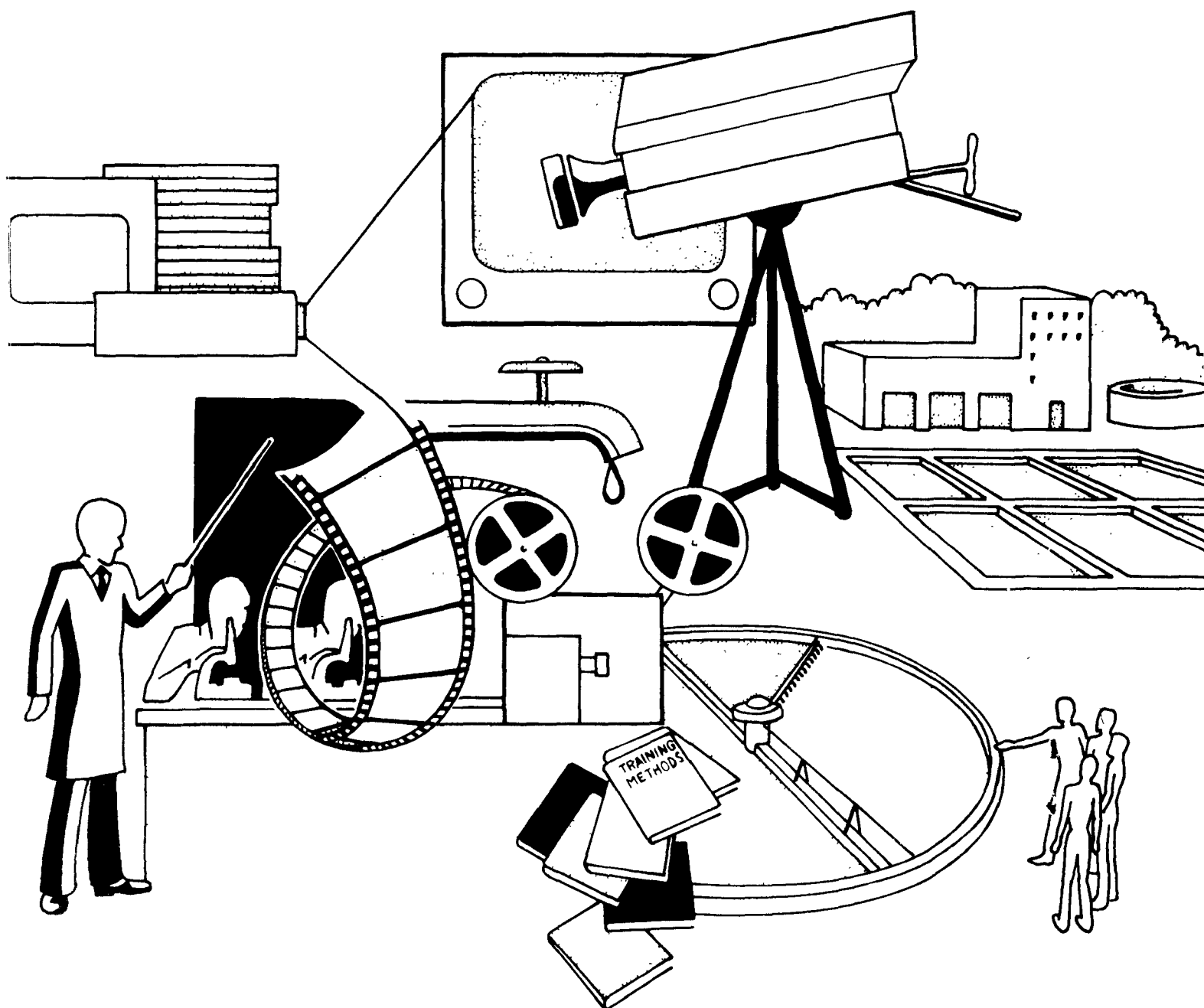


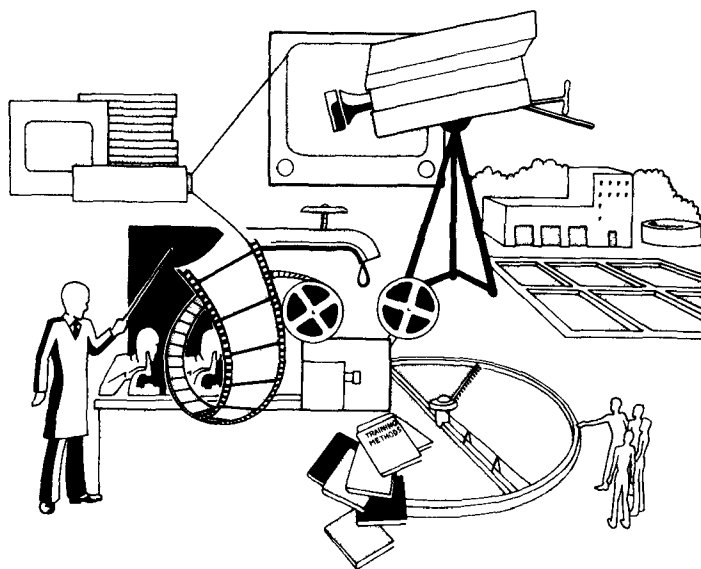


Water Quality Control Instructional Materials

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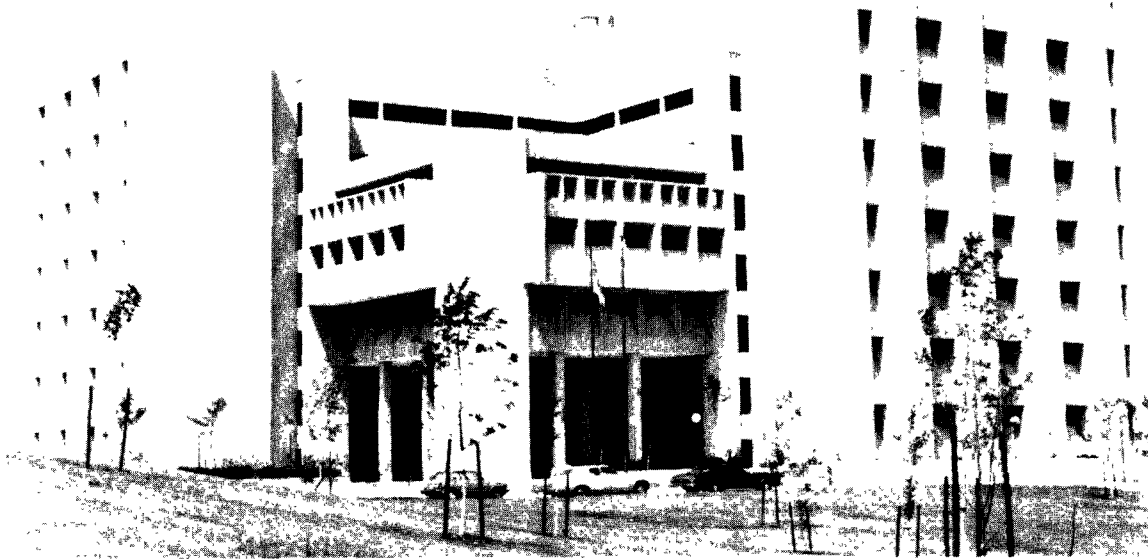


WATER QUALITY CONTROL INSTRUCTIONAL MATERIALS



DISCLAIMER

Reference to commercial products, trade names, or manufacturers is for purposes of example and illustration. Such references do not constitute endorsement by the Office of Water Program Operations, U.S. Environmental Protection Agency.



NATIONAL TRAINING AND OPERATIONAL TECHNOLOGY CENTER

The *National Training and Operational Technology Center (NTOTC)* is located at the U.S. Environmental Protection Agency Environmental Research Center in Cincinnati, Ohio.

***NTOTC* functions in conjunction with USEPA Regional Offices as the operational focal point for the Office of Water Program Operations in course development, course presentations, and assistance programs to help provide Federal, State and local government agencies, educational institutions and the private sector with the necessary training and skills required to achieve an effective water pollution control and abatement program. Training self-sufficiency at the State and local level is a major goal of *NTOTC*'s efforts.**

***NTOTC* conducts training courses in the areas of wastewater treatment, water quality management, biology, and chemical and bacteriological analyses for water quality control programs. Training manuals, audiovisual instructional materials and instructor guides are prepared for use in the presentation of courses.**

***NTOTC* works directly with personnel at wastewater treatment facilities and conducts on-site training in process control directed toward improving final effluent quality. Based on extensive field experience in the operation of**

activated sludge treatment facilities, assistance and information for the development of design criteria, new process control strategies, and training of wastewater treatment personnel are provided.

NTOTC maintains a comprehensive *Instructional Resources Center (IRC)* to provide assistance to those involved in pollution control training and education.

The purpose of the *IRC* is to systematically inventory and maintain current pollution control training and education materials and to disseminate these materials to governmental agencies, educational institutions and the private sector.

The materials maintained by the *IRC* are listed in a comprehensive computerized information base called the *Instructional Resources Information System (IRIS)*. *IRIS* categorizes each item according to several specific parameters including the title, author, source and an abstract. This information is available to assist in selecting materials for pollution control instructional uses.

The *IRC Study Lab*, a special viewing room in the Environmental Research Center in Cincinnati, is available Monday through Friday to permit educators to review audiovisual instructional materials. NTOTC staff members are available at the Center for consultation and assistance.

A major service of the IRC is the *Lending Library*. The purpose of this component is to lend audiovisual instructional units to education and training organizations to support classroom activities. Slide/tape units, videocassette units and films are available for free, short-term loan. This *Water Quality Control Instructional Materials* catalog has been prepared to inform water quality control training personnel about supporting materials and services available from the *Lending Library*.

Instructional materials available from the *Lending Library* fall into two categories—audiovisual supportive materials and packaged courses. The following pages of this catalog provide information on audiovisual materials and packaged training courses that can be borrowed on a short-term basis from the *Lending Library*. Audiovisual materials are designed to supplement pollution control courses—they are not designed for independent learning. The packaged courses include a complete unit of printed and audiovisual materials to teach a specific pollution control topic or procedure.

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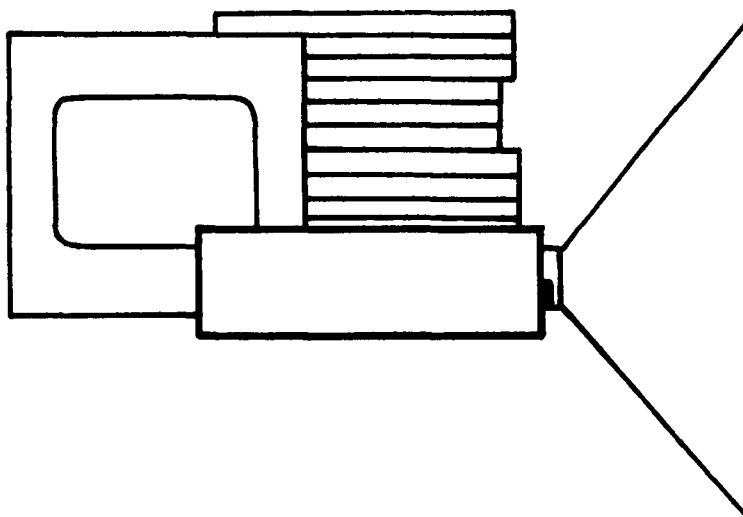
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SLIDE/TAPE INSTRUCTIONAL UNITS

The slide/tape instructional units listed on the following pages are currently used in support of EPA training efforts. These training aids are not self-contained units designed to replace an instructor, nor are they intended to provide an exhaustive coverage of any given topic; they were developed to be used as part of an integrated water quality presentation.

Each unit consists of a set of 2" \times 2" slides in sequential order in a carousel tray with cued narration tape (ANSI Standard 1000 Hz) which automatically changes slides in a projector. To activate automatic slide changes, the user will need a cassette player for standard size cassettes to connect to a Kodak Carousel or equivalent to allow the electronic pulse to activate the slide mechanism on the projector. For manual operation of the slide projector, all units include a script of the narration with a clearly defined format indicating slide changes.

SUGGESTIONS FOR THE DISCUSSION LEADER

PREPARATION:

- See the catalog description of the intended audience for the unit.
- Preview the instructional unit.
- Review the unit topic.

References are listed in the catalog. The script and any associated information are sent with the unit. Questions about content should be directed to:

National Training & Operational Technology Center
Office of Water Program Operations
U.S. Environmental Protection Agency
Cincinnati, OH 45268

- Give viewers sufficient notice of any preparatory assignments.

UTILIZATION:

- Tell the viewers about the content of the program and important points to notice while viewing. Tell them to concentrate on seeing and hearing rather than on taking notes during the presentation.
- Run the program. The tape playback can be stopped during the program, if desired.
- Conduct a discussion of the content. Particular slides can be projected if desired.
- If necessary, run the program again.

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UPGRADING BIOLOGICAL TREATMENT

XT-25

Discusses ways to get maximum use of present existing secondary treatment processes by improved operational control or design. Case histories of how the pollutorial strength of an activated sludge plant effluent was reduced to one-quarter of its former strength at one location; and how trickling filter pretreatment with activated sludge polishing accomplished 99% reduction for a combination of domestic sewage and strong meat packing wastes at another.

It is intended for experienced and supervisory wastewater works operators and managerial personnel. Of interest to design engineering personnel.

28 minute tape and 65 slides, also script. (1969)

ATOMIC ABSORPTION

XT-26

The basic theory of Atomic Absorption Spectroscopy; the design fundamentals of the instrumentation involved; kinds of interferences that can be encountered and methods for eliminating those effects; methods for increasing sensitivity and the application of atomic absorption instrumentation for the analysis of trace metals in water. References are Walsh, *Spectrochem-Acta* (1955); Willard, et.al., *Instrumental Methods of Analysis* (Book-1965).

It is intended for chemists, biologists and engineers having a professional background and responsibility for performing, using or interpreting chemical analyses for water quality.

20 minute tape and 52 slides; also script and booklet: "Atomic Absorption Spectroscopy" (an introductory theoretical discussion), 8 pp.

CHEMICAL OXYGEN DEMAND (COD)

XT-27

An introduction to the Chemical Oxygen Demand (COD) procedure. Order of topics is: basis of test, how it differs from the Biochemical Oxygen Demand (BOD) Test, potassium dichromate as an oxidizing agent, use of blank and reflux condensers, role of ferrous ammonium sulfate and ferroin, etc., sample preservation, applications of test results and COD/BOD ratios. References are *Standard Methods* (1975); Moore, et.al., *Analytical Chemistry*, (1951); Van Hall, et.al., *Analytical Chemistry* (1963); Sawyer and McCarty, *Chemistry for Sanitary Engineers* (Book-1967).

It is intended for chemists, biologists and engineers having a professional background and responsibility in performing, using, or interpreting chemical analyses for water quality.

17 minute tape and 60 slides, also script, quiz and key. (1971)

DETERMINATION OF PHENOLICS

XT-28

An introduction to the determination of phenolics. Defines and gives sources and uses of phenolics, biological treatment, effects on fish and water quality, the 4-aminoantipyrine reaction, sample preservation, procedure, interferences and remedies. References are Standard Methods, 14th Edition (1975); ASTM Standards (1974); McFarren, et.al., Water Phenols No. 1 (1967); Burttschell, et.al., JAWWA (1959); and Dennis, Proceedings: Ohio Sewage and Industrial Wastes Treatment Conference (1951).

It is intended for chemists, biologists, and engineers having a professional background and responsibility for performing, using or interpreting chemical analyses for water quality.

17 minute tape and 64 slides, also script, quiz, and key. (1971)

DISSOLVED OXYGEN DETERMINATION

XT-29

Sampling techniques; basic chemistry of the Winkler dissolved oxygen determination and the Alsterberg azide modification; methods for the addition of reagents; sample preservation and the basic calculations used in the determination. Photos of relevant laboratory equipment are included. References are Standard Methods, 14th Edition (1975); E P A Methods Manual (1974); Sawyer, Chemistry for Sanitary Engineers (Book-1960).

It is intended for beginning laboratory personnel (chemistry).

