M E M O R A N D U M

DEPARTMENT OF ENVIRONMENTAL QUALITY

DIVISION OF WATER

OFFICE OF WATER RESOURCES MANAGEMENT

SUBJECT: **OWRM Program Guidance Memorandum No. 93 -** 030
Procedures for Approving Plans and Specifications for Sewerage Systems and Sewage Treatment Works and Concept Engineering Designs for Industrial Facilities

TO: **Regional Directors**

FROM: **Larry G. Lawson, P. E.**
Director, Office of Water Resources Management

DATE: DEC 2 1 1993

COPIES: **Bob Burnley, Alan Anthony, John Roland, Alan Anthony, Martin Ferguson, Ron Gregory, Regional Office Water Resource Managers, Compliance Auditors**

On May 8, 1989, I sent you a memorandum entitled "Staff Guidance - Approval of Concept Engineering Reports and Plans and Specifications" (Attachment No. 1). The purpose of that memorandum was to provide guidance on the interpretation of the State Water Control Law (Law), the Sewerage Regulations and the Permit Regulation on the approval of Plans and Specifications (P&S) and concept engineering designs for industrial or other wastes wastewater treatment facilities.

The purpose of this memorandum is to supplement that guidance document by providing guidance to the Regional Offices on the procedures for the Regional Directors' approvals of sewerage systems P&S and concept designs for industrial facilities. The procedures are divided into those applicable to sewerage systems and sewage treatment plants and those applicable to industrial concept engineering designs.

If you have any questions regarding the procedures or the attachments or if you need any assistance please give me a call.

PROCEDURE FOR PROCESSING
PLANS AND SPECIFICATIONS FOR SEWERAGE SYSTEMS
AND SEWAGE TREATMENT PLANTS

Section 62.1-44.19. of the State Water Control Law (Law) Approval of sewerage systems and sewage treatment works sets forth the procedures that are to be followed in approving P&S. The following procedure is provided for your guidance in carrying out that Section of the Law.

1. Receipt of SDH Letter Report

   The first step is the receipt of the State Department of Health (SDH) Letter Report setting forth their recommendations. This letter will either approve the P&S without conditions or with conditions (which is generally the case). Until this letter is received the staff shall not act on the P&S.

2. Comments from OE Compliance Auditor

   Send the SDH Letter Report to the Compliance Auditor for review and comment (Attachment No. 2). The Compliance Auditor's comments (Attachment No. 3) should address any enforcement action ongoing at the sewage treatment plant. I recommend obtaining the Compliance Auditor's comments before the P&S are sent to the Regional Director for final action.

3. Review of P&S

   The staff should review the P&S to determine whether or not, based on similar situations, the engineering concepts employed in the design will theoretically allow the facility to meet the permit requirements, if the permittee and/or his agents properly designs, constructs, maintains, and operates the facilities in a workmanlike manner. The SDH does the detailed technical review of the P&S. The regional office staff should only be looking at the P&S to determine if the permit requirements will be maintained.

4. Approval Memorandum

   Attachment No. 4 is the approval memorandum format for sewage treatment plants and Attachment No. 5 is the approval memorandum format for sewerage systems (collector lines and transmission mains, etc.) that should be sent from the Region Office Water Resources Manager to the Regional Director. The Regional Director should sign the approval memorandum for the Director. Please recognize that the

Director did not delegate the approval of the P&S to the Regional Director. The Director authorized the Regional Director to approve the P&S for the Director. The approval memorandum should contain only the essential information to allow the Regional Director to make a decision.

5. Regional Director Approval Letter

Attachment No. 6 is a recommended letter that the Regional Director should sign notifying the owner of the P&S approval.

PROCEDURE FOR PROCESSING
CONCEPT ENGINEERING REPORTS FOR INDUSTRIAL WASTES

Section 62.1-44.16. of the Law Industrial Wastes sets forth the requirements for the approval of facilities for the treatment or control of industrial wastes or other wastes. The following procedure is provided for your guidance in carrying out that Section of the Law.

