

# **OHIO EPA PLAN REVIEW PROCEDURES FOR DRINKING WATER FACILITIES**

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## INTRODUCTION

Chapter 6109 of the Ohio Revised Code (ORC) authorizes the director of environmental protection to safeguard public health by enforcing requirements of the Safe Drinking Water Act. Oversight of public drinking water facilities is the responsibility of the Division of Drinking and Ground Waters of the Ohio EPA (the Division), and is articulated in its mission statement:

Protect human health and environment by characterizing and protecting ground water quality and ensuring that Ohio's public water systems provide adequate supplies of safe drinking water.

Review of engineering plans and other information pertinent to the proposed project is the first in a series of activities undertaken by the Ohio EPA to ensure that adequate quantities of safe drinking water are provided by all drinking water facilities.

## PURPOSE

The purpose for this manual is to provide a framework for obtaining plan approval for drinking water facilities in a manner that is efficient and free of unnecessary delays. A well designed and properly equipped water treatment facility is essential in fulfilling the Division's mission.

## DEFINITIONS

- Agency - Ohio Environmental Protection Agency.
- AWWA - American Water Works Association.
- Detail Plans - Engineering drawings in conformance with rule 3745-91-03 of the Ohio Administrative Code, and Section 1.2.2 of Recommended Standards.
- Director - Director of the Ohio Environmental Protection Agency, or authorized representative.
- Division - Division of Drinking and Ground Waters.

- DWAF - Drinking Water Assistance Fund
- Engineer - engineering professional contracted by and representing the owner in dealings with the Agency.
- Facility - a public works designed for the purpose of providing drinking water which meets all applicable drinking water requirements.
- General Plans - preliminary design information of a proposed drinking water facility including, as appropriate, its design capacity, description of raw water source(s), treatment processes, basic treatment units and their loading rates, plant layout and proposed service area.
- NPDWR - National Primary Drinking Water Regulations.
- OAC - Ohio Administrative Code.
- ORC - Ohio Revised Code.
- Owner - the person or entity legally responsible for a drinking water facility.
- Recommended Standards - Recommended Standards for Water Works Great Lakes Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers.
- Specifications - complete, technical information of all appurtenances in conformance with Section 1.3 of Recommended Standards.
- SRF - State Revolving Loan Fund.
- USEPA - United States Environmental Protection Agency.

## **PRE-DESIGN ACTIVITIES**

Before submitting detail plans, the owner and engineer are encouraged to meet with a representative of the Division engineering staff. Meetings early in the project can result in a more streamlined plan review process. Benefits of a pre-design meeting include:

- A common understanding of the basic project concepts.
- An understanding of the Agency's plan review process.
- An early discovery of facets of a proposed design which may need to be examined, documented and/or further investigated.
- Recognition by both the Agency and the Owner of major design flaws at an early stage, preventing unnecessary investment in an unapprovable project.
- Exploration of alternatives which may not have been considered by the Agency or the Owner.
- Presentation by the Owner of project schedules and any special circumstances relevant to plan review.
- Discussion of system deficiencies which will need to be addressed, when the subject water facility is an existing one.

In general, pre-design meetings should be considered essential for projects with a high degree of complexity, non-standard technologies, unusual features and/or deviations from standards and guidelines used by the Agency. A pre-design meeting should also be considered essential for an Owner unfamiliar with the Agency's plan review process.

The following sequence of events should be considered for complex projects:

1. Owner requests a meeting through the district representative to discuss an upcoming project. This will trigger a file review by Ohio EPA for items that are critical for plan approval.
2. Ohio EPA will send confirmation of the meeting date, time, and location along with a list of critical items to be considered on the meeting agenda.
3. No later than one week before the meeting, Owner should send any pertinent documentation to Ohio EPA for review.
4. The meeting results will be documented and copied to all participants with the next series of activities clearly identified along with a tentative schedule for the next submittal or review.

## **Additional Permit Requirements**

During the pre-design period, the Owner is also responsible for contacting other divisions of the Agency and other state, local, county and federal agencies in order to determine other permits that the project may require. Additional Agency permits commonly required by water treatment facilities include a Permit to Install (PTI) from the Division of Surface Water for onsite waste handling facilities, a National Pollutant Discharge Elimination System (NPDES) permit for waste discharges, and a permit from the Division of Air Pollution Control for packed tower aerators used to remove Volatile Organic Chemicals (VOCs).

