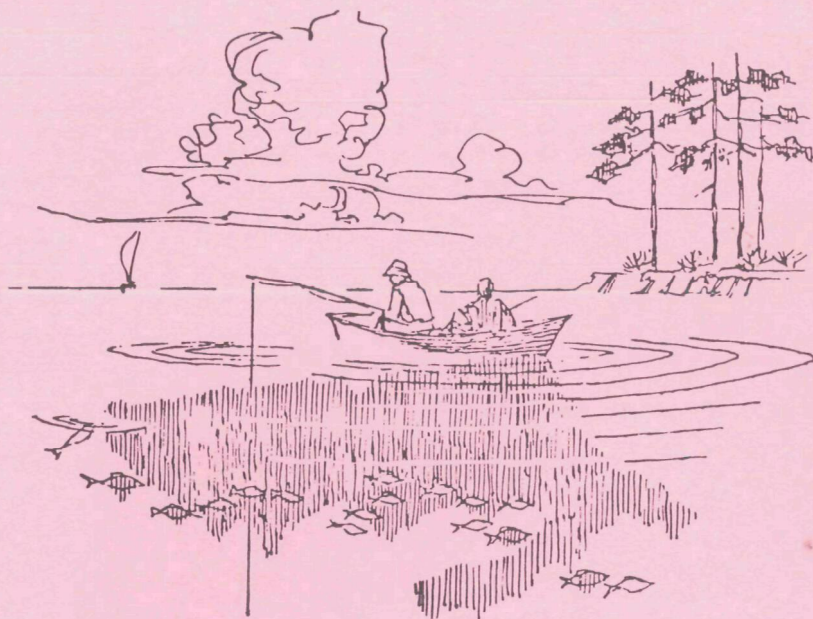




WATER QUALITY STANDARDS CRITERIA DIGEST
A COMPILATION OF FEDERAL/STATE CRITERIA ON
**WATER QUALITY SAMPLING
AND ANALYTICAL METHODS**



ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C.

AUGUST 1972

WATER QUALITY STANDARDS DIGEST

Water Quality Sampling and Analytical Methods and Applicable Stream Flow Provisions

This digest was compiled in order to provide general information to the public as well as to Federal, State, and local officials. It quotes those provisions of State/Federal water quality standards which relate to water quality sampling and analytical methods techniques and which stipulate the applicable stream flows.

The water quality standards program is directed by the Environmental Protection Agency, an independent regulatory agency which has responsibility for approving State-adopted standards for interstate waters, evaluating adherence to the standards, and overseeing enforcement of standards compliance.

Standards, the first nationwide strategy for water quality management, contain four major elements: the use (recreation, drinking water, fish and wildlife propagation, industrial, or agricultural) to be made of the interstate water; criteria to protect those uses; implementation plans (for needed industrial-municipal waste treatment improvements, among others) and enforcement plans; and an antidegradation statement to protect existing high quality waters.

A majority of the standards establish specific requirements regarding analytical methods. Some standards also expressly include sampling methods. In a minority of standards, provisions are not regulatory but instead merely describe the methods used by the state agency. No provisions for sampling and analytical methods were found in the nine states.

The methodology provisions in many standards include authority for the state agency to approve methods other than those set forth in the standards. Where this authority exists, the state agency should be consulted prior to actual sampling and analysis to determine whether distinct practices have been established. In particular, many state standards which were adopted prior to publication of the thirteenth edition of Standards Methods for the Examination of Water and Wastewater (APHA, AWWA, WPCF, 13th Ed., 1971) expressly require that sampling and analysis be conducted pursuant to methods prescribed in the twelfth edition. In these states, the state agency should be consulted to ascertain whether adherence to the methodology of the thirteenth edition is now required.

Finally, the Legal Support Division of the Office of Enforcement and General Counsel, EPA, has published "A Primer on the Law, Evidence, and Management of Federal Water Pollution Control Cases" (EPA, Washington, D.C. 20460, May 1972). Chapter VIII, "Gathering and Preserving Evidence in Water Pollution Enforcement Actions," is enclosed as Appendix A to this summary. It should be recalled that in testing for violations of standards, specific methodology provisions of the applicable standards supersede any other method.

Individual State-adopted provisions follow.

ALABAMA

Water Quality Criteria adopted May 5, 1967, Section III - GENERAL CONDITIONS APPLICABLE TO ALL WATER QUALITY CRITERIA.

2. Tests or analytical procedures to determine compliance or non-compliance with water quality criteria shall be in accordance with the methods given in the latest edition of Standard Methods for the Examination of Water and Wastewater, published by the American Public Health Association, American Water Works Association and Water Pollution Control Federation. Where other tests or analytical procedures are found to be more applicable and satisfactory, these may be used upon acceptance and approval by the Commission.

Flow (Implementation Plan)

Water quality criteria and standards adopted by the Commission apply to all conditions of flow in streams receiving wastes.

ALASKA

Title 18. Environmental Quality. Chapter 70, Water Quality Standards. (1971.) 18 AAC 70.070, note (1).

The analytical procedures used as methods of analysis to determine the chemical, bacteriological, biological and radiological quality of waters sampled shall be in accordance with the 12th edition of "Standard Methods for the Examination of Water and Waste Water" or other approved standards.

Flow

No specification.

ARIZONA

Section 6-2-7 IMPLEMENTATION & SURVEILLANCE. REG. 6-2-7.2. 3. Miscellaneous studies. Adopted August 8, 1968.

Sampling and examination of water samples should be conducted in accordance with the procedures contained in the latest edition of "Standard Methods for the Examination of Water and Wastewater", or by other acceptable procedures.

Flow

4. Stream Flows - These criteria are based upon the assumption that existing flow conditions in interstate streams shall continue without material change. The minimum weekly flow that occurs on the average once in 10 years will be used in applying these criteria.

ARKANSAS

Arkansas Pollution Control Commission Regulation No. 2, May 26, 1967.
Regulation Establishing Water Quality Criteria for Interstate Streams.

II. General Criteria. 1. Methods - The methods of sample collection, preservation, measurements and analyses shall be in accordance with the latest edition of "Standard Methods for the Examination of Water and Wastewater" or other proven methods acceptable to the Commission.

Flow Section IV. Criteria.

. . . The criteria specifically shall apply at the point of withdrawal from the stream for the use indicated. For non-point-source uses such as fish and wildlife propagation and aesthetics, the criteria shall apply to the entire reach of such use at or above the stated stream flow. . . .

(Stream flows are specified for each major river.)

CALIFORNIA

"Water quality control policies" are adopted by regional water quality control boards. Some lack provisions regarding sampling and analytical methods. The Lake Tahoe Water Quality Control Policy includes detailed specifications. The control policy for the area being surveyed should be consulted.

Flow

Flow frequently not specified. The control policy for the area being surveyed should be consulted.

CONNECTICUT

Water Quality Standards. June 28, 1967; 1968; November 11, 1969; 1970

(No provisions regarding sampling and analytical methods.)

Flow (Implementation Plan)

In order to be able to certify the accomplishment of this enforcement program the Commission will occupy and sample water quality at all the sampling stations shown on the watershed maps. The program contemplates the sampling at each of these points at least five times per year during the types of flow which are more critical for the assessment of the individual water quality parameters in that particular stream. These samples will be adjusted by computations to a common denominator of flow frequency so that they will be comparable one to another and from year to year. Traditionally, the Commission has used the flow which occurs at least 85% of the time because of certain hydrologic considerations in Connecticut. Once the parameters have been established on a common flow condition, a uniform method will be developed to interpret quality data in terms of the percent occurrence flow to which standards should apply.

