Working for Clean Water

An Information Program for Advisory Groups

Industrial Pretreatment

Instructor Guide

This program was prepared by

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Acknowledgements

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Graphics support was provided by the Office of Public Awareness, Environmental Protection Agency.

This information program was financed with federal funds from the U.S. Environmental Protection Agency under Cooperative Agreement No. CT900980 01. The information program has been reviewed by the Environmental Protection Agency and approved for publication. Approval does not signify that the contents necessarily reflect the views and policies of the Environmental Protection Agency, nor does mention of trade names or commercial products constitute endorsement of recommendation for use.

This project is dedicated to the memory of Susan A. Cole.

Industrial Pretreatment

Many municipalities have publicly-owned treatment works (POTW) that treat both municipal and industrial wastes. Recent legislation about to be implemented by the EPA will require these municipalities to develop and implement a pretreatment program for their industrial users. This program will ensure that pollutants will not enter the collection system or the treatment plant that will:

- Interfere with the functioning of the POTW
- Pass through the POTW and cause it to violate its NPDES permit, or
- Contaminate the sludge so that it cannot be disposed by the usual procedure.

At the end of this session the participant should be able to:

- List the three options available to industry for treating industrial wastewater
- Describe the objectives of a pretreatment program
- Understand the meaning of prohibited discharge and categorical effluent standards
- Discuss the EPA requirements for the development of an approvable pretreatment program.

Required Materials

☐ Set of slides with cassette tape for audiovisual presentation, "Industrial Pretreatment"

☐ Slide projector, cassette tape player, and screen

☐ Set of transparencies with overhead projector or flip charts with easel for guided discussion

☐ Copy of handbook, "Industrial Pretreatment," for each participant

☐ Copies of handouts on Toxic Pollutants, and Industries with Categorical Standards (optional).

Important Notes

1. This guide is applicable only if joint treatment exists or it is a distinct possibility for the community. (Check with the U.S. Environmental Protection Agency or state regulatory agency to see if a pretreatment program would be required for this facility.)

2. The citizen handbooks and instructor guides on the overview of facility planning, municipal wastewater processes, land treatment, and innovative and alternative technologies should precede this topic.

3. The instructor should develop a list of the categories of industries in the community prior to the presentation. The existing wastewater treatment plants, zoning board, Chamber of Commerce, and consultants are useful sources of the information.

4. The instructor may want to have the consulting engineer for the municipal agency and an industrial representative present at the presentation.

Suggested Activities

Introductory Comments	5 minutes
Audiovisual Presentation	10 minutes
Guided Discussion	40 minutes
Closing Remarks	5 minutes
TOTAL TIME	60 minutes

Introductory Comments (5 minutes)

1. Open with a statement about the importance of industry to the community, and how its pollutants can make waste treatment more difficult. However, with proper pretreatment by the industry, these wastes often can be treated together with the municipal wastewater to the benefit of both parties.

See handbook "Industrial Pretreatment" for advantages of pretreatment.

An advantage of joint treatment is that municipal waste nutrients can be used in the processing of industrial wastes. A disadvantage is that industrial toxic materials may pass through the treatment systems to end up in the sludge from the municipal facilities.

2. Indicate that this topic is being discussed because joint treatment either exists or is possible in the future for this agency. Briefly discuss the objectives for this presentation.

List objectives on transparency or flip chart.

Audiovisual Presentation (10 minutes)

1. The slide-tape program will discuss the treatment options available to industry for its wastes, the standards set for pretreatment when the joint treatment option is chosen, and the pretreatment regulations that must be developed by the managing agency.

Script is in Appendix in case of equipment malfunction.

2. Point out items that particularly pertain to the local situation.

Guided Discussion (40 minutes)

1. Ask the group to recall the three options available to an industry for treatment of wastes. Review them and state that this discussion will focus on indirect discharge with pretreatment.

Use slides 15, 16, and 17 of slide-tape program.

List on chalkboard:

Direct discharge

Indirect discharge

Indirect discharge with pretreatment

Use Chart 1 on Prohibited Discharges.

