

OKLAHOMA FUNDING AGENCY COORDINATING TEAM

**CHECKLIST FOR
ENGINEERING REPORTS
FOR
WATER PROJECTS**

ENDORSED BY:

**OKLAHOMA WATER RESOURCES BOARD
OKLAHOMA CITY AREA INDIAN HEALTH SERVICE
USDA - RURAL DEVELOPMENT - OKLAHOMA
OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY
OKLAHOMA DEPARTMENT OF COMMERCE**

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Engineering Report Checklist: Water Projects

I. INTRODUCTION.

II. PROJECT PLANNING AREA.

A. Location, maps, photographs, and sketches.

- Provide a map showing legal and natural boundaries of entire service area.
- Include a map showing new service areas or annexed areas.

B. Growth areas and population trends.

- Describe the population projections within the project planning area and/or concentrated growth areas for the defined design period (must be based on recognized sources).
- Include a summary of the current and projected water use data. See Appendix A in Guidelines.

C. Current and projected water use data.

- Describe present water consumption.
- Provide projected maximum daily demands and peak hourly flow. See Appendix B in Guidelines.

D. Environmental concerns in the service area.

- Describe major environmental concerns in the service area.

E. Community Engagement.

- Describe community engagement in the project planning process.

III. EXISTING FACILITIES AND NEED FOR PROJECT.

A. Location and layout.

- Provide site plan.
- Provide schematic layout of existing treatment facilities.

B. Condition of existing facilities.

- Discuss existing water source quantity and quality.
- Water lines: discuss adequacy and suitability for continued use, and compliance with DEQ requirements (Consent orders, etc.).
- Pump stations and storage: discuss adequacy and suitability for continued use, and compliance with DEQ requirements (Consent orders, etc.).
- Treatment facilities: discuss adequacy and suitability for continued use, and compliance with DEQ requirements (Consent orders, etc.).
- Discuss disposal of backwash water and residuals.
- Table of design capacity provided (see Appendix C&D in Guidelines).

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Not Applicable

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C. Health and safety.

- Discuss concerns expressed by regulatory agencies, and relevant correspondence included.
- Include reference of applicable agency regulation(s).
- Handicap accessibility (for federally funded projects): provide a description of the accessibility of the office or other public spaces. Any deficiencies should be addressed in the proposed project.
- Security: provide determination of necessary security improvements as defined by the system's vulnerability assessment. Note: the information contained in the engineering report should only describe the construction necessary to enhance the water system's security. It should not provide any specific information regarding inadequacies.

D. System O&M.

- Provide description of concerns (indicate those with greatest impact).
- Describe investigation of water losses.
- Discuss adequacy of management.
- Discuss inefficient design(s).
- Discuss problem elimination.

E. Growth capacity.

- Describe growth capacity necessary to meet needs during planning period.
- Determine facilities needed to meet future growth.
- Design for phased construction.
- Provide number of new customers committed to project.

F. Sanitary sewage system availability.

- Describe existing sewage system & treatment.
- Describe effect of proposed project on existing sewage system.

G. System mapping.

- Include location and mapping of existing and proposed facilities.

IV. ALTERNATIVES CONSIDERED.

A. Describe of facilities associated with each alternative:

- Source of water.
- Treatment.
- Storage.

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Not Applicable

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- Distribution lines.
- Pump stations.
- Discharge point and receiving body of water.

B. Design criteria.

- State the design parameters used for evaluation purposes.

C. Environmental impacts.

- Provide a short description of environmental impacts that may preclude any alternatives.

D. Land requirements.

- Identify site(s), and specify if currently owned or to be purchased or to be leased.
- Identify easement(s) to be acquired.

E. Describe any potential construction problems:

- Subsurface rock and unsuitable materials.
- High water table.
- Flood prone area(s) and related maps.
- Limited access.

F. Cost estimates.

- Include construction costs.
- Include any non-construction and other related costs.
- Include annual operation and maintenance costs.
- Include effective present worth analysis costs. See Appendix E in Guidelines.

G. Advantages/disadvantages.

- Describe abilities to meet owner's needs within its financial and operational resources.
- Evaluate compliance with DEQ requirements.
- Describe compatibility with existing comprehensive area-wide development plans.
- Satisfy public and environmental concerns.
- Decision matrix considering monetary and non-monetary factors.

V. PROPOSED PROJECT DESIGN AND COST ESTIMATE.

A. Source(s) of water supply.

1. For surface water sources include:

- Hydrologic data, stream flow & weather records.
- Safe yield and quantity.