The Owner is responsible for obtaining all necessary permits, licenses and approvals. Plan approval by the Division will in no way imply that other permits, approvals and licenses are not required.

## **FILE REVIEW**

For projects which involve modifications to or expansion of an existing facility, the Division will review the files for any documented deficiencies, and will discuss them with the owner at the meeting. If the deficiencies are not critical, the Agency may negotiate a reasonable timetable for correction of the deficiencies, outside the timetable for the current project. The negotiated timetable for correcting deficiencies will be added to the plan approval.

## **GENERAL PLANS AND DESIGN STUDIES**

General plans and any accompanying Engineer's report (or design study) should be submitted to the Division for review for any project consisting of a new water treatment facility. Submission of general plans for modifications to or expansion of an existing water treatment facility may be worthwhile for some projects. In these instances, the Owner should contact a representative of the engineering staff for help in deciding whether a general plan submission is warranted.

General plans may either be submitted formally or informally, and will be reviewed with the same timetable as detail plans. Formally submitted general plans will require a fee for review. (See Appendix A for fees.) Formally submitted general plans will, following satisfactory resolution of all deficiencies, result in approval from the Director. Informally submitted general plans will not require a review fee and will result in one comment letter from the Agency with no subsequent approval. It will be the expectation of the Agency that the comments will be incorporated in the final design. Submission of an Engineer's report in addition to general plans as described in Section 1.1 of Recommended Standards is highly recommended.

## **REQUIREMENTS FOR NEW WATER SOURCES**

### **Ground Water Sources**

If a new ground water source is to be approved, the Owner must first obtain a site acceptance letter from the appropriate district office. Site acceptance for a new well (or wells) is performed to ensure that proposed wells are drilled in areas with no nearby sources of contamination.

Following site acceptance, the well(s) may be drilled. A 24 hour pump test as detailed in Recommended Standards must be completed. Following the pump test the raw water must be analyzed at an Ohio EPA certified laboratory for specific contaminants. Acceptability of the proposed well(s) and the required treatment will depend on the results of the bacteriological, chemical, and radiological testing, and results of the pump test. Contact the appropriate district office for a list of analytical requirements.

### **Surface Water Sources**

For proposed water treatment plants which are to use a surface water source which is presently being used by an existing surface water treatment plant, no water quality testing is required.

For a proposed surface water source which is not presently being used by a surface water treatment plant, a full year of sampling is required to ensure suitability. Contact the Division for sampling requirements.

## **DETAIL PLANS**

Chapter 3745-91 of the OAC and section 1.2 of Recommended Standards detail requirements for detail plans. Complete detailed technical specifications must accompany the detail plans. Submission of a design summary is recommended.

All plans need to be submitted to the appropriate district office where they will be separated into two main categories. Plans for new water treatment plants or modifications to existing water treatment plants for all community water systems (with the exception of plans for mobile home systems) will be forwarded to the Central Office for review. All other types of plans will be reviewed in the appropriate district office. Turnaround goals for various phases of plan review are listed in Appendix A.

## **TRACKING**

All plan review submissions are tracked by a network based computer tracking program available to review engineers and managers. The program tracks milestones such as date the application receipt date, all meetings, review letters, revisions received, and approval dates.

## **ACTIVITIES DURING THE DESIGN**

A meeting with the Agency at the beginning of the project design phase is recommended for projects with unusual features, or special scheduling needs. While the pre-design meeting focused on project direction and concepts, the design meeting will focus more on project details. Although reviews are completed on a first come first serve basis, the Agency will make every effort possible to accommodate project schedules. The Engineer should contact the Division engineering staff if the design is to be substantially changed from what was presented in pre-design meetings. Examples of substantial changes include changes to the treatment scheme, additions and/or deletions of treatment units or chemical feed systems, or changes in unit sizing or capacities.

If no pre-design meetings have been held, the Engineer should contact the Division engineering staff if the design is to involve deviations from requirements, standards or guidelines, in order to minimize revisions to the design.

## **REVIEW OF DETAIL PLANS**

The plans and specifications will be reviewed for conformance to Recommended Standards, AWWA Standards, all applicable sections of the ORC, OAC, generally acceptable engineering design practices for public water treatment systems and Agency guidelines included in Appendix B. In addition, any aspect of the proposed design which will hinder its ability to deliver adequate quantities of water that meets all applicable standards will be brought to the attention of the Engineer.

