Attachment A: Data Elements List

Regional Municipal Water and Wastewater Systems Inventory

Section 1: Basic System Information

System Name:

System Type *(Municipal, Rural Water District, Private, Other)*:

If "Other," please specify:

Ownership Structure:

- Ownership type *(Village, City, Regional District, Private, County)*
- If privately operated, list the operator and describe the contract and responsibilities.

Service Area:

- Defined boundaries of the service area
- Total geographic coverage (in square miles)
- Identification of critical infrastructure served (e.g., hospitals, emergency shelters)

System Connections *(check all that apply)*:

- Independent Water/Wastewater System
- Purchases water/sewer services from another system
    - List provider(s), volume, and agreement terms
- Provides bulk water/sewer services to other communities
    - List recipient(s) and contract terms
- Seasonal or temporary interconnections (purpose and frequency)
- Emergency interconnection agreements (with whom and for what capacity)

Customer Base *(number and description)*:

- Residential
- Commercial
- Industrial
    - Identify key industries, usage levels, and special service needs

- Institutional
    - Schools, hospitals, government facilities, etc., with notable demands
- Total active and inactive service connections

Governance & Partnerships:

- Existence of interlocal agreements, regional partnerships, or shared service governance

Section 2: Age & Condition of Infrastructure

Major System Upgrades:

- Timeline and reasons for significant upgrades (e.g., population growth, compliance, modernization)
- Notable technology updates, material replacements, or capacity expansions

Component Overview
(Provide installation year, condition rating, and maintenance/refurbishment history for each)

- **Wells or Surface Water Intakes**
    - Number, depth, capacity
    - History of contamination or performance issues
- **Treatment Facilities** *(e.g., chlorination, UV, filtration)*
    - Type, capacity, condition
    - Maintenance schedules and known weaknesses
- **Distribution & Collection Mains**
    - Total length by material (PVC, cast iron, etc.)
    - % of mains over 50 years old
    - History of pipe bursts, boil orders, emergency repairs (past 5 years)
- **Storage Tanks & Pumping Stations**
    - Storage capacity, age, inspection frequency
    - Operational efficiency and maintenance records
- **Lift Stations & Force Mains**
    - Number, capacity, condition
    - Role in system and recent upgrades or plans for replacement

System Vulnerabilities & Condition Monitoring:

- Frequency and cause of system failures (breaks, leaks, treatment issues)
- Average response and repair times
- Unidentified water loss
- Practices for full-system condition assessments and integration into capital planning

Risk Identification & Mitigation:

- High-risk components or zones
- Emergency response plans and mitigation strategies
- Climate/weather-related vulnerabilities (e.g., freeze/thaw, flooding)

Materials, Compatibility & Modernization:

- Historical and current material profiles (e.g., for mains and tanks)
- Technology integration challenges (SCADA, treatment systems, etc.)
- Upgrade prioritization criteria
- Anticipated funding sources and timelines for future replacements

Section 3: Capacity & Demand

System Capacity Overview:

- Current treatment capacity (MGD) for both water and wastewater
- Peak operational thresholds and daily variability
- Critical capacity limitations

Demand Patterns:

- Average daily vs. peak demand
- Seasonal and daily fluctuation trends
- Key factors driving peak usage (e.g., industry, tourism, agriculture)

Permitted Maximum Capacity:

- State/federal permit limits for water and wastewater systems
- Regulatory implications of exceeding thresholds
- Historical compliance related to capacity use

Connection & Usage Policies:

- Restrictions on new residential, commercial, or industrial connections
- Impact of moratoriums or caps on growth

Growth Forecast & Planning:

- Projected residential, commercial, and industrial growth
- 5-, 10-, and 20-year capacity planning forecasts
- Planned infrastructure expansions in response to expected growth
- Anticipated regional development impacts

Shared Capacity & Interconnections:

- Existing intermunicipal capacity-sharing agreements
- Available reserve capacity through regional partnerships
- Long-term capacity access agreements