15 minute tape and 72 slides, also script, quiz and key. (Revised 1976)

ULTIMATE DISPOSAL TO THE ENVIRONMENT

XT-30

Possible disposal sites for liquid and solid wastes and presented along with pollutional and economic factors relevant to each. Sludge disposal and the use of sludge for reclaiming mine spoil and other low grade soils are considered in detail with on-site examples of the methods considered. Using a periodic chart, a summary of disposal site choices and of re-use possibilities for common elements and their compounds is included with special emphasis on successful reclamation of water. Referenced is Dean, EPA-OWP Training Manual Outline (1971).

It is intended for anyone seeking an introduction to the topic, especially agricultural uses of sludge.

42 minute tape and 37 slides; also script, reprint Dean: "Ultimate Disposal of Waste Water: A Philosophical View," 4 pp. and reprint Evans: "The Soil as a Resource Renovator," 4 pp. (1971)

MARGIN FOR SAFETY

XT-31

Providing safe conditions for performance of routine duties in Wastewater works. Includes detailed discussions of the importance of good housekeeping, preventing slips or falls, personal protective equipment, and dealing with fire extinguishers, machinery with moving parts and vehicular traffic in work areas. Also emphasizes safety attitudes. The Water Pollution Control Federation Safety Committee in consultation with the Bureau of Safety (Middle West Service Company) developed the script and the original series of slides.

It is intended for all wastewater works personnel.

18 minute tape and 45 slides, also script. (1970)

The slides and script for XT-31 are COPYRIGHT MATERIAL and MAY NOT BE REPRODUCED. They may be purchased from the Water Pollution Control Federation, 3900 Wisconsin Ave., N.W., Washington, DC 20016 @ \$11.50.

THE SAFE WAY

XT-32

Performing routine duties in wastewater works in a safe way. Duties considered involve manholes, electrical equipment, sampling, contaminated water, air tools, steep stairways, vehicular traffic, excavations, bar screens, wire ropes, flammable materials and chemicals. The Water Pollution Control Federation Safety Committee in consultation with the Bureau of Safety (Middle West Service Company) developed the script and the original series of slides.

It is intended for all wastewater works personnel.

14 minute tape and 39 slides, also script. (1970)

The slides and script for XT-32 are COPYRIGHT MATERIAL and MAY NOT BE REPRODUCED. They may be purchased from the Water Pollution Control Federation, 3900 Wisconsin Ave., N.W., Washington, DC 20016 @ \$11.50.

ANAEROBIC DIGESTION AND ANALYTICAL CONTROL

XT-34

Discussion of the anaerobic decomposition processes utilized to treat organic materials in wastes, the environmental conditions required for the involved bacteria, and a description of the related process control analyses: volatile acids (stepwise procedure given), alkalinity, total organic nitrogen content, total organic load, pH and gas production. References are Eckenfelder and O'Connor, Biological Waste Treatment (Book-1961); Sawyer and McCarty, Chemistry for Sanitary Engineers (Book-1967).

It is intended for experienced wastewater treatment plant operators who wish to upgrade plant performance and to increase their own knowledge and skills.

13 minute tape and 62 slides, also script. (1972)

LET'S INVENTORY YOUR CHLORINE HANDLING PRACTICES

XT-35

Discussion on handling elemental chlorine. Principle divisions of information are: physical and chemical characteristics of chlorine, safety requirements for six segments of typical chlorine feed systems, chlorine emergency procedures, in-plant operating procedures for safe handling of chlorine (15 items), and sources of additional information. The Ohio Department of Health, Division of Engineering developed the script, the original series of slides and a taped narration. References cited in the narration are: The Chlorine Institute, Inc., Chlorine Manual (1969); Health Education Service, Recommended Standards for Sewage Works (1968); AWWA Manual M3, Ohio Industrial Commission (claims records) and Manufacturers' literature.

It is intended for all personnel in water supply and wastewater treatment plants.

32 minute tape and 80 slides, also script. (1970)

RESIDUAL CHLORINE AND CHLORINE DEMANDS

XT-37

Basic principles of chlorination practices in treatment plants, reactions of chlorine with water and wastewater, sanitary significance of chlorine residuals and analytical procedures for the determination of chlorine and chlorine residuals in treatment plant effluents. Referenced is Sawyer and McCarty, Chemistry for Sanitary Engineers (Book-1967).

It is intended for beginning wastewater treatment plant operators.

12 minute tape and 56 slides, also script. (Revised 1974)

SAFETY PROGRAM GUIDE

XT-38

A guide for establishing an effective safety program including the role of management, organization required, record-keeping, accident investigation and evaluation procedures, causes of accidents, protective equipment required, establishing safety rules and procedures, elements of employee training programs and suggestions for motivating employees. The Water Pollution Control Federation Safety Committee in consultation with the Bureau of Safety (Middle West Service Company) developed the script and the original series of slides.

It is intended for wastewater works supervisory personnel and management.

20 minute tape and 39 slides, also script. (1969)

The slides and script for XT-38 and XT-39 are COPYRIGHT MATERIAL and MAY NOT BE REPRODUCED. They may be purchased from the Water Pollution Control Federation, 3900 Wisconsin Ave., N.W., Washington, DC 20016 for \$16.50.

**WHY A SAFETY PROGRAM IN EVERY
WATER POLLUTION CONTROL WORKS**

XT-39

Demonstrates the need to establish an effective safety program by discussing safety as efficient operations, knowledge of job requirements, good relations with public, effective cost control, good employee relations and good management. Gives sources for further information. The Water Pollution Control Federation Safety Committee in consultation with the Bureau of Safety (Middle West Service Company) developed the script and the original series of slides.

It is intended for wastewater works supervisory personnel and management.

12 minute tape and 27 slides, also script. (1969)

The slides and script for XT-38 and XT-39 are COPYRIGHT MATERIAL and MAY NOT BE REPRODUCED. They may be purchased from the Water Pollution Control Federation, 3900 Wisconsin Ave., N.W., Washington, DC 20016 for \$16.50.

**OPERATIONAL CONTROL TESTS FOR THE
ACTIVATED SLUDGE PROCESS—Part I**

XT-40

Part One of a three-part lesson series on operational control tests for the activated sludge process. Entitled "Observations," this first part is concerned with the accurate reading of meters and with the visual observations to be made both at the aerator (foam characteristics, sludge color and odor) and at the final clarifiers (clarity, evidences of bulking and of septic solids). Provisional interpretations to be made of these visual observations are presented, and also a detailed discussion of the effective use of a sludge blanket finder.

It is intended for experienced wastewater works operators who wish to upgrade plant performance and to increase their own knowledge and skills.

16 minute tape and 50 slides, also script. (1971)

**OPERATIONAL CONTROL TESTS FOR THE
ACTIVATED SLUDGE PROCESS—Part II**

XT-41

Part Two of a three-part lesson series on operational control tests for the activated sludge process. This part is a detailed discussion of the preferred techniques involved in conducting settlometer tests to determine settling characteristics and in centrifuging samples to determine the concentration of the mixed liquor and return sludge. Handling the related samples is included along with provisional interpretations and applications of the tests presented.

It is intended for experienced wastewater works operators who wish to upgrade plant performance and to increase their own knowledge and skills.

17 minute tape and 47 slides, also script. (1971)

**OPERATIONAL CONTROL TESTS FOR THE
ACTIVATED SLUDGE PROCESS—Part III**

XT-42

Part Three of a three-part lesson series on operational control tests for the activated sludge process. This concluding part presents development of settling and concentration curves from settlometer and centrifuge test results, techniques for conducting turbidity tests as well as the significance of turbidity results, a summary of all the tests presented in the three-part series, the control adjustments which are made on the basis of these test results, and progressive trend charts of process characteristics.

It is intended for experienced wastewater works operators who wish to upgrade plant performance and to increase their own knowledge and skills.

22 minute tape and 67 slides, also script. (1971)

**DISSOLVED OXYGEN ANALYSIS—
ACTIVATED SLUDGE CONTROL TESTING**

XT-43

Rapid and valid techniques are described for control of the activated sludge treatment process using electronic measurement of DO and DO changes. Sample data are discussed for interpretation of sludge condition in response to stabilization, feed, load ratio or conditions. Information obtainable within 20 minutes provides suggested corrective action in time to upgrade effluent quality.

It is intended for advanced wastewater treatment plant operators or plant control supervisors.

34 minute tape and 73 slides, also script, supplement Ludzack: "Dissolved Oxygen Testing Procedure," 4 pp., and lesson plan. (1971)

THE DETERMINATION OF PHOSPHORUS

XT-44

Presents the reasons for determining phosphorus, an explanation of phosphorus terminology, and the Office of Water Programs analytical procedures. Discussion of procedure includes basic chemistry involved, sensitivity range, sample collection and preservation, filtration and digestion, pH, reagent preparation, color development and spectrophotometric determination, care of glassware and possible interferences. USEPA Methods for Chemical Analysis of Water and Wastewater (1974) was used as a reference.

It is intended for beginning laboratory personnel (chemistry).

15 minute tape and 65 slides, also script, quiz, and key. (Revised 1976)

TAPE-SLIDE PRESENTATIONS—HOW TO MAKE THEM

XT-45

How to compile a tape-slide audiovisual presentation—also the equipment required to produce one. Topics include statistics on the effectiveness of combining visual materials and sound, basic equipment required, five steps to produce a program, incorporating sound effects, etc., guidelines for planning slides, and equipment available for specific uses of the finished program. The Elco Optisonics Division of the Elco Corporation developed and produced this series of slides and the accompanying narration tape with cues.

It is intended for anyone interested in producing tape-slide presentations.

10 minute tape and 80 slides. (1970)

The slides for XT-45 are COPYRIGHT MATERIAL and MAY NOT BE REPRODUCED. They may be purchased from Brand Studios, 1208 Central Parkway, Cincinnati, OH 45210 @ \$38.50

GRAPHICAL ANALYSIS VIA NORMAL PROBABILITY PAPER

XT-47

Viewers are introduced to graphical analysis of data for normal distribution, using normal probability paper only. They are shown how to plot data on normal paper and ascertain if it is normal, how to estimate the mean and the standard deviation for normal data, and how to identify why some nonlinear graphs are not normal.

It is intended for anyone required to test a set of data for normal distribution, or who is interested in graphical analysis techniques per se. Three prerequisites for the viewer are introductory knowledge about the normal curve, ability to plot data on a coordinate system, and ability to draw a line of best fit through this plotted data.

18 minute tape and 38 slides; also script, instructions and problem solution for Discussion Leader, 2 pp., and a problem sheet with associated materials for viewers, 5 pp. Instructor reproduces problem sheets for each viewer. (1971)

DETERMINATION OF CHEMICAL OXYGEN DEMAND

XT-48

A basic presentation of the laboratory technique involved in test procedures for all levels of COD. Sequence of topics is: method summary, sample handling and preservation, interferences, apparatus, preparation of reagents, step-wise procedure, example of calculations, correction for high chloride and treatment of mercury-containing test wastes. USEPA Methods for Chemical Analysis of Water and Wastewater (1974) Also abstract reprint *Recovery of Mercury in Solution*, Maag & Hecker, 1 p. (1971) is used as a reference.

It is intended for beginning laboratory personnel and wastewater treatment plant operators.

22 minute tape and 80 slides; also script and reprint Dean, et.al.: "Disposal of Mercury Wastes from Water Laboratories," 2 pp.

BASIC STATISTICS – PART I

XT-49

Part One of a two-part series. Topics: analytical results as samples of a number population; some requirements for valid data; construction of frequency tables, histograms and polygons; normal distribution curves; use of normal probability paper; definition and determination of the mode, median, and mean as measures of central tendency.

It is intended for laboratory personnel (chemistry) and others who need basic information about (1) graphical techniques for summarizing data and (2) the determination of central tendency statistics.

20 minute tape and 46 slides; also script, instructions and problem solutions for Discussion Leader, 2 pp., and an outline, 5 pp., worksheet, 1 p., and problem sheet, 1 p., for Viewers. Instructor reproduces outline and worksheets for each viewer. (1972)

BASIC STATISTICS – PART II

XT-50

Part Two of a two-part series. Topics: definitions and step-by-step instructions for Viewer to calculate dispersion statistics (the range, deviation of data and of the mean, variance, and standard deviation of data and of the mean); contrasts among them and criteria for choosing which to calculate; application of mean and standard deviation as estimates of normal distribution parameters; and a summary of Parts I and II.

It is intended for laboratory personnel (chemistry) and others who need basic information about the calculation of dispersion statistics.

30-minute tape and 59 slides; also script, instructions and problem solutions for Discussion Leader, 2 pp., and an outline, 5 pp., work sheet, 1 p., and problem sheet, 1 p., for Viewers. Instructor reproduces outline and worksheets for each viewer. (1972)

USE OF THE SPECTRONIC 20 SPECTROPHOTOMETER

XT-51

The stepwise use of the spectrophotometer including warm-up procedures, adjustments prior to use, making measurements and changing the photo tube. Bausch and Lomb Instrument Manual was used in this demonstration.

It is intended for beginning laboratory personnel and wastewater treatment plant operators.

10 minute tape and 35 slides, also script. (1972)

THE DETERMINATION OF BIOCHEMICAL OXYGEN DEMAND

XT-54

An introduction to the BOD Test. Topics include reasons for making the determination, the preparation of dilution water, seeding techniques, sample pretreatment and dilution, and

calculations. Used as references are Standard Methods, 14th Edition (1975); and EPA Methods Manual (1974).

It is intended for beginning laboratory personnel and wastewater treatment plant operators.

13 minute tape and 71 slides, also script. (1972)

DETERMINATION OF GREASE AND OIL

XT-56

The laboratory procedure to determine grease and oil. Topics are: terminology, problems caused by grease and oil in wastewater treatment, sampling and preservation, apparatus, the stepwise procedure and calculations. EPA Methods Manual (1974) was used as a reference.

Beginning laboratory personnel and wastewater treatment plant operators.

15 minute tape and 54 slides, also script. (Revised 1976)

DETERMINATION OF SUSPENDED SOLIDS

XT-57

The laboratory procedure to determine suspended solids. Topics are: importance of suspended solids to water quality, sampling, apparatus, the step-wise procedure and calculations. Procedures based on USEPA Methods for Chemical Analysis of Water & Wastewater (1974); Standard Methods, 14th Edition (1975).

It is intended for beginning laboratory personnel and wastewater treatment plant operators.

10 minute tape and 40 slides, also script. (Revised 1976)

DETERMINATION OF TOTAL ORGANIC CARBON

XT-59

Use of a Carbonaceous Analyzer to determine organic materials in water. Topics: BOD, COD, TOC tests defined and contrasted, steps of TOC determination, functions of instrument components, injection syringe characteristics, sampling and preservation, stepwise procedure

to prepare and use a calibration graph to determine carbon in samples, sample pretreatment, discussion of two types of analyzers and calculations using data from each. Procedures based on USEPA Methods Manual (1974); and Standard Methods, 14th Edition (1975).

It is intended for beginning laboratory personnel and wastewater treatment plant operators.

13 minute tape and 62 slides, also script. (1973)

PROCESS CONTROL DEMANDS (PART A)

XT-60

Introduction to a series on operational control of an activated sludge process. A plant schematic is used to present the effects of return sludge flow adjustments on sludge concentrations, sludge detention times, process equilibrium, sludge characteristics, and final effluent quality.

It is intended for experienced wastewater works operators who wish to upgrade plant performance and to increase their own knowledge and skills.

10 minute tape and 36 slides, also script. (1972)

PROCESS CONTROL DEMANDS (PART B)

XT-61

One of a series, this unit presents the derivation of mixing formulae that will be used in subsequent sections to develop the return sludge flow demand formula used in operational control of an activated sludge process. A schematic is used to illustrate components of the formulae and to develop a final mass balance ratio of return sludge concentration to mixed liquor concentration in terms of clarifier sludge percentage. Simple mixing formulae are then derived for each of the three factors along with example calculations.

It is intended for experienced wastewater works operators who wish to upgrade plant performance and to increase their own knowledge and skills.