COLORADO

Water Pollution Control Commission, Terms and Definitions, June 10, 1969.

17. STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTE WATER, LATEST EDITION. - A publication prepared jointly by the American Public Health Association, American Water Works Association, and the Water Pollution Control Federation, accepted by Federal, State, and local authorities in the field of water pollution control as the authority for analytical procedures to be utilized in the examination or analysis of waters and waste waters.

Water Quality Standards for Colorado, Adopted May 15, 1968.

For purposes of enforcement of these standards, sampling will be done at a point where these standards can be evaluated.

For purposes of enforcement of water classification standards, sampling of the waters will be done at any point, except for areas immediately adjacent to outfalls and except as may be noted in the text of the standards. In such areas, cognizance will be given to the opportunity for admixture of waste effluents with receiving water.

Tests or analytical procedures to determine compliance with standards will insofar as practicable and applicable, be made in accordance with the methods given in the latest edition of "Standard Methods For The Examination of Water And Waste Water" published by the American Public Health Association, or in accordance with tests or analytical procedures that have been found to be equal or more applicable and satisfactory and accepted and approved by the Commission.

Flow

No specification. The 1966 Colorado Water Pollution Control Act, as amended (1967) requires the Water Pollution Control Commission, in adopting standards, to consider among other things (section 8(2)(e)), "Whether a standard that is to be applicable to discharges into flowing water should be written in such a way that the degree of pollution tolerated or treatment required will be dependent upon the volume of flow of the receiving water or the extent to which the discharge is diluted therein."

DELAWARE

Water Quality Standards for Interstate Streams. June, 1967.

General. 3. Reservations.

Maintenance of stream quality criteria is dependent upon the following conditions.

- b. The standards proposed are based upon the ability of the Commission to measure and to determine compliance. All measurements will be made at selected sampling stations. Such stations will be selected after determining "representativeness" of the sample obtained and the nature of the mixing at the station.

(No further provisions regarding sampling and analytical methods requirements.)

Flow

Design of waste treatment facilities should be based on maintaining an effluent of such character that the Water Quality Indicators meet the specifications as state for individual receiving streams, during a low flow period equivalent to the minimum seven (7) consecutive day low flow recurring once every 10 years.

FLORIDA

Plan of Implementation and Enforcement of Florida's Water Quality Standards and Stream Classifications. May 31, 1967. 170C-5.03 Water quality testing. -

Tests or analytical procedures to determine compliance or noncompliance with water quality criteria provided by this chapter shall be in accordance with methods given in the latest edition of Standard Method for the Examination of Water and Wastewater, published by the American Public Health Association, American Water Works Association and Water Pollution Control Federation; and a copy of same shall be available for public inspection at the offices of the State Board of Health. Where other tests or analytical procedures are found to be more satisfactory, such tests or procedures will be used only upon the acceptance and approval of the regulatory agency.

Flow

No specification.

GEORGIA

Establishment of Water Quality Standards and Classifications for Interstate Waters in the State of Georgia. June, 1967.

(No provisions regarding sampling and analytical methods.)

Flow (Criteria)

730-3-.08 Streamflows. Amended. Specific criteria or standards set for the various parameters apply to all flows on regulated streams. On unregulated streams, they shall apply to all streamflows equal to or exceeding the 7-day, 10-year minimum low flow.

HAWAII

Department of Health Water Quality Standards, June 29, 1967, Water Quality Surveillance Program.

The sampling procedure and testing methods used will be those currently in common usage, such as "Standard Methods" or those published by the American Society for Testing Materials, the U.S. Bureau of Standards, or other published methods which are considered valid and acceptable to the Director of Health.

Flow (Enforcement)

Water quality standards will be in effect at all times. It is recognized, however, that in the cases of discharges which occur beyond the reasonable control of man, such as flood-flows of storm water where practicable man-made facilities or control measures are inadequate to the situation, that situations will result which are not in compliance with standards. These will not be excused, but neither will immediate punitive action be taken for such extreme cases until the Director feels that all reasonable measures have been exhausted to obtain voluntary action on the part of the persons or agency responsible for the discharge or the land or enterprise from which it arose to correct the situation or treat the discharge which led to the discharge of offending material.

IDAHO

Rules and Regulations for Standards of Water Quality for the Interstate Waters of Idaho and Disposal Therein of Sewage and Industrial Wastes, June, 1967.

3. Maintenance of Standards of Quality.

- C. For purposes of enforcement of these standards, sampling will be done at a point where these standards can be evaluated, except for areas immediately adjacent to outfalls. . .
- D. Tests or analytical procedures to determine compliance with standards will, insofar as practicable and applicable, be made in accordance with the methods given in the twelfth edition of "Standard Methods for the Examination of Water and Waste Water" published by the American Public Health Association, or in accordance with tests or analytical procedures that have been found to be equal or more applicable and satisfactory and accepted and approved by the State Board of Health, as set forth in Appendix 1.

Appendix 1. Laboratory Tests and Procedures

Standard Methods for the Examination of Water and Wastewater, Twelfth Edition, 1965, prepared and published jointly by American Public Health Association, American Water Works Association, Water Pollution Control Federation.

Flow

3. Maintenance of Standards of Quality.

- A. The degree of sewage or waste treatment required to restore and maintain the standards of quality shall be determined in each instance by the State Board of Health and shall be based upon the following:

* * * *

(2) The size and nature of flow of the receiving stream.

* * * *

(Stream flows are specified for each major river.)

ILLINOIS

Water Pollution Regulations of Illinois, through March 7, 1972. Chapter 3: Water Pollution. Part 1: Introduction.

105 Analytical Testing

All methods of sample collection, preservation, and analysis used in applying any of the rules and regulations in this Chapter shall be in accord with those prescribed in "Standard Methods for the Examination of Water and Waste Water, Thirteenth Edition, or with other generally accepted procedures.

Flow Part II Water Quality Standards.

202 Stream Flows

Except as otherwise provided in this Chapter with respect to temperature, the water quality standards in this Part shall apply at all times except during periods when flows are less than the average minimum seven day low flow which occurs once in ten years.

(The exceptions to the applicability of the temperature criteria do not relate to stream flow.)

INDIANA

Official Regulation SPC IR-2. Adopted and Promulgated by the Stream Pollution Control Board of the State of Indiana, July 21, 1970.

Note 2.

The analytical procedures used as methods of analyses to determine the chemical, bacteriological, biological, and radiological quality of waters sampled shall be in accordance with the latest edition of Standard Methods for the Examination of Water and Wastewater or other methods approved by the Indiana Stream Pollution Control Board and the Federal Water Pollution Control Administration.

Flow (Implementation and Enforcement; set for individual basins.)

The minimum weekly flow, which occurs once in ten years, will be used in applying the standards. It is recognized that the all-time minimum flow will be less but will occur only a very small percentage of the time. During these periods, only minimum damage to the stream will result.

IOWA

Water Quality Criteria and Plan for Implementation and Enforcement for the Surface Waters of Iowa. May, 1967.

Section I. General. 1-Sec.2.1. General Policy Considerations.

Sampling to determine conformance to these criteria shall be done at sufficient distances downstream from waste discharge points to permit adequate mixing of waste effluents with the surface waters. In the performance of tests or analytical determinations to determine compliance with the established surface water criteria, samples will be collected at such locations, times, frequencies, and in such a manner as approved by the Commission.

