



**Department
of Health**

**Environmental
Facilities Corporation**

Engineering Report Outline for New York State Assisted Drinking Water Infrastructure Projects

Effective October 1, 2021

For Projects Receiving Assistance Through the Drinking Water State Revolving Fund (DWSRF)
or Other State Assistance Requiring Approval by the New York State Department of Health.

Statement of Purpose

This document provides guidance to municipalities, consulting engineers and others interested in receiving Drinking Water State Revolving Fund (DWSRF) and other state financial assistance requiring an acceptable engineering report. This outline was created to promote the development of comprehensive engineering evaluations that communities can use to make informed decisions about infrastructure. Use of the outline may help to ensure that a submitted report satisfies DWSRF programmatic and technical requirements. While it is intended that all the items in the outline must be addressed for every project, the engineer's evaluation may determine that some elements of the outline do not apply to a project and can be stated as such.

After reviewing a submitted report, the New York State Department of Health (DOH) may determine that the report may need additional information before it can be found acceptable for funding purposes. In addition, a report determined to be acceptable for funding purposes may not contain the detailed technical information necessary for DOH to complete a technical review and approval of the proposed project, and a more detailed basis of design report may be required as the project progresses. DOH will advise prospective applicants if needed. While this outline has been prepared as guidance for applicants seeking New York State financial assistance, it may also be suitable for use for public water system infrastructure projects that are not being financed through the State.

Engineering Report Preparation Standards

Engineering reports shall be prepared, stamped, and dated by a New York State licensed Professional Engineer and developed in accordance with the following standards whenever practicable and as appropriate:

1. Recommended Standards for Water Works, Latest Edition - Policies for the Review, and Approval of Plans and Specifications for Public Water Supplies (commonly known as the 10 States Standards)
2. New York Codes, Rules and Regulations, Title 10, Part 5, Subpart 5-1
3. Applicable standards (latest edition) published by the American Water Works Association
4. Table B-3 of the New York State Design Standards for Intermediate Sized Wastewater Treatment Systems (March 5, 2014) if applicable for estimating water demand
5. New York State Flood Risk Management Guidance for Implementation of the Community Risk and Resiliency Act (CRRA)

There may be components described in the applicable standards that are pertinent to a project that are not addressed in this outline. The engineer preparing the report should ensure that applicable standards are addressed during the development of the report.

If seeking assistance from these federal agencies; Department of Agriculture – Rural Development, Environmental Protection Agency, Department of Homeland Security, and Housing and Urban Development, the engineering report may need to comply with the January 16, 2013 Engineering Report Interagency Memo (Bulletin 1780-2 found online at <http://www.rd.usda.gov/publications/regulations-guidelines/bulletins/water-and-environmental>)

Drinking Water Engineering Report Outline

Engineering reports must include a Table of Contents with page numbers, and the sections outlined below.

Table of Contents:

Executive Summary	1
Project Background & History	1
1. Site Information.....	1
2. Ownership & Service Area.....	1
3. Existing Facilities	2
4. Need for Project.....	2
5. Capacity Development.....	3
Alternatives Analysis.....	3
1. Description.....	4
2. Cost Estimate	4
3. Non-Monetary Factors.....	5
Summary and Comparison of Alternatives	5
Recommended and Selected Alternatives	5
Engineering Report Certification.....	5
Smart Growth	5
Maps and Figures.....	6

Appendix A - Capacity Development Evaluation Form

Appendix B - Examples of Short-Lived Assets

Appendix C - Smart Growth Assessment Form

Executive Summary

Provide a brief description of the purpose of the report, need for the project, evaluations conducted, recommended alternative, and proposed course of action.

Project Background & History

1. Site Information

Describe the area(s) under consideration and include the following:

- Location
- Geologic conditions (soil type, depth to bedrock and groundwater, slope if significant)
- Surface water features
- Environmental resources (potentially impacted areas, aquifers, species, etc.)
- Environmental justice areas potentially impacted
- Floodplain considerations (100-year flood elevation and highest flood of record, if known)

2. Ownership & Service Area

Describe the ownership of the facilities and area(s) being served or to be served. Include details of the following:

- Publicly or Privately-owned
 - Municipal, State, Federal, Water Authority, Water Works Corporation, Homeowners Association, Water Works Transportation Corporation, Native American Reservation, Commercial, Industrial, School, Other
- Water system management
 - Water system operators (name and certification level)
- Water district boundaries (existing and proposed)
 - Projects financed through New York State need to comply with the State's Smart Growth Act and therefore care should be taken when setting the boundaries if creating new or expanding existing water districts. Large areas of vacant lands should not be included if state funding will be sought for a project. District boundaries should be set to capture residences and businesses that will be within the district. For example, instead of using tax map boundaries that may include significant areas of vacant land, district boundaries could be set at some distance from center of the right always sufficient to capture homes and businesses that will be served.
- Outside users
 - Discuss any existing/required water purchase contracts between water supplies, and/or inter-municipal/private/industrial agreements
- Nearby agricultural or industrial land use activities
- Population trends and growth
 - U.S. Census or other data (include references) for the service area for at least the past 20 years or Period of Probable Usefulness (PPU) if available
 - Discuss any planned or anticipated development
 - Projected population over next 20 years in five-year intervals
- Historical and projected water use data
 - Type of use (i.e., residential, commercial, agricultural, industrial)
 - Equivalent Dwelling Units (EDUs)
 - Average and maximum day demands, including fire flow demand

- Peak hourly flow
- Percent of unaccounted water and estimated reduction of water loss as a result of the proposed project
- Adjacent or nearest public water systems
- Community involvement (support/opposition)

3. Existing Facilities

Provide overview of major system components and include the following:

- Location and layout
 - Map, site plan and schematic layout for existing facilities and treatment processes
 - Photographs of existing facilities
- General description & history
 - Purpose of system component
 - When component was constructed, renovated, expanded, or removed from service
 - Failure history and component limitations
 - History of damage due to storm or flood impacts
- Present condition
 - Adequacy of current facilities (source, conveyance, treatment, storage, disposal and security)
 - Source capacity
 - Description of watershed
 - Ground water – total and with largest producing well out of service. Include safe yield analysis.
 - Surface water – capacity during one in fifty-year drought or extreme drought of record, include consideration of multiple year droughts. Include safe yield analysis.
 - Table of design capacity and normal and peak operating capacity for each facility component
 - Raw water and finished water quality
 - Ability to meet treatment objectives
 - Monitoring parameters
 - Sampling requirements/frequency
 - Ability to maintain system pressure and required fire flows (if applicable)
 - Type and quantity of wastes generated and disposal ability
 - Energy consumption (include energy audit results if available)
 - Suitability for continued use
- Permit conditions (e.g., Water Withdrawal Permit limits, SPDES permit requirements)
- History of infrastructure damage due to storm or flood impacts (include elevation of floodwaters)

4. Need for Project

Describe the need for the project. Include maps, photographs, or schematics as it relates to:

- Health, sanitation, and/or security
 - Water quality and quantity
 - Regulations
- Aging infrastructure
 - Loss of source capacity
 - Distribution system water loss
 - System pressure
 - Treatment or storage needs

- Inefficient design
- Safety concerns
- Reasonable growth
 - Future growth needs (provide supporting calculations)
 - Adequacy of revenue to meet future growth needs
- Water, energy, and/or waste considerations (include audits, if available)
- Suitability for continued use
- Storm & flood resiliency (sea level rise, storm surge, potential for flooding impacts, or other extreme weather event)
- Compliance with local, state and federal requirements. Discuss and provide copies of the following:
 - Notices of violation
 - Consent orders
 - Judicial orders
 - EPA orders
 - Sanitary survey
- Compliance with current design standards (i.e., Recommended Standards for Water Works, latest edition)

5. Capacity Development

DOH is required to ensure that all systems receiving DWSRF assistance have adequate technical, managerial, and financial capabilities to provide safe drinking water. Systems that lack adequate capacity may be determined as ineligible by DOH to receive DWSRF assistance unless the project to be financed corrects the technical, managerial, and financial deficiencies.

- For projects funded with DWSRF assistance, complete the Capacity Development Program Evaluation Form (Appendix A)

Alternatives Analysis

Conduct a comprehensive analysis of each feasible alternative, including a no-action alternative. All projects must also evaluate the possibility to interconnect to another public water system. If the system applying for DWSRF assistance decides not to pursue a possible interconnection alternative when such alternative exists and would address the scope of the project with respect to its priority health ranking, then a detailed justification satisfactory to DOH must be provided demonstrating that the interconnection is a technically, financially, or managerially disadvantageous option.

Briefly discuss any alternatives considered that were found to be technically infeasible.

As appropriate, the following alternatives should be evaluated:

- No action
- Repair or replacement versus new construction
- Regional consolidation and/or interconnection
- Shared services or partnership opportunities
- Technically feasible alternatives

For each alternative, the analysis should include the information outlined below.

