

DEPARTMENT OF THE ARMY
NORTH PACIFIC DIVISION, CORPS OF ENGINEERS
P.O. Box 2870
Portland, Oregon 97208-2870

NPDEN-WM
Regulation
No. 1110-2-101

19 December 1986

Engineering and Design
WATER CONTROL MANAGEMENT, WATER QUALITY

Supplementation of this regulation and/or other local forms of regulatory guidance is prohibited without prior approval from NPDEN-WM, P.O. Box 2870, Portland, Oregon 97208-2870.

1. PURPOSE. This regulation provides guidance to Corps of Engineers Districts within the North Pacific Division for those water quality data collection, reporting, storage, and analysis activities which are necessary for supporting water control management functions, and to provide for the periodic reporting to higher authorities of these and other water quality related activities.
2. APPLICABILITY. This regulation is applicable to all Districts in the North Pacific Division (NPD) with existing civil works projects, exclusive of marine/estuarine, groundwater and dredging projects.
3. REFERENCES.
 - a. Required Publications.
 - (1) ER 15-2-14 (Committee on Water Quality). Cited in para 11a.
 - (2) ER 1110-1-261 (Control of Field Testing Procedures). Cited in para 6.
 - (3) ER 1110-1-8100 (Laboratory Investigations and Material Testing). Cited in para 6.
 - (4) ER 1110-2-240 (Water Control Management). Cited in para 9.
 - (5) ER 1110-2-1402 (Hydrologic Investigation Requirements for Water Quality Control). Cited in para 7b.
 - (6) ER 1130-2-334 (Reporting of Water Quality Management Activities at Corps Civil Works Project). Cited in para 4c(1).
 - (7) ER 1130-2-415 (Water Quality Data Collection, Interpretation, and Application Activities). Cited in para 7a.

*This regulation supersedes NPDR 1110-2-101, 6 November 1978.

NPDR 1110-1-101
19 December 1986

(8) ETL 1110-2-252 (Quality Control of Water Quality Field Sampling). Cited in para 7a.

(9) NPDR 1110-1-2 (North Pacific Division Materials Laboratory). Cited in para 6.

b. Related Publications.

(1) ER 1110-1-263 (Chemical Quality Management -- Toxic and Hazardous Wastes).

(2) ER 1110-2-1403 (Hydraulic and Hydrologic Studies).

(3) ER 1110-2-1941 (Drought Contingency Plan).

(4) ETL 1110-2-239 (Nitrogen Supersaturation).

(5) ETL 1110-2-244 (Water and Wastewater Laboratory Control).

(6) ETL 1110-2-253 (Measurement of Nitrogen).

(7) ETL 1110-2-281 (Reservoir Contaminants).

4. RESPONSIBILITIES.

a. Corps of Engineers' responsibilities for water quality at Corps civil works projects include the effects of the impoundments on the quality of water in storage and water released downstream, and their relationships to federal and state standards.

b. At the Division level, the Water Management Branch NPDEN-WM will serve as the coordination point for impoundment-related water quality activities of the Division.

c. Each District is responsible for:

(1) Establishing and implementing, for each civil works project that has a potential for significant negative environmental impacts, a comprehensive water quality management program including specific water quality management objectives and/or goals consistent with ER 1130-2-334.

(2) Keeping the Division's water quality management staff informed of potential and actual water quality problems, and corrective actions to be undertaken.

(3) Reporting annually on and preparing a management analysis of the District water quality programs and activities.

(4) Performing any corrective actions necessitated by water quality emergencies.

d. In order to provide an effective, coordinated water quality program, the District Engineer will assign a functional element, preferably one that is connected with water control management, the responsibility for the coordination of District water quality activities. This coordination includes internal coordination with project managers and environmental planners in the various District elements, and with the Division office. All water quality concerns during pre- and post-authorization planning, construction, and operating phases of civil works projects are to be considered.

5. COORDINATION WITH OTHER AGENCIES. Each District's programs for water quality management at both existing and proposed projects should be coordinated with relevant programs of Federal and State agencies, especially with regard to water quality and pollutant source monitoring. All practicable methods for sharing the work and cost should be explored. The District functional element tasked with water quality coordination responsibility mentioned above should coordinate this activity to ensure continuity and consistency.

