.55	6.61	4.90	3.26	2.14

(1) Calculate the waste load allocations for zinc using the equation and data supplied above.

(2) Using the statistical methodologies recommended in the EPA Technical Support Document for Water Quality-based Controls (March 1991) calculate the long-term average (LTA), Maximum Daily Limit (MDL), and the Average Monthly Limit (AML)?

[NOTE: Assume a CV=0.6; monitoring requirement of 4 samples per month; LTA percentile = 99%; MDL percentile = 99%; and AML percentile = 95%]

(3) Compare the chemical specific water quality-based limits calculated above with the technology-based effluent limitations given below for Outfall 001. In which case(s) is the water quality-based limit(s) less stringent?

Technology-Based Effluent Limitations

Pollutant	Maximum Daily Limit (MDL)	Average Monthly Limit (AML)
Zinc	0.15 mg/l	0.10 mg/l

(4) Discussion Question: How could a permit writer account for technology-based limitations prior to calculating water quality-based effluent limits for a specific chemical? _______

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MODULE # 6D

TITLE: **Whole Effluent Toxicity** (WET)

OVERALL OBJECTIVES:

- Discuss the applicability and uses of whole effluent toxicity (WET)
- Describe WET test endpoints
  - Acute
  - Chronic
- Explain the use of toxicity units
- Define acute-to-chronic ratio
- Describe WET test methods
- Describe the purpose of toxicity reduction evaluations

LOGISTICS:

Presentation Format: Lecture, practical exercise
Approximate Presentation Time: 90 minutes
Review Questions/Exercise: 45 minutes
Applicable Statutory/Regulatory Citations:

CWA Section 301(b)(1)(C)	Effluent limitations compliance dates
40 CFR §122.44(d)	Water quality standards and State requirements

Whole Effluent Toxicity

7088-6D-1

Learning Objectives

- Foster better understanding of scientific underpinnings of WET
  - Describe uses and limitations
- Discuss WET implementation requirements
- Describe WET test methods
- Explain the purpose of toxicity reduction evaluations

1670-6D-2

What is Whole Effluent Toxicity (WET) Testing

- **Part of water quality-based toxics control approach**
- **Measures the aggregate toxic effect of effluent or ambient water**
  - **measures the response of exposed aquatic organisms**

1670-6D-3

Why WET?

- **Allows for the protection of the narrative standard "no toxics in toxic amounts"**
  - **Implementation Policy**
- **Integrated Approach to Water Quality-Based Toxics Control**
  - **Chemical specific approach**
  - **Biological criteria approach**
  - **Whole effluent toxicity approach**

1670-6D-4

Uses and Potential Pitfalls of WET Testing

- **Uses**
  - Complex effluents
  - Supplement to chemical-specific limits
  - Ambient water testing
- **Potential Concerns**
  - QA/QC
  - Quality of labs
  - Training

1670-6D-5

Acute/Chronic Toxicity

- **Acute**
  - Test duration: 96 hours or less
  - Endpoint: Mortality (expressed as LC_{50})
- **Short-term Chronic**
  - Test duration: 1.5 hours (sea urchins) to 9 days (sheepshead minnows)
  - Endpoint: Growth, reproduction, etc., (expressed as NOEC and LOEC)

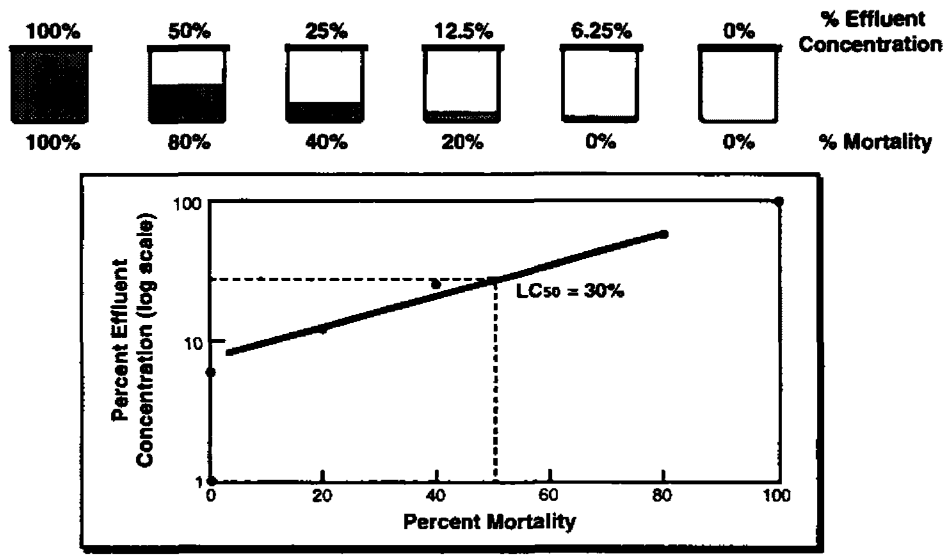
1670-6D-6

Acute WET Statistical Endpoints: Definitions

- **LC50**
  - **Concentration of effluent that is lethal to 50 percent of the exposed organisms**
    - **uses a dilution series**
- **pass/fail**
  - **instream waste concentration (IWC) or ambient toxicity test measured against a control**

1670-6D-7

Example of Acute Test Data and Statistical Analysis



1670-6D-8

Example of Pass/Fail Acute Test at IWC or Ambient

- **Instream Waste Concentration (IWC) equals 75%**
- **Statistical evaluation using student-t test compares mortality rates of ambient or IWC sample against the control**
  - **Is there a "significant statistical difference"?**

1670-6D-9

Statistical Approaches

- **Hypothesis testing**
  - **LOEC, NOEC**
- **Point estimate techniques**
  - **LC50, EC_p, IC_p**

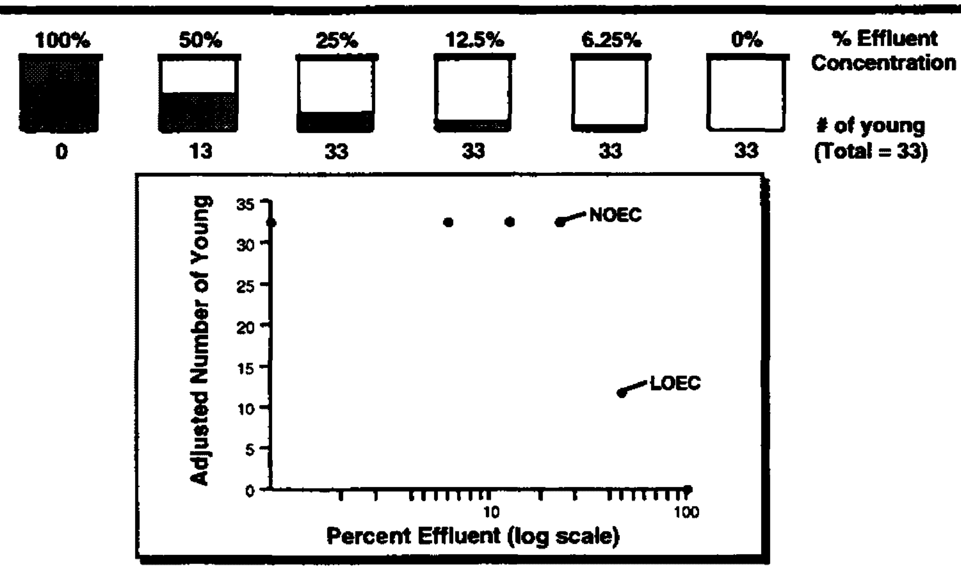
1670-6D-10

Chronic WET Statistical Endpoints (Hypothesis Testing)

- **LOEC**
  - **Lowest Observed Effect Concentration (LOEC) - the lowest concentration of an effluent or a toxicant that results in observable adverse effects in the aquatic test organisms**
- **NOEC**
  - **No Observed Effect Concentration (NOEC) - the highest concentration of an effluent or a toxicant at which no adverse effects are observed on the aquatic test organisms**

1670-6D-11

Example of Chronic Test Data



1670-6D-12

Chronic WET Statistical Endpoints (Point Estimate)

- IC_p
  - Inhibition Concentration (IC) - a point estimate of the toxicant concentration that would cause a given percent reduction in a nonlethal biological measurement of the test organisms (e.g., reproduction, growth, etc.)

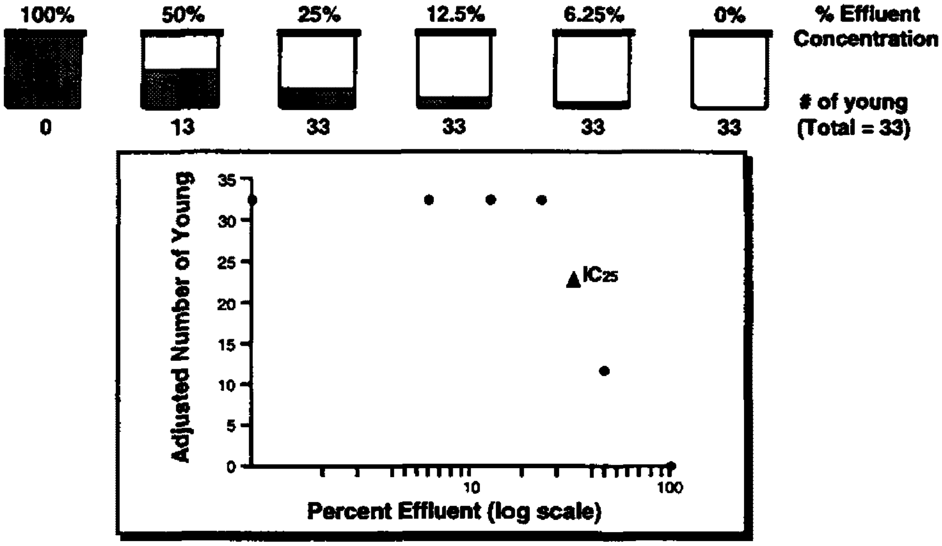
1670-6D-13

Chronic WET Statistical Endpoints (Point Estimate)

- EC_p
  - A point estimate of the toxicant concentration that would cause an observable adverse effect in a given percentage of the test organisms (e.g., death, immobilization)

1670-6D-14

Example of Determining an IC25 from Chronic Test Data



1670-6D-15

Hypothesis Testing Facts

- NOEC are not point estimates
- Cannot calculate coefficients of variation or confidence intervals
- NOEC may represent a different amount of effect from test to test
- NOEC is a lower concentration level than the LOEC

1670-6D-16

Point Estimates Facts

- Can caluculate coefficients of variation and confidence intervals
- Always estimating same effect
- Need specification of a biological effect - what value of p

1670-6D-17

Options for Expressing WET Values

- Option A
  - Use LC_{50}, NOEC, LOEC, or IC_{25} directly (after accounting for dilution)
  - Example Limit: LC_{50} @ 30% effluent
- Option B
  - Use toxic units

$$TUa = \frac{100}{LC_{50}}$$

$$TUc = \frac{100}{NOEC}$$

1670-6D-18

Examples of Toxic Units

- **Acute (TUa)**
  - **Assuming LC_{50} = 28%**

    $$TUa = \frac{100}{LC_{50}} = \frac{100}{28} = 3.6$$
  - **Assuming LC_{50} = 10%**

    $$TUa = \frac{100}{LC_{50}} = \frac{100}{10} = 10.0$$
- **Chronic (TUc)**
  - **Assuming NOEC = 50%**

    $$TUc = \frac{100}{NOEC} = \frac{100}{50} = 2.0$$
  - **Assuming NOEC = 30%**

    $$TUc = \frac{100}{NOEC} = \frac{100}{30} = 3.3$$

1670-6D-19

Definition of Acute-Chronic Ratio

- **Acute-chronic ratio (ACR) - the ratio of the acute toxicity of an effluent or a toxicant to its chronic toxicity**
  - **Used as a factor for estimating chronic toxicity on the basis of acute toxicity data, or for estimating acute toxicity on the basis of chronic toxicity data**
- **Example:** $ACR = \frac{LC_{50}}{NOEC} = \frac{65\%}{25\%} = 2.6$

* $ACR = \frac{TUc}{TUa} = \frac{4.0}{1.5} = 2.6$

1670-6D-20

ACR Calculations

$$ACR = \frac{\text{Acute Endpoint}}{\text{Chronic Endpoint}} = \frac{LC_{50}}{NOEC}$$

$$TUa = \frac{100}{LC_{50}} \qquad TUc = \frac{100}{NOEC}$$

$$\therefore \quad LC_{50} = \frac{100}{TUa} \qquad NOEC = \frac{100}{TUc}$$

$$ACR = \frac{LC_{50}}{NOEC} = \frac{(100/TUa)}{(100/TUc)} = \frac{TUc}{TUa}$$

167D-6D-21

Whole Effluent Toxicity

Developing WET Effluent Limitations

167D-6D-22

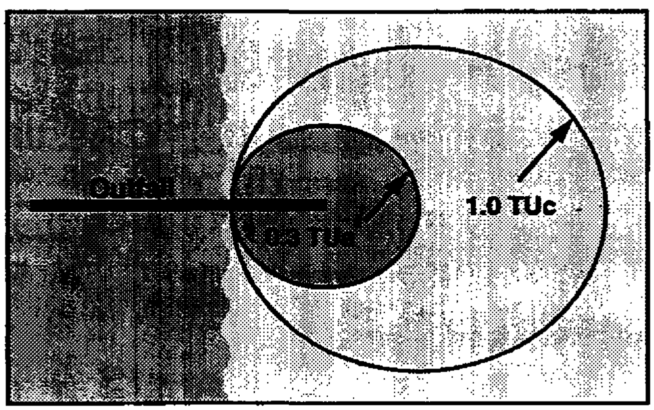
Whole Effluent Toxicity Criteria

- Narrative - "no toxics in toxic amounts"
- Numeric - (recommended in TSD)
  - Acute = 0.3 TUa = 100/LC50
  - Chronic = 1.0 TUc = 100/NOEC

167D-6D-23

Whole Effluent Toxicity Criteria
(Continued)

- Assumptions for applying 0.3 TUa and 1.0 TUc



167D-6D-24

Steps in Developing WET Permit Limitations

Acute and Chronic Wasteload Allocations

Step 1: Convert Acute WLA into Chronic WLA (WET only)

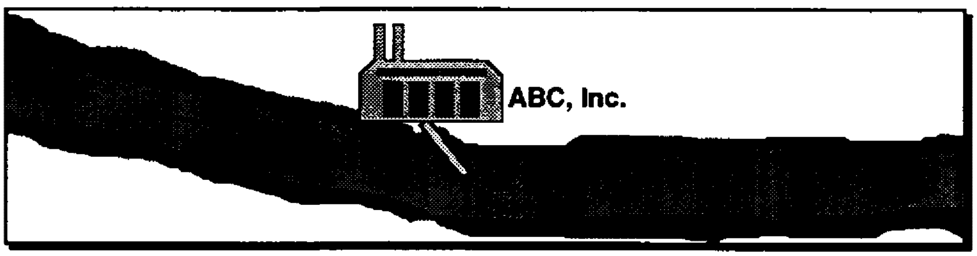
Step 2: Calculate LTA for Both

Step 3: Select Lowest LTA

Step 4: Calculate Maximum and Average Limits

1670-6D-25

What is the Maximum Allowable Whole Effluent Toxicity in the ABC, Inc. Effluent Assuming Complete Mixing?



Qs = Upstream river flow

1Q10 = 1.2 cfs

7Q10 = 3.6 cfs

Qd = Discharge flow = 0.31 cfs

Cs = Upstream river concentration = 0 TUc

Cr = Water quality criteria
Acute = 0.3 TUa applied at 1Q10 low flow
Chronic = 1.0 TUc applied at 7Q10 low flow

1670-6D-26

Acute WLA

$$\text{Cd} = \frac{\text{Cr(Qd + Qs) - CsQs}}{\text{Qd}}$$

$$\text{Cd Acute} = \frac{0.3\ (0.31 + 1.2) - (0)(1.2)}{0.31}$$

$$\text{Cd Acute} = \text{WLA}_a = 1.5\ \text{TUa}$$

1670-6D-27

Chronic WLA

$$\text{Cd} = \frac{\text{Cr(Qd + Qs) - CsQs}}{\text{Qd}}$$

$$\text{Cd chronic} = \frac{1.0\ (0.31 + 3.6) - (0)(3.6)}{0.31}$$

$$\text{Cd chronic} = \text{WLA}_c = 13\ \text{TUc}$$

1670-6D-28

Step 1: Convert Acute WLA into Chronic WLA

Assume observed ACR = $10\left(\frac{TUc}{TUa}\right)$

$WLA_{a,c}$ = Acute WLA expressed in TUc

$WLA_{a,c}$ = WLAa x ACR

$$= 1.5\ TUa \times 10\left(\frac{TUc}{TUa}\right) = 15\ TUc$$

5670-6D-29

Step 2: Calculate LTAs

CV	WLA multipliers $e^{[0.5\sigma^2 - z\sigma]}$ 95th percentile	99th percentile
0.1	0.853	0.797
0.2	0.736	0.643
0.3	0.644	0.527
0.4	0.571	0.440
0.5	0.514	0.373
0.6	0.468	0.321
0.7	0.432	0.281
0.8	0.403	0.249
0.9	0.379	0.224
1.0	0.360	0.204
1.1	0.344	0.187
1.2	0.330	0.174
1.3	0.319	0.162
1.4	0.310	0.153
1.5	0.302	0.144
1.6	0.296	0.137
1.7	0.290	0.131
1.8	0.285	0.126
1.9	0.281	0.121
2.0	0.277	0.117

Acute LTA

Number of samples = 4

CV = 0.6

WLAa,c = 15 TUc

= 99th percentile value

LTAa = 15 TUc x 0.321 = 4.8 TUc

5670-6D-30

Step 2: Calculate LTAs

CV	WLA multipliers $e^{[0.5\sigma_4^2 - z\sigma_4]}$ 95th percentile	99th percentile
0.1	0.922	0.891
0.2	0.853	0.797
0.3	0.791	0.715
0.4	0.736	0.643
0.5	0.687	0.581
0.6	0.644	0.527
0.7	0.606	0.481
0.8	0.571	0.440
0.9	0.541	0.404
1.0	0.514	0.373
1.1	0.490	0.345
1.2	0.468	0.321
1.3	0.449	0.300
1.4	0.432	0.281
1.5	0.417	0.264
1.6	0.403	0.249
1.7	0.390	0.236
1.8	0.379	0.224
1.9	0.369	0.214
2.0	0.360	0.204

Chronic LTA

Number of samples = 4

CV = 0.6

WLAc = 13 TUc

= 99th percentile value

LTAc = 13 TUc x 0.527 = 6.9 TUc

5670-6D-31

Step 3: Select Lowest LTA

LTAa = 4.8 TUc

LTAc = 6.9 TUc

Select LTAa = 4.8 TUc

5670-6D-32

Step 4: Calculate MDL and AML

CV	LTA multipliers $e^{[z\sigma - 0.5\sigma^2]}$ 95th percentile	LTA multipliers $e^{[z\sigma - 0.5\sigma^2]}$ 99th percentile
0.1	1.17	1.25
0.2	1.36	1.55
0.3	1.55	1.90
0.4	1.75	2.27
0.5	1.95	2.68
0.6	2.13	3.11
0.7	2.31	3.56
0.8	2.48	4.01
0.9	2.64	4.46
1.0	2.78	4.90
1.1	2.91	5.34
1.2	3.03	5.76
1.3	3.13	6.17
1.4	3.23	6.56
1.5	3.31	6.93
1.6	3.38	7.29
1.7	3.45	7.63
1.8	3.51	7.95
1.9	3.56	8.26
2.0	3.60	8.55

MDL

CV = 0.6

MDL = 99th percentile value

MDL = 4.8 TUc x 3.11 = 15 TUc

5670-6D-33

Step 4: Calculate MDL and AML

CV	LTA multipliers $e^{[z\sigma_n - 0.5\sigma_n^2]}$ 95th percentile n=1	n=2	n=4	n=8	n=30	99th percentile n=1	n=2	n=4	n=10	n=30
0.1	1.17	1.12	1.08	1.06	1.03	1.25	1.18	1.12	1.08	1.04
0.2	1.36	1.25	1.17	1.12	1.06	1.56	1.37	1.25	1.16	1.08
0.3	1.55	1.38	1.26	1.18	1.09	1.90	1.59	1.40	1.24	1.13
0.4	1.75	1.52	1.36	1.25	1.12	2.27	1.83	1.55	1.33	1.18
0.5	1.96	1.66	1.45	1.31	1.16	2.68	2.09	1.72	1.42	1.23
0.6	2.13	1.90	1.55	1.38	1.19	3.11	2.37	1.90	1.52	1.28
0.7	2.31	1.94	1.65	1.45	1.22	3.56	2.66	2.08	1.62	1.33
0.8	2.48	2.07	1.75	1.52	1.26	4.01	2.96	2.27	1.73	1.39
0.9	2.64	2.20	1.85	1.59	1.29	4.46	3.28	2.48	1.84	1.44
1.0	2.78	2.33	1.95	1.66	1.33	4.90	3.59	2.68	1.96	1.50
1.1	2.91	2.45	2.04	1.73	1.36	5.34	3.91	2.90	2.07	1.56
1.2	3.03	2.56	2.13	1.80	1.39	5.76	4.23	3.11	2.19	1.62
1.3	3.13	2.67	2.23	1.87	1.43	6.17	4.55	3.34	2.32	1.68
1.4	3.23	2.77	2.31	1.94	1.47	6.56	4.86	3.56	2.45	1.74
1.5	3.31	2.86	2.40	2.00	1.50	6.93	5.17	3.78	2.58	1.80
1.6	3.38	2.95	2.48	2.07	1.54	7.29	5.47	4.01	2.71	1.87
1.7	3.45	3.03	2.56	2.14	1.57	7.63	5.77	4.23	2.84	1.93
1.8	3.51	3.10	2.64	2.20	1.61	7.95	6.06	4.46	2.98	2.00
1.9	3.56	3.17	2.71	2.27	1.64	8.26	6.34	4.68	3.12	2.07
2.0	3.60	3.23	2.78	2.33	1.68	8.55	6.61	4.90	3.26	2.14

AML

Number of samples = 4

CV = 0.6

AML = 95th percentile value

AML = 4.8 TUc x 1.55 = 7.4 TUc

5670-6D-34

Permits Must Specify

- Test species and method
- Testing frequency
- Statistical endpoints
- Steps to address toxicity

1670-6D-35

Toxicity Reduction Evaluations

- **What is a TRE?**

  Procedures for investigating the causes and identifying corrective actions for effluent toxicity problems

- **Why are TREs necessary?**

  Achieve compliance with limits or requirements for effluent toxicity contained in NPDES permits

1670-6D-36

Toxicity Reduction Evaluations
(Continued)

- **How are TREs performed?**
- **Site-specific study designed to:**
  - Identify the causative agents of effluent toxicity
  - Isolate the sources of the toxicity
  - Evaluate the effectiveness of toxicity control options
  - Confirm the reduction in effluent toxicity

1670-6D-37

Mechanisms for Requiring TREs

- **Special conditions in NPDES permit**
- **Section 308 letter**
- **Section 309 Administrative Order or a Consent Decree**

1670-6D-38

What Does the Permit Writer Need to Know?

- **Goals of WET testing**
- **State Implementation Policy**
- **WET Test Methods**
  - **test and endpoints**
- **Statistical Procedures that are to be used**
- **QA/QC**

PRACTICAL EXERCISE

Whole Effluent Toxicity
Water Quality-Based Effluent Limitations

DIRECTIONS:

Preliminary examination of toxicity testing data submitted by a discharger indicates that toxicity is present in the effluent discharged to the receiving water. Therefore, you must determine if there is a need for developing whole effluent toxicity (WET) effluent limitations for the permit. If you determine a need for WET effluent limitations, then calculate those limits.

GIVEN:

$$C_r = \frac{(C_d)(Q_d) + (C_s)(Q_s)}{(Q_d + Q_s)}$$

Where

- C_r = receiving water concentration
- C_d = effluent concentration
- Q_d = effluent flow
- C_s = receiving water background concentration
- Q_s = appropriate receiving water flow

Toxicity Data (Fathead minnows) from Discharge Monitoring Reports:

	LC_{50} (% effluent)	NOEC (% effluent)	Acute to Chronic Ratio
	62	10	6.2
	18	10	1.8
	68	25	2.7
	61	10	6.1
	63	25	2.5
	70	25	2.8
	17	5	3.4
	35	10	3.5
	35	10	3.5
	35	25	1.4
	47	10	4.7
Mean	**46**	15	3.5
CV	**0.4**	**0.5**	-
Multiplier	**2.1**	**2.5**	-

CV = Coefficient of Variation
Multiplier=Reasonable Potential Multiplier from Table 3-1 of the USEPA Technical Support Document

(1) Determine the maximum projected effluent concentrations (in Toxic Units (TU)) for acute and chronic toxicity.

[HINT: First convert the maximum measured acute and chronic toxicity (in LC_{50} and NOEC)to toxic units (TU), then apply the reasonable potential multiplier]

(2) Calculate the receiving water concentration (C_r) in toxic units for both acute and chronic toxicity given the following:

$C_s = 0$
$Q_s = 23.6$ cfs (the 1Q10 for acute protection)
$Q_s = 70.9$ cfs (the 7Q10 for chronic protection)
$Q_d = 7.06$ cfs

(3) Determine the need for WET limitations by comparing each receiving water concentration calculated in question (2) with the State water quality standards for acute and chronic protection. Given that:

State Water Quality Standard for Acute Protection = 0.3 TU_a
State Water Quality Standard for Chronic Protection = 1.0 TU_c

Are WET effluent limitations necessary? Explain your answer.

(4) If it was determined in question (3) above that WET limitations are needed, then calculate the waste load allocations for acute and chronic WET using the following equation:

$$C_d = WLA = \frac{[C_r (Q_d + Q_s) - (C_s)(Q_s)]}{Q_d}$$

(5) Convert the acute WLA (in TU_a) to TU_c using the acute to chronic ratio (ACR) provided with the toxicity data.

(6) Discussion Question: What would the water quality-based effluent limitations be if the methodologies recommended in the EPA Technical Support Document for Water Quality-based Controls (March 1991) were used?

MODULE # 6E

TITLE: **Variances to Water Quality-Based Effluent Limits**

OVERALL OBJECTIVES:

- Define the different types of water quality standard variances
  - Site-specific criteria modification
  - Designated use
  - Water quality standard variance
- Describe how the variances affect water quality-based effluent limits
- Describe the role of NPDES permit writer in implementing the variances

LOGISTICS:

Presentation Format: Lecture
Approximate Presentation Time: 30 minutes
Review Questions/Exercise: None
Applicable Statutory/Regulatory Citations:

CWA Section 303(c)	Adopting and modifying water quality standards
40 CFR Part 131	Water Quality Standards

Variances to Water Quality-Based Effluent Limits

Learning Objectives

- Describe the types of variances from water quality standards
- Discuss how variances affect water quality-based effluent limits
- Explain the role of the permit writer

Types of Water Quality Variances

- Site-specific modification of water quality criteria
  - Permanent change in criteria
  - Designated uses maintained
- Designated use reclassification
  - Permanent change in water quality standard
  - Use and criteria change

Types of Water Quality Variances
(Continued)

- Water quality standard variance
  - Short-term and temporary change to standard
  - Basic water quality standards remain in place
  - Pollutant and discharger specific

Affect of Variances on Permit Limits

- Changes the fundamental basis of water quality-based effluent limits
  - May impact reasonable potential determination
  - May result in more or less stringent limitations
- Role of permit writer
  - Ensure that variance is reflected in permit

MODULE 6 - SUGGESTED REFERENCE MATERIALS

Final Guidance for Implementation of Requirements Under Section 304(l) of the Clean Water Act as Amended, EPA, Office of Water Regulations and Standards and Office of Water Enforcement and Permits, March 1988.

Technical Support Document for Water Quality-Based Toxics Control (EPA/505/2-90-001), EPA, Office of Water Enforcement and Permits, March 1991.

Introduction to Water Quality Standards (EPA 440/5-88-089), EPA. Office of Water Regulations and Standards, September 1988.

Quality Criteria for Water, 1986 (EPA/440/5-86-001), EPA, Office of Water Regulations and Standards, May 1986.

Water Quality Standards Handbook: Second Edition (EPA -823-B-94-005a), EPA, Office of Water, August, 1994.

Guidance for Water Quality-based Decisions: The TMDL Process (EPA 440/4-91-001), EPA, Office of Water, April 1991.

Methods for Measuring Acute Toxicity of Effluents to Freshwater and Marine Organisms, Fourth Edition (EPA/600/4-90/027F), EPA, Environmental Monitoring and Support Laboratory, 1991.

Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Third Edition (EPA/600/4-91/002), EPA, Environmental Monitoring and Support Laboratory, 1991.

Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms, Second Edition (EPA/600/4-91/003), EPA, Environmental Monitoring and Support Laboratory, 1991.

Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms (EPA/600/R-95/136), EPA, Environmental Monitoring and Support Laboratory, 1995.

MODULE # 7

TITLE: Monitoring and Reporting Conditions

OVERALL OBJECTIVES:

- Explain the regulatory requirements and purpose of establishing monitoring requirements in NPDES permits
- Discuss considerations for establishing monitoring conditions in permits
- Identify different methods for sample collection
- Discuss conditions under which certain sampling techniques are appropriate
- Describe the elements of monitoring conditions and the applicability to municipal and non-municipal dischargers
- Describe whole effluent toxicity monitoring requirements and considerations
- Explain analytical requirements for sample analysis
- Discuss reporting and record-keeping requirements for NPDES permits
- Define Discharge Monitoring Reports (DMRs)
- Provide questions for reviewing monitoring conditions in a permit
- Provide examples for specifying sampling locations and setting monitoring requirements in a permit

LOGISTICS:

Presentation Format: Lecture

Approximate Presentation Time: 1 hour

Review Questions/Exercise: None

Applicable Statutory/Regulatory Citations:

CWA Section 304(h)	Guidelines Establishing Test Procedures for Analysis of Pollutants
CWA Section 405(d)(4)	Monitoring on a Case-by-Case Basis
CWA Section 503	Sludge
40 CFR §122.41(j)(1)	Representative Monitoring
40 CFR §122.41(j)(2)	Records
40 CFR §122.41(l)(4)	Discharge Monitoring Reports
40 CFR §122.42(a)	Pollutants Subject to Notification Requirements
40 CFR §122.44(i)	Reporting at Least Once per Year
40 CFR §122.45(e)	Frequency and Rate of Discharge for Noncontinuous Discharge
40 CFR §122.45(f)	Other Measurements including Internal Waste Streams
40 CFR §122.48	Monitoring, Recording, Recordkeeping

Monitoring and Reporting Conditions

167D-7-1

Learning Objectives

- Describe purpose of monitoring conditions
- Discuss the considerations for establishing monitoring conditions
- Explain analytical method requirements
- Describe reporting requirements

167D-7-2

Purpose of Monitoring

- Determine compliance with permit conditions
- Establish a basis for enforcement actions
- Other
  - Assess treatment efficiency
  - Characterize effluents
  - Characterize receiving water

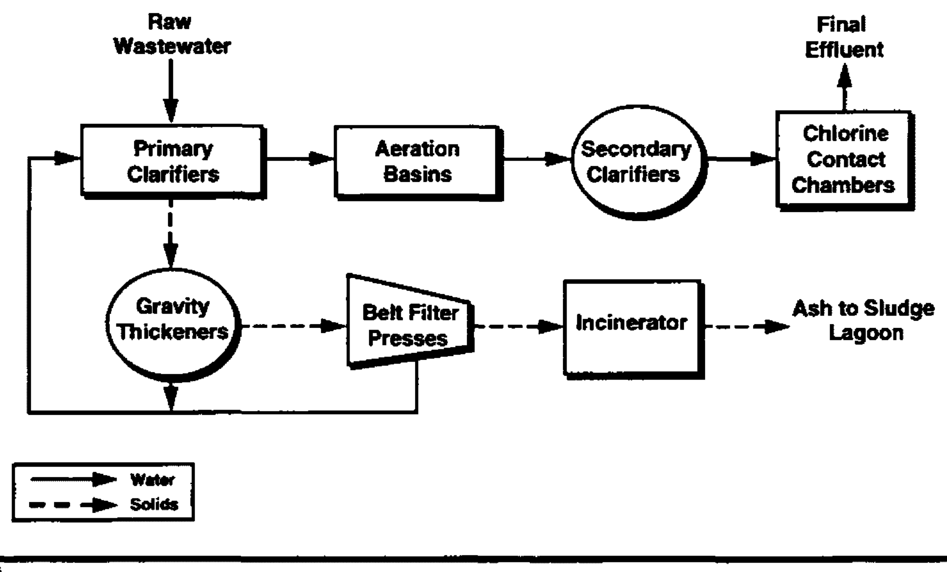
1670-7-3

Types of Monitoring

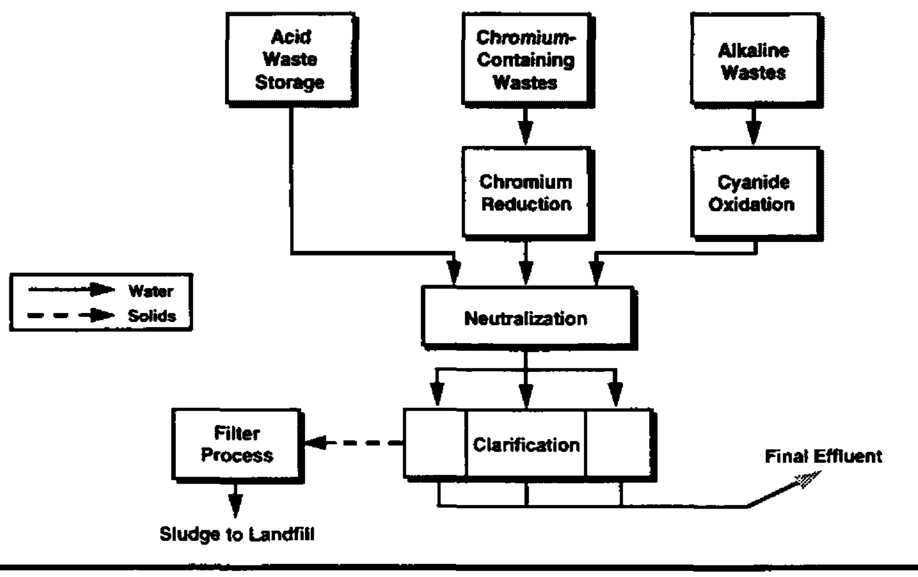
- Self monitoring
  - Permittee performs sampling and analysis
- Compliance monitoring
  - Permitting authority monitors effluent during compliance inspection

1670-7-4

Example POTW: Flow Diagram



Example: Industrial Flow Diagram



Self Monitoring Considerations

- Location
- Frequency
- Type of sample
- Cost

1670-7-7

Considerations for Monitoring Location

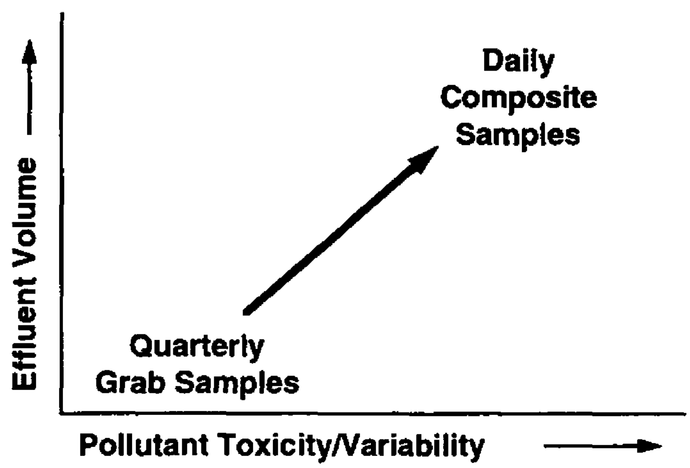
- Is it on the facility's property?
- Is it accessible?
- Will the results be representative of the targeted wastestream?
- Are monitoring internal points needed?