1. Regional Office Review

   The Regional Office staff should evaluate whether or not, based on similar situations, the engineering concepts employed in the design will theoretically allow the facility to meet its permit requirements, if the permittee and/or his agents properly designs, constructs, maintains, and operates the facilities in a workmanlike manner.

2. Approval Memorandum

   Attachment No. 7 is a recommended approval memorandum that should be sent from the Regional Office Water Resources Manager to the Regional Director. The Regional Director approves for the Director.

3. Regional Director Approval Letter

   Attachment No. 8 is a recommended letter that the Regional Director should sign notifying the permittee that the concept engineering design for the industrial facilities has been approved.

COMMONWEALTH of VIRGINIA

STATE WATER CONTROL BOARD

2111 Hamilton Street

Richard N. Burton
Executive Director

Post Office Box 11143
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William T. Clements
Henry O. Hoffimon, Jr.
Ronald M. Plotkin
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Robert C. Winninger

GUIDELINE FOR FORM AND CONTENT

OF A

CONCEPT ENGINEERING REPORT

FOR

INDUSTRIAL WASTEWATER TREATMENT FACILITIES

May 1989

INTRODUCTION

This document provides the guidelines for the form and contents of a concept engineering report for industrial wastewater treatment facilities requiring approval by the State Water Control Board.

REGULATORY REQUIREMENTS

Section 62.1-44.16 of the State Water Control Law (Law) states that:

> "(1) Any owner who erects, constructs, opens, reopens, expands or employs new processes in or operates any establishment from which there is a potential or actual discharge of industrial wastes or other wastes to state waters shall first provide facilities approved by the Board for the treatment or control of such industrial wastes or other wastes.
>
> Application for such discharge shall be made to the Board and shall be accompanied by pertinent plans, specifications, maps, and such other relevant information as may be required, in scope and details satisfactory to the Board."

The Board's application forms for a Virginia Pollutant Discharge Elimination System (VPDES) permit or a Virginia Pollution Abatement (VPA) permit will generally request the information to satisfy this section of the Law. However, for a significant discharger or where conventional wastewater treatment technology is not proposed, the Board's staff may request plans and specifications on the wastewater handling/treatment facilities. This request can generally be satisfied by providing a Concept Engineering Report.

DEFINITIONS

The definitions contained in the Law and the Permit Regulation apply to this document. In addition "Concept Engineering Report" means a document setting forth preliminary concepts or basic information for the design of industrial wastewater treatment facilities and the supporting calculations for sizing the treatment operations.

BOARD APPROVAL

Upon receipt of the Concept Engineering Report the Board's staff will review it to evaluate whether or not, based on similar situations, the engineering concepts employed in the design will theoretically allow the facility to meet its permit requirements, if the permittee properly designs, constructs, maintains, and operates the facilities.

Board approval of the Concept Engineering Report does not relieve the permittee of the responsibility of designing, constructing, maintaining, and operating the facility in a reliable and consistent manner to meet the effluent limitations or other special conditions of the permit. If facility deficiencies, design and/or operational, are identified in the future which could affect the facility performance or reliability, it is the responsibility of the permittee to correct such deficiencies. The Board approval of the Concept Engineering Report does not constitute endorsements or recommendations for the use of commercial products, nor denote or imply any guarantee by the Board that the facilities will in fact meet the permit requirements.

SUGGESTIONS FOR COMPLETION OF CONCEPT ENGINEERING REPORT

A suggested format for the Concept Engineering Report is presented on the following pages of this document. The report format is a guide. It is the responsibility of the owner to complete all the appropriate sections of the report and to submit all the information necessary to support the design criteria utilized.

The Concept Engineering Report necessarily will be more detailed for a more complicated treatment system and one whose effluent, if not properly treated, may have a more significant impact on the receiving stream than a small discharge with a relatively simple treatment system. Final, detailed construction plans and specifications are not required, but may be requested on a case-by-case basis.

