

STATEMENT OF QUALIFICATIONS

for

WASTEWATER TREATMENT

and

RESIDUALS MANAGEMENT



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1.0 OVERVIEW

Wastewater treatment and management of the resulting residuals are issues of importance to the public, government entities responsible for providing treatment and disposal services, as well as commercial and industrial establishments throughout the United States.

Effective planning for wastewater treatment and residuals management presents an opportunity to minimize and control long-term costs, to seek beneficial uses of residuals, and to select wastewater management, treatment, and disposal technologies that results in acceptable environmental impacts while providing reliable service. In addition, opportunities for regionalization and public-private partnerships may provide desirable means to reduce and offset costs, operational and maintenance responsibilities, and environmental liabilities.

Alternative Resources, Inc. (ARI) is an independent consulting firm providing engineering, environmental, economics, and planning services to assess alternatives and implement solutions for wastewater treatment and residuals management.

ARI has provided consulting services for more than 50 wastewater treatment and residuals management projects in 14 states. The company serves both public entities and private developers. ARI's public clients are districts, authorities, municipalities, and counties, in urban, suburban and rural areas. Private clients have included major developers with facilities throughout the United States and developers of individual facilities. ARI also provides specialty subconsultant services to wastewater design firms.

2.0 ORGANIZATION

ARI was incorporated in Massachusetts in 1984. The company is a Subchapter S Corporation, owned by its working principals.

ARI's resources are organized in four major groups: Planning, Engineering, Environmental Compliance, and Economics and Finance. Engineering skills include wastewater treatment, mechanical, civil, chemical, and environmental disciplines. Scientists provide expertise in meteorology, chemistry, and soil science. Planners and economists provide the framework for integrating engineering and scientific analyses. As appropriate, these skills are brought together on a project team basis to address client needs. The project team is directed by a project manager responsible for client interaction, project quality, and cost control

ARI offices are located in Concord, Massachusetts. Services are offered nationwide.

3.0 SERVICES AND EXPERIENCE

ARI offers services for:

- FACILITIES PLANNING
- ANALYSIS OF ALTERNATE PROJECT DELIVERY METHODS
- ANALYSES OF OPTIONS FOR PUBLIC-PRIVATE PARTNERSHIPS
- ASSESSMENT OF REGIONALIZATION OPPORTUNITIES
- RESIDUALS MANAGEMENT
- OPERATIONS MANAGEMENT
- PROGRAM MANAGEMENT
- ENVIRONMENTAL PERMITTING
- ODOR CONTROL
- PROCUREMENT AND CONTRACT NEGOTIATIONS
- ECONOMIC AND FINANCIAL ANALYSES
- OPTIMIZATION/ASSET MANAGEMENT EVALUATION
- DESIGN
- CONSTRUCTION MONITORING
- OPERATIONS MONITORING
- FACILITIES PERFORMANCE AND ACCEPTANCE TESTING

Figure 1 lists specific ARI services. Further descriptions of these services are provided below.

Tables 1, 2, 3 and 4 provide representative examples of project experience with: facilities planning; wastewater treatment design, construction, and operations; procurement; and residuals management.

3.1 Facilities Planning

The facilities planning process is established to analyze the technical, economic, environmental and financial factors necessary to select a cost-effective wastewater or residuals management plan. During facilities planning, ARI defines the problem, identifies the client's needs, defines and develops alternative treatment and disposal systems, performs technical and economic analysis on selected alternatives, defines a plan and outlines the future actions required to implement the selected plan. The ultimate objective of facilities planning is to arrive at a well defined, cost-effective, and environmentally sound wastewater treatment system accepted by both the municipality and the regulatory authorities.

Figure 1

ARI SERVICES

FACILITIES PLANNING

- water and wastewater characterization
- biosolids and residuals characterization
- technology evaluations
- conceptual design
- siting analysis
- public participation programs
- life-cycle economic analysis
- cost/benefit analysis
- preparation of facility plans
- analysis of alternative project delivery
- assessment of regional alternatives

ENGINEERING DESIGN

- design of new facilities
- design of modifications and retrofits
- independent design review
- preparation of plans/specifications
- preparation of equipment prequalification documents

FINANCIAL AND ECONOMIC ANALYSIS

- assessment of capital improvement programs
- construction and O&M cost estimates
- life-cycle economic analyses
- analyses of financing methods
- revenue requirement analyses
- rate analysis
- State Revolving Fund applications

ENVIRONMENTAL PERMITTING

- environmental impact statements/reports
- Part 503 permitting
- odor control plans
- NPDES permitting
- negotiation of compliance orders
- Clean Air Act permitting

**CONSTRUCTION MANAGEMENT,
ACCEPTANCE/PERFORMANCE TESTING**

- review of contract documents
- monitoring of contractors
- resident observation
- change order negotiations
- review of payment requests

**CONSTRUCTION MANAGEMENT,
ACCEPTANCE/PERFORMANCE TESTING
(continued)**

- maintaining project records
- maintaining project diaries
- ensuring quality assurance/quality control
- preparation of as-built drawings
- acceptance and long-term performance testing

OPERATIONS MANAGEMENT

- development of operation and maintenance manuals and maintenance management systems
- operations monitoring and troubleshooting
- operator training programs and courses
- development of asset management programs
- optimization analysis

**ANALYSES OF AND PROCUREMENT FOR
PUBLIC-PRIVATE PARTNERSHIPS**

- seminars
- planning workshops
- analysis of public-private partnership options
- preparation of special legislation for innovative procurements
- preparation of Requests for Qualifications and Requests for Proposals
- evaluation of qualification statements and proposals
- assistance in contract negotiations
- contract administration and monitoring

PROGRAM MANAGEMENT

- assistance in establishing project framework/goals
- project management and scheduling
- interfacing with regulatory agencies
- consultant coordination
- consultant review/selection
- cost control

Table 1


 Representative Wastewater Facilities Planning Projects	Project Type				Scope of Services								Specialty Issues						
	Wastewater Collection	Wastewater Treatment	Biosolids/Residuals Treatment	Biosolids/Residuals Disposal	Technology Evaluations	Conceptual Designs	Environmental Assessments	Siting Analysis	Public Participation Programs	Life-Cycle/Economic Analysis	Rate Analysis	Product Market Plan	Facilities Plan	Innovative Solutions Recommended	Alternative Technologies Recommended	Small Community Project	Large Community Project	Federal Grants Applied	State Grants Applied
Massachusetts																			
Greater Lawrence Sanitary Sewer District		■	■	■	■		■		■	■			■					■	■
Upper Blackstone Water Pollution Abatement District		■	■	■	■	■	■		■	■			■					■	■
City of Springfield		■	■	■	■	■				■								■	
Town of Essex	■	■			■			■	■				■	■	■	■			
Town of Plymouth	■	■	■	■	■	■	■		■	■	■		■	■	■				
City of Fall River	■	■			■	■	■	■	■	■	■						■	■	■
Connecticut																			
City of Bridgeport			■	■	■	■		■		■		■				■			
New York																			
Town of Milo	■				■	■	■	■	■	■	■		■	■	■	■		■	■
Village of Rushville	■	■			■	■	■	■	■	■	■		■	■	■	■		■	■
Village of Interlaken	■	■	■		■	■	■	■	■	■	■		■	■	■	■		■	■
Town of Montour Falls	■	■			■	■		■	■	■	■		■	■		■			
Village of Odessa	■	■			■	■		■	■	■	■		■	■		■			
Town of Farmington	■	■			■	■		■		■	■		■			■			
Village of Victor/Town of Victor	■	■			■	■		■		■	■		■			■		■	■
Village of Avon		■	■		■	■				■		■		■	■				
Monroe County Pure Waters District	■	■			■	■	■	■	■	■	■		■				■	■	■
Onondaga County				■	■	■	■	■	■	■	■		■						
Pennsylvania																			
Monroe County		■	■		■	■	■	■	■	■		■		■				■	
Clinton County				■	■	■	■	■	■	■		■					■		
Hanover Township		■	■	■	■	■		■					■		■				
Union County	■	■	■	■	■				■				■			■	■		■