6. PROCUREMENT OF WATER QUALITY LABORATORY SERVICES. ER 1110-1-8100 and NPDR 1110-1-2 place primary responsibility for freshwater and saline water quality testing and related services with the Division Materials Laboratory. As necessary, each District should consult with the Director of the Division Laboratory regarding their sampling and testing needs, schedules for completion, and costs. When circumstances preclude using the Division Laboratory, water quality testing services may be obtained by contract with other laboratories. Before contracting for such services, a quality assurance inspection should first be conducted by Division Laboratory personnel as required by ER 1110-1-261.

7. WATER QUALITY SURVEYS AND STUDIES.

a. The scope of water quality management programs and sampling frequencies of specific projects should be in accordance with ER 1130-2-415 and ETL 1110-2-252.

b. Pre-impoundment investigations should be made to collect physical, chemical and biological data to define existing baseline water quality conditions, and predict future environmental impacts. Use of mathematical modeling techniques is encouraged for the modeling of future conditions, including development of detailed design and operating criteria. Water quality objectives for these investigations must be established in accordance with ER 1110-2-1402.

c. Post-impoundment investigations and water quality surveys will be made to ensure that Corps civil works projects are meeting applicable state standards. If necessary, alternative solutions to the identified problem areas must be formulated, including a prediction of the expected water quality improvements that would result. Priorities for such investigations should be as follows:

(1) Problems which threaten or affect an authorized project use of storage or project function.

(2) Problems that violate stream standards.

(3) Situations in which water quality conditions may be enhanced.

d. For non-routine water quality investigations and studies affecting the operations of an existing or pre-authorized Corps impoundment, a Plan of Study must be developed and sent to the Division, ATTN: NPDEN-WM for review and comments prior to finalizing them.

e. A suggested format for a water quality study report is shown in Appendix A.

f. Maintenance monitoring schedules will be established and maintained for all Corps impoundments to detect significant changes in water quality in the impoundments and in the area downstream influenced by project discharges. Parameters monitored will include, but not be limited to, those parameters found to be of concern during the initial water quality investigations and/or surveys, and needed to furnish information for use in regulation of discharges and design of future facilities.

8. FUNDING.

a. Programming. In preparing budget requests, plans must consider systematic progress toward comprehensive and responsive water quality management programs. Close coordination should be maintained between Engineering, Planning, Construction/Operations, and Navigation divisions for developing adequate funding for these programs.

b. Budgeting. Budgeting will be accomplished in accordance with the guidance furnished by HQUSACE for each annual budget submission. Water quality data collection, processing and analysis required for project operation will be considered among the highest priority water control management activities in the budgeting process. If necessary, NPDEN-WM will coordinate any special program requirements or problem areas.

c. Cost Data. Pre-authorization studies that include water quality activities will be funded by the appropriate survey authority. Water quality investigations for authorized projects and projects under construction will be charged to the applicable appropriation and feature account. Water quality programs conducted at completed projects will normally be funded by the O & M, General Appropriation, and costs will be reflected in the Water Control management feature (609) on the PB-2a form.

9. WATER CONTROL MANAGEMENT. The quality of reservoir releases must be controlled in strict accordance with the reservoir regulation manual, applicable water quality standards, and ER 1110-2-240. District water quality

elements will periodically review basin-wide water quality data collected, with special attention to reservoir and downstream water quality during low flow periods or other adverse water conditions. Corrective actions for water quality problems will be considered concurrently with related quantitative hydrologic conditions.

10. DISTRICT ANNUAL WATER QUALITY REPORT.

a. Reporting Requirements.

(1) District Engineers will submit two copies of the District's Annual Water Quality Report to the Division office, ATTN: NPDEN-WM by 15 December each year. The Division will compile a Division Report and submit two copies to HQDA(DAEN-CWH-W) by 1 February.

(2) The Division office (NPDEN-WM) should be informed of unusual water quality conditions associated with the construction and operation of reservoir projects.

b. General.

(1) The District's Annual Water Quality Report should include concise summaries of water quality activities conducted at all District water control projects during the past calendar year. All planned activities for the forthcoming year, and use of data management systems should be included. Sufficient detail should be furnished for significant items to permit their inclusion in the Division's Annual Water Quality Report.

(2) Tabulations of routine data should not be included in the annual report. Such data are to be maintained by the District and be readily available upon request.