2. Discuss briefly pretreatment effluent standards in terms c prohibited discharges and categorical effluent standards to be set by the EPA. Note that prohibited wastes include:

- Materials that may create a fire or explosive hazard
- Corrosive-type materials and no discharges with <pH5 (unless POTW is specifically designed to treat this acidic pollutant)
- Solid or viscous pollutants in amounts to obstruct flows or interfere with operations
- Discharges of any pollutant such as BOD and suspended solids in volume or strength to disrupt the unit processes and violat the POTW permit
- Heat discharges which exceed 65°C (150°F) as they enter the sewer, or which will inhibit biological activity, or increase POTW influent to 40°C (104°F) or greater unless POTW is design to handle the heat.

Use Chart 2 on Toxic Pollutants.

Use handout on 65 Toxic Pollutants... (optional).

3. EPA effluent standards are to be set for toxic pollutants only. Point out familiar toxic substances to participants that most people recognize: arsenic, asbestos, chloroform, cyanides, lead, mercury, etc. (Don't dwell on exotic material.

The chart gives a condensed list of toxic substances. The instructor may use the handout which features a more extensive selection, especially if local industries are likely to discharge these materials.

Use Chart 3 for a condensed list of Industrial Groups.

Use handout on Industries...(optional).

4. There are 34 industrial categories for which categorical standards are to be set. Most industries fit into one of thes 34 categories.

Instructor may choose to circulate a handout or industries for which categorical standards are to be established.

List on flip chart or chalkboard.

5. Review the list of industrial categories and list those th are within the local agency's system. Add to the list industri that might have other incompatible or prohibited discharges. This group activity should emphasize the potential problems that might result from industrial discharges.

Use Chart 4 on Pretreatment Program Requirements.

6. Review essential requirements for establishing pretreatmen regulations. These are the requirments that the community must satisfy:

- Local legal authority must be evaluated and established.

- Procedures to ensure compliance with the program must be developed

- Resources to carry out the program must be obtained

- An organizational structure must be developed

- An Industrial Waste Survey must be conducted

- A detailed description of the pretreatment program must be submitted to the proper regulatory authority for review

- If desired, the authority to revise categorical standards must be obtained

- A determination of Fundamentally Different Factors must be made.

7. Review one of the three examples of organizational structures that appears to fit the needs of the community. Discuss this arrangement in terms of the potential for setting it up with the local community. A sheet of paper may be used to blank out parts of the diagram during the explanations.

Use one of the organizational structures for small, medium, and large treatment agencies in the Appendix.

Closing Remarks (5 minutes)

1. Answer any remaining questions.

2. Emphasize that a pretreatment program is the community's responsibility.

3. Develop a list of ways to encourage industry to cooperate in the development of an industrial pretreatment program.

List on chalkboard or flip chart.

Local Pretreatment Program Requirements and Guidance. Springfield VA: Environmental Technology Consultants, Inc., September 1979. 135 pp.

This document served as the basis for the preparation of the handbook. It represents Environmental Technology Consultants' viewpoints and interpretation of the requirements to be met by POTWs in developing an approved local pretreatment program. It is the most up-to-date document on the subject. It contains more detailed information on each of the subjects discussed in the handbook. It can be obtained from Environmental Technology Consultants, Inc. at The Executive Plaza, Suite 502, 6501 Loisdale Court, Springfield, VA 22150.

Federal Guidelines, State and Local Pretreatment Programs. MCD-4 Washington, DC: U.S. Environmental Protection Agency, Office of Water Program Operations, 1977. Vols. I, II, III. 661 pp.

This document contains the most detailed information available on pretreatment programs. However, it is being revised and m not be available. Volume I describes the programs. Volume II provides information on pollutant removal, pass through of wastes, and interference for the POTW. Volume III contains information on the 34 industries for which categorical standards are to be developed.

Pretreatment of Industrial Wastes, Joint Municipal and Industrial Seminar. Seminar Handout, Cincinnati, OH: U.S. Environmental Protection Agency, Environmental Research Information Center, 197[illegible] 488 pp.

This comprehensive handout is designed principally for publicly-owned treatment plant operators and industry. It presents a detailed review of the development and management of the pretreatment program, user charge systems, and monitoring and reporting. Specific examples and case histories are included to illustrate the principles. It is available from the Regional EPA Pretreatment Program Coordinators.

Appendix

A. Charts for use by the instructor in the suggested activities. These charts may be used to make transparencies <u>or</u> may be copied onto chalkboards.