Table 2



 Representative Wastewater Collection & Treatment Project Experience	Size	Type				Dis-charge		Scope of Service						Specialized Services					
	Flow MGD	Secondary Treatment	Nutrient Removal & Advanced Treatment	Collection Systems & Pump Stations	Septage Treatment	Surface Water	Groundwater Recharge	Planning	Design Plans & Specifications	Construction Management	Start-up / Operations Monitoring	Troubleshooting	O&M Manual Preparation	Operator Training	Public / Private Partnerships	Program Management	Procurement	Operations Management	Permitting
Massachusetts Town of Essex (Private Development)	0.5	■	■	■			■	■	■	■		■	■						■
Town of Carver (Private)	0.1	■	■	■	■		■			■	■			■	■	■			
Greater Lawrence Sanitary Sewer District	52.0	■			■	■		■						■					
Town of Buckland	0.5	■	■			■			■	■	■			■					■
Upper Blackstone Water Pollution Abatement District	56.0	■	■		■	■		■		■	■			■	■	■			
City of Taunton	8.4	■	■			■		■						■		■			
MWRA, Quincy						■													
Town of Grafton	0.25			■				■	■										■
Town of Essex	0.1			■				■	■										■
Town of Beverly	0.1			■				■	■										■
New York Village of Massena	2.5	■				■		■	■	■	■	■	■					■	■
Village of Webster	2.0	■	■	■		■		■	■	■	■	■							■
Town of Webster	15.0	■	■	■		■		■	■	■	■	■							■
Town of Canadaigua	22.0	■	■			■		■		■			■						■
Seneca Army Depot	5.0	■	■	■		■	■		■	■									
Village of Avon	2.5	■				■			■	■	■			■					■
Village of Walden	1.0	■				■					■		■						■
Village of Rushville	0.3	■	■	■		■		■	■	■			■						■
Village of Interlaken	0.75	■	■	■		■		■	■	■			■						■
Town of Milo	0.5			■		■		■	■	■			■						■
Pennsylvania Monroe County	0.35	■	■		■	■		■	■					■					■
Hanover Township	0.4	■	■		■	■		■	■					■					■

Table 3

 <h1 style="margin: 0;">ARI</h1> <p style="margin: 0;">Recent Experience: Public-Private Partnerships</p>				Service Provided							
				Optimization Benchmark, Studies	Type of Procurement*	Pre-RFP Assessment	Preparation of RFQ/RFP	Proposal Review	Contract Negotiations	Contract Operations Monitoring	Design Review/ Construction Monitoring
Location	Population Served	Type of Facility	Size								
California Stockton	232,000	Water, Wastewater & Stormwater	42 MGD	●	D/B/O	●	●	●	●		
Iowa Sioux City	130,000	Wastewater	30 MGD	●	D/O	●	●	●	●		
Massachusetts Billerica	10,000	Water	14 MGD	●	D/B	●					
Fort Devens		Wastewater	3 MGD		D/B/O		●				
Gardner	21,000	Water & Wastewater	3 MGD		D/B/O		●	●			
Greater Lawrence Sanitary District	100,000	Wastewater	52 MGD	●	D/B/O	●					
Lee	5,000	Water & Wastewater	1.5 MGD		Contract Operations		●	●	●	Did not Privatize	
MWRA	Boston area	Water	20 MG		D/B		●	●	●		●
Plymouth	50,000	Wastewater	3 MGD	●	D/B/O D/B		●	●	●	●	●
Taunton	75,000	Wastewater	9.8 MGD		D/B/O	●	●	●	●	●	●
Upper Blackstone Water Pollution Abatement District	250,000	Wastewater	56 MGD	●	D/B	●	●	●	●	●	●
New Jersey Chester Borough	1,000	Water & Wastewater	100,000 GPD	●	Sale (water) D/B/O (waste-water)		●	●	●	●	●
Pennsylvania Middlesex Township	6,000	Wastewater	0.6 MGD		D/B/O		●	●	●		
Ohio Springboro	10,331	Water & Wastewater	7 MGD/ 2 MGD			●					
Rhode Island Westerly	14,000	Wastewater	3 MGD		D/B			●	●		●
<i>Johnston</i>	5,000	Water	0.5 MGD		Sale, Lease or Operations	●	●	●	●	Did not privatize	
<i>Smithfield</i>	19,000	Wastewater	3.5 MGD		D/B/O		●	●	●		
Connecticut Bridgeport Solid Waste Advisory Committee	1,000,000	Solid Waste	250 TPD (Recycling) 2,250 TPD (WTE)	●	D/B/O				●		
Housatonic Resource Recovery Authority	100,000	Solid Waste	80 TPD	●	D/B/O	●	●	●	●	●	●
Naugatuck	50,000	Wastewater	10.3 MGD	●	D/B/O		●	●	●	●	●
Waterbury	110,000	Water	25 MGD		O		●	●	●		
Maine Mid-Maine Waste Action Advisory Committee	100,000	Solid Waste	200 TPD	●	Option for facility sale		●	●	●	Did not privatize	
Rockland		Wastewater	2.9 MGD		O		●				
Puerto Rico Commonwealth of Puerto Rico	2,000,000	Solid Waste	3,600 TPD	●	D/B/O	●	●	●	●		