The collection, preservation, and testing of samples will be made in conformance with the methods given in the latest edition of "Standard Methods of the Examination of Water and Sewage." Where more than one method is prescribed, that method designated by the Commission shall be used. Any methods deviating from those prescribed must be approved by the Commission.

Flow (Criteria)

1.2(3). The following criteria are applicable at flows greater than the lowest flow for seven consecutive days which can be expected to occur at a frequency of once every ten years.

KANSAS

Kansas Water Quality Standards, January 14, 1969.

Plan of Implementation for Water Quality Control and Pollution Abatement, Kansas State Board of Health, June, 1967, Part II, Water Quality Surveillance Network; Sample Collection and Analysis Procedure.

The collection of water samples and laboratory analyses shall be in accord with the latest edition of "Standard Methods for the Examination of Water and Wastewater", prepared and published jointly by the American Public Health Assoc., the American Water Works Assoc., and the Water Pollution Control Federation with the following exceptions:

1. Bacteriological analysis will be made on samples collected up to 48 hours prior to receipt in the laboratory. This is necessary in some instances where samples are shipped to the laboratory by mail.
2. Bacteriological samples of surface waters collected by department field staff are iced during hot weather for preservation in transportation to the laboratory.
3. Grease analysis will be determined by the "Wet Method of Grease Analysis" developed by Dr. Raymond Loehr, professor of civil engineering, University of Kansas.

Other analytical methods may be approved by the Board of Health in the future.

Flow (Criteria; set for individual basins.)

28-16-11. Neosho River Basin. The concentrations limitations of the parameters and pollutants stipulated herein for the Neosho River are selected to establish quality criteria for stream flows in excess of 11 cfs*at the Kansas-Oklahoma state line. The concentration limitations of the parameters and pollutants stipulated herein for the Cottonwood River are selected to establish quality criteria for stream flows in excess of 56 cfs at Emporia, Kansas. The concentration limitations of the parameters and pollutants stipulated herein for the Spring River are selected to establish quality criteria for stream flow in excess of the 10-year one day low flow which is set forth as 27 cfs near Quapaw, Oklahoma. The concentrations limitations of the parameters and pollutants stipulated herein for Shoal Creek are selected to establish criteria for stream flows in excess of the 10-year, one day low flow which is set forth as 37 cfs near Joplin, Missouri. Quality criteria will be met insofar as is practicable when stream flows are less than those stipulated above. (Similar provisions for other basins.)

*(Cubic Feet Per Second)

KENTUCKY

Kentucky Water Quality Standards. June, 1967. Amended, 1971.

(No provisions regarding sampling and analytical methods.)

Flow

No specification.

LOUISIANA

Louisiana Stream Control Commission Water Quality Criteria. (No date.)
Sampling and Analytical Procedures.

Procedures for securing samples to be used in analyses for determination of compliance with the criteria shall be subject to the following restrictions.

- (1) Samples will be obtained at a depth or depths which adequately determine stream conditions.
- (2) Samples will be collected from the present established sampling stations to ensure continuity in monitoring with that done in the past. In those cases where there are not sufficient established points, it may be necessary to establish additional new ones. This statement does not preclude sampling at other points in the conduct of field investigations.
- (3) Collection and preservation of samples will be in accordance with accepted practices to assure representative samples of the water and minimized alterations prior to analyses.

Numerical values of the various criteria in fresh waters will be determined by analytical procedures prescribed by the regulatory agency. In general these procedures will follow the latest edition of STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTE WATER, published jointly by the American Public Health Association, American Water Works Association, and Water Pollution Control Federation. For coastal and estuarine waters procedures will be prescribed by the regulatory agency and in general be those specified in a MANUAL OF SEA WATER ANALYSES, published by the Fisheries Research Board of Canada. Other analytical procedures shall be subject to approval of the regulatory agencies.

Flow

No specification.

MAINE

State of Maine Material of Implementation Plan Common to all Interstate and Tidal Basins. (No date.) Surveillance Program.

Generally all tests and surveys will be conducted and performed in accordance with the latest edition of Standard Methods for the Examination of Water and Waste Water as prepared by the American Public Health Association, American Water Works Association, and the Water Pollution Control Federation or may be in accordance with other acceptable methods which have proven to yield reliable data.

Flow

No specification.

MARYLAND

Maryland's Water Quality Program; Maryland Plan; Document B - "Plan for the Implementation and Enforcement of Water Quality Standards for all Maryland Waters." (concise form). May 22, 1967. V. Water Quality Surveillance Program.

Sampling will be done, or supervised, by qualified scientists who will employ standard procedures to assure the collection of representative samples which will be preserved according to accepted practice prior to analysis. Analysis will be performed according to standard methods or other approved methods, and may include bio-assay techniques or other special techniques--where needed--to supplement other analytical data, or where cause and effect cannot otherwise be well established.

Flow (Criteria)

Article 3--Standards-Related Design Stream Flow. The water quality standards established for specified water zones shall be maintained during periods of low stream flow, which is defined as the mean seven (7) consecutive day low flow having a frequency of recurrence of once in ten (10) years. For the duration of lower stream flows, the Department may apply the general water quality criteria, or such other standards as it may deem necessary and feasible.

MASSACHUSETTS

Water Quality Standards. Vol. 1. Laws, Policy and Standards. March, 1967.

(No provisions regarding sampling and analytical methods.)

Flow

No specification.

MICHIGAN

Water Quality Standards. Revised June 1967. Basic premises.

4. Analysis of water to determine the levels of pollutants will be made according to procedures outlined in Standard Methods for the Examination of Water, Sewage and Industrial Wastes published jointly by the American Public Health Association, American Water Works Association, and the Federation of Sewage and Industrial Wastes Associations, or other methods approved by the Michigan Water Resources Commission and the Federal Water Pollution Control Administration.

Flow (Summary of Program to Control and Abate Pollution.)

The accepted design stream flow to which the standards will apply are those equal to or exceeding the 10-year recurrence of minimum low flow average of 7-day duration.

MINNESOTA

State of Minnesota Pollution Control Agency, Chapter Fifteen: WPC 15, April 8, 1969. (a) Introduction; (3) Determination of Compliance.

In making tests or analyses of the interstate waters of the state, sewage, industrial wastes or other wastes to determine compliance with the standards, samples shall be collected in such manner and place, and of such type, number and frequency as may be considered satisfactory by the Agency from the view-point of adequately reflecting the condition of the interstate waters, the composition of the effluents, and the effects of the pollutants upon the specified uses. Reasonable allowance will be made for dilution of the effluents in relation to the uses of the interstate waters into which they are discharged or other interstate waters which may be affected. The samples shall be preserved and analysed in accordance with the procedures given in the 1965 edition of Standard Methods for the Examination of Water and Waste Water, by the American Public Health Association, American Water Works Association, and the Water Pollution Control Federation, and any revisions or amendments thereto, or other methods acceptable to the Agency.

Flow (General Standards Applicable to all Interstate Waters.)

(8) . . . (I)f at the applicable stream flows mentioned in the sections on specific standards of interstate water quality and purity it is evident that the specified stream flow may be less than the effluent flow, the specific standards may be interpreted as effluent standards for control purposes, where applicable. The period of record for determining the specific flow for the stated recurrence interval, where records are available, will include at least the most recent 10 years of record, including flow records obtained after establishment of flow regulation devices, if any. Such calculations will not be applied to lakes and their embayments which have no comparable flow recurrence interval. Where stream flow records are not available, the flows may be estimated on the basis of available information on the watershed characteristics, precipitation, run-off and other pertinent data. (Emphasis of the text.)