1. Prohibited Discharges
2. Toxic Pollutants in NRDC Consent Decree
3. Industrial Groups with Categorical Standards
4. Pretreatment Program Requirements

B. Handouts for use by the instructor in the guided discussions. Copies will need to be made for each participant.

1. 65 Toxic Pollutants Listed in NRDC Consent Decree
2. Industries for which Categorical Standards are to be Established

C. Organizational diagrams for use by the instructor in the guided discussion. These diagrams may be used to make transparencies and slides <u>or</u> the contents may be copied onto flip charts.

1. Typical Organization of a Small POTW System
2. Typical Organization of a Medium-Size POTW System
3. Typical Organization of a Large POTW System

D. Copy of the script for the slide-tape program, "Industrial Pretreatment."

Prohibited Discharges

Explosive or fire-prone substances
Corrosive materials
Solid or viscous pollutants
Concentrated or large volumes
Heated effluent

Toxic Pollutants in NRDC Consent Decree

Asbestos
Benzene
Cadmium and compounds
Cyanides
Lead and compounds
Chlorinated organic compounds
Other substances

Industrial Groups with Categorical Standards

- Metals
- Electroplating
- Glass
- Leather
- Other groups
- Organic chemicals
- Inorganic chemicals
- Pulp and paper
- Food processing
- Adhesives and paint

Pretreatment Program Requirements

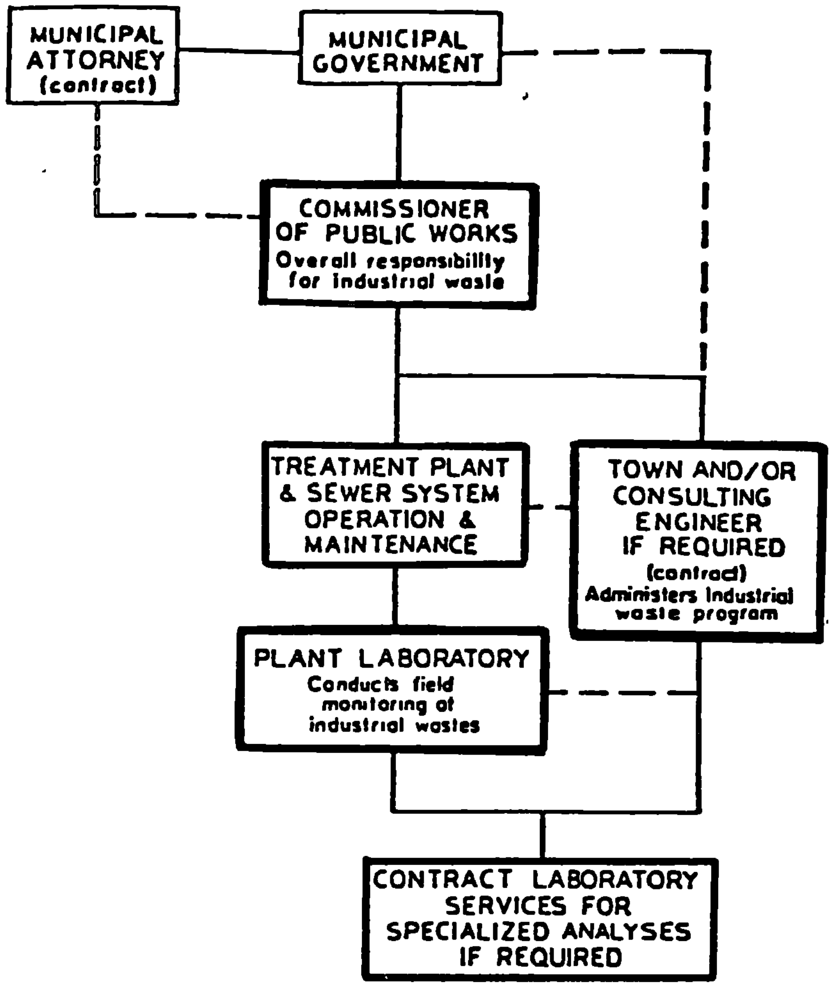
Local legal authority
Organizational structure
Compliance procedures
Implementation resources
Industrial waste survey
Program description