1670-7-8

Frequency Considerations

- Size and design of facility
- Type of treatment
- Location of discharge
- Frequency of discharge (batch, continuous)
- Compliance history
- Nature of pollutants
- Number of monthly samples used in developing permit limit

1670-7-9



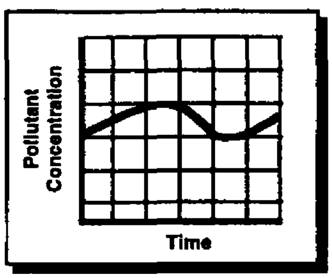
1670-7-10

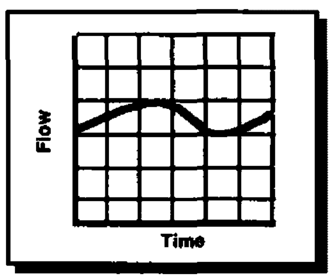
Types of Samples

- <u>Grab Sample</u>: **Taken from a wastestream on a one-time basis without consideration of the flow rate of the wastestream and without consideration of time**
  - **Must be used to monitor certain parameters (e.g., pH, volatile organics, cyanide)**
  - **Used for monitoring batch discharges**

1670-7-11

Example Situation – Case #1





- **Slight daily fluctuation in pollutant concentration and flow**
- **Recommendation: Grab Sample**

1670-7-12

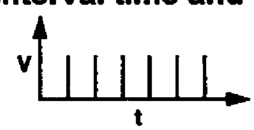
Types of Samples (Continued)

- <u>Composite</u>: **Sample composed of two or more discrete aliquots. The aggregate sample will reflect the average water quality over the sample period.**
  - **More representative measure of the discharge of pollutants over a given period of time**
  - **Accounts for variability in pollutant concentration and discharge flow rate**
  - **May be sequential discrete samples or a single combined sample**

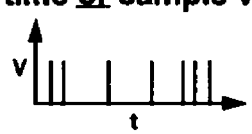
1670-7-13

Types of Samples (Continued)

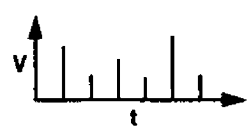
- **Composite Sample is defined by the time interval between aliquots, and the volume of each aliquot (t, V).**
  - <u>Time Proportional</u> (t_c, V_c): **Interval time and sample volume are constant**



  - <u>Flow Proportional</u>: **Interval time <u>or</u> sample volume may vary**
    - Constant volume (t_v, V_c)

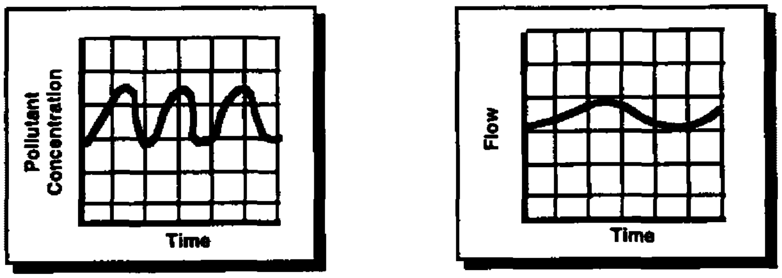


    - Constant time (t_c, V_v)



1670-7-14

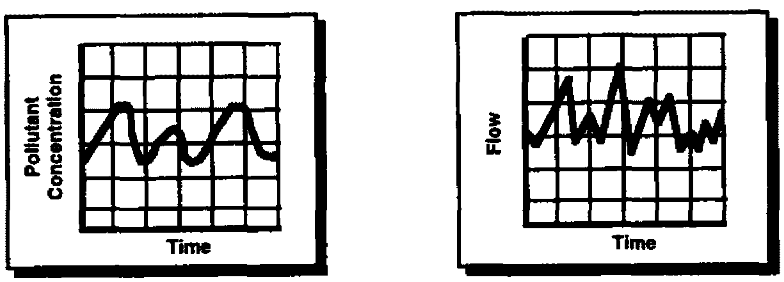
Example Situation – Case #2



- Regular fluctuations in pollutant loading over the course of the day
- Very slight fluctuations in flow
- Recommendation: Time Proportional Composite

1670-7-15

Example Situation – Case #3



- Irregular fluctuations in pollutant loading over the course of the day
- Erratic fluctuations in flow
- Recommendation: Flow Proportional Composite

1670-7-16

Types of Samples (Continued)

- <u>Continuous Sample</u>: **Automated collection and analysis of a parameter in a discharge**
  - **Typically used for pH and flow**
  - **40 CFR § 401.17 allows excursions for pH**

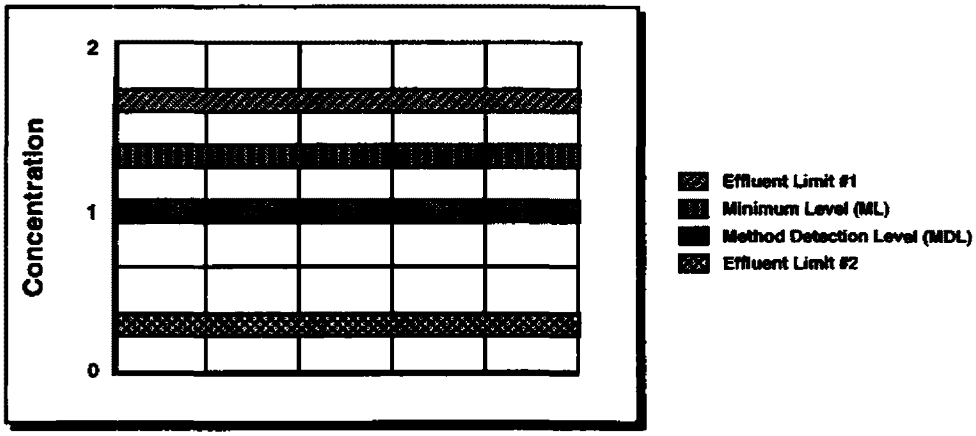
1670-7-17

Analytical Methods

- **40 CFR Part 136**
  - **Test methods in Appendix A to Part 136**
  - **Standard Methods for the Analysis of Water and Wastewater**
  - **Methods for the Chemical Analysis of Water and Wastes**
  - **Test Methods: Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater**
- **Alternative methods**

1670-7-18

Analytical Detection Level Considerations



- Compliance with Limit #1 → 40 CFR Part 136
- Compliance with Limit #2 → ? ? ?

1670-7-19

Estimated Costs for Analytical Procedures

BOD5	$30
TSS	$15
TOC	$60
Oil and Grease	$35
Odor	$30
Color	$30
Turbidity	$30
Fecal coliform	$15
Metals (each)	$15
Cyanide	$35
Gasoline (Benzene, Toluene, Xylene)	$100
Purgeable Halocarbons (EPA Method 601)	$113
Acrolein and Acrylonitrile (EPA Method 603)	$133
Purgeables (EPA Method 624)	$251
Phenols (EPA Method 604)	$160
Organochlorine Pesticides and PCBs (EPA Method 608)	$157
Polynuclear Aromatic Hydrocarbons (EPA Method 610)	$175
Dioxin (2, 3, 7, 8-TCDD) (EPA Method 613)	$400
Base/Neutrals and Acids (EPA Method 625)	$434
Priority pollutant scan*	$2,000
TCLP	$150
Acute WET	$750
Chronic WET	$1,500

* Includes 13 metals, cyanide, dioxin, volatiles (purgeables), base/neutral and acids, pesticides and PCBs, and asbestos

1670-7-20

Example #1: Annual Analytical Costs

	Times Per Year	Unit Cost ($)	Annual Cost ($)
BOD5	104	30	3,120
TSS	104	15	1,560
Fecal Coliform	104	15	1,560
Oil and Grease	104	35	3,640
		Total	9,880

1670-7-21

Example #2: Annual Analytical Costs

Pollutant	No. Samples	Cost/ Sample	Cost/ Year
Priority Pollutants	4	$2,000	$8,000
Acute WET	4	$750	$3,000
Phenols	12	$160	$1,920
Cyanide	52	$35	$1,820
BOD5	156	$30	$4,680
TSS	156	$15	$2,340
Metals (Ni, Cr, Cu, Pb, Zn)	780	$15	$11,700
		Total	$33,460

1670-7-22

Reporting of Monitoring Results

- **What is reported?**
  - Data required in permit
  - Data for pollutants monitored more frequently than required
- **When is information reported?**
  - At least 1/year for limited pollutants
- **Who is responsible for reporting?**
  - The Permittee
- **What format is used for reporting?**
  - Discharge Monitoring Reports

1670-7-23

Discharge Monitoring Reports (DMRs)

- **Must be used to report self-monitoring data**
  - Required at 40 CFR §122.41(1)(4)(i)
  - States may alter format

1670-7-24

Record Keeping

- Records of monitoring must be kept for 3 years
  - Records for sewage sludge use and disposal activities must be kept for 5 years
- Monitoring records include:
  - Data, place, and time
  - Individual performing sampling
  - Date of analysis
  - Individual performing analysis
  - Analytical methods used
  - Analytical results
- Permit should specify where records should be located

1670-7-25

PERMITTEE NAME/ADDRESS (Include Facility Name/Location if different)

NAME ____________

ADDRESS ____________

____

____

FACILITY ____________

LOCATION ____________

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

DISCHARGE MONITORING REPORT (DMR)

(2-16)	(17-19)
PERMIT NUMBER	DISCHARGE NUMBER

	MONITORING PERIOD						
FROM	YEAR	MO	DAY	TO	YEAR	MO	DAY
	(20-21)	(22-23)	(24-25)		(26-27)	(28-29)	(30-31)

NOTE: Read instructions before completing this form.

PARAMETER (32-37)		(3 Card Only) QUANTITY OR LOADING (46-53)	(54-61)		(4 Card Only) QUALITY OR CONCENTRATION (38-45)	(46-53)	(54-61)		NO. EX	FREQUENCY OF ANALYSIS	SAMPLE TYPE
		AVERAGE	MAXIMUM	UNITS	MINIMUM	AVERAGE	MAXIMUM	UNITS	(62-63)	(64-68)	(69-70)
	SAMPLE MEASUREMENT										
	PERMIT REQUIREMENT										
	SAMPLE MEASUREMENT										
	PERMIT REQUIREMENT										
	SAMPLE MEASUREMENT										
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	SAMPLE MEASUREMENT										
	PERMIT REQUIREMENT										

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER	I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN; AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION, I BELIEVE THE SUBMITTED INFORMATION IS TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT. SEE 18 U.S.C. § 1001 AND 33 U.S.C. § 1319. *(Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 years.)*		TELEPHONE		DATE		
TYPED OR PRINTED		SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	AREA CODE	NUMBER	YEAR	MO	DAY

COMMENT AND EXPLANATION OF ANY VIOLATIONS *(Reference all attachments here)*

MODULE 7 - SUGGESTED REFERENCE MATERIALS

Standard Methods for the Examination of Water and Wastewater, American Public Health Association, American Water Works Association, and Water Pollution Control Federation. (Use most current version)

Methods for Chemical Analysis of Water and Wastewater (EPA/600/4-79-020), EPA, Environmental Monitoring and Support Laboratory, March 1979.

Guidelines Establishing Test Procedures for the Analysis of Pollutants under the Clean Water Act (40 CFR Part 136). (Use most current version)

NPDES Storm Water Sampling Guidance Document (EPA/833-B-92-001), EPA, Office of Water, July 1992.

Methods for Measuring Acute Toxicity of Effluents to Freshwater and Marine Organisms, Fourth Edition (EPA-600/4-90/027), EPA, Environmental Monitoring and Support Laboratory, 1991.

Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Third Edition (EPA/600/4-91/002), EPA, Environmental Monitoring and Support Laboratory, 1991.

Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms (EPA/600/4-91/003), EPA, Environmental Monitoring and Support Laboratory,1991.

NPDES Compliance Monitoring Inspector Training: Laboratory Analysis, EPA, Office of Water, August 1990.

NPDES Compliance Monitoring Inspector Training: Sampling, EPA, Office of Water, August 1990.

NPDES Compliance Monitoring Inspector Training: Biomonitoring, EPA, Office of Water, August 1990.

POTW Sludge Sampling and Analysis Guidance, EPA, Office of Water, August 1989.

Handbook for Sampling and Sample Preservation of Water and Wastewater (EPA/600/4-82-029), EPA, Environmental Monitoring and Support Laboratory, 1982.

Handbook for Monitoring Industrial Wastewater, EPA, Office of Technology Transfer, 1973.

MODULE # 8

TITLE: **Special Conditions**

OVERALL OBJECTIVES:

- Describe the purpose of special conditions
- Describe the regulatory authority for establishing special conditions
- Describe the general types of special conditions applicable to municipal and non-municipal dischargers
  - Non-Regulatory Monitoring
  - Best Management Practices (BMPs)/Pollution Prevention
  - Compliance Schedules
- Introduce the types of special conditions unique to municipal and non-municipal sources

Municipal	Non-municipal
Pretreatment Program	BMPs/Pollution Prevention
Grants	Storm Water Pollution Prevention Plans
Sewage Sludge	
Combined Sewer Overflows	
Storm Water	

LOGISTICS:

Presentation Format: Lecture
Approximate Presentation Time: 45 minutes
Review Questions/Exercises: 15 minutes
Applicable Statutory/Regulatory Citations:

40 CFR §122.44(f)	Notification Level
40 CFR §122.44(k)	Best Management Practices
40 CFR §122.44(n)	Grants
40 CFR §122.47	Schedules of Compliance

Special Conditions

Special Conditions are Used in NPDES Permits to...

- Address unique situations
- Incorporate preventative requirements
- Incorporate compliance schedules
- Incorporate other NPDES programmatic requirements (e.g., pretreatment, sewage sludge)

Types of Special Conditions

- Additional monitoring
- Best management practices (BMPs)/ pollution prevention
- Compliance schedules

Additional Monitoring

- Used to supplement effluent limits
- Used to collect data for future limit development
- Examples:
  - Dilution studies
  - Sediment samples
  - Bioconcentration studies

Definition of Best Management Practices

"Best management practices (BMPs) are actions or procedures to prevent or minimize the potential for the release of toxic pollutants or hazardous substances in significant amounts to surface waters"

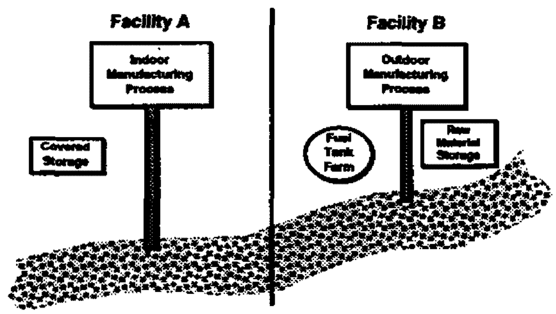
Best Management Practices Legislative Authority

- Section 304(e)
  - The Administrator...may publish regulations supplemental to effluent limitations for a class or category of point sources for toxic or hazardous pollutants under Section 307(a) or 311 of the Act to control:
    - Plant site runoff
    - Spillage or leaks
    - Sludge or waste disposal
    - Drainage from raw material storage

Best Management Practices Legislative Authority (Continued)

- **Section 304(e) (Continued)**
  - ...which are associated with or ancillary to the industrial manufacturing or treatment process and may contribute significant amounts of such pollutants to navigable waters
- **Section 402(a)(1)**
  - In the absence of BMPs promulgated for a category of point sources (such as steel mills, petroleum refiners, etc.) under authority of Section 304(e), permit writers may place BMPs in permits on a case-by-case basis

BMP Candidates?



BMPs in NPDES Permits

- **BMP plan**
- **Site-specific BMPs**
  - Facility-specific
  - Pollutant-specific

Recommended Components of a BMP Plan

- Minimum requirements
  - Name and location of facility
  - Statement of BMP policy and objectives
  - Review by plant manager

Recommended Components of a BMP Plan
(Continued)

- Specific requirements
  - BMP committee
  - Risk identification and assessment
  - Reporting of BMP incidents
  - Materials compatibility
  - Good housekeeping
  - Preventive maintenance
  - Inspections and records
  - Security
  - Employee training

Specific BMPs Are...

- Most effectively used in conjunction with effluent limitations in permits
- Qualitative – should generally indicate how or what, not how much
- Procedural

Procedural

- Visual inspections
- Training
- Maintain maintenance logs
- Material handling procedures
- Preventive maintenance
- Housekeeping

Other Examples of BMPs

- Water conservation/ non-use
- Secondary containment
- Nondestructive testing
- Materials engineering
- Covering
- Sealing
- Packaging
- Waste stream segregation
- Source Elimination
- Alarm systems
- Diverting
- Paving
- Runoff control
- Sludge management
- Monitoring
- Security

BMPs Should Not:

- Substitute for quantitative controls
- Tell managers how to run their plants
- Require costly methods when inexpensive ones will suffice

Pollution Prevention and Special Conditions

- Hierarchy of pollution prevention practices
  - Source reduction
  - Environmentally sound reuse and recycling
  - Treatment
  - Disposal
- Pollution prevention measures are implemented through BMPs

Compliance Schedules

- 40 CFR §122.47
  - Allows for establishing schedules of compliance with CWA and regulations
    - Interim dates if schedule exceeds 1 year from permit issuance
    - Reporting 14 days following each interim date

MODULE # 8A

TITLE: **Special Conditions for Municipal Dischargers**

OVERALL OBJECTIVES:

- Describe the purpose of special conditions for municipal dischargers
- Describe the regulatory authority for establishing special conditions
- Describe special conditions unique to municipal dischargers
  - Pretreatment Program
  - Sewage Sludge
  - Combined Sewer Overflows

LOGISTICS:

Presentation Format: Lecture
Approximate Presentation Time: 40 minutes
Review Questions/Exercise: 20 minutes
Applicable Statutory/Regulatory Citations:

40 CFR §122.44(j)	Pretreatment Programs for POTWs
40 CFR §122.44(k)	Best Management Practices
40 CFR Part 403	General Pretreatment Regulations
40 CFR Part 503	Standards for the Use and Disposal of Sewage Sludge

Special Conditions for Municipal Dischargers

Learning Objectives

- **Define pretreatment program requirements**
- **Define sewage sludge requirements**
- **Define combined sewer overflow requirements**

Domestic Sewage Exclusion

- **Domestic sewage or any mixture of domestic sewage and other wastes that pass through a sewer system to a POTW *are not* considered "solid waste" under RCRA...**
- **Unless received at the POTW by:**
  - **Truck**
  - **Rail**
  - **Dedicated pipeline**

National Pretreatment Program

- Major goal is controlling discharges in order to:
  - Prevent interference with POTW processes
  - Prevent pass through of pollutants
  - Protect sludge management options
- Additional programmatic goals
  - Encourage recycling and reclamation
  - Ensure POTW personnel health and safety

Regulatory Requirements – General Pretreatment Regulations (40 CFR PART 403)

- Elements:
  - National Pretreatment Standards
  - Requirements for POTW and State programs
  - Industrial and POTW reporting requirements
- Effluent Limitations Guidelines (40 CFR 405-471)
  - Including categorical pretreatment standards

Pretreatment Program Development

- Who?
  - POTWs > 5 MGD
  - POTWs < 5 MGD with past problems
- What?
  - Legal authority
  - Industrial user survey
  - Individual control mechanisms for all SIUs
  - Compliance/enforcement
  - Resources
  - Data management

NPDES Permits Drive the Pretreatment Program by Requiring:

- Adequate legal authority
- Maintaining industrial user inventory
- Development/implementation local limits
- Individual control mechanisms be issued all SIUs
- Compliance monitoring activities

NPDES Permits Drive the Pretreatment Program by Requiring:

- Swift and effective enforcement
- Data management and recordkeeping
- Reporting to the approval authority (EPA or State)
- Public participation

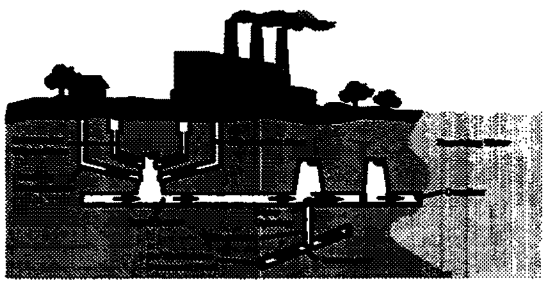
Permits for Municipal Sewage Sludge (Biosolids)

- Any Section 402 permit issued to a POTW should contain requirements for sewage use and/or disposal
- 40 CFR Part 503 requirements should be incorporated into a permit for:
  - Incineration
  - Land application
  - Surface disposal

Permits for Municipal Sewage Sludge (Biosolids) (Continued)

- Other entities may be delegated responsibility to comply (40 CFR Part 503 standards and requirements may not all be placed in the POTW permit)
- Permits must contain:
  - Additional standard conditions
  - Special conditions

Typical Combined Sewer System Configuration



Requirements for Combined Sewer Overflows (CSOs)

- Technology-based requirements (BPJ)
  - BAT (none promulgated)
  - BCT (none promulgated)
- Applicable State water quality standards

Considerations for Developing Special Conditions for CSOs

- Characteristics of the discharge
- Control technologies
- CSO control policy

Overview of CSO Control Policy Approach

Years after Phase I Permit Issuance

Time 0 → 5 → 10+ →

NPDES Permit Requirements	Phase I	Phase II	Post Phase II
A. Technology-Based	[illegible]	NMC, at a minimum	NMC, at a minimum
B. Water Quality-Based	Narrative	[illegible]	[illegible]
C. Monitoring	[illegible]	[illegible]	[illegible]
D. Reporting	[illegible]	[illegible]	[illegible]
E. Special Conditions	[illegible]	[illegible]	[illegible]

The National Sewage Sludge Program

Legal Authority

As mandated by the Clean Water Act of 1987, EPA has issued national standards regulating the use or disposal of sewage sludge. These standards, promulgated in 40 CFR Part 503, in conjunction with the permitting requirements established in 40 CFR Parts 122, 123, and 501, make up the regulatory framework of the National Sewage Sludge Program.

Who is Regulated?

Part 503 generally regulates treaters and preparers of sewage sludge that will be land applied, incinerated, or placed on a surface disposal site, as well as the generators and end users or disposers of the sewage sludge.

What is Regulated?

The National Sewage Sludge Program generally regulates all sewage sludge that is used or disposed through land application, surface disposal, or incineration.

What is sewage sludge ?

Sewage sludge is defined as a "solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works. Sewage sludge includes, but is not limited to, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment processes; and material derived from sewage sludge." (Materials derived from sewage sludge include the products of sludge composters and digesters, treated sewage sludge which is bagged for sale as fertilizer, or any other type of processed or treated sewage sludge which is land applied, incinerated, or placed in a surface disposal site.) "Sewage sludge does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screenings generated during the preliminary treatment of domestic sewage in a treatment works." (§503.9 (w))

Domestic septage is also regulated by Part 503. Domestic septage is "liquid or solid material removed from a septic tank, cesspool, portable toilet, Type III marine sanitation device, or similar treatment works that receives only domestic sewage..." (§503.9(f))

Currently excluded from regulation under Part 503, are industrial sludge and septage from industrial or commercial facilities. Generally, sludge generated at an industrial facility is not regulated by Part 503. However, if the domestic wastewater is segregated from the process water, the sewage sludge generated by the treatment of the domestic wastewater is covered by Part 503.

> *If you work with sewage sludge (including domestic septage) you are probably regulated by the National Sewage Sludge Program.*

Sludges classified as hazardous and sludges containing 50 mg/kg or more polychlorinated biphenyls (PCBs) are also not regulated in Part 503, but are subject to other regulatory requirements.

When is Compliance Required?

Deadlines for compliance with Part 503 regulations were established in the Clean Water Act of 1987. In most cases, Part 503 is a "self-implementing" regulation; it is directly enforceable even in the absence of a permit. Part 503 requires compliance with the monitoring and recordkeeping requirements (except for monitoring of total hydrocarbon emissions in incinerator exit gases) by July 20, 1993. Part 503 requires compliance with all other standards (including total hydrocarbon emissions monitoring) as soon as possible, but no later than February 19, 1994 (or February 19, 1995 if construction of a pollution control facility is required to comply with the regulation.)

Permits: Who Applies for One, and Who Doesn't?

Section 405(f) of the Clean Water Act requires National Pollutant Discharge Elimination System (NPDES) permits issued to publicly owned treatment works and other treatment works treating domestic sewage to contain conditions implementing Part 503. EPA has defined treatment works treating domestic sewage to be "a [publicly owned treatment works] or any other sewage sludge or wastewater treatment devices or systems, regardless of ownership (including federal facilities) used in the storage, treatment, recycling, or reclamation of municipal or domestic sewage, including land dedicated for the disposal of sewage sludge. This definition does not include septic tanks or similar devices....In States where there is no approved State sludge management program...the Regional Administrator may designate any person subject to the standards for sewage sludge use and disposal in 40 CFR Part 503 as a 'treatment works treating domestic sewage,'... when he or she finds that such designation is necessary to ensure that such person is in compliance with 40 CFR Part 503." (§122.2)

> **Important Note:**
> Compliance is required by the dates above, regardless of whether a permit has been issued.

Practices and Materials Not Regulated by 40 CFR Part 503

- Non-hazardous industrial sludge (Part 257)
- Drinking water treatment sludge
- Industrial sludge generated at an industrial facility by treatment of sanitary wastewater mixed with process wastewater (Part 257*)
- Hazardous sludge (Parts 261 - 268)
- Sludge containing 50 mg/kg or more of polychlorinated biphenyls (PCBs) (Part 761)
- Sewage sludge co-incinerated with more than 30% municipal solid waste (Part 60)
- Sewage sludge incinerator ash
- Grit and screenings removed during the preliminary treatment of domestic sewage in a treatment works
- Sewage sludge ultimately used as a feed supplement for animals
- Thermal conversion of sewage sludge to oil which is used to generate steam and electricity
- Use of sludge slag as concrete aggregate, for road subbase, in making pavement blocks, or as raw material to produce other building materials
- Use of sludge in concrete and bituminous mixes
- Commercial or industrial septage, or any mixture of commercial and/or industrial septage with domestic septage (Part 257*)
- Septage disposed of at a POTW or other treatment works

* Practices which may be regulated by the National Sewage Sludge Program in the future.

Under this definition, facilities which must apply for a permit include the generators, treaters, and disposers of sewage sludge. All generators of sewage sludge that will be land applied, incinerated, placed in a surface disposal site, or sent to a municipal solid waste landfill, will need to apply for a permit. Also, all persons who change the quality (i.e., change the pathogen level, the vector attraction characteristics, or the pollutant concentration) of sewage sludge that will be land applied, incinerated, or placed in a surface disposal site, will need to apply for a permit.

For example, a composting facility would be required to apply for a permit, because composting reduces the level of pathogens in the sewage sludge. On the other hand, a facility that only dewaters sewage sludge is not considered to be changing sludge quality and therefore, would not need to apply for a permit.

Surface disposal facilities and sewage sludge incinerators will also need to apply for a permit. Land appliers who do not generate or change the quality of the sewage sludge will not need to apply for a permit.

Septic tanks and similar devices, such as portable toilets, are excluded from the definition of treatment works treating domestic sewage. Domestic septage pumpers, haulers, treaters, and land appliers will generally not need to apply for a permit. However, centralized septage treatment facilities may be required to apply for a permit.

When Are Permit Applications Due?

Facilities seeking site-specific permit limits (as authorized by Part 503) must submit permit applications within 180 days after publication of Part 503 (August 18, 1993). All sewage sludge incinerators will be required to submit applications for site-specific permits limits. Any surface disposal facility may request site-specific permit limits.

Facilities must request site-specific permit limits during the initial 180 day period, and may not be allowed to request them later, unless the applicant can show "good cause" exists (e.g., a change in disposal practice or a new site that could not be anticipated during the initial 180-day period).

Other facilities which already have NPDES permits must file sewage sludge permit application information with the sludge permitting authority at the time of their next NPDES permit renewal application.

Facilities which do not have NPDES permits are referred to as "sludge-only" facilities. These facilities may include composting facilities, non-discharging sewage treatment plants and other facilities which generate, treat, or dispose of sewage sludge but do not have NPDES permits. If these facilities are required to (or want to) apply for site-specific permit limits, they must submit permit applications within the 180 day period described above. Otherwise, these facilities will be required to submit limited permit application information by February 19, 1994.

Who is the Permitting Authority?

In most cases the Permitting Authority will be the EPA Regional Office. EPA is working with State agencies in the development of approved State programs to administer the Federal sewage sludge regulations. Contact your EPA Regional Sludge Coordinator (listed on the back of this fact sheet) for more information on the Permitting Authority or permit applications.

Pollutants with Numeric Limits

Land Application

arsenic	cadmium	chromium
copper	lead	mercury
nickel	selenium	zinc
molybdenum		

Unlined Surface Disposal Sites

arsenic	cadmium	nickel

Lined Surface Disposal Sites

None

Sewage Sludge Incinerators

lead	cadmium	chromium
nickel	mercury	beryllium

total hydrocarbons (a surrogate for organic compounds in the exit gas)

Regulated Use and Disposal Practices

Land Application

Land application is defined as "the spraying or spreading of sewage sludge onto the land surface; the injection of sewage sludge below the land surface; or the incorporation of sewage sludge into the soil so that sewage sludge can either condition the soil or fertilize crops or vegetation grown in the soil" (§503.11 (h)). Examples are: use at reclamation sites as a soil conditioner; use by sod farms; and the distribution of sludge as a commercial fertilizer.

Surface Disposal

A surface disposal site is an area which contains one or more "sewage sludge units," where only sewage sludge is placed for final disposal. This term does not include municipal solid waste landfills that accept sewage sludge. Furthermore, this does not include land on which sewage sludge is placed for either storage or treatment. (§503.21 (n) and (p))

As a rule of thumb, storage is placement of sludge on a site for up to 2 years. If sewage sludge is stored for more than 2 years, then a rationale supporting the need for the additional time should be submitted to the permitting authority. For more information on storage, call your EPA Regional Sludge Coordinator.

