“RETTEW’s hands-on experience helped the University Area Joint Authority optimize the systems that make up the Beneficial Reuse Project. Their staff has an extensive knowledge on water reuse-related issues and concerns. They are practical and work side by side with our staff to achieve our goals for maintaining world-class treatment and reuse.”

Cory Miller, Executive Director
University Area Joint Authority

FEASIBILITY STUDIES
- Source and Life Analysis
- Reuse Options and Customer Analysis
- Treatment Protections and Quality Requirements
- Opportunity Identification and Quantification
- Proforma Development

TREATMENT DESIGNS
- Treatment Train Development
- Conceptual Design
- Pilot Studies, Field Trials, Benchtop Testing
- Facility Design
  - High- and Low-Pressure Membrane Treatment
  - Biological Filtration and Conventional Filtration
  - Advanced Oxidation Processes
  - Lime Softening and Ion Exchange
  - Integrated Wastewater/Water Treatment
  - Natural Systems

TRANSMISSION AND DISTRIBUTION
- Reclaimed Water Storage
- Reclaimed Water Distribution/Transmission Lines
- Reclaimed Pumping Stations

HEALTH AND HUMAN IMPACTS
- Potential Impacts and Process Safety
- Endocrine Disrupting Compounds and Treatment
- Indirect and Direct Potable Consumption

DATA MANAGEMENT
- GIS Data Acquisition and Design
- SCADA Design and Implementation
- Program Management

FUNDING AND GRANT COORDINATION
- Work with Private and Public Funding Agencies
- Identifying and Obtaining Assistance
- Application Development
- Funding Contract Administration

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SUSTAINABILITY COMMITMENT
RETTEW is committed to minimizing our impact on the environment. In addition to our focus on resource conservation and sustainable design projects, we are committed to behaving in an environmentally responsible way in our everyday business practices. Our corporate sustainability policy ensures that RETTEW remains an eco-friendly community partner. This policy contributes to our purpose of improving the quality of life for the communities and clients we serve.

SUPPORT INFORMATION
Water Reclamation and Reuse
Minimizing the Water Footprint

“Water is the soul of the Earth.”
- W. H. Auden, poet

Water is necessary for life, but only a small percentage is available for human consumption. Water is also an invaluable commodity relied upon by industries and communities for growth and prosperity. With increasing water demands throughout rural and urban regions, many have turned to water reclamation and reuse to harvest this valuable resource, while reducing costs and improving sustainability. RETTEW’s goal is minimizing the water footprint through reclamation and reuse. Expanding water reuse can significantly increase water resources.

RETTEW’s team members are recognized experts within the water reuse community, providing extensive knowledge of pertinent national and state regulations. We can assist you in advancing cost-effective water reuse programs.

SERVICE OVERVIEW
- Feasibility Studies
- Treatment Design
- Transmission and Distribution
- Health and Human Impacts
- Data Management
- Funding and Grant Coordination
PROJECT EXPERIENCE

RETTEW has completed or assisted in organizing numerous projects focused on the capture, treatment, and reuse of wastewater, groundwater, produced water, and stormwater. We can help you identify and evaluate water reuse opportunities, pilot test and verify technology, provide detailed facility design, and direct project implementation.

RETTEW’s clients currently produce reclaimed water from wastewater, reusing it for agriculture, industry, oil and gas fracturing, non-potable commercial purposes, and to replenish groundwater. Our clients have implemented these projects for various reasons, including meeting regulatory requirements, to protect the environment or to save money.

Our experience includes every aspect of a reuse project including treatment, distribution, discharge, pumping, and data management. Treatment system designs have included biological wastewater treatment, filtration, microfiltration, reverse osmosis (RO), chemical feed systems for pH control and antiscalant, advanced oxidation processes (AOP), and disinfection via ultraviolet (UV) and chlorine.

TREATMENT
Water Treatment Facility, Niobrara Shale Play, WY
RETTEW assisted in managing field-produced water by treating the wastewater to meet Wyoming Department of Environmental Quality standards. Untreated water contains high concentrations of total dissolved solids commonly found in Wyoming’s deep aquifers. The wastewater facility encompasses various pretreatment technologies including oil/water separation, filtration, and ion exchange prior to final treatment through a multi-stage RO process. This project marks an important advance in pursuing natural gas and oil resource development in an environmentally conscious manner by maximizing opportunities to recycle water.

SUPPLEMENT FOR POTABLE DEMAND
Wastewater Reclamation Facility, University Area Joint Authority, PA
RETTEW assists a large wastewater reclamation facility, which uses reuse to reduce its discharge to a local spring-fed creek with a world-class brown and rainbow trout population, to recharge the groundwater while providing quality necessary for indirect potable reuse. Indirect potable reuse customers include hotels (irrigation/laundry/swimming pool), an industrial launderer, car washes, government buildings, and a country club (irrigation/swimming pool). RETTEW assisted with planning, permitting, design, and operations of the facilities. We also recently designed, permitted, and oversaw construction of an AOP system for the control of biofouling of its RO membranes.

GROUNDWATER RECHARGE
Ross Spray Field Construction, Oxford Area Sewer Authority, PA
RETTEW designed, obtained permitting, and oversaw construction of a new wastewater treatment plant with spray irrigation of effluent. Member communities chose spray disposal to meet stringent Chesapeake Bay nutrient limits and recharge the local aquifer. RETTEW was responsible for the design and construction of a new mechanical treatment plant, upgrades to existing treatment ponds to convert them to treated wastewater storage, construction of a 39.4-million-gallon treated water storage lagoon, and design and equipping of the farm with spray disposal apparatus. Because of this project, the Authority now owns and operates the largest effluent spray operation in Pennsylvania.

PILOT TESTING
Irrigation District Pilot Testing
Kern County, CA
RETTEW recently completed pilot testing for an irrigation district in California as a follow-up to a conceptual design study that evaluated the feasibility of treating produced water to a quality suitable for irrigation of crops. We performed pilot testing to confirm the effectiveness of the proposed process treatment train, to validate key water quality parameters, and to determine potential equipment sizing and costs. Based on the results of the study, the pilot testing validated the results of the conceptual design. Testing indicated that the produced water could be treated to the desired standards for irrigation. The client is currently testing another source and intends to proceed with design and permitting of a full-size facility.

TRANSMISSION AND DISTRIBUTION
Utilities, Ohio River Water System
Multiple Counties, WV
RETTEW provided permitting and engineering design services for two pumping facilities, with 20 miles of buried pipeline between them. The stations are capable of moving 80 barrels of water per minute, or 3,360 gallons per minute, at a discharge pressure of 434 pounds per square inch. The first station withdraws water from the Ohio River via a submerged intake screen and intake pipe. A wet well collects the water and pumps it through a 20- to 24-inch pipe downstream, ranging in distance from 20 to 70 miles away, to the second pumping station. The stations feature four 400-horsepower vertical turbine pumps and telemetry controls.

DATA MANAGEMENT
Comprehensive Data System Development
PA, WV, and OH, Marcellus and Utica Shale Plays
RETTEW’s natural gas client was completing a complex waterline project involving more than 600 miles of temporary waterlines. We proactively combined multiple data sets from several sites into a simple yet comprehensive system, enabling construction coordination of new pipelines based on water, gas, roadway, and environmental impacts. Our client used the data to clarify operation schedules, ensuring the right timing for source availability. This sophisticated system also provided extensive data used in support of the Pennsylvania One Call System to identify utilities in a specific geography.