65 TOXIC POLLUTANTS LISTED IN NRDC CONSENT DECREE

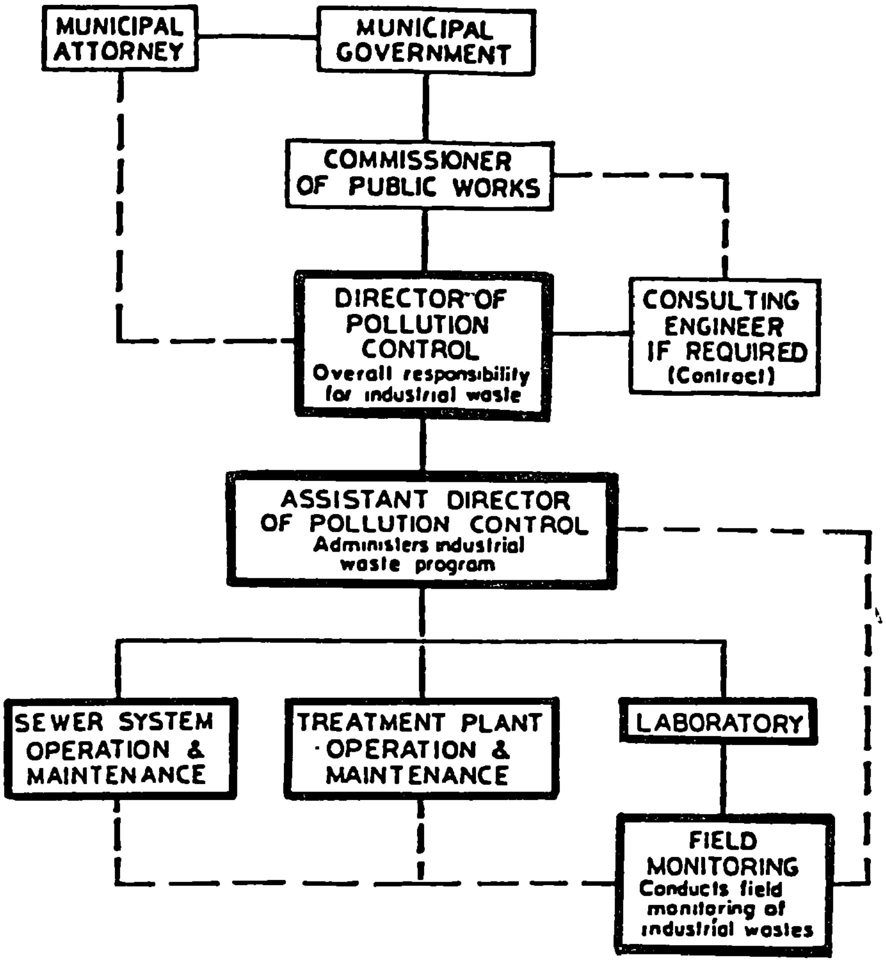
Acenapthene
Acrolein
Acrylonitrile
Aldrin/Dieldrin
Antimony and compounds
Arsenic and compounds
Asbestos
Benzene
Benzidine
Beryllium and compounds
Cadmium and compounds
Carbon tetrachloride
Chlordane
Chlorinated benzenes
Chlorinated ethanes
Chloralkyl ethers
Chlorinated naphthalene
Chlorinated phenols
Chloroform
2-chlorophenol
Chromium and compounds
Copper and compounds
Cyanides
DDT and metabolities
Dichlorobenzenes
Dichlorobenzidine
Dichloroethylenes
2, 4-dichlorophenol
Dichloropropane & Dichloropropene
2, 4-dimethylphenol
Dinitrotoluene
Diphenylhydrazine
Endosulfan and metabolites
Endrin and metabolites
Ethylbenzene
Fluoranthene
Haloethers
Halomethanes
Heptachlor and metabolites
Hexachlorobutadiene
Hexachlorocyclopentadiene
Hexachlorocyclohexane
Isophorone
Lead and compounds
Mercury and compounds
Napthalene
Nickel and compounds
Nitrobenzene
Nitrophenols
Nitrosamines
Pentachlorophenol
Phenol
Phthalate esters
Polychlorinated biphenyls (PCBs)
Polynuclear aromatic hydrocarbons
Selenium and compounds
Silver and compounds
2,3,7,8,-Tetrachlorodibenzo-p-dioxin (TCDD)
Tetrachloroethylene
Thallium and compounds
Toluene
Toxaphene
Trichloroethylene
Vinyl chloride
Zinc and compounds