Disposal in a municipal solid waste landfill (MSWLF) is not considered surface disposal. A generator who sends sewage sludge to a MSWLF needs to apply for a permit, but the MSWLF is not regulated by the National Sewage Sludge Program.

Examples of surface disposal include disposal in a sewage sludge monofill and the trenching of septage.

Incineration

Incineration is defined as the combustion of the organic matter and inorganic matter in sewage sludge at high temperatures in an enclosed device that fires only sewage sludge and an auxiliary fuel. The auxiliary fuel can include, but is not limited to, natural gas, fuel oil, coal, and municipal solid waste. Municipal solid waste can be up to 30% of the combined dry weight of the sewage sludge and the municipal solid waste. Hazardous waste is not considered an auxiliary fuel. (§503.41(b), (g) and (k))

Are You Regulated by The National Sewage Sludge Program?

Are you a publicly owned treatment works or other generator of sewage sludge regulated by Part 503*?	Yes →	You are regulated and will need to apply for a permit.
No ↓		
Do you send sewage sludge to a municipal solid waste landfill?	Yes →	You will need to apply for a permit. However, the municipal solid waste landfill is not regulated by Part 503 and will not need to apply for a permit.
No ↓		
Are you an industrial facility which separately treats domestic wastewater and generates a sewage sludge regulated by Part 503*?	Yes →	You are regulated and will need to apply for a permit.
No ↓		
Do you change the quality† of sewage sludge regulated by Part 503*?	Yes →	You are regulated and will need to apply for a permit.
No ↓		
Do you operate a sewage sludge incinerator or a sewage sludge surface disposal site?	Yes →	You are regulated and will need to apply for a permit.
No ↓		
Do you treat or dispose of pumpings from septage tanks or similar devices?	Yes →	You are regulated, but generally do not need to apply for a permit. However, if you treat septage at a centralized facility you may be required to apply for a permit.
No ↓		
Do you just land apply sewage sludge?	Yes →	You are regulated, but generally do not need to apply for a permit.
No ↓		
Do you just handle or distribute sewage sludge?	Yes →	You may be subject to some aspects of the National Sewage Sewage Sludge Program, but generally do not need to apply for a permit.
No ↓		
You are probably not regulated by the National Sewage Sludge Program.		

* Part 503 only regulates sewage sludge which is land applied, incinerated in a sewage sludge incinerator, or placed in a surface disposal unit.

† To change the sewage sludge quality means to alter one of the regulated sludge quality criteria. The criteria are: pathogens, vector attraction characteristics, and regulated organic and inorganic pollutants.

Publication Sources

National Technical Information Service:
NTIS
5285 Port Royal Rd.
Springfield, VA 22161
Tele: (703) 487-4650

National Small Flows Clearinghouse:
NSFC
P.O. Box 6064
Morgantown, WV 26506-6064
Tele: (800) 624-8301

Environmental Resource Information Center (ERIC/CSMEE)
1200 Chambers Rd., Room 310
Columbus, OH 43212
Tele: (614) 292-6717

Federal Register Notices

Part 503 was published on February 19, 1993 at 58 *Federal Register* (*FR*) 9248. Amendments to the National Sewage Sludge Program permit application deadlines were also published on February 19, 1993, at 58 *FR* 9404.

Most Federal Depository Libraries receive copies of the *Federal Register*. Many college, university, and public libraries are Federal Repository Libraries.

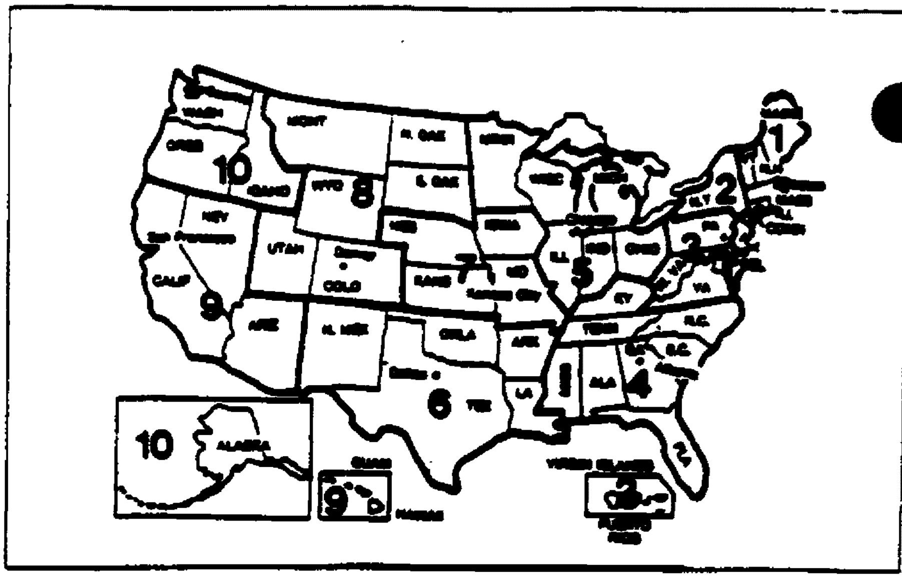
SLUDGE PUBLICATIONS

Guidance Documents

- POTW Sludge Sampling & Analysis Guidance Document (Revised), 1993
- Guidance for Writing Permits for the Use and Disposal of Sewage Sludge, 1993
- Simplified Federal EPA Rules for Land Application of Domestic Septage to Agricultural, Forest, and Disturbed Lands (Non-Public Contact Sites): Guidance, 1993

Other Documents

- EPA's Policy Promoting the Beneficial Use of Sewage Sludge and the New Technical Sludge Regulations Booklet (Revised), 1993
- Beneficial Use of Sewage Sludge: Land Application Pamphlet/Poster
- Final Sewage Sludge State Program and Permitting Regulations, 54 *FR* 18716 (May 2, 1989) (Amended 2/19/93, at 58 *FR* 9404)



EPA Regions

Regional Sludge Coordinators

REGION 1
Thelma Hamilton
JFK Federal Bldg.
One Congress St.
Boston, MA 02203
Tele: (617) 565-3569

REGION 2
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REGION 3
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Tele: (215) 597-9406

REGION 4
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345 Courtland St. N.E.
Atlanta, GA 30365
Tele: (404) 347-2391

REGION 5
~~John Colletti~~ Ash Sajjad
(5WQP-16J)
77 W. Jackson Blvd.
Chicago, IL 60604-3590
Tele: (312) 886-~~6109~~ 6112

REGION 6
Stephanie Kordzi
(6-WPM)
1445 Ross Ave #1200
Dallas, TX 75202-2733
Tele: (214) 655-7520

REGION 7
John Dunn
726 Minnesota Ave.
Kansas City, KS 66101
Tele: (913) 551-7594

REGION 8
Bob Brobst
(8WM-C)
999 18th St., Suite 500
Denver, CO 80202-2405
Tele: (303) 293-1627

REGION 9
Lauren Fondahl
75 Hawthorne St. (W-5-2)
San Francisco, CA 94105
Tele: (415) 744-1909

REGION 10
Dick Hetherington
1200 Sixth Ave.
Seattle, WA 98101
Tele: (206) 553-1941

Laura Felten
1200 Sixth Ave. (WD-134)
Seattle, WA 98101
Tele: (206) 553-1647

EPA

SEWAGE SLUDGE OR BIOSOLIDS USE OR DISPOSAL DOCUMENTS

List Compiled by:
Sharie Centilla, USEPA, OWM/Permits Division (202) 260-6052

Sewage sludge publications are available from the following sources. Not all documents are available from all sources. Please note sources in margin adjacent to document name.

OWRC **Office of Water Resources Center (OW Resource Center)**
USEPA - RC-4100
401 M Street, S.W.
Washington, D.C. 20460
Tele: (202) 260-7786

ERIC **Education Resources Information Center (ERIC)**
1929 Kenny Road
Columbus, OH 43210-1080
Tele: (614) 292-6717 or Fax: (614) 292-0263

CERI **Center for Environmental Research Institute**
CERI Publications
26 West Martin Luther King Drive
Cincinnati, OH 45248
Tele: (513) 569-7562 or Fax: (513) 569-7566

NTIS U.S. Department of Commerce
National Technical Information Service (NTIS)
5285 Port Royal Road
Springfield, VA 22161
Tele: (703) 487-4650 or (800) 553-6847

Document numbers beginning with PB are used by NTIS. Other sources DO NOT use this identification code.

NSFC **National Small Flows Clearinghouse (NSFC)**
c/o WV University
P.O. Box 6064
Morgantown, West Virginia 26506-6064
Tele: (800) 624-8301 or Fax: (304) 293-3161

PUBLICATIONS ON SLUDGE/BIOSOLIDS
August 1994

OWRC NTIS NSFC — *Guidance for Writing Case-By-Case Permit Requirements for Municipal Sewage Sludge* (EPA 505/8-90-001), May 1990; USEPA OWEC/Permits Div; NTIS (PB91-145508); (1989 document: NTIS only; revised March 1993: new title: *Guidance For Writing Permits For Use or Disposal of Sewage Sludge*; draft only available from OW Resource Center; final available late 1994)

NTIS — *POTW Sludge Sampling and Analysis Guidance Document*, August, 1989; USEPA OWEC/Permits Div; available only from NTIS (PB93-227957); (being revised late 1994)

OWRC NTIS NSFC — *Preparing Sewage Sludge For Land Application or Surface Disposal: A Guide for Preparers of Sewage Sludge on the Monitoring, Recordkeeping, and Reporting Requirements of the Federal Standards For Use or Disposal of Sewage Sludge*, 40 CFR Part 503 (EPA 831B-93-002a); August 1993.

OWRC NTIS NSFC — *Surface Disposal of Sewage Sludge: A Guide For Owners/Operators of Surface Disposal Facilities on the Monitoring, Recordkeeping, and Notification Requirements of the Federal Standards For the Use or Disposal of Sewage Sludge*, 40 CFR Part 503: May 1994.

OWRC — *Land Application of Sewage Sludge: A Guide For Land Appliers on the Recordkeeping and Notification Requirements of the Federal Standards For the Use or Disposal of Sewage Sludge*, 40 CFR Part 503: Available September 1994 from OW Resource Center.

OWRC — *Questions & Answers on Part 503*; available late 1994

OWRC — *THC Continuous Emission Monitoring Guidance for Part 503 For Sewage Sludge Incinerators*; June 1994

OWRC — Federal Register Notice 5/2/89 *Final Sludge State Program and Permitting Regulations*

OWRC — Federal Register Notice 7/24/90 *General Pretreatment & NPDES Regulation Changes (the Domestic Sewage Study)*

OWRC — Video: *Sewage Sludge Sampling Techniques*, 20 minutes long, USEPA OWEC Enforcement Division; 1993

OWRC — *State Sludge Management Program Guidance Manual*, Oct. 1990, USEPA OWEC

Municipal Support Division Publications—Sludge Treatment and Disposal:

NTIS — *Environmental Regulations & Technology: Use & Disposal of Municipal Wastewater Sludge* (PB 80200546 for NTIS only), March 1989

NTIS — *Anaerobic Sludge Digestion: Operations Manual* (EPA 430/09-76-001) (PB 250129/AS for NTIS only), Feb. 1976

NTIS — *Application of Sewage Sludge to Cropland; Appraisal of Potential Hazards of the Heavy Metals to Plants and Animals* (EPA 430/09-76-013) (PB 264015/AS for NTIS only), Nov. 1976

NTIS — *Sludge Handling & Conditioning - Operations Manual* (EPA 430/09-78-002) (PB 279449/AS for NTIS only), Feb. 1978

NTIS *Composting Processes to Stabilize & Disinfect Municipal Sewage Sludge* (EPA 430/09-81-011) (PB 81240509 for NTIS only), June 1981

NTIS *Institutional Constraints & Public Acceptance Barriers to Utilization of Municipal Wastewater & Sludge For Land Reclamation & Biomass Productions* (EPA 430/09-81-013) (PB 83128629 for NTIS only), July 1981

NTIS *Sludge & the Land: The Role of Soil & Water Conservation Districts in Land Application of Sewage Sludge* (EPA 430/09-82-007) (PB 83156307 for NTIS only), Sept. 1982

NTIS *Sludge Recycling for Agricultural Use* (EPA 430/09-82-008) (PB 83164202 for NTIS only), Oct. 1982

NTIS *Multiple-Hearth & Fluid Bed Sludge Incinerators: Design & Operational Considerations* (EPA 430/09-85-002) (PB 86179660 for NTIS only), Sept. 1985

NTIS *Heat Treatment/Low Pressure Oxidation Systems: Design & Operational Considerations* (EPA 430/09-85-001) (PB 86120003 for NTIS only), Sept. 1985

NTIS *Startup & Operation of Chemical Process Technologies in the Municipal Sector: The Carver-Greenfield Process for Sludge Drying* (EPA 430/09-89-007) (PB 90161902 for NTIS only), June 1989

NTIS *Evaluation of Sludge Management Systems: Evaluation Checklist & Supporting Commentary* (EPA 430/9-80-001) (MCD-61/OWPO), Feb. 1980

OWRC *Domestic Septage Regulatory Guidance: A Guide to the EPA 503 Rule*; Sept. 1993
NTIS (EPA/832-B-92-005)
NSFC
ERIC

OWRC *EPA's Policy Promoting the Beneficial Use of Sewage Sludge and the New Proposed*
NTIS *Technical Sludge Regs.* (pamphlet), June 1989; revised/renamed in June 1994: "Biosolids
NSFC Recycling: Beneficial Technology For A Better Environment"
ERIC

OWRC *A Guide to the Biosolids Risk Assessment Methodology For the EPA 503 Rule*; late 1994
NTIS from OW Resource Center
NSFC

OWRC *A Plain English Guide to the EPA Part 503 Biosolids Rule*; October 1994 from OW Resource
NTIS Center
NSFC

ORD Publications

OWRC *Environmental Regulations & Technology - Control of Pathogens and Vector Attraction in*
CERI *Sewage Sludge* (EPA/625/R-92/013); Dec. 1992

OWRC *Cooperative Testing of Municipal Sewage Sludges by the Toxicity Characteristic Leaching*
CERI *Procedure & Compositional Analysis* (EPA 430/09-91-007); April 1991

OWRC *Process Design Manual for Surface Disposal of Sewage Sludge & Domestic Septage* (Old
CERI name: *Municipal Sludge Landfills*); being revised; revision available Oct. 1994

OWRC CERI *Land Application of Municipal Sludge*; (EPA 625/1-83-016) Oct. 1983; being revised & renamed: *Process Design Manual For Land Application of Sewage Sludge & Domestic Septage*"; revision available July 1995

OWRC CERI *Septage Treatment and Disposal*; (EPA 625/6-84/009) Oct. 1984

OWRC CERI *Handbook: Estimating Sludge Mgmt. Costs* (EPA 625/6-85/010); Oct. 1985

OWRC CERI *Dewatering Municipal Wastewater Sludges*; (EPA 625/1-87/014) Sept. 1987

OWRC CERI *Summary Report: In-Vessel Composting of Municipal Wastewater Sludge* (EPA 625/-8-89--16)

OWRC CERI *Autothermal Thermophilic Aerobic Digestion of Municipal Wastewater Sludge*; (EPA 625/10-90/007)

OWRC CERI *Use and Disposal of Municipal Wastewater Sludge* (EPA 625/10-84/003)

OWRC CERI *ORD BBS Users' Manual* (V 2.0) (EPA 600/M-91/050)

OWRC CERI NTIS *Composting Municipal Sludge: A Technology Evaluation* (EPA 600/2-87-021); PB87-171252/AS for NTIS only

CERI **CERI/ORD ELECTRONIC BULLETIN BOARD: Tele: (513) 569-7610 (24 hours operation) To Get Sludge/Biosolids/Residuals: Conference 11**

USEPA OW/Office of Science & Technology: Technical Support Documents For Part 503

NTIS *TSD For Land Application of Sewage Sludge*, Volume I (PB93-110575 for NTIS only)

NTIS *TSD For Land Application of Sewage Sludge*, Volume II (PB93-110583 for NTIS only)

NTIS *TSD For Surface Disposal of Sewage Sludge* (PB93-110591 for NTIS only)

NTIS *TSD For Incineration of Sewage Sludge* (PB93-110617 for NTIS only)

NTIS *TSD For Pathogen & Vector Attraction Reduction in Sewage Sludge* (PB93-110609 for NTIS only)

NTIS *Human Health Risk Assessment For Use & Disposal of Sewage Sludge: Benefits of Regulation* (PB93-111540 for NTIS only)

NTIS *The Regulatory Impact Analysis* (PB93-110625 for NTIS only)

United States
Environmental Protection
Agency

Office of Water
(4201)

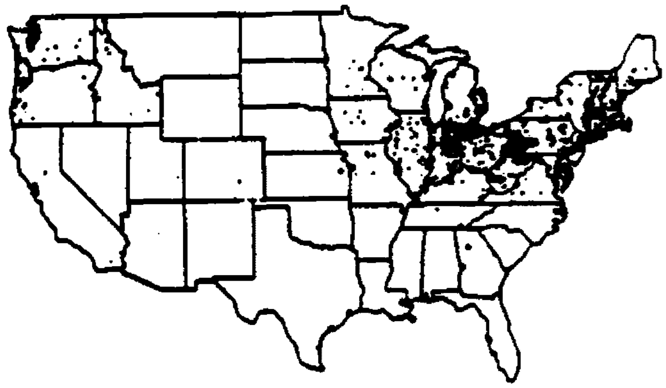
EPA 832-F-94-002
April 1994

EPA

Combined Sewer Overflow Control Policy: A Consensus Solution to Improve Water Quality

Overview

The U.S. Environmental Protection Agency (EPA) is issuing a "Combined Sewer Overflow Control Policy" which establishes a national framework and provides guidance to communities and State/Federal officials for controlling **combined sewer overflows (CSOs)**. The Policy calls for communities with CSOs to take immediate and long-term actions to address their CSOs. Rather than a one-size-fits-all mandate, the Policy provides communities with the flexibility to develop a workable, cost-effective solution to a major environmental problem.



CSOs are discharges of raw sewage, industrial and commercial wastes, and storm water. About 1100 communities, mostly in the Northeast and Great Lakes, have CSOs that serve a population of about 43 million.

Given the high control cost and serious nature of CSOs, EPA decided to pursue a negotiated dialogue with all interested stakeholders in developing the Policy. Representatives of communities with CSOs, State officials, plus environmental and other interest groups joined EPA at the table and helped develop the consensus Policy. Endorsements have come from municipal and environmental groups alike.

President Clinton's Clean Water Initiative recommends that the 1994 amendments to the Clean Water Act (CWA) endorse the final CSO Policy.

What are CSOs?

CSOs are a remnant of the country's early infrastructure. In the past, cities built sewer systems to collect both storm water and sanitary wastewater in the same sewer. These are called **"combined sewers."**

During dry weather, combined sewers carry wastewater to treatment facilities. However, when it rains, combined sewers may not have the capacity to carry all the storm water and wastewater, or the treatment plant may not be large enough to treat all of the combined flow. In these situations, some of the combined wastewater overflows untreated into the nearest body of water -- streams, lakes, rivers, or estuaries -- creating a **combined sewer overflow (CSO)**. These CSOs may pose risks to your health and environment.

Why are CSOs a problem?

Since CSOs are comprised of raw sewage, commercial and industrial wastes, and storm water runoff, many different types of pollutants may be present. The main constituents of CSOs are untreated human and industrial wastes, toxic materials like oil and pesticides, and floating debris washed into the sewer system from streets and their drainage area. These pollutants can affect your health when you swim in CSO-polluted water or eat fish or shellfish contaminated by CSOs. CSO impacts on water quality are unique to each location and may be responsible for beach closures, shellfish bed closures, fish kills, and other water quality degradation in your community.

How are CSOs regulated?

CSOs are considered to be "point sources" of pollution under the Clean Water Act (CWA). The CWA requires EPA and States to issue permits for controlling point sources, including discharges from CSOs. National Pollutant Discharge Elimination System (NPDES) permits must be issued to address CSOs.

Permits are written to meet the **water quality standards** for a particular waterbody. Water quality standards are State-adopted or Federally-promulgated rules that serve as the goals for the waterbody and the legal basis for NPDES permit requirements under the CWA.

For example, a waterbody may be designated for a variety of recreational activities (e.g., swimming, boating, fishing, etc.), and standards are developed accordingly.

What are the key components of the Policy?

EPA's CSO Policy ensures that municipalities, permitting and water quality standards authorities, and the public engage in a comprehensive and coordinated planning effort to achieve cost-effective CSO controls and ultimately comply with the Clean Water Act. The Policy recognizes the site-specific nature of CSOs and their impacts, and provides the necessary flexibility to tailor controls to local situations. Key components include:

- **Municipalities should immediately implement the nine minimum controls** (see box on next page);
- **Municipalities should use a targeted approach,** giving the highest priority to environmentally sensitive receiving waters;
- **Municipalities, in cooperation with EPA, States, environmental agencies, and water quality groups, must develop long-term CSO control plans.** These plans should identify and evaluate various control strategies, and lead to selection of an approach that is sufficient to meet water quality standards.
- **States may decide to review and revise, as appropriate, State water quality standards** during the CSO long-term planning process.
- **The financial capability of municipalities may be considered** when developing schedules for implementation of CSO controls.
- **Public participation** is essential throughout all CSO planning and implementation efforts.

The Policy also provides flexibility to accommodate ongoing or completed CSO projects, the special needs of small communities, and watershed planning.

How expensive are CSO control measures?

Past CSO proposals have carried national price tags as high as $160 billion or more. The negotiated Policy has reduced that cost to $41 billion, a substantial savings. CSO costs may be high in some communities, but low in others. The severity and frequency of CSOs, plus the local water quality standards, will determine the types of controls that are needed and their costs.

EPA recognizes that financial considerations are often a major factor affecting the implementation of CSO controls. For that reason, the Policy allows consideration of a community's financial capability in connection with the long-term CSO control planning effort, water quality standards review, and enforcement actions. However, communities are ultimately responsible for aggressively pursuing financial arrangements for implementation of the minimum controls and the long-term CSO control plan.

EPA and State agencies will work with CSO communities to find economically achievable solutions that will improve public health and create a safer environment for everyone.

How will the Policy be enforced?

Elements of the Policy will be incorporated into National Pollutant Discharge Elimination System (NPDES) permits or other appropriate enforceable mechanisms.

The enforcement portion of the Policy indicates EPA's intent to commence an enforcement initiative immediately against municipalities that have CSOs that occur during dry weather. It also provides guidance on the enforcement of the wet-weather elements of the Policy.

Nine Minimum Controls

Communities should immediately implement the following minimum controls:

1. Proper operation and regular maintenance programs for the sewer system and CSOs;
2. Maximum use of the collection system for storage;
3. Review and modification of pretreatment requirements to assure CSO impacts are minimized;
4. Maximization of flow to the municipal sewage treatment plant for treatment;
5. Prohibition of CSOs during dry weather;
6. Control of solid and floatable materials in CSOs;
7. Pollution prevention;
8. Public notice to ensure that the public receives adequate notification of CSO occurences and impacts; and
9. Monitoring to effectively characterize CSO impacts and the efficacy of CSO controls.

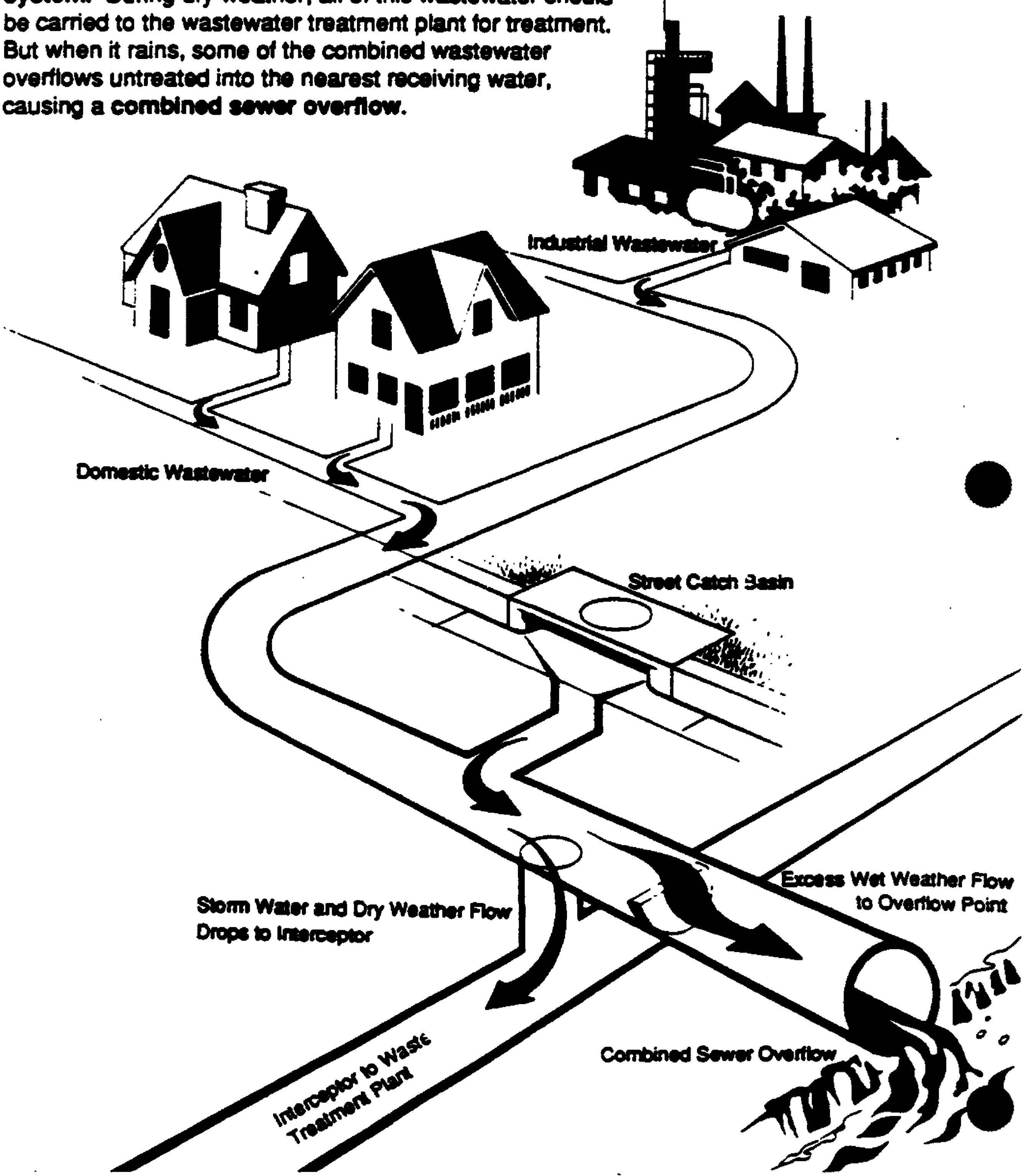
For more information

For copies of the **CSO Control Policy**, please contact the Office of Water Resource Center in Washington, DC, at (202) 260-7786. Or write:

Office of Water Resource Center
US EPA, Mailcode RC-4100
Washington, DC 20460

Diagram of a Combined Sewer System During Wet Weather

This diagram shows how domestic wastewater (sewage), industrial and commercial wastes and storm water are collected in the same sewer pipes in a **combined sewer system**. During dry weather, all of this wastewater should be carried to the wastewater treatment plant for treatment. But when it rains, some of the combined wastewater overflows untreated into the nearest receiving water, causing a **combined sewer overflow.**



PRACTICAL EXERCISE

Special Conditions for Municipal Dischargers

SITUATION:

The City of Otherville has a population of 30,000. The wastewater treatment plant, an activated sludge treatment plant, has a design flow of 4 million gallons per day (MGD). Municipal wastewater is collected throughout the service area by a combined sewer system; the main interceptor can contain up to 8 MGD. The City discharges into a river, and comprises 60 percent of the river flow at low flow (7Q10). During wet weather, one of the seven lift stations in the service area cannot handle all of the flow, resulting in untreated sewer overflows to the river.

The City had been disposing of its treatment plant sludge at the municipal solid waste landfill, but is currently stockpiling its sludge on-site until the landfill's co-composting operation for leaf litter and sludge becomes operational.

The City's wastewater treatment plant also serves two adjacent towns. The City has had a pretreatment program since 1984. The last pretreatment compliance inspection (PCI) report noted the following:

> There is a significant industrial user (SIU) in one of the contributing towns of which the City had been unaware of.
>
> The City is now accepting treated groundwater from a leaking underground tank cleanup operation at the City's vehicle maintenance garage. The annual pretreatment monitoring of influent and effluent indicates benzene present in the influent, but most effluent concentrations are below detection. The City has no local limit for benzene.

QUESTIONS:

(1) Briefly describe the general or specific special conditions (if any) that should be included in the City's permit:

Combined sewer overflows ______________________________

____

____

Pretreatment program ______________________________

____

____

(2) Any there any other general or specific special conditions that should be considered for the City? If so, then describe briefly below. ______________________________

____

____

____

____

MODULE 8 - SUGGESTED REFERENCE MATERIALS

NPDES Best Management Practices Guidance Document (EPA/600/9/79-045), EPA, Office of Water Enforcement and Office of Research and Development, December 1979.

Guidance Manual for Developing Best Management Practices (BMPs)(EPA 833-B-93-004), EPA, Office of Water, October 1993.

Storm Water Management for Industrial Activities: Developing Pollution Prevention Plans and Best Management Practices (EPA 832-R-92-006), EPA, Office of Water, September 1992.

Pollution Prevention Information Clearinghouse (PPIC), EPA, Office of Pollution Prevention and Office of Environmental Engineering and Technology Demonstration, April 1990.

U.S. EPA Pollution Prevention Information Clearinghouse (PPIC): Electronic Information Exchange System (EIES) - User Guide, Version 1.1 (EPA/600/9-89/086), EPA Office of Pollution Prevention and Office of Environmental Engineering and Technology Demonstration, September 1989.

Waste Minimization Opportunity Assessment Manual (EPA 625-7-88-003), EPA, Office of Research and Development, July 1988.

Environmental Regulations and Technology The National Pretreatment Program (EPA/625-10-86/005), EPA, Office of Water Enforcement and Permits, July 1986.

Guidance for Developing Control Authority Enforcement Response Plans, EPA, Office of Water, September 1989.

Guidance Manual for POTW Pretreatment Program Development, EPA, Office of Water Enforcement and Permits, October 1983.

Guidance Manual on the Development and Implementation of Local Discharge Limitations Under the Pretreatment Program, EPA, Office of Water Enforcement and Permits, December 1985. Supplemental Manual on the Development and Implementation of Local Discharge Limitations Under the Pretreatment Program, EPA, Office of Water, May 1991.

RCRA Information on Hazardous Wastes for Publicly Owned Treatment Works, EPA, Office of Water Enforcement and Permits, September 1985.

Guidance for Writing Case-by-Case Permit Requirements for Municipal Sewage Sludge (EPA 505/8-90-001), EPA, Office of Water, May 1990.