Specific Standards of Interstate Quality and Purity:

(2): Fisheries and Recreation (all classes; includes warm and cold water F & WL*and bathing): Discharges of sewage, industrial waste or other waste effluents shall be controlled so that the standards will be maintained at all stream flows which are equal to or exceeded by 90 percent of the seven consecutive daily average flows of record (the lowest weekly flow with a once in ten year recurrence interval) for the critical month(s). (Emphasis of the text.)

MISSISSIPPI

Water Quality Standards. Mississippi Air & Water Pollution Control Commission. June 19, 1967. Implementation and Enforcement Plan.

Surveys shall be conducted and samples taken from points so distributed over the areas and depth of the waters being studied as to permit a realistic appraisal of such actual or potential damage to water use or aquatic life as may exist. Samples shall be analysed in accordance with the latest edition of 'Standard Methods' or other methods acceptable to the Commission.

*(Fish & Wildlife Propagation)

The Commission will issue permits and require prompt and regular submissions of operational reports from treatment plants to enable the evaluation of the quality of effluents.

Flow (Criteria)

Section 1. General Conditions. . . . All criteria contained herein shall apply at all stages of stream flow which exceed the 7-day, 10-year minimum flow in unregulated, natural streams. This requirement shall not be interpreted to permit any unusual waste discharges during periods of lower flow.

MISSOURI

Water Quality Standards, June, 1967; revised August, 1968.

Water Quality Criteria; Specific Criteria. 3. Methods of Sampling, Preservation and Analysis.

The methods of sample collection, preservation, analyses, and measurements to determine water quality and the accuracy of results shall be in accordance with the Twelfth edition of Standard Methods for the Examination of Water and Wastewater, published jointly by the American Public Health Association, American Water Works Association and the Water Pollution Control Federation, or in the case of interstate streams, other methods mutually agreed upon by the Missouri Water Pollution Control Board and the State Water Pollution Control Agencies of contiguous states.

Flow (Criteria)

General Criteria. 2. Minimum water quality conditions applicable to all waters of the State including: 1) low flow streams which are defined as any stream with a flow of 0.1 cfs* or less for an average of seven consecutive days which average flow is expected to recur once every two years or less; 2) any streams for which an exception to the water quality criteria has been granted due to low flow conditions or other reasons; . . .

Specific Criteria. 1. Flow - Water quality standards shall be met at all times regardless of the flow unless an exception is granted by the Missouri Water Pollution Board. For flow information, the U.S. Army Corps of Engineers and U.S. Geological Survey should be consulted.

MONTANA

Water Quality Standards for the Surface Waters of Montana. Montana State Water Pollution Control Council. Water Quality Criteria. June 5, 1967. Policy Statements.

12. Tests or analytical procedures to determine compliance with standards will, insofar as practicable and applicable, be made in accordance with the methods given in the twelfth edition of "Standard Methods for the Examination of Water and Waste Water" published by the American Public Health Association, et al, or in accordance with tests or analytical procedures that have been found to be equal or more applicable.

*(Cubic Feet per Second)

Flow

Policy Statements. 7. For treatment plant design purposes, streamflow dilution requirements shall be based on the minimum consecutive 7-day average flow which may be expected to occur on the average once in 10 years.

NEBRASKA

Water Quality Standards Applicable to Nebraska Waters. December 21, 1967. Plan of Implementation and Enforcement. G. Method of Water Sample Collection.

The method of water sample collection, sample preservation, analysis, and measurement to determine water quality and the accuracy of the results shall be in accordance with the latest Edition of Standard Methods for the Examination of Water and Waste Water, or by appropriate regulations or procedures approved by the Nebraska Water Pollution Control Council or the Federal Water Pollution Control Administration.

Flow (Implementation and Enforcement)

H. Stream Flow Design Criteria. The Water Quality Criteria contained in these standards are applicable at flows equal to or greater than the lowest flow for seven consecutive days which can be expected to occur at a frequency of once every ten years. For design purposes, this flow may be determined by any accepted statistical procedure using published stream flow data such as Gumbel's method of logarithmic extremal probability using low mean discharge data from the Missouri Basin Inter-Agency Committee studies. The drought flow at any point along a stream may be determined by relating the drought flows at gaging stations and their drainage to the drainage above the point of interest on the stream.

"Water Quality Criteria for Intermittent Waters shall apply:"

(1) Whenever the waste source is discharging into waters with a record of periodic zero flows 7 consecutive days of a once in 10-year low flow, (2) Whenever the design flow of the waste source is greater than the design drought flow 7 consecutive days of a once in 10-year low flow, (3) Whenever the actual flow of the receiving waters is less than the waste source discharge.

NEVADA

Interstate Water Quality Standards and Plan of Implementation, 1967. Sampling and Testing.

The analyses for nitrogen and phosphorus in samples from Lake Tahoe shall be according to A Manual of Sea Water Analysis, Strickland, J.D.H. and Parsons, T.R. All sampling and all other testing procedure shall adhere to the latest edition of Standard Methods for the Examination of Water and Wastewater. A sample will normally consist of a grab sample taken during working hours. Treatment plant operators will normally take composite samples.

Flow

Water Quality Standards. . . . These standards shall apply to all stream flows unless indicated otherwise for a particular stream.

NEW HAMPSHIRE

Report on Water Quality Standards, June 29, 1967.

Section I. Classification of Surface Waters.

A. Standards:

1. . . . Tests and sampling for the purposes of examinations of waters shall be performed in accordance with the provisions of paragraph VI, (sic) APPENDIX A.

Appendix A, Paragraph V.

All tests and sampling for the purpose of examination of waters shall be performed and carried out in a reasonable manner and whenever practicable, in accordance with the current edition of the Standard Methods for Examination of Water and Sewage as published jointly by the American Public Health Association and the American Water Works Association. . . .

NEW JERSEY

New Jersey Department of Health, Division of Clean Air and Water, Water Pollution Control Program; Stream Classification - Standards of Quality - Implementation; June 1967; Section II, Raritan River Basin, Implementation Plan.

A routine surveillance program is maintained. This provides for inspections of all sewage and industrial waste treatment plants in the State. . . These inspections include effluent sampling on each occasion. Included herewith is a routine inspection form indicating analyses of samples. All analyses are performed in accordance with "Standard Methods for the Examination of Water and Wastewater." Of course more complete analyses are made for more intensive studies of plant operation. (Emphasis of the text.)

The Program maintains a routine sampling schedule covering fixed sampling stations on streams throughout the State.

[Sections covering other basins refer to Section II, above, for policies and procedures regarding implementation which generally are uniform throughout the State.]

Flow

Statement of Policy. 1.12. The levels of quality specified for various water uses, where applicable, are expected to be maintained under conditions comprising minimum consecutive seven day fresh water flows with ten year recurrence intervals.

NEW MEXICO

Water Quality Standards for the Pecos River in New Mexico, June, 1967. (Identical for other New Mexico rivers.)

Definitions.

8. Dissolved Ionic Constituents. This term is used to imply to filterable substances dissolved in water. For practical purposes, it is taken to be equivalent to the total dissolved solids content of a water as determined by the filterable residue test described on page 245 of the twelfth edition of Standard Methods for the Examination of Water and Wastewater.

9. Sampling Period. A sampling period is the time interval specified in the language of a particular standard over which samples are to be collected for analysis for the detection of an infraction of the particular standard.