(3) The District's Annual Water Quality Report should be prepared in two separate parts. The first portion should address the District's over-all water quality management program and highlight significant water quality accomplishments. The second portion should present a project by project summary.

c. Part 1 - Program Status and Projected Activities. The following areas should be addressed:

(1) Technical Staff Capabilities

(2) Relationship between Water Quality and Water Control Management Activities

(3) Contracted Workload

(4) Laboratory Facilities (Corps and Commercial) including any Laboratory inspection

(5) Data Management Systems

(6) Training and areas of needs

(7) Coordination with other agencies

(8) Research and Development Needs

(9) Special Studies Completed or Required.

d. Part 2 - Project Summary. This part should provide basic information on all pertinent factors affecting water quality for each reservoir project. This information should include, whenever applicable, the following items:

(1) Watershed Characteristics

(2) Project Description and Background Information

(3) Physical Project Elements Affecting Water Quality (including presence/absence of selective withdrawal facilities)

(4) Project Water Quality Management Activities

(5) Project Regulation/Operation Required to Meet Water Quality Objectives

(6) Description of Water Quality Data Collection Program

(7) Over-all Water Quality Conditions and Trends

(8) Special Regulation Activities that Impact on Water Quality

(9) New or Modified Water Quality Data Collection Programs

(10) Problems Encountered at Each Project

(11) Plans to Address Identified Problems

(12) Progress on Solving Past Problems

(13) Progress on Solving Present Problems

(14) Discussion on How Well Each Project Met Its Water Quality Objectives and Re-evaluation of Each Project Objective

(15) Possible Corps-wide Application of Available Data

(16) General Recommendations

If any of the above information is the same as in the previous report it should be so stated in the current report and not repeated. Suggested report contents are given in Appendix B for a Reservoir/River System Project.

11. CONSULTING SERVICES.

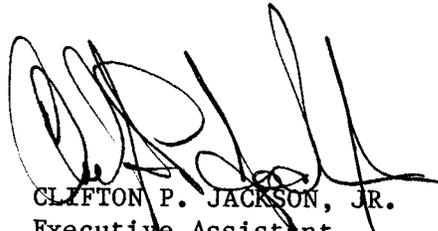
a. ER 15-2-14 establishes procedures for requesting consulting services from the Corps' Committee on Water Quality. District offices are encouraged to use these services and should direct questions pertaining to or requests for this service to the Division Office, ATTN: NPDEN-WM. Some of the services currently provided by the Committee on Water Quality are as follows:

- (1) Review of Water Quality Reports
- (2) Design of Data Collection Programs
- (3) Predicting Water Quality Effects
- (4) Methods of Data Evaluation and Interpretation
- (5) Investigations Related to Legislative Requirements such as P.L. 92-500
- (6) Coastal and Estuarine Water Quality Programs

b. Districts are encouraged to seek the expertise available in the Division office, other NPD Districts and Corps offices to help solve their technical problems.

12. WATER QUALITY MEETING. A North Pacific Division's Water Quality Meeting will be held at least once every two years to provide a forum for collective discussion on and review of activities, problems, coordination, etc. by all staff including water quality and laboratory personnel. To the extent feasible, the meeting will be rotated from District to District.

FOR THE COMMANDER:



CLIFTON P. JACKSON, JR.
Executive Assistant

DISTRIBUTION:
A and B

APPENDIX A

SUGGESTED FORMAT FOR A WATER QUALITY STUDY REPORT

1. SUMMARY AND CONCLUSIONS. Include a summary of major conclusions based on evaluation of the project water quality data. Summarize the status of the project's (in certain areas, also the river basin) water quality management program by the Corps and others as to adequacy of equipment, methodologies of sample collection, transportation and analysis, funding and data reporting system. Recommendations for improved management and/or compliance with Federal/State laws and regulations should be stated. Include an abstract of current and/or proposed water quality data studies and current identified research needs.

2. INTRODUCTION.

a. A general statement covering the laws, regulations and policies under which the water quality management activities for the subject project were initiated. Summarize the various purposes for water quality management, i.e.

(1) Relationship of the project's water quality problems to those generally prevalent within the basin;

(2) Relationship of project water quality to possible detrimental effects to water uses, and measures necessary for warning of potential problems;

(3) Overview of the effects that the project may have on water quality.

b. Include a citation of pertinent references. These references will usually include:

(1) Administrative Correspondence,

(2) related project reports and memoranda, and

(3) manuals and technical references.