SUGGESTED FORMAT

FOR A

CONCEPT ENGINEERING REPORT

1. Letter of Submittal

A letter of submittal should be the first page and be an integral part of the report. The letter should state that the Concept Engineering Report has all the information necessary to adequately support the concept engineering for the wastewater treatment facilities and request approval of the Concept Engineering Report submittal. The letter should be addressed to the Regional Office of the State Water Control Board in the area in which the facility is proposed to be located.

2. Number of Copies

Two copies of the Concept Engineering Report should be submitted to the appropriate Regional Office.

3. Introduction

In the introductory section of the Concept Engineering Report explain any special circumstances involved in the project and any other pertinent information which will help the Board evaluate the basis of the design. For example, if the plans are for the expansion of an existing wastewater treatment plant, indicate changes in production, nature of waste, etc. which required the proposed expansion.

4. Wastewater Sources

A brief description of the manufacturing process should be provided to adequately indicate the sources and quantities of wastewater. A diagrammatic sketch of the process wastewater flow should also be submitted, along with identification of which constituents and flow volumes each phase of the process contributes.

5. Wastewater Characteristics

A. The raw wastewater characterization data should be used as a basis for the calculations for the design presented. Describe how this data was obtained.

B. The wastewater should be characterized by those parameters that have limitations specified in the proposed or existing VPDES or VPA permit and any other parameters used in the design of the treatment facilities.

C. In cases where the wastewater characteristics need to be estimated because the manufacturing facility has yet to be built, provide supporting data, reference literature, and rationale upon which the estimated flow(s) and wastewater characteristics have been determined.

6. Treatability of Wastes

The wastewater treatability information which provides the basis for the design should include the following:

A. Experimental bench test or pilot work test procedures (include references)

B. Experimental Results

1. Treatability results (provide data)
2. Discussion of the treatability results

C. Treatment Design Parameters

In those cases where, instead of experimental work (bench test or pilot work tests), treatment design parameters are obtained from published literature or from operating data from treatment plants using a similar treatment operation on wastewater of similar characteristics, the supporting data and rationale should be presented and adequately referenced.

Rationale for use of such data as the basis of design should include a comparison of the referenced manufacturing operations, production rates, raw waste loads and treatment facilities with the permittee's production facilities, wastewater characteristics and wastewater treatment facilities.

7. Design Approach and Methods

A. Design Approach Used

Discussion of the approach used for the design of wastewater treatment facilities should be provided. Calculations, constraints, or any other information

ATTACHMENT No. 1

COMMONWEALTH of VIRGINIA

STATE WATER CONTROL BOARD

2111 Hamilton Street

Richard N. Burton
Executive Director

Post Office Box 11143
Richmond, Virginia 23230-1143
(804) 367-0056

May 8, 1989

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Ronald M. Plotkin
Velma M. Smith
Patrick L. Standing
W. Bidgood Wall, Jr.
Robert C. Wininger

M E M O R A N D U M

SUBJECT: Staff Guidance - Approval of Concept Engineering Reports and Plans and Specifications

TO: Regional Directors

FROM: Larry G. Lawson

COPIES: Bill Woodfin, Don Richwine, Alan Anthony, Dale Jones, Martin Ferguson, Al Willett, Regional Office Water Resource Managers, OWRM Permit Staff

Attached are the following two documents:

1. Staff Guidance for the Approval of: (1) Concept Engineering Reports for Industrial Wastes and Other Wastes Handling/Treatment Facilities and (2) Plans and Specifications for Sewerage Systems and Sewage Treatment Plants.

2. Guideline for Form and Content of a Concept Engineering Report for Industrial Wastewater Treatment Facilities.

The first document is provided as guidance to the staff on the interpretation of the State Water Control Law, the Sewerage Regulations and the Permit Regulation on the approval of plans and specifications and concept engineering reports for industrial or other wastes wastewater treatment facilities. The second document is provided as guidance to the public and the permittee on the information needed for the staff to evaluate a concept engineering report for industrial wastewater treatment facilities.