MODULE # 9

TITLE: **Standard Conditions of NPDES Permits**

OVERALL OBJECTIVES:

- Identify the purpose of standard conditions
- Discuss methods to implement standard conditions
- Provide understanding of each standard condition

LOGISTICS:

Presentation Format: Lecture
Approximate Presentation Time: 45 minutes
Review Questions/Exercise: None
Applicable Statutory/Regulatory Citations:

40 CFR §122.41 Conditions applicable to all permits
40 CFR §122.42 Additional conditions applicable to specified categories of NPDES permits

Standard Conditions of NPDES Permits

Learning Objectives

- Describe the role of "boilerplate" language
- Discuss methods for placing standard conditions in permits
- Review the types of standard conditions

Standard Conditions in the Permit

- Standard conditions must appear in every NPDES permit
- Standard conditions may be placed in permits verbatim or by reference (40 CFR §122.41 and §122.42)

Types of Standard Conditions

- Duty to comply
- Duty to reapply
- Need to halt or reduce activity not a defense
- Duty to mitigate
- Proper O & M
- Permit actions
- Property rights

Types of Standard Conditions
(Continued)

- Duty to provide information
- Duty to allow inspections/entry
- Monitoring and records
- Signatory/certification
- Planned change
  - Plant alteration/addition
  - Pollutants/flow/production
  - Sludge use/disposal method

Types of Standard Conditions
(Continued)

- Anticipated noncompliance
- Nontransferability
- Monitoring reports
- Compliance schedules
- 24 hour reporting of endangerment
- Bypass
- Upset

Other Standard Conditions

- Notification levels for existing non-municipal discharges
  - e.g., 200 ug/l for acrolein and acrylonitrile
- Notification for POTWs
  - New significant indirect discharger
  - Change in pollutant volume or character
- Annual report for municipal separate storm sewer systems

MODULE # 10

TITLE: **Administrative Process**

OVERALL OBJECTIVES:

- Explain regulatory requirements and procedures of permit issuance
- Define requirements and need for fact sheet and statement of basis, and provide examples of good permit documentation
- Discuss public participation requirements
- Explain permit appeals process
- Explain EPA and State/Tribe roles in issuance process
- Discuss administrative activities after issuance of final permit
- Identify the conditions under which a permitting authority may re-open existing permits

LOGISTICS:

Presentation Format: Lecture, example, exercise
Approximate Presentation Time: 1.5 hours
Review Questions/Exercise: none
Applicable Statutory/Regulatory Citations:

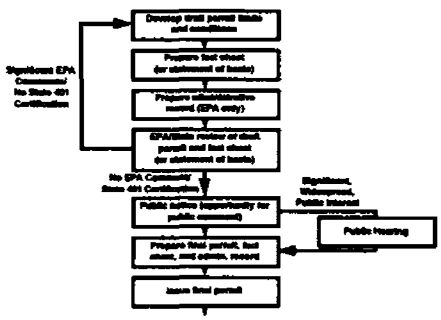
CWA Section 401	Untitled
40 CFR §122.61	Transfer of Permits
40 CFR §122.62	Modification or Revocation and Reissuance of Permits
40 CFR §122.63	Minor Modifications of Permits
40 CFR §122.64	Termination of Permits
40 CFR Part 123	State Program Requirements
40 CFR Part 124	Procedures for Decision Making
Subpart A	General Program Requirements
Subpart D	Specific Procedures Applicable to NPDES Permits
Subpart E	Evidentiary Hearing for EPA-issued NPDES Permits and EPA terminated RCRA Permits
Subpart F	Non-adversary Panel Procedures

Administrative Process

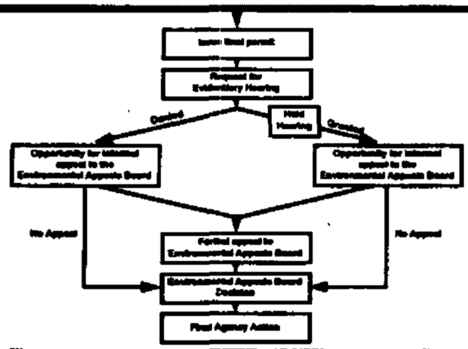
Learning Objectives

- Describe NPDES permit administrative procedures
- Discuss requirements and need for documentation
- Explain public participation requirements
- Describe administrative activities after final permit issuance

NPDES Permitting Process



NPDES Permitting Process (Continued)



NPDES Administrative Process

- The administrative process of developing and issuing a permit involves:
  - Documenting all permit decisions
  - Coordinating EPA and State review of the draft permit
  - Providing public notice, conducting hearings (if appropriate), and responding to comments
  - Defending the permit and modifying after issuance (if required)

Reasons for Good Documentation

- Streamlines reissuance/compliance-monitoring process
- Establishes permanent record of the basis for the permit
- Explains legal basis of permit
- Provides sound basis for future modifications and permits
- Requires permit writer to be organized and logical throughout permit development process

Contents of Administrative Record - Draft Permit

- What is it?
- What is in it?
  - Application and supporting data
  - Draft permit
  - Statement of basis or fact sheet
  - Documents/items cited in statement of basis or fact sheet
  - Other items supporting permit development
  - Environmental Impact Statement (EIS) for new source draft permits

Fact Sheet vs. Statement of Basis

Fact Sheet

- Permit involves a major facility
- Permit incorporates a variance
- Permit is an NPDES general permit
- Permit is subject to widespread public interest

Statement of Basis

- Used when fact sheet not required
- Requires:
  - Description of conditions
  - Reasons for conditions

Minimum Elements of a Fact Sheet

- General facility information
  - Description of facility or activity
  - Sketch or description of location
  - Type and quantity of waste/pollutants discharged
- Summary rationale of permit conditions
  - Applicable statutory/regulatory citations
  - References to administrative record

Minimum Elements of a Fact Sheet
(Continued)

- Detailed rationale of permit conditions
  - Explanation and calculation of effluent limitations and conditions
  - Specific explanation of:
    - Toxic pollutant limits
    - Limits on internal wastestreams
    - Case-by-case requirements
    - Limits on indicator pollutants
    - Regulation of users (Non-POTWs only)
  - Sewage sludge land application plan
  - Inappropriateness of requested variances

Minimum Elements of a Fact Sheet
(Continued)

- Administrative Requirements
  - Permit procedures
    - Comment period begin and end dates
    - Procedures for requesting a hearing
    - Public involvement in final decision
  - Permitting authority contact name and telephone

EPA and State/Tribal Roles

- State/Tribal issued permits
  - EPA required to review:
    - Major municipal and industrials
    - General permits
    - Class I sludge facilities
  - EPA reviews other significant permits (minor)
- EPA issued permits
  - State/Tribal Section 401 certification required
    - Certifies that permit will achieve water quality standard

Public Notice

- Purpose of public notice
- Types of actions requiring public notice
  - Tentative denial of application
  - Draft NPDES permit
  - Public hearing
  - Formal appeal of permit (after issuance)
  - Major permit modifications (after issuance)
  - Granting of evidentiary hearing (after issuance)

Public Notice (Continued)

- Methods applicable to public notice process
  - Publication in newspaper
  - Direct mailing
- Contents of public notice
  - Name and address of regulatory authority
  - Name and address of permittee
  - Brief description of facility
  - Name, address, and telephone of contact
  - Additional information (EPA-issued permits)

Public Notice (Continued)

- Timing of public notice
  - After EPA/State review
  - Allow at least 30 days for comments
- Responding to comments
  - Significant comments must be responded to in writing

Public Hearings

- Public hearings may be requested by any party
- Hearings are optional
- Scheduling the hearing automatically extends the comment period until the close of the hearing [40 CFR §124.12(c)]
- A transcript of the hearing must be available to interested persons

Contents of Administrative Record - Final Permit

- All comments received
- Public hearing tape or transcript
- Response to comments
- Final EIS for new sources
- Final permit
- Although not mandated, records from the draft permit should be added

After Final Permit Issuance

- Permit appeals
- Minor/major permit modifications
- Permit termination
- Permit Transfer

Permit Appeal

- Used by permittee to contest final permit limits and conditions
- Must be requested within 30 days following final permit issuance
  - Challenges limited to issues raised during public comment on draft permit (unless good cause is shown)
- Regional administrator decides to grant/deny request
- Hearing must be public noticed
- Only contested permit conditions are stayed

Permit Appeal

- Permit writers' role during appeal
  - Witness for permit authority
  - Source of technical knowledge for attorney
  - Assist in developing cross-examination questions

Minor Modifications

- Used to make corrections to permit conditions
- Exempt from administrative procedures (i.e., draft permit, public notice, etc.)
- Actions considered minor:
  1. Typographical errors
  2. More frequent monitoring
  3. Change in interim compliance date (<120 days)
  4. Change in ownership
  5. Change in construction schedule for new source
  6. Deletion of point source outfall
  7. Incorporate approved local pretreatment program

Major Modifications

- Required to address new information that may impact permit conditions
- Administrative procedures must be followed (i.e., draft permit, public notice, etc.)
- Causes for modification:
    1. Reopener condition
    2. Correct technical and legal mistakes
    3. Failure to notify interested State
    4. New information
    5. Alterations justifying new/different conditions

Major Modifications

- Causes for modification:
    6. New regulations
    7. Modification of a compliance schedule (>120 days)
    8. Require POTW to develop pretreatment programs
    9. Unsuccessful BPJ treatment installed
    10. Address non-limited pollutants
    11. Variance request
    12. Adjust limits to reflect net pollutant treatment
    13. Insert 307(a) toxic or Part 503 sludge use/disposal
    14. Establish notification levels

Permit Terminations

- Used to retract privilege to discharge during permit term
- Administrative procedures must be followed (i.e., public notice)
- Causes for termination:
    - Suspend effectiveness in emergency
    - Terminate for falsifications, recalcitrants or changed conditions (e.g., plant closure)

Permit Transfer

- Necessary to address change in owner or operator
- Transfer Options
  - Transfer by modification or revocation and reissuance
  - Automatic transfer
    - Prior 30-day notice
    - Written agreement between new and old owners
    - Permit will not be modified or revoked

EXAMPLE NPDES PERMIT

Permit No.: IL0654321

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

AUTHORIZATION TO DISCHARGE UNDER THE

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Clean Water Act, as amended, (33 U.S.C. §1251 et seq; the "Act"),

LUSTER GLASS, INC.

is authorized to discharge from a facility located in Morris, Illinois

to receiving waters named the Illinois River

in accordance with discharge point(s), effluent limitations, monitoring requirements and other conditions set forth herein. Authorization for discharge is limited to those outfalls specifically listed in the permit.

This permit shall become effective

August 31, 1989

This permit and the authorization to discharge shall expire at midnight, August 31, 1994.

Signed this day of

Authorized Permitting Official

Director
Water Management Division
Title

TABLE OF CONTENTS

I. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

A. Definitions.

1. The "30-day (and monthly) average," other than for fecal coliform bacteria and total coliform bacteria, is the arithmetic average of all samples collected during a consecutive 30-day period or calendar month, whichever is applicable. Geometric means shall be calculated for fecal coliform bacteria and total coliform bacteria. The calendar month shall be used for purposes of reporting self-monitoring data on discharge monitoring report forms.

2. The "7-day (and weekly) average," other than for fecal coliform bacteria and total coliform bacteria, is the arithmetic mean of all samples collected during a consecutive 7-day period or calendar week, whichever is applicable. Geometric means shall be calculated for fecal coliform bacteria and total coliform bacteria. The 7-day and weekly averages are applicable only to those effluent characteristics for which there are 7-day average effluent limitations. The calendar week which begins on Sunday and ends on Saturday, shall be used for purposes of reporting self-monitoring data on discharge monitoring report forms. Weekly averages shall be calculated for all calendar weeks with Saturdays in the month. If a calendar week overlaps two months (i.e., the Sunday is in one month and the Saturday in the following month), the weekly average calculated for that calendar week shall be included in the data for the month that contains the Saturday.

3. "Daily Maximum" ("Daily Max.") is the maximum value allowable in any single sample or instantaneous measurement.

4. "Composite samples" shall be flow proportioned. The composite sample shall, as a minimum, contain at least four (4) samples collected over the compositing period. Unless otherwise specified, the time between the collection of the first sample and the last sample shall not be less than six (6) hours nor more than 24 hours. Acceptable methods for preparation of composite samples are as follows:

   a. Constant time interval between samples, sample volume proportional to flow rate at time of sampling;

   b. Constant time interval between samples, sample volume proportional to total flow (volume) since last sample. For the first sample, the flow rate at the time the sample was collected may be used;

   c. Constant sample volume, time interval between samples proportional to flow (i.e., sample taken every "X" gallons of flow); and,

   d. Continuous collection of sample, with sample collection rate proportional to flow rate.

5. A "grab" sample, for monitoring requirements, is defined as a single "dip and take" sample collected at a representative point in the discharge stream.

6. An "instantaneous" measurement, for monitoring requirements, is defined as a single reading, observation, or measurement.

7. "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

8. "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility.

9. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

10. "Director" means Director of the United States Environmental Protection Agency's Water Management Division.

11. "EPA" means the United States Environmental Protection Agency.

12. "Sewage Sludge" is any solid, semi-solid or liquid residue that contains materials removed from domestic sewage during treatment. Sewage sludge includes, but is not limited to, primary and secondary solids and sewage sludge products.

13. "Acute Toxicity" occurs when 50 percent or more mortality is observed for either test species (See Part I.C.) at any effluent concentration. Mortality in the control must simultaneously be 10 percent or less for the effluent results to be considered valid.

14. "Chronic Toxicity" occurs when the survival, growth, or reproduction, as applicable, for either test species, at the effluent dilution(s) designated in this permit (see Part I.C.), is significantly less (at the 95 percent confidence level) than that observed for the control specimens.

B. Description of Discharge Points

The authorization to discharge provided under this permit is limited to those outfalls specifically designated below as discharge locations. Discharges at any location not authorized under an NPDES permit is a violation of the Clean Water Act and could subject the person(s) responsible for such discharge to penalties under Section 309 of the Act. Knowingly discharging from an unauthorized location or failing to report an unauthorized discharge within a reasonable time from first learning of an unauthorized discharge could subject such person to criminal penalties as provided under the Clean Water Act.

Outfall Serial Number	Description of Discharge Point
001	Discharge of effluent from the wastewater treatment oil/water separator and settling basins, and cooling tower blowdown to the Illinois River.

C. Specific Limitations and Self-Monitoring Requirements

1. Effluent Limitations (Outfall 001)

Effective immediately and lasting through the life of the permit, the permittee is authorized to discharge from Outfall 001. Such discharges shall be limited by the permittee as specified below:

Effluent Parameter	30-Day a/ Average	Daily a/ Maximum
Flow, MGD	N/A	N/A
Total Suspended Solids,		
lb/day	351.3	451.1
mg/l	9.23	11.86
Oil and Grease,		
lb/day	104.2	104.2
mg/l	2.74	2.74
Total Phosphorus,		
lb/day	16.5	16.5
mg/l	0.43	0.43
Total Zinc,		
lb/day	3.75	3.75
mg/l	0.1	0.1
Total Lead,		
lb/day	1.14	1.52
mg/l	0.03	0.04
Whole Effluent Toxicity (WET), TU_c b/	3.7	5.9
pH, s.u.	c/	c/
Temperature	d/	d/

There shall be no discharge of floating solids or visible foam in other than trace amounts.

---

a/ See Definitions, Part I.A. for definition of terms.

b/ The permittee shall demonstrate compliance with WET requirements specified in Part I.C.3 of this permit.

c/ pH shall not be less than 6.0 s.u. nor greater than 9.0 s.u.

d/ Temperature shall not be greater than 2.8 degrees Centigrade above ambient, or 1.7 degrees Centigrade above the following maximum limits: from December 1 through March 31, 16 degrees Centigrade (60 degrees Fahrenheit) and from April 1 through November 30, 32 degrees Centigrade (90 degrees Fahrenheit).

C. Specific Limitations and Self-Monitoring Requirements (Cont.)

2. Self-Monitoring Requirements (Outfall 001)

As a minimum, upon the effective date of this permit, the following constituents shall be monitored at the frequency and with the type of measurement indicated; samples or measurements shall be representative of the volume and nature of the monitored discharge. If no discharge occurs during the entire monitoring period, it shall be stated on the Discharge Monitoring Report Form (EPA No. 3320-1) that no discharge or overflow occurred.

Effluent Parameter	Frequency	Sample Type a/
Flow, MGD b/	Daily	Instantaneous or Continuous
Temperature	Daily	Continuous
Total Suspended Solids	Weekly	24-Hour Composite
Oil and Grease	Weekly	Grab
Total Phosphorus	Weekly	24-Hour Composite
Total Zinc	Weekly	24-Hour Composite
Total Lead	Weekly	24-Hour Composite
Whole Effluent Toxicity (WET), Chronic	2/Month	24-Hour Composite
pH	Daily	Continuous or Grab

Sampling by the permittee for compliance with the monitoring requirements specified above shall be performed at the following locations(s): within 100 feet of Outfall 001 to the Illinois River.

a/ See definitions, Part I.A.

b/ Flow measurements of effluent volume shall be made in such a manner that the permittee can affirmatively demonstrate that representative values are being obtained.

C. Specific Limitations and Self-Monitoring Requirements (Cont.)

3. Whole Effluent Toxicity Testing - Chronic Toxicity

Starting the effective date of this permit, the permittee shall conduct biweekly chronic toxicity tests on a 24 hour composite sample of the final effluent. If chronic toxicity is detected, the permittee shall conduct a Toxicity Reduction Evaluation, according to specifications in Part I.C.4 of this permit. Test species shall consist of *Pimephales promelas* (Fathead minnows). The chronic toxicity tests shall be conducted in general accordance with the procedures set out in the latest revision of "Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms", EPA/600-4-89-001. If control mortality exceeds 20 percent, the test shall be considered invalid. Chronic toxicity occurs when the No Observed Effect Concentrations (NOECs) (calculated within a 95 percent confidence interval) exceed(s) the permit limit(s). Test results shall be reported along with the Discharge Monitoring Report (DMR) submitted for the end of the calendar period during which the whole effluent test was run. The report shall include all the physical testing as specified and shall report test conditions, including temperature, pH, conductivity, mortality, total residual chlorine concentration, control mortality, and statistical methods used to calculate an NOEC.

If the results for one year (26 consecutive weeks) of whole effluent testing indicate no chronic toxicity, the permittee may request the permit issuing authority to allow the permittee to reduce testing frequency. The permit issuing authority may approve, partially approve, or deny the request based on results and other available information.

4. Toxicity Reduction Evaluation (TRE)

If the permittee fails to meet toxicity requirements specified in this permit, the permit issuing authority shall determine that a TRE is necessary. The permittee shall be so notified and shall initiate a TRE immediately thereafter. The TRE shall include a TRE Test Plan that must be submitted to the permitting authority within 60 days after notification of a TRE requirement. The permitting authority will then establish a deadline for compliance. The purpose of the TRE will be to establish the cause of the toxicity, locate the source(s) of the toxicity, and control or provide treatment for the toxicity prior to the deadline.

If acceptable to the permit issuing authority, this permit may be reopened and modified to incorporate any additional numerical limitations, a modified compliance schedule if judged necessary by the permit issuing authority, and/or a modified whole effluent protocol.

Failure to conduct an adequate TRE, or failure to submit a plan or program as described above, or the submittal of a plan or program judged inadequate by the permit issuing authority, shall in no way relieve the permittee from the deadline for compliance contained in this permit.

II. MONITORING, RECORDING AND REPORTING REQUIREMENTS

A. Representative Sampling. Samples taken in compliance with the monitoring requirements established under Part I shall be collected from the effluent stream prior to discharge into the receiving waters. Samples and measurements shall be representative of the volume and nature of the monitored discharge.

B. Monitoring Procedures. Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in this permit.

C. Penalties for Tampering. The Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate, any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than two years per violation, or by both.

D. Reporting of Monitoring Results. Effluent monitoring results obtained during the previous month(s) shall be summarized for each month and reported on a Discharge Monitoring Report Form (EPA No. 3320-1), postmarked no later than the 28th day of the month following the completed reporting period. If no discharge occurs during the reporting period, "no discharge" shall be reported. Until further notice, sludge monitoring results may be reported in the testing laboratory's normal format (there is no EPA standard form at this time), but should be on letter size pages. Legible copies of these, and all other reports required herein, shall be signed and certified in accordance with the Signatory Requirements (see Part IV), and submitted to the Director, Water Management Division and the State water pollution control agency at the following addresses:

original to: United States Environmental Protection Agency
Attention: Water Management Division
Compliance Branch

copy to: State Department of Health
Attention: Permits and Enforcement

E. Compliance Schedules. Reports of compliance or noncompliance with, or any progress reports on interim and final requirements contained in any Compliance Schedule of this permit shall be submitted no later than 14 days following each schedule date.

F. Additional Monitoring by the Permittee. If the permittee monitors any pollutant more frequently than required by this permit, using test procedures approved under 40 CFR 136 or as specified in this permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR. Such increased frequency shall also be indicated.

G. Records Contents. Records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurements;

2. The initials or name(s) of the individual(s) who performed the sampling or measurements;

3. The date(s) analyses were performed;

4. The time(s) analyses were initiated;

5. The initials or name(s) of individual(s) who performed the analyses;

6. References and written procedures, when available, for the analytical techniques or methods used; and,

7. The results of such analyses, including the bench sheets, instrument readouts, computer disks or tapes, etc., used to determine these results.

H. Retention of Records. The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three years from the date of the sample, measurement, report or application. This period may be extended by request of the Director at any time. Data collected on site, copies of Discharge Monitoring Reports, and a copy of this NPDES permit must be maintained on site during the duration of activity at the permitted location.

I. Twenty-four Hour Notice of Noncompliance Reporting.

1. The permittee shall report any noncompliance which may seriously endanger health or the environment as soon as possible, but no later than twenty-four (24) hours from the time the permittee first became aware of the circumstances. The report shall be made to the EPA Emergency Response Branch at (312) 293-1788 and the State at (312) 370-9395.

2. The following occurrences of noncompliance shall be reported by telephone to the EPA Compliance Branch at (312) 293-1589 and the State at (312) 331-4590 by the first workday (8:00 a.m. - 4:30 p.m.) following the day the permittee became aware of the circumstances:

   a. Any unanticipated bypass which exceeds any effluent limitation in the permit (See Part III.G., Bypass of Treatment Facilities.);

   b. Any upset which exceeds any effluent limitation in the permit (See Part III.H., Upset Conditions.); or,

   c. Violation of a maximum daily discharge limitation for any of the pollutants listed in the permit to be reported within 24 hours.

3. A written submission shall also be provided within five days of the time that the permittee becomes aware of the circumstances. The written submission shall contain:

   a. A description of the noncompliance and its cause;

   b. The period of noncompliance, including exact dates and times;

   c. The estimated time noncompliance is expected to continue if it has not been corrected; and,

   d. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

4. The Director may waive the written report on a case-by-case basis if the oral report has been received within 24 hours by the Compliance Branch, Water Management Division by phone, (312) 293-1589.

5. Reports shall be submitted to the addresses in Part II.D., Reporting of Monitoring Results.

J. Other Noncompliance Reporting. Instances of noncompliance not required to be reported within 24 hours shall be reported at the time that monitoring reports for Part II.D. are submitted. The reports shall contain the information listed in Part II.I.2.

K. Inspection and Entry. The permittee shall allow the Director, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to:

1. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and,

4. Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the Act, any substances or parameters at any location.

III. COMPLIANCE RESPONSIBILITIES

A. Duty to Comply. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application. The permittee shall give the Director advance notice of any planned changes at the permitted facility or of an activity which may result in permit noncompliance.

B. Penalties for Violations of Permit Conditions. The Act provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a civil penalty not to exceed $25,000 per day of such violation. Any person who willfully or negligently violates permit conditions implementing Sections 301, 302, 306, 307, or 308 of the Act is subject to a fine of not less than $5,000, nor more than $50,000 per day of violation, or by imprisonment for not more than 3 years, or both. Except as provided in permit conditions in Part III.G., Bypass of Treatment Facilities and Part III.H., Upset Conditions, nothing in this permit shall be construed to relieve the permittee of the civil or criminal penalties for noncompliance.

C. Need to Halt or Reduce Activity not a Defense. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

D. Duty to Mitigate. The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

E. Proper Operation and Maintenance. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit. However, the permittee shall operate, as a minimum, one complete set of each main line unit treatment process whether or not this process is needed to achieve permit effluent compliance.

F. Removed Substances. Collected screenings, grit, solids, sludges, or other pollutants removed in the course of treatment shall be buried or disposed of in such a manner so as to prevent any pollutant from entering any waters of the state or creating a health hazard. Filter backwash shall not be directly blended with or enter either the final plant discharge and/or waters of the United States.

G. Bypass of Treatment Facilities:

1. Bypass not exceeding limitations. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of paragraphs 2. and 3. of this section.

2. Notice:

   a. Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least 60 days before the date of the bypass.

   b. Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required under Part II.I., Twenty-four Hour Reporting.

3. Prohibition of bypass.

   a. Bypass is prohibited and the Director may take enforcement action against a permittee for a bypass, unless:

      (1) The bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

      (2) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgement to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and,

      (3) The permittee submitted notices as required under paragraph 2. of this section.

   b. The Director may approve an anticipated bypass, after considering its adverse effects, if the Director determines that it will meet the three conditions listed above in paragraph 3.a. of this section.

H. Upset Conditions.

1. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with technology based permit effluent limitations if the requirements of paragraph 2. of this section are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review (i.e., Permittees will have the opportunity for a judicial determination on any claim of upset only in an enforcement action brought for noncompliance with technology-based permit effluent limitations).

2. Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

   a. An upset occurred and that the permittee can identify the cause(s) of the upset;

   b. The permitted facility was at the time being properly operated;

   c. The permittee submitted notice of the upset as required under Part II.I., Twenty-four Hour Notice of Noncompliance Reporting; and,

   d. The permittee complied with any remedial measures required under Part III.D., Duty to Mitigate.

3. Burden of proof. In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof.

I. Toxic Pollutants. The permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the Act for toxic pollutants within the time provided in the regulations that establish those standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement.

J. Changes in Discharge of Toxic Substances. Notification shall be provided to the Director as soon as the permittee knows of, or has reason to believe:

1. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":

   a. One hundred micrograms per liter (100 ug/L);

   b. Two hundred micrograms per liter (200 ug/L) for acrolein and acrylonitrile; five hundred micrograms per liter (500 ug/L) for 2,4-dinitrophenol and for 2-methyl-4, 6-dinitrophenol; and one milligram per liter (1 mg/L) for antimony;

   c. Five (5) times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 CFR 122.21(g)(7); or,

   d. The level established by the Director in accordance with 40 CFR 122.44(f).

2. That any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":

   a. Five hundred micrograms per liter (500 ug/L);

   b. One milligram per liter (1 mg/L) for antimony:

   c. Ten (10) times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 CFR 122.21(g)(7); or,

   d. The level established by the Director in accordance with 40 CFR 122.44(f).

IV. GENERAL REQUIREMENTS

A. Planned Changes. The permittee shall give notice to the Director as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:

1. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source as determined in 40 CFR 122.29(b); or

2. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under Part IV.A.1.

B. Anticipated Noncompliance. The permittee shall give advance notice of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

C. Permit Actions. This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

D. Duty to Reapply. If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit. The application should be submitted at least 180 days before the expiration date of this permit.

E. Duty to Provide Information. The permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.

F. Other Information. When the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or any report to the Director, it shall promptly submit such facts or information.

G. Signatory Requirements. All applications, reports or information submitted to the Director shall be signed and certified.

1. All permit applications shall be signed as follows:

a. For a corporation: by a responsible corporate officer;

b. For a partnership or sole proprietorship: by a general partner or the proprietor, respectively;

c. For a municipality, State, Federal, or other public agency: by either a principal executive officer or ranking elected official.

2. All reports required by the permit and other information requested by the Director shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

a. The authorization is made in writing by a person described above and submitted to the Director, and,

b. The authorization specified either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.)

3. Changes to authorization. If an authorization under paragraph IV.G.2. is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph IV.G.2. must be submitted to the Director prior to or together with any reports, information, or applications to be signed by an authorized representative.

4. Certification. Any person signing a document under this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

H. Penalties for Falsification of Reports. The Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than two years per violation, or by both.

I. Availability of Reports. Except for data determined to be confidential under 40 CFR Part 2, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the State water pollution control agency and the Director. As required by the Act, permit applications, permits and effluent data shall not be considered confidential.

J. Oil and Hazardous Substance Liability. Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under Section 311 of the Act.

K. Coast Guard. If the Permittee operates its facility at certain times as a means of transportation over water, the Permittee shall comply with any applicable regulations promulgated by the Secretary of the department in which the Coast Guard is operating, that establish specifications for safe transportation, handling, carriage, and storage of pollutants.

L. Property Rights. The issuance of this permit does not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.

M. Severability. The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

N. Transfers. This permit may be automatically transferred to a new permittee if:

1. The current permittee notifies the Director at least 30 days in advance of the proposed transfer date;

2. The notice includes a written agreement between the existing and new permittees containing a specific date for transfer of permit responsibility, coverage, and liability between them; and,

3. The Director does not notify the existing permittee and the proposed new permittee of his or her intent to modify, or revoke and reissue the permit. If this notice is not received, the transfer is effective on the date specified in the agreement mentioned in paragraph 2. above.

O. State Laws. Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authority preserved by Section 510 of the Act.

P. Reopener Provision. This permit may be reopened and modified (following proper administrative procedures) to include the appropriate effluent limitations (and compliance schedule, if necessary), or other appropriate requirements if one or more of the following events occurs:

1. Water Quality Standards: The water quality standards of the receiving water(s) to which the permittee discharges are modified in such a manner as to require different effluent limits than contained in this permit.

2. Wasteload Allocation: A wasteload allocation is developed and approved by the State and/or EPA for incorporation in this permit.

3. Water Quality Management Plan: A revision to the current water quality management plan is approved and adopted which calls for different effluent limitations than contained in this permit.

Q. <u>Toxicity Limitation-Reopener Provision</u>. This permit may be reopened and modified (following proper administrative procedures) to include a new compliance date, additional or modified numerical limitations, a new or different compliance schedule, a change in the whole effluent protocol, or any other conditions related to the control of toxicants if one or more of the following events occur:

1. Toxicity was detected late in the life of the permit near or past the deadline for compliance.

2. The TRE results indicate that compliance with the toxic limits will require an implementation schedule past the date for compliance and the permit issuing authority agrees with the conclusion.

3. The TRE results indicate that the toxicant(s) represent pollutant(s) that may be controlled with specific numerical limits, and the permit issuing authority agrees that numerical controls are the most appropriate course of action.

4. Following the implementation of numerical controls on toxicants, the permit issuing authority agrees that a modified whole effluent protocol is necessary to compensate for those toxicants that are controlled numerically.

5. The TRE reveals other unique conditions or characteristics which, in the opinion of the permit issuing authority, justify the incorporation of unanticipated special conditions in the permit.

V. SPECIAL REQUIREMENTS

A. Best Management Practices (BMP) Plan

A BMP plan shall be developed within six months of permit reissuance, addressing each of the nine specific requirements described in the June 1981 EPA document, NPDES BMP Guidance Document. Emphasis shall be placed on good housekeeping practices, visual inspection, and preventative maintenance.

The BMP plan shall be written up and delivered to the U.S. Environmental Protection Agency no later than February 5, 1990.

B. BMP Implementation

The BMP plan shall be fully implemented within twelve months of permit reissuance. An implementation report shall be delivered to the U.S. Environmental Protection Agency no later than August 5, 1990.

C. Site-Specific BMPs

The following site-specific BMPs shall be included:

1. Tank Number 42: Remedial action is required to repair the damaged tank. This shall include transfer of the contents to another vessel (e.g., tank truck), cleaning the tank, and repairing, welding, or plugging the hole. To prevent environmental damage in the future, secondary containment is required. Monthly visual inspections and/or preventative maintenance shall be conducted.

2. Drum Storage Area: The drums shall be inventoried to identify the contents and amounts of chemicals therein. The drums shall be inspected for deterioration or leaks. They shall be segregated and any leaking or deteriorating drums shall be disposed of or repaired. Any contaminated soil shall be removed and adequately disposed of. The remaining drums shall be neatly stacked in a manner to eliminate hazards to humans or the environment by isolating the drums from walkways or roadways, placing them on an impervious pad, covering the storage area, diking the area, moving the storage area away from the river, or some combination thereof.

EXAMPLE FACT SHEET

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT
FACT SHEET

Permittee Name:	Luster Glass, Inc.
NPDES Permit Number:	IL0654321
Mailing Address:	P.O. Box 319 Morris, IL 60123
Location:	1 River Ridge Drive Morris, IL 60123
Contact Person:	Mr. John Baker, Vice President
Telephone:	(312) 834-4536

I. Status of Permit

NPDES Permit No. IL0654321 was issued on August 5, 1984, became effective on August 31, 1984, and expired on August 31, 1989. The permittee submitted an NPDES permit application for the renewal of the permit on March 1, 1989.

II. Facility Description

Luster Glass Inc. operates a manufacturing facility in Morris, IL. The facility specializes in manufacturing auto glass. On average, 40,000 sq. ft./day of auto tempered glass, and 275,000 sq. ft./day of auto laminated glass is produced at the facility.

III. Description of Discharge

All wastewater generated at this facility is discharged through Outfall 001 to the Illinois River. The primary waste streams discharged through Outfall 001 are process and rinse waters from the glass manufacturing processes and cooling tower blowdown. The glass manufacturing process wastewaters from auto glass tempering (cutting, grinding, polishing edges, bending, and tempering) and auto glass lamination (cutting, bending, washing, and laminating) are routed through a wastewater treatment system consisting of oil and water separators and settling basins. The cooling tower blowdown is not treated prior to discharge.

IV. Receiving Water

The receiving water for Outfall 001 is the Illinois River, Segment 16 of the Northern Illinois River Basin. Downstream of the facility, the Illinois River flows approximately 3 miles to Segment 15 of the Northern Illinois River Basin. Following is a summary of flow data for Segment 16 of the Illinois River:

Average Flow - 446.7 cfs
Harmonic Mean Flow - 245.5 cfs
7Q10 - 70.9 cfs
1Q10 - 58.8 cfs

The use designations for the Illinois River are given below:

Indigenous Aquatic Life

The applicable water quality standards to protect these uses are specified the State Water Pollution Control Rules in Part 302 (State Administrative Code, Title 35 - Environmental Protection; Subtitle C - Water Pollution, Chapter 1; adopted March 17, 1980). The effluent standards are found in Part 304.