15 minute tape and 40 slides, also script. (1972)

ALKALINITY**XT-66**

A general consideration of alkalinity in water supplies including sources and effects, summary of laboratory determinations, classification systems for hydroxide, carbonate and bicarbonate, and applications of alkalinity data. Procedures based on Standard Methods, 14th Edition (1975); and EPA Methods Manual (1974).

It is intended for professional chemists and sanitary engineers.

11 minute tape and 66 slides, also script. (1973)

DETERMINATION OF AMMONIA NITROGEN**XT-67**

Determination of ammonia concentrations of 1–25 mg/liter. Topics are summary of method, the required laboratory apparatus and reagents, the stepwise procedure, and an example of calculating ammonia nitrogen from test results. Referenced is the USEPA Methods Manual (1974).

It is intended for beginning laboratory personnel and wastewater treatment plant operators.

8 minute tape and 45 slides, also script. (1973)

DETERMINATION OF ALKALINITY**XT-68**

The laboratory procedure to determine alkalinity electrometrically to an end point of pH 4.5. Topics are: alkalinity fundamentals and titration curves, sampling, apparatus, the stepwise procedure, calculation formula, and applications of alkalinity data. Referenced is USEPA Methods Manual (1974); ASTM Standards (1974); and Standard Methods, 14th Edition (1975).

It is intended for beginning laboratory personnel and wastewater treatment plant operators.

15 minute tape and 74 slides, also script. (1973)

pH METER – LABORATORY OPERATION**XT-69**

Introduction to the theoretical concepts of pH measurement. Designed to be shown as supplemental information for laboratory session on pH measurements in Environmental Monitoring Procedures course for wastewater treatment plant operators. Sequence shows set-up, calibration and operational procedures for portable type pH meter. Procedures based on Standard Methods, 14th Edition (1975).

It is intended for wastewater treatment plant operators learning to perform this operation.

11 minute tape and 50 slides, also script. (1974)

FLUORIDE ANALYTICAL PROCEDURES**XT-80**

Covers the Environmental Protection Agency approved analytical methods as published in the 14th Edition of Standard Methods and the EPA Methods Manual. The distillation procedure recommended is also discussed.

It is intended for operators who are adding fluoride or expect to do so. It is also for those who are responsible for the analytical testing of potable or waste waters.

20 minute tape and 46 slides, also script. (Revised 1978)

PUBLIC HEALTH ASPECTS OF WATER FLUORIDATION**XT-81**

Covers the public health ideas of fluoridation of water supplies. Produced in conjunction with the Dental Health Division of the Public Health Service.

It is intended for operators or concerned groups.

22 minute tape and 41 slides, also script. (1974)

**DETERMINATION OF DISSOLVED OXYGEN—
POLAROGRAPHIC PROBE METHOD****XT-83**

Basic procedure for set-up, calibration and use of YSI oxygen meter for the determination of dissolved oxygen in a sample of wastewater treatment plant effluent. Designed to be shown as supplemental information for laboratory session on dissolved oxygen measurements in Effluent Monitoring Procedures Course. References used are Standard Methods, 14 Edition (1975); Yellow Springs Instrument Co. Instruction Manual (Model 54).

It is intended for wastewater treatment plant operators learning to perform this procedure.

6 minute tape and 30 slides (estimated*), also script. (1974)

**SIMPLIFIED GEOMETRIC MEAN
PARTS I, II, III****XT-85**

The instructional objective is to teach the procedure for the calculation of the geometric mean of fecal coliform counts when using logarithms. It is assumed the viewer has not used logarithms, but can add a series of decimal numbers and divide the total by some whole number. Development of the topic is done in stages where the tape is stopped at paced intervals for student practice. Two checks for gross errors are given. (Normally the instructor will use either **XT-85** or **XT-86**, but not both.)

It is intended for persons who can apply the basic skills of addition, subtraction, multiplication and division, but who are not familiar with logarithms.

3 tapes totaling 47 minutes, 87 slides, 3 scripts and a handout. Instructor reproduces handout for each trainee. (1975)

**GEOMETRIC MEAN
PARTS I, II, III**

XT-86

The instructional objective is to teach the procedure for the calculation of the geometric mean of fecal coliform counts when using logarithms. The viewer may or may not have used logarithms, but should be able to add a series of decimal numbers and divide the total by some whole number. The procedure is illustrated with examples. Sample problems are to be worked by the student after viewing the program. Two checks for gross errors are given. (Normally the instructor will use either **XT-85** or **XT-86**, but not both.)

It is intended for persons who can calculate simple averages. Prior ability to use logarithms helpful but not mandatory.

3 tapes totaling 35 minutes, 78 slides, 3 scripts and a handout. Instructor reproduces handout for each trainee. (1975)

ENGINEERING ASPECTS OF WATER FLUORIDATION

XT-89

Introduction to water supply operators on the addition of fluorides to a water supply. Covers the basic chemicals used in most plants as well as the types of feeders that can be used. Also considered is the topic of locations of the equipment. Used for a reference is Fluoridation Engineering Manual, USEPA, Water Supply Division, 1972.

It is intended for operators and supervisors of water treatment plants or anyone connected with controlled fluoridation.

24 minute tape and 60 slides, also script. (1974)

ODOR DETECTION IN DRINKING WATER

XT-91

This slide/tape sequence is designed to show the operator the recommended procedure for determining the odor of water and how to express his finding as the threshold odor number. The procedure is not difficult and once mastered, the odor level becomes easy to determine.

It is intended for operators or laboratory personnel working in water treatment plants.

16 minute tape and 47 slides, also script. (1977)

**FLAMELESS ATOMIC ABSORPTION DETERMINATION
OF MERCURY (Coleman MAS-50)**

XT-92

Presents the laboratory procedure covering the use of the Coleman MAS-50 system for the determination of mercury by the cold vapor or flameless technique. Both the instrumental and chemical portions of the procedure are discussed. Used as references are EPA Methods Manual (1974) and Coleman Instrument Company Instrument Manual.

It is intended for water and wastewater treatment plant operators learning to perform this procedure.

14 minute tape and 37 slides, also script. (1977)

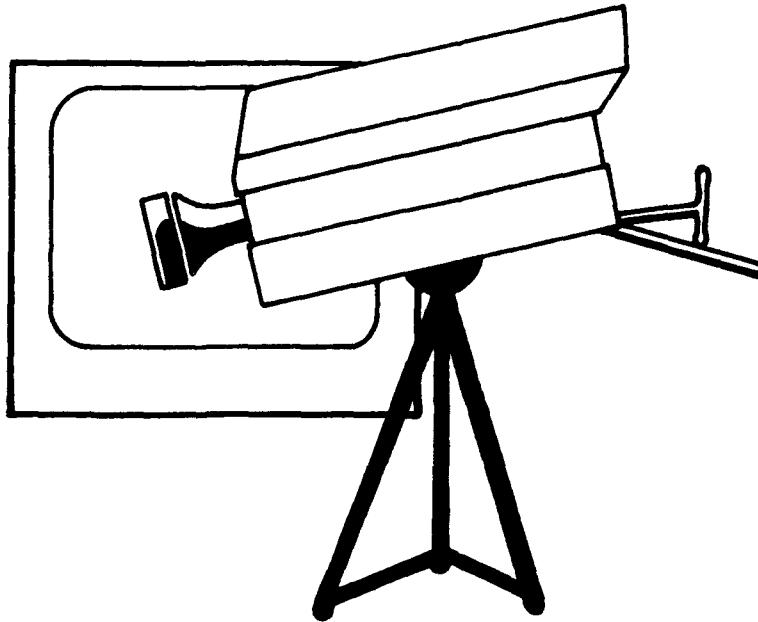
**DETERMINATION OF TOTAL RESIDUAL CHLORINE
IODOMETRIC TITRATION METHOD**

XT-93

The laboratory procedure to determine total residual chlorine using the iodometric titration method. Topics included are reasons for chlorination of wastewater treatment plant effluents, chemicals used for chlorination, their effects on the pH of the effluent, chemical species produced by their use, their reaction with ammonia, methods for their analysis, and calculations used in the determination. References used are EPA Methods for Chemical Analysis of Water and Wastes (1974) and Standard Methods for the Examination of Water and Wastewater, 14th Edition (1975).

It is intended for beginning laboratory personnel and wastewater treatment plant operators.

10 minute tape and 42 slides, also script. (1977)



VIDEOCASSETTE INSTRUCTIONAL UNITS

Most of the videocassette units have been designed as supplementary material for water and wastewater training courses, not as total training packages.

Videocassette materials contained in this catalog include those prepared by NTOTC as well as selected units prepared by others.

Units prepared by the University of Wyoming can be used for group or individualized training.

All videocassettes are 3/4" U-Matic. The user will need a receiving TV monitor and a 3/4" U-Matic Videocassette playback unit.

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BURET: CONSTRUCTION AND USE**VC-4**

The general physical features of a buret are discussed; graduation marks, stopcock and tip. Buret filling techniques are demonstrated.

An acid-base titration is carried out using phenolphthalein indicator; emphasis is placed on titration technique.

The tape is suitable for persons who are unfamiliar with the use of a buret and titration procedures.

3/4"U-Matic Videocassette, color, 15 minutes. (1973)

WINKLER DISSOLVED OXYGEN DETERMINATION**VC-5**

A dissolved oxygen determination, using a Winkler titration (azide modification) is demonstrated.

Special attention is given to techniques for the addition of reagents and to color changes involved in the titration.

The tape is suitable for persons who are familiar with titrations in general, but not with a Winkler titration.

3/4"U-Matic Videocassette, color, 15 minutes. (1973)

LABORATORY BRIEFING: COD TITRATION PROCEDURES**VC-6**

Demonstration of the technique involved in titrating a digested sample to determine the chemical oxygen demand.

This tape is designed for use as a lab briefing.

3/4"U-Matic Videocassette, color, 15 minutes. (1973)

PLANKTON AND EUTROPHICATION**VC-7**

This is a review of the problem of eutrophication. The viewer should be able to define and understand the phenomenon of eutrophication and should recognize the symptoms in his own area of involvement.

This presentation is suitable for use in plankton analysis.

3/4"U-Matic Videocassette, color, 15 minutes. (1973)

MICROSCOPIC EXAMINATION OF ACTIVATED SLUDGE

VC-8

The purpose of this unit is to instruct operators in a more efficient use of their microscope, to learn the basic types of protozoa and rotifers and relate this community of living organisms to operating conditions and effluent quality. Included is the viewing of live organisms as the plant operator sees them through a microscope. Reference used is "Process Control Manual for Aerobic Biological Wastewater Treatment Facilities," EPA 430/9-77-006 March 1977.

It is intended for wastewater treatment plant operators.

3/4" U-Matic Videocassette, color, 9 minutes. (1978)

FLUORIDE DETERMINATION IN WATER (SPADNS Method)

VC-9

This is a demonstration of the SPADNS method for determining fluoride in drinking water.

The viewer should be able to run this test in his own laboratory understanding the principle and procedures. This presentation is suitable for use in teaching fluoride analysis.

3/4"U-Matic Videocassette, color, 25 minutes. (1973)

B C AND THE CLAMS

VC-10

This is an overview of bivalve structure and function and the resulting problem of biological magnification including toxic substances in the environment. The viewer should gain familiarity with bivalve structure and anatomy and problems of biological magnification.

This presentation is suitable for use in a training course in water microbiology.

3/4"U-Matic Videocassette, black and white, 25 minutes. (1973)

STREAM BIOTA Riffle Organisms

VC-11

This is a detailed and close-up study of typical benthic stream communities.

Nets of the caddis fly larvae are shown in operation. A simple "stop net" method of benthic sampling is demonstrated as an "over the shoulder" presentation.

The viewer should gain familiarity with the structure and types of benthic stream animals and simple procedures for collecting, examining, and preserving benthic sample.

This presentation is suitable for use in teaching water quality studies.

3/4" U-Matic Videocassette, black and white, 8 minutes. (1973)

MPN PROCEDURES

VC-12

Instructional material presented here was prepared for use in training of wastewater treatment operational personnel in total and fecal coliform tests by the multiple dilution tube (MPN) method.

The four parts of this unit (A-D, inclusive) can be used (1) as supplementary material to reinforce live classroom instruction; (2) for individualized instruction, provided that a knowledgeable individual is available to reinforce, interpret, or clarify instructions; and/or (3) as preliminary demonstration-instruction prior to going to the laboratory for applied instruction.

This instructional unit makes fullest possible use of actual laboratory supplies and equipment in all demonstrations. This body of instruction is continued in VC-13, with five additional stages in the test.

Individual segments, for use in support of specific lessons in fecal coliform testing by multiple tube method are:

Equipment and supplies (23 min. running time)
Data sheets for laboratory (7 min. running time)
Tube labeling (5 min. running time)
Inoculating sample (5 min. running time)

3/4"U-Matic Videocassette, color, 60 minutes. (1973)

MPN PROCEDURES

VC-13

Instructional material presented here is a continuation of material presented in VC-12, and covers five additional stages in the determination of total and fecal coliform density in treatment plant effluent samples.

The material presented here can be used in the same manner as described for VC-12. As with VC-12, fullest possible use is made of actual laboratory supplies and equipment, with realistic demonstration of sample testing procedures.

Individual segments, for use in support of specific lessons in fecal coliform testing by multiple tube method are:

24-hour procedures (16 min. running time)
48-hour procedures (12 min. running time)
72- and 96-hour procedures (3 min. running time)
Codifying results (5 min. running time)
MPN table and calculations (15 min. running time)

3/4"U-Matic Videocassette, color, 60 minutes. (1973)

LAND DISPOSAL PROJECT**VC-15**

This tape is about the Boone County Sanitary Landfill. The Boone County field site is operated by the solid waste laboratory of the Cincinnati EPA. The purpose of this field site is to investigate on a field scale, a solid waste disposal by sanitary landfill methods. There are two experiments going on at this site. The objectives of the first one are to determine on a field scale the applicability of previous results obtained in lab studies, the survival of viral and bacteriological pathogens, the production rates of leachate, and the rates of settlement. The objective of the second experiment is to determine the validity of using six-foot diameter pipes to simulate a larger cell, and to determine the variability of pipe performances. This tape deals with both of these topics.

3/4"U-Matic Videocassette, color, 10 minutes. (1972)

DETERMINATION OF ORGANICS IN DRINKING WATER**VC-16**

This presentation covers the basic construction, operation and advantages of the mini-sampler, a new unit designed to determine the organics level in drinking water.

3/4"U-Matic Videocassette, color, 20 minutes. (1972)

CHEMICAL AND PHYSICAL PROPERTIES OF OIL**VC-18**

Discusses the need to identify an oil and physical properties and chemical composition of various oils.

3/4"U-Matic Videocassette, color, 25 minutes. (1974)

WELCOME TO ERC-CINCINNATI**VC-19**

The Environmental Research Center in Cincinnati is a central tool of the Environmental Protection Agency. As explained by Dr. Stephan, Senior Official, Research & Development, Cincinnati, the center here is one of the main research operations of the EPA. The six major areas of research develop practical solutions for known environmental problems. Other activities of the EPA are also located in Cincinnati. This presentation will display the work done by the United States Environmental Protection Agency and specifically the work done by the Environmental Research Center in Cincinnati.

3/4"U-Matic Videocassette, color, 25 minutes. (1977)

AQUATIC ECOSYSTEMS

VC-20

The four basic parts of an ecosystem are illustrated graphically in parts and in energy flow. This is further illustrated by close up of live organisms in a closed ecosystem. It includes all basic aquatic communities. It is for a general audience – introductory level.

3/4"U-Matic Videocassette, color, 10 minutes. (1974)

SUSPENDED SOLIDS

VC-21

There are two segments on the tape, produced as laboratory instruction units for the Effluent Monitoring Procedure, Suspended (Non-Filterable) Solids.

First segment – *Preparing the Filter Disc* presents the equipment and technique for this procedure.

Second segment – *Procedure* presents recording sample identity, filtration and rinsing, and putting the disc with residue into an oven. Both the membrane filter assembly and the Gooch crucible are used in this demonstration.

3/4"U-Matic Videocassette, color; first segment 15 minutes, second segment 13 minutes. (1974)

WATER RESOURCES AND NEEDS

VC-22

Hydrologic cycle and relationship to water supply. Distribution of water supply and general uses.