10. BOD. 5-day, 20°C biochemical oxygen demand in mg/l*as determined by the dilution bottle technique described in the most current edition of Standard Methods for the Examination of Water and Waste-Water, published by the American Public Health Association.

11. DO. Dissolved oxygen concentration in mg/l as determined by the unmodified Winkler technique as described in the most current edition of Standard Methods for the Examination of Water and Waste-Water or by an appropriate modification of the Winkler method as described in that text.

12. MPN Technique. A method used to evaluate the most probable number of coliform bacteria in a unit volume of water; for techniques, see the most current edition of Standard Methods for the Examination of Water and Waste-Water.

Policy Guidelines Followed in Establishing Standards and to be Followed in Evaluating Compliance. (As amended, 3/4/68.)

It should be noted that the standards are stream standards and not effluent standards, as samples taken for the regulation and enforcement of these standards are to be collected at the mid-point of the stream flow at locations of sufficient distance downstream from the point of introduction of a waste-water inflow to provide for reasonable mixing of the stream and the inflowing water. Where stratification exists, other sampling techniques may be employed. Sampling in reservoirs and lakes for the purposes of the standards may be at any point in the body of the water, but not closer than 250 feet from the point of introduction of a water contaminant. A reservoir or lake is considered to include all of the area flooded when the water in the basin is at the spillway level.

General Standards.

7. Toxic Substances. . . . Toxicities of substances in receiving waters will be determined by appropriate bio-assay techniques, or other acceptable means, for the particular form of aquatic life which is to be preserved.

Flow (Criteria; set for individual basins.)

Pecos River. General Standards. The following general standards shall apply to the waters of the main stem of the Pecos River in New Mexico regardless of the magnitude of flow. . . . Special Standards. The flow in the Pecos River and the uses of the waters of the river vary considerably from one section to the next. Because of these variations, two sets of special standards are proposed to protect the waters of the river for both existing and potential future uses. . . . A. For the main stem of the Pecos River from Anton Chico, New Mexico to the head waters at all flows. . . . Special Standards for Chlorides, Sulfates, and Total Dis-

solved Solids. (Main stem, Pecos River) . . . At very low flows, the concentration of some of the chemical constituents is quite high and quite variable, but these flows represent a relatively small part of the total water supply of the river. Because of its hydrologic nature and because of the regulations of the flows of the Pecos River by dams and reservoirs, the experience at many points on the river is that either relatively high flows exist or that there is virtually no flow in the stream. To allow for these low flow periods, and to protect the quality of the stream at high flows, the standards for chlorides, sulfates and total dissolved solids have been formulated in terms of mathematical relationships between flow and the concentration of the particular constituent. Special standards for this purpose apply only to samples collected at the station indicated and for periods during which the flow in the stream is within the range used to establish the relationship.

NEW YORK

Classifications and Standards of Quality and Purity for Waters of New York State, Parts 700-703, Title 6, Official Compilation of Codes, Rules and Regulations, November, 1967.

Section 700.1. Collection of samples. In making any tests or analytical determinations of classified water to determine compliance or non-compliance of sewage, industrial wastes or other wastes discharges with established standards, samples shall be collected in such manner and at such locations as are approved by the Water Pollution Control Board as being representative of the receiving waters after opportunity for reasonable dilution and mixture with the wastes discharged thereto.

Section 700.2. Tests or analytical determinations. Tests or analytical determinations to determine compliance or non-compliance with standards shall be made in accordance with methods and procedures approved by the Water Pollution Control Board.

Flow

Supplemental Materials for Water Quality Standards Submissions from State of New York (Applicable to All Basins.)

Appendix 9. Program Implementation Regarding Waste Water Treatment Facilities Required to Meet the Surface Water Quality Objectives of the State of New York.

II. Program Implementation Concerning Treatment Facilities.

A. General.

(5) Effects of waste water discharges into surface waters shall be evaluated on prospective conditions 30 years in the future and based on a consecutive 7 day low flow with a return period of once every 50 years.

NORTH CAROLINA

Rules, Regulations, Classifications and Water Quality Standards Applicable to the Surface Waters of North Carolina, Adopted by the Board of Water and Air Resources, Department of Water and Air Resources, Raleigh, N.C., October 13, 1970.

Rules Applicable to Classifications and Water Quality Standards.

RULE NO. III. - Test or analytical procedures to determine conformity or nonconformity with standards will, insofar as practicable and applicable, be made in accordance with the methods given in the latest edition of "Standard Methods for the Examination of Water and Wastewater," published by the American Public Health Association, American Water Works Association, and Water Pollution Control Federation or the latest edition of "Methods for Chemical Analysis of Water and Wastes", published by the Federal Water Quality Administration, or where other tests or analytical procedures have been found by the Department to be more applicable and satisfactory, same may be used upon adoption by the Board as a rule pursuant to General Statute 143-215.4(b). Latest edition as used in this rule means that edition of the publication which has been most recently published with reference to the date at which a test or analytical procedure is carried out, and applies prospectively to editions issued subsequent to adoption of this rule.

Flow (Regulations Applicable to Classifications and Water Quality Standards)

VI. The governing flow, which shall be the criterion for the standards and for the design of waste treatment facilities, shall be the minimum average flow for a period of seven consecutive days that have an average recurrence of once in ten years. In cases where the stream is regulated, the governing flow shall be the instantaneous minimum flow.

NORTH DAKOTA

Water Quality Standards for Surface Waters of North Dakota, April 21 and May 16, 1967, Standards of Surface Water Quality IV. General Conditions.

The analytical procedures used to determine compliance or noncompliance with the quality standards adopted for the surface waters shall be in accordance with the latest edition of "Standard Methods of the Examination of Water and Sewage," as published by the American Public Health Association. Tests for radioactivity shall be in conformance with the publication "Laboratory Manual of Methodology, Radionuclide Analysis of Environmental Samples, Technical Report R 59-6," published by the United States Public Health Service.

Flow (Criteria; set by individual stream.)

Red River of the North, etc.: II Specific Standards, A. The dissolved oxygen in the waters shall be maintained at not less than five

(5) milligrams per liter based on the minimum monthly average flow of record after January 1, 1955, except that seasonal discharges of certain agricultural products processing wastes shall be based on the average of the lowest 10% of all average monthly flows of record for either the months of April or May, using whichever month is lower. . . . H. These standards shall be met at all times, regardless of flow, unless an exception is granted by the State Water Pollution Control Agency and the United States Department of the Interior for all interstate waters and the State Water Pollution Control Agency for intrastate waters.

(Other basins do include the paragraph H provision but not the paragraph A provision applicable to the Red River of the North.)

OHIO

Water Quality Standards, June 13, 1967.

(No provisions regarding sampling and analytical methods.)

Flow (Implementation and Enforcement; set for specific basins.)

Most waters. (1) The design or critical flow defined as the minimum annual seven consecutive day warm weather flow which is exceeded in 90% of the years will be used in applying the stream-water quality criteria.

Ohio River. (1) The critical or minimum flows in the Ohio River are those that may be expected during a seven day period once in ten years based on flow augmentation from all reservoirs that will be in operation by 1970; these flows were estimated by the U.S. Corps of Engineers and the Ohio River Valley Water Sanitation Commission.

Mahoning, etc. (1) The design or critical flows based on information from the U.S. Corps of Engineers after the West Branch Reservoir is placed in operation are 450 cfs* during the summer and 225 cfs during the winter. These flows will be used in applying the stream water quality criteria.