INDUSTRIES FOR WHICH CATEGORICAL STANDARDS ARE TO BE ESTABLISHED

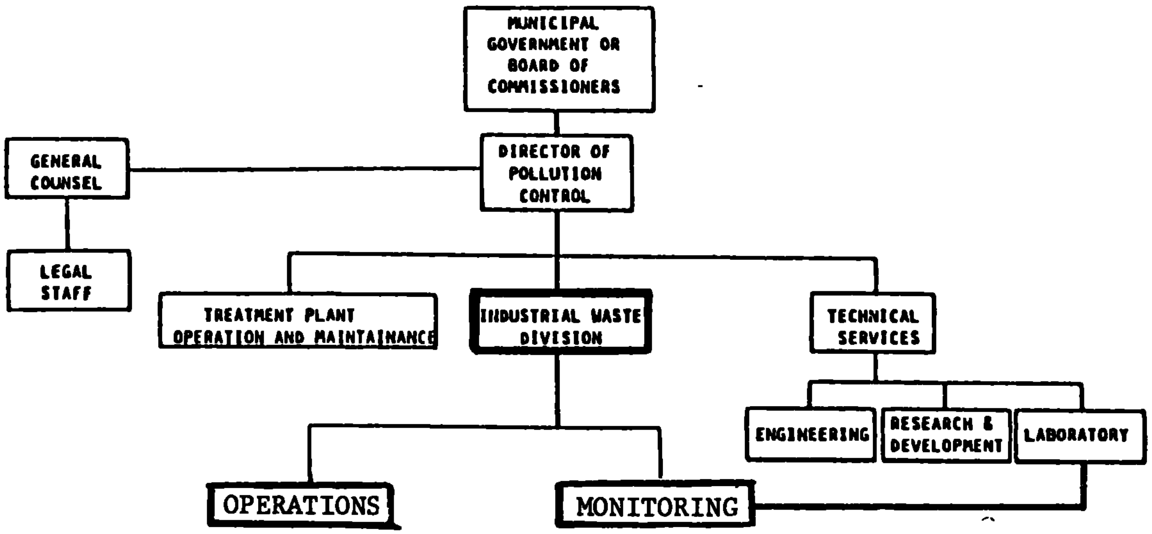
Adhesives
Leather Tanning and Finishing
Soaps and Detergents
Aluminum Forming
Battery Manufacturing
Coil Coating
Copper Forming
Electroplating
Foundries
Iron and Steel
Nonferrous Metals
Photographic Supplies
Plastics Processing
Porcelain Enamel
Gum and Wood Chemicals
Paint and Ink
Printing and Publishing
Pulp and Paper
Textile Mills
Timber
Coal Mining
Ore Mining
Petroleum Refining
Steam Electric
Organic Chemicals
Pesticides
Pharmaceuticals
Plastic and Synthetic Materials
Rubber
Laundries
Mechanical Products
Electrical and Electronic Components
Explosives Manufacturing
Inorganic Chemicals



TYPICAL ORGANIZATION OF A SMALL POTW SYSTEM



TYPICAL ORGANIZATION OF A MEDIUM-SIZE POTW SYSTEM



TYPICAL ORGANIZATION OF A LARGE POTW SYSTEM

INDUSTRIAL PRETREATMENT

Slide Description	Narrative
1. Words: Start cassette on this slide	
2. Picture: Industry with Title Overlay	Music
3. Picture: Industry	Is there an indüstry in your municipality? Does this industry discharge into the sanitary sewer? Does it discharge toxic materials in its waste? Does industry pay its fair share of the wastewater treatment costs? These are all very important questions for a citizen advisory group.
4. Picture: Industry	Industry is part of the lifestyle of America.
5. Picture: Industrial Waste Discharge Scene	Industrial waste is a by-product of industry.
6. Picture: Outfall	These industrial wastes require special attention by communities. Industrial wastes are difficult to deal with because of the nature of the waste and sensitivity of both the environment and waste treatment processes to their strong or toxic nature.
7. Words: Nature of Wastes · toxic at low levels · combined effects · unknown effects	Toxic problems occur from the nature of materials in the waste. Some are toxic at very low levels. Sometimes, when two or more toxic materials are combined, their total effects are more dramatic than either material alone. There are also those effects which as of yet have not been determined. Finally, we are finding many previously unrecognized materials actually cause cancer when people are exposed to them over long periods of time.
8. Words: Nature of Wastes (continued) · vary widely in strength · vary widely in concentration	Industrial waste streams can vary widely in both strength and in concentration.