Table 4

 Representative Residuals Management Experience	Type of Facility						Scope of Service															
	Incineration	Pyrolysis/Gasification	Drying Pelletizing	Composting	Lime Stabilization &/or Land Application	Transfer	Residuals Quantity/Characteristics	Technology Evaluation	Facility Conceptual Design	Economic Analysis	Environmental Assessment	Siting Analysis	Residuals Management Plans	Procurement (Contract Negotiations)	Environmental Permitting	Design/Review/Construction Monitoring	Acceptance Testing	Odor Control/Monitoring	Public Participation Programs	Intermunicipal Agreements	Product Market Plans	
Maine Portland			■				■															
Massachusetts Boston Harbor/MWRA			■				■					■					■	■	■			
Greater Lawrence Sanitary Sewer District	■		■	■	■	■	■	■		■	■	■	■	■	■			■	■	■		
Upper Blackstone Water Pollution Abatement District	■						■	■	■	■	■		■	■	■	■	■	■	■	■	■	
Fitchburg	■														■							
Newburyport		■													■							
South Essex Sewer District	■	■		■	■	■	■	■		■		■	■	■								
Springfield			■	■			■	■	■	■		■		■			■	■				
Rhode Island Woonsocket	■										■						■	■				
Connecticut Bridgeport				■			■	■	■	■		■		■	■							
Waterbury	■		■					■		■		■		■	■	■						
New York New York City – Bronx			■				■				■				■					■		
New York City – Brooklyn						■	■			■	■			■	■			■	■			
Nassau County			■		■	■	■			■		■	■	■	■				■			
Glen Cove	■													■								
Onondaga County				■		■	■	■	■	■			■	■	■	■			■	■	■	■
New Jersey PVSC			■	■	■	■	■		■	■	■	■	■	■								
Carteret		■						■		■	■				■							■
Elizabeth	■														■							
Pennsylvania Monroe County			■				■	■	■	■	■	■		■	■	■	■			■	■	■
Schuylkill County				■			■	■						■	■				■			
Clinton County				■		■	■	■	■	■	■		■	■	■	■	■	■	■	■	■	■
Hanover Township					■		■	■	■		■			■	■							
Maryland Baltimore			■												■					■		
Hagerstown			■											■		■						
Ohio Clark County	■														■							
Wisconsin Green Bay															■							
Florida Tampa			■								■											
Texas Sierra Blanca					■	■	■	■		■	■		■	■	■					■		
Arizona Bowie					■	■	■	■		■	■		■	■	■							
Australia Sydney			■				■								■							

As indicated in Table 1, ARI staff have considerable experience in the preparation of municipal wastewater facilities' plans. Plans have been prepared for communities of different size and demographics. These included well-developed communities with established wastewater collection and treatment infrastructure and more rural communities, requiring solutions that utilized innovative techniques. For example, for rural communities, innovative technologies evaluated and recommended in facilities plans included: small diameter gravity sewers; septic tank effluent pump collection systems; grinder pumps and pressure sewer combinations; septage treatment systems; aerated lagoon systems; on-site decentralized systems; and recirculation sand filters for treatment. Table 2 illustrates representative wastewater treatment project experience.

Staff experience in facilities planning assures our clients that a systematic approach is used to achieve a recommended solution which meets the criteria set forth by the client and the regulatory agency and which is completed within budget. The company has developed an excellent reputation for negotiating agreements with regulatory agencies that precludes unnecessary expenditure of public funds.

3.2 Residuals Management

ARI has extensive experience in assessing the feasibility, planning for, permitting and implementing both beneficial use and disposal options for residuals. These include projects for: land application of biosolids; composting; drying and pelletizing to produce a fertilizer; alkaline stabilization; incineration; and landfilling. Table 3 provides a summary of representative project experience.

3.3 Economic and Financial Analyses

As part of the facilities planning process, ARI provides economic services including preparation of: construction and operation and maintenance cost estimates; life-cycle economic analyses; cost-benefit analyses; and equivalent uniform cost comparisons. In addition, ARI prepares analyses of financial alternatives and determines the impact of capital projects on rate payers. As part of these activities, ARI typically works with client accountants, investment bankers, state/federal officials and other financial advisors.

3.4 Permitting

Whether undertaking development of a new facility, or the expansion/upgrade of an existing wastewater treatment facility, a vital task is obtaining the permits required to secure financing and commence construction. ARI provides comprehensive air, water and solid waste permitting services to assist clients in meeting the requirements of Federal and State regulations.

ARI believes that early discussion with regulatory agencies to identify the specific information requirements for a complete permit application is a key element for successful

permitting. Also, proper planning includes structuring permit applications to allow maximum flexibility for facility growth and operations. Finally, for publicly-controversial projects, programs must be developed for effective public communication.

3.5 Procurement

ARI has assisted numerous clients nationally in procuring service for facilities' design, construction and operation. In Massachusetts, this experience includes that in the procurement of services, designers, and contractors under M.G.L. Chapters 30B, 7, and 149. In addition, ARI has prepared, and the State legislature adopted, special legislation allowing a wastewater authority to implement a multimillion-dollar upgrade to their treatment facility using a design/build approach to reduce performance risk. The Inspector General's office has remarked that recent RFPs prepared by ARI are model RFPs for use Statewide.

Specific wastewater treatment and residuals management procurement services provided include the following:

- Development of Procurement Strategies to include: ownership and operating options; technology options; risk sharing; and financing options.
- Preparation of Procurement Documents; such as, Request for Qualifications, and Request for Proposals.
- Evaluation of Qualification Statements and Proposals.
- Negotiation of Contracts

3.6 Construction Management

Providing construction management services, ARI utilizes techniques that ensure timely construction in accordance with the project plans and specifications. ARI monitors the design and construction progress from Notice-to-Proceed through completion of performance testing. Typical construction management services include: review of engineering drawings and other pertinent design deliverables; review of vendor shop drawing submittals; negotiation of contractor change order requests; providing on-site resident management services; review and approval of contractor payment requests; supervision of the maintenance of records and contract documents; observing the contractor's quality control and assurance protocols; coordination of periodic progress review meetings and construction conferences, preparation of minutes of these meetings, and follow up with action items as required; maintaining diaries documenting construction progress; coordinating punch lists; and conducting final facility inspections.

3.7 Operations Management

Operations management in the wastewater treatment field is a dynamic task. Changing regulations and effluent discharge requirements make the job of the treatment plant operator challenging. The treatment plant operator must continuously look for innovative ways to operate and maintain the facilities. ARI staff assist the treatment plant operator in a number of key areas:

- Development of Operations and Maintenance Manuals;
- Operations Monitoring and Troubleshooting;
- Operations Management; and
- Operator Certification and Licensing Training.

ARI staff are trained in all phases of wastewater treatment plant operations. Wastewater treatment facilities will operate efficiently only if those who operate them have the knowledge and training to make it happen. New operators need training to pass certification exams to help ensure that they can perform their duties safely and effectively. Talented “seasoned” operators may have the hands-on knowledge to advance, but lack the formal training to obtain certification in a higher grade.

ARI staff develop training programs for the necessary courses that will prepare operators to pass the Massachusetts wastewater treatment plant operator Grades 1-4 certification examinations for municipal treatment plant operators and the Grades 4 and 6 combined municipal/industrial examinations. ARI staff have taught wastewater certification programs in the continuing education division of the University of Massachusetts; thus, have the required background to ensure the success of your training program. ARI engineers can also tailor a training program to your needs.

3.8 Public-Private Partnerships

Faced with the increased costs of permit compliance, aging facilities which require modification and maintenance, the need for new facilities to accommodate growing populations, and the competing pressures for funds by other public programs, governments may be limited in their ability to finance wastewater treatment plant improvements and maintenance programs.

Public/private partnerships offer an alternative means of funding and designing, building and operating wastewater treatment and residuals management facilities. A partnership is a contractual relationship between the local government and a private party to provide a wastewater treatment or residuals management service. Each partnership is unique, with provisions designed to meet the particular needs of each community. Cost savings and risk reduction can result from such partnerships.

Since the early 1980's, ARI has focused on public/private partnerships for municipal solid waste facilities and services, assisting public entities who were seeking to acquire long-

term disposal services without the risk of facility ownership, construction, and operation. Design/build, design/build/operate, and full-service procurements and contracts evolved.

