CHECKLIST FOR

ENGINEERING REPORTS

FOR

WASTEWATER 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

Revised: February 18, 2016
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). See Appendix A in Guidelines.
   □□ Include a summary of the current and projected water use data.

C. Current and projected wastewater flows.
   □□ Provide current flows (hydraulic) and organic loads for all users (domestic and industrial).
   □□ Include projected flows (hydraulic) and organic loads for all users (domestic and industrial).
   □□ Present wastewater flow rates during average and peak flow periods. See Appendix B in Guidelines.

D. Environmental concerns in 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 treatment facilities.

B. Condition of existing facilities.
   □□ Sewer lines: discuss adequacy and suitability for continued use, and compliance with DEQ requirements (Consent orders, etc.).
   □□ Lift stations: discuss adequacy and suitability for continued use, and compliance with DEQ requirements (Consent orders, etc.).
   □□ Treatment facilities: discuss hydraulic and organic capacity and suitability for continued use, and compliance with DEQ requirements (Consent orders, etc.).
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 inflow, infiltration, and leakage.

☐☐ Discuss adequacy of management.

☐☐ Discuss inefficient design(s) or outdated facilities.

☐☐ Discuss problem elimination.

E. **Design hydraulic and organic 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. **Water system availability.**

☐☐ Describe existing water or proposed supply to wastewater treatment systems.

☐☐ Describe effect of proposed project on existing water system.

G. **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.

H. **System mapping.**

☐☐ Include location and mapping of existing and proposed facilities.

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**IV. ALTERNATIVES CONSIDERED.**
A. **Describe facilities associated with each alternative:**

- ☐☐ Treatment.
- ☐☐ Wet weather flow equalization.
- ☐☐ Lift stations.
- ☐☐ Collection lines.
- ☐☐ Discharge facilities and locations.
- ☐☐ Sludge handling facilities.

B. **Design criteria.**

- ☐☐ State the design parameters used for evaluation purposes.
- ☐☐ Provide data in a tabular form. See Appendix D in Guidelines.

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. **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 non-construction and other related costs.
- ☐☐ Include annual operation and maintenance costs.
- ☐☐ Include cost effective present worth analysis. See Appendix C in Guidelines.

G. **Advantages/disadvantages.**

- ☐☐ Describe ability 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 (Recommended Alternative).

A. Wastewater.

1. Treatment.
   - ☐☐ Provide plan view of site layout.
   - ☐☐ Provide schematic and identify plant location and site of any discharges.
   - ☐☐ Describe the process in detail.
   - ☐☐ Provide status of compliance with the 208 plan (applicable for discharging facilities).
   - ☐☐ Provide description of how sludge is/will be managed and a copy of DEQ approval letter for sludge management plan.
   - ☐☐ Provide a table showing the design capacity for each treatment unit. See Appendix D in Guidelines.
   - ☐☐ Describe the foundation conditions and floodplain elevations at sites of proposed structures.
   - ☐☐ Provide approximate elevation of groundwater in relation to subsurface structures.
   - ☐☐ Provide geotechnical results for all treatment facilities including lagoons.
   - ☐☐ Include hydraulic profile.
   - ☐☐ Provide alternate power source.

2. Pumping stations.
   - ☐☐ Identify size, type and site location and any special power requirements.
   - ☐☐ Identify method for emergency operations.
   - ☐☐ Describe the foundation conditions and floodplain elevations at sites of proposed structures.
   - ☐☐ Provide approximate elevation of groundwater in relation to subsurface structures.
   - ☐☐ Provide alternate power source.
   - ☐☐ Address potential clogging issues.

3. Collection system layout and hydraulic calculations.
   - ☐☐ List sewer line lengths.
   - ☐☐ State collection line sizes.
   - ☐☐ Describe slopes, manholes, and key components.
   - ☐☐ Describe character of soil through which mains will be installed including NRCS soil maps and descriptions.

4. Hydraulic, design, and organic calculations.
   - ☐☐ Provide sufficiently detailed calculations to comply with DEQ design requirements.

5. Waste disposal.
☐☐ Discuss various sites considered and advantages of recommended site.
☐☐ Discuss proximity to residences, industry and other establishments.

6. **Green project reserve components (for SRF Projects Only).**
☐☐ Identify and discuss any components of the proposed project that may qualify as “green” based on the guideline in Appendix E.
☐☐ Complete and attach the GPR check sheet as an appendix to the Engineering Report.

7. **Stormwater components.**
☐☐ Identify any stormwater projects with potential to help achieve the water quality objectives of the Clean Water Act.

8. **Recommended alternative cost estimate:**
☐☐ Development costs.
☐☐ Construction costs.
☐☐ Land and rights.
☐☐ Legal fees.
☐☐ Engineering fees.
☐☐ Resident project representation or construction inspection fees.
☐☐ Environmental costs.
☐☐ Operation and maintenance manual as appropriate.
☐☐ Interest.
☐☐ Contingency.
☐☐ Refinancing.
☐☐ Other costs associated with the proposed project.

**B. Water reuse.**

1. **Volume and quality of reclaimed water flow.**
☐☐ Describe anticipated flow from WW treatment works to the water reuse treatment facility.
☐☐ Describe how proposed project impacts the design flow in the Oklahoma Water Quality Management Plan (208 Plan) and other applicable OPDES permit limits.

2. **Treatment, category, and usage.**
☐☐ Describe treatment processes.
☐☐ Describe disinfection system.
☐☐ Describe biosolids management.
☐☐ Describe category and usage of reclaimed water.
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☐ ☐ Describe location of plant.
☐ ☐ Describe discharge points.

3. **Storage, retreatment, and chlorination.**
☐ ☐ Describe storage facility.
☐ ☐ Describe retreatment.
☐ ☐ Describe chlorination.

4. **Pumping stations.**
☐ ☐ Identify size, type, and locations.
☐ ☐ Identify any special power requirements.
☐ ☐ Identify provisions for emergency operations.

5. **Reclaimed water distribution system layout.**
☐ ☐ Identify general locations of line improvements (lengths, sizes, and key components).
☐ ☐ Include the direction of flow of all existing and proposed reclaimed water distribution lines.

6. **Hydraulic and design calculations.**
☐ ☐ Provide supporting calculations to demonstrate DEQ compliance.

7. **Other requirements.**
☐ ☐ Include waste disposal.
☐ ☐ Include green project reserve components.
☐ ☐ Include recommended alternative cost estimate.

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

☐ ☐ Provide current and proposed or projected rate schedules.
☐ ☐ Discuss annual O & M cost.
☐ ☐ Provide tabulation of users by monthly usage categories.
☐ ☐ Provide revenue received for the last three fiscal years or financial audits if available.
☐ ☐ Discuss status of existing debt and required reserve accounts.
☐ ☐ Provide an evaluation of short-lived assets. See Appendix F in Guidelines.

VII. **CONCLUSIONS AND RECOMMENDATIONS.**

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

END OF CHECKLIST