9. Picture: Plant with weekend shutdown	Their variations are from hour to hour, day to day and season to season. For example, some plants shut down each weekend and produce no waste when they are shut down.
10. Picture: Plant with seasonal shutdown	Others are seasonal, for instance the vegetable and fruit canning industry. Industry needs the flexibility but it makes waste treatment difficult.
11. Picture: Outfall with a ? on it.	Because of this unpredictability, a large factor-of-safety or conservatism is needed in dealing with the industrial wastes, especially those containing known toxic materials.
12. Picture: 4 parts people | stream waste water plant | industry	The environment, including the people living in it, and the waste treatment plant are sensitive systems. Industry is also a sensitive system. We need industry. But industry must balance its waste treatment costs, labor, raw materials, market, and so forth, with its ability to stay in business. There are many issues that must be addressed in this balancing.
13. Picture: Typical community	The people must determine how they can accommodate their health, the environment, and the industry.
14. Graphic: Industrial Waste Options	Industry has three major options for treating the wastewater coming from manufacturing processes:
15. Repeat Slide 2, highlight Option #1	1. Treat the wastewaters in their own facilities, and discharge them directly into the receiving waters.
16. Repeat Slide 2, highlight Option #2	2. Discharge the wastes directly to a publicly-owned treatment works that can treat both industrial and municipal wastewaters, or
17. Repeat Slide 2, highlight Option #3	3. Pretreat the wastes to remove pollutants that are not compatible with the publicly-owned treatment works and then discharge them to the publicly-owned treatment works for final treatment.

18.	Words:	<u>Incompatible Pollutants</u> • Upset treatment process • Interfere with sludge disposal • Impair water quality	The main disadvantage of joint treatment is that some pollutants in the industrial wastewater may be <u>incompatible</u> with the publicly-owned waste treatment plant. Such incompatible pollutants tend to: - upset treatment processes - interfere with sludge disposal or - impair water quality.
19.	Graphic:	WWTP, overlay of words "Upset Treatment Processes" (Animated visual)	The pollutant may interfere with the functioning of one or more of the treatment processes. For example, cyanide is toxic to the microorganisms in biological treatment, and excessive amounts of organic matter or suspended solids can overload the plant.
20.	Picture:	Sludge disposal on land, overlay of words "Interfere with Sludge Disposal"	The pollutant as a part of the sludge can make the sludge so toxic that it cannot be disposed on land. The metal cadmium may cause such a problem.
21.	Picture:	Polluted stream, overlay of words, "Impair Water Quality"	Or, the pollutant may pass through the treatment plant without interfering with the treatment processes or sludge disposal, but cause the water quality standards in the receiving waters to be violated. Chlorides are an example of such a pollutant.
22.	Words:	<u>EPA Pretreatment Requirements</u> • Establish pretreatment effluent standards • Require specific municipalities to develop general pretreatment requirements	In order to prevent abuse of our publicly-owned treatment plants, Congress enacted legislation reqiring EPA to see that pretreatment programs are established. The EPA is: - establishing pretreatment effluent standards for industrial wastes, and - requiring specific municipalities to develop general pretreatment regulations.
23.	Words:	<u>Pretreatment Effluent Standards</u> • Prohibited Discharges • Categorical Standards	Two types of national pretreatment effluent standards for pollutants are being developed: "Prohibited Discharge Standards" and "Categorical Standards."

24. Graphic: Prohibited Discharges

The prohibited discharges apply to all non-domestic discharges. Pollutants include those that may have a deleterious effect on the treatment plant or receiving waters. They include:

- Materials that may cause fire or explosion
- Corrosive materials
- Solid or viscous pollutants
- Heat discharges that will inhibit biological activity, and
- Discharges that will cause violations of permit requirements.

25. Words: Categorical Standards
Apply to materials that:
- occur in receiving waters and drinking water
- lead to health hazards
- have toxic effects

Categorical discharge standards apply to specific categories of industrial wastes. These standards apply to materials that could occur in receiving waters and drinking water, could lead to health hazards and could have toxic effects.

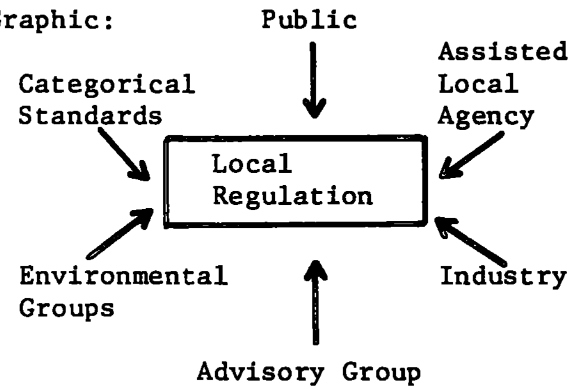
26. Picture: Washington, DC

In 1976 and 1979, in settlement of a suit with the National Resources Defense Council, EPA agreed to concentrate attention on potentially toxic substances using currently available standards.