3/4"U-Matic Videocassette, color, 20 minutes. (1974)

INFRARED SPECTROSCOPY: AgCl WINDOW, NaCl WINDOW

VC-23

AgCl Window - The Wilks infrared liquid mini-cell and its component parts are discussed.

Cell filling and means for varying the cell path length are demonstrated.

NaCl Window - An infrared sodium chloride sandwich cell is discussed. Cell filling is demonstrated.

The tape is suitable for persons who have only a basic understanding of infrared laboratory procedures.

3/4"U-Matic Videocassette, color, 7 minutes and 6 minutes, respectively. (1973)

ANALYSIS OF PLANKTON

VC-24

This is a review of the many techniques for plankton analysis.

The viewer should be able to choose the test(s) applicable to his own type sample.

This presentation is suitable for use in plankton analysis.

3/4" U-Matic Videocassette, black and white, 30 minutes. (1973)

ALGAE AS AN INDICATION OF POLLUTION

VC-25

This is an exploration of Dr. Palmer's pollution index using algae as indicators.

The viewer should be able to apply the index to his own local water samples of lakes and streams given this tape presentation and a chart prepared by Dr. Palmer.

This presentation is suitable for use in plankton analysis.

3/4"U-Matic Videocassette, color, 30 minutes. (1973)

SEWAGE

VC-26

This is an overview of typical activated sludge microorganisms.

The viewer should gain familiarity with the types and variety of typical forms of the activated sludge process and indicator organisms.

This presentation is suitable for use in bacteriological analysis of drinking water.

3/4" U-Matic Videocassette, black and white, 15 minutes. (1973)

BIOASSAY PROCEDURE

VC-27

This unit consists of a detailed demonstration of a full scale (96 hour) static bioassay test. Dr. Herbert Jackson, former USEPA aquatic biologist, uses wastewater from industries for samples and uses minnows as test animals. He then discusses the results and how to interpret the results to be used in determining management policy for a particular effluent. Reference used is Standard Methods, 13th Edition, 1971.

It is suitable for laboratory personnel interested in overview of the Bioassay technique.

3/4" U-Matic Videocassette, 16 mm (MP-11), color, 25 minutes. (1973)

THE EFFECTS OF LEAD ON BROOK TROUT**VC-28**

This is a graphic presentation of one-year old brook trout which had been exposed continuously from egg stage to 250 ppb and 150 ppb of lead. Shows their characteristic growth deformity, swimming ability loss, and contrasts them with normal trout the same age, unexposed to lead. Incidentally shown are bioassay dilution systems. It was conducted at National Water Quality Laboratory, Duluth, Minnesota.

3/4"U-Matic Videocassette, color, 6-1/2 minutes. (1974)

ATOMIC ABSORPTION INSTRUMENTATION – LAB BRIEFING**VC-29**

Depicts set-up operation and calibration of Atomic Absorption Spectrophotometer. It is designed as a laboratory briefing for students learning chemical analysis

3/4"U-Matic Videocassette, color, 7 minutes. (1973)

DETERMINATION OF DISSOLVED OXYGEN: TITRATION OF SAMPLE**VC-38**

The dissolved oxygen content of a water sample contained in a 300 ml biochemical oxygen demand bottle is determined by means of a Winkler titration – azide modification. Emphasis is placed on recognition of the titration end point. Calculations are shown.

Although designed as a laboratory briefing for students attending the training course Self-Monitoring Procedures: Basic Parameters for Municipal Effluents (164.1), it may be useful to others teaching the subject.

3/4"U-Matic Videocassette, color, 27 minutes. (1974)

DETERMINATION OF DISSOLVED OXYGEN: STANDARDIZATION OF SODIUM THIOSULFATE**VC-39**

Approximately 0.0375 N sodium thiosulfate is standardized against 0.0375 N potassium biiodate. Calculations are shown.

Although designed specifically for use in the training course, Self-Monitoring Procedures: Basic Parameters for Municipal Effluents (164.1), it may be useful to others teaching the subject.

3/4"U-Matic Videocassette, color, 27 minutes. (1974)

**DETERMINATION OF FIVE DAY BIOCHEMICAL OXYGEN DEMAND
(SAMPLE DILUTION)**

VC-40

Two techniques are shown:

1. Dilution of a biochemical oxygen demand sample in a graduated cylinder. Nutrient salt solutions and buffer are added. Emphasis is placed on mixing technique.
2. Filling of biochemical oxygen demand bottles by siphoning from the graduated cylinder.

Although designed specifically for use in training course Self-Monitoring Procedures: Basic Parameters for Municipal Effluents (164.1), it may be useful to others teaching the subject.

3/4"U-Matic Videocassette, color, 23 minutes. (1974)

**DETERMINATION OF DISSOLVED OXYGEN USING A DISSOLVED
OXYGEN METER – PARTS A AND B**

VC-41

The Weston & Stack Model 300 dissolved oxygen meter is placed into operation. Steps included in Parts A and B are:

- Battery check
- Cleaning of electrodes
- Membrane installation
- Discussion of calibration methods

Although designed specifically for use in the training course, Self-Monitoring Procedures: Basic Parameters for Municipal Effluents (164.1), it may be useful to others teaching the subject.

Two 3/4" U-Matic Videocassettes, color, 26 and 38 minutes, respectively. (1974)

SETTLEABLE SOLIDS (A,B,C, AND D)

VC-42

This is a classroom briefing for laboratory procedure to determine settleable solids, milligrams per liter Imhoff Settling Cone. Reference used was Standard Methods, 14th Edition (1975).

It is intended for beginning wastewater treatment plant operators.

3/4"U-Matic Videocassette, color, 15 minutes. (1974)

USE OF GRANULAR CARBON FOR WASTEWATER TREATMENT

VC-51

This tape is intended for those interested in granular carbon adsorption as an alternative to conventional waste treatment techniques. The subject matter includes basic principles as well as operating information on laboratory pilot and full scale plants. Cost information, however, is not current and should be ignored (or compared to dollar values approximate to 1967-1970).

3/4" U-Matic Videocassette, black and white, 40 minutes.

UPGRADING ACTIVATED SLUDGE TREATMENT PLANTS

VC-52

This three part tape is intended for those interested in upgrading secondary treatment plants for higher plant efficiencies.

Part one, Pre-plant Considerations, addresses topics such as sewer repair and flow equalization and what can be done prior to treatment at the plant to upgrade performance.

Part two, Upgrading Activated Sludge, discusses various physical and chemical modifications that can be made at existing facilities to enhance solids, organics and nutrients removals.

Part three, Post-Plant Considerations, deals with filtration and micro-straining as techniques for improved solids capture as well as granular activated carbon adsorption as a tertiary polishing step.

3/4" U-Matic Videocassette, black and white, 40 minutes.

PROJECT HYPOLIMNION

VC-53

Joint project between Canada and NASA on biological life in Lake Erie. Its special use is for training in estuary studies and for those interested in underwater photography.

3/4" U-Matic Videocassette, color, 17 minutes.

DETERMINATION OF OIL AND GREASE: BASIC SKILLS, SEPARATORY FUNNEL

VC-55

Part I of this program demonstrates four entry level skills needed for use with the effluent monitoring procedure. The skills are use of pH sensitive paper, use of partial and total immersion thermometers, folding and placing filter paper in a 60° funnel.

Part II of this videocassette demonstrates the use of a separatory funnel to extract a water sample with Freon.

Special attention is given to safety, separation of the water and solvent layers, and manipulation of the stopcock to separate the two layers.

Although the narration scripts are taken from the effluent monitoring procedure, "Determination of Oil and Grease," CH.of.EMP.1b.12.75, they may be useful to others teaching these procedures.

3/4" U-Matic Videocassette, color; Part I – 17 minutes, Part II – 13 minutes. (1976)

DETERMINATION OF OIL AND GREASE: DISTILLATION SET UP

VC-56

Near the end of the effluent monitoring procedure, "Determination of Oil and Grease" CH.of.EMP.1b.12.75, instructions are given for removal of the Freon solvent. One method of removal is distillation. This videocassette demonstrates the assembly of a distillation apparatus. Several distillation "heads" are shown.

Although this was prepared specifically for the effluent monitoring procedure, it may be useful to others teaching this subject.

3/4 U-Matic Videocassette, color, 15 minutes. (1976)

USE OF A SPECTROPHOTOMETER

VC-57

Use of a Bausch and Lomb Spectronic 20 spectrophotometer is demonstrated.

Special attention is given to techniques for placing the instrument into operation, taking absorbance readings, and changing the phototube.

Although the narration script is taken from the effluent monitoring procedure, "Use of a Spectrophotometer" CH.IN.sp.EMP.1a.9.75, it may be useful to others teaching this instrument.

3/4" U-Matic Videocassette, color, 21 minutes. (1976)

THE PREPARATION OF CADMIUM REDUCTION COLUMN

VC-58

This tape is designed as a lab briefing for one of the laboratory procedures in the effluent monitoring procedure, "Determination of Nitrate-Nitrite Nitrogen and of Nitrate Nitrogen, Cadmium Reduction Method." The author demonstrates cutting a pipet and assembling the glass column, preparing copperized cadmium, filling the column with the copper-cadmium and adjusting the flow rate for the reduction process.

3/4" U-Matic Videocassette, color, 21 minutes. (1975)

STORM WATER POLLUTION CONTROL

VC-59

History of first storm sewers, how sanitary wastes entered in, and the introduction of wastewater treatment plants. Discusses present combined sewers and sewage overflow into lakes and streams. Gives alternative methods for sewage overflow to keep the water clean. Also shows methods of solids removal.

3/4" U-Matic Videocassette, color, 40 minutes. (1975)

NEW DEVICES FOR SAMPLING IN RIVERS

VC-64

This was prepared for presentation by Ichthyological Associates, Inc. It shows gear and sampling methods devised to cover sampling problems encountered in rivers with rocky substrate, strong currents and fluctuating water levels.

Sampling devices used are anchoring, "Creeper", ladder, submersible raft, "Dome" sampler, zooplankton pump, pontoon boat and trash pump, and airboat. It was prepared for a Midwest Benthological Society meeting.

3/4" U-Matic Videocassette, black and white, silent, 17 minutes.

ORGANICS IN DRINKING WATER

VC-67

Part I contains the information on events leading up to and causing interest in the occurrence of organic materials in drinking water. Because of concern over an article published in Consumer Reports entitled "How Safe is Your Water to Drink" indicating possible risk in consuming drinking waters, EPA did a study on the New Orleans water supply.

Information is supplied on the research conducted, the the results which eventually caused the passage of the Safe Drinking Water Act, and the promulgation of the National Interim Primary Drinking Water Regulations.

*Part II** discusses the water supply research activities within EPA concerning the chloroform issue and the voluntary reduction program for drinking water supplies. The laboratory evaluation of water treatment unit processes which led to the "Interim Treatment Guide for the Control of Chloroform and Other Trihalomethanes" are presented along with the proposed field studies and EPA's future research direction for trace organics removal.

Two 3/4" U-Matic Videocassettes, color, 34 minutes and 43 minutes, respectively.

* An update of this material is being planned pending the outcome of the proposed regulation "Control of Organic Chemical Contaminants in Drinking Water."

DETECTION OF ODOR IN DRINKING WATER

VC-68

Designed to show the operator the recommended procedure for determining the odor of water and how to express his findings as the threshold odor number. The procedure is not difficult and once mastered, the odor level becomes easy to determine.

It is intended for operators or laboratory personnel working in water treatment plants.

3/4" U-Matic Videocassette, color, 16 minutes.

INDUSTRIAL POLLUTION CONTROLS

VC-71

A four part tape dealing with pollution controls. *Part I* handles measurement technology, *Part II* is wastewater treatment, *Part III* is air pollution control, and *Part IV* is advanced control technology.

3/4" U-Matic Videocassette, black and white, 30 minutes.

SAFE DRINKING WATER ACT – WHAT IT MEANS TO YOU

VC-72

A dialog between Jack Mannion, Office of Water Supply, EPA, and Betty Abbott, Omaha Nebraska City Council, concerning the role of the elected official in implementing the Safe Drinking Water Act.

The significance of the Act toward providing safe water to the general public and how the act came to be are discussed along with the public notification aspects from the viewpoint of an elected official. This pointed out that the public should be informed if levels are surpassed and what they should do about it, and what will be done to elevate the situation by this potable water treatment plant.

The costs involved and how officials can begin to prepare for any increase in financial need is discussed along with ideas of the method to gain information on what increases might be expected.

The presentation is designed to be viewed by local officials and the general public.

3/4" U-Matic Videocassette, 16 mm (MP-60), color, 16 minutes. (1976)

SAFE DRINKING WATER ACT

VC-73

A discussion of the Safe Drinking Water Act and how it builds upon existing programs and extends this to more public drinking water treatment plants totaling over a quarter million supplies. Betty Abbott, member of the National Drinking Water Advisory Board discusses such topics as which contaminants are covered by the Act, how it will be implemented, public

notification of the persons served if levels are surpassed and the application of variances and exemptions from the regulations.

The presentation is designed to answer questions which might arise covering the Act.

3/4" U-Matic Videocassette, 16 mm (MP-63), color, 17 minutes. (1976)

INTRODUCTION TO NTOTC

VC-74

Described the function of the USEPA National Training and Operational Technology Center and the services it provides. The facilities are toured showing the laboratories, classrooms, and the individual study lab, as well as describing the Instructional Resources Center and course offerings.

3/4" U-Matic Videocassette, color, 9 minutes. (1977)

DESIGNATION FOR AREAWIDE WATER QUALITY

VC-77

Films and slides from various EPA Regions depicting the sources and hazards of water pollution; also gives examples of effective water quality management plans comprising Section 208 of the 1972 Water Pollution Control Act.

3/4" U-Matic Videocassette, color, 50 minutes. (1975)

GRANT PROCESS FOR 208 PLANNING: THE DESIGNATION PROCESS

VC-78

John Quarles, Deputy Administrator, EPA, speaks to planning agencies about the Federal Water Pollution Control Act. A panel discusses the procedures for dealing with water pollution and the implementation of the 208 plan.

3/4" U-Matic Videocassette, color, 45 minutes. (1975)

FIRE DEPARTMENT RESPONSE TO OIL SPILLS

VC-80

Oil spills have become a problem in every part of the world. Their occurrence results in major financial and ecological loss. The Marine Division of the New York City Fire Department has highly trained personnel to deal with the problems of oil slicks. This tape discusses the equipment employed and the operations used in various oil spill situations.

3/4" U-Matic Videocassette, color, 20 minutes.

QUALITY CONTROL TESTS FOR COMMUNITY WATER SYSTEMS**VC-81**

Discusses the different microbiological tests used by water treatment plants operators. Both field and laboratory tests are explained, and the importance of each is emphasized. The use of these tests gives the operator knowledge of his water source.

It is intended for anyone interested in the type of microbiological tests performed in water treatment.

3/4" U-Matic Videocassette, 16 mm (MP-58), color, 17 minutes.

WATER, WATER, EVERYWHERE**VC-86**

Public laws in most states prohibit cross connections of a potable water supply. This presentation gives several examples of actual cross connection episodes. Animated illustrations of how cross connections occur and of the four classes of control devices available are included.

3/4" U-Matic Videocassette, color, 14 minutes.

**UNIVERSITY OF WYOMING PROGRAMMED TRAINING
UNITS FOR WATER/WASTEWATER OPERATIONS**

Each unit in this selection consists of four different parts:

- *The **Videocassette** presents the subject matter to the operator;*
- *The **Workbook Notes** are provided to guide the operator through the unit and include sketches, problem examples and tables;*
- *The **Practice Problems** show the operator applications of subject matter for use after studying the tape and workbook notes; and the **Academic Tests** are used to determine if the operator has achieved the objective of the unit.*

Although the operator can proceed at his own pace, a group leader should oversee the operator's progress and give instruction where needed.