If you have any questions regarding these documents please give Don Richwine or me a call.

COMMONWEALTH of VIRGINIA

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STAFF GUIDANCE

APPROVAL OF:

1. CONCEPT ENGINEERING REPORTS FOR INDUSTRIAL WASTE AND OTHER WASTES WASTEWATER HANDLING/TREATMENT FACILITIES, and
2. PLANS AND SPECIFICATIONS FOR SEWERAGE SYSTEMS AND SEWAGE TREATMENT WORKS

May 1989

INTRODUCTION

This document sets forth staff guidance for approving (1) concept engineering reports for industrial wastes or other wastes handling/treatment facilities and (2) plans and specifications for sewerage systems and sewage treatment works. This guidance interprets but does not replace, the State Water Control Law (the Law), the Sewerage Regulations, or the Permit Regulation.

DEFINITIONS

The definitions contained in the Law, Permit Regulation and Sewerage Regulations apply. In addition "Concept Engineering Report" means a document setting forth preliminary concepts or basic information for the design of industrial wastewater treatment facilities and the supporting calculations for sizing the treatment operations.

REGULATORY AUTHORITY

The Law, specifically Sections 62.1-44.16, 62.1-44.17, and 62.1-44.19, provides the Board with the authority to approve industrial wastes, other wastes, and sewerage systems and sewage treatment works plans and specifications.

Section 62.1-44.16. Industrial Wastes. states:

> " (1) Any owner who erects, constructs, opens, reopens, expands or employs new processes in or operates any establishment from which there is a potential or actual discharge of industrial wastes or other wastes to state waters shall first provide facilities approved by the Board for the treatment or control of such industrial wastes or other wastes.
>
> Application for such discharge shall be made to the Board and shall be accompanied by pertinent plans, specifications, maps, and such other relevant information as may be required, in scope and details satisfactory to the Board."

Section 62.1-44.17. Other Wastes. states:

> " (2) Any owner under this section requested by the Board to provide facilities or adopt such measures shall make application thereof to the Board. Such application shall be accompanied by a copy of pertinent plans, specifications, maps, and such other relevant information as may be required, in scope and details satisfactory to the Board."

Section 62.1-44.19. Approval of Sewerage Systems and Sewage Treatment Works. states"

> " (3) After the application has been approved by the Board the owner shall file concurrently with the Department and the Board copies of pertinent plans, specifications, maps, and such other information as may be required, in scope and detail satisfactory to the Department and the Board."

PLANS AND SPECIFICATIONS FORMAT AND INFORMATION TO BE SUBMITTED

The Board's regulatory authority for review and approval of the handling/treatment works for industrial wastes, other wastes, and for sewerage systems and sewage treatment works uses the words "...pertinent plans, specifications, maps, and such other information as may be required, in scope and detail satisfactory to the Board...". This provision is interpreted as follows for the wastewater treatment facilities indicated:

1. for new or modified sewerage systems and sewage treatment works the Sewerage Regulations that have been jointly adopted by the State Department of Health and the Board define the plans and specifications that must be submitted.

2. for new or modified land application and recycle/reuse wastewater systems the Virginia Pollution Abatement Permit (VPA) application defines the plans and specifications information that must be submitted.

3. for all other new or modified wastewater handling/treatment facilities the Virginia Pollutant Discharge Elimination System (VPDES) permit application will generally be sufficient to include the plans and specifications information needed. However, for significant dischargers or where conventional wastewater treatment technology is not proposed, the Board's Regional Office may request a Concept Engineering Report. If a Concept Engineering Report is requested, the Board document entitled "Guideline for Form and Content of a Concept Engineering Report for Industrial Wastewater Treatment Facilities" provides a suggested form and content.

4. for existing sewage, industrial, or other wastes wastewater handling/treatment facilities the VPA or VPDES application will generally provide sufficient plans and specifications information. If additional information is desired the Board's Regional Office may request the information from the permittee.