Similar trends have emerged in the wastewater treatment and residuals management service sector. In the past ten years, a major focus of ARI's activities has been assisting both public and private clients in considering and implementing public/private, design/build, design/build/operate, and full-service agreements for facilities and services for wastewater treatment and residuals management.

ARI has pioneered several recent public/private partnership initiatives that are a first in the Commonwealth of Massachusetts and in the nation. These projects are described in full in Section 4 of this document.

4.0 REPRESENTATIVE PROJECT EXPERIENCE

In the sections that follow, ARI has summarized its corporate and staff experience in wastewater treatment and residuals management projects. The project experience is divided into three major sections as follows:

- Wastewater Treatment Facilities Planning, Design and Construction
- Residuals Management
 - land application
 - composting
 - thermal pelletizing
 - sludge incineration
 - pyrolysis and gasification
- Public/Private Partnerships

4.1 Wastewater Treatment Facilities Planning, Design Construction

- **Milo, New York**
Conducted detailed facilities planning, environmental impact analysis, final design and implementation of an innovative collection system which gathered wastewater from approximately 200 homes along one of New York State's Finger Lakes resort towns. Low-pressure force mains, grinder pumps and septic tank effluent pumps were designed to mitigate negative impacts of failing septic systems on the lake water quality.
- **Rushville, New York**
Prepared a detailed wastewater facilities plan, environmental impact analysis and conceptual design documents for an innovative/alternative wastewater collection and treatment system. The collection system consisted of using small diameter gravity

sewers after the individual septic tanks and community septic tanks for intermediate treatment. The treatment system consisted of a nitrifying recirculating sand filter.

- ***Carver, Massachusetts***

Provided design review, permitting review, construction monitoring, and facilities acceptance testing for a 100,000 gallon per day private, septage only treatment facility. The treatment facility utilizes rotating biological contactors, filtration and subsurface rapid infiltration of treated septage. The unique features of this design are its ability to handle septage with a higher than normal grease content.

- ***Plymouth, Massachusetts***

ARI provided facilities planning, environmental impact analysis, and design services for an integrated wastewater and septage treatment facility. The facilities planning effort was conducted on behalf of a private developer who was proposing privatizing a portion of the municipal wastewater treatment services of the Town.

- ***Interlaken, New York***

Prepared a detailed wastewater facilities plan and conceptual design documents for an innovative collection and treatment system using small diameter gravity sewers, septic tank effluent pumping and aerated lagoons for wastewater treatment. The aerated lagoons utilized a state-of-the-art aeration system and an innovative ozone injection system for post aeration and algae control.

- ***Canandaigua, New York***

Conducted facilities planning, conceptual design and final design of a 22 MGD advanced municipal wastewater treatment facility for a resort community within the Finger Lakes Region of New York. This treatment facility utilized an innovative application of rotating biological contactors, flow equalization techniques and anaerobic digester mixing equipment. The treatment plan was designed to handle both seasonal flows from the resort town and excess stormwater flows.

- ***Cohasset/Essex, Massachusetts***

Conducted facilities planning and obtained a MA DEP groundwater discharge permit for two private municipal wastewater treatment facilities. Both treatment facilities utilized rotating biological contactors, mixed media filtration, ultra violet light disinfection and subsurface disposal of high quality effluent into the groundwater. These treatment plants were required due to the high density of individual systems in the area.

- ***Hanover, Pennsylvania***

Provided design, permitting, construction monitoring and facility acceptance testing for a private, regional septage and liquid sludge treatment and dewatering facility. The innovative aspect of this project was that the core facilities of the septage plant are an existing abandoned municipal treatment plant. ARI utilized the existing facilities to the extent possible and modified other existing unit processes to provide a new septage/liquid sludge treatment plant

- **Massena, New York**
Preparation of conceptual design, final design plans and specifications and Federal/State grant administration for a 2.75-MGD municipal wastewater treatment facility.
- **Pearl Harbor, Hawaii**
Preparation of detailed design plans and specifications for secondary treatment facilities at the Fort Kamehameha Treatment Plant in support of USS Missouri docking facilities.
- **Avon, New York**
Designed modification to an existing 2.5-MGD wastewater treatment facility to correct seasonal SPDES permit violations. Implemented chemical treatment with Odophos™ and polyelectrolytes for phosphorus removal; improved solids capture in secondary settling and gravity thickening.
- **Avon, New York**
Obtained a demonstration grant from the New York State Energy Research and Development Authority to build a co-generation facility that will utilize anaerobic digester gas to produce electricity. The power generated would be used within the plant or cross the utility power grid.
- **Fall River, Massachusetts**
Preparation of a detailed facilities plant to evaluate alternatives for the abatement of combined sewer overflows (CSO) into Mount Hope Bay. Analysis included: computer simulation of sewer system response to rainfall events, analysis to completely separate sanitary and storm sewers, and recommendations for increasing the capacity of the interceptor network.
- **Webster, New York**
Preparation of design plans and specifications for a 15-MGD advanced municipal wastewater treatment facility. This design integrated existing trickling filter technology on the site with a new, conventional, activated, sludge secondary process for both phosphorus and nitrogen removal.
- **Monroe County, Pennsylvania**
Permitting, procurement, design review, construction monitoring, acceptance testing for a private client for 300,000 GPD septage treatment and liquid sludge dewatering facility and for a 76-Dry Tons Per Day (DTPD) sludge thermal pelletizing facility.
- **Bridgeport, Connecticut**
Engineering and economic analysis of alternative dewatering systems (belt filter presses and centrifuges) for a 35-MGD dewatering facility.

- **Clark County, Ohio**
Design review and permitting for wastewater pretreatment system and sewer discharge for a private 1750-TPD waste-to-energy facility. Service also included NPDES stormwater permitting.
- **Upper Blackstone Water Pollution Abatement District, Millbury Massachusetts**
Assessment of impact of metals loading from upgraded air pollution control system on wastewater treatment plant discharge.
- **Rochester, New York**
Preparation of database and detailed computer analyses of the impact of combined sewer overflows (CSO) on the water quality of the Genesee River. Computer simulations linked three separate drainage basins with rainfall events through the 100-year storm event.
- **Monroe County, New York**
Performed hydraulic analyses and prepared detailed plans and specifications for a 5,000-LF extension to the county's main interceptor network utilizing 84-inch and 96-inch diameter prestressed concrete intercept for sewer and renovation of six combined sewer overflow.
- **Peabody, Massachusetts; Little Falls, New York; Southbridge, Massachusetts**
Preparation of design plans and specifications for local sewer extensions due to residential and commercial developments.
- **Union County, Pennsylvania**

ARI assisted Union County, Pennsylvania, in the development of a comprehensive residuals and septage management program. This effort included: developing a septage and sludge licensing program for county haulers; characterization and quantification of residuals and septage generated in Union County; identification and evaluation of viable management alternatives; and preparing for and conducting a regional, Residuals-Management Seminar (Union County and seven adjacent counties). The seminar, conducted in May 1995, covered the available alternatives for residuals beneficial-use (drying/pelletizing, composting, alkaline stabilization, digestion, land application), as well as disposal options (landfill, incineration). Federal regulations (40 CFR Part 503) and proposed State regulations applicable to the alternative options for the beneficial use and disposal of residuals were also addressed.