*The individual section of the workbook corresponding to each topic borrowed will be loaned with that videocassette. **Workbook Notes** should be **reproduced** for each participant.*

MATHEMATICS 1, 2, 3, 4, 5

VC-150.1

In **Lesson 1** the operator is shown how to add, subtract, multiply, and divide whole and decimal numbers and to learn the use of significant numbers; in **Lesson 2** the operator is shown how to add, subtract, multiply, and divide fractions and mixed numbers and change mixed numbers to improper fractions; in **Lesson 3** he learns to interchange fractions to decimals, to percents and to solve simple equations containing percents; **Lesson 4** shows how to compute the median and mean of a set of numbers; and in **Lesson 5** he learns to compute the area of a rectangle, triangle and a circle, and to learn the units associated with an area measurement.

3/4" U-Matic Videocassette, color, 58 minutes.

MATHEMATICS 6, 7

VC-150.2

Lesson 6 shows how to convert between cubic feet and gallons, between gallons and pounds of water, and between mgd and cfs, also given two of those values, he learns to find either distance, velocity or time; in **Lesson 7** he learns to compute a chemical dosage in pounds per day (or month) given the chemical application in ppm and the average flow in mgd.

3/4" U-Matic Videocassette, color, 25 minutes.

MATHEMATICS 8, 9, 10

VC-150.3

Lesson 8 shows how to compute the volume of a rectangle solid (box) and a cylinder, and learn the units associated with volume; in **Lesson 9** he learns to compute the volume of a

cone and a sphere and convert cubic feet to gallons; in **Lesson 10** he learns the units of specific weight, how it is affected by temperature and how to compute specific weight given the specific gravity.

3/4" U-Matic Videocassette, color, 39 minutes.

MATHEMATICS 11, 12

VC-150.4

In **Lesson 12** the operator learns to apply the dosage formula (mathematics 7) in computing chemical cost and also is shown the conversion factor between grains per gallon and parts per million; **Lesson 12** shows how to compute detention times given flow rate and tank dimensions.

3/4" U-Matic Videocassette, color, 48 minutes.

CHEMISTRY 1, 2, 3

VC-151.1

Lesson 1 defines an element and an atom and explains symbols and valences and a table showing common elements and their symbols and valences; **Lesson 2** tells what a compound is and gives rules in balancing equations using charges with several examples; **Lesson 3** explains how to recognize a radical, a table of common radicals and their electrical charge and examples of chemical equations with radicals.

3/4" U-Matic videocassette, color, 41 minutes.

CHEMISTRY 4, 5

VC-151.2

Lesson 4 explains dissolution and how compounds dissolve in water to form ions, water as a universal solvent and examples of dissolution equations; **Lesson 5** shows how to recognize acids and bases and how they react in water, and the meaning of the pH scale in terms of acids and bases.

3/4" U-Matic Videocassette, color, 26 minutes.

CHEMISTRY 6, 7, 8, 9

VC-151.3

Lesson 6 discusses common prefixes and units in the cgs (metric) System and their conversion to English units with tables showing units of length, volume and weight and a table for conversion of units; in **Lesson 7** the relationships are given between water volume and weight in the cgs System with examples of conversion from mg/ml to milligrams per liter. **Lesson 8** teaches the common atomic weights and how to use them to determine molecular

weight; and **Lesson 9** discusses Conservation of Mass with examples of how to apply molecular weights to chemical equations.

3/4" U-Matic Videocassette, color, 44 minutes.

CHEMISTRY—TESTING 1, 2, 3

VC-152.1

Lesson 1 inspects the major features of an analytical balance and demonstrates how to weigh an object; in **Lesson 2** the procedures and calculations involved in the test for Total Solids are shown; and **Lesson 3** inspects the major parts of a pH meter, gives a brief description of buffer solutions and the step-by-step procedures showing use of a pH meter including standardization.

3/4" U-Matic Videocassette, color, 42 minutes.

CHEMISTRY—TESTING 4, 5

VC-152.2

Lesson 4 gives a list of equipment plus a step-by-step procedure for determining alkalinity by electrometric titration. Shows calculation for a 100 ml sample to determine alkalinity and an introduction to the units of alkalinity. **Lesson 5** shows the importance of cleaning laboratory equipment and the practices used.

3/4" U-Matic Videocassette, color, 23 minutes.

CHEMISTRY—TESTING 6, 7, 8

VC-152.3

In **Lesson 6** it is learned what dissolved oxygen is, how it changes with temperature and elevation and a brief explanation is given of the Winkler Test with a list of equipment and chemicals needed for the Azide Modification; **Lesson 7** shows the procedure to determine dissolved oxygen by use of the BOD bottle and step-by-step procedure showing how to fix the oxygen in the BOD bottle; **Lesson 8** gives the procedure for completing the determination of the DO test and gives sample calculations.

3/4" U-Matic Videocassette, color, 43 minutes.

CHEMISTRY—TESTING 9, 10

VC-152.4

Lesson 9 is a demonstration of the construction and uses of different types of glassware commonly encountered in a chemistry laboratory including beakers, bottles, crucibles, flasks, filtration apparatus, graduates, burets and pipets; **Lesson 10** shows how to correctly measure liquids in common pieces of laboratory glassware, how to use a pipet bulb with three valves and how to correctly transfer liquids.

3/4" U-Matic Videocassette, color, 25 minutes.

CHEMISTRY—TESTING 11, 12**VC-152.5**

Lesson 11 is a demonstration of the Imhoff cone test for the volume measurement of settleable solids; **Lesson 12** is a demonstration of the test for suspended solids.

3/4" U-Matic Videocassette, color, 25 minutes.

MICROBIOLOGY 1,2,3**VC-153.1**

Lesson 1 shows the general characteristics of bacteria; discussion of bacteria size, shape and growth needs plus definition of aerobic, anaerobic and facultative bacteria; **Lesson 2** gives the explanation of an indicator organism and a list of ideal characteristics; in **Lesson 3** the operator learns what the coliform bacteria is and its advantage and disadvantages as an indicator organism.

3/4" U-Matic Videocassette, color, 26 minutes.

HYDRAULICS 1,2,3,4**VC-154.1**

Lesson 1 shows the use of the basic flow equation $Q = A V$ for a pipe flow problem; in **Lesson 2** the use of the flow equation is applied to problems other than pipe flow; in **Lesson 3** the operator learns to use the pressure equation $P = h$; and **Lesson 4** shows problem solving of pressure problems using $P = h$.

3/4 U-Matic Videocassette, color, 26 minutes.

EFFLUENT STANDARDS 1,2,3,4**VC-155.1**

NOTE: Instructor should mention the differences between 1977 and 1978 Clean Water Act.

Lesson 1 discusses reasons for effluent standards, what they are and how used; **Lesson 2** shows how permit system relates to dischargers (tied to 1977 date no mention of U.S. EPA permit system); **Lesson 3** discusses the "Now" Standards and examples from various permits are given and how they are set; **Lesson 4** is a discussion of secondary treatment standards, (based on 7/1/77 standards with no clear distinction between municipal and industrial discharges).

3/4 U-Matic Videocassette, color, 44 minutes.

EFFLUENT STANDARDS 5,6**VC-155.2**

Lesson 5 explains what the Compliance schedule of a permit is and how it works (tied to 1977 Standards); **Lesson 6** explains the requirements of the monitoring section of a permit (tied to municipal monitoring and testing only).

3/4" U-Matic Videocassette, color, 19 minutes.

WATER TREATMENT 1, 2, 3, 4**VC-156.1**

Lesson 1 considers the basic orientation to water treatment, compares differences between simple and complex types of treatment plants and discusses various factors to be considered in plant design; **Lesson 2** discusses the purpose and general operation of a flocculation-coagulation unit process with illustration of major systems. In **Lesson 3** the purpose and general operation of a rapid-sand filter unit as a backup to the clarifier to aid in producing water that meets the drinking water standards is discussed; in discussing the purpose and operation of the clear well and chlorination units, **Lesson 4** explains chlorination, flow measurement, clear well and fluoridation.

3/4" U-Matic Videocassette, color, 50 minutes.

WATER TREATMENT 5, 6, 7, 8**VC-156.2**

Lesson 5 discusses the use of a conveyor belt to facilitate handling of bagged chemicals along with the use of dust collectors on the hopper of the chemical feeder, safety, respirators, hopper loading and bag disposal; **Lesson 6** shows how a gravimetric gate type belt feeder works. In **Lesson 7** the operation and maintenance of a gravimetric gate type belt feeder is explained; **Lesson 8** discusses the general operation and tips on the maintenance of coagulation-flocculation units.

3/4" U-Matic Videocassette, color, 61 minutes.

WATER TREATMENT 9, 10, 11**VC-156.3**

Lesson 9 covers the general operation, use and maintenance of clarifiers and sedimentation basins; **Lessons 10 and 11** considers the general operation, use and maintenance of a rapid sand filter and the preparation and backwash of filters.

3/4" U-Matic Videocassette, color, 48 minutes.

WASTEWATER TREATMENT 1,2,3**VC-157.1**

Lesson 1 explains the reasons for treating wastewater, the composition and types of sewage and terminology used in wastewater treatment; in **Lesson 2** the operator learns the purposes of bar screens, grit chambers, flow measurement and comminutor; **Lesson 3** instructs on the purposes of the remaining primary plant units: the clarifier, digester and sludge drying beds.

3/4 U-Matic Videocassette, color, 42 minutes.

WASTEWATER TREATMENT 4,5,6**VC-157.2**

Lesson 4 discusses the secondary treatment and the basic workings of a trickling filter; in **Lesson 5** we're shown the basic workings of an activated sludge system; in **Lesson 6** we learn about the general order of plants in the primary and secondary treatment plants.

3/4" U-Matic Videocassette, color, 27 minutes.

WASTE STABILIZATION LAGOON 1,2**VC-158.1**

Lesson 1 explains the basic operations of aerobic and facultative systems; **Lesson 2** teaches operations of anaerobic and aerated lagoons and discussion of lagoon Maintenance.

CHLORINATION 1, 2**VC-159.1**

In **Lesson 1** the operator learns the basic properties of chlorine, the reasons for chlorination and basic first aid and safety procedures; **Lesson 2** explains the set-up of hypochlorinators and gas chlorinators.

3/4" U-Matic Videocassette, color, 21 minutes.

CHLORINATION 3, 4, 5, 6**VC-159.2**

Lesson 3 covers the use and general description of the Fisher-Porter vacuum paced type of chlorinator; **Lesson 4** explains the various parts of the Fisher-Porter chlorinator; the use and hook-up of the 100 pound and 1 ton chlorine containers is covered in **Lesson 5**; **Lesson 6** discusses the swimming pool type of Fisher-Porter chlorine meter, its use and maintenance.

3/4" U-Matic Videocassette, color, 36 minutes.

SAFETY 1, 2, 3**VC-160.1**

The hazards of toxic gases and how to test for them is explained in **Lesson 1**; **Lesson 2** shows the hazards of combustible gases and how to test for them; and in **Lesson 3** the use and limitations of respirators and gas masks is shown.

3/4" U-Matic Videocassette, color, 42 minutes.

SAFETY 4**VC-160.2**

Lesson 4 gives a step-by-step procedure of the use and care and maintenance of self-contained breathing apparatus.

3/4" U-Matic Videocassette, color, 15 minutes.

MAINTENANCE 1, 2, 3, 4, 5**VC-161.1**

In **Lesson 1** the major parts of a centrifugal pump are studied; **Lesson 2** continues with the pump this time teaching the operations of rotation and a water bleed system; in **Lesson 3** the methods and procedures of preventative maintenance are observed; **Lesson 4** shows procedures and methods of lubrication; and **Lesson 5** shows step-by-step procedures for breaking down, inspecting, repairing and reassembling a centrifugal pump.

3/4" U-Matic Videocassette, color, 60 minutes.

MAINTENANCE 6, 7**VC-161.2**

In **Lesson 6** the operator learns the major parts of a gate valve and the operation and maintenance of the gate valve; **Lesson 7** continues with valves, showing the use, operation and maintenance of a plug valve, regulator valve and special high pressure valve.

3/4" U-Matic Videocassette, color, 41 minutes.

MICROBIOLOGY TESTING 1, 2, 3**VC-162.1**

Lesson 1 gives the general procedure and the equipment needed for testing for coliforms using the MF test. **Lesson 2** demonstrates the proper procedure for washing and preparing the equipment for the MF test for sterilization; in **Lesson 3** the correct procedures for preparing the buffered dilution water for the test.

3/4" U-Matic Videocassette, color, 38 minutes.

MICROBIOLOGY TESTING 5, 6 and 12**VC-162.2**

Lesson 5 shows the proper methods of sample taking in a stream or a household tap; **Lesson 6** discusses sample size and dilution and the associated mathematics of each situation. **Lesson 12** teaches procedures of coliform incubation demonstrating a warm air incubator, waterbath incubator and coliform incubation techniques.

3/4" U-Matic Videocassette, color, 40 minutes.

MICROBIOLOGY TESTING 4, 7, 8**VC-162.3**

Lesson 4 shows the preparation of the M-endo MF broth for the coliform test; **Lesson 7** shows the proper procedure to perform the MF total coliform test using sterile techniques; in **Lesson 8** colony counting of total coliform is discussed.

3/4" U-Matic Videocassette, color, 52 minutes.

MICROBIOLOGY TESTING 9, 10, 11**VC-162.4**

Lesson 9 demonstrates the proper techniques for preparing the M-FC broth and rosolic acid solution for the fecal coliform test; **Lesson 10** shows how to perform the test for fecal coliforms; in **Lesson 11** the proper procedures are demonstrated for fecal coliform colony counting.

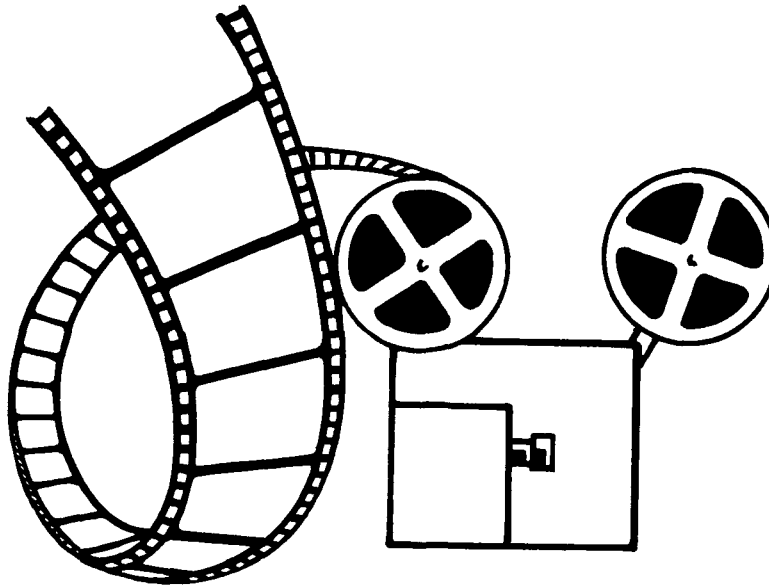
3/4" U-Matic Videocassette, color, 38 minutes.

FLUORIDATION 1, 2, 3, 4, 5**VC-163.1**

Lesson 1 gives the history and general information regarding fluoridation of water supplies; **Lesson 2** instructs in the major compounds used in fluoridation and the characteristics of each; in **Lesson 3** the major parts, operation and maintenance of an upflow saturator is discussed; **Lesson 4** does the same with the downflow saturator; and **Lesson 5** teaches the general safety and protection of handling fluoride compounds.

TRICKLING FILTERS 1, 2, 3, 4, 5, 6**VC-164.1**

Lesson 1 introduces the trickling filter and its major parts; **Lesson 2** explains the biological action of the process; in **Lesson 3** the importance of daily and periodic checks and how to deal with problems of uneven distribution and ponding is explained; **Lesson 4** deals with odor, freezing and filter fly problems; in **Lesson 5** the operator learns the maintenance necessary for distributor arms, bearings and mercury seals; **Lesson 6** shows hydraulic and organic loadings and how to compute them for trickling filters.



FILMS

A wide variety of 16 mm films are included in this section. Some are useful as training aids, while others give a general overview of a topic. Most deal with water quality.

A standard 16 mm projector is required to view films.

Since our supply of each film is very limited, films may be borrowed for a viewing period of only 3 days.