BOARD APPROVAL OF PLANS AND SPECIFICATIONS

Upon receipt of the plans and specifications for sewerage systems and sewage treatment works, concept engineering reports for industrial facilities, or a VPA/VPDES permit application the Board's staff will review them to evaluate whether or not, based on similar situations, the engineering concepts employed in the design will theoretically allow the facility to meet its permit requirements, if the permittee and/or his agents properly designs, constructs, maintains, and operates the facilities. The review and approval of plans and specifications, concept engineering reports, or VPA/VPDES permit application does not constitute endorsements or recommendations for the use of commercial products, nor denote or imply any guarantee by the Board that the facilities will in fact meet the permit requirements.

Board approval of the engineering concept, the plans and specifications, or a permit application does not relieve the permittee of the responsibility of designing, constructing, maintaining, and operating the facility in a reliable and consistent manner to meet the effluent limitations or other special conditions of the permit. If facility deficiencies, design and/or operational, are identified in the future which could affect the facility performance or reliability, it is the responsibility of the permittee to correct such deficiencies.

pertinent to the use of the approach selected for design should be provided. The procedures for handling and ultimate disposal of the sludge that may be generated in the treatment process should be discussed.

Also address any monitoring concepts utilized in the treatment facilities design. Design approach for earthen structures used as a wastewater treatment unit operation should be addressed.

B. Design Calculations

1. Show design calculations for each unit operation. Any assumption made should be noted and adequately justified.

2. Symbols used in equations should be clearly defined.

3. Include manufacturer's design as it applies.

4. Provide references where necessary for models, equations, coefficients, etc. in an appendix.

C. Summary of Conceptual Design

List each unit operation, unit's manufacturer, size, capacity, detention time, etc.

D. Diagrammatic Plan Drawing

The flow diagram of the wastewater treatment facility design should be a simple block and line diagram which should include the following information:

1. The name of the unit operation (when more than one, indicate number of units).

2. Mass loading information such as, but not limited to:

   Surface Loading Rate
   Air Requirements
   Horsepower of Aerators
   Rate of Chemical Addition
   Percentage Solids
   Flow
   Kg Pollutant/1000 kg Product (raw materials)
   pH as necessary
   Temperature or BTU as necessary
   Concentrations of Pollutants as necessary

3. Size of Unit(s)

Indicate size in terms best suited to the unit, for example:

Gallons/minute
Diameter and Depth
Area (square feet) and Depth
Volume
Surface Area
Horsepower

4. Detention time should be noted on each unit, as applicable.

5. Size of Drawing

The drawing should be 8 1/2" x 11" or 11" x 17" (which will fold to 8 1/2" x 11") and should be an integral part of the report. In general, construction or detailed drawings need not be supplied, however, they may be requested by the Board for clarification of an engineering report.

6. Site Plan

Show the location of treatment unit(s) and discharge(s) on a site map which shows the surrounding area (approximately 1 mile radius).

7. Topography Map and Earthen Structure Profile Drawing (applicable only for wastewater treatment facilities having earthern structures)

Provide a topographic map of the area in which the earthen structure is to be built. Also, provide a drawing showing the profile of the earthen structure.

ATTACHMENT No. 2

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY

SUBJECT: PLANS AND SPECIFICATIONS FOR APPROVAL

TO: Compliance Auditor

FROM: Regional Office

DATE:

Attached for your review and comment is a SDH Letter Report dated on the following project:

Please complete the attached form and return it to me by .

ATTACHMENT No. 3

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY

SUBJECT: **PLANS AND SPECIFICATIONS FOR APPROVAL**

TO: **Regional Office**

FROM: **Compliance Auditor**

DATE:

Pursuant to your request of on the plans and specifications for the project I have the following comments.