4.2 Residuals Management

4.2.1 Land Application

- **New York State**

- Land Application of Biosolids for Hybrid Tree Farm*

- Research program to develop commercial, hybrid tree farms utilizing biosolids as a fertilizer to produce biomass for fuel at power plants in New York State. The research program includes both greenhouse studies and 10-acre field demonstration program.

- **Tennessee**

- Assessment of Permissible Loading Rates for Mine Reclamation Site*

- For a private client, ARI determined the permissible biosolids loading rates pursuant to Part 503 regulations for a mine reclamation site in northeast Tennessee.

- **Pennsylvania**

- Regulatory Review for Application of Biosolids at Mine Reclamation Site*

- Reviewed and developed a permit plant for use of biosolids at a mine reclamation site in Pennsylvania.

- **West Virginia**

- Review of Regulations for Application of Biosolids at Mine Reclamation Site*

- Prepared a summary of the regulatory and permit requirements to utilize biosolids at a mine reclamation site in West Virginia.

- **Texas**

- Review of Land Application Regulations*

- For a private client, ARI investigated and compared land application regulations for both Texas and New York State to determine if certain sludges currently land applied in Texas would also be acceptable for land application in New York State.

- **Bowie, Arizona**

- Assessment of Permissible Loading Rates and Land Requirements*

- For a private client, ARI assessed the permissible loading rates and land capacity for sludges for nonfood crops. Part 503 and State regulations were considered.

4.2.2 Sludge Composting

- **Schuylkill County, Pennsylvania**

- Design and Permitting of Yard Waste and Sewage Sludge Compost Facility*

ARI has prepared the site registration and completed the facility conceptual design and environmental permitting for a yard waste and sewage sludge compost facility planned by a private development in Schuylkill County, Pennsylvania.

- **Clinton County, Pennsylvania**

- Development of a Sludge Composting Facility*

ARI assisted a private developer with site evaluation and technology assessment for a planned sludge composting facility, and also assisted the developer with public interface. ARI recently provided testimony in a zoning hearing which determined that composting is allowed in an area zoned for agriculture.

- **Springfield, Massachusetts**

- Procurement Specifications, Air Permitting, Emissions Testing for Odor and Emissions Control Upgrade at a 40-DTPD In-Vessel Compost Facility*

ARI served on a team of consultants selected by the City to design and permit an upgrade of the air pollution control system at the existing sludge treatment facility at the Springfield Regional WWTP. ARI's specific responsibilities included:

- Design and direction of an emissions test program, the results of which were input to the design of a planned new regeneration afterburner (RTO).
 - Participation in the development of performance specifications for the RTP, and, if needed, for additional control equipment for particulate matter (wet ESP).
 - Determination of Good-Engineering-Practice (GEP) stack height.
 - Preparation of the air permit application, including emissions estimates, top-down BACT analysis, and, as necessary, air quality modeling and air toxics assessments.
 - Negotiation of an emissions compliance test protocol with Massachusetts DEP.
- **New York State – Multiple Sites**
Feasibility Evaluations of Sludge Composting Facilities

For a private developer, ARI evaluated existing sludge composting facilities at several locations in New York State for potential upgrade or expansion.

4.2.3 Sludge Thermal Pelletizing

- **Private Sludge Drying and Incineration Facility, Waterbury, Connecticut**
Third-Party Review for Financing

The City of Waterbury let a private contract for the management of the sewage sludge produced at its wastewater treatment plant. The City has contracted with a private firm to construct, own, and operate two sludge dryers (37-DTPD) and a fluid-bed incinerator (50-DTPD) to process the City's sludge. To improve project economics, the contract allows it to process sludge delivered from other municipalities in the region.

ARI prepared the Engineer's Feasibility Report for financing of the project. ARI's report included in the bond underwriter's Official Statement presented a comprehensive review of project feasibility, including contractual issues, and engineering, regulatory, and economic feasibility.

- **Boston Harbor – Massachusetts**
Air Quality Analysis and Air Permitting – 164-DTPD Sludge Thermal Pelletizer

AIR estimated the air emissions from and prepared the air permit for construction and operation of a 164-DTPD sludge thermal drying and pelletizing system (Enviro-Gro Technologies) to process sludge from the metropolitan Boston area. This was part of the Massachusetts Water Resources Authority's effort to develop interim (1991-1995) sludge disposal facilities. ARI directed pilot testing for air emissions, prepared BACT analysis and an air quality impact assessment for the Environmental Impact Report, and prepared the air permit application. Permits were approved, and the project is constructed and operating. ARI has assisted with plant performance evaluations and improvements, and directed environmental compliance tests.

- **Monroe County, Pennsylvania**
Procurement, Permitting, Design Review, Construction Monitoring, Acceptance Tests for 76-DTPD Sludge Thermal Pelletizing Facility

For the Pocono Grow Company in Pennsylvania, ARI has completed air quality and solid waste permitting for a thermal drying and pelletizing facility, and served as technical consultant for procurement of the system (prepared Request for Qualifications and Request for Proposals, and assisted in contract negotiations).

- **New York City, New York**
Permitting and EIS Support for 300-DTPD Sludge Thermal Pelletizing Facility

ARI provided technical input to the City's preparation of the EIS. Then, for a private client, ARI prepared the required air permit application. An evaluation of air pollution control equipment (BACT) was conducted, emissions estimates were developed and an ambient air quality impact analysis and risk assessment were prepared. ARI also assisted with the procurement of a continuous emissions monitoring system and in planning emissions compliance testing. ARI assisted with public interface during

development of the project, including interface with City Community Boards and adversarial groups. The facility is in operation.

- **Baltimore, Maryland**

Permitting, 110-DTPD Sludge Pelletizing Facility

For a private client, ARI has prepared the air permit application, and assisted with public interface. The application includes estimates of emissions, a BACT analysis, an air quality impact assessment, and an air toxics assessment.

- **Hagerstown, Maryland**

Permitting, 20-DTPD Sludge Pelletizing Facility

For a private client, ARI prepared the air permit application and responded to agency questions. Permits were approved; the facility was constructed and is in commercial operation.

- **Nassau County, New York**

Permitting and EIS Preparation, Two 50-DTPD Sludge Pelletizing Facilities

Serving on a team of consultants, ARI prepared an air quality impact analysis for the EIS for two sludge pelletizing facilities proposed by Nassau County. In addition, ARI assisted in preparing the evaluation of air pollution control equipment (BACT) and developed emissions estimates as part of the preparation of the air permit applications.

- **Hanover, Adams County, Pennsylvania**

Design and Permitting of a 26-DTPD Sludge Pelletizing Facility

For a private client, ARI prepared the solid waste and air permit applications for a proposed 26-DTPD sludge pelletizing facility.

- **Technology Review**

For a private client, ARI evaluated the environmental performance of a European direct-fired sludge drying system, compared that system with existing United States technology, and made procurement recommendations.