V. Description of Discharge

a. Permit Application Summary

The following table summarizes the discharge characteristics of Outfall 001 as reported in the NPDES permit application dated March 1, 1989:

Parameter	Long-Term Average	Daily Maximum
Flow (MGD)	4.563	4.591
TSS (mg/l)	18.8	50.0
COD (mg/l)	ND	50.0
pH (S.U.)	6.6 min.	9.0 max.
Oil & Grease (mg/l)	12	22
Phosphorus (lbs/day)	19	29
Zinc (mg/l)	0.036	0.07
Lead (mg/l)	0.025	0.047

Note: Only data for parameters reported above detection limits are shown above.

b. Discharge Monitoring Report (DMR) Data

A summary of DMR data is given in Table 1. This data was taken from March 1988 through February 1989.

Whole Effluent Toxicity (WET) testing performed during the last year of the permit term (March 1988 to February 1989) demonstrated acute toxicity at Outfall 001. Test results indicated a fathead minnow LC50 of 8 percent and a Ceriodaphnia LC50 of 15.8 percent. Chronic Toxicity tests also demonstrated toxicity at Outfall 001. Chronic toxicity test results indicated a fathead minnow NOEC of 1.3 percent and a Ceriodaphnia NOEC of 2.7 percent. A summary of WET data for Luster is also presented in Table 1.

VI. Proposed Technology-Based Effluent Limitations

Regulations promulgated at 40 CFR §122.44(a) require technology-based effluent limitations to be placed in NPDES permits based on National effluent limitations guidelines and standards, best professional judgement (BPJ), or a combination of the two. Discharges from Outfall 001 are subject to effluent limitations given in 40 CFR Part 426 for the Glass Manufacturing Point Source Category, and State effluent and water quality standards.

Limits were developed for Luster Glass Inc. based on an evaluation of the permit application and DMRs. Lead and zinc were detected in significant concentrations in the discharge as reported in DMRs. While the previous permit did not contain limits for lead and zinc, monitoring was required. Thus, technology-based effluent limits were set for zinc found in the cooling tower blowdown. Technology-based limits were also established for lead which is found in the process wastewater, however water quality-based limits were found to be more limiting (see Section VII of this Fact Sheet).

Effluent mass limits for total suspended solids (TSS), phosphorus, and oil and grease are based on the best practicable control technology currently available (BPT) limitations specified for the Automotive Glass Tempering Subcategory in 40 CFR §426.62 and for the Automotive Glass Laminating Subcategory in 40 CFR §426.72. These limitations are shown below:

Automotive Glass Tempering Subcategory

	Effluent Limits	
Pollutant	Monthly Avg. ($lb/1000ft^2$)	Daily Max. ($lb/1000ft^2$)
TSS	0.25	0.40
Oil and Grease	0.13	0.13

pH shall be within the range of 6.0 to 9.0 standard units.

Automotive Glass Laminating Subcategory

	Effluent Limits	
Pollutant	Monthly Avg. ($lb/1000ft^2$)	Daily Max. ($lb/1000ft^2$)
TSS	0.90	0.90
Oil and Grease	0.36	0.36
Phosphorus	0.22	0.22

pH shall be within the range of 6.0 to 9.0 standard units.

Effluent limitations for oil and grease, TSS, phosphorus, and pH from the process wastewater contribution to Outfall 001 are calculated using the above effluent limits and the production rates of 40,000 square feet per day of tempered glass and 275,000 square feet per day of laminated glass. The TSS effluent limitations for cooling tower blowdown are based on State Effluent Standards for TSS in non-process wastewaters, including cooling tower blowdown. Calculations of the effluent limitations are shown below. It should be noted that both mass and concentration limits will be applied to Outfall 001 for oil and grease, TSS, and phosphorus.

<u>Oil and Grease</u>

Mass Limitations (Monthly Average and Daily Maximum)

Oil & Grease = (40,000 ft^2/day (tempered) x 0.13 lb/1000 ft^2) + (275,000 ft^2/day (laminated) x 0.36 lb/1000 ft^2) = 5.2 + 99 = 104.2 lbs/day

Concentration Limitations - Outfall 001 (Monthly Average and Daily Maximum)

Oil & Grease = (104.2 lbs/day)(454 g/ 1 lb)(1000 mg/ 1 g)(1 gal/ 3.785 l)(1 day/ 4.563 10^6 gal) = 2.74 mg/l

<u>TSS</u>

Mass Limitations - Process Wastewater (Monthly Average)

TSS = [(40,000 ft^2/day (tempered) x 0.25 lb/1000 ft^2) + (275,000 ft^2/day (laminated) x 0.9 lb/1000 ft^2)]/1000 = 257.5 lbs/day

Mass Limitations - Process Wastewater (Daily Maximum)

TSS = [(40,000 ft^2/day (tempered) x 0.4 lb/1000 ft^2) + (275,000 ft^2/day (laminated) x 0.9 lb/1000 ft^2)]/1000 = 263.5 lbs/day

Mass Limitations - Cooling Tower Blowdown (Monthly Average)

TSS = (25 mg/l)(0.45 10^6 gal/day)(1 lb/454,000 mg)(3.785 l/gal) = 93.8 lbs/day

Mass Limitations - Cooling Tower Blowdown (Daily Maximum)

TSS = (50 mg/l)(0.45 10^6 gal/day)(1 lb/454,000 mg)(3.785 l/gal) = 187.6 lbs/day

Mass Limitations - Outfall 001 (Monthly Average)

TSS = 257.5 lbs/day + 93.8 lbs/day = 351.3 lbs/day

Mass Limitations - Outfall 001 (Daily Maximum)

TSS = 263.5 lbs/day + 187.6 lbs/day = 451.1 lbs/day

Concentration Limitations - Outfall 001 (Monthly Average)

TSS = (351.3 lbs/day)(454,000 mg/lb)(1 gal/3.785 l)(day /4.563 10^6 gal) = 9.23 mg/l

Concentration Limitations - Outfall 001 (Daily Maximum)

TSS = (451.1 lbs/day)(454,000 mg/lb)(1 gal/3.785 l)(day /4.563 10^6 gal) = 11.86 mg/l

Phosphorus

Mass Limitations - Outfall 001 (Monthly Average and Daily Maximum)

Phosphorus = 275,000 ft^2/day (laminated) x 0.06 lb/1000 ft^2) = 16.5 lbs/day

Concentration Limitations - Outfall 001 (Monthly Average and Daily Maximum)

Phosphorus = (16.5 lbs/day)(454,000 mg/lb)(1 gal/3.785 l)(day /4.563 10^6 gal) = 0.43 mg/l

pH

pH limits are based on State effluent standards, as follows:

State Effluent Standards

Pollutant/Parameter	Range	Monthly Avg. (mg/l)	Daily Max. (mg/l)
pH	6.0 - 9.0	N/A	N/A

Toxic Pollutants

Zinc and lead were detected in the effluent discharge when the previous permit was issued. At that time no limits were set, but a requirement was made to monitor for zinc and lead. Significant concentrations of zinc (used as a corrosion inhibitor in cooling water) and lead (from lead soldering of products) have been found, as reported in DMRs. Therefore, technology-based effluent limitations are being established and will be included in the draft permit.

Technology-based effluent limitations for the toxic pollutant zinc present in the cooling tower blowdown are based on the transfer of the best available technology economically achievable (BAT) limitations specified in the Steam Electric Effluent Guidelines and Standards at 40 CFR §423.13(d)(1). These limitations are shown below:

BAT Effluent Limitations

Pollutant	Monthly Avg. (mg/l)	Daily Max. (mg/l)
Zinc (total)	1.0	1.0

Using the average blowdown flow from the cooling towers (0.45 mgd), monthly average and daily maximum mass limitations are calculated as follows:

Zinc = (1.0 mg/l)(0.45 10^6 gal/day)(1 lb/454,000 mg)(3.785 l/gal) = 3.75 lbs/day

Equivalent end-of-pipe concentration effluent limitations are also being established in the draft permit. Using the total Outfall 001 flow (4.563 mgd), monthly average and daily maximum concentration limitations are calculated as follows:

Zinc = (3.75 lbs/day)(454,000 mg/lb)(1 gal/3.785 l)(day /4.563 10^6 gal) = 0.10 mg/l

Technology-based effluent limitations for lead found in the process wastewaters are based on transfer of BAT limitations specified in the Metal Finishing Effluent Guidelines and Standards at 40 CFR §433.14(a). These limitations, which are based on the performance of lime precipitation and sedimentation, are shown below.

BAT Effluent Limitations

Pollutant	Monthly Avg. (mg/l)	Daily Max. (mg/l)
Lead (total)	0.43	0.69

Due to the potential for dilution of the treated process wastewaters by the cooling tower blowdown wastewaters, both mass and concentration limitations are established. Using the average process flow (4.113 mgd), mass limitations are calculated as follows:

Monthly Average

Lead = (0.43 mg/l)(4.113 10^6 gal/day)(1 lb/454,000 mg)(3.785 l/gal) = 14.74 lbs/day

Daily Maximum

Lead = (0.69 mg/l)(4.113 10^6 gal/day)(1 lb/454,000 mg)(3.785 l/gal) = 23.66 lbs/day

Equivalent end-of-pipe concentration effluent limitations are also being established in the draft permit. Using the total Outfall 001 flow (4.563 mgd), concentration limitations are calculated as follows:

Monthly Average

Lead = (14.74 lbs/day)(454,000 mg/lb)(1 gal/3.785 l)(day /4.563 10^6 gal) = 0.38 mg/l

Daily Maximum

Lead = (23.66 lbs/day)(454,000 mg/lb)(1 gal/3.785 l)(day /4.563 10^6 gal) = 0.62 mg/l

VII. Proposed Water Quality-Based Effluent Limitations

The State water quality standards require that point source discharges shall not cause a violation of any applicable water quality standards nor interfere with the attainment or maintenance of that water quality which assures the protection and propagation of a balanced indigenous population of shellfish, fish, and wildlife and allows recreational activities in and on the water. In addition, a requirement of the State water quality standards is that no effluent shall, alone or in combination with other sources, cause a violation of any applicable water quality standard.

Temperature

Temperature limits are based on State water quality standards as follows:

State Water Quality Limits

Pollutant/Parameter	Range
Temperature	Not greater than 2.8°C above ambient, or 1.7°C above the following maximum limits: in December through March, 16°C (60°F) and in April through November, 32°C (90°F)

Toxic Pollutants

Based on evaluation of the NPDES permit application and DMR data submitted by Luster Glass Inc., the following pollutants and parameters for which applicable State water quality standards are available are present in Outfall 001: lead and zinc. Based on the fact that no other toxic pollutants are expected to be present in Outfall 001 at significant concentrations, evaluation for compliance with water quality standards will only be performed for lead and zinc.

The State water quality regulations require that water quality standards be achieved under the following critical receiving water flow conditions:

Chronic water quality standards:
7 day, 10 year return frequency flow (7Q10)

Acute water quality standards:
One-third (1/3) of the 7Q10 flow

The 7Q10 for the Illinois River is 70.9 cubic feet per second (cfs)

The facility provided a study of the outfall which showed that the outfall quickly achieved complete mixing across the width of the river. Dilution at the edge of the mixing zone can therefore be characterized by the complete mixing equation:

$$Cr = \frac{(Cd)(Qd) + (Cs)(Qs)}{(Qd + Qs)}$$

where
Cr = the receiving water concentration,
Cd = the effluent concentration,
Qd = the effluent flow,
Cs = the receiving water background concentration, and
Qs = the appropriate receiving water flow.

The receiving water concentrations (Cr) expected in the Illinois River are calculated using the equation described above, and the following data:

Pollutant	Effluent Concentration (Cd)* (mg/l)	Receiving Water Concentration (Cs)** (mg/l)
Lead	0.38	0
Zinc	0.21	0.07

* - Maximum daily concentration reported in the application Form 2C
** - Source U.S.G.S. STORET

For comparison with acute water quality standards, receiving water concentrations are calculated as follows:

Cr (lead) = [(0.38 mg/l)(7.06 cfs) + (0 mg/l)(23.6 cfs)]/(7.06 cfs + 23.6 cfs)
= 0.088 mg/l

Cr (zinc) = [(0.21 mg/l)(7.06 cfs) + (0.07 mg/l)(23.6 cfs)]/(7.06 cfs + 23.6 cfs)
= 0.102 mg/l

For comparison with chronic water quality standards, receiving water concentrations are calculated as follows:

Cr (lead) = [(0.38 mg/l)(7.06 cfs) + (0 mg/l)(70.9 cfs)]/(7.06 cfs + 70.9 cfs)
= 0.034 mg/l

Cr (zinc) = [(0.21 mg/l)(7.06 cfs) + (0.07 mg/l)(70.9 cfs)]/(7.06 cfs + 70.9 cfs)
= 0.083 mg/l

The following table compares each receiving water concentration calculated above with the State Water Quality Standard for aquatic life protection:

Pollutant	State Standard (µg/l)	Receiving Water Concentration (µg/l)
Zinc		
Chronic	110	83
Acute	120	102
Lead		
Chronic	3.2	34
Acute	82	88

Since the calculated receiving water concentrations are less than the criterion for zinc and greater than the criterion for lead, water quality limits will be necessary for lead, but not for zinc. It should be noted that the procedure used above does not account for the variability of the pollutant concentrations in the effluent. The EPA Technical Support Document for Water Quality-based Toxics Control recommends accounting for this variability by calculating the reasonable potential for pollutants to cause exceedances of water quality standards. Specifically, the reasonable potential is calculated using the maximum expected effluent concentration, which is estimated by using a multiplication factor (F) that incorporates both the coefficient of variation (CV) and the number of effluent samples collected. If this methodology were used with the existing data for Luster Glass, Inc., there would be a reasonable potential for the concentration of zinc in the discharge to exceed both the acute and chronic water quality standards, and thus water quality permit limits will also be calculated for zinc.

The following equation is used to calculate the effluent concentrations [which is commonly referred to as the waste load allocation (WLA)] for lead and zinc that will ensure protection of the State water quality standard.

$$Cd = WLA = \frac{Cr\ (Qd + Qs) - (Cs)(Qs)}{Qd}$$

where Cd = WLA = waste load allocation
Cr = the applicable water quality standard
Qd = the effluent flow = 7.06 cfs
Qs = the appropriate receiving water flow
Cs = the receiving water background concentration

Based on the following information, the waste load allocations for lead and zinc are calculated.

Pollutant	Cr = Acute State Water Quality Standard	Cs = Upstream Concentration
Lead	0.082 mg/l	0 mg/l
Zinc	0.12 mg/l	0.07 mg/l

Pollutant	Cr = Chronic State Water Quality Standard	Cs = Upstream Concentration
Lead	0.0032 mg/l	0 mg/l
Zinc	0.11 mg/l	0.07 mg/l

Lead (acute) Cd = [(0.082 mg/l)(7.06 cfs + 23.6 cfs) - (0 mg/l)(23.6 cfs)] / 7.06 cfs
= 0.36 mg/l

Lead (chronic) Cd = [(0.0032 mg/l)(7.06 cfs + 70.9 cfs) - (0 mg/l)(70.9 cfs)]/ 7.06 cfs
= 0.04 mg/l

Zinc (acute) Cd = [(0.12 mg/l)(7.06 cfs + 23.6 cfs) - (0.07 mg/l)(23.6 cfs)] / 7.06 cfs
= 0.29 mg/l

Zinc (chronic) Cd = [(0.11 mg/l)(7.06 cfs + 70.9 cfs) - (0.07 mg/l)(70.9 cfs)]/ 7.06 cfs = 0.51 mg/l

Given that all State water quality standards are expressed as never to be exceeded (i.e., water quality-based limits must be protective of the most stringent waste load allocation), a maximum daily limitation (MDL) and a average monthly limitation (AML) for lead and zinc are calculated using the waste load allocations calculated above. It should be noted that the ratio of daily maximum to monthly average for the technology-based effluent limitations for lead and zinc are used to derive the MDL and AML. Specifically, these ratios are 1.6 for lead and 1.0 for zinc.

Lead - Since the chronic WLA is more limiting than the acute WLA (i.e., 0.04 mg/l < 0.36 mg/l), it will be used as the basis for limitations. Since the chronic WLA can never be exceeded, 0.04 mg/l is used as the MDL. The AML is calculated as follows:

$$\frac{0.04 \text{ mg/l}}{1.6} = 0.03 \text{ mg/l}$$

Zinc - Since the acute WLA is more limiting than the chronic WLA (i.e., 0.29 mg/l < 0.51 mg/l), it will be used as the basis for limitations. Since the acute WLA can never be exceeded, 0.029 mg/l is used as the MDL. The AML is calculated as follows:

$$\frac{0.29 \text{ mg/l}}{1.0} = 0.29 \text{ mg/l}$$

Comparing the chemical specific water quality-based limits calculated above with the technology-based effluent limitations calculated for Outfall 001 (see Section VI above), the water quality-based limits for lead are more stringent than the technology-based limits, so they will be used as the basis for effluent limits in the permit. Since the technology-based effluent limits for zinc are more stringent than the water quality-based limits, the technology-based effluent limits will be used.

Equivalent end-of-pipe mass effluent limitations are also being established in the draft permit. Using the total Outfall 001 flow (4.563 mgd), mass limitations for lead are calculated as follows:

MDL = (0.04 mg/l)(4.563 10^6 gal/day)(1 lb/454,000 mg)(3.785 l/gal)
= 1.52 lbs/day

AML = (0.03 mg/l)(4.563 10^6 gal/day)(1 lb/454,000 mg)(3.785 l/gal)
= 1.14 lbs/day

Whole Effluent Toxicity

The previous NPDES permit issued to the Luster Glass facility contained a requirement for conducting monthly acute and chronic toxicity tests during the fourth and fifth year of the permit (March 1988 through February 1989). The test species selected by the facility was the fathead minnow, based on an initial comparison of species sensitivity performed in February 1988. The results of these toxicity tests were reviewed to determine whether an effluent limit on toxicity should be developed for the permit.

The concentration of acute and chronic toxicity in the receiving water is calculated and is then compared to the State water quality standards. The receiving water concentrations for acute and chronic toxicity were calculated using the following formula:

$$Cr = \frac{(Cd)(Qd) + (Cs)(Qs)}{(Qd + Qs)}$$

Where

Cr = receiving water concentration
Cd = effluent concentration
Qd = effluent flow
Cs = receiving water background concentration
Qs = appropriate receiving water flow

The following summarizes the toxicity data submitted by Luster Glass for the period from March 1988 to February 1989:

Toxicity Data (Fathead minnows)

LC_{50} (% effluent)	NOEC (% effluent)
58.0	50
25.2	3
55.0	10
46.3	30
44.8	25
5.9	1
67.8	10
3.9	1
50.1	30
52.0	10
32.1	3
41.7	30

All toxicity testing by Luster Glass involved the use of upstream ambient water for the control and diluent, so that in all calculations, the upstream toxicity is assumed to be zero. The highest result of chronic toxicity measured was an NOEC equal to 1% effluent. By dividing 1 into 100, the NOEC is converted to chronic Toxic Units (TU_c). Similarly for acute toxicity, the highest acute toxicity was measured at an LC_{50} equal to 3.9 % which converts to 25.6 TU_a.

The resultant receiving water concentration (Cr) in toxic units for both acute and chronic toxicity are calculated using the following data:

Cs = 0
Qs = 23.6 cfs (one third the 7Q10 for acute protection)
Qs = 70.9 cfs (the 7Q10 for chronic protection)
Qd = 7.06 cfs

Acute

$$Cr = (25.6\ TU_a)\ (7.06\ cfs)/(7.06\ cfs + 23.6\ cfs)$$
$$= 5.9\ TU_a$$

Chronic

$$Cr = (100\ TU_c)\ (7.06\ cfs)/(7.06\ cfs + 70.9\ cfs)$$
$$= 9.1\ TU_c$$

The State water quality standards for acute and chronic protection are summarized below:

State Water Quality Standard for Acute Protection = 0.3 TU_a
State Water Quality Standard for Chronic Protection = 1.0 TU_c

WET limits would be necessary since the calculated receiving water concentrations exceed the state water quality standards for both acute and chronic protection:

For acute protection 5.9 TU_a > 0.3 TU_a
For chronic protection 9.1 TU_c > 1.0 TU_c

Using steady state assumptions, the WLAs were calculated using the following formula:

$$Cd = [Cr(Qd + Qs) - (Cs)(Qs)] / Qd$$

where:

- Cd = Concentration of the pollutant in the discharge, or waste load allocation
- Cr = State Water Quality Standard
  for chronic protection = 1.0 TU_c
  for acute protection = 0.3 TU_a
- Qd = Discharge flow = 7.06 cfs
- Qs = Appropriate receiving water flow
  chronic flow (7Q10) = 70.9 cfs
  acute flow = 23.6 cfs
- Cs = Receiving water or upstream concentration = 0

Assuming zero background toxicity, the limits are calculated as follows:

$$\text{WLA (acute)} = \frac{[(0.3\ TU_a)(7.06\ \text{cfs} + 23.6\ \text{cfs})] - [(0)(23.6\ \text{cfs})]}{7.06\ \text{cfs}}$$

$$= 1.3\ TU_a$$

$$\text{WLA (chronic)} = \frac{[(1.0\ TU_c)(7.06\ \text{cfs} + 70.9\ \text{cfs})] - [(0)(70.9\ \text{cfs})]}{7.06\ \text{cfs}}$$

$$= 11.0\ TU_c$$

An acute to chronic ratio (ACR) was calculated from the toxicity data by taking the average ACR from each data set as follows:

LC_{50} (% effluent)	NOEC (% effluent)	ACR
58.0	50	1.16
25.2	3	8.40
55.0	10	5.50
46.3	30	1.54
44.8	25	1.79
5.9	1	5.9
67.8	10	6.78
3.9	1	3.9
50.1	30	1.67
52.0	10	5.20
32.1	3	10.7
41.7	30	1.39
	Average	4.5

The acute WLA (in TU_a) are converted to TU_c using the acute to chronic ratio (ACR) as follows:

$$\begin{aligned} \text{WLA (in } TU_{a,c}) &= 1.3\ TU_a * \text{ACR} \\ &= 1.3\ TU_a * 4.5 \\ &= 5.9\ TU_{a,c} \end{aligned}$$

Given that all State water quality standards are expressed as never to be exceeded (i.e., water quality-based limits must be protective of the most stringent waste load allocation), a maximum daily limitation (MDL) and a average monthly limitation (AML) for WET were calculated using the waste load allocations calculated above. A ratio of daily maximum to monthly average of 1.6 is assumed for WET based upon technolgy-based effluent limits for lead.

Since the acute WLA is more limiting than the chronic WLA (i.e., 5.9 $TU_{a,c}$ < 11.0 TU_c), it will be used as the basis for limitations. Since the acute WLA can never be exceeded, 5.9 $TU_{a,c}$ is used as the MDL. The AML is calculated as follows:

$$\frac{5.9\ TU_{a,c}}{1.6} = 3.7\ TU_c$$

The permittee shall conduct chronic toxicity tests according to methods outlined in "Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms" (EPA 600/4-89 001).

VIII. Proposed Effluent Limitations

Table 2 summarizes the proposed effluent limitations for Outfall 001. Proposed effluent limitations for zinc are based on BPJ. The limitation for temperature is based on State water quality standards. The proposed limitations for lead were calculated above as chemical specific water quality-based limitations. The remainder of the effluent limitations are based on BPT/BAT effluent guidelines at 40 CFR Part 426 and State effluent standards.

IX. Monitoring Requirements

Monitoring for those pollutants expected to be present in Outfall 001 (i.e., TSS, oil and grease, phosphorus, lead, and zinc) will be required once per week. Except for oil and grease, for which a grab sample is required, 24-hour composite samples are required. Temperature is to be monitored continuously during discharge.

Whole effluent toxicity testing for chronic toxicity shall be conducted 2/month on a 24-hour composite sample of the final effluent.

X. Special Conditions

Luster Glass Inc. will be required to update their existing Best Management Practices (BMP) plan to address the potential for leakage of gasoline from Tank Number 42 and nitric acid from the drum storage area. Specifically, Luster Glass Inc. should undertake the following two site-specific BMPs and incorporate them into their plan. First, remedial action must be taken on Tank Number 42 to repair the damaged tank. The gasoline must be transferred to another vessel (e.g., tank truck) while the tank is cleaned, repaired, welded or holes plugged. To prevent environmental damage at this site in the future, the following BMPs should be incorporated into the plan: visual inspection, secondary containment, preventative maintenance, or some combination thereof. Secondly, the drum storage area must be cleaned up by following procedures such as the following: inventory the drums to identify the contents and amounts of chemicals therein; inspect the drums for deterioration or leaks, and segregate and adequately dispose of the leaking or deteriorating drums; remove and adequately dispose of any contaminated soil; neatly stack the remaining drums in a manner to eliminate hazards to humans or the environment by isolating the drums from walkways or roadways, placing them on an impervious pad, covering the storage area, diking the area, moving the storage area away from the stream or some combination thereof.

XI. Information Sources

While developing effluent limitations, monitoring requirements, and special conditions for the draft permit, the following information sources were used:

(1) EPA NPDES Application Forms 1 and 2C dated October 1980 and February 1985, respectively.

(2) State Effluent Standards, Part 304 of the State Administrative Code, Title 35 - Environmental Protection; Subtitle C - Water Pollution, adopted March 17, 1980.

(3) Division files related to the Luster Glass Inc. NPDES Permit No. IL0654321.

(4) State Water Quality Standards, Part 302 of the State Administrative Code, Title 35 - Environmental Protection; Subtitle C - Water Pollution, adopted March 17, 1980.

(5) EPA Technical Support Document for Water Quality-Based Toxics Control.

(6) 40 CFR Parts 423, 433, and 426.

TABLE 1
DISCHARGE MONITORING REPORT
LUSTER GLASS INC.

March 1988 through February 1989

Date	Flow (mgd) Mon. Avg.	Flow (mgd) Daily Max.	TSS (lb/d)	Oil & Grease (lb/d)	Phosphorus (lb/d)
03-88	4.575	4.583	180.4	19	14
04-88	4.554	4.567			
05-88	4.552	4.569			
06-88	4.568	4.573	245.2	27	18
07-88	4.585	4.589			
08-88	4.588	4.591			
09-88	4.571	4.581	429.3	88	29
10-88	4.568	4.572			
11-88	4.553	4.573			
12-88	4.551	4.541	308.7	22	15
01-89	4.550	4.561			
02-89	4.560	4.570			

TABLE 1 (Continued)
DISCHARGE MONITORING REPORT
LUSTER GLASS INC.

March 1988 through February 1989

Date	pH (S.U.)	Temperature (degrees F)	Zinc (mg/l)	Lead (mg/l)	COD (mg/l)
03-88	6.6	80	0.21	0.10	50
04-88					
05-88					
06-88	7.1	83	0.08	0.17	
07-88					
08-88					
09-88	9.0	78	0.09	0.12	
10-88					
11-88					
12-88	8.1	61	0.06	0.38	
01-89					
02-89					

TABLE 1 (Continued)
DISCHARGE MONITORING REPORT
LUSTER GLASS INC.

March 1988 through February 1989

Toxicity Test Data: Unless otherwise indicated, acute toxicity tests were conducted using fathead minnow and reported as 48 hr. LC_{50}; chronic toxicity tests were conducted using fathead minnows and reported as 7 day NOEC.

DATE	LC_{50} (% effluent)	NOEC (% effluent)
3/88	58.0	50
4/88	25.2	3
5/88	55.0	10
6/88	46.3	30
7/88	44.8	25
8/88	5.9	1
9/88	67.8	10
10/88	3.9	1
11/88	50.1	30
12/88	52.0	10
1/89	32.1	3
2/89	41.7	30

* Toxicity tests using *Ceriodaphnia dubia* 48 hour survival (acute) and 7 day reproduction (chronic)

TABLE 2
PROPOSED EFFLUENT LIMITATIONS
NPDES PERMIT NO. IL0654321

PARAMETER	DAILY MAXIMUM LBS/DAY	DAILY MAXIMUM MG/L	MONTHLY AVERAGE LBS/DAY	MONTHLY AVERAGE MG/L
Flow (mgd)	Report	--	Report	--
TSS	451.1	11.86	351.3	9.23
Oil & Grease	104.2	2.74	104.2	2.74
Phosphorous	16.5	0.43	16.5	0.43
pH	a/	--	--	--
Temperature	b/	--	--	--
Total Lead	1.52	0.04	1.14	0.03
Total Zinc	3.75	0.10	3.75	0.10
Whole Effluent Toxicity (WET)	c/	--	c/	--

a/ pH shall be within the range of 6.0 - 9.0 standard units

b/ Not greater than 2.8 degrees Centigrade above ambient, or 1.7 degrees Centigrade above the following maximum limits:

December 1 through March 31	16 deg C (60 deg F)
April 1 through November 30	32 deg C (90 deg F)

c/ Discharges of effluent with toxicity greater than the following amounts are prohibited: Maximum Daily Chronic Toxicity of 5.9 $TU_{a,c}$ and Average Monthly Chronic Toxicity of 3.7 TU_c.

EXAMPLE ADMINISTRATIVE RECORD

EXAMPLE

CONTENTS OF THE ADMINISTRATIVE RECORD

A brief explanation follows of the express statutory or regulatory precision on which permit requirements are based, including appropriate supporting references to the Administrative Record required by 40 CFR S124.9:

The following items are used to establish the basis of the draft permit:

(1) NPDES Permit No. LA0002933, effective date 2/17/80, expiration date 3/31/81.

(2) Consolidated Permit Application Forms No. 1 and 20 received 4/3/82.

(3) Louisiana Water Quality Criteria, LSCC, 1977.

(4) Louisiana Water Quality Management Plan, Department of Natural Resources, including Appendix D (Ponchartrain Basin) and Appendix F (Mississippi River), Phase II, Vols. I.

(5) 40 CFR Part 415 Subpart F, [47 FR 28260, 6/29/83].

(6) 40 CFR Part 415.65(b) [39 FR 9616, 3/12/74].

(7) Letter White (EPA) to Vlacos (Vulcan) dated 3/29/76.

(8) Letter White (EPA) to Campbell (Vulcan) DAted 6/9/76.

(9) ROC Hale (EPA) to Leonard (Vulcan) dated 11/10/76.

(10) 40 CFR Part 122.29 (d)(1) [48 FR 14146, 4/1/83].

(11) Letters Gordon (Vulcan) to McHam (EPA) dated 5/17/82 and 7/19/82.

(12) 40 CFR Part 401.17, 6/4/82.

(13) Letters Gordon (Vulcan) to Hale (EPA) dated 1/30/81.

(14) Discharge Monitoring Reports 1980-1982.

(15) 40 CFR Part 122.62(a)(3) [48 FR 14146, 4/1/83].

(16) 40 CFR Part 122.44(1)(2)(1) [48 FR 14146, 4/1/83].

(17) 40 CFR Part 415.65(b) [47 FR 28260, 6/29/82].

(18) 40 CFR Part 415.62(b) [47 FR 28260, 6/29/82].

(19) Final Development Document for Inorganic Chemicals, EPA 440/1-82/007, June 1982.

(20) Letter Gordon (Vulcan) to Ferguson (EPA) dated 10/30/79.

(21) 40 CFR Part 125.3(a)(2)(v) [44 FR 32948, 6/7/89, as amended at 45 FR 33512, 5/19/80].

(22) 40 CFR part 415.63(b) [47 FR 28260, 6/29/82].

(23) 40 CFR Part 122.29(d)(2) [48 FR 14146, 4/1/83].

(24) 40 CFR Part 141.12 [40 FR 59570, 12/24/75, as amended at 44 FR 68641, 11/29/79.

(25) Preamble to Inorganic Chemical Effluent Limitations Guidelines 47 FR 28263, 6/29/82, Column 3].

(26) ROC McHam (EPA) to Gordon (Vulcan) dated 5/25/83.

(27) EPA Treatability Manual, EPA 600/2-82/001, September 1982 (Revised).

(28) Work Book for Determining Economic Achievability for NPDES Permits: prepared for Hap Thron, Permits Division; prepared by Putnam, Hayes & Bartlett, Inc.. August 1982.

(29) Moody's Industrial Manual, 1982, pp. 4602-4605

(30) C E Plant Cost Index, Chemical Engineering Magazine, 6/13/83, page 7.

EXAMPLE RESPONSE TO COMMENTS

RESPONSE TO COMMENTS
FINAL PERMIT DECISION

This is our response to comments received on the subject draft permit in accordance with regulations promulgated at 40 CFR Part 124.17.

Permit No.	LA0006181
Applicant:	Allied Chemical Corporation P.O. Box 226 Geismar, Louisiana 70734
Issuing Office:	U.S. Environmental Protection Agency Region 6 1445 Ross Avenue Dallas, Texas 75202-2733
Prepared By:	Edward C. McHam, Engineer Industrial Permits Section (6W-PI) Permits Branch Water Management Division (214) 655-7180
Permit Action:	Final permit decision and response to comments received on the draft permit publicly noticed on 7/7/84.
Date Prepared:	9/5/84

Unless otherwise stated, citations to 40 CFR refer to promulgated regulations listed at Title 40, Code of Federal Regulations, revised as of 7/1/83.