1. Description

Describe how each alternative will resolve the identified need. Present the following information for each technically feasible alternative, as appropriate:

- Proposed preliminary design, design standards, sizing, and supporting calculations
- Impact on existing facility
 - Average and peak design flows
 - Change in system pressure
 - Change in required operator certification grade
 - Potential for change in water chemistry in the distribution system as a result of changes to water source or treatment, and means of addressing such change
 - Waste generated
- Location map and/or schematic drawing
- Land requirements
 - Current ownership
 - Land to be acquired
 - Lease or access agreement
 - Easements required
- Environmental impacts & mitigation measures
 - Potential State Environmental Quality Review (SEQR) concerns such as water quality and supply, noise levels, air quality, population growth, wetlands, floodplains, and other sensitive areas
 - Potential impacts (both positive and negative) on environmental justice areas
- Construction and site considerations
 - Subsurface rock
 - High water table
 - Access limitations
 - Flood prone areas
 - Availability of utility and communication infrastructure
- Permit requirements (new/proposed and existing)
- Identify the water & energy efficiency measures used in each alternative
 - Efficient water use, reuse, conservation, and energy efficient design, and/or renewable generation of energy
- Storm & flood resiliency (sea level rise, storm surge, potential for flooding impacts, or other extreme weather events)
- Schedule and constructability

2. Cost Estimate

Provide cost estimates for each alternative, including a breakdown of the following:

- Total project cost showing itemized construction, non-construction & contingency costs
 - Non-construction may include land/easement acquisition, legal, engineering, construction management, fiscal advisor, grant/loan administrator, etc.
- Annual operation and maintenance (O&M) costs (existing and proposed) considering the following:
 - Personnel
 - Administration
 - Water purchase
 - Waste treatment/disposal costs
 - Insurance
 - Energy cost (fuel or electric)

- Process chemical, monitoring & testing
- Short-lived asset maintenance and replacement (see Appendix B - Examples of Short-Lived Assets)
- Professional services
- Annual debt service resulting from each alternative

3. Non-Monetary Factors

Include discussion of all relevant non-monetary factors such as increased recreational opportunities, increased local employment, aesthetics, improved habitat, reduced carbon footprint, climate resiliency, standardization, personnel impacts, permit issues, or community objections.

Summary and Comparison of Alternatives

Provide a summary table of all feasible alternatives identifying any major differences, pros and cons, non-monetary factors, and costs.

- Provide a summary life cycle cost analysis for all technically feasible alternatives. A comprehensive life cycle cost analysis may be warranted for projects involving new infrastructure technologies. This analysis should convert capital, O&M, short-term assets, and salvage costs to present worth values. State the time period and the interest rate used in the evaluation.

Recommended and Selected Alternatives

Identify the recommended alternatives for consideration if more than one and the selected alternative including:

- Basis of selection
- Cost estimate
- Project schedule (including submittal of plans and specification, advertisement for bid, contract award, initiation of construction, substantial completion, final completion, startup)
- Next steps (including special studies, pilot tests, special coordination, community engagement)

Engineering Report Certification

All engineering reports must be signed and sealed by a professional engineer licensed to practice engineering in the state of New York.

Smart Growth

All projects funded through EFC must comply with the New York State Smart Growth Public Infrastructure Policy Act to the extent practicable. Provide a completed and signed Smart Growth Assessment form (Appendix C). A copy of the form in a fillable format is available at www.efc.ny.gov/SmartGrowth

Maps and Figures

Provide a series of maps, drawings, schematics, and/or figures that provide detailed information regarding the site, the project, and its impacts. For each figure, overlay with applicable information such as municipal boundaries, water district boundaries, floodplain elevations, topography, and environmental justice Areas. Include necessary map elements including, but not limited to, a north arrow, legend, and scale. Include:

1. Overall service area
 - a. Water District or service area boundaries
 - b. Sources
 - c. Tanks
 - d. Distribution mains
 - e. Pump stations
 - f. Treatment plant(s)

2. Existing project site
 - a. Site layout/overall schematic drawing
 - b. Hydraulic profile
 - c. Process flow diagram

3. Proposed improvements for each alternative
 - a. Sources
 - b. Water Mains (Identify type of improvement: new, repair, replace, line, etc.)
 - c. Storage Tanks
 - d. Pump stations
 - e. Treatment plant site(s)
 - f. Hydraulic profile
 - g. Process flow diagram

Appendix A - Capacity Development Evaluation Form

CAPACITY DEVELOPMENT PROGRAM

TECHNICAL, MANAGERIAL, AND FINANCIAL EVALUATION CRITERIA FOR: COMMUNITY PUBLIC WATER SYSTEMS

SYSTEM NAME: _____

COUNTY: _____ PWSID #: _____

COMPLETED BY: _____ DATE: _____

Technical Capacity

A. System Infrastructure

1. Does the system have as-built plans, drawings, or maps of its facilities including source, treatment, storage, and distribution?