4.2.4 Sludge Incineration

- **Upper Blackstone Water Pollution Abatement District, Millbury, Massachusetts**
Design, Build Contract for Sludge Incinerator and Air Pollution Control Upgrade

ARI was the Project Manager for the District for improvements to the existing incinerators and a major air pollution control upgrade. As overall project manager, ARI assisted the District with assessing design alternatives, permitting, evaluating financing options, implementing financing, developing a procurement strategy,

preparing procurement documents, assisting in contract negotiations, and in providing construction monitoring and acceptance testing. Specific to air pollution control, ARI has negotiated Consent Order conditions with DEP regarding air pollution upgrade requirements for the District's sludge incinerators, directed emissions testing, advised the District on selection of new emissions controls (RTO and wet ESP), and performed the extensive air-quality permitting required for the upgrade.

Since the air pollution control equipment approved by DEP is complex and represents a new application for such equipment to sludge incinerators, the District accepted ARI's recommendation and procured the services for design and construction with single point responsibility vested in one private contractor who would be responsible for meeting performance guarantees for the entire system. This private procurement approach required obtaining Special Legislation which was signed by the Governor in July 1994. ARI prepared the text of the Special Legislation for review by the District's legal counsel. The legislation was required for exemption from Chapters 7 and 149 procurement laws. The State's Inspector General granted its approval to the proposed legislation, which facilitated State legislative approval. ARI prepared the Request for Proposal, evaluated proposals and assisted in contract negotiations. Afterward, ARI provided design review and construction monitoring services.

- ***Green Bay, Wisconsin***

Part 503 Permitting for 149-DTPD Multiple-Hearth Incinerators

ARI performed the air quality modeling and determined the dispersion factor (DF) for the incinerators to meeting requirements of the CWA Part 503. The modeling was carried out using a protocol that ARI negotiated with US EPA Region V.

- ***Fitchburg, Massachusetts***

Permitting for Air Pollution Control Upgrade for 48-DTPD Multiple-Hearth Incinerator

The air pollution control system was upgraded to include an afterburner and wet ESP, under terms of a State Consent Order. For permitting the upgrade, ARI performed the air quality modeling analysis, and also supported the project engineer's efforts in the preparation of the BACT analysis.

- ***Upper Blackstone Water Pollution Abatement District, Massachusetts***

Air Permitting under CWA Part 503 for 48-DTPD Multiple-Hearth Incinerators

ARI directed emissions testing, performed air quality modeling, prepared the Part 503 permit application, and conducted permitting negotiations with US EPA Region I for the multiple-hearth incinerators.

- ***Glen Cove, Long Island***
PSD Air Quality Permitting, 250-TPD Sewage Sludge and Municipal Waste Incinerator

ARI's Director of Environmental Services performed the PSD air quality impact assessment for the Glen Cove co-disposal facility. The Glen Cove facility co-combusts sewage sludge and municipal solid waste, and has operated for over a decade.

- ***South Essex, Massachusetts – South Essex Sewage District***
Analysis of Air Emissions and Impacts – Sludge Incineration, Pyrolysis and Pelletizing

ARI estimated the air emissions from and identified the environmental permits and approvals required for three sewage sludge disposal technologies considered by the South Essex Sewage District. These included a multiple-hearth furnace, Thermofix (a pyrolysis process where toxic metals are bound in a char residue), and the EGT[®] sludge drying process (a process that produced a sterilized dry pellet).

- ***Chicopee, Massachusetts***
Air Pollution Control Review, Multiple-Hearth Incinerator

As part of the design of the primary and secondary wastewater treatment facilities for the City of Chicopee, the City's consultant selected and specified multiple-hearth sludge incinerators which have been used by the City for many years. The sludge management study included an evaluation of improvements required to upgrade the incinerators so that they could be operated in accordance with current standards. ARI was retained to evaluate several air pollution control technologies for the incinerators, as part of a BACT assessment.

- ***Elizabeth, New Jersey***
PSD Air Quality Permitting for a Sewage Sludge Incinerator

ARI's Director of Environmental Services performed the PSD air quality impact assessment for a large, multiple-hearth sludge incinerator.

- ***Northeastern United States***
Odor Problem Resolution at Sludge Incinerator

ARI diagnosed terrain-induced stack downwash as the cause of a community odor problem at a multiple-hearth incinerator, and reviewed with the facility operator options for abating the odor, ranging from increasing stack exit velocity to adding an odor scrubber.

4.2.5 Sludge Pyrolysis & Gasification

- **Newburyport, Massachusetts**
Air Permitting, Thermofix Sludge Pyrolysis Process, 12-DTPD

ARI prepared the air permit application for a Thermofix facility, which pyrolyzes sludge to char residue. The process significantly reduces sludge volume and binds toxic metals in the residue.

- **New Jersey**
Host Community Review of a Proposed Sludge Gasification Project

ARI conducted a technical, environmental and economic review of a proposed sludge gasification project.

4.2.6 Sludge Transfer

- **New York City, New York**
Permitting for a 1570 Wet Tons per Day (WTPD) Sludge Transshipment Facility

For a private client, ARI prepared an EIS Supplement for a truck-barge-rail transshipment center to transport containerized sludge filter cake for land reclamation in Texas. The assessment focused on potential impacts on traffic, noise, air quality, land use, and historic resources. ARI also obtained the required State Solid Waste Permit for the facility.

4.2.7 Product Marketing

- **Monroe County, Pennsylvania**
Development of Marketing Plan

ARI identified markets for and developed product specifications for the pellets for a 76-DTPD sludge drying and pelletizing facility.

- **New York, New Jersey, Pennsylvania**
Development of Marketing Plan

For a private client, ARI developed a comprehensive plan for marketing in excess of 200,000 cubic yards per year of sludge compost. Conventional and innovative options that were explored included: soil supplements for landscaping, growing ornamental shrubs, raising high growth trees for wood products, forest and grass management and landfill cover.

4.3 Public/Private Partnerships

- **Greater Lawrence Sanitary District, Lawrence, Massachusetts**
Evaluation of Public-Private Partnership Options for 52-MGD Wastewater Treatment Plant and Residuals Management Facilities

ARI assisted the District to evaluate and decide what level of public-private partnership makes sense for the District's wastewater treatment plant and sludge incineration facilities. ARI prepared background information on public-private partnerships (e.g., the options, the issues, the advantages and disadvantages, the history of and examples of success and failure, and advantages and lessons learned). ARI conducted workshops with District officials to present the aforementioned information; and, as part of the workshop, developed a matrix of options and assisting the District to reach a consensus on preferred options for further analysis. Options included facility ownership, lease, and/or operation.

In the second phase of the project, ARI prepared a report relative to the technical, economic, environmental, regulatory financial, legal and legislative aspects of each preferred option. To assist the District in reaching a consensus on the most preferred option, ARI conducted further workshops with District officials, in which an evaluation methodology and evaluation criteria were developed. The final report served as the basis for subsequent procurement activities.

- **City of Taunton, Massachusetts**
Assessment of Public/Private Partnership Options

In May 1995, ARI developed options for public/private partnerships to reduce costs and to enhance revenues at the City's wastewater treatment plant and ancillary facilities. In developing the options, ARI also addressed the City's interest in limiting exposure for potential noncompliance with the plant's NPDES permit.