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YOU PACK YOUR OWN CHUTE**MP-1**

This is a motivational film. It is a study of a woman preparing to sky dive into the ocean when she has never sky dived before and cannot swim. The viewer is encouraged to become aware of his behavior and unrealistic fears. The awareness can be used to control behavior and overcome fears. It is intended for anyone interested in encouraging motivational behavior.

16 mm, color, 30 minutes.

TALENT SEARCH**MP-2**

This film stresses the importance of careers in the Wastewater Treatment field. It also shows the rewarding work and the attractive career opportunities of the Wastewater Treatment plant operator, his work, and what the waste treatment plant does for the health and well being of the community. It is intended for anyone interested in promoting careers in the Wastewater Treatment field.

16 mm, color, 20 minutes.

EN BUCCO DE TALENTO**MP-3**

(Spanish version of MP-2)

SOMEBODY AROUND HERE IS DOING SOMETHING GOOD**MP-4**

Pilot project on solving the problems of updating already existing water treatment plants by the additions of chemical treatment. Advanced Waste Treatment shows a concerned community and the benefits of having tertiary treatment. Explains the basic workings of the plant.

16 mm, color, 15 minutes. Richardson, Texas (1972)

NEW WATER FOR A THIRSTY WORLD**MP-5**

Produced in the Sixties, this film discusses the growing uses and needs of water throughout the world. The central topic is the search for and successful use of saline conversion techniques.

16 mm, color, 20 minutes.

IT'S ONLY WATER**MP-6**

The Denver, Colorado Region is the focus for this film. It discusses the importance of developing sufficient water sources to meet the needs of a growing community. Techniques used in processing and distribution are also explored. It may be useful to those persons interested in developing water sources.

16 mm, color, 20 minutes.

THE WATER PLAN**MP-7**

A look at how a community in California is meeting their Wastewater Treatment needs. They explored possible solutions and chose a long range plan that would encourage wildlife in the area, keep the water clean, and allow for future technological developments to be implemented. Useful for showing the success of community involvement in Wastewater Treatment.

16 mm, color, 25 minutes. Alameda Creek, CA. (1973)

ENTRAPPED AIR IN PIPELINES**MP-8**

The film deals with the problems of entrapped air in pipelines. Causes and effects are discussed, with solutions presented to prevent pipe damage. These solutions include: automatic air release valves; having pipes laid to grade; or bleed any remaining air from lines before testing.

16 mm, color, 18 minutes.

PURE WATER AND PUBLIC HEALTH**MP-9**

This film dates to the early sixties, consequently its viewpoint is not completely relevant to the problems of the seventies. It deals with a community that has outgrown its water supply and the problems caused by the inadequacies of the system. It can be used as an introduction to the topic of planning and developing adequate water systems.

16 mm, color, 28 minutes.

BIOASSAY**MP-11**

This film consists of a detailed demonstration of a full scale (96 hour) static Bioassay test. Dr. Jackson, former USEPA aquatic biologist, uses wastewater from two industries for

examples with minnows as the test animals. He then discusses the results and how to interpret the results to be used in determining management policy for a particular effluent. Reference used was Standard Methods. (1971) It is suitable for laboratory personnel interested in the Bioassay techniques especially an industrial wastewater laboratory analysis training program.

16 mm, color, 25 minutes.

MODERN SEWERS FOR MODERN COMMUNITIES

MP-12

The need for adequate sewers requires the best in durable materials. Certainteed Pipe Company explains the quality and advantages of using their pipes. It would interest those persons planning sewer installations.

16 mm, color, 10 minutes.

TRICKLING FILTERS

MP-13

An in-depth look at the construction of a trickling filter for a wastewater treatment plant. The film explains the necessity of careful construction of the filter so as not to damage the underdrains. The importance of selecting size, gradation, and shape of crushed stones is also stressed.

16 mm, color, 15 minutes.

MODERN WATER TREATMENT

MP-14

An overview of differing approaches to wastewater, and how treatment plants differ across the country with regard to the type of sewage entering each plant. Explains the mechanics involved.

16 mm, color, 30 minutes.

FIRST YOU CARE

MP-15

A look at how some Canadian Industries are cleaning up their effluent even though doing this at a loss, because they care about pollution of the rivers. Discusses some specific pollutants and how they are handled.

16 mm, color, 14 minutes.

GROUND WATER – “AMERICA'S BURIED TREASURE”**MP-16**

Ground water makes up 95% of the earth's fresh water supply. It requires less treatment because the soil filters water as it moves through the ground. The cost of transferring ground water is less than half that of surface water. Care must be taken to insure it's purity against strip mining, oil drilling, chemicals in farming and refuse. There is no quick or simple way to correct polluted ground water as there is with surface water. Fresh surface water is gradually disappearing.

16 mm, color, 13 minutes.

WATER TREATMENT – A CENTURY OF PROGRESS**MP-17**

A detailed look at the transition from early filtering methods to the more sophisticated treatment methods of the early sixties. It shows the development of water treatment plants from the slow sand filter plant of the early 1900's to rapid sand to the pit-con process plant.

16 mm, color, 35 minutes.

MAJESTIC POLLUTED HUDSON**MP-18**

Walter Cronkite narrates this film depicting the present day Hudson River. He compares the scenic, historic parts of the river with the degradations that have occurred. The Hudson will soon lose its beauty if steps are not taken to halt the pollutants coming into the river.

16 mm, color, 30 minutes.

MEMBRANE MICROFILTRATION**MP-19**

“A new tool for classroom science”. Explains how Millipore membrane filters work and how they are used to isolate and culture micro-organisms or to screen out particles from air, water or other fluids. Presents a detailed description of how students adapt these professional techniques in the classroom and in field projects.

16 mm, color, 23 minutes.

IT COULD HAPPEN TO YOU**MP-20**

The importance of safety habits and apparel when working on sewer lines. Also discussed and demonstrated are the proper tools and equipment used in cleaning sewer lines.

16 mm, color, 20 minutes.

WE CAME A LONG WAY**MP-21**

A look at the early days of cleaning sewers to the 1930's when the modern method of using a steel rod was introduced. Since then a variety of cutting tools have appeared. Their functions are discussed in the film along with two methods for cleaning water mains.

16 mm, color, 35 minutes.

WATER POLLUTION: CAN WE KEEP OUR WATER CLEAN**MP-22**

Tracing the origins of our waterways and six different causes of pollution that develop along its pathways to the ocean from the mountains to the cities. Discusses water uses and the increase in pollution.

16 mm, color, 18 minutes.

LAKE TAHOE — TODAY AND TOMORROW**MP-23**

A history of Lake Tahoe. Former Governor Ronald Reagan narrates the origin of Lake Tahoe, its present condition and what the State of California is doing to maintain and develop it as a natural source of beauty. It shows advantages of advanced water treatment.

16 mm, color, 13 minutes.

WATER POLLUTION**MP-24**

A brief look at the importance of clean water, and the results of pollution; demonstrates some of the ways pollution can be controlled or eliminated.

16 mm, color, 10 minutes.

LIVING THINGS IN A DROP OF WATER**MP-25**

A drop of water may seem to be clear, but with a hand lens or microscope we can see that it contains a whole world of interesting living things. Close observation reveals that all microscopic plants and animals carry on the same life functions as larger living things—feeding, growth, movement and reproduction.

It is useful for persons unfamiliar with microbiology.

16 mm, color, 10 minutes.

PROTOZOA (ONE-CELLED ANIMALS)**MP-26**

This film shows the appearance of various protozoa. Demonstrates how they move and how they are classified by their movement. How they obtain food and digest it. Explains how protozoa reproduce. Discusses how protozoa live in relationship with other animals. Illustrates colonial organization among the protozoa.

16 mm, color, 11 minutes.

PUMP SALES FEATURES; REPLACEMENT OF MECHANICAL SEAL**MP-27**

Care and maintenance of mechanical seals in sewage treatment units are discussed in this film.

16 mm, color, 20 minutes.

WATERWORLD**MP-28**

From the Seattle, Washington World's Fair. This film discusses how man has harmed his water supply through progress and what he has done to correct it. It also discusses new techniques man has developed to improve the quality of water.

16 mm, color, 30 minutes.

INCINERATION**MP-29**

Produced by the Department of Health, Education and Welfare, it deals with incineration; a common method of solid waste disposal. The film describes the different types of incinerations and methods of operations. It discusses the component parts, the end products of incineration, as well as the advantages incineration may have over other solid waste disposal methods.

16 mm, black and white, 15 minutes.

TROUBLED WATERS**MP-30**

Filmed in 1966, Henry Fonda narrates a story of the many forms and sources of water pollution in the Ohio and Missouri Rivers, as well as places such as Vermont, Maine, Alaska, Washington, D.C. and California. Discussed are community efforts to solve the problems, time factors involved, thermal and chemical pollution, and the need for research in the field of water quality.

16 mm, color, 25 minutes.

WATER—REJECT OR RESOURCE?**MP-31**

As the Lake Tahoe region developed and pollution increased, the residents realized that wastewater treatment was necessary to keep the Tahoe region beautiful. The film describes the advanced waste treatment processes used in a tertiary stage plant to solve this problem. This includes chemical removal of phosphates and nitrogen, ammonia stripping towers, and recycling of waste materials for efficient plant operation. The treated water is cleaner than water found in many city drinking water supplies.

16 mm, color, 16 minutes.

**INDIVIDUAL SEWAGE DISPOSAL SYSTEMS:
PART I – PRINCIPLES OF OPERATION AND DESIGN****MP-32**

Discussed is the importance of operation and design in individual sewage disposal systems.

16 mm, black and white, 15 minutes.

EARTH'S HUMAN RESOURCES**MP-33**

The wet air oxidation unit provides an answer to the primary and secondary treatment plant's inability to digest sewage sludge. A process of high or low oxidation can be used in the unit. High oxidation leaves a minimum of organic ash. Low oxidation leaves a residue of organic materials which can be used as a soil amendment. Both methods destroy the disease organisms within the sludge. The film is a discussion of Zimpro's product as an answer to the problem.

16 mm, color, 17 minutes.

FROM THE EARTH AND BACK AGAIN**MP-34**

The National Clay Pipe Institute takes the viewer on a trip through one of their sewage pipe factories and research laboratory. The narrative discusses how clay pipes are made, their durability to withstand abrasive waste and chemicals and what this durability means in financial savings to industry, the community and the environment. It is useful for persons interested in the construction of sewers.

16 mm, color, 22 minutes.

MUNICIPAL SEWAGE TREATMENT PROCESS**MP-35**

A look at the makeup of the operation of a municipal sewage treatment plant which collects and destroys the water carried wastes of the community. One of many ways to conserve our water resources.

16 mm, color, 13 minutes.

MAN IS RESPONSIBLE TO THE EARTH**MP-36**

Chemical pesticides have been an invaluable aid in overcoming the insect, weed, nematode, and disease pests which severely limit production of food and fiber. Although we depend upon these chemicals for greatly improved quantity and quality of our crops, it has become clear that some pesticides have been used incorrectly or unnecessarily. This film, set in the pea growing areas of Washington and Idaho, illustrates large scale field use and value to farmers of insect scouting to determine the need for insecticide use. Trained scouts closely inspected the pea fields to determine whether the insect population was large enough to warrant insecticide application. Scouting in the pea growing area offered substantial savings to the farmer while at the same time providing effective control with minimum doses of DDT added to the environment.

16 mm, color, 15 minutes.

THE ACCELATOR**MP-37**

A look at the operating procedures of the "Accelator", one of the newest methods of water treatment in use. It provides for a faster means of purification with simpler operating know-how and takes up less space than more conventional plants. All of this means lower construction and operating costs.

16 mm, color, 15 minutes.

OCEANOGRAPHY: SCIENCE FOR SURVIVAL**MP-39**

This film explores the importance of the ocean to modern man. Many government agencies are involved in ocean research and the film deals with the type of research being done. The water is studied as well as the organisms in the water, their physiology and patterns of behavior. Food from the sea is an important resource as are the minerals found there. The natural resources of the sea are being carefully researched to learn how best to use and protect them. The results from this research are then being used to solve some of the ocean's pollution problems.

16 mm, color, 40 minutes.

TASK FOR TODAY AND TOMORROW**MP-40**

Briefly describes the training program developed for a wastewater treatment specialist by the New England Interstate Water Pollution Control Commission. Overview of the history of wastewater treatment and explanation of primary and secondary methods of treatment.

16 mm. color, 15 minutes.

WITHIN OUR REACH**MP-41**

Within Our Reach is about an American town, Parsippany-Troy Hills, New Jersey, with determination to clean up its wastewater. That determination has been backed up with Federal funds administered by the U.S. Environmental Protection Agency. These funds are part of a massive multi-billion dollar program which provides grants for the construction of municipal wastewater treatment facilities. It details exactly what towns can do to qualify for these funds. The program also offers important benefits such as up to 25,000 construction jobs for every billion dollars spent.

16 mm, color, 15 minutes.

OHIO RIVER POLLUTION**MP-44**

By the late 1930's, pollution in the Ohio River was already a problem. A contemporary film of the times, it indicates the problems, and what was being done to solve them. This is a silent, black and white film with photography of the 1937 flood, *Kiski* the floating laboratory, dams and locks on the river and the Mill Creek, then dumping 40 mgd's into the Ohio, among other things. It is an interesting look into the history of pollution along the Ohio River.

16 mm, black and white, 30 minutes.

PANDORA'S EASY OPEN POP-TOP BOX**MP-45**

This film contrasts the city environment to a rural environment using the power of photography rather than narration. Recordings of sounds from the two environments indicate the levels of noise pollution in the city as well as air, water and visual pollution. Although brief, this film sensitizes the viewer to his surroundings.

16 mm, color, 15 minutes.

THE GIFTS**MP-46**

Lorne Greene narrates this portrayal of how the nation has abused the gifts of air, land and water. Many aspects of pollution have been included in the photography to show the viewer the extent of the damage.

16 mm, color, 26 minutes.

WATER**MP-47**

This film discusses the importance of water in the development of civilization. Modern uses and misuses are explained, including residential, industrial, commercial, and recreational. Pollution is discussed, as well as waste treatment. The chemical properties of water are described, showing a substance with many unique attributes. The hydrologic cycle is explained.

16 mm, color, 30 minutes.

CONTINUOUS FLOW ANALYSIS**MP-50**

Chemical flow analysis is a repetitious procedure. Due to human inaccuracies, no analysis is ever done exactly the same way twice. This film proposes that analysis be mechanized. This will free chemists for other things, and will make testing a uniform process. The Continuous Flow Analysis Machine consists of a sampler, pump, mixing coil, dialyzer, heating bath, recorder and colorimeter. This machine can be used in many areas, and provides a reliability in chemical analysis.

16 mm, color, 13 minutes.

PROJECT HYPOLIMNION**MP-51**

Lake Erie is the shallowest and oldest of the Great Lakes. A joint study was done by the Canadian Office of Inland Waters and the Environmental Protection Agency to see if the aging

process could be slowed down. The study concerned the hypolimnion of the lake—the colder bottom waters. In the summer the hypolimnion is devoid of oxygen. The study was completed in the summer of 1970 to discover the reason behind this, as well as the mechanics of Dissolved Oxygen depletion and nutrients regeneration. Twenty-five sampling stations were set up, and many sampling techniques used are described in the film. This is a brief overview of the study and some of the results.

16 mm, color, 13 minutes.

PIPELINE TO THE CLOUDS

MP-53

Pipeline to the Clouds deals with the problems of water supply. It discusses the water cycle and traces the path of a raindrop through precipitation, percolation or surface runoff, transpiration or evaporation, and precipitation again. The film describes the history of water use and its importance to commerce and industry. Water shortages are discussed as well as the problems of flooding. This was produced in the 50's and although dated is a good overview of water supply.

16 mm, color, 25 minutes.

HEALTH AND THE CYCLE OF WATER

MP-55

The film discusses water and its importance to life. It deals with the cycle, transpiration, evaporation and precipitation. It also deals with the problems of polluted water supply and the history of water treatment, both drinking and wastewater. A basic explanation is provided of a water works and of a waste treatment plant. Although this film dates to the 1940's, the principles of water treatment are essentially the same, and the film deals with these principles.

16 mm, color, 20 minutes.