Yes No Not Applicable

If the system lacks certain plans, please specify:

2. Does the system have exact location measurements of all main valves and service shut-offs?

Yes No Not Applicable

3. Can the system's pumping, storage and distribution facilities meet current normal and peak demands and required distribution pressures?

Yes No Not Applicable

4. Does the system have a water conservation plan?

Yes No Not Applicable

5. Are all customers on the water system metered?

Yes No Not Applicable

6. Is the system equipped with "master" meters that measure the amount of water the system produces or purchases for each source of water?

Yes No Not Applicable

B. Source Water Evaluation

1. Does the system have a copy of its Source Water Assessment?

Yes No Not Applicable

2. Has a yield analysis been done for the system's source?

Yes No Not Applicable

3. Does the system have a description of the existing source-pumping capacity and the system's raw and finished water storage capacity?

Yes No Not Applicable

4. For groundwater systems, does your system have a wellhead protection program in place?

Yes No Not Applicable

C. Technical Knowledge

1. Has an evaluation of the water system facilities been conducted with respect to its ability to reliably meet current and proposed State and Federal drinking water regulations?

Yes No Not Applicable

If system can't meet regulations, please specify:

2. Does the system have monthly water production records or treatment records that show daily and monthly water production for each source used by the system?

Yes No Not Applicable

3. Has an evaluation been conducted to document the condition and remaining service life of existing facilities?

Yes No Not Applicable

4. Has the system been cited within the past two years for failing to sample and report test results?

Yes No Not Applicable

5. Has the system been cited within the past two years for operating deficiencies as a result of a sanitary survey or other inspection conducted by the DOH?

Yes No Not Applicable

6. If you answered "Yes" to Questions 4 or 5, has corrective action been taken to correct all deficiencies?

Yes No Not Applicable

D. Certified Operators

1. Does the water system have a certified water operator(s) and designated an operator in responsible charge?

Yes No

2. If the water system does not have a state-certified water treatment operator, or lacks the necessary number of operators to safely and reliably operate the system, does the system have a plan to acquire the services of a (additional) state-certified operator?

Yes No Not Applicable

Managerial Capacity

A. Staffing and Organization

1. What type of training/continuing education did system personnel attend within the last two years (please specify)?

2. Who is responsible for policy and operational decisions for the water system (*name and title*)?

3. Who is responsible for ensuring compliance with state regulatory requirements (*name and title*)?

4. Who is responsible for approving expenditures (*name and title*)?

5. *For systems that contract for system operation or management:* Does the system have a valid (signed) contract that summarizes the duties and responsibilities the contractor must provide to the system?

Yes No Not Applicable

B. Ownership

1. *If the system is under temporary ownership*, has a future owner been found for the water system?

Yes No Not Applicable

If "Yes", who will the future owner be?

2. *For systems that use, but do not own, land or facilities that are essential to water system operation*: Is there a valid long-term contract (i.e., lease) between the water system and the owner of the land or facilities essential to the operation of the system?

Yes No Not Applicable

3. *For systems with a single proprietor*: Does the system have a contingency plan for continuing system operation in the event the owner becomes incapable of carrying out his/her responsibilities?

Yes No Not Applicable

C. Consolidation/Restructuring

1. Has the system examined the feasibility of:
- a) Incorporating with an existing water system in the immediate proximity?

Yes No Not Applicable

- b) Selling ownership to an existing water system?

Yes No Not Applicable

- c) Contracting for the management or operation of the system with an existing system or satellite management/operations agency?

Yes No Not Applicable

D. Emergency/Disaster Response Plans

1. Has the system developed an Emergency Response Plan?

Yes No Not Applicable

2. Does the Emergency Response Plan:

- a) Designate responsible personnel in the event of an emergency?

Yes No Not Applicable

b) Provide for emergency phone and radio capabilities?

Yes No Not Applicable

c) Describe public and health department notification procedures?