ARI presented the public-private partnership options to the Mayor and DPW staff, discussing the pros and cons of each option. ARI recommended determining the most economically advantageous option, by soliciting private-sector proposals for expanded contract operations, a lease arrangement, or facility sale. ARI outlined specific steps for undertaking the procurement process.

- **Bergen County Utilities Authority (BCURA), Bergen County, New Jersey**
Seminar on Options for Public-Private Partnerships

ARI presented a seminar on options for public-private partnerships of regional wastewater treatment, as a first step towards public-private partnerships. The seminar participants were members of the Privatization Panel of the Bergen County Utilities Authority (BCUA), comprised of BCUA Commissioners, the former Attorney General of New Jersey, and elected County and municipal officials. In the seminar, ARI addressed the available privatization options, and the advantages and disadvantages of each. ARI then reviewed privatization experience nationally, discussing "lessons learned" from numerous, specific examples of wastewater management public-private partnership.

ARI recommended to BCUA a series of steps for completing the assessment of public-private partnership options and implementation.

- ***Upper Blackstone Water Pollution Abatement District, Millbury, Massachusetts***
Private Design/Build Contract for Sludge Incinerator and Air Pollution Control Upgrade

ARI was the project manager for the District's project to improve the existing sludge incinerators and design/build a new air pollution control system. As overall project manager, ARI assisted the District with the implementation of a private design/build contract for its wastewater treatment plant sludge incinerator by: assessing design alternatives, permitting, evaluating financing options, implementing financing, developing a procurement strategy, preparing procurement documents, assisting in contract negotiations, and in providing construction monitoring and acceptance testing.

Since the air pollution control equipment approved by DEP was complex and represents a new application of such equipment to sludge incinerators, the District chose to procure the services for design and construction with single-point responsibility vested in one entire system. This private procurement approach required obtaining Special Legislation (authored by ARI) which was signed by the Governor in July 1994. This special legislation was needed to circumvent the traditional two-step process required under existing procurement law; i.e., select a design contractor (Chapter 7), then select a separate "lowest-bid", construction contractor (Chapter 149). Although not a Chapter 30(B) procurement law, this was helpful in obtaining the Inspector General's approval, which facilitates legislative approval.

The Inspector General's Office has indicated that the special legislation that ARI authored would serve as a model for other public works projects for which the design/build procurement approach is of interest.

Procurement of the private design/build contractor is complete. Construction commenced in July 1995.

- ***MWRA, Quincy***
Private Design/Build/Operation of Sludge Drying and Pelletizing Facility

ARI was a consultant to the New England Fertilizer Company which was awarded a contract by MWRA to design, build and operate a sludge drying and pelletizing facility for residuals management for the Boston Harbor cleanup. ARI assisted in proposal preparation, negotiation of contract issues, air emissions testing for a pilot facility, conceptual design of the air pollution and odor control systems, preparation of the air quality section of the EIR, air permitting, and emissions testing of the completed facility.

- ***Private Sludge Drying and Incineration Facility, Waterbury, Connecticut***
Third-Party Review for Financing

The City of Waterbury contracted with a private company for the management of the sewage sludge produced at its wastewater treatment plant. The City contracted with New England Treatment Company (NETCO) for NETCO to construct, own and operate

two sludge dryers (37-DTPD) and a fluid-bed incinerator (50-DTPD) to process the City's sludge. To improve project economics, NETCO's contract allow it to process sludge delivered from other municipalities in the region.

ARI prepared the engineer's Feasibility Report for financing the project. ARI's report included in the bond underwriter's Official Statement presented a comprehensive review of project feasibility, including contractual issues, and engineering, regulatory, and economic feasibility. The dryer facility began operation in 1994. The incinerator initiated operations in 1997.

- **City of Taunton, Massachusetts**

Preparation of Request for Proposals, Evaluation of Responses, Contract Negotiations, and Contract Monitoring for Long-Term (20-years) Contract Operations, Sale or Lease of Wastewater Treatment Plant and Pump Stations, and Design/Build for CSO and Other Capital Improvements

In May 1996, ARI completed preparation of a request for proposals for either the long-term (20 years) contract operations, or sale or lease of the City's 9 MGD wastewater treatment plant and pump stations. The private contractor was to be responsible for financing, design and construction of capital improvements, a significant portion of which are CSO projects. This unique "menu" approach was used to provide the City with multiple proposals which it could assess to determine which approach and proposal would be most advantageous for the City. The City also compared the private contract options to existing City practices of short-term private operation with City ownership. Procedures and processes are conforming to both Executive Order 12803 and IRS regulations (Rev. Proc. 97-13).

A draft RFP was issued to obtain vendor comments on the RFP, including key terms and conditions of contract. More than 30 pages of written comments were reviewed in preparing the Final RFP. The draft RFP concept is an ARI innovation and has been extremely helpful in attracting vendor interest in this project.

After release of the final RFP in August 1996, a pre-bid conference was held and answers to bidders' questions and addenda to the RFP were prepared. Seven strong and competitive proposals were received from national firms in December 1996. Proposal evaluation was completed in November 1997. ARI then assisted the City with contract negotiations. The final contract was executed in August 1998.

Special legislation was required. The cooperation of labor, the Mayor, Municipal Council, the Inspector General's office and the State Legislature was essential in developing and gaining approval of this unique legislation in August 1996.

ARI is currently assisting the City as Contract Monitor providing contract oversight, facilities monitoring, design review, construction monitoring, and financial advisory services.

- ***Chester Borough, New Jersey***

Preparation of Request for Proposal, Evaluation of Proposals and Contract Negotiations for Long-Term Operation, Sale or Lease of the Water System and Wastewater Treatment Facilities, and Design/Build for Capital Improvements

Chester Borough owned and operated its water and wastewater systems. It was faced with the dual needs of significant capital facilities improvements and expansion of its water and sewer lines. The Borough sought private proposals for long-term contract operations, sale or lease of its water and wastewater systems.

ARI prepared the request for proposals, assisted in evaluation of proposals, and assisted the community with contract negotiations. The RFP was released in December 1996. The procurement was conducted in accordance with the New Jersey 1995 Water and Wastewater Privatization Acts.

The Borough decided to sell its water system and to enter into a 20-year operations and maintenance contract for its wastewater system. The private contract operator for the wastewater system is also responsible for financing, designing, and constructing capital improvements. Contract negotiations were completed in 1997.

Particular concerns regarding financing improvements to the wastewater system were compliance with the new IRS tax regulations (Rev. Proc. 97-13) and preserving existing SRF funding. These were accomplished.

ARI is currently serving as the Contract Monitor for the Borough to ensure that all contract obligations are met.

- ***Borough of Naugatuck, Connecticut***

Preparation of Request for Proposal, Proposal Review, Contract Negotiations and Contract Monitoring for Upgrade and Long-Term Operation of Wastewater Treatment Plant and Sludge Incinerator

ARI served as leader of a team of procurement, technical, financial, and legal specialists for the procurement to upgrade and provide long-term contract operation (20 years) of the Borough's 10-mgd wastewater treatment plant and multiple-hearth incinerators. ARI has provided management, engineering, environmental and financial expertise. ARI was responsible for preparing the RFP, reviewed proposals, and assisted in contract negotiations. ARI also assisted in preparing the "benchmark analyses" for comparison to the proposals. ARI then provided design review and construction and operations monitoring services. The project is unique in that the Borough is continuing its history of "no-cost" for wastewater treatment plant operations (i.e., revenues derived from incineration of outside sludge cover the cost of operating and maintaining the wastewater treatment plant.)