3. LAKE AND RIVER BASIN CHARACTERISTICS. Provide a general description of the characteristics of the lake, river, river basin and other associated water resource projects as a basis for indicating the inter-relationships of water quality problems within the basin. Information should be drawn from other available reports and only a summary included in this report.

a. River Basin Characteristics. Provide a description of the basin, and the activities within the basin that influence or are influenced by the quality of the water. For this information to be pertinent, the boundary of the river basin should be limited to that portion whose water quality is influencing or is influenced by the quality of the water at the project. Pictures and maps should be utilized to highlight basin conditions. Pertinent river basin characteristics related to water quality will usually include the following:

(1) Cities, towns

(2) Geological characteristics as they affect water quality such as dissolved mineral content and turbidity.

(3) Agricultural and other non-point (mining operations, storm water runoff) sources of pollution.

(4) Location of Corps and other (USGS, EPA, State, etc.) gages and water quality sampling stations.

b. Lake Characteristics. Provide a general description of the lake and specific project water quality problems and activities including:

(1) Project Purposes. Summarize project purposes and storage allocations along with a discussion of the purposes which are benefited by low flow augmentation directly or indirectly. Describe any specific water quality benefits the lake was designed to provide, and if those provisions are being met.

(2) Project Description. A brief description of the lake and control works, especially those facilities used for water quality control.

(3) Lake Regulation Plan. A brief summary of the regulation plan with primary emphasis on flow augmentation aspects.

(4) Associated Projects. Discuss those projects which are influenced by or influence the quality of water in the lake and any system operation arrangements designed to improve water quality.

4. WATER QUALITY DATA COLLECTION AND PARAMETERS MEASURED. Provide a description of sampling locations, parameters measured and frequency of measurements.

a. Location of Measurements. A map is helpful in depicting the location of sites comprising the data collection network. A diagram showing the vertical coverage of samples within the lake or river site should also be included.

b. Parameters to be Measured.

(1) Those required to meet the downstream control requirements.

(2) Those considered essential for environmental impact studies and for the planning and/or operations of the project.

c. Frequency of Measurement. Include information on the interval of time between measurements, including changes in measurement frequency resulting from changes in seasons, streamflows, pool elevations, and other associated factors.

d. Accuracy of Measurement. Indicate the accuracy of measurements. Note the sensitivity of the instrumentation and of laboratory analysis. Any deviations in methodologies from generally established standards should be noted.

5. ANALYSIS AND EVALUATION OF DATA. Include an analysis and evaluation of the water quality data and the data developed for associated projects. Also describe studies currently in progress. Summarize problem areas and any research needs associated with methodologies, instrumentation, measurement or testing.

6. RECOMMENDATIONS.

a. Recommendations should reflect identified water quality problems (or lack thereof) associated with the project, with the testing program and any remedial actions in effect or proposed for mitigation. Detailed recommendations pertinent to the District's project report could include the following items:

- (1) Changes in the location of measurements.
- (2) Inclusion or deletion of water quality parameters.
- (3) Changes in the frequency of measurements.
- (4) Changes in the accuracy of the measurements.
- (5) Areas of needed research.

b. In addition, recommendations should include broader considerations such as any desired alterations in the associated hydrologic and meteorologic data collection system. Also, give full consideration to the possible effects of such alterations on other project purposes.

APPENDIX B

RIVER AND RESERVOIR WATER QUALITY MANAGEMENT

PROJECT NAME
(Reservoir or River System)

1. PROJECT DESCRIPTION. Location, size (water surface area, acre-feet, depth), project purpose, operational plan, wildlife management.
2. PROBLEMS IDENTIFIED. Low D.O., algae, high nutrient, include instream flow needs. Are State quality standards met in downstream releases?
3. DATA COLLECTION ACTIVITIES. Programs completed, programs underway, programs needed. Brief description of frequency and location of sampling and parameters collected.
4. IMPROVEMENTS NEEDED. For example, boom for algae control, improved D.O., aquatic plant control.
5. FUNDING AND SCHEDULING. Based upon response to item 3 and 4 above, establish time schedule and funding requirements to accomplish needed programs (a milestone schedule). Include a brief description of the work for the next two years, noting both the objective of the work and the funding required to accomplish these tasks.
6. LONG-TERM WATER QUALITY MANAGEMENT OBJECTIVES. For example, periodic monitoring, operational changes, corrective actions.