OKLAHOMA

Water Quality Serveillance Program, June, 1967.

1. Routine monitoring of significant waste discharges:
2. Checks by State Agencies. State Department of Health.

. . . All test procedures will be in accordance with the latest edition of "Standard Methods for the Examination of Waters and Waste Water" published by the American Public Health Association, Inc. - except that in plant control and routine surveillance checks, other widely accepted procedures may be approved if it can be demonstrated that the results obtained are comparable to the results obtained by

*Cubic Feet per Second.

standard methods.

II. Stream water quality monitoring stations.

. . . Sampling frequencies and kinds of water quality measurements will be those necessary to determine compliance with the water quality criteria or as necessary for water resources management. Sampling and analytical procedures will conform to standard methods or other widely accepted procedures comparable to standard methods and approved by the water pollution control agencies.

Flow (Criteria; set by river basins.)

The proposed criteria are applicable at all times and at all flows, except as otherwise indicated.

Salt Fork of the Arkansas, etc. Specific Criteria. 9. Dissolved Oxygen - The dissolved oxygen concentration shall not be less than 4 mg/l,* except that this limitation of 4 mg/l will not be applicable in the immediate vicinity of the point of waste discharge when the stream flow is less than 200% of the waste flow. In addition, the relationship of dissolved oxygen, biochemical oxygen demand and chemical oxygen demand of waste releases, and the flow characteristics of the stream shall not create conditions downstream that are detrimental to beneficial uses.

(Other areas--provisions identical.)

OREGON

Implementation and Enforcement Plan for the Public Waters of the State of Oregon, May, 1967. Water Quality Standards Surveillance Plan for Drainage Basins in Oregon; General Surveillance.

The present state of Oregon's water quality surveillance program involves periodic checking of fixed stations that are selected as monitoring or control points above and below pollution sources or near the mouths of streams. As these points it is usual to run a sanitary survey consisting of date, time, flow, pH, temperature, dissolved oxygen (DO), biochemical oxygen demand (BOD), Perle Benson Index (PBI), specific conductance, most probable number of coliforms (MPN), and any other parameter that appears to be pertinent to the particular area or condition. In many cases waste treatment samples, domestic, municipal, agricultural or industrial, are analyzed jointly with the sanitary survey to coordinate cause and effect relationships. In addition to the sanitary survey, basic data are run at strategic locations. For these points laboratory analyses are performed including pH, color, turbidity, total solids, suspended solids, alkalinity, hardness, sulfates, ammonia nitrogen, nitrate-nitrogen, phosphates, and chlorides. Wherever other chemicals or problems are suspected, special analyses are made to characterize these conditions. All testing is in accordance with Standard Methods*. Frequency of sampling varies from daily to yearly depending on needs for the data. Each of the stations is identified by code numbers, river mile

*Milligrams per Liter.

and other identifying features so that samples are taken at the same point each time. . .

**Standard Methods for Analysis of Water and Wastewater, 12th Edition, APHA, AWWA and WPCF, 1962.

Flow

11-105. Maintenance of Standards of Quality. (1) The degree of waste treatment required to restore and maintain the above standards of quality shall be determined in each instance by the State Sanitary Authority and shall be based upon the following:

(b) The size and nature of flow of the receiving stream. . . .

Implementation. 9. Design Stream flow. Hydrographs of flow for selected points in the basins are shown in the tentative water quality standards. Currently no comprehensive program for assessing the relationships between flows, treatment and resources has been completed for the state of Oregon. The Oregon State Sanitary Authority is presently engaged in an Ultimate Needs Study with the Water Resources Board to determine minimum flow needs. . . . Much more work is needed before acceptable minimal stream flows can be set. The main needs are for travel times and physical characteristics of the streams to determine reoxygenation coefficients and for tests to determine deoxygenation rates.

PENNSYLVANIA

Water Quality Standards for Pennsylvania's Interstate Streams, June, 1967. Section V, Implimentation Plan, Part II. I. Sarveillance Program. (b) Stream Monitoring.

We believe that the stream monitoring program related to water quality standards enforcement should be carried out by an intensive low flow sampling program. Such low flow sampling would be conducted in the critical reaches of streams. We believe that this type of sampling will enable us to determine if the water quality criteria are being met and better relate waste treatment requirements of water quality criteria.

(No provisions regarding analytical methods.)

Flow (Implementation)

D. Design Flow, The implementation plan has been designed using a criteria or design stream flow equivalent to the minimum seven consecutive day flow that occurs one time in ten years. Treatment plants designed to meet the criteria at the critical flow conditions are to be operated at that design efficiency at all times. This will result in water quality exceeding the criteria most of the time.

Part II, Surveillance Program. (b) Stream Monitoring. We believe that the stream monitoring program related to water quality standards enforcement should be carried out by an intensive low flow sampling program. Such low flow sampling would be conducted in the critical reaches of streams. We believe that this type of sampling will enable us to determine if the water quality criteria are being met and better relate waste treatment requirements to water quality criteria.

RHODE ISLAND

Water Quality Standards for Interstate Waters. Department of Health, Division of Water Pollution Control. June, 1967. Surveillance.

Programs.

To evaluate water quality, composite samples of non-tidal streams taken during periods of low flow and in the case of tidal streams samples representative of the various tidal stages will be collected and analyzed periodically, and whenever there has been a significant change in the amount of pollution entering the watercourse. . . The samples will be collected, preserved and analyzed in accordance with the recommendations of the latest edition of "Standard Methods for the Examination of Water and Wastewater."

Flow (Criteria.)

Notes. 9. The minimum average daily flow for seven consecutive days that can be expected to occur once in ten years shall be the minimum flow to which the standards apply.

SOUTH CAROLINA

Water Classification-Standards for the State of South Carolina, Adopted by the Pollution Control Authority September 8, 1971. Section III, Rules Applicable to All Classes and Standards.

5. In making any tests or analytical determinations on classified waters to determine compliance or non-compliance with water quality standards, representative samples shall be collected at locations approved by the Pollution Control Authority.

- a. Samples shall be taken from points so distributed over the area and depth of the waters being studied as to permit a realistic appraisal of such actual or potential damage to water use or aquatic life as may exist.
- b. Bioassay methods may be employed in appropriate situations to determine medium tolerance limits (TLM) and/or concentration of toxic substances.
- c. Temporal distribution of samples in tidal waters shall be such

as to cover the full range of tidal conditions.

- d. The criteria are applicable to any fresh water stream when the flow rate is equal to or greater than the minimum seven-day average flow rate that occurs with an average frequency of once in ten years.

Implementation Plan, Section I. F. Implementation Program.

2. Monitoring and Surveillance Programs. . . . Analytical and other technical procedures are as prescribed in the latest edition of STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, or by such other methods which are considered to be reliable by the professional staff of the Pollution Control Authority. . .

Flow (Rules Applicable to All Classes and Standards.)

6.d. The criteria are applicable to any fresh water stream when the flow rate is equal to or greater than the minimum seven-day average flow rate that occurs with an average frequency of once in ten years.

Definitions. Swamp Waters shall refer to those waters having those color and chemical characteristics found in waters which have been exposed for a substantial time to decaying vegetable matter under natural conditions. Under appropriate conditions this designation shall be applied without regard to the velocity of the flow of the water.

SOUTH DAKOTA

Water Quality Standards for the Surface Waters of South Dakota, Adopted by the South Dakota Committee on Water Pollution, February 16, 1967.

Section II - Conditions Applying to All Surface Water.