- **City of Waterbury, Connecticut**

Procurement for operations and maintenance of 25-MGD Water Treatment Plant; Preparation of an RFP, Evaluation of Proposals and Contract Negotiations for Private Operations;

A private contractor has operated the City of Waterbury's water treatment plant since it was constructed six years ago. Prior to the expiration of the existing contract, the City (Bureau of Water) retained ARI to provide technical and financial assistance in preparing an RFP for continued private operation and maintenance of the plant. ARI then assisted in evaluation of proposals received and negotiation and preparation of the contract for continued operations and maintenance of the plant.

ARI continues to provide assistance to the Bureau of Water during transition to a new operator and for oversight during initial contract operations.

- **Town of Plymouth, Massachusetts**

Assistance with Preparation of Request for Proposal, Evaluation of Proposals and Contract Negotiations for Design, Construction and the Long-Term Operation and Maintenance of a New Wastewater Treatment Plant

ARI has assisted the Town in several aspects of their procurement to design, build, operate and maintain a new wastewater treatment plant, and operate and maintain a new pump station and force main for a 20-year term. ARI has provided strategic guidance for this public/private partnership on technical, business, contract, and financial issues to aid in structuring the RFP. ARI has also assisted with RFP preparation, review of proposals, preparation of a "benchmark" analysis estimating the facility costs without a public/private partnership, and comparing private proposals for design/build/operate with the benchmark analysis for a traditional procurement approach.

In addition, ARI prepared an RFP, evaluated proposals and assisted in contract negotiations for design/build services for the new force main and pump station.

A presentation to Town Meeting comparing the public and private options was made, and Town Meeting voted to move ahead with contract negotiations. ARI assisted the Town in completing the contract negotiations and served as contract monitor for technical and financial matters.

- **City of Gardner, Massachusetts**

Preparation of Request for Proposal and Evaluation of Proposals for Long-Term Operation and Maintenance of the Water and Wastewater Systems, and Design/Build for a new Water Treatment Plant and other Capital Improvements

ARI provided assistance to the City of Gardner in the preparation of a Request for Proposals and in evaluation of proposals for long-term (20-year) operation of the water and wastewater systems, including treatment facilities, the water distribution system, wastewater collection system, pump stations, watershed management, and the residuals landfill. The private contractor will be responsible for finance, design, and

construction of a new water treatment plant and other capital improvements, and operation and maintenance of all water and wastewater facilities for the 20-year term.

- ***Town of Lee, Massachusetts***

Procurement for Short-Term Operations and Maintenance of Water and Wastewater Treatment Facilities and Water Distribution and Sewer Collection Systems; Preparation of the RFP, Evaluated Proposals and Assisted in Contract Negotiations; Provided Management, Technical and Financial Expertise

The Town of Lee has entered into Administrative Consent Orders with the Massachusetts Department of Environmental Protection which require the upgrade of its Water Treatment and Distribution Facilities and Wastewater Treatment Plant and Collection System. The Town undertook a procurement for short-term (2 year) private operations and maintenance of its 2-MGD water and 1-MGD wastewater treatment plants and water distribution and sewer collection systems. The intent was to procure an operator for two years while the Town considered the upgrades necessary to meet ACO requirements. The Town would then consider a long-term DBO procurement for these facilities.

ARI assisted the Town's Board of Public Works by developing the RFP and contract principles, evaluating proposals received and assisting during contract negotiations. The procurement was conducted pursuant to the requirements of Chapter 30(B), the Commonwealth's procurement law for services.

- ***Town of Smithfield, Rhode Island***

Management, Technical and Financial Advisor for Design/Build/Operate (DBO) Procurement for Upgrade of WWTP & Collection System; Overall Management Responsibility in Directing Procurement Process

ARI served as leader of a team of procurement, technical, financial, and legal advisors for the procurement to upgrade and provide long-term contract operation (10 years) of the Town's 3.5 MGD wastewater treatment plant and wastewater collection system.

ARI provided management, engineering, environmental and financial expertise. ARI was responsible for preparing the RFP and proposal evaluation. ARI was also instrumental in contract negotiations with the selected proposer. ARI also assisted in preparing the "benchmark analyses" for comparison to the proposals.

ARI is also assisting the Town in obtaining a tax-exempt certificate of participation to support the implementation of the required capital improvements. Upgrades to the plant are based on an Alternative Capital Plan developed through the procurement process which will result in more than \$2 million in savings compared to the Base Capital Plan proposed in accordance with the existing Facilities Plan.

The project includes more than 7 million dollars in capital improvements for the WWTP and collection system.

- **Town of Westerly, Rhode Island**

Contract Negotiation for a Design/Build (D/B) Project for Improvements to WWTP

The Town of Westerly was faced with compliance with a RIDEM Consent Agreement which required the upgrade of its WWTF for dechlorination and nitrogen removal. The project included the installation of dechlorination equipment, conversion to fine bubble aeration, new nitrification technology and the construction of supplemental secondary clarification tankage. New headworks and septage receiving facilities and major pump station rehabilitation were also included.

To expedite the project and to maximize the utilization of an existing SRF Bond, the decision was made to pursue a D/B procurement. ARI was contracted to assist in development of a D/B agreement and negotiation with the selected vendor. In this effort ARI developed preliminary term sheets and business terms for the project.

In an effort to initiate project design while the D/B contract was developed, ARI developed a stand alone design contract for the improvements to the chlorination system.

- **Sioux City, Iowa**

Assessment of Needs, Design/Build Procurement, Contract Negotiation, Project Management and Contract Monitoring for Wastewater Treatment Plant

ARI is lead consultant in managing a design-operate (D/O) procurement for the City. Assessment activities included an initial engineering and economic assessment of needs to upgrade the existing 30MGD wastewater treatment plant and comparing that to an alternative for the relocation, design, and construction of a new facility within the regional service area. Procurement activities included the preparation of a Request for Information to assess private contractor interest in the project, preparation of a Request for Proposals, proposal evaluation and contract negotiations.

- **City of Stockton, California**

Preparation of RFQ, RFP, Qualifications and Proposal Evaluation, Contract Negotiations for Long-Term Contract Operations for Water, Wastewater, and Stormwater Utilities; Design/Build (D/B) of Capital Improvements to the Utilities System

ARI was engaged by the City of Stockton in 2000 to assist in a public-private partnership procurement for the City's water, wastewater, and stormwater utilities.

ARI provided strategic guidance for this public-private partnership on technical, business, and financial issues, prepared the Request for Qualifications and Expressions of Interest (RFQEI) and the Request for Proposal (RFP) procurement documents, and assisted in the evaluation of the Qualification Statements and Proposals. ARI was also responsible for the evaluation and comparison of the City's "benchmark" analysis to the private proposals. ARI also assisted in contract negotiations and presentation of the contract to City Council. The City Council approved the contract in February 2003.

ARI had Program Management responsibilities in coordinating efforts of the consultants involved.