Infrastructure Utilization & Optimization:

- % of infrastructure utilized under normal and peak conditions
- Optimization strategies to extend asset life and delay major investments

Demand Management & System Stress Testing:

- Use of demand-side management tools (e.g., smart meters, leak detection)
- Frequency, scope, and findings of recent stress tests
- Use of test results in planning and mitigation

Environmental & Regulatory Considerations:

- Environmental impacts of system expansion
- Strategies for addressing climate-related risks (drought, flood, extreme heat/cold)

Section 4: Existing Needs & Deficiencies

Infrastructure Weaknesses:

- Aging pipelines (% requiring immediate repair and locations)
- Undersized mains causing low pressure (identify affected zones)
- Sewer overflows or backups (frequency and impact)
- Chronic problem areas:
    - Low pressure

    - Water loss
    - Boil water advisories (frequency, causes, duration)

Regulatory Compliance & Public Health Risks:

- Recent or ongoing violations (e.g., NPDES, SDWA, water quality exceedances)
- Enforcement actions taken (e.g., letters of non-compliance, consent orders)
- Steps taken or planned to address violations
- Health/environmental risks from contamination (e.g., lead lines, nitrate exceedances)
- Exposure to extreme weather events and related vulnerabilities

Service Interruptions & Reliability Issues:

- Frequency and causes of outages (by system component)
- Redundancy gaps in critical infrastructure
- Emergency response capacity for service disruptions

Customer Service Challenges:

- Persistent complaints (e.g., taste, odor, color)
- Recurring pressure or drainage issues
- Trends in customer dissatisfaction

Operational & Asset Management Gaps:

- Staffing limitations affecting maintenance and compliance
- Shortage of specialized equipment or technology
- Lack of up-to-date system maps and asset records
- Absence or gaps in asset management plans and prioritization criteria
- Operator certification status

Financial & Resource Constraints:

- Unfunded immediate infrastructure needs
- Budget shortfalls for critical maintenance
- Barriers to securing external funding (e.g., due to compliance issues)

Community & Economic Impacts:

- Effect of deficiencies on local health, safety, and economic development
- Risks to community well-being or business retention/expansion

Risk Mitigation & Technical Barriers:

- Identification of high-risk areas needing urgent action
- Existing emergency action plans and their effectiveness
- Geographic or engineering constraints impacting upgrades
- Strategies for overcoming technical or environmental challenges

Section 5: Planned or Proposed Projects

Capital Improvement Planning:

- Existence of a current Capital Improvement Plan (CIP)
- Scope, duration, and date of most recent update

Planned Infrastructure Upgrades:

- Description of upcoming or proposed projects
- Indicate whether projects address:
    - Regulatory compliance
    - Operational efficiency
    - Service expansion or capacity needs

Project Feasibility & Cost Estimates:

- Status of preliminary engineering reports (PERs)
- Date of most recent feasibility study
- Source and basis of cost estimates (e.g., engineer's estimate, internal review)
- Total estimated cost, broken down by major component

Funding Strategy:

- Secured funding sources and amounts (local, state, federal, private)
- Total funding gap, if any
- Contingency plans if full funding is not obtained
- History of successful grant applications or funding partnerships
- Existing debt obligations related to planned improvements

Resilience & Sustainability Planning:

- Integration of climate resilience and energy efficiency

- Anticipated long-term cost savings or operational benefits from proposed upgrades
- Role of new or upgraded technology in proposed projects

Community and Economic Development Alignment:

- Alignment with local or regional development goals
- Projected economic impact or growth opportunities
- Plans for engaging the public in project development and implementation

Section 6: Technology & System Efficiency

Treatment Technologies:

- **Water Treatment**:
    - Processes used (e.g., chlorination, UV, filtration, reverse osmosis)
    - Age, condition, and efficiency of technologies
    - Plans for upgrades or innovation
- **Wastewater Treatment**:
    - Processes used (e.g., lagoons, activated sludge, membrane systems)
    - Capacity relative to demand
    - Energy usage and planned technology improvements