The following comments have been received on the draft permit:

Letter Dessert (Allied) to Caldwell (EPA) dated 7/30/84

ISSUE NO. 1

The draft permit establishes biomonitoring requirements at Outfall 004. The company requests deletion of these requirements.

RESPONSE NO. 1

The request is denied.

The permittee states that biomonitoring will be duplicative and unnecessary because:

(1) EPA has identified the toxic pollutants of concern.

(2) The proposed permit places BAT limits and monitoring requirements on these pollutants.

(3) The BAT limits are more restrictive than water quality-based limitations.

(4) Biomonitoring results could be distorted and masked by the osmotic stress on test organisms exerted by the salts present in an HF plant effluent.

The biomonitoring method is a standardized method used throughout EPA Region 6 to measure the toxicity of various effluents which contain toxic components. The test is not based on water quality impacts of a specific receiving stream. Under Section 308 of the Clean Water Act, EPA Region 6 has the authority to require permittees to support development of data bases such as those associated with toxics. Therefore, biomonitoring requirements as established in the draft permit are retained in the final permit.

Chevron

Chevron Chemical Company
P.O. Box 78, St. James, LA 70086 • Phone (504) 473-7946

D. P. Teichman
Plant Manager
St. James Plant

January 12, 1990

CERTIFIED MAIL - RETURN RECEIPT # P 965 729 397

Ms. Ellen Caldwell
Permits Branch (6W-PS)
U.S. EPA Region VI
1445 Ross Avenue
Dallas, TX 75202-2733

SUBJECT: CHEVRON CHEMICAL COMMENTS
NPDES PERMIT NO. LA0029963

Dear Ms. Caldwell:

We have reviewed draft NPDES Permit No. LA0029963 for Chevron Chemical's St. James Plant issued for public comment by the EPA on December 16, 1989. We have the following comments:

1. As represented in the Fact Sheet (Part VIII.Section C 1), we understand an administrative order will be issued concurrent with the final permit decision. We understand the administrative order will establish interim limits which will be in effect until 2/1/91, when our upgraded effluent treatment plant will be operational. As a result, we have not reviewed, and are not providing comments on the draft permit relative to it being in effect during the interim period (i.e. from final permit issuance to 2/1/91).

2. We want to clarify that the discharge description included in Part V of the Fact Sheet is representative of our current facility discharge. Following completion of our ongoing facility expansion, the concentration of pollutants in our discharge will significantly decrease and the discharge flowrate will increase from current levels. These changes to our discharge were detailed in our submittals to the EPA and have been properly recognized in development of the proposed permit limits.

3. We request that you change the pH of the Outfall 002 from 9.0 to 10.0. The plant's clarified water and firewater is purchased and is lime softened with a pH of 10. This water has a high pH but a low alkalinity and is not hazardous to personnel nor to the environment.

In the last 6 months we have had 2 permit excursions due to these water systems. In the first instance, by simply washing the paved areas of the plant with firewater, we exceeded the 9.0 pH limit. In the second instance, a number of clarified water

JAN 18 1990

OW-PS

and firewater lines failed due to the hard December freeze. This water overflowed the retention pond and again we had a permit exceedence.

We have developed and have begun implementing a plan to eliminate continuous sources of high pH water currently discharged to our retention pond. This work will be completed by the 1/1/91. We therefore feel that a change of the pH limit on Outfall 002 from 9.0 to 10.0 would not endanger people nor the environment and would eliminate nuisance excursions.

We appreciated receiving the well-organized and readable fact sheet which clearly established the basis for the permit requirements. Although the proposed permit limits are substantially lower than those in our previous permit, we expect to be able to achieve and maintain compliance once our upgraded effluent treatment plant is fully operational.

If you have any questions or wish to discuss our comments further, please do not hesitate to contact me or my staff.

Very truly yours,

D. P. Teichman

LLR/vho

(fill—in areas are spaced for elite type, i.e., 12 characters/inch).

Form Approved. OMB No. 2040-0086 Approval expires 7-31-88

FORM 1 GENERAL

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY

GENERAL INFORMATION

Consolidated Permits Program

(Read the "General Instructions" before starting.)

I. EPA I.D. NUMBER

F US1234567

LABEL ITEMS

I. EPA I.D. NUMBER

III. FACILITY NAME

V. FACILITY MAILING ADDRESS

VI. FACILITY LOCATION

PLEASE PLACE LABEL IN THIS SPACE

GENERAL INSTRUCTIONS

If a preprinted label has been provided, affix it in the designated space. Review the information carefully; if any of it is incorrect, cross through it and enter the correct data in the appropriate fill—in area below. Also, if any of the preprinted data is absent *(the area to the left of the label space lists the information that should appear)*, please provide it in the proper fill—in area(s) below. If the label is complete and correct, you need not complete Items I, III, V, and VI *(except VI-B which must be completed regardless)*. Complete all items if no label has been provided. Refer to the instructions for detailed item descriptions and for the legal authorizations under which this data is collected.

II. POLLUTANT CHARACTERISTICS

INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of bold—faced terms.

SPECIFIC QUESTIONS	YES	NO	FORM ATTACHED	SPECIFIC QUESTIONS	YES	NO	FORM ATTACHED
A. Is this facility a publicly owned treatment works which results in a discharge to waters of the U.S.? (FORM 2A)	X			B. Does or will this facility *(either existing or proposed)* include a concentrated animal feeding operation or aquatic animal production facility which results in a discharge to waters of the U.S.? (FORM 2B)		X	
C. Is this a facility which currently results in discharges to waters of the U.S. other than those described in A or B above? (FORM 2C)		X		D. Is this a proposed facility *(other than those described in A or B above)* which will result in a discharge to waters of the U.S.? (FORM 2D)		X	
E. Does or will this facility treat, store, or dispose of hazardous wastes? (FORM 3)		X		F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)		X	
G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)		X		H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)		X	
I. Is this facility a proposed stationary source which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X		J. Is this facility a proposed stationary source which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X	

III. NAME OF FACILITY

1 SKIP TOWN OF OTISBURG WWTF

IV. FACILITY CONTACT

A. NAME & TITLE (last, first, & title)	B. PHONE (area code & no.)
2 JONES DAVE SUPERINTENDENT	123 456 7890

V. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX

3 123 MAIN ST

B. CITY OR TOWN	C. STATE	D. ZIP CODE
4 OTISBURG	ST	12345

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER

5 123 MAIN ST

B. COUNTY NAME

C. CITY OR TOWN	D. STATE	E. ZIP CODE	F. COUNTY CODE (if known)
6 OTISBURG	ST	12345	

CONTINUED FROM THE FRONT

VII. SIC CODES (4-digit, in order of priority)

A. FIRST		B. SECOND	
7 4952	(specify) PUBLICLY OWNED TREATMENT WORKS	7	(specify)
C. THIRD		**D. FOURTH**	
7	(specify)	7	(specify)

VIII. OPERATOR INFORMATION

A. NAME: 8 TOWN OF OTISBURG

B. Is the name listed in Item VIII-A also the owner? ☑ YES ☐ NO

C. STATUS OF OPERATOR (Enter the appropriate letter into the answer box; if "Other", specify.)

F = FEDERAL
S = STATE
P = PRIVATE
M = PUBLIC (other than federal or state)
O = OTHER (specify)

Answer: M (specify)

D. PHONE (area code & no.): A 123 456 7890

E. STREET OR P.O. BOX: 123 MAIN ST

F. CITY OR TOWN: B OTISBURG

G. STATE: ST

H. ZIP CODE: 12345

IX. INDIAN LAND

Is the facility located on Indian lands? ☐ YES ☑ NO

X. EXISTING ENVIRONMENTAL PERMITS

A. NPDES (Discharges to Surface Water)	D. PSD (Air Emissions from Proposed Sources)	
9 N US1234567	9 P	
B. UIC (Underground Injection of Fluids)	**E. OTHER (specify)**	
9 U	9	(specify)
C. RCRA (Hazardous Wastes)	**E. OTHER (specify)**	
9 R	9	(specify)

XI. MAP

Attach to this application a topographic map of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in the map area. See instructions for precise requirements.

XII. NATURE OF BUSINESS (provide a brief description)

PUBLICLY OWNED TREATMENT WORKS

XIII. CERTIFICATION (see instructions)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE (type or print)	B. SIGNATURE	C. DATE SIGNED
JOE SMITH - CITY MANAGER	Joe Smith	05/22/9

COMMENTS FOR OFFICIAL USE ONLY

C

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Approval expires 7-31-88

FOR AGENCY USE

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM APPLICATION FOR PERMIT TO DISCHARGE WASTEWATER

STANDARD FORM A – MUNICIPAL

SECTION I. APPLICANT AND FACILITY DESCRIPTION

Unless otherwise specified on this form all items are to be completed. If an item is not applicable indicate 'NA.'

ADDITIONAL INSTRUCTIONS FOR SELECTED ITEMS APPEAR IN SEPARATE INSTRUCTION BOOKLET AS INDICATED. REFER TO BOOKLET BEFORE FILLING OUT THESE ITEMS.

		Please Print or Type
1. Legal Name of Applicant (see instructions)	101	Town of Otisburg Wastewater Treatment Facility
2. Mailing Address of Applicant (see instructions)		
Number & Street	102a	123 Main Street
City	102b	Otisburg
State	102c	ST
Zip Code	102d	12345
3. Applicant's Authorized Agent (see instructions)		
Name and Title	103a	Dave Jones Superintendent
Number & Street	103b	123 Main Street
City	103c	Otisburg
State	103d	ST
Zip Code	103e	12345
Telephone	103f	(123) 456-7890 Area Code / Number
4. Previous Application If a previous application for a permit under the National Pollutant Discharge Elimination System has been made, give the date of application.	104	90 5 22 YR MO DAY

I certify that I am familiar with the information contained in this application and that to the best of my knowledge and belief such information is true, complete, and accurate.

Joe Smith Printed Name of Person Signing	102e	City Manager Title
Joe Smith Signature of Applicant or Authorized Agent	102f	95 5 22 YR MO DAY Date Application Signed

18 U.S.C. Section 1001 provides that:

Whoever, in any matter within the jurisdiction of any department or agency of the United States knowingly and wilfully falsifies, conceals or covers up by any trick, scheme, or device a material fact, or makes any false, fictitious or fraudulent statement or representation, or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statement or entry, shall be fined not more than $10,000 or imprisoned not more than five years, or both.

FOR AGENCY USE

Received ____ ____ ____
YR MO DAY

OFFICE: ____ EPA Region Number
____ State

5. **Facility (see instructions)**
Give the name, ownership, and physical location of the plant or other operating facility where discharge(s) presently occur(s) or will occur.

Name	105a	See #2 above
Ownership (Public, Private or Both Public and Private).	105b	☒ PUB ☐ PRV ☐ BPP
Check block if a Federal facility	105c	☐ FED
and give GSA Inventory Control Number	105d	
Location: Number & Street	105e	See # 2 above
City	105f	
County	105g	
State	105h	

6. **Discharge to Another Municipal Facility (see instructions)**

a. Indicate if part of your discharge is into a municipal waste transport system under another responsible organization. If yes, complete the rest of this item and continue with item 7. If no, go directly to item 7.	106a	☐ Yes ☒ No
b. Responsible Organization Receiving Discharge Name	106b	N/A
Number & Street	106c	
City	106d	
State	106e	
Zip Code	106f	
c. Facility Which Receives Discharge Give the name of the facility (waste treatment plant) which receives and is ultimately responsible for treatment of the discharge from your facility.	106g	N/A
d. Average Daily Flow to Facility (mgd) Give your average daily flow into the receiving facility.	106h	N/A mgd

7. **Facility Discharges, Number and Discharge Volume (see instructions)**
Specify the number of discharges described in this application and the volume of water discharged or lost to each of the categories below. Estimate average volume per day in million gallons per day. Do not include intermittent or noncontinuous overflows, bypasses or seasonal discharges from lagoons, holding ponds, etc.

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		Number of Discharge Points		Total Volume Discharged, Million Gallons Per Day
To: Surface Water	107a1	1	107a2	2.7
Surface Impoundment with no Effluent	107b1	N/A	107b2	N/A
Underground Percolation	107c1	N/A	107c2	N/A
Well (Injection)	107d1	N/A	107d2	N/A
Other	107e1	N/A	107e2	N/A
Total Item 7	107f1	1	107f2	2.7

If 'other' is specified, describe 107g1 ______

If any of the discharges from this facility are intermittent, such as from overflow or bypass points, or are seasonal or periodic from lagoons, holding ponds, etc., complete item 8.

8. Intermittent Discharges

a. Facility bypass points
Indicate the number of bypass points for the facility that are discharge points.(see instructions) 108a N/A

b. Facility Overflow Points
Indicate the number of overflow points to a surface water for the facility (see instructions). 108b N/A

c. Seasonal or Periodic Discharge Points Indicate the number of points where seasonal discharges occur from holding ponds, lagoons, etc. 108c N/A

9. Collection System Type
Indicate the type and length (in miles) of the collection system used by this facility. (see instructions) 109a

Separate Storm	☐ SST
Separate Sanitary	☒ SAN
Combined Sanitary and Storm	☐ CSS
Both Separate Sanitary and Combined Sewer Systems	☐ BSC
Both Separate Storm and Combined Sewer Systems	☐ SSC

Length 109b 500 miles

10. Municipalities or Areas Served (see instructions)

	Name		Actual Population Served
110a	Town of Otisburg	110b	20,000
110a		110b	
110a		110b	
110a		110b	
110a		110b	

Total Population Served 110c ______

	FOR AGENCY USE

11. **Average Daily Industrial Flow**
Total estimated average daily waste flow from all industrial sources. 111 0.6 mgd

Note: All major industries (as defined in Section IV) discharging to the municipal system must be listed in Section IV.

12. **Permits, Licenses and Applications**
List all existing, pending or denied permits, licenses and applications related to discharges from this facility. (see instructions)

	Issuing Agency	For Agency Use	Type of Permit or License	ID Number	Date Filed YR/MO/DA	Date Issued YR/MO/DA	Date Denied YR/MO/DA	Expiration Date YR/MO/DA
112	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
1.	EPA		NPDES	US1234567	90/1/1	90/3/1	---	95/3/1
2.								
3.								

13. **Maps and Drawings**
Attach all required maps and drawings to the back of this application. (see instructions)

14. **Additional Information**

114	Item Number	Information

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STANDARD FORM A—MUNICIPAL

FOR AGENCY USE

SECTION II. BASIC DISCHARGE DESCRIPTION

Complete this section for each present or proposed discharge indicated in Section I, Items 7 and 8, that is to surface waters. This includes discharges to other municipal sewerage systems in which the waste water does not go through a treatment works prior to being discharged to surface waters. Discharges to wells must be described where there are also discharges to surface waters from this facility. Separate descriptions of each discharge are required even if several discharges originate in the same facility. All values for an existing discharge should be representative of the twelve previous months of operation. If this is a proposed discharge, values should reflect best engineering estimates.

ADDITIONAL INSTRUCTIONS FOR SELECTED ITEMS APPEAR IN SEPARATE INSTRUCTION BOOKLET AS INDICATED. REFER TO BOOKLET BEFORE FILLING OUT THESE ITEMS.

1. **Discharge Serial No. and Name**
   a. **Discharge Serial No.** (see instructions) — 201a — 001
   b. **Discharge Name** Give name of discharge, if any (see instructions) — 201b — Treatment plant effluent
   c. **Previous Discharge Serial No** If a previous NPDES permit application was made for this discharge (Item 4, Section I) provide previous discharge serial number. — 201c — 001

2. **Discharge Operating Dates**
   a. **Discharge to Begin Date** If the discharge has never occurred but is planned for some future date, give the date the discharge will begin. — 202a — -- YR -- MO
   b. **Discharge to End Date** If the discharge is scheduled to be discontinued within the next 5 years, give the date (within best estimate) the discharge will end. Give reason for discontinuing this discharge in Item 17. — 202b — -- YR -- MO

3. **Discharge Location** Name the political boundaries within which the point of discharge is located:

				Agency Use
State	203a	ST	203d	
County	203b	Otisburg	203e	
(if applicable) City or Town	203c	Otisburg	203f	

4. **Discharge Point Description** (see instructions) Discharge is into (check one)

Stream (includes ditches, arroyos, and other watercourses)	204a	[X] STR
Estuary		☐ EST
Lake		☐ LKE
Ocean		☐ OCE
Well (Injection)		☐ WEL
Other		☐ OTH
If 'other' is checked, specify type	204b	

5. **Discharge Point — Lat/Long.** State the precise location of the point of discharge to the nearest second. (see instructions)

Latitude	205a	42 DEG. 36 MIN. ___ SEC
Longitude	205b	98 DEG. 30 MIN. ___ SEC

DISCHARGE SERIAL NUMBER

001

FOR AGENCY USE

6. **Discharge Receiving Water Name**
Name the waterway at the point of discharge.(see instructions)

Pristine Creek

For Agency Use		
Major	Minor	Sub

For Agency Use
303e

If the discharge is through an outfall that extends beyond the shoreline or is below the mean low water line, complete Item 7.

7. **Offshore Discharge**
   a. **Discharge Distance from Shore** -- feet
   b. **Discharge Depth Below Water Surface** -- feet

If c harge is from a bypass or an overflow point or is a seasonal discharge from a lagoon, holding pond, etc., complete items 8, 9 or 10, as applicable, and continue with Item 11.

8. **Bypass Discharge** (see instructions)
   a. **Bypass Occurrence**
   Check when bypass occurs
      Wet weather ☐ Yes ☐ No
      Dry weather ☐ Yes ☐ No
   b. **Bypass Frequency** Give the actual or approximate number of bypass incidents per year.
      Wet Weather N/A times per year
      Dry weather N/A times per year
   c. **Bypass Duration** Give the average bypass duration in hours.
      Wet weather N/A hours
      Dry weather N/A hours
   d. **Bypass Volume** Give the average volume per bypass incident, in thousand gallons.
      Wet weather N/A thousand gallons per incident
      Dry weather N/A thousand gallons per incident
   e. **Bypass Reasons** Give reasons why bypass occurs. N/A

Proceed to Item 11.

9. **Overflow Discharge** (see instructions)
   a. **Overflow Occurrence** Check when overflow occurs.
      Wet weather ☐ Yes ☐ No
      Dry weather ☐ Yes ☐ No
   b. **Overflow Frequency** Give the actual or approximate incidents per year.
      Wet weather N/A times per year
      Dry weather N/A times per year

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c. **Overflow Duration** Give the average overflow duration in hours.

Wet weather — N/A hours

Dry weather — N/A Hours

d. **Overflow Volume** Give the average volume per overflow incident in thousand gallons.

Wet weather — N/A thousand gallons per incident

Dry weather — N/A thousand gallons per incident

Proceed to Item 11

10. **Seasonal/Periodic Discharges**

a. **Seasonal/Periodic Discharge Frequency** If discharge is intermittent from a holding pond, lagoon, etc., give the actual or approximate number of times this discharge occurs per year. — N/A times per year

b. **Seasonal/Periodic Discharge Volume** Give the average volume per discharge occurrence in thousand gallons. — N/A thousand gallons per discharge occurrence

c. **Seasonal/Periodic Discharge Duration** Give the average duration of each discharge occurrence in days. — N/A days

d. **Seasonal/Periodic Discharge Occurrence—Months** Check the months during the year when the discharge normally occurs.

☐ JAN ☐ FEB ☐ MAR
☐ APR ☐ MAY ☐ JUN
☐ JUL ☐ AUG ☐ SEP
☐ OCT ☐ NOV ☐ DEC

11. **Discharge Treatment**

a. **Discharge Treatment Description** Describe waste abatement practices used on this discharge with a brief narrative. (See instructions)

Communition, grit removal, primary settling, activated sludge, secondary clarification, rapid sand filtration, and chlorination.

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001

FOR AGENCY USE

b. Discharge Treatment Codes — 211b: SC, G, C, AS, N, FSR, PG

Using the codes listed in Table I of the Instruction Booklet, describe the waste abatement processes applied to this discharge in the order in which they occur, if possible.

Separate all codes with commas except where slashes are used to designate parallel operations.

If this discharge is from a municipal waste treatment plant (not an overflow or bypass), complete items 12 and 13

12. Plant Design and Operation Manuals
Check which of the following are currently available

a. Engineering Design Report — 212a: ☐

b. Operation and Maintenance Manual — 212b: XX

13. Plant Design Data (see instructions)

a. Plant Design Flow (mgd) — 213a: 3.83 mgd

b. Plant Design BOD Removal (%) — 213b: 85 %

c. Plant Design N Removal (%) — 213c: 40 %

d. Plant Design P Removal (%) — 213d: 10 %

e. Plant Design SS Removal (%) — 213e: 85 %

f. Plant Began Operation (year) — 213f: 1983

g. Plant Last Major Revision (year) — 213g: ----

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14. Description of Influent and Effluent (see instructions)

Parameter and Code 214	Influent	Effluent					
	Annual Average Value (1)	Annual Average Value (2)	Lowest Monthly Average Value (3)	Highest Monthly Average Value (4)	Frequency of Analysis (5)	Number of Analyses (6)	Sample Type (7)
Flow Million gallons per day 50050	2.9	2.7	2.2	3.2	Cont.	--	--
pH Units 00400			7.1	7.4	1/week	52	G
Temperature (winter) ° F 74028	65	63	63	64	1/week	52	G
Temperature (summer) ° F 74027	69	67	65	68	1/week	52	G
Fecal Streptococci Bacteria Number/100 ml 74054 (Provide if available)				N/A	N/A	N/A	N/A
Fecal Coliform Bacteria Number/100 ml 74055 (Provide if available)				86	1/month	12	G
Total Coliform Bacteria Number/100 ml 74056 (Provide if available)				N/A	N/A	N/A	N/A
BOD 5-day mg/l 00310	165	19	10	21	1/week	52	C
Chemical Oxygen Demand (COD) mg/l 00340 (Provide if available)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
OR							
Total Organic Carbon (TOC) mg/1 00680 (Provide if available) (Either analysis is acceptable)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chlorine–Total Residual mg/l 50060	---	2.5	2.0	2.8	1/week	52	G

DISCHARGE SERIAL NUMBER

001

FOR AGENCY USE

14. Description of Influent and Effluent (see instructions) (Continued)

Parameter and Code 214	Influent	Effluent					
	Annual Average Value (1)	Annual Average Value (2)	Lowest Monthly Average Value (3)	Highest Monthly Average Value (4)	Frequency of Analysis (5)	Number of Analyses (6)	Sample Type (7)
Total Solids mg/l 00500	575	108	98	135	1/week	52	C
Total Dissolved Solids mg/l 70300	324	40	38	43	1/week	52	C
Total Suspended Solids mg/l 00530	145	13	12	14	1/week	52	C
Settleable Matter (Residue) ml/l 00545	11	N/A	N/A	N/A	1/week	52	G
Ammonia (as N) mg/l 00610 (Provide if available)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Kjeldahl Nitrogen mg/l 00625 (Provide if available)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Nitrate (as N) mg/l 00620 (Provide if available)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Nitrite (as N) mg/l 00615 (Provide if available)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Phosphorus Total (as P) mg/l 00665 (Provide if available)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dissolved Oxygen (DO) mg/l 00300		6.1	6.0	6.2	1/day	365	G

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15. Additional Wastewater Characteristics

Check the box next to each parameter if it is present in the effluent. (see instructions)

Parameter (215)	Present	Parameter (215)	Present	Parameter (215)	Present
Bromide 71870		Cobalt 01037		Thallium 01059	
Chloride 00940		Chromium 01034		Titanium 01152	
Cyanide 00720		Copper 01042 0.048 mg/l	X	Tin 01102	
Fluoride 00951		Iron 01045		Zinc 01092	
Sulfide 00745		Lead 01051		Algicides* 74051	
Aluminum 01105		Manganese 01055		Chlorinated organic compounds* 74052	
Antimony 01097		Mercury 71900		Oil and grease 00550	
Arsenic 01002		Molybdenum 01062		Pesticides* 74053	
Beryllium 01012		Nickel 01067		Phenols 32730	
Barium 01007		Selenium 01147		Surfactants 38260	
Boron 01022		Silver 01077		Radioactivity* 74050	
Cadmium 01027					

*Provide specific compound and/or element in Item 17, if known.

Pesticides (Insecticides, fungicides, and rodenticides) must be reported in terms of the acceptable common names specified in *Acceptable Common Names and Chemical Names for the Ingredient Statement on Pesticide Labels*, 2nd Edition, Environmental Protection Agency, Washington, D.C. 20250, June 1972, as required by Subsection 162.7(b) of the Regulations for the Enforcement of the Federal Insecticide, Fungicide, and Rodenticide Act.

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16. **Plant Controls** Check if the following plant controls are available for this discharge

236

Alternate power source for major pumping facility including those for collection system lift stations — X APS

Alarm for power or equipment failure — X ALM

17. **Additional Information**

237

Item Number	Information

FORM APPROVED
OMB No. 158-R0-X0

FOR AGENCY USE

STANDARD FORM A—MUNICIPAL

SECTION III. SCHEDULED IMPROVEMENTS AND SCHEDULES OF IMPLEMENTATION

This section requires information on any uncompleted implementation schedule which has been imposed for construction of waste treatment facilities. Requirement schedules may have been established by local, State, or Federal agencies or by court action. IF YOU ARE SUBJECT TO SEVERAL DIFFERENT IMPLEMENTATION SCHEDULES, EITHER BECAUSE OF DIFFERENT LEVELS OF AUTHORITY IMPOSING DIFFERENT SCHEDULES (ITEM 1b) AND/OR STAGED CONSTRUCTION OF SEPARATE OPERATIONAL UNITS (ITEM 1c), SUBMIT A SEPARATE SECTION III FOR EACH ONE.

FOR AGENCY USE
Sched. No. ______

1. **Improvements Required**

   a. **Discharge Serial Numbers Affected** List the discharge serial numbers, assigned in Section II, that are covered by this implementation schedule — 300

   b. **Authority Imposing Requirement** Check the appropriate item indicating the authority for the implementation schedule. If the identical implementation schedule has been ordered by more than one authority, check the appropriate items. (see instructions) — 301a ______, ______, ______, ______, ______

   301b

   - Locally developed plan ☐ LOC
   - Areawide Plan ☐ ARE
   - Basin Plan ☐ BAS
   - State approved implementation schedule ☐ SQS
   - Federal approved water quality standards implementation plan ☐ WQS
   - Federal enforcement procedure or action ☐ ENF
   - State court order ☐ CRT
   - Federal court order ☐ FED

   c. **Improvement Description** Specify the 3-character code for the General Action Description in Table II that best describes the improvements required by the implementation schedule. If more than one schedule applies to the facility because of a staged construction schedule, state the stage of construction being described here with the appropriate general action code. Submit a separate Section III for each stage of construction planned. Also, list all the 3-character (Specific Action) codes which describe in more detail the pollution abatement practices that the implementation schedule requires.

   - 3-character general action description — 301c ______
   - 3-character specific action descriptions — 301d ______/______/______/______

2. **Implementation Schedule and 3. Actual Completion Dates**

Provide dates imposed by schedule and any actual dates of completion for implementation steps listed below. Indicate dates as accurately as possible. (see instructions)

Implementation Steps		2. Schedule (Yr /Mo /Day)		3. Actual Completion (Yr /Mo /Day)
a. Preliminary plan complete	302a	____/____/____	303a	____/____/____
b. Final plan complete	302b	____/____/____	303b	____/____/____
c. Financing complete & contract awarded	302c	____/____/____	303c	____/____/____
d. Site acquired	302d	____/____/____	303d	____/____/____
e. Begin construction	302e	____/____/____	303e	____/____/____
f. End construction	302f	____/____/____	303f	____/____/____
g. Begin Discharge	302g	____/____/____	303g	____/____/____
h. Operational level attained	302h	____/____/____	303h	____/____/____

FORM APPROVED
OMB No. 158–R0100

FOR AGENCY USE

STANDARD FORM A—MUNICIPAL

SECTION IV. INDUSTRIAL WASTE CONTRIBUTION TO MUNICIPAL SYSTEM

Submit a description of each major industrial facility discharging to the municipal system, using a separate Section IV for each facility description. Indicate the 4 digit Standard Industrial Classification (SIC) Code for the industry, the major product or raw material, the flow (in thousand gallons per day), and the characteristics of the wastewater discharged from the industrial facility into the municipal system. Consult Table III for standard measures of products or raw materials. (see instructions)

1. **Major Contributing Facility** (see instructions)

Name	401a	We Are Milk
Number & Street	401b	
City	401c	Otisburg
County	401d	
State	401e	
Zip Code	401f	

2. **Primary Standard Industrial Classification Code** (see instructions) — 402: 202

3. **Principal Product or Raw Material** (see instructions)

				Quantity		Units (See Table III)
Product	403a	Milk	403c		403e	
Raw Material	403b	Cows	403d		403f	

4. **Flow** Indicate the volume of water discharged into the municipal system in thousand gallons per day and whether this discharge is intermittent or continuous.

404a 100 thousand gallons per day

404b ☐ Intermittent (int) ☒ Continuous (con)

5. **Pretreatment Provided** Indicate if pretreatment is provided prior to entering the municipal system

405 ☒ Yes ☐ No

6. **Characteristics of Wastewater** (see instructions)

406a	Parameter Name	BOD	TSS	O & G				
	Parameter Number	00310	00530	---				
406b	Value	300 mg/l	200 mg/l	60 mg/l				

FORM APPROVE
OMB No. 158-R0

FOR AGENCY USE

STANDARD FORM A—MUNICIPAL

SECTION IV. INDUSTRIAL WASTE CONTRIBUTION TO MUNICIPAL SYSTEM

Submit a description of each major industrial facility discharging to the municipal system, using a separate Section IV for each facility description. Indicate the 4 digit Standard Industrial Classification (SIC) Code for the industry, the major product or raw material, the flow (in thousand gallons per day), and the characteristics of the wastewater discharged from the industrial facility into the municipal system. Consult Table III for standard measures of products or raw materials. (see instructions)

1. **Major Contributing Facility** (see instructions)

Name	401a	The Metal Finishing Shop
Number & Street	401b	
City	401c	Otisburg
County	401d	
State	401e	
Zip Code	401f	

2. **Primary Standard Industrial Classification Code** (see instructions) — 402: 3479

3. **Principal Product or Raw Material** (see instructions)

				Quantity		Units (See Table III)
Product	403a	Miscellaneous Jewelry Products	403c		403e	
Raw Material	403b	Silver, Copper, Lead	403d		403f	

4. **Flow** Indicate the volume of water discharged into the municipal system in thousand gallons per day and whether this discharge is intermittent or continuous.