FLUORIDE DETERMINATION IN WATER SPADNS Method

MP-56

This is a demonstration of the SPADNS method for determining fluoride. The viewer should be able to run this test in his own laboratory understanding the principle and procedures. This presentation is suitable for use in training course on fluoride analysis.

16 mm, 3/4" U-Matic videocassette VC-9, color, 25 minutes.

INVESTMENT TO PROTECT**MP-57**

Over 18 million dollars in Federal funds are available for the building of wastewater treatment plants. Hinsdale, Illinois used Federal funding to build a treatment plant. Local tax dollars also went into the construction of the facility. The people of Hinsdale wanted clean water, and they wanted the plant run properly to protect the investment of their money. The operators have class 2 certification, and the plant is run well. It consists of barracks, grit and sand removal facilities and primary clarification; and activated sludge, both anaerobic and aerobic, for secondary treatment. Shows the importance of good operation and training and how they go hand-in-hand.

16 mm, color, 12 minutes.

QUALITY CONTROL TESTS FOR COMMUNITY WATER SYSTEMS**MP-58**

Discusses the different microbiological tests used by water treatment operators. Both field and laboratory tests are explained, and the importance of each is emphasized. The use of these tests gives the operator a thorough knowledge of his water source.

16 mm, 3/4" U-Matic videocassette (VC-81), color, 17 minutes.

STORM WATER POLLUTION CONTROL**MP-59**

History of first storm sewers, how sanitary wastes entered in, and the introduction of wastewater treatment plants. Discusses present combined sewers and sewage overflow into lakes and streams. Gives alternative methods for sewage overflow to keep the waters clean.

16 mm, 3/4" U-Matic videocassette (VC-59), color, 40 minutes.

SAFE DRINKING WATER: WHAT IT MEANS TO YOU**MP-60**

A dialogue between Jack Mannion, Office of Water Supply, EPA, and Betty Abbott, Omaha, Nebraska City Council, concerning the role of the elected official in implementing the Safe Drinking Water Act. The significance of the Act towards providing safe water to the general public and how the Act came to be are discussed along with the public notification aspects from the viewpoint of the elected official. It is pointed out that the public should be informed if levels are surpassed and what they should do about it, and what will be done to alleviate the situation by this supply. The costs involved and how officials can begin to prepare for any increase in financial need are discussed along with ideas of the method to gain information on what increases might be repeated.

16 mm, 3/4" U-Matic videocassette (VC-72), color, 16 minutes.

FACTORY BUILT PUMPING STATION (2 Parts)**MP-61**

A complete factory built pumping station ready for shipping and easy installation. The film describes the equipment that makes up the station and how it operates.

16 mm, color, 10 minutes.

MAINTENANCE OF PUMP STATIONS

The factory built pump station requires only a minimum of maintenance to keep it running efficiently.

16 mm, color, 8 minutes.

GROUND WATER—THE HIDDEN RESERVOIR**MP-62**

This film explains many of the terms connected with ground water science. It explains how ground water begins as rain and moves through the hydrologic cycle. Now water is stored in the pores, cracks, fissures in aquifers. Springs, artesian wells, geysers, and hardness are explained as well as how caves are formed. The amount of ground water available as well as the amount used are covered and a plea for care not to contaminate the deep aquifers is given.

16 mm, color, 20 minutes.

SAFE DRINKING WATER ACT**MP-63**

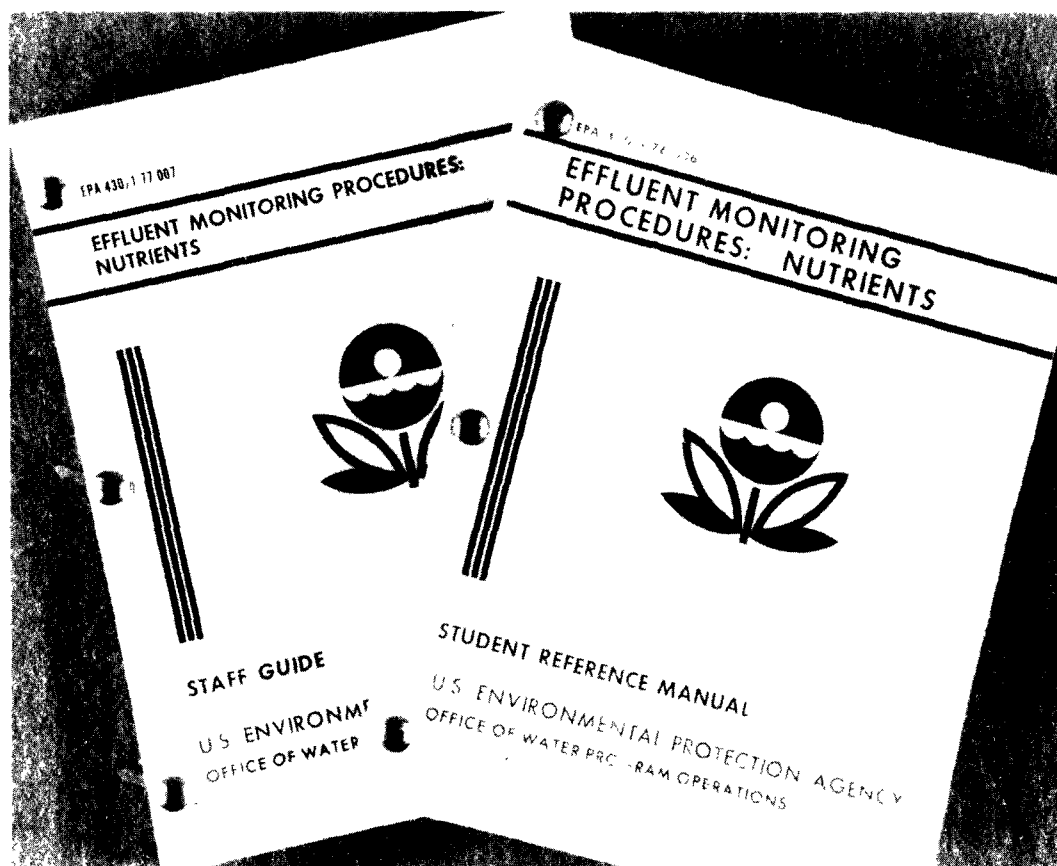
A discussion of the Safe Drinking Water Act and how it builds upon existing programs and extends this to more public drinking water treatment plants totaling over one-quarter million supplies. Betty Abbott, member of the National Drinking Water Advisory Board discusses such topics as which contaminants are covered by the Act, how it will be implemented, public notification of the persons served if levels are surpassed, and the application for variances and exemptions from the regulations. The presentation is designed to answer questions which might arise concerning the Act.

16 mm, color, 17 minutes.



COURSE UNITS

The National Training and Operational Technology Center has developed a series of fully integrated training courses designed for classroom use. These special *packaged* courses are prepared when there is a need for consistency in training for and demonstration of standard procedures. Such courses are also assembled to assist others in presenting certain topics where exceptionally large or widespread target groups exist.



SELF MONITORING PROCEDURES: BASIC PARAMETERS FOR MUNICIPAL EFFLUENTS

An instructional package consisting of a course manual for participants and a staff guide. The course is intended for municipal wastewater treatment plant technicians and others who are responsible for self-monitoring plant effluents. The **manual** contains laboratory procedures for Five-day Biochemical Oxygen Demand, Dissolved Oxygen (Winkler and Meter), pH, Fecal Coliform (Most Probable Number and Membrane Filter), Bacteriological Sampling, Geometric Mean, Open Channel Flow Measurement (Parshall Flume and Sharp Crested Weir), Amperometric Chlorine Determination (in Water and in Wastewater), Titrimetric Chlorine Determination (in wastewater), Suspended Solids, Settleable Solids, and Discharge Monitoring Reports. The **staff guide** is designed for use by administrators, support staff and instructors who will be responsible for presenting the topics in the course manual. It contains information about course planning and management—course plan and working schedules; required staff, facilities, equipment, supplies, and instructional resources; registration, record-keeping, and attendant printed materials. It also contains instructional package worksheets for each topic in the course manual. References used are Code of Federal Regulations, Title 40, Part 136, EPA Methods Manual (1974), Standard Methods (1975) and ASTM Standards (1975).

The course is intended for use by instructors with experience in performing the analyses.

Manual, 375 pp.; staff guide, 272 pp.; the staff guide lists the audiovisual instructional materials developed for each topic. Manuals may be purchased from NTIS (see p. 78); A/V materials are available for loan from NTOTC.

EFFLUENT MONITORING PROCEDURES: BASIC LABORATORY SKILLS

An instructional package consisting of a course manual for participants and a staff guide. The course is designed for the treatment plant operator or technician who is required to monitor effluent discharges and who has had little or no previous experience in laboratory work. The **manual** contains a review of basic mathematics which includes the metric system, whole numbers, decimals, formulas and percentage. The chemical laboratory sections contain applications such as weighing techniques, use of laboratory equipment, and preparation of standardization of reagents. An introduction to basic microbiological techniques is also included. The **staff guide** is designed for use by administrators, support staff and instructors who will be responsible for presenting the topics in the course manual. It contains information about course planning and management—course plan and working schedules; required staff, facilities, equipment, supplies and instructional resources; registration, record-keeping and attendant printed materials. It also contains instructional package worksheets for each topic in the course manual.

Manual, 127 pp.; staff guide 211 pp.; the staff guide lists the audiovisual instructional materials developed for each topic. Manuals may be purchased from NTIS (see p. 78); A/V materials are available for loan from NTOTC.

EFFLUENT MONITORING PROCEDURES: NUTRIENTS

An instructional package consisting of a course manual for participants and a staff guide. The course is designed for municipal wastewater treatment plant technicians and others who are responsible for self-monitoring of nutrient concentrations. The **manual** contains laboratory procedures for Chemical Oxygen Demand; the Nitrogen Series (Total, Ammonia, Nitrate, Nitrite) and Total Phosphorus. The **staff guide** is designed for use by administrators, support staff and instructors who will be responsible for presenting the topics in the course manual. It contains information about course planning and management—course plan and working schedules; required staff, facilities, equipment, supplies and instructional resources; registration, record-keeping and attendant printed materials. It also contains instructional package worksheets for each topic in the course manual.

Manual, 314 pp.; staff guide, 213 pp.; the staff guide lists the audiovisual instructional materials developed for each topic. Manuals may be purchased from NTIS (see p. 78); A/V materials are available for loan from NTOTC.

EFFLUENT MONITORING PROCEDURES: METALS ANALYSIS

An instructional package consisting of a course manual for participants and a staff guide. The course is designed for municipal wastewater treatment plant operators and others who are responsible for self-monitoring metal concentrations. The **manual** contains laboratory procedures for parameters selected as examples of the methods used to determine metals—atomic absorption (copper, lead, etc.), flameless atomic absorption (mercury), colorimetry (boron), volumetric analyses (calcium) and flame emission (sodium). Digestion for total metal analysis and extraction with PDCA are included. The **staff guide** is designed for use by

administrators, support staff and instructors who will be responsible for presenting the topics in the course manual. It contains information about course planning and management; course plan and working schedules; required staff, facilities, equipment, supplies and instructional resources; registration, record-keeping and attendant printed materials. It also contains instructional package worksheets for each topic in the course manual.

Manual, 200 pp.; staff guide, 138 pp.; the staff guide lists the audiovisual instructional materials developed for each topic. Manuals may be purchased from NTIS; A/V materials are available for loan from NTOTC.



METHODS FOR DETERMINATION OF CHEMICAL CONTAMINANTS IN DRINKING WATER

An instructional package consisting of a student course manual and an instructor manual. The course is designed for chemists and technicians with little or no experience in the chemical procedures required to monitor drinking water. Participants should have basic laboratory skills, including use of volumetric glassware. The instructional materials show the correct procedures for performing analysis for the inorganic and organic chemical contaminants listed in the Interim Primary Drinking Water Regulations. Course topics are arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, fluoride, nitrate and organics (chlorinated hydrocarbons, chlorophenoxys). Representative methods have been selected for student laboratory assignments. Other considerations are sample handling, quality control, data processing and drinking water regulations. The **instructor manual** is designed for use by instructors who will teach others to perform these analyses as set down in the Regulations. It includes examples of course announcements, agendas, certificates, records and registration procedures; training facilities and staff needs. It also includes lesson plans giving details relative to presenting instruction for each analysis contained in the student manual.

Manual, 454 pp.; instructor manual, 194 pp. Manuals may be purchased from NTIS (see Source Index).

METHODS FOR DETERMINATION OF BACTERIOLOGICAL CONTAMINANTS IN DRINKING WATER

An instructional package consisting of a student course manual and an instructor manual. The course is designed for bacteriologists and technicians with basic skills used in bacteriology laboratory operations but who have little or no experience in bacteriological procedures required to monitor drinking water.

The instructional materials show how to perform the membrane filter and the most probable number method to determine the bacteriological contaminants listed in the *Interim Primary Drinking Water Regulations*. Course topics are the membrane filter (MF) method and the most probable number (MPN) method to determine bacteriological contaminants. Related considerations are sample collecting, quality control, data processing and drinking water regulations. The **instructor manual** is designed for use by instructors who will teach others in these bacteriological methods. It includes examples of course announcements, certificates, records, registration procedures; training facility and staff needs, and lesson plans.

Manual, 384 pp., may be purchased from NTIS (see Source Index). Instructor manual available from NTIS by Fall 1978.

METHODS FOR DETERMINATION OF TURBIDITY AND RESIDUAL CHLORINE IN DRINKING WATER

An instructional package consisting of a student course manual and an instructor manual. This course is designed for operators of water treatment plants and any other persons who will be responsible for sampling and analysis for residual chlorine and turbidity. No previous skills are necessary. The instructional materials show the requirements for monitoring and analysis as set down in the *National Interim Primary Drinking Water Regulations* and show how to perform the analytical tests for these parameters. Course topics include explanation of MCL's, substitution of residual chlorine for bacteriological analysis, equipment use, calibrations and availability. The **instructor manual** will aid the person offering the course in planning as well as in presenting. It is to be used in conjunction with the student reference manual. Topics included are examples of course announcements, course agenda and course certificate; consideration of training staff needs, training facilities, course records and registration procedures. Also included are instructor lesson plans giving details relative to presenting instruction regarding each topic in the student manual. These lesson plans are keyed to available slides on each topic.

A copy of both manuals may be borrowed for reproduction from NTOTC. Manuals available from NTIS by Fall 1978. Slides on loan from NTOTC.



OPERATIONAL CONTROL PROCEDURES FOR THE ACTIVATED SLUDGE PROCESS

This is a series of technical reference materials which can be used to augment course presentations on the process control of activated sludge. The pamphlets describe activated sludge process procedures based on sludge quality and solids inventory. The series may also be used as a supplement to Slide/Tape Instructional Units XT-40, 41 and 42. It consists of the following parts:

OBSERVATIONS AND CONTROL TESTS, I AND II

OBSERVATIONS describes the interpretation of process status and requirements from physical observations such as color, kind, and amount of foam or scum, turbulence and aeration tanks, and the appearance of final clarifiers.

CONTROL TESTS describes the control tests used for process control. Included are the settlometer, centrifuge, clarifier sludge blanket level, and final effluent turbidity tests.

CALCULATION PROCEDURES, III-A

Describes, with examples, the calculations used with the control test results to develop the necessary process status and control decision information.

CALCULATION PROCEDURES FOR STEP-FEED PROCESS RESPONSES, III-B

Describes the special calculational procedures required for the step-feed configuration of the activated sludge process.

ADDENDUM NO. 1

Presents simplified step-feed calculations and corrections to Part III-B.

**UPDATED SUMMARY OF THE OPERATIONAL CONTROL PROCEDURES
FOR THE ACTIVATED SLUDGE PROCESS – January 1978**

Provides an updated summary of the operational control procedures with new material on SLUDGE QUALITY and PROCESS CONTROL and expanded versions of RETURN SLUDGE FLOW CONTROL which considers most types of sludges encountered in actual practice.