2. Toxic Materials. . . . Median tolerance concentrations shall be based on the results of the most recent research results for the material being studied or, in the case of disagreement, by bioassay tests simulating actual stream conditions run in accordance with procedures outlined in the latest edition of "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association and using test animals or organisms specified by the Committee. (Amended 12/5/69.)

Section III - Enforcement Provisions.

5. Tests or analytical procedures to determine conformity or non-conformity with the criteria will be made in accordance with the methods given in "Standard Methods for the Examination of Water and Wastewater - 1965" published by the American

Public Health Association, or as otherwise specified by the Committee. Acceptability of laboratory results will be determined by the Committee.

6. In making tests or analytical determinations of surface waters to determine conformity or non-conformity with the established criteria, samples shall be collected in such manner and at such locations, times and frequencies as approved by the Committee. Every effort should be made to make the samples representative of the receiving waters after reasonable opportunity for dilution and mixture with the pollution material discharged thereto.

TENNESSEE

Implementation and Enforcement Plan for Interstate Streams of Tennessee, Adopted on May 26, 1967, Tennessee Stream Pollution Control Board. 8. Water Quality Surveillance Program.

d) Sample Collection and Analysis Sampling, preservation and analytical procedures are as directed by Standard Methods or other approved procedures.

Flow (Interpretation of Criteria.)

4. The criteria set forth shall be applied on the basis of the following stream flows: Unregulated streams - stream flows equal to or exceeding the 3-day minimum, 20-year recurrence interval; regulated streams - instantaneous minimum flow.

TEXAS

General Statement, Texas Water Quality Requirements. Oct. 5, 1967.

3. Sampling will be in accordance with fully recognized procedures. Samples must be representative of the receiving waters allowing time and distance for mixing.
5. The values established by the parameters in these water quality requirements relate to analytical procedures outlined in the latest edition of the "Standard Methods for the Examination of Water and Wastewater" as prepared and published jointly by the American Public Health Association, the American Water Works Association, and the Water Pollution Control Federation.

In evaluating toxicity, bioassay techniques are to be selected suited for the particular purpose at hand. . .

6. The suitability of water for irrigation will be based on the irrigation water classification system developed by the University of California at Davis and the U.S. Salinity Laboratory at Riverside, California. . .

The SAR (sodium adsorption ratio) should not exceed 8 for waters safe for irrigation. Sampling and analytical procedures and schedules are not specified, but will be as appropriate for adequate protection of irrigation water.

Flow

No specification.

UTAH

Water Quality Standards and Implementation Plan for Interstate Water. June, 1967. Implementation and Enforcement Plan. Surveillance.

Sampling and analytical techniques. Samples for MPN coliforms and for BOD analyses are collected in appropriate containers and are packed in ice from time of collection until delivery to the laboratory. Delay in route for these samples is seldom in excess of 24 hours. Samples for chemical and radiological analyses are collected in appropriate containers and are also delivered to the laboratory on a rapid schedule.

All analyses of interstate water samples, except radiologic analyses, are carried out by the Utah State Department of Health Division of Laboratories in accordance with "Standard Methods for the Examination of Water and Wastewater - Twelfth Edition 1956" as published by the American Public Health Association, Inc. Radiologic analyses are conducted by the radiological health laboratory within the Division of Environmental Health.

Flow (Criteria.)

Specific Standards Assigned to Interstate Waters. Stream flow and sampling considerations. Although not covered explicitly by the standards, it is clearly implied that the quality requirements relate to all uses and must apply, therefore, to all flows. At the same time, anyone knowledgeable in matters of water quality control will realize that a given set of standards can be made unachievable if the normal wide fluctuation in stream stages is not recognized. For this reason standards have been related to minimum monthly-average flows in specific situations where permits are being considered. The complexities of stream patterns argue for the development of more information before flows are tied precisely to quality parameters.

Nevertheless, as presently constituted and applied, standards require minimum practicable treatment for any situation, including a dry stream channel, by reason of the requirement that any effluent release from a controlled area must meet certain bacterial and B.O.D. standards (See following discussion under "Effluent Standards").

* * *

Effluent standards (minimum practicable treatment . While the standards described apply generally to receiving stream flow, they can and must become effluent standards as required by lack of dilution water. . . .

VERMONT

Implementation Plan, Vermont Water Resources Board, June, 1967.

Surveillance

In general, sampling and analyses are done in accordance with Standard Methods. . . Stream sampling is done on a "grab" sample basis except where time and space of the pollution distribution is questionable and should be considered.

Flow

Implementation Plan, June 1967. Surveillance.

. . . Standards shall apply to stream conditions existing during critical minimum low flow periods. On many streams the critical flow does not have the usual frequency of occurrence that can be assigned on a hydrologic basis, but rather the flow is regulated by the operation of hydroelectric stations. The usual summer or low flow operation is released during the peak electric use time and stored during the remainder; this becomes critical on summer weekends.

On streams where regulation is not a problem, the low seven-day average flow with a return period once in ten years will be used.

VIRGINIA

Commonwealth of Virginia, Water Quality Standards, 1970.

2.04 Samples to determine compliance with standards established for estuarine or open ocean waters will be collected at slack before flood tide or slack before ebb tide.

The standards contain no general provision regarding analytical methods. The following methodology was employed in a study of the James River.

U.S. Public Health Service - Virginia Institute of Marine Science - JAMES RIVER STUDY, Analytical Methods.

Analysis	Method or Reference
ALL WATER SAMPLES	Submersible pump
1. Temperature	Thermometer
2. Salinity	Conductimetry (Ind. Instr. RS7A)
3. Dissolved oxygen	"Standard Methods" page 316 (modified)
4. pH	Beckman N-2 Meter
5. Alkalinity	Barnes, 1959, page 204
6. Phytopigments	Yentsch and Menzell, 1963
7. Secchi Disk Reading	

8. Seston
 - a. Total
 - b. Bioseston (loss on ignition)
 - c. Abioseston (fixed residue)
9. Phosphorus forms
 - a. Soluble reactive
 - b. Soluble unreactive
 - c. Particulate reactive
 - d. Particulate unreactive
 - e. Total Phosphorus
10. Nitrogen forms
 - a. Ammonia
 - b. Nitrite
 - c. Nitrate
 - d. Organic Nitrogen

Modified from "Standard Methods"
 0.8 u membrane filters used
 instead of gooch crucibles
 Separation of Forms;
 Strickland and Parsons, 1960
 Oxidation:
 Menzel and Corwin, m.s.
 Colorimetry:
 Standard Methods, page 203 (modified)

To be frozen until method refined
 Strickland and Parsons, 1960
 Reduction - Norris and Riley, 1963
 modified by Carpenter.
 Micro-Kjeldael, A.O.A.C. page 643.

Flow (Rules with General State-wide Application.)

1.02. Stream standards will apply whenever flows are equal to, or greater than, the minimum mean 7-consecutive day drought flow with a 10-year return frequency.

WASHINGTON

Implementation and Enforcement Plan for Interstate and Coastal Waters. December, 1967.

(No provisions regarding sampling and analytical methods.)

Flow

No specification..

WEST VIRGINIA

West Virginia Administrative Regulations, State Water Resources Board. Requirements Governing the Discharge of Sewage, Industrial Wastes and Other Wastes into the Waters of the State. Chapter 20, Articles 5 and 5A, Code of West Virginia. Effective: August 18, 1970. Section 4. Reporting Spills and Accidental Discharges. (c) It shall be the responsibility of each industrial establishment or other entity discharging directly to a stream to have available insofar as practicable and reasonable the following information pertaining to those substances that are employed or handled in its operation in sufficiently large amounts as to constitute a hazard in case of an accidental spill and discharge into a public stream:

- (2) Details on analytical procedures for the quantitative estimation of such substances in water.