27. Graphic: <u>Examples of Some Toxic Materials</u>
- Asbestos
- Cadmium
- Lead
- DDT

This Natural Resources Defense Council decree listed 65 toxic pollutants in 34 industrial categories. These pollutants included such toxic materials as asbestos, cadmium, lead and DDT. Other pollutants and industries will undoubtedly be added in the future.

28. Graphic:



Although your assisted agency will have little input into setting the categorical standards for toxic pollutants, its input into the establishment of local regulations is major.

29.	Picture: Industry	Industrial pretreatment regulations control incompatible discharges; require local enforcement; allow adjustment of standards, and apply whether or not there is federal funding.
30.	Picture: Industrial Scene	
31.	Words: <u>Parts of Pretreatment Regulations</u> • Local legal authority • Resources • Organizational structure • Industrial Waste Survey • Program Approval	The following requirements are essential in order to have your pretreatment program approved by EPA. • Local legal authority • Resources. • Organizational structure • Industrial waste survey • Program Approval
32.	Repeat Slide 15, highlight • Local legal authority	The publicly-owned treatment works must operate under local legal authority to apply the various legislative requirements.
33.	Word Slide: • Statutes • Ordinances • Contracts • Agreements	It may take the form of statutes, ordinances, contracts, or agreements.
34.	Picture: Slide Township Building	It must be binding upon industrial users, enforceable under contract law or police powers and at a minimum must assure compliance with the pretreatment regulations.
35.	Picture: Industrial Waste Ordinance	Although legal authority can take many forms, the most common is the Industrial Waste Ordinance. Model ordinances are available and they should be examined, along with ordinances from other agencies before adopting one. The guidance and assistance of legal council will be needed in writing and enacting an ordinance.
36.	Repeat Slide 15, highlight • Resources	The assisted agency should have sufficient resources to operate the pretreatment program. This includes both funds and personnel.
37.	Graphic: Pie chart of user charges	Funds generally will be obtained from user charges paid by all users of the sewerage system and based on a formula designed to charge each user his fair share of the cost of operation.

	The number of personnel required will vary from two to 100, depending upon the size of the sewage system.
38. Repeat Slide 15, highlight • Organizational Structure	The size and complexity of the organizational structure required to administer and operate a pretreatment program depends largely on the size of the sewage system.
39. Diagram: Typical Organization of A Small POTW System	In a small system a loosely defined structure with some part-time involvement and contract services for administration and laboratory services may be sufficient to handle the expected workload.
40. Diagram: Typical Organization of a Medium-Size POTW	In a medium sized system, the work will be less demanding and usually can be done within the usual organizational structure with a minimum of specialized personnel.
41. Diagram: Typical Organization of a Large POTW System	A large system will have a well defined organizational structure utilizing personnel with specialized training and qualifications. These people usually will operate out of an Industrial Waste Division and will have no responsibilities other than industrial wastes.
42. Repeat Slide 15, highlight • Industrial Waste Survey	Before a pretreatment program can be approved, the grantee must conduct an industrial waste survey.
43. Words: Industrial Waste Survey Highlight 1st item • Identify principal users • Gather information about process, waste, control procedures, and pretreatment operations • Notify users of applicable pretreatment standards • Establish good public involvement	In this survey the assisted agency should: • Identify the principal users of the publically owned treatment works.
44. Repeat slide 42, highlight 2nd item	• Gather information about the industrial processes producing wastes, the quantity and characteristics of the waste produced, in-plant control procedures, and pretreatment operations.