Monitoring & Automation Systems:

- Use and capabilities of SCADA or remote monitoring systems
- Integration of predictive maintenance and data analytics tools
- Cybersecurity measures for digital and automated systems

Metering & Consumption Management:

- Percentage of metered customers
- Use of smart meters and remote-read technology
- Leak detection and unauthorized usage monitoring
- Use of metering data in system optimization and planning

Energy Efficiency & Emissions Reduction:

- Use of energy-efficient equipment (pumps, motors, etc.)
- Energy recovery systems and renewable energy adoption

- Carbon footprint assessment and emissions reduction strategies

System Optimization Tools:

- Hydraulic modeling and adaptive management practices
- Demand forecasting and optimization through AI/machine learning

Research, Innovation & Barriers to Adoption:

- Participation in pilot projects or partnerships with institutions
- Budget allocated for R&D and innovation
- Challenges to adopting new technologies:
    - Funding limitations
    - Staffing expertise
    - Regulatory hurdles

Section 7: Communications & Coordination

Regional & Shared Service Agreements:

- Participation in regional utility agreements
    - Scope, duration, terms, and benefits (e.g., cost savings, resource sharing)
    - Challenges in maintaining collaboration
- Shared services with neighboring communities
    - Joint use of treatment, emergency water supply, or operations
    - Cost-sharing and responsibilities
    - Frequency and effectiveness of shared service utilization
- Future opportunities for service consolidation or regionalization

Emergency Planning & Mutual Aid:

- Existing mutual aid agreements and participating entities
- Emergency response plans for droughts, floods, contamination events, etc.
- Emergency drill/training frequency
- Availability of backup equipment and alternate water sources

Public Communication & Outreach:

- Notification methods for service issues (e.g., boil orders, outages)

- Communication channels used (e.g., social media, text alerts, news outlets)
- Public education efforts (e.g., conservation, infrastructure awareness)
- Accessibility of services for non-English speakers and persons with disabilities

Stakeholder & Community Engagement:

- Processes for involving the public (e.g., public hearings, advisory boards)
- Strategies for handling public concerns or complaints
- Partnerships with schools, businesses, or community organizations for outreach

Inter-Agency Coordination:

- Collaboration with planning agencies, environmental regulators, and emergency services
- Use of shared data systems or platforms for real-time coordination
- Joint planning exercises or aligned operational strategies

Customer Feedback & Transparency:

- Methods for collecting and analyzing customer feedback
- Key performance indicators tied to customer satisfaction
- Trends in complaints and response strategies
- Transparency policies, including access to service performance and financial reports
- Media engagement strategies for major initiatives or emergencies

Section 8: Water & Wastewater Quality

Compliance History & Violations:

- All EPA, NDEE, and SDWA violations within the past five years
- Corrective actions taken or planned
- Fines or penalties issued and resolution status

Water Quality Monitoring & Contaminants:

- Frequency and scope of routine testing
- Use of certified labs or real-time monitoring systems
- Most recent results for lead, nitrate, arsenic, and other regulated contaminants
- Trends in contaminant levels over the past decade
- Response measures for elevated levels

- Public notification procedures for exceedances

Wastewater Effluent Quality:

- Compliance with effluent discharge standards
- History of exceedances and enforcement actions
- Monitoring frequency and methodology
- Impact of effluent on receiving water bodies

Public Communication & Complaints:

- Frequency, causes, and duration of boil water advisories
- Nature and frequency of public complaints (e.g., taste, odor, color, pressure)
- Effectiveness of communication strategies during advisories
- Customer satisfaction with complaint resolution
- Trends in feedback and proactive measures taken

Source Water Protection:

- Programs to protect drinking water sources
- Land use controls, watershed management, or other preventative measures
- Public involvement in source water protection