Receiving Plant Performance: _____

_____

_____

_____

_____

_____

Previous Agency Action: _____

_____

_____

_____

_____

_____

Comments: _____

_____

_____

Recommendations: _____

_____

ATTACHMENT No. 4

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY

SUBJECT: PLANS AND SPECIFICATIONS FOR SEWAGE TREATMENT PLANTS

TO: Director, Department of Environmental Quality

FROM: Regional Office Water Resources Manager

DATE:

Project Name:

Project Owner:

Project Scope:

Design Basis: This project has been designed for an average flow of . The proposed facilities have been designed to comply with effluent limits of

Previous Agency Action:

VA Department of Health Action: By letter dated the VA Department of Health (conditionally approved/approved) the plans and specifications as noted in their letter report.

Staff Comments:

STAFF RECOMMENDATIONS:

The staff recommends that the Director:

(Approve the P&S or Conditionally Approve the P&S subject to the following conditions:)

Approved: _____
Director, Department of Environmental Quality

Date: _____

ATTACHMENT No. 5

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY

SUBJECT: PLANS AND SPECIFICATIONS FOR SEWERAGE SYSTEMS

TO: Director, Department of Environmental Quality

FROM: Regional Office Water Resources Manager

DATE:

Project Name:

Project Owner:

Project Scope:

Receiving Plant Performance:

Previous Agency Action:

VA Department of Health Action: By letter dated the VA Department of Health (conditionally approved/approved) the plans and specifications as noted in their letter report.

Staff Comments:

STAFF RECOMMENDATIONS:

The staff recommends that the Director:

(Approve the P&S or Conditionally Approve the P&S subject to the following conditions:)

Approved: _____
Director, Department of Environmental Quality

Date: _____

ATTACHMENT No. 6

Owner of Project

RE: Name of Project

Dear :

The Director has **(approved/conditionally approved)** the plans and specifications for the above referenced project. This action is in accordance with a memorandum from the Regional Office Water Resources Manager to the Director dated , a copy of which is enclosed for your information.

This document constitutes your Certificate to Construct as required by Section 2.04.04 of the VA Sewerage Regulations. Also enclosed is a letter report from the VA Department of Health **(approving/conditionally approving)** this project.

As the owner of these facilities you will be required to comply with the following sections of the VA Sewerage Regulations: Section 2.05 (Statement Required Upon Completion of Construction) and Section 2.06 (Issuance of the Certificate to Operate).

The Department of Environmental Quality approval does not relieve the owner of the responsibility of operating the facility in a consistent manner to meet the facility performance requirements or the responsibility for the correction of design and/or operation deficiencies. Nor does this approval relieve the owner from meeting all other applicable laws and regulations.

If you have any questions, please contact .

Sincerely,

Regional Director

cc: **Copy everyone listed in VDH letter**
DEQ - OWRM Construction Assistance **(If applicable)**
VDH - Office of Water Programs and Region

ATTACHMENT No. 7

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY

P. O. Box 11143 Richmond, VA 23230

SUBJECT: CONCEPT ENGINEERING DESIGN

TO: Director, Department of Environmental Quality

FROM: Regional Office Water Resources Manager

DATE:

Project Name:

Project Owner:

Project Scope:

Previous Agency Action:

Staff Comments:

STAFF RECOMMENDATIONS:

The staff recommends that the Director:

(Approve the concept engineering design or conditionally approve the concept engineering design subject to the following conditions:)

Approved: _____
Director, Department of Environmental Quality

Date: _____

ATTACHMENT No. 8

Owner of Project

RE: Name of Project

Dear :

The Director has **(approved/conditionally approved)** the concept engineering design for the above referenced project. This action is in accordance with a memorandum from the Regional Office Water Resources Manager to the Director dated , a copy of which is enclosed for your information.

The Department of Environmental Quality approval does not relieve the owner of the responsibility of operating the facility in a consistent manner to meet the facility performance requirements or the responsibility for the correction of design and/or operation deficiencies. Nor does this approval relieve the owner from meeting all other laws and regulations as may be applicable.

If you have any questions, please contact .

Sincerely,

Regional Director