Yes No Not Applicable

3. Does the system have any emergency contract agreements under which it operates (e.g., emergency water interconnections and alternative sources)?

Yes No Not Applicable

E. Water System Policies

1. Does the system have a *written* System Operations Manual or Policy?

Yes No Not Applicable

F. Record Keeping

1. Does the system keep water utility records including: financial, regulatory, facility, operations and maintenance, data quality, Annual Water Quality Reports, and correspondence with the NYS Department of Health and/or local Health Departments (and where appropriate, the NYSPSC)?

Yes No Not Applicable

Financial Capacity

A. Budget Projection – Revenues and Expenses

1. Does the system have a water budget?

Yes No Not Applicable

2. Are the system's annual water revenues sufficient to cover the annual water expenses as well as anticipated capital improvements?

Yes No Not Applicable

3. Are the system's water rates, when combined with other revenue sources, sufficient to cover all listed expenditures for the water system?

Yes No Not Applicable

4. Does the system retain budget information for at least two years?

Yes No Not Applicable

B. Reserves

1. Does the system have a reserve account (or funds within a reserve account) dedicated to:

a) Financing the emergency replacement of critical facilities in the event of their failure?

Yes No Not Applicable

b) The maintenance of cash flow in the event of an unexpected funding shortfall?

Yes No Not Applicable

2. If the system has a reserve account, how does it determine the amount to put into the account?

_____ Fixed Amount _____ Percentage of Revenues _____ Percentage of Expenses

_____ Other (please specify) _____

3. If the system has a reserve account, what type(s) of reserve account(s) does it have?

_____ Operation and Maintenance _____ Capital Projects _____ Debt Service

_____ Other (please specify) _____

C. Capital Improvement Plan

1. How do you finance operation and maintenance costs (Check all that apply)?

_____ Rates collected from ratepayers _____ Rental fees

_____ Other business revenue _____ Personal capital

_____ Surcharges _____ Reserve account

_____ Other (Please specify) _____

2. How did you finance your LAST major repair or improvement?

_____ Commercial bank loan _____ Bonds

_____ DWSRF _____ Other State or federal loan/grant program

_____ Surcharge _____ Personal Capital

_____ Reserve Account _____ Revenue from other business

_____ Other (Please specify) _____

3. What options do you have for financing your NEXT major repair or improvement?

- | | |
|---|--|
| <input type="checkbox"/> Commercial bank loan | <input type="checkbox"/> Bonds |
| <input type="checkbox"/> DWSRF | <input type="checkbox"/> Other State or federal loan/grant program |
| <input type="checkbox"/> Surcharge | <input type="checkbox"/> Personal Capital |
| <input type="checkbox"/> Reserve Account | <input type="checkbox"/> Revenue from other business |
| <input type="checkbox"/> Other (Please specify) _____ | |

D. Water System Rates

1. Does the water system management review user fee, user charge, or rate system at least once every two years?

- Yes No Not Applicable

2. What is the frequency of billing (e.g., 12, 6, or 4 times per/year)? _____ times/year

3. Where applicable, what are the system's water rates?

4. What are rates based on?

- Capital Improvement Plan and Annual Budget
- Annual Budget Only
- Cash on Hand
- Last year's expenses
- Not sure
- Other (Please specify _____)

5. What was the date of the last rate increase? -

END OF DOCUMENT

Appendix B- Examples of Short-Lived Assets

<p><u>Source Relates</u></p> <ul style="list-style-type: none"> Pumps Pump Controls Pump Motors Telemetry Intake/Well Screens Water Level Sensors Pressure Transducers 	<p><u>Distribution System Related</u></p> <ul style="list-style-type: none"> Residential and Small Commercial Meters Meter boxes Hydrants and Blow-offs Pressure Reducing Valves Cross Connection Control Devices Altitude Valves Alarms & Telemetry Vaults, Lids and Access Hatches Security Devices and Fencing Storage Reservoir Painting/Patching
<p><u>Treatment Related</u></p> <ul style="list-style-type: none"> Chemical Feed Pumps Altitude Valves Valve Actuators Water Level Sensors Pressure Transducers Air Compressor and Controls Pumps Pump Controls Pump Motors Chemical Feed Pumps Granular Filter Media Membranes Field & Process Instrumentation Equipment UV Lamps Back-up Power Generator Chemical Leak Detection Equipment Flow Meters SCADA Systems 	

Appendix C - Smart Growth Assessment Form

**A copy of this form in a fillable format is available at
www.efc.ny.gov/SmartGrowth**