404a: 20 thousand gallons per day

404b: ☒ Intermittent (int) ☐ Continuous (con)

5. **Pretreatment Provided** Indicate if pretreatment is provided prior to entering the municipal system

405: ☒ Yes ☐ No

6. **Characteristics of Wastewater** (see instructions)

406a	Parameter Name	Ag	Cu	Pb	Zn			
	Parameter Number	01077	01042	01051	01092			
406b	Value	0.06	0.5	1.2	1.3			

FORM APPROVE
OMB No. 158-R01

FOR AGENCY USE

STANDARD FORM A—MUNICIPAL

SECTION IV. INDUSTRIAL WASTE CONTRIBUTION TO MUNICIPAL SYSTEM

Submit a description of each major industrial facility discharging to the municipal system, using a separate Section IV for each facility description. Indicate the 4 digit Standard Industrial Classification (SIC) Code for the industry, the major product or raw material, the flow (in thousand gallons per day), and the characteristics of the wastewater discharged from the industrial facility into the municipal system. Consult Table III for standard measures of products or raw materials. (see instructions)

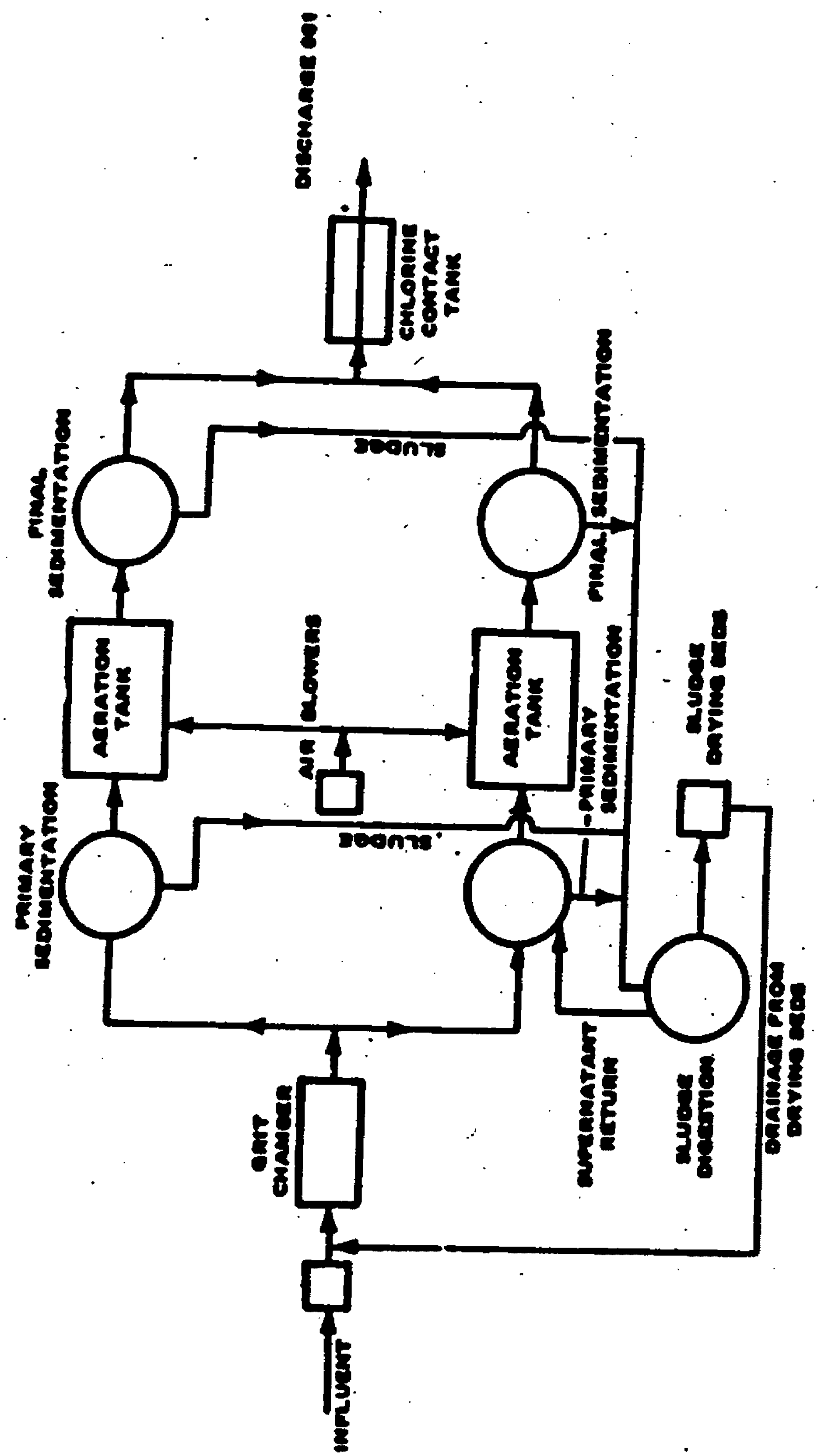
1. Major Contributing Facility (see instructions)
   - Name — 401a — Electroplating, Inc.
   - Number & Street — 401b —
   - City — 401c — Otisburg
   - County — 401d —
   - State — 401e —
   - Zip Code — 401f —
2. Primary Standard Industrial Classification Code (see instructions) — 402 — 3479
3. Principal Product or Raw Material (see instructions)

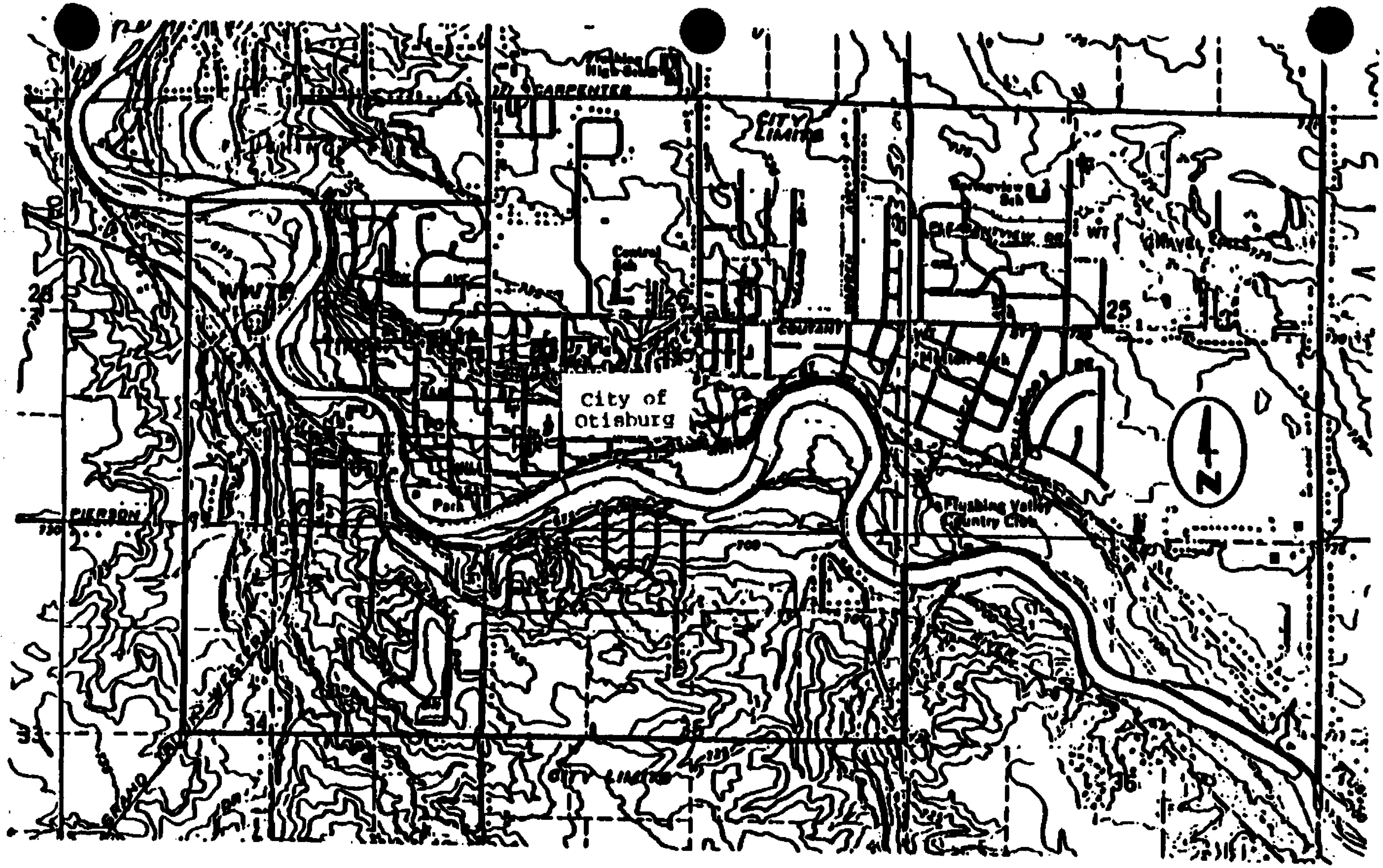
			Quantity		Units (See Table III)
Product	403a Automotive Parts	403c	1000	403e	ft^2/da.
Raw Material	403b Bumpers (steel)	403d		403f	

4. Flow Indicate the volume of water discharged into the municipal system in thousand gallons per day and whether this discharge is intermittent or continuous.
   - 404a — 100 thousand gallons per day
   - 404b — ☐ Intermittent (int) ☒ Continuous (con)
5. Pretreatment Provided Indicate if pretreatment is provided prior to entering the municipal system — 405 — ☒ Yes ☐ No
6. Characteristics of Wastewater (see instructions)

	Parameter Name	Cu	Pb	Zn	Cd			
406a	Parameter Number	01042	01051	01092	01027			
406b	Value	1.2	0.8	0.9	1.1			

13. Required Line Drawing - Schematic of Wastewater Flow - Otisburg





SCALE 1:24000

1 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 5 FEET
DATUM IS MEAN SEA LEVEL

7.5 MINUTE SERIES (TOPOGRAPHIC)

MUNICIPAL PERMIT WRITING EXERCISE
Application Review

Instructions:

In preparing for development of an NPDES permit for the Otisburg municipal wastewater treatment facility, you must first review the submitted permit application. Review the attached NPDES application forms and determine the following:

1. Are the application forms accurate and complete? If no, what additional information is needed?

2. For which parameters must you establish technology-based effluent limits (specifically)?

3. For which parameters must you establish water quality-based effluent limits (generally)?

4. What additional information, if any, would you need to begin development of the NPDES permit conditions?

5. What is the next step in developing NPDES permit conditions?

MUNICIPAL PERMIT WRITING EXERCISE
Developing Effluent Limits
Technology-Based Limits Worksheet

The final technology-based effluent limits are:

TECHNOLOGY-BASED EFFLUENT LIMITS

Parameter	Daily Max.		7-Day Average		30-Day Average	
	Conc. (ug/l)	Mass (lb/day)	Conc. (ug/l)	Mass (lb/day)	Conc. (ug/l)	Mass (lb/day)

MUNICIPAL PERMIT WRITING EXERCISE
Developing Effluent Limits (Cont.)
Water Quality-Based Limits Worksheet

Receiving Water Information

A search of the EPA STORET database identified a monitoring station on Pristine Creek less than 1 mile upstream from the Otisburg outfall. The data extracted for the last 6 years include:

Parameter	Minimum Concentration (ug/l)	Maximum Concentration (ug/l)	Number of Data Points
Copper	2.0	8.0	24
Cadmium	1.0	1.0	1
Chromium (total)	20.1	23.3	6
Lead	11.1	13.5	6
Nickel	39.4	41.6	6
Zinc	14.7	15.1	24
pH	6.9 s.u.	7.5 s.u.	24

Current United States Geological Survey (USGS) flow guage data for Pristine Creek, provided the following information [NOTE: 1 MGD = 1.55 cfs]:

1Q10 = 50 cfs
7Q10 = 80 cfs
Harmonic Mean = 150 cfs

Summary of Effluent Data for Copper from Application and DMR

$C_{d(1)} = 0.048$ mg/l $C_{d(4)} = 0.045$
$C_{d(2)} = 0.032$ mg/l $C_{d(5)} = 0.022$
$C_{d(3)} = 0.039$ mg/l $C_{d(6)} = 0.037$

[Note: Less than 10 observations; therefore, use default CV = 0.6]

MUNICIPAL PERMIT WRITING EXERCISE
Developing Effluent Limits (Cont.)
Water Quality-Based Limits Worksheet

<u>Summary of State Water Quality Standards</u>

The following designated uses apply to Pristine Creek:

- Warmwater habitat
- Agricultural and industrial water supply
- Primary contact recreation

The State Water Quality Criteria applicable to these uses are provided in the following Table:

APPLICABLE STATE WATER QUALITY STANDARDS

Paramter	Units	Aquatic Life		Human Health
		Acute	Chronic	
Total Residual Chlorine	ug/l	19	11	--
Whole Effluent Toxicity	TUx	0.3 TUa	1.0 TUc	--
Cadmium	ug/l	12	3	10
Copper	ug/l	18	12	1000
Chromium (Total)	ug/l	3,000	500	50
Lead	ug/l	320	20	50
Nickel	ug/l	800	95	600
Zinc	ug/l	220	150	5,000
pH	s.u.	Within range of 6.5 to 9		

For the purposes of determining reasonable potential and developing wasteload allocations, the following design stream flows shall be used:

1. 1-day, 10-year (1Q10) flow for acute protection of aquatic life
2. 7-day, 10 year (7Q10) flow for chronic protection of aquatic life
3. Harmonic Mean Flow for protection of human health.

MUNICIPAL PERMIT WRITING EXERCISE

Developing Effluent Limits (Cont.)

Water Quality-Based Limits Worksheet

Table 3-1 from the EPA *Technical Support Document*

Number of Samples	Coefficient of Variation 0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0
1	1.6	2.5	3.9	6.0	9.0	13.2	18.9	26.5	36.2	48.3	63.3	81.4	102.8	128.0	157.1	190.3	227.8	269.9	316.7	368.3
2	1.4	2.0	2.9	4.0	5.5	7.4	9.8	12.7	16.1	20.2	24.9	30.3	36.3	43.0	50.4	58.4	67.2	76.6	86.7	97.5
3	1.4	1.9	2.5	3.3	4.4	5.6	7.2	8.9	11.0	13.4	16.0	19.0	22.2	25.7	29.4	33.5	37.7	42.3	47.0	52.0
4	1.3	1.7	2.3	2.9	3.8	4.7	5.9	7.2	8.7	10.3	12.2	14.2	16.3	18.6	21.0	23.6	26.3	29.1	32.1	35.1
5	1.3	1.7	2.1	2.7	3.4	4.2	5.1	6.2	7.3	8.6	10.0	11.5	13.1	14.8	16.6	18.4	20.4	22.4	24.5	26.6
6	1.3	1.6	2.0	2.5	3.1	3.8	4.6	5.5	6.4	7.5	8.6	9.8	11.1	12.4	13.8	15.3	16.8	18.3	19.9	21.5
7	1.3	1.6	2.0	2.4	2.9	3.6	4.2	5.0	5.8	6.7	7.7	8.7	9.7	10.8	12.0	13.1	14.4	15.6	16.9	18.2
8	1.2	1.5	1.9	2.3	2.8	3.3	3.9	4.6	5.3	6.1	6.9	7.8	8.7	9.6	10.6	11.6	12.6	13.6	14.7	15.8
9	1.2	1.5	1.8	2.2	2.7	3.2	3.7	4.3	5.0	5.7	6.4	7.1	7.9	8.7	9.6	10.4	11.3	12.2	13.1	14.0
10	1.2	1.5	1.8	2.2	2.6	3.0	3.5	4.1	4.7	5.3	5.9	6.6	7.3	8.0	8.8	9.5	10.3	11.0	11.8	12.6
11	1.2	1.5	1.8	2.1	2.5	2.9	3.4	3.9	4.4	5.0	5.6	6.2	6.8	7.4	8.1	8.8	9.4	10.1	10.8	11.5
12	1.2	1.4	1.7	2.0	2.4	2.8	3.2	3.7	4.2	4.7	5.2	5.8	6.4	7.0	7.5	8.1	8.8	9.4	10.0	10.6
13	1.2	1.4	1.7	2.0	2.3	2.7	3.1	3.6	4.0	4.5	5.0	5.5	6.0	6.5	7.1	7.6	8.2	8.7	9.3	9.9
14	1.2	1.4	1.7	2.0	2.3	2.6	3.0	3.4	3.9	4.3	4.8	5.2	5.7	6.2	6.7	7.2	7.7	8.2	8.7	9.2
15	1.2	1.4	1.6	1.9	2.2	2.6	2.9	3.3	3.7	4.1	4.6	5.0	5.4	5.9	6.4	6.8	7.3	7.7	8.2	8.7
16	1.2	1.4	1.6	1.9	2.2	2.5	2.9	3.2	3.6	4.0	4.4	4.8	5.2	5.6	6.1	6.5	6.9	7.3	7.8	8.2
17	1.2	1.4	1.6	1.9	2.1	2.5	2.8	3.1	3.5	3.8	4.2	4.6	5.0	5.4	5.8	6.2	6.6	7.0	7.4	7.8
18	1.2	1.4	1.6	1.8	2.1	2.4	2.7	3.0	3.4	3.7	4.1	4.4	4.8	5.2	5.6	5.9	6.3	6.7	7.0	7.4
19	1.2	1.4	1.6	1.8	2.1	2.4	2.7	3.0	3.3	3.6	4.0	4.3	4.6	5.0	5.3	5.7	6.0	6.4	6.7	7.1
20	1.2	1.3	1.6	1.8	2.0	2.3	2.6	2.9	3.2	3.5	3.8	4.2	4.5	4.8	5.2	5.5	5.8	6.1	6.5	6.8

Table 5-1 from the EPA *Technical Support Document*:

Table 5-1. Back Calculations of Long-Term Average

CV	WLA Multipliers $e^{[0.5\sigma^2 - z\sigma]}$ 95th Percentile	99th Percentile
0.1	0.853	0.797
0.2	0.736	0.643
0.3	0.644	0.527
0.4	0.571	0.440
0.5	0.514	0.373
0.6	0.468	0.321
0.7	0.432	0.281
0.8	0.403	0.249
0.9	0.379	0.224
1.0	0.360	0.204
1.1	0.344	0.187
1.2	0.330	0.174
1.3	0.319	0.162
1.4	0.310	0.153
1.5	0.302	0.144
1.6	0.296	0.137
1.7	0.290	0.131
1.8	0.285	0.126
1.9	0.281	0.121
2.0	0.277	0.117

Acute

$$LTA_{a,c} = WLA_{a,c} \cdot e^{[0.5\sigma^2 - z\sigma]}$$

where $\sigma^2 = ln[CV^2 + 1]$,
$z = 1.645$ for 95th percentile occurrence probability, and
$z = 2.326$ for 99th percentile occurrence probability

Chronic (4-day average)

$$LTA_c = WLA_c \cdot e^{[0.5\sigma_4^2 - z\sigma_4]}$$

where $\sigma_4^2 = ln[CV^2/4 + 1]$,
$z = 1.645$ for 95th percentile occurrence probability, and
$z = 2.326$ for 99th percentile occurrence probability

CV	WLA Multipliers $e^{[0.5\sigma_4^2 - z\sigma_4]}$ 95th Percentile	99th Percentile
0.1	0.922	0.891
0.2	0.853	0.797
0.3	0.791	0.715
0.4	0.736	0.643
0.5	0.687	0.581
0.6	0.644	0.527
0.7	0.606	0.481
0.8	0.571	0.440
0.9	0.541	0.404
1.0	0.514	0.373
1.1	0.490	0.345
1.2	0.468	0.321
1.3	0.449	0.300
1.4	0.432	0.281
1.5	0.417	0.264
1.6	0.403	0.249
1.7	0.390	0.236
1.8	0.379	0.224
1.9	0.369	0.214
2.0	0.360	0.204

MUNICIPAL PERMIT WRITING EXERCISE

Developing Effluent Limits (Cont.)
Water Quality-Based Limits Worksheet

<u>Table 5-2 from the EPA *Technical Support Document*:</u>

Table 5-2. Calculation of Permit Limits

Maximum Daily Limit

CV	LTA multipliers $e^{[z\sigma - 0.5\sigma^2]}$ 95th Percentile	LTA multipliers $e^{[z\sigma - 0.5\sigma^2]}$ 99th Percentile
0.1	1.17	1.25
0.2	1.36	1.55
0.3	1.55	1.90
0.4	1.75	2.27
0.5	1.95	2.68
0.6	2.13	3.11
0.7	2.31	3.56
0.8	2.48	4.01
0.9	2.64	4.46
1.0	2.78	4.90
1.1	2.91	5.34
1.2	3.03	5.76
1.3	3.13	6.17
1.4	3.23	6.56
1.5	3.31	6.93
1.6	3.38	7.29
1.7	3.45	7.63
1.8	3.51	7.95
1.9	3.56	8.26
2.0	3.60	8.55

$$MDL = LTA \cdot e^{[z\sigma - 0.5\sigma^2]}$$

where $\sigma^2 = \ln[CV^2 + 1]$,
$z = 1.645$ for 95th percentile occurrence probability, and
$z = 2.326$ for 99th percentile occurrence probability

Average Monthly Limit

$$AML = LTA \cdot e^{[z\sigma_n - 0.5\sigma_n^2]}$$

where $\sigma_n^2 = \ln[CV^2/n + 1]$,
$z = 1.645$ for 95th percentile,
$z = 2.326$ for 99th percentile, and
n = number of samples/month

CV	LTA Multipliers $e^{[z\sigma_n - 0.5\sigma_n^2]}$ 95th Percentile					99th Percentile				
	n=1	n=2	n=4	n=10	n=30	n=1	n=2	n=4	n=10	n=30
0.1	1.17	1.12	1.08	1.06	1.03	1.25	1.18	1.12	1.08	1.04
0.2	1.36	1.25	1.17	1.12	1.06	1.55	1.37	1.25	1.16	1.09
0.3	1.55	1.38	1.26	1.18	1.09	1.90	1.59	1.40	1.24	1.13
0.4	1.75	1.52	1.36	1.25	1.12	2.27	1.83	1.55	1.33	1.18
0.5	1.95	1.66	1.45	1.31	1.16	2.68	2.09	1.72	1.42	1.23
0.6	2.13	1.80	1.55	1.38	1.19	3.11	2.37	1.90	1.52	1.28
0.7	2.31	1.94	1.65	1.45	1.22	3.56	2.66	2.08	1.62	1.33
0.8	2.48	2.07	1.75	1.52	1.26	4.01	2.96	2.27	1.73	1.39
0.9	2.64	2.20	1.85	1.59	1.29	4.46	3.28	2.48	1.84	1.44
1.0	2.78	2.33	1.96	1.66	1.33	4.90	3.59	2.68	1.96	1.50
1.1	2.91	2.45	2.04	1.73	1.36	5.34	3.91	2.90	2.07	1.56
1.2	3.03	2.56	2.13	1.80	1.39	5.76	4.23	3.11	2.19	1.62
1.3	3.13	2.67	2.23	1.87	1.43	6.17	4.55	3.34	2.32	1.68
1.4	3.23	2.77	2.31	1.94	1.47	6.56	4.86	3.56	2.45	1.74
1.5	3.31	2.86	2.40	2.00	1.50	6.93	5.17	3.78	2.58	1.80
1.6	3.38	2.95	2.48	2.07	1.54	7.29	5.47	4.01	2.71	1.87
1.7	3.45	3.03	2.56	2.14	1.57	7.63	5.77	4.23	2.84	1.93
1.8	3.51	3.10	2.64	2.20	1.61	7.95	6.06	4.46	2.98	2.00
1.9	3.56	3.17	2.71	2.27	1.64	8.26	6.34	4.68	3.12	2.07
2.0	3.60	3.23	2.78	2.33	1.68	8.55	6.61	4.90	3.26	2.14

<u>**Work Space:**</u>

MUNICIPAL PERMIT WRITING EXERCISE
Developing Effluent Limits (Cont.)
Water Quality-Based Limits Worksheet

Work Space:

MUNICIPAL PERMIT WRITING EXERCISE
Developing Effluent Limits (Cont.)
Water Quality-Based Limits Worksheet

Work Space:

WATER QUALITY-BASED EFFLUENT LIMITS

Parameter	Daily Max.		7-Day Average		30-Day Average	
	Conc.	Mass	Conc.	Mass	Conc.	Mass

MUNICIPAL PERMIT WRITING EXERCISE
Developing Effluent Limits

Instructions:

Complete the table based on the calculations performed above Provide a <u>brief</u> justification for each parameter for which limits are required below. If limits are not required or are not appropriate for a parameter, also provide a brief justification below. (Be sure to indicate the appropriate units.)

FINAL EFFLUENT LIMITS

<table>
<tr><th rowspan="2">Parameter</th><th colspan="2">Daily Max.</th><th colspan="2">7-Day Average</th><th colspan="2">30-Day Average</th></tr>
<tr><th>Conc. (ug/l)</th><th>Mass (lb/day)</th><th>Conc. (ug/l)</th><th>Mass (lb/day)</th><th>Conc. (ug/l)</th><th>Mass (lb/day)</th></tr>
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</table>

JUSTIFICATION FOR EFFLUENT LIMITS

Parameter	Justification

MUNICIPAL PERMIT WRITING EXERCISE
Developing Monitoring Conditions

Instructions:

Complete the following Table by developing appropriate monitoring frequencies and sample types for each of the parameters for which effluent limits were established. Provide a brief justification for each decision.

MONITORING FREQUENCIES

Parameter	Monitoring Frequency	Sample Type	Justification

What sample location(s) would be specified in the permit? Do any parameters require any unique sampling requirements (i.e., special sampling location)?

MUNICIPAL PERMIT WRITING EXERCISE
Developing Special Conditions

Questions:

1. Should the facility be required to develop a Pretreatment Program? Provide a brief justification for your decision.

2. What special conditions should the NPDES permit include regarding the discharges from the electroplating facilities?

3. What other special conditions might be included in the permit for this facility?

Please print or type in the unshaded areas only (fill—in areas are spaced for elite type, i.e., 12 characters/inch).

Form Approved. OMB No. 2040-0086 Approval expires 7-31

FORM 1 GENERAL — EPA — U.S. ENVIRONMENTAL PROTECTION AGENCY

GENERAL INFORMATION

Consolidated Permits Program

(Read the "General Instructions" before starting.)

I. EPA I.D. NUMBER

F

LABEL ITEMS

I. EPA I.D. NUMBER

III. FACILITY NAME

V. FACILITY MAILING ADDRESS

VI. FACILITY LOCATION

PLEASE PLACE LABEL IN THIS SPACE

GENERAL INSTRUCTIONS

If a preprinted label has been provided, a it in the designated space. Review the info ation carefully; if any of it is incorrect, c through it and enter the correct data in appropriate fill—in area below. Also, if any the preprinted data is absent *(the area to left of the label space lists the informat that should appear)*, please provide it in proper fill—in area(s) below. If the label complete and correct, you need not compl Items I, III, V, and VI *(except VI-B wh must be completed regardless)*. Complete items if no label has been provided. Refer the instructions for detailed item desc tions and for the legal authorizations un which this data is collected.

II. POLLUTANT CHARACTERISTICS

INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of bold—faced terms.

SPECIFIC QUESTIONS	YES	NO	FORM ATTACHED	SPECIFIC QUESTIONS	YES	NO	FORM ATTACHED
A. Is this facility a **publicly owned treatment works** which results in a **discharge** to **waters of the U.S.**? (FORM 2A)		X		B. Does or will this facility *(either existing or proposed)* include a **concentrated animal feeding operation** or **aquatic animal production facility** which results in a **discharge** to **waters of the U.S.**? (FORM 2B)		X	
C. Is this a facility which currently results in **discharges** to **waters of the U.S.** other than those described in A or B above? (FORM 2C)	X			D. Is this a proposed facility *(other than those described in A or B above)* which will result in a **discharge** to **waters of the U.S.**? (FORM 2D)		X	
E. Does or will this facility treat, store, or dispose of **hazardous wastes**? (FORM 3)		X		F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)		X	
G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)		X		H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)		X	
I. Is this facility a **proposed stationary source** which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an **attainment area**? (FORM 5)		X		J. Is this facility a **proposed stationary source** which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an **attainment area**? (FORM 5)		X	

III. NAME OF FACILITY

1 SKIP HIDES R US

IV. FACILITY CONTACT

A. NAME & TITLE (last, first, & title)	B. PHONE (area code & no.)
2 HYDE JECKYL PRESIDENT	333 666 1234

V. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX

3 P. O. BOX 78

B. CITY OR TOWN	C. STATE	D. ZIP CODE
4 ANYTOWN		21212

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER

5 555 LEATHER STREET

B. COUNTY NAME

RAWHIDE

C. CITY OR TOWN	D. STATE	E. ZIP CODE	F. COUNTY CODE (if known)
6 ANYTOWN		21212	

CONTINUED FROM THE FRONT

VII. SIC CODES *(4-digit, in order of priority)*

A. FIRST		B. SECOND	
7 3111	*(specify)* LEATHER PRODUCTS	7	*(specify)*
C. THIRD		**D. FOURTH**	
7	*(specify)*	7	*(specify)*

VIII. OPERATOR INFORMATION

A. NAME

8 JECKYL HYDE

B. Is the name listed in Item VIII-A also the owner? ☒ YES ☐ NO

C. STATUS OF OPERATOR *(Enter the appropriate letter into the answer box; if "Other", specify.)*

F = FEDERAL
S = STATE
P = PRIVATE
M = PUBLIC *(other than federal or state)*
O = OTHER *(specify)*

(specify)

D. PHONE *(area code & no.)*

A 212 567 8901

E. STREET OR P.O. BOX

P.O. BOX 78

F. CITY OR TOWN	G. STATE	H. ZIP CODE
B ANYTOWN		21212

IX. INDIAN LAND

Is the facility located on Indian lands? ☐ YES ☒ NO

X. EXISTING ENVIRONMENTAL PERMITS

A. NPDES *(Discharges to Surface Water)*	D. PSD *(Air Emissions from Proposed Sources)*	
9 N	9 P	
B. UIC *(Underground Injection of Fluids)*	**E. OTHER** *(specify)*	
9 U	9	*(specify)*
C. RCRA *(Hazardous Wastes)*	**E. OTHER** *(specify)*	
9 R	9	*(specify)*

XI. MAP

Attach to this application a topographic map of the area extending to at least one mile beyond property bounderies. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in the map area. See instructions for precise requirements.

XII. NATURE OF BUSINESS *(provide a brief description)*

MANUFACTURER OF LEATHER GLOVES FROM PIGSKINS AND SHEEPSKINS

XIII. CERTIFICATION *(see instructions)*

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE *(type or print)*	B. SIGNATURE	C. DATE SIGNED

COMMENTS FOR OFFICIAL USE ONLY

C

Please print or type in the unshaded areas only.

EPA I.D. NUMBER (copy from Item 1 of Form 1)

OMB No. 2040-0086
Approval expires 7-31-88

FORM 2C NPDES

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY
APPLICATION FOR PERMIT TO DISCHARGE WASTEWATER
EXISTING MANUFACTURING, COMMERCIAL, MINING AND SILVICULTURAL OPERATIONS
Consolidated Permits Program

I. OUTFALL LOCATION

For each outfall, list the latitude and longitude of its location to the nearest 15 seconds and the name of the receiving water.

A. OUTFALL NUMBER (list)	B. LATITUDE 1. DEG.	2. MIN.	3. SEC.	C. LONGITUDE 1. DEG.	2. MIN.	3. SEC.	D. RECEIVING WATER (name)
001							PRISTINE CREEK

II. FLOWS, SOURCES OF POLLUTION, AND TREATMENT TECHNOLOGIES

A. Attach a line drawing showing the water flow through the facility. Indicate sources of intake water, operations contributing wastewater to the effluent, and treatment units labeled to correspond to the more detailed descriptions in Item B. Construct a water balance on the line drawing by showing average flows between intakes, operations, treatment units, and outfalls. If a water balance cannot be determined (*e.g., for certain mining activities*), provide a pictorial description of the nature and amount of any sources of water and any collection or treatment measures.

B. For each outfall, provide a description of: (1) All operations contributing wastewater to the effluent, including process wastewater, sanitary wastewater, cooling water, and storm water runoff; (2) The average flow contributed by each operation; and (3) The treatment received by the wastewater. Continue on additional sheets if necessary.

1. OUT-FALL NO (list)	2. OPERATION(S) CONTRIBUTING FLOW: a. OPERATION (list)	b. AVERAGE FLOW (include units)	3. TREATMENT: a. DESCRIPTION	b. LIST CODES FROM TABLE 2C-1	
	SHEEPSKIN	50,000 gpd	PRIMARY CLARIFICATION	1-T	1-U
001	PIGSKIN	100,000 gpd	SULFIDE PRECIPITATION	2-C	
			EXTENDED AERATION	3-A	

OFFICIAL USE ONLY (effluent guidelines sub-categories)

CONTINUED FROM THE FRONT

C. Except for storm runoff, leaks, or spills, are any of the discharges described in Items II-A or B intermittent or seasonal?

☐ YES (complete the following table) ☐ NO (go to Section III)

1. OUTFALL NUMBER (list)	2. OPERATION(s) CONTRIBUTING FLOW (list)	3. FREQUENCY a. DAYS PER WEEK (specify average)	3. FREQUENCY b. MONTHS PER YEAR (specify average)	4. FLOW a. FLOW RATE (in mgd) 1. LONG TERM AVERAGE	4. FLOW a. FLOW RATE (in mgd) 2. MAXIMUM DAILY	4. FLOW b. TOTAL VOLUME (specify with units) 1. LONG TERM AVERAGE	4. FLOW b. TOTAL VOLUME (specify with units) 2. MAXIMUM DAILY	c.

III. PRODUCTION

A. Does an effluent guideline limitation promulgated by EPA under Section 304 of the Clean Water Act apply to your facility?

☒ YES (complete Item III-B) ☐ NO (go to Section IV)

B. Are the limitations in the applicable effluent guideline expressed in terms of production (or other measure of operation)?

☒ YES (complete Item III-C) ☐ NO (go to Section IV)

C. If you answered "yes" to Item III-B, list the quantity which represents an actual measurement of your level of production, expressed in the terms and units used in the applicable effluent guideline, and indicate the affected outfalls.

1. AVERAGE DAILY PRODUCTION a. QUANTITY PER DAY	b. UNITS OF MEASURE	c. OPERATION, PRODUCT, MATERIAL, ETC. (specify)	2. AFFECTED OUTFALLS (list outfall numbers)
12,000	lbs/day	SHEEPSKINS	001
52,000	lbs/day	PIGSKINS	001

IV. IMPROVEMENTS

A. Are you now required by any Federal, State or local authority to meet any implementation schedule for the construction, upgrading or operation of waste-water treatment equipment or practices or any other environmental programs which may affect the discharges described in this application? This includes, but is not limited to, permit conditions, administrative or enforcement orders, enforcement compliance schedule letters, stipulations, court orders, and grant or loan conditions.