Normally, the Agency review engineer will send a review letter to both the Engineer and the Owner, with copies to the appropriate district office and any other parties who may have an interest in the plans being reviewed. At the request of either the Owner, Engineer, or reviewing engineer, a meeting may be held before the first review letter is sent by the Agency. The optimum time for a meeting would be as soon as the Agency reviewer has completed the review of the first submittal. A meeting at this stage of the review would be especially beneficial for plans which are complex or have unusual features or technologies. This type of meeting may also be useful for clarifying (to the reviewing engineer) any aspect of the plans which may be unclear.

In addition to reviewing engineering drawings and specifications, the Agency files will be reviewed for all projects involving modifications or expansions of an existing public water system. The purpose of the file review is to ensure that unresolved system deficiencies are brought to the attention of the Owner.

Normally, unresolved deficiencies will be brought to the attention of the Owner during a pre-design meeting. However, if plans are submitted without any prior meetings, deficiencies will be noted in the Agency's first review letter.

## **SPECIAL PROCEDURES**

### **Self-Certification**

A means is available for Owners who employ a properly licensed engineer to bypass the normal review process (for detail plans only) for distribution system projects such as water line extensions, elevated finished water storage tanks and booster pumping stations. Please contact the Division for requirements for obtaining self-certification.

### **Source Water Protection**

For systems treating ground water, Ohio has developed a wellhead protection program which has been endorsed by USEPA. A wellhead protection plan is required for all projects which include new wells and as of this writing, is voluntary for all other ground water based public water systems. For information about Ohio's wellhead protection program, contact the Ground Water program in the appropriate district office. Guidelines for source water protection of surface water sources are presently in development.

### **Pilot Testing**

Pilot testing (or demonstration testing) is required for treatment processes which have not been sufficiently used in the state of Ohio to demonstrate effectiveness. Examples of processes which presently require piloting are: membrane treatment, granular activated carbon treatment, ozonation. Pilot or demonstration testing is also required for approval of loading rates higher than normally approved for conventional treatment processes.

If a proposed treatment plant is to include a treatment process which will require pilot or demonstration testing, it is imperative that the design engineer meet with the engineering group as soon as possible. Pilot or demonstration testing for surface water treatment processes will normally require a year for data collection, and will therefore have a major impact on project scheduling.

Pilot testing protocols have been developed for many new technologies, and for increased ratings of conventional treatment processes at surface water treatment plants and for some processes at ground water treatment plants. However, if a treatment process is proposed for which no pilot testing protocol has been developed, additional time must be allotted for development of a protocol which may, in itself, involve research and data collection.

## **Design-Build**

The design-build process is becoming more prevalent as a project delivery system. An Owner considering a design-build project should notify the Agency as early as possible, to arrange a meeting with the Engineering staff. The purpose of the meeting is to allow the Agency to become acquainted with the basic concepts of the project and to explore major issues which may need to be resolved in the early stages of the project.

Submission of General Plans should be the next step towards plan approval and should be considered essential in a design-build project.

Following approval of the General Plans, the Owner should submit Detail Plans for review. The Detail Plans must contain sufficient detail to allow the reviewer to ensure that process units comply with Recommended Standards and any other applicable requirements. Detail Plan approval can subsequently be issued with a condition specifying that as-built plans must be submitted upon completion of the project and that as-built plans are not in conflict with the conditionally approved Detail Plans or applicable requirements. Conditional approval of Detail Plans will allow construction to begin.

Following construction of the project, the Engineer will need to submit as-built Detail Plans for review. Any aspect of the as-built plans which is not in conformance with the conditionally approved Detail Plans will need to be satisfactorily resolved.

## **Water Supply Revolving Loan Account (WSRLA)**

Any project which is to be financed in any part by the WSRLA will need to meet additional requirements as detailed in the Drinking Water Assistance Fund Management Plan.

## **Capability Assurance**

The 1996 Safe Drinking Water Act (SDWA) Amendments included a provision for Capacity Development as part of a broad prevention strategy. Ohio has adopted the terminology "Capability Assurance".

Capability assurance provisions offer a framework within which the Ohio EPA and water systems can work together to ensure that systems acquire and maintain the technical, financial, and managerial capability needed to achieve consistently public health protection objectives of the SDWA.

All systems seeking loans from the DWAF will need to satisfy capability requirements. Beginning October 1, 1999, all new Community Water Systems and Non Transient Non Community Water Systems that begin operation must demonstrate technical, managerial and financial capability to meet all NPDWR. A separate capability assurance guidance document is under development.