Implementation Plan, 1968. Water Quality Surveillance Program.

The Division of Water Resources has had a water quality network since 1960. It is the plan to expand the existing network and where possible to monitor the State waters on a continuous basis.

The Division maintains and staffs a large well-equipped laboratory with the latest instruments. The laboratory applies methods of analysis that are in the current edition of Standard Methods for the Examination of Water and Wastewater.

The State Water Quality Network.

The Division of Water Resources will collect river samples at the locations listed as stream monitoring stations.

Sample collectors will be employed and trained to properly collect, and bring to the central laboratory, water samples from the monitoring stations.

Bacterial samples (coliform) will be collected at station site in 4 oz. pre-sterilized sample bottles. The sterilizing will be done at the central laboratory. Bacteria bottles will be subjected to twenty pounds pressure, 248° F for fifteen minutes. Coliform samples will either be brought or bussed to the central laboratory so that not more than 24 hours time will have elapsed from collection to the beginning of the analysis. In addition to coliform, the Division of Water Resources will monitor fecal streptococcus and fecal coliform at all station sites.

Water samples for mineral and other chemical determinations will be collected at sample location in properly clean polyethylene containers. Samples that require the addition of preservation will be collected in separate containers.

Temperature will be made in the field at station location; thermometer will be Fahrenheit scale and will be checked and corrected against a Bureau of Standards thermometer kept in the central laboratory.

Dissolved oxygen tests will be collected and fixed in the field at station sites.

River Samples will be made at a point judged by samples to be representative of stream flow. The only exception to this criteria will be on the Kanawha River where presently mass discharge points are located at each bridge sample station.

Flow (Criteria; set for individual basins.)

The following stream quality standards are to apply at all times when flows are equal to or greater than the minimum mean 7-consecutive day drought with a 10-year return frequency.

WISCONSIN

State of Wisconsin. Water Quality Standards for Interstate Waters with Report on Implementation and Enforcement. June, 1967. Chapter RD 2.

RD2.01. Guidelines for application of standards.

(3) Test procedures shall conform with "Standard Methods for the Examination of Water and Wastewater," 12th Edition, 1965, prepared and edited by the American Public Health Association, American Waterworks Association and Water Pollution Control Federation or by other methods acceptable to the department of resource development and not contrary to the requirements of the federal government. The U.S. Atomic Energy Commission Rules and Regulations, Title 10, Part 20, Standards for Protection Against Radiation, December 22, 1965, will apply to the disposal and permissible concentrations of radioactive substances.

(4) . . . Available water, when used in evaluating compliance with standards, will be based on the lowest average dilution for any period of 7 consecutive days in the most recent 10 years. In evaluating compliance, determinations of water quality will be made in accordance with procedures which will assure that the designated uses of such waters are fully protected.

Flow

RD 2.01. Guidelines for application of standards. (4) Water quality standards do not assure quantity and natural quality. Available water, when used in evaluating compliance with standards, will be based on the lowest average dilution for any period of 7 consecutive days in the most recent 10 years. . . .

WYOMING

Wyoming Department of Public Health Water Quality Standards for Interstate Waters in Wyoming, filed October 31, 1968.

Chapter 1, Policy and Definitions.

Section 6. Control Points. Generally the following policies will govern the selection of sampling sites.

a. Bacteriological standards which protect water supply and full body contact will be determined at water supply intakes and designated full body contact recreation areas. Bacteriological standards covering limited body contact may be determined at any point on the stream.

b. Basic chemical analysis will be determined from samples taken at established U.S.G.S. sampling points.

c. Parameters which are toxic or generally affect aquatic life, wildlife, etc. will be determined at any point in the stream as indicated by conditions.

d. The effect of physical parameters such as color, temperature and turbidity shall be determined after time for mixing.

Section 9. Testing Procedures. For determination of the parameters involved in the standards, analysis will be in accord with "Standard Methods for the Examination of Water and Wastewater, 12th Edition, 1965", where applicable.

Where standard methods of testing have not been established, the suitability of testing procedures shall be determined by the public agencies involved.

Section 10. Flow Conditions. On the developed standards, the basis of stream selection, the parameters used, and units of measurement make these standards apply to all flow conditions. However, it would be expected that some of the standards would be violated under the 1 in 25 year drought conditions.

Flow

Policy and Definitions. Section 10. Flow Conditions. On the developed standards, the basis of stream selection, the parameters used, and units of measurement make these standards apply to all flow conditions. However, it would be expected that some of the standards would be violated under the 1 in 25 year drought conditions.

Section 2. Basis of Designation. . . . Water quality standards will be developed for all interstate streams that maintain sufficient flow at the state line to maintain a permanent fishery.

DISTRICT OF COLUMBIA

Revised Water Quality Criteria and Uses (1972)--1968.

. . . Sampling frequency shall provide a sound basis for computations. Within the limits of field conditions, sampling point locations will be selected to permit the collection of representative samples. The following criteria shall apply to all stream flows equal to or exceeding the 7-day, 10-year minimum flow except where, and to the extent that, natural conditions prevent their attainment.

Implementation and Enforcement Plan.

M. Surveillance:

1. Department of Sanitary Engineering. The Water Pollution Control Plant of the District of Columbia has full time laboratory control which provides complete monitoring of discharges to the Potomac River. Samples are collected and analyzed by the D.C. Department of Sanitary Engineering at the following points . . .

Sampling and analytical methods are in accordance with the latest

edition of "Standard Methods for the Examination of Water and Wastewater," APHA, WPCF.

2. The Department of Public Health monitors Rock Creek. Five locations from the D.C. line to Pennsylvania Avenue are sampled weekly

Samples are collected and analyzed in accordance with procedures contained in the latest edition of "Standard Methods."

Flow (Criteria)

. . . The following criteria shall apply to all stream flows equal to or exceeding the 7-day, 10-year minimum flow except where, and to the extent that, natural conditions prevent their attainment.

GUAM

Standards of Water Quality for the Waters of the Territory of Guam, April, 1968. Water Quality Surveillance and Monitoring Program.

All sampling, testing and reporting procedures will be conducted in accordance with the latest edition of Standard Methods for the Examination of Water, Sewage and Industrial Wastes, or with other techniques acceptable to the Federal Water Pollution Control Administration.

Bio-assay procedures will be conducted in accordance with the methods stated in the National Technical Advisory Committee's Report to the Secretary of the Interior.

Flow

No specification.

PUERTO RICO

Report on Water Quality Criteria and Plan of Implementation for Coastal Waters of the Commonwealth of Puerto Rico. Implementation and Enforcement Plan.

All analysis will be performed according to the "Standard Methods for the Examination of Water and Waste Waters" (latest edition).

Flow

No specification.

VIRGIN ISLANDS

Report of Water Quality Standards Criteria and Plan for Implementation. Virgin Islands, July, 1967, with Revisions of 8/25/67. Water Quality Criteria.

Note: The analytical procedures used as methods of analysis to determine the chemical, bacteriological, biological, and radiological quality for waters sampled shall be in accordance with the latest edition of "Standard Methods for the Examination of Water and Wastewater" or other methods approved by the Virgin Islands Department of Health and the Federal Water Pollution Control Administration.

Flow

No specification.