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- Maximum flood/pool elevation(s).
- Description of watershed with consideration of raw water quality.
- Summary of the quality of raw water with special references to fluctuations in quality.

2. For groundwater sources include:

- Sites considered.
- Advantage of selected site.
- Elevation with respect to surroundings and floodplains.
- Character of formations.
- Geologic conditions of site.
- Summary of source exploration, including groundwater quality.
- Description of all possible sources of contamination.
- Industrial and other private supplies.

3. For purchase water systems include:

- Quantity available from source water system.
- Quality of source water system.
- Copy of purchase water contract as applicable.

B. Water rights.

- Describe existing water rights.
- Describe proposed water rights and status of acquisition.
- Provide a copy of application submitted to the OWRB, COE, or GRDA, as applicable.
- Provide a copy of water rights permit issued by OWRB, COE, or GRDA, as applicable.
- Provide verification that all wells and/or diversion points being utilized are in authorized locations according to the water rights held at the OWRB, COE, or GRDA. (GPS or land surveys must be submitted along with the 10-acre tract legal location of each).
- Provide verification that the water right held at the OWRB, COE, or GRDA are in good standing and not subject to cancellation or reduction. See Appendix F in Guidelines.

C. Treatment.

- Provide plan view and schematic of plant.
- Detail proposed processes.
- Provide hydraulic profile for water treatment plants.
- Discuss any process discharges.
- Provide plan view of site layout.

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- Describe foundation conditions and elevations at sites of proposed structures based on geotechnical information.
- Provide floodplain elevations in relation to critical structures.
- Provide approximate elevation of groundwater in relation to subsurface structures.
- Provide a table showing the design capacity for each treatment unit. See Appendix C & D in Guidelines.
- Show detailed calculations for the design capacities listed in the table.
- Provide a description of back-up and/or alternate power supply.

D. Storage.

- Identify size, type & site location for each proposed storage facility.
- Discuss hydraulic interactions with existing facilities and usable storage.
- Describe foundation conditions and elevations at sites of proposed structures based on geotechnical information.
- Provide floodplain elevations in relation to critical structures.
- Provide approximate elevation of groundwater in relation to subsurface structures.

E. Pumping stations.

- Identify size, type, site location and any special power requirements.
- Describe foundation conditions and elevations at sites of proposed structures based on geotechnical information.
- Provide floodplain elevations in relation to critical structures.

F. Distribution layout identification.

- List the lengths.
- State pipe sizes.
- Identify key components.
- Describe character of soil through which water mains will be installed including NRCS soil maps and descriptions.

G. Hydraulic calculations.

- Include hydraulic map corresponding to hydraulic analysis.
- Describe fire flows as provided by proposed project.
- Describe requirements of Insurance Services Office.
- Provide elevation of each node.
- List pipe diameters.

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Not Applicable

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- Provide pipe segment length.
- Include reservoir and storage tank elevation.
- Identify domestic and commercial peak water demands.
- List pressures.
- Describe fire flow as applicable.

H. Waste disposal.

- Provide a description of residual management and status of the sludge management plan.
- Discuss types of waste including residuals, volumes, proposed treatment, points of discharge, discharge permit required and/or method of disposal.
- Discuss various sites considered and advantages of recommended site.
- Discuss proximity to residences, industry and other establishments.
- Discuss potential sources of pollution.
- Provide geotechnical results for lagoons.

I. Recommended alternative cost estimate:

- Development costs (e.g. pilot studies, geotechnical, survey, etc.).
- Construction costs.
- Land and water rights.
- Legal fees.
- Engineering fees.
- Resident project representation or construction inspection fees.
- Environmental costs.
- Operation and maintenance manual as appropriate.
- Interest.
- Contingency.
- Refinancing, if applicable.
- Other costs associated with proposed project.

VI. FINANCIAL STATUS. *Required and reviewed only by USDA-RD funded projects.

- Provide rate schedule(s) (current and proposed).
- Discuss annual O & M cost.
- Provide tabulation of users by monthly usage categories.
- Provide revenue received for the last three fiscal years. Provide financial audits, if available.

Completed
Not Applicable

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- Discuss status of existing debt and required reserve accounts.
- Provide an evaluation of short-lived assets. See Appendix G in Guidelines.

VII. CONCLUSIONS AND RECOMMENDATIONS.

- Describe additional findings and recommendations.
- Discuss special studies.
- Include special coordination.
- Provide implementation plan.

END OF CHECKLIST