45. Repeat Slide, highlight 3rd item	• Notify the industrial users of all applicable pretreatment standards and develop procedures for notifying Industrial Users of new standards.
46. Repeat Slide, highlight 4th item	• Establish good public involvement programs with industry, commercial concerns, and the public.
47. Picture: Public meeting 48. Picture: Public meeting	This public involvement program should be initiated as soon as possible and maintained at all times as it stimulates industrial cooperation and provides additional input for the entire waste program.
49. Picture: Public meeting	There are many public concerns with joint treatment of industrial and municipal wastes.
50. Picture: Industry with workers leaving front gate	The main concerns include safety and health.
51. Diagram: Depicting industrial health hazard	Real or only assumed health risks create emotional conflicts over pretreatment of industrial wastes.
52. Picture: Industry with $ overlay	The pretreatment program, besides insuring health and safety of the public, insures that industry pays its fair share of costs. In other words, industry is a partner that must provide an effluent to the public treatment works that will not interfere with the wastewater or sludge disposal processes.
53. Picture: Man with hardhat in front of industry shaking hands with a mayor or a citizen	Joint treatment benefits are not limited to industry since the town as a whole may often benefit by reduced overall treatment costs.
54. Repeat Slide 15, highlight • Program Approval	After the pretreatment regulations have been developed, they must be submitted to the proper regulatory agency for approval. The documents submitted must contain enough information to demonstrate the publicly-owned treatment work's ability to carry out the pretreatment program.

55. Picture: Advisory Group	The advisory group can help implement a satisfactory toxics control program. Implementation takes cooperation between industry and the agency, but at the same time the environment and the public safety must be protected.
56. Picture: Advisory Group	Fear or misinformation often causes the public to react negatively to a joint/municipal treatment facility. On the other hand an informed advisory group and public may prevent discharge of harmful or troublesome materials to the publicly owned treatment works.
57. Words: Pretreatment Program Issues • Roles of governments • Safety factors • Regulatory effectiveness Administrative and • Financial Commitments	As representatives of the community, the advisory group has a special stake in an effective pretreatment program. Several important issues include the relative roles of government, safety factors in waste treatment, an effective regulatory agency, and long-term administrative and financial commitments.
58. Graphic: Three governmental units pulling together on a pretreatment program rope	It is appropriate for the advisory group to ask: What are the limits and flexibility of local programs? What powers are reserved by state and federal governments? and what are the advantages of governmental combinations?
59. Picture: Idyllic nature scene	The advisory groups should point out the need for factors-of-safety to be built into the local regulations. These are necessary due to the limits of understanding ecological systems, and the variability of industrial wastes.
60. Picture: Idyllic nature scene	The advisory groups should ascertain if the management agency can react quickly to pretreatment problems.
61. Picture: Idyllic nature scene	The advisory group should also make the regulatory agency face up to the responsibilities of dealing with violators, perhaps even by closing down industries that employ local people.

62.	Graphic: $ and manpower being stretched very thin, with prominent question mark	Finally the advisory groups can help agencies address the long-term commitment to administrative and financial responsibilities such as: public and industrial capital investment, monitoring of ecological and treatment systems, and plant operations.
63.	Picture: Person sitting at desk	Advisory groups can help agencies identify the administrative and staff resources that are needed.
64.	Picture: Advisory group	The advisory group can help make sure that government, industry, and public cooperate to manage toxic wastes through industrial pretreatment.
65.	Credit slide	Music.

*U S GOVERNMENT PRINTING OFFICE: 1980 341-082/111

Working for Clean Water is a program designed to help advisory groups improve decision making in water quality planning. It aims at helping people focus on essential issues and questions, by providing trained instructors and materials suitable for persons with non-technical backgrounds. These materials include a citizen handbook on important principles and considerations about topics in water quality planning, an audiovisual presentation, and instructor guide for elaborating points, providing additional information, and engaging in problem-solving exercises.

This program consists of 18 informational units on various aspects of water quality planning:

- Role of Advisory Groups
- Public Participation
- Nonpoint Source Pollution: Agriculture, Forestry, and Mining
- Urban Stormwater Runoff
- Groundwater Contamination
- Facility Planning in the Construction Grants Program
- Municipal Wastewater Processes: Overview
- Municipal Wastewater Processes: Details
- Small Systems
- Innovative and Alternative Technologies
- Industrial Pretreatment
- Land Treatment
- Water Conservation and Reuse
- Multiple Use
- Environmental Assessment
- Cost-Effectiveness Analysis
- Wastewater Facilities Operation and Maintenance
- Financial Management

The units are not designed to make technical experts out of citizens and local officials. Each unit contains essential facts, key questions, advice on how to deal with the issues, and clearly-written technical backgrounds. In short, each unit provides the information that citizen advisors need to better fulfill their role.

This program is available through public participation coordinators at the regional offices of the United States Environmental Protection Agency.