## **CONSTRUCTION**

Any changes from the approved plans must be communicated to the reviewing office. Some changes may require submittal of revised plans for review and approval.

For new water treatment plants, an Operation and Maintenance Manual is recommended. Operator training is also recommended, especially for any water treatment plant with non traditional treatment processes.

## APPENDIX A

### Agency Fees and Performance Goals

#### Fees

The fees for review of plans are as follows:

Informally submitted general plans	No fee
Formally submitted general plans	\$150.00
Detail plans	\$150.00 + 0.35% of project cost (\$20,000.00 maximum)

#### Performance Goals

The following are performance goals for plan review milestones:

Milestone	Central Office Goal	District Office Goal
Initial review and comment letter	60 days	21 days
Review of revisions and/or issuance of plan approval	30 days	21 days
Total time to approval	180 days for 85% of plans	90 days for 85% of plans

## APPENDIX B

### Reference Documents for Plan Approval

The following is a list of documents that are used for reference during the plan approval process:

1. Ohio Administrative Code; available on the Division web site.\*
2. Ohio Revised Code; available on [www.avv.com/orc](http://www.avv.com/orc)
3. Recommended Standards for Water Works Great Lakes Upper Mississippi River Board of State Public Health and Environmental Managers; available from [www.hes.org](http://www.hes.org)
4. AWWA Standards; available from [www.awwa.org](http://www.awwa.org)
5. Guidelines for Design of Small Public Water Systems; available from the Division.
6. Backflow Prevention and Cross-Connection Control; available from the Division.
7. Guidelines for Clarifier and Filter Ratings at Surface Water Treatment Plants; available on the Division web site.\*
8. Guidelines for Treatment Process Ratings at Precipitative (e.g., Lime) Softening Ground Water Treatment Plants; available on the Division web site\*.
9. Minimum Requirements for a General Plan for Self Certification Agreements; available from the Division.
10. Required Analysis for New Wells to be Used by Public Water Supplies; available from the Division.
11. State of Ohio Technical Guidance for Sealing Unused Wells; available from the Division.
12. Air Stripping Towers (Design Requirements); available from the Division.
13. Drinking Water Treatment Plant Waste Recycling; available from the Division.
14. Policy Statement on Pellet Chlorinators; available from the Division.
15. Data Requirements for New Surface Water Sources; available from the Division.
16. Guidelines for Tracer Studies; available from the Division.
17. Laboratory Construction and Remodeling; available on the Division web site\*.
18. Guidance for Designation of Water Sources as Surface Water or Ground Water; available from the Division.
19. Upground Reservoirs; available from the Division.

\*[www.epa.state.oh.us/ddagw](http://www.epa.state.oh.us/ddagw)

## APPENDIX C

### Checklist for Preliminary Submittals of Design-Build Water Projects

#### Process

1. Projected peak, average and minimum flow rates to be produced by plant
2. Design capacity of plant
3. Treatment process description and flow schematic including flow streams, valve and gate locations, chemical addition points, sampling points, process equipment location, flowmeters and other process control devices
4. Hydraulic profile for all major gravity process pipelines and hydraulic structures
5. Preliminary major equipment and pipeline sizing
6. Major equipment preferences; indoor or outdoor installation; valve and actuator preferences
7. Chemical feed systems: description of receiving, storage, handling and feed systems; protective devices or strategies
8. Mechanical plan layouts and building footprints
9. Preliminary yard piping plan

#### Civil

1. Flood plain impacts and constraints
2. Vehicle access points
3. Preliminary storm water control concepts
4. Preliminary site plan

#### Architectural

1. Architectural theme for building exterior(s)
2. Building functions and approximate floor area required
3. Type of building(s) and interior/exterior finishes
4. Preliminary floor plans and exterior elevations

## **Building Mechanical**

1. Type of HVAC system(s) for all buildings
2. Sewer and water service accessibility

## **Instrumentation and Control**

1. Control philosophy including level of local control, type of control system, level of automation, and supervisory control
2. Equipment and instrument tag numbering, naming and abbreviation conventions
3. Operational description of each major process
4. Telemetry type and requirements

## **Electrical**

1. Electrical utility and type of supply available and its reliability
2. Standby power assessment or alternate power supply availability
3. Preliminary one-line power diagram
4. Uninterruptible power supply (UPS) assessment
5. Preliminary load calculations
6. Electrical room sizes