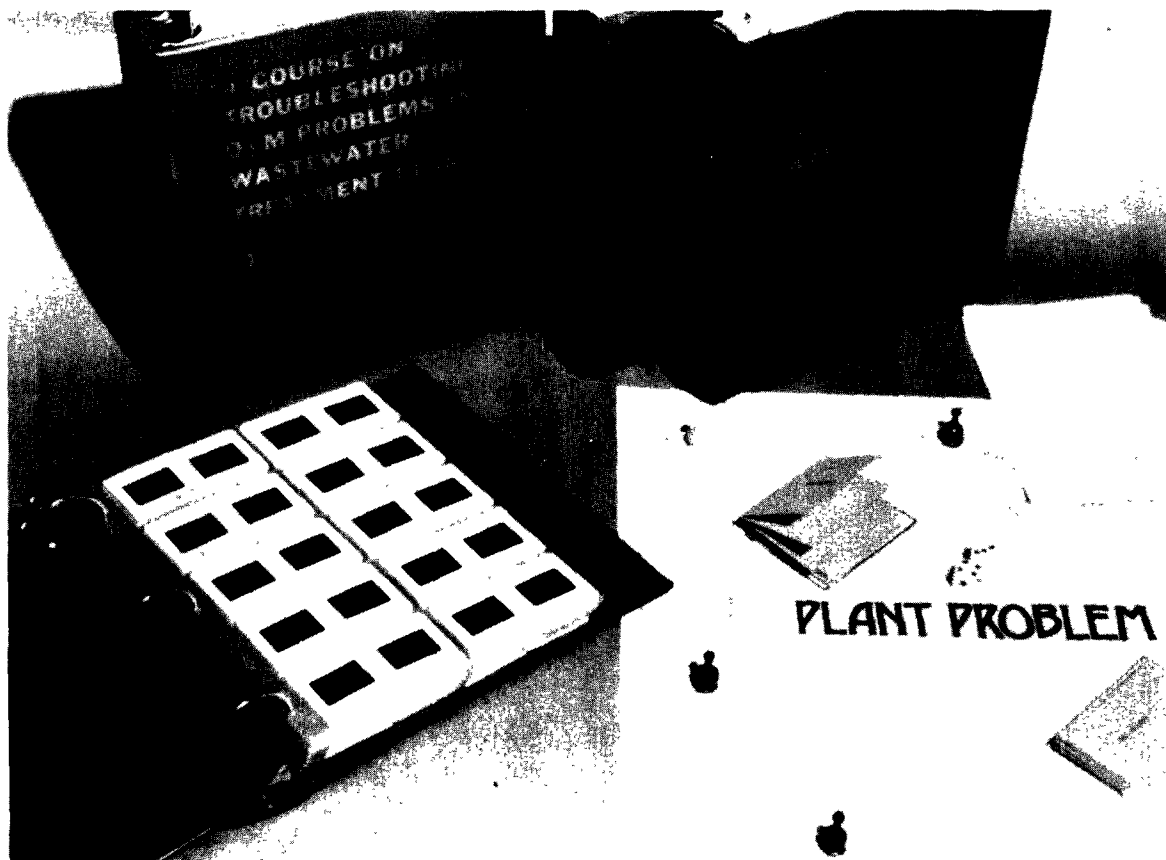
RETURN SLUDGE FLOW CONTROL

Describes a method for determining the return sludge flow rate for sludges of fair to good quality using information developed from the control tests. This pamphlet should be used in conjunction with the **Updated Summary of the Operational Control Procedures for the Activated Sludge Process**.

APPENDIX

Describes data presentation techniques useful in process control, testing equipment used in performing control tests, and symbols and terminology used in the pamphlet series.

7 pamphlets, 192 pp. Copies may be purchased from NTIS. Those wishing to reproduce the pamphlets in quantity may borrow one complete set from NTOTC.



TROUBLESHOOTING OPERATION AND MAINTENANCE PROBLEMS IN WASTEWATER TREATMENT PLANTS

An instructional package consisting of a Student Manual for participants and an Instructors Notebook. The course is designed for use by instructors who wish to teach a short-term education/training course on the process of troubleshooting operation and maintenance problems in wastewater treatment plants. The materials are geared toward procedures for identifying and isolating a problem, formulating alternative actions and solutions, and combining corrective action with short and long range followup. The materials will assist Federal, State and local employees of wastewater facilities in assuming and administering their responsibilities and preparing for O&M inspections. Some topics included are activated sludge, flow measurement, lab procedures, chlorine and solids handling. The Student Notebook contains summaries, flow charts, check-lists, diagrams and references needed to participate in the course. As the course proceeds the instructor adds to the notebook with handouts and problems for the trainee. It can only be used in conjunction with the Instructors Notebook.

Instructors Notebook, 672 pp.; Student Manual, 231 pp.; 561 slides; game board components for problem solving. Manuals may be purchased from NTIS, or loaned for reproduction from your EPA Region, State Training Officer, or NTOTC. Each Region and NTOTC has a set of slides for loan. For purchase information on slides, see p. 77.



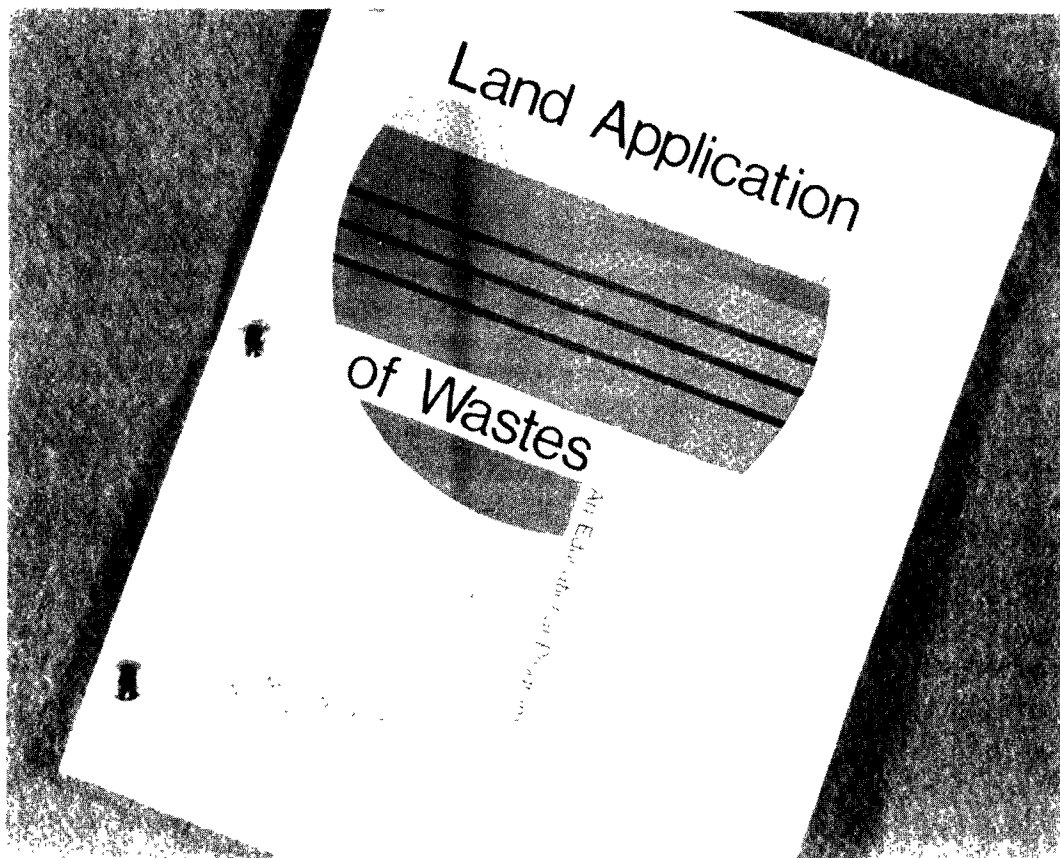
EROSION AND SEDIMENT CONTROL

An instructional package consisting of thirteen lessons complete with visual aids, student handouts and audiovisuals (slides and taped narration or videocassettes), workbooks and instructors manual. A series of technical presentations and a certification plan for erosion and sediment control specialists is presented. Materials are designed to provide an effective education program for qualifying construction personnel and others to pass a certification by examination. The list of lessons is as follows:

- Goals, objectives and principles of erosion and sediment control
- Soils
- Rainfall-runoff relationships
- Erosion and Sedimentation
- Plant Materials
- Control of runoff during construction
- Vegetative soil stabilization
- Stream erosion control
- Temporary soil stabilization
- Control of sediment generated on construction sites
- Erosion and sediment control planning
- Wooded site development
- Foreman-inspector responsibilities

Student course manual, 334 pp.; instructors guide, 68 pp.; 13 lessons with audiovisuals for each. Select lessons required and corresponding A/V's. Specify whether slides or

videocassettes are desired for loan. For further information, contact Mrs. Eileen Hopewell, NTOTC.



LAND APPLICATION OF WASTES

An instructional package consisting of 21 lessons using printed matter and audiovisuals. The course is designed for a workshop setting where participants are at all levels of experience. Land treatment of municipal, agricultural and industrial wastes and residues as an efficient means of pollution control and resource recovery is evaluated. Information for evaluation derives from sanitary and environmental engineering, agronomy, soil science and agricultural engineering, economics and law. The program provides a summary of the basic concepts that make soil an effective treatment system. Design examples are used to develop problem solving skills. The course uses an individualized modular approach.

The material in each module requires 0.5 to 3 hours of study time and describes the knowledge needed prior to use, concepts to be presented, and knowledge to be presented, and knowledge to be obtained. Concepts in the module relate to each other and to important concepts in other modules.

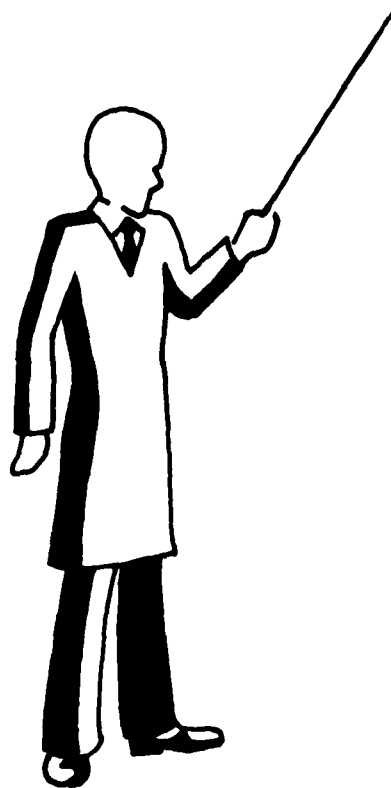
The components of the program concentrate on the following topics:

- Soil as a treatment medium
- Site evaluation procedures
- Design approaches
- Social factors
- Vegetative cover
- Alternative treatment systems, efficiency and cost
- Monitoring
- Nitrogen management

- Phosphorus management
- Toxic element interactions
- Organics
- Legal aspects
- Crop selection
- Non-crop uses
- Costing procedure
- Water management and climate effects

Completion of this course will enable participants to compare alternative cost estimates, primary designs, and to locate potential land treatment sites for specific application.

Study materials include combinations of the following (1) a printed study guide, including drawings, diagrams, questions and problems, (2) cassette audiotape to guide portions of the module, (3) photographs, slides for viewing, models or mockups and (4) laboratory study materials when appropriate. Basic needs required are study carrels, tutors, reference materials and resource personnel. For further information, contact Mrs. Eileen Hopewell, NTOTC.



GENERAL INFORMATION

This section contains information concerning the ordering of materials and ordering duplication of materials. Additional questions may be addressed by writing the NTOTC or calling 513/684-7501.

DUPLICATION

Unless specified as COPYRIGHT, slide/tape and videocassette instructional units and associated materials may be reproduced. However, if loaned copies of these materials are used for copy processes, loss of quality may result.

To obtain copies of **videocassettes** made from the Master Videotapes you may send a blank, 3/4" U-Matic Videocassette of the appropriate length for each one required to NTOTC and a copy will be made for you at no charge. Please include both code number and title of each unit. For information on obtaining **slides and audio cassettes** made from the masters, write Mrs. Eileen Hopewell, NTOTC.

LOAN INFORMATION

All audiovisual units are available for short-term loan to educational institutions, governmental agencies and training organizations. A copy of the manuals mentioned in the Course Units section may be borrowed for reproduction from NTOTC. Priority is given to those who train personnel engaged in the detection, causes, prevention and control of environmental pollution.

To prevent duplication be sure selected topics are not merely alternative media for the same unit.

It is also recommended that users review materials to assure compliance with state or local regulations and procedures which may vary.

To borrow an instructional unit, use the Request for Loan form in the back of this catalog accordingly:

SLIDE/TAPES - If your Regional Office is listed in the Source Index, send request form to your Regional Office. If your Regional Office does not appear or cannot supply you with units on your specified date, you can borrow from the NTOTC Lending Library, addressed to Mrs. Eileen Hopewell, NTOTC (see Source Index).

VIDEOCASSETTES & FILMS - Send request forms directly to NTOTC.

The following course manuals are available from the National Technical Information Service:

Self-Monitoring Procedures: Basic Parameters for Municipal Effluents (PB-274-876/AS, student manual, 375 pp.) @ \$12.50

Effluent-Monitoring Procedures: Basic Parameters for Municipal Effluents (PB-274-877/AS, staff guide, 272 pp.) @ \$10.75

Effluent Monitoring Procedures: Basic Laboratory Skills (PB-274-321/AS, student manual, 127 pp.) @ \$7.25

Effluent Monitoring Procedures: Basic Laboratory Skills (staff guide, 211 pp.) @ \$9.25

Effluent Monitoring Procedures: Nutrients (PB-261-290/AS, student manual 314 pp.) @ \$11.75

Effluent Monitoring Procedures: Nutrients (PB-274-320, staff guide, 213 pp.) @ \$9.25

Effluent Monitoring Procedures: Metals Analyses (PB-275-391/AS, student manual, 200 pp.) @ \$9.00

Effluent Monitoring Procedures: Metals Analyses (PB-275-393/AS, staff guide, 138 pp.) @ \$7.25

Methods for Determination of Bacteriological Contaminants in Drinking Water (manual, 384 pp.) @ \$13.00

Methods for Determination of Chemical Contaminants in Drinking Water (manual 454 pp.) @ \$14.50

Methods for Determination of Chemical Contaminants in Drinking Water (instructor manual, 194 pp.) @ \$9.00

Operational Control Procedures for the Activated Sludge Process (7 brochures, 192 pp.) @ \$9.00

Troubleshooting Operation and Maintenance Problems in Wastewater Treatment Plants (student manual, 230 pp.) @ \$9.50

Troubleshooting Operation and Maintenance Problems in Wastewater Treatment Plants (instructor manual, 672 pp.) @ \$19.00

Erosion and Sediment Control Workbook (PB-258-471, student manual, 354 pp.) @ \$12.50

Erosion and Sediment Control (PB-256-901, instructor guide, 88 pp.) @ \$6.00

Water Quality Instructional Resources Information System, Volumes I thru IV (PB-262-223/AS, complete set, 1,120 pp.) @ \$31.00 (No microfiche available on sets)

Water Quality Instructional Resources Information System, Volume I Users Manual (PB-262-224/AS, 99 pp.) @ \$5.00

Water Quality Instructional Resources Information System, Volume II IRIS Tables (PB-262-225/AS, 96 pp.) @ \$5.00

Water Quality Instructional Resources Information System, Volume III Identification Number Master Report (PB-262-226/AS, 494 pp.) @ \$12.50

Water Quality Instructional Resources Information System, Volume IV Subject Index (PB-262-227/AS, 431 pp.) @ \$11.75

Microfiche available @ \$3.25

SOURCE NAME INDEX

NTIS	U.S. Department of Commerce National Technical Information Service 5285 Port Royal Road Springfield, VA 22151	
NTOTC	Mrs. Eileen Hopewell National Training & Operational Technology Center Office of Water Program Operations U.S. Environmental Protection Agency Cincinnati, OH 45268	
REGIONS	REGION I Mr. Hibbard Armour Operations & Maintenance Br. U.S. Environmental Protection Agency JFK Federal Bldg. Boston, MA 02203	REGION V Mr. Joel Margolis Manpower Development Branch U.S. Environmental Protection Agency 230 S. Dearborn, 14th Floor Chicago, IL 60604
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