☐ YES (complete the following table) ☒ NO (go to Item IV-B)

1. IDENTIFICATION OF CONDITION, AGREEMENT, ETC.	2. AFFECTED OUTFALLS a. NO.	2. AFFECTED OUTFALLS b. SOURCE OF DISCHARGE	3. BRIEF DESCRIPTION OF PROJECT	4. FINAL COMPLIANCE DATE a. REQUIRED	4. FINAL COMPLIANCE DATE b. PROJECTED

B. OPTIONAL: You may attach additional sheets describing any additional water pollution control programs (or other environmental projects which may affect your discharges) you now have underway or which you plan. Indicate whether each program is now underway or planned, and indicate your actual or planned schedules for construction. ☐ MARK "X" IF DESCRIPTION OF ADDITIONAL CONTROL PROGRAMS IS ATTACHED

 CONTINUE ON PAGE 3

CONTINUED FROM PAGE 2

EPA I.D. NUMBER (copy from Item 1 of Form 1)

Form Approved.
OMB No. 2040-0086
Approval expires 7-31-88

V. INTAKE AND EFFLUENT CHARACTERISTICS

A, B, & C: See instructions before proceeding — Complete one set of tables for each outfall — Annotate the outfall number in the space provided.
NOTE: Tables V-A, V-B, and V-C are included on separate sheets numbered V-1 through V-9.

D. Use the space below to list any of the pollutants listed in Table 2c-3 of the instructions, which you know or have reason to believe is discharged or may be discharged from any outfall. For every pollutant you list, briefly describe the reasons you believe it to be present and report any analytical data in your possession.

1. POLLUTANT	2. SOURCE	1. POLLUTANT	2. SOURCE

VI. POTENTIAL DISCHARGES NOT COVERED BY ANALYSIS

Is any pollutant listed in Item V-C a substance or a component of a substance which you currently use or manufacture as an intermediate or final product or byproduct?

☐ YES *(list all such pollutants below)* ☒ NO *(go to Item VI-B)*

CONTINUED FROM THE FRONT

VII. BIOLOGICAL TOXICITY TESTING DATA

Do you have any knowledge or reason to believe that any biological test for acute or chronic toxicity has been made on any of your discharges or on a receiving water in relation to your discharge within the last 3 years?

☐ YES (identify the test(s) and describe their purposes below) ☐ NO (go to Section VIII)

VIII. CONTRACT ANALYSIS INFORMATION

Were any of the analyses reported in Item V performed by a contract laboratory or consulting firm?

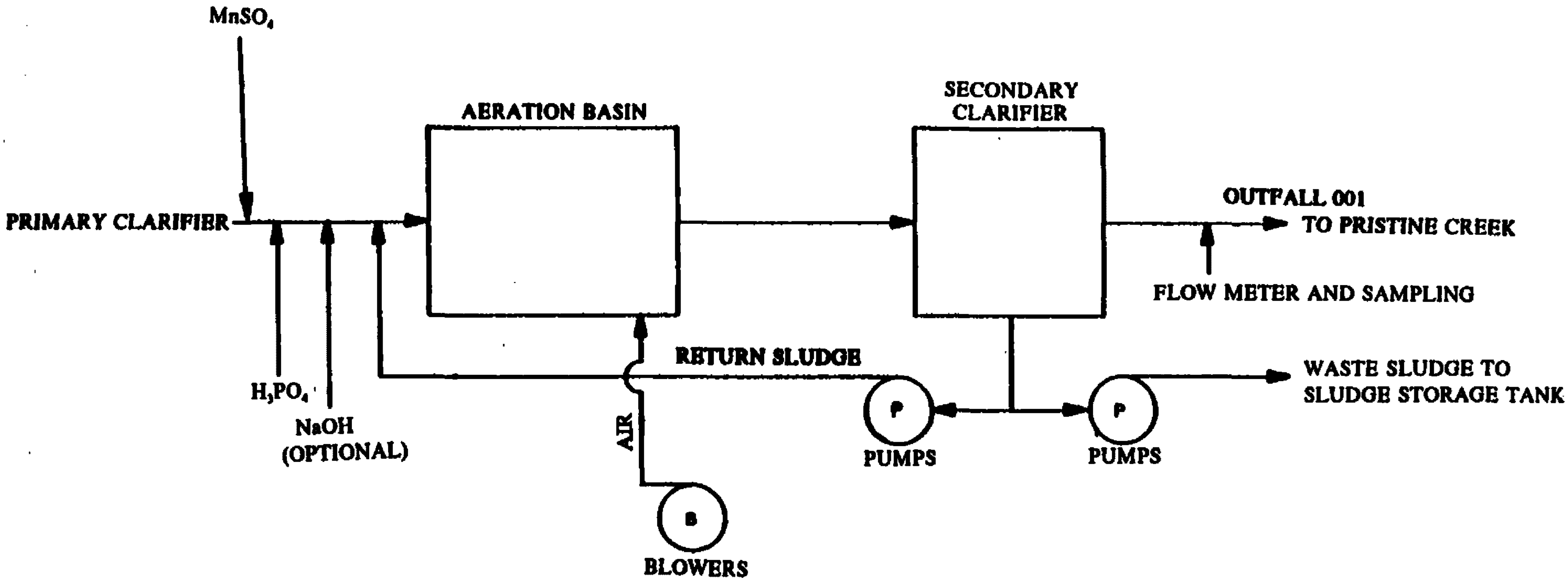
☒ YES (list the name, address, and telephone number of, and pollutants analyzed by, each such laboratory or firm below) ☐ NO (go to Section IX)

A. NAME	B. ADDRESS	C. TELEPHONE (area code & no.)	D. POLLUTANTS ANALYZE (list)
ANALYTICAL SERVICES	666 TEST DRIVE ANYTOWN	(212) 891-7034	CHROMIUM BOD TSS AMMONIA SULFIDE COD TOC

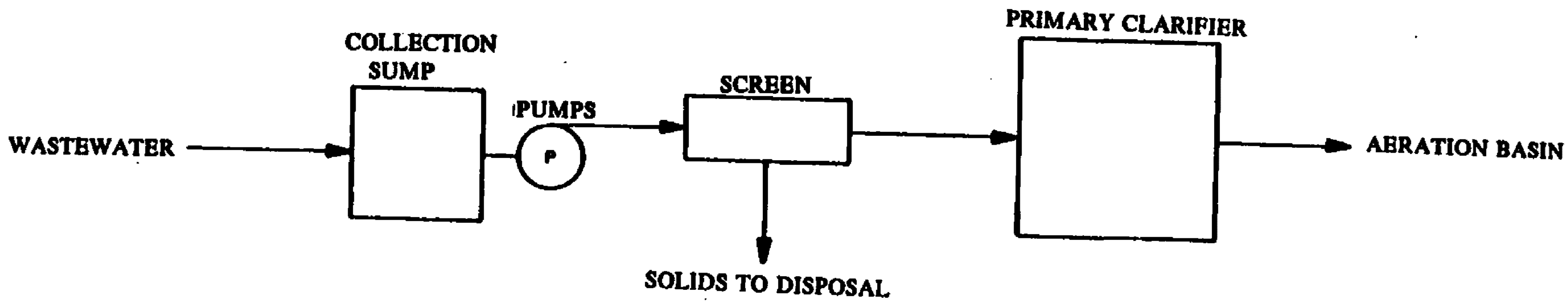
IX CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

A. NAME & OFFICIAL TITLE (type or print)	B. PHONE NO. (area code & no.)
C. SIGNATURE	D. DATE SIGNED

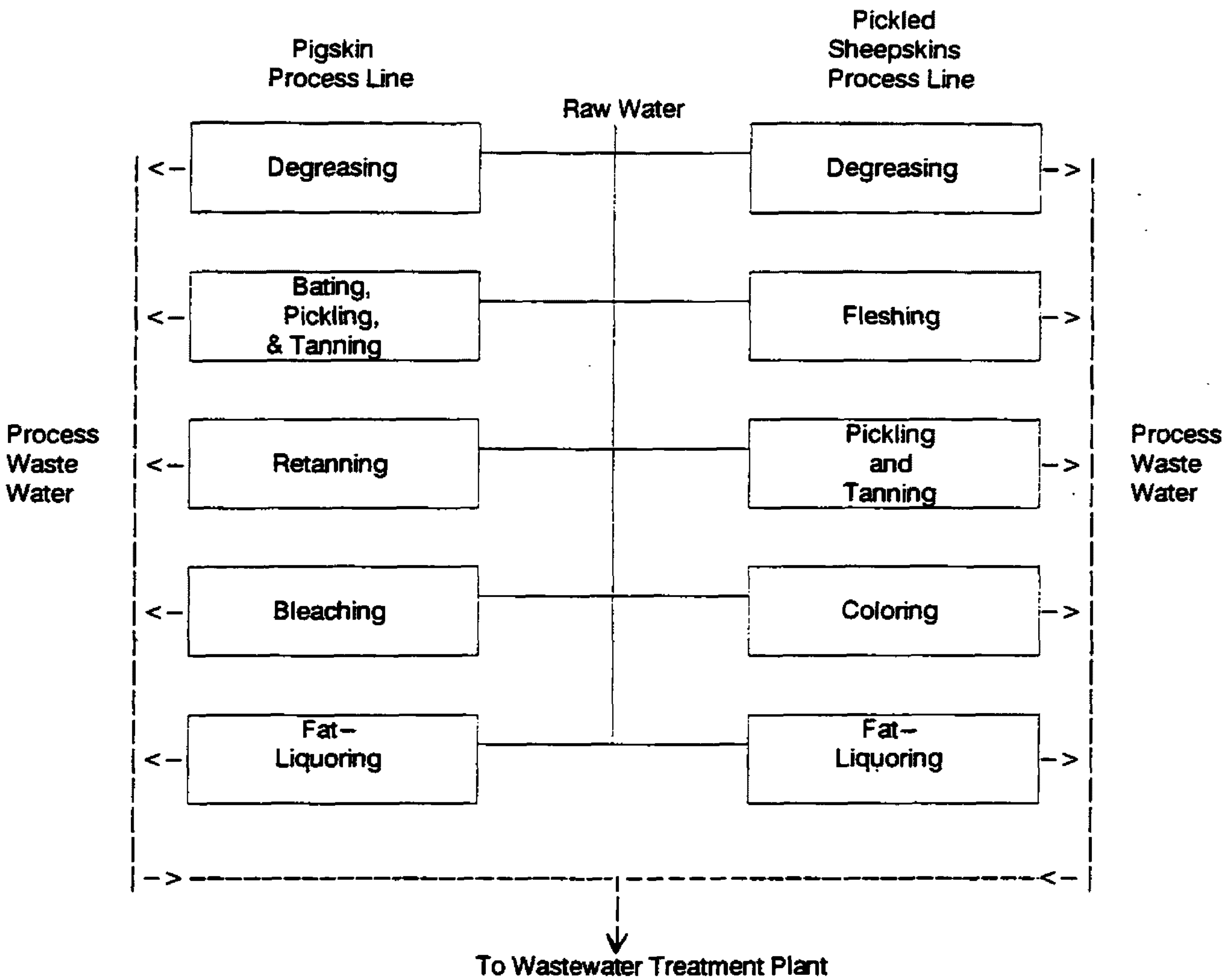


SCHEMATIC LAYOUT FOR ACTIVATED SLUDGE (EXTENDED AERATION)


WASTEWATER
COLLECTION
SUMP
PUMPS
P
SCREEN
SOLIDS TO DISPOSAL
PRIMARY CLARIFIER
AERATION BASIN

SCHEMATIC

Process Water/Wastewater Schematic
Hides R Us



PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY. You may report some or all of this information on separate sheets *(use the same format)* instead of completing these pages.
SEE INSTRUCTIONS.

EPA I.D. NUMBER *(copy from Item 1 of Form 1)*

Form Approved
OMB No. 2040-0086
Approval expires 7-31-88

V. INTAKE AND EFFLUENT CHARACTERISTICS *(continued from page 3 of Form 2-C)*

OUTFALL NO. 001

PART A - You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

1. POLLUTANT	2. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	2.a (2) MASS	b. MAXIMUM 30 DAY VALUE *(if available)* (1) CONCENTRATION	2.b (2) MASS	c. LONG TERM AVRG. VALUE *(if available)* (1) CONCENTRATION	2.c (2) MASS	d. NO. OF ANALYSES	3. UNITS *(specify if blank)* a. CONCENTRATION	3. b. MASS	4. INTAKE *(optional)* a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	4.a (2) MASS	4. b. NO. OF ANALYSES
a. Biochemical Oxygen Demand *(BOD)*	94	117	35	44	35	44	48	mg/l	lbs/day			
b. Chemical Oxygen Demand *(COD)*	175	219					1	mg/l	lbs/day			
c. Total Organic Carbon *(TOC)*	250	313					1	mg/l	lbs/day			
d. Total Suspended Solids *(TSS)*	150	188	40	50	40	50	48	mg/l	lbs/day			
e. Ammonia *(as N)*	5	6										
f. Flow	VALUE 150,000		VALUE 150,000		VALUE 150,000		350	gpd		VALUE		
g. Temperature *(winter)*	VALUE 15		VALUE		VALUE		1	°C		VALUE		
h. Temperature *(summer)*	VALUE 20		VALUE		VALUE		1	°C		VALUE		
i. pH	MINIMUM 7.5	MAXIMUM 9.0	MINIMUM 7.5	MAXIMUM 9.0			48	STANDARD UNITS				

PART B - Mark "X" in column 2-a for each pollutant you know or have reason to believe is present. Mark "X" in column 2-b for each pollutant you believe to be absent. If you mark column 2a for any pollutant which is limited either directly, or indirectly but expressly, in an effluent limitations guideline, you must provide the results of at least one analysis for that pollutant. For other pollutants for which you mark column 2a, you must provide quantitative data or an explanation of their presence in your discharge. Complete one table for each outfall. See the instructions for additional details and requirements.

1. POLLUTANT AND CAS NO. *(if available)*	2. MARK "X" a. BELIEVED PRESENT	2. b. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	3.a (2) MASS	b. MAXIMUM 30 DAY VALUE *(if available)* (1) CONCENTRATION	3.b (2) MASS	c. LONG TERM AVRG. VALUE *(if available)* (1) CONCENTRATION	3.c (2) MASS	d. NO. OF ANALYSES	4. UNITS a. CONCENTRATION	4. b. MASS	5. INTAKE *(optional)* a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	5.a (2) MASS	5. b. NO. OF ANALYSES
a. Bromide (24959-67-9)		X												
b. Chlorine, Total Residual		X												
c. Color	X													
d. Fecal Coliform		X												
e. Fluoride (16984-48-8)		X												
f. Nitrate-Nitrite *(as N)*		X												

ITEM V-B CONTINUED FROM FRONT

1. POLLUTANT AND CAS NO. (if available)	2. MARK "X"		3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. BELIEVED PRESENT	b. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
			(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
g. Nitrogen, Total Organic (as N)	X		20						1	mg/l				
h. Oil and Grease	X													
i. Phosphorus (as P), Total (7723-14-0)		X												
j. Radioactivity														
(1) Alpha, Total		X												
(2) Beta, Total		X												
(3) Radium, Total		X												
(4) Radium 226, Total		X												
k. Sulfate (as SO_4) (14808-79-8)		X												
l. Sulfide (as S)	X													
m. Sulfite (as SO_3) (14265-45-3)		X												
n. Surfactants		X												
o. Aluminum, Total (7429-90-5)		X												
p. Barium, Total (7440-39-3)		X												
q. Boron, Total (7440-42-8)		X												
r. Cobalt, Total (7440-48-4)		X												
s. Iron, Total (7439-89-6)		X												
t. Magnesium, Total (7439-95-4)		X												
u. Molybdenum, Total (7439-98-7)		X												
v. Manganese, Total (7439-96-5)		X												
w. Tin, Total (7440-31-5)		X												
x. Titanium, Total (7440-32-6)		X												

CONTINUED FROM PAGE 3 OF FORM 2-C

EPA I.D. NUMBER (copy from Item 1 of Form 1)	OUTFALL NUMBER

Form Approved
OMB No. 2040-0086
Approval expires 7-31-88

PART C - If you are a primary industry and this outfall contains process wastewater, refer to Table 2c-2 in the instructions to determine which of the GC/MS fractions you must test for. Mark "X" in column 2-a for all such GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols. If you are not required to mark column 2-a *(secondary industries, nonprocess wastewater outfalls, and nonrequired GC/MS fractions)*, mark "X" in column 2-b for each pollutant you know or have reason to believe is present. Mark "X" in column 2-c for each pollutant you believe is absent. If you mark column 2a for any pollutant, you must provide the results of at least one analysis for that pollutant. If you mark column 2b for any pollutant, you must provide the results of at least one analysis for that pollutant if you know or have reason to believe it will be discharged in concentrations of 10 ppb or greater. If you mark column 2b for acrolein, acrylonitrile, 2,4 dinitrophenol, or 2-methyl-4, 6 dinitrophenol, you must provide the results of at least one analysis for each of these pollutants which you know or have reason to believe that you discharge in concentrations of 100 ppb or greater. Otherwise, for pollutants for which you mark column 2b, you must either submit at least one analysis or briefly describe the reasons the pollutant is expected to be discharged. Note that there are 7 pages to this part; please review each carefully. Complete one table *(all 7 pages)* for each outfall. See instructions for additional details and requirements.

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE (1) CONCENTRATION	a. MAXIMUM DAILY VALUE (2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	b. MAXIMUM 30 DAY VALUE (if available) (2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	c. LONG TERM AVRG. VALUE (if available) (2) MASS	d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	a. LONG TERM AVERAGE VALUE (2) MASS	b. NO. OF ANALYSES
METALS, CYANIDE, AND TOTAL PHENOLS															
1M. Antimony, Total (7440-36-0)			X												
2M. Arsenic, Total (7440-38-2)			X												
3M. Beryllium, Total, 7440-41-7)			X												
4M. Cadmium, Total (7440-43-9)			X												
5M. Chromium, Total (7440-47-3)		X		10.5	13	0.85	1	0.85	1	48	mg/l	lbs/day			
6M. Copper, Total (7440-50-8)			X												
7M. Lead, Total (7439-92-1)			X												
8M. Mercury, Total (7439-97-6)			X												
9M. Nickel, Total (7440-02-0)			X												
10M. Selenium, Total (7782-49-2)			X												
11M. Silver, Total (7440-22-4)			X												
12M. Thallium, Total (7440-28-0)			X												
13M. Zinc, Total (7440-66-6)			X												
14M. Cyanide, Total (57-12-5)			X												
15M. Phenols, Total			X												
DIOXIN															
2,3,7,8-Tetrachlorodibenzo-P-Dioxin (1764-01-6)			X	DESCRIBE RESULTS											

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – VOLATILE COMPOUNDS															
1V. Acrolein (107-02-8)			X												
2V. Acrylonitrile (107-13-1)			X												
3V. Benzene (71-43-2)			X												
4V. Bis (Chloromethyl) Ether (542-88-1)			X												
5V. Bromoform (75-25-2)			X												
6V. Carbon Tetrachloride (56-23-5)			X												
7V. Chlorobenzene (108-90-7)			X												
8V. Chlorodibromomethane (124-48-1)			X												
9V. Chloroethane (75-00-3)			X												
10V. 2-Chloroethylvinyl Ether (110-75-8)			X												
11V. Chloroform (67-66-3)			X												
12V. Dichlorobromomethane (75-27-4)			X												
13V. Dichlorodifluoromethane (75-71-8)			X												
14V. 1,1-Dichloroethane (75-34-3)			X												
15V. 1,2-Dichloroethane (107-06-2)			X												
16V. 1,1-Dichloroethylene (75-35-4)			X												
17V. 1,2-Dichloropropane (78-87-5)			X												
18V. 1,3-Dichloropropylene (542-75-6)			X												
19V. Ethylbenzene (100-41-4)			X												
20V. Methyl Bromide (74-83-9)			X												
21V. Methyl Chloride (74-87-3)			X												

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EPA I.D. NUMBER (copy from Item 1 ... 1) | OUTFALL NUMBER

OMB No. 2040-0086
Approval expires 7-31-88

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X' a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	(2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	(2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	(2) MASS	d. NO. OF ANALYSES	4. UNITS a. CONCENTRATION	b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	(2) MASS	b. NO. OF ANALYSES
GC/MS FRACTION – VOLATILE COMPOUNDS *(continued)*															
22V. Methylene Chloride (75-09-2)			X												
23V. 1,1,2,2-Tetrachloroethane (79-34-5)			X												
24V. Tetrachloroethylene (127-18-4)			X												
25V. Toluene (108-88-3)			X												
26V. 1,2-Trans-Dichloroethylene (156-60-5)			X												
27V. 1,1,1-Trichloroethane (71-55-6)			X												
28V. 1,1,2-Trichloroethane (79-00-5)			X												
29V. Trichloroethylene (79-01-6)			X												
30V. Trichlorofluoromethane (75-69-4)			X												
31V. Vinyl Chloride (75-01-4)			X												
GC/MS FRACTION – ACID COMPOUNDS															
1A. 2-Chlorophenol (95-57-8)			X												
2A. 2,4-Dichlorophenol (120-83-2)			X												
3A. 2,4-Dimethylphenol (105-67-9)			X												
4A. 4,6-Dinitro-O-Cresol (534-52-1)			X												
5A. 2,4-Dinitrophenol (51-28-5)			X												
6A. 2-Nitrophenol (88-75-5)			X												
7A. 4-Nitrophenol (100-02-7)			X												
8A. P-Chloro-M-Cresol (59-50-7)			X												
9A. Pentachlorophenol (87-86-5)			X												
10A. Phenol (108-95-2)			X												
11A. 2,4,6-Trichlorophenol (88-06-2)			X												

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE (1) CONCENTRATION	a. MAXIMUM DAILY VALUE (2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	b. MAXIMUM 30 DAY VALUE (if available) (2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	c. LONG TERM AVRG. VALUE (if available) (2) MASS	d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	a. LONG TERM AVERAGE VALUE (2) MASS	b. NO. OF ANALYSES
GC/MS FRACTION — BASE/NEUTRAL COMPOUNDS															
1B. Acenaphthene (83-32-9)			X												
2B. Acenaphtylene (208-96-8)			X												
3B. Anthracene (120-12-7)			X												
4B. Benzidine (92-87-5)			X												
5B. Benzo (a) Anthracene (56-55-3)			X												
6B. Benzo (a) Pyrene (50-32-8)			X												
7B. 3,4-Benzofluoranthene (205-99-2)			X												
8B. Benzo (ghi) Perylene (191-24-2)			X												
9B. Benzo (k) Fluoranthene (207-08-9)			X												
10B. Bis (2-Chloroethoxy) Methane (111-91-1)			X												
11B. Bis (2-Chloroethyl) Ether (111-44-4)			X												
12B. Bis (2-Chloroisopropyl) Ether (102-60-1)			X												
13B. Bis (2-Ethylhexyl) Phthalate (117-81-7)			X												
14B. 4-Bromophenyl Phenyl Ether (101-55-3)			X												
15B. Butyl Benzyl Phthalate (85-68-7)			X												
16B. 2-Chloronaphthalene (91-58-7)			X												
17B. 4-Chlorophenyl Phenyl Ether (7005-72-3)			X												
18B. Chrysene (218-01-9)			X												
19B. Dibenzo (a,h) Anthracene (53-70-3)			X												
20B. 1,2-Dichlorobenzene (95-50-1)			X												
21B. 1,3-Dichlorobenzene (541-73-1)			X												

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EPA I.D. NUMBER *(copy from Item 1)*	OUTFALL NUMBER

Form Approved
OMB No. 2040-0086
Approval expires 7-31-88

1. POLLUTANT AND CAS NUMBER *(if available)*	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE *(optional)*		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE *(if available)*		c. LONG TERM AVRG. VALUE *(if available)*		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS *(continued)*															
22B. 1,4-Dichlorobenzene (106-46-7)			X												
23B. 3,3'-Dichlorobenzidine (91-94-1)			X												
24B. Diethyl Phthalate (84-66-2)			X												
25B. Dimethyl Phthalate (131-11-3)			X												
26B. Di-N-Butyl Phthalate (84-74-2)			X												
27B. 2,4-Dinitrotoluene (121-14-2)			X												
28B. 2,6-Dinitrotoluene (606-20-2)			X												
29B. Di-N-Octyl Phthalate (117-84-0)			X												
30B. 1,2-Diphenylhydrazine *(as Azobenzene)* (122-66-7)			X												
31B. Fluoranthene (206-44-0)			X												
32B. Fluorene (86-73-7)			X												
33B. Hexachlorobenzene (118-74-1)			X												
34B. Hexachlorobutadiene (87-68-3)			X												
35B. Hexachlorocyclopentadiene (77-47-4)			X												
36B. Hexachloroethane (67-72-1)			X												
37B. Indeno *(1,2,3-cd)* Pyrene (193-39-5)			X												
38B. Isophorone (78-59-1)			X												
39B. Naphthalene (91-20-3)			X												
40B. Nitrobenzene (98-95-3)			X												
41B. N-Nitrosodimethylamine (62-75-9)			X												
42B. N-Nitrosodi-N-Propylamine (621-64-7)			X												

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS *(continued)*															
43B. N Nitro-sodiphenylamine (86-30-6)															
44B. Phenanthrene (85-01-8)															
45B. Pyrene (129-00-0)															
46B. 1,2,4 - Tri-chlorobenzene (120-82-1)															
GC/MS FRACTION – PESTICIDES															
1P. Aldrin (309-00-2)															
2P. α-BHC (319-84-6)															
3P. β-BHC (319-85-7)															
4P. γ-BHC (58-89-9)															
5P. δ-BHC (319-86-8)															
6P. Chlordane (57-74-9)															
7P. 4,4'-DDT (50-29-3)															
8P. 4,4'-DDE (72-55-9)															
9P. 4,4'-DDD (72-54-8)															
10P. Dieldrin (60-57-1)															
11P. α-Endosulfan (115-29-7)															
12P. β-Endosulfan (115-29-7)															
13P. Endosulfan Sulfate (1031-07-8)															
14P. Endrin (72-20-8)															
15P. Endrin Aldehyde (7421-93-4)															
16P. Heptachlor (76-44-8)															

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OMB No 2040 0086
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EPA I.D. NUMBER (copy from Item 1 of Form 1)

OUTFALL NUMBER

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X'			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – PESTICIDES (continued)															
17P. Heptachlor Epoxide (1024 57 3)			X												
18P. PCB-1242 (53469-21-9)			X												
19P. PCB-1254 (11097-69-1)			X												
20P. PCB-1221 (11104-28-2)			X												
21P. PCB-1232 (11141-16-5)			X												
22P. PCB-1248 (12672-29-6)			X												
23P. PCB-1260 (11096-82-5)			X												
24P. PCB-1016 (12674-11-2)			X												
25P. Toxaphene (8001-35-2)			X												

INDUSTRIAL PERMIT WRITING EXERCISE
Application Review

Instructions:

Review the attached NPDES application form, discharge monitoring data, state water quality standards, receiving water information, and facility inspection report and determine the following:

1. Has the facility provided all the information required by the form? If no, what information is missing? Is there additional information needed?

2. For which parameters must you establish technology-based effluent limits (generally)?

3. Is this facility subject to effluent limitation guidelines and standards? If yes, which guidelines should apply?

4. For which parameters must you develop water-quality based effluent limits (generally)?

INDUSTRIAL PERMIT WRITING EXERCISE
Developing Effluent Limits
Technology-Based Limits Worksheet

Summary of Recent NPDES Compliance Inspection of Hides R Us Facility

The report for an inspection performed by EPA in February 1995 at the Hides R Us facility noted the following information:

- Although production volume has remained relatively consistent (see data below), the facility's wastewater flow has decreased due to water conservation and reuse practices. The facility reuses the spent tanning solutions and also uses a portion of the tanning rinse waters as make-up for the pickling liquor.

  Production volume (lb/day)

	1992	1993	1994
Sheepskins	9,750	10,700	9,550
Pigskins	50,000	52,000	48,000

- Facility records indicate numerous slug loadings (of grease) to the activated sludge system occur when the grease recovery system is not operational.

- Numerous spills in the degreasing process area and in the tanning area due to operators accidentally overfilling the drums.

- The drains in the trenches around the process areas are clogged with hair and pieces of hides. The process wastewater spills overflow the trenches instead of draining to the treatment system.

INDUSTRIAL PERMIT WRITING EXERCISE
Developing Effluent Limits (Cont.)
Technology-Based Limits Worksheet

TECHNOLOGY-BASED EFFLUENT LIMITS

Parameter	Daily Max.		30-Day Average	
	Conc.	Mass	Conc.	Mass

INDUSTRIAL PERMIT WRITING EXERCISE
Developing Effluent Limits (Cont.)
Water Quality-Based Limits Worksheet

In addition to the technology-based requirements for BOD_5, TSS, oil and grease, total chromium, and pH, the permit writer also determined that the discharges of total chromium and pH by Hides R Us may contribute, cause, or have the potential to cause an exceedance of applicable water quality standards (40 CFR §122.44(d)).

[Note: There are no State water quality criteria for BOD_5, TSS, and oil and grease, so effluent limits for these pollutants would be based solely on technology-based requirements.]

Water Quality-Based Effluent Limits

Using the approach describe in the EPA *Technical Suppport Document for Water Quality-Based Toxics Control* (TSD), the following permit limits were developed:

WATER QUALITY-BASED EFFLUENT LIMITS

Parameter	**Daily Max.**		**30-Day Average**	
	Conc.	**Mass**	**Conc.**	**Mass**
BOD_5	--	--	--	--
TSS	--	--	--	--
Oil and Grease	--	--	--	--
Total Chromium	7,020 ug/l	8.8 lb/day	4,680 ug/l	5.9 lb/day
pH	Within the range of 6.5 - 9.0 S.U			

INDUSTRIAL PERMIT WRITING EXERCISE
Developing Effluent Limits

Instructions:

Complete the table based on the calculations performed above. Provide a brief justification for each parameter for which limits are required. If limits are not required or are not appropriate for a parameter, also provide a brief justification. (Be sure to indicate the appropriate units.)

FINAL EFFLUENT LIMITS

Parameter	Daily Max.		30-Day Average	
	Conc.	Mass	Conc.	Mass

JUSTIFICATION FOR EFFLUENT LIMITS

Parameter	Justification

INDUSTRIAL PERMIT WRITING EXERCISE
Developing Monitoring Conditions

Instructions:

Indicate in the following Table the parameters to be monitored by the facility, the appropriate monitoring frequencies, and the sample type for each of the parameters to be monitored. Provide a brief justification for each decision (i.e., why that parameter must be monitored, why that frequency is required, and why that sample type must be used.)

FINAL MONITORING FREQUENCIES

Parameter	Monitoring Frequency	Sample Type	Justification

What sample location would be specified in the permit? Do any parameters require any unique sampling requirements (i.e., special sampling location)?

INDUSTRIAL PERMIT WRITING EXERCISE
Developing Special Conditions

Questions:

1. Should the facility's permit require development and implementation of specific BMPs or a BMP Plan? Is yes, what would these be?

2. Would you require whole effluent toxicity monitoring of the effluent? If so, briefly outline the condition and justification.

3. What other, if any, special conditions would you impose?

INDUSTRIAL PERMIT WRITING EXERCISE
The Administrative Process

Instructions:

You have now completed permit development, documented your decisions in the Fact Sheet, provided notice of the draft permit to interested parties, and issued the final NPDES permit for Hides R Us (whew!). However, the owner of the facility, unhappy with your work, seeks an administrative appeal of the permit and in so doing, raises the following issues:

- The permit is improperly based on the provisions of 40 CFR Part 425 (Subcategories E and H));
- The effluent limitations for chromium and oil and grease are calculated incorrectly;
- The facility's written comment to delete the "duty to mitigate" standard condition was improperly ignored;
- The weekly monitoring requirements for chromium and oil and grease are excessive; and
- The Agency violated its regulations and established policy by refusing to hold a hearing as requested by the facility.

QUESTIONS:

(1) Assuming the facility's appeal is granted, what effect will this have on the effectiveness of the NPDES permit?____

(2) What standard of review should the Hearing Officer use to evaluate the permit? _____

(3) You have been called upon to testify on behalf of the Permit Authority. How do you respond to each of the issues raised?

(a) The improper application of effluent guidelines regulations: ____________

(b) The calculation of limitations: ____________

(c) The inclusion of the duty to mitigate condition: ____________

(d) The excessive monitoring requirements: ____________

(e) The failure to hold a hearing: ____________

(4) In addition to this logically organized and undeniably scientific testimony concerning your actions in developing this permit, what other assistance might you be asked to lend to your attorney? ____________

(5) Once the Hearing Officer has made a decision, what is the next step in the process of getting the Hides R Us permit final and effective? ____________