Cross-Connection & Backflow Prevention:

- Policies and enforcement mechanisms
- Inspection frequency and staff/contractor training programs

Nutrient Management & Wastewater Reuse:

- Nutrient removal technologies in place
- Wastewater reuse opportunities and active programs
- Regulatory considerations for reuse initiatives

Water Loss Control:

- Annual audit practices
- Main causes of water loss (e.g., leaks, theft, meter inaccuracies)
- Strategies to reduce loss and improve efficiency

Emerging Contaminants & Innovation:

- Monitoring for emerging or unregulated contaminants

- Response planning for detected substances
- Participation in state/federal programs related to emerging water quality issues

Section 9: Financial Health & Debt Obligations

Debt Obligations:

- List of all outstanding debt, including:
    - Bond issues (type, amount, issuance/maturity dates)
    - SRF, USDA-RD, private loans, or other sources
    - Annual debt service requirements
    - Terms and repayment conditions

Revenue & Operating Costs:

- Total annual utility revenue
- Operating cost breakdown (labor, energy, chemicals, maintenance, etc.)
- 5-year comparison of revenue vs. operating costs
- Efficiency trends and cost-saving efforts

Maintenance & Capital Budgets:

- % of budget allocated to maintenance and capital improvements
- Historical capital spending patterns
- Gaps between projected needs and available funds

Reserve Funds & Contingencies:

- Current reserve fund balance
- Policies for reserve contributions and withdrawals
- Assessment of adequacy against industry best practices

Financial Performance & Sustainability:

- Surplus or deficit status
- Contributing factors to deficits, if applicable
- Long-term sustainability projections

Funding Sources & Grant Access:

- Mix of local, state, federal, and private funding sources

- Grant success rate and history of partnerships
- Barriers to external funding access (e.g., eligibility, match requirements)

Affordability & Rate Impact:

- Rate affordability for low-income households
- Impacts of past or proposed rate changes
- Strategies for balancing financial needs with community affordability

Financial Risk Management:

- Risk assessment (economic downturns, emergencies, inflation)
- Insurance coverage for major infrastructure and liability
- Contingency plans for unexpected financial shocks

Long-Term Financial Planning:

- Existence of a 10+ year financial plan
- Integration with capital improvement and rate plans
- Strategies to address unfunded liabilities (e.g., pensions, major capital needs)

Transparency & Financial Reporting:

- Availability of audited financials
- Public access to financial documents and performance data
- Use of performance metrics to assess financial health

Section 10: Rates & Anticipated Rate Adjustments

Current Rate Structure:

- Residential, commercial, and industrial rate schedules:
    - Monthly base charge (separate for water and sewer)
    - Usage charge (e.g., per 1,000 gallons or other unit)
    - Connection fees and additional service charges
- Type of rate structure used (flat fee, tiered, volume-based, seasonal)
- Rationale for the chosen structure

Rate Adjustment History:

- Record of rate changes over the past 10 years

    - Dates and % increase or decrease for each adjustment
    - Reasons for changes (e.g., infrastructure upgrades, compliance, inflation)

Planned Rate Adjustments:

- Anticipated rate changes in the next 5 years
- Estimated % increases and projected revenue impact
- Justification for upcoming adjustments (e.g., capital improvement funding, operating costs)

Rate Study & Analysis:

- Availability and date of the most recent rate study
- Key findings and recommendations
- Plans for updating rate studies and frequency of review

Revenue Adequacy:

- Assessment of whether current rates meet operational and debt service needs
- Use of cost-of-service or affordability analyses in rate setting
- Financial outlook under current rate structures (short- and long-term)

Stakeholder Engagement:

- Methods for involving customers and stakeholders in rate-setting (e.g., hearings, advisory groups)
- Communication strategies to explain rate changes and collect public input
- Summary of recent community feedback and actions taken

Future Rate Planning:

- Rate projections for the next 10–20 years
- Integration of rate forecasts with financial and capital improvement planning
- Consideration of inflation, regulatory requirements, and infrastructure aging in future rate modeling

Section 11: Interstate & Regional Infrastructure Connections

Cross-Border System Connections:

- Does the system connect with utilities in other states?
- Description of connection points, infrastructure, and capacity

- Frequency and volume of water/sewer exchanges across state lines

Formal Agreements for Cross-State Services:

- Existing agreements with out-of-state providers or recipients
- Duration, terms, and renewal conditions
- Legal or regulatory frameworks governing cross-border service

Water/Sewer Sales and Purchases:

- Details of services sold to or purchased from out-of-state entities
- Volume exchanged, pricing structures, and annual revenue generated

Regional Planning & Long-Term Integration:

- Participation in interstate or regional infrastructure planning initiatives
- Opportunities to enhance service reliability through regional collaboration
- Long-term strategies for integration, shared capacity, or joint infrastructure development

Operational Efficiencies from Regional Coordination:

- Cost savings, redundancy, or performance improvements from regional connections
- Examples of successful shared projects or partnerships
- Future plans for coordinated infrastructure investment or service delivery

Section 12: Workforce & Staffing

Workforce Composition:

- Total number of full-time and part-time staff
- Role breakdown (e.g., operators, maintenance, administrative, technical)
- % of workforce dedicated to water vs. wastewater operations

Certified Operators:

- Number of operators by certification level (Class I–IV, treatment/distribution)
- Minimum certification levels required for key roles
- Current gaps or coverage concerns

Experience & Skillsets:

- Average years of experience in critical positions
- Specialized in-house capabilities (e.g., SCADA, lab testing, engineering)

- Identified skill or certification gaps

Staffing Challenges:

- Anticipated retirements or staff shortages (5–10 year outlook)
- Recruitment or retention difficulties, especially for technical roles
- Contributing factors to turnover
- Current strategies to retain qualified staff

Succession Planning:

- Existence of formal or informal succession plans
- Continuity strategies for technical and leadership transitions

Training & Professional Development:

- Access to training programs for certification advancement
- Participation in continuing education or skills development initiatives
- In-house mentoring or peer support programs

Health & Safety Practices:

- Safety training and certifications held by staff
- Use of PPE and workplace safety technology
- History of incidents and corrective measures taken

Compensation & Benefits:

- Comparison of wages and benefits to industry benchmarks
- Availability of health insurance, retirement plans, and other incentives
- Influence of compensation on recruitment and retention success

Section 13: Workforce & Economic Development

Local Workforce Development Partnerships:

- Participation in local or regional workforce training initiatives
- Collaboration with workforce boards, economic development agencies, or nonprofits
- Successes or challenges in connecting training programs to utility employment needs

Apprenticeships & Internships:

- Availability of apprenticeship or internship programs

- Partnerships with technical schools, community colleges, or universities
- Measurable outcomes (e.g., number of hires, certification completions)
- Mentorship or onboarding opportunities for entry-level workers

Utility's Role in Economic Development:

- How utility infrastructure supports local business growth and retention
- Involvement in municipal or regional economic development planning
- Impact of reliable water/wastewater service on housing, business recruitment, and public facilities

Business Support Services:

- Utility support for business expansion (e.g., expedited connections, capacity analysis, technical assistance)
- Case studies or examples of how utility involvement supported business success

Innovation & Economic Growth:

- Investment in technologies that promote sustainable economic growth
- Pilot projects or partnerships aimed at innovation in service delivery
- Community benefits from R&D or modernization efforts

Incentive & Funding Programs:

- Participation in state, federal, or private programs supporting workforce or economic development
- Incentives provided to businesses for sustainable practices (e.g., water reuse, conservation)

Economic Impact Analysis:

- Evaluation of how utility operations support the local economy and workforce
- Assessment of risks that infrastructure gaps pose to economic resilience
- Long-term strategies to maintain utility contributions to economic development