



## OVERVIEW

Blueleaf Incorporated is a small process engineering company located in New England that performs pilot studies for water and wastewater treatment systems. We have completed over 120 pilot studies in the last five years in the US and Central America investigating the removal of iron, manganese, arsenic, organics and other contaminants from potable water sources, and many pilot studies investigating nutrient removal from wastewater treatment systems.

## PROFESSIONAL INDEPENDENCE AND INTEGRITY

Blueleaf's main clientele is consulting engineers and treatment system manufacturers. We provide an independent and impartial third party evaluation of the processes selected by the consultant, or proposed by the vendor. Consulting engineers find that Blueleaf helps them to be more competitive, by adding experience of specific processes to their team, by providing fully equipped and tested pilot and laboratory equipment, and by providing a third-party evaluation of the processes. Vendors find that Blueleaf helps them to be more competitive by providing their clients with the assurance that comes with independent evaluations.

## COMPETENCE

Blueleaf is comprised of a group of science-minded professionals interested in advancing the understanding of water treatment. We use methods of statistical analysis and experimental design that are used in many other industries to improve the performance of treatment systems.



Rising floc from backwashing biological iron filter



## SERVICES

Pilot plant studies are performed to predict the performance of a process. Blueleaf can design the pilot facility to investigate the variables of interest, perform sampling and analysis of the raw water and effluent streams, and complete the data analysis and report. Pilot studies can be designed to develop parameters for full-scale design, compare two or more processes to choose the most efficient or cost-effective, and assess the effect of changes in raw water quality.

System optimization services use methods of statistical analysis and experimental design embraced by corporations in many other industries to improve the performance of treatment systems. The field of water and wastewater treatment can be thought of as an industry that creates a high-quality product with highly variable raw materials. Methods made popular by Demming and Taguchi are applied to this process to identify methods to reduce finished water variability and improve overall water quality.

Water and wastewater characterization is done to identify important parameters for further design and testing. Identify sources, flows and composition of industrial or municipal wastewater. Identify seasonal variability of raw water quality of drinking water source.

Start-up services are offered to assist engineers, contractors and manufacturers' representatives in making a new treatment process functional. Provide services for the emergency restoration of service due to the failure of a major piece of equipment, flood or fire.



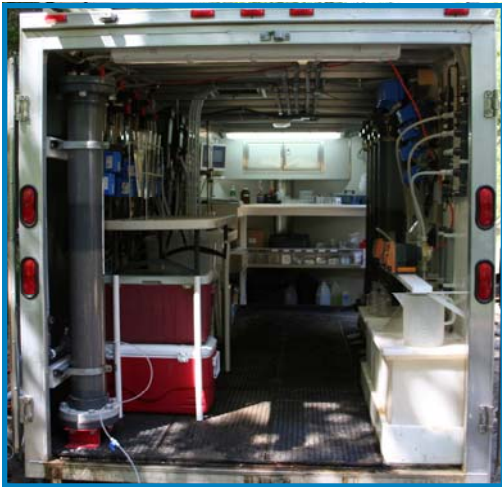
Automated Pilot Filters for Ozone/BAC Pilot



## **CAPABILITIES**

### **Adsorptive Media Processes**

This portable Adsorptive Media Trailer is capable of piloting four adsorptive media filters in a side-by-side comparison using identical raw water and pretreatment conditions. The trailer has individual control of flow rates, as well as continuous monitoring of pressure loss and turbidity of each filter. The trailer measures 14'L x 8'W x 7'H and uses a single 20Amp 120V electrical supply. The pilot system is equipped with a pressure reducing valve (PRV) on the raw water supply line and requires 10 gpm at 45 psi.



### **IDI Ferazur/Mangazur Process**

This portable Ferazur / Mangazur Trailer is capable of piloting an Infilco Degremont Technologies process that uses an inert media for the organic removal of iron and manganese. The trailer has individual control of flow rates, as well as monitoring of pH, temperature, flowrate, pressure loss and turbidity of each filter. The trailer measures 16'L x 8'W x 11'H and uses a single 20Amp 120V electrical supply. The pilot system is equipped with a PRV on the raw water supply line and requires 10 gpm at 45 psi. The pH and dissolved oxygen of raw water are balanced prior to distribution to the first filter for biological iron removal. The filter effluent is then re-balanced for pH and DO prior to being fed to the second filter for biological manganese removal. Each filter is equipped with a system of four manual ball valves that allow for automated control of filter service and backwash cycles.



### **Conventional Treatment Trailer**

The Conventional Treatment Trailer is equipped with mixers, chambers and a settling basin. The trailer is 16'L x 8'W x 11'H and uses a single 20Amp 120V electrical supply. Pilot water supply requires 10 gpm at 45 psi.



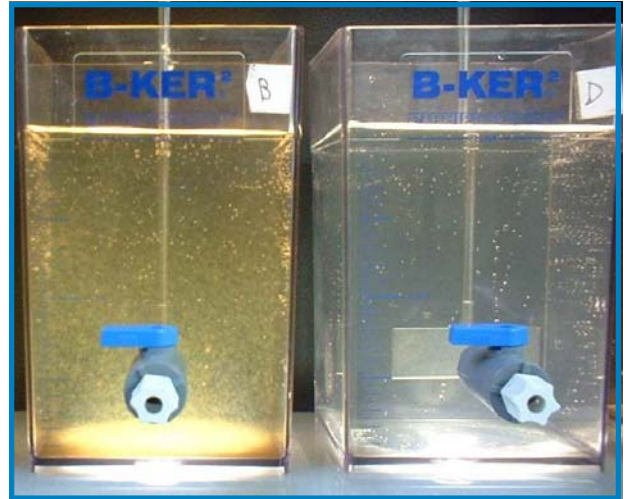




## CAPABILITIES

### Bench-Scale / Jar Testing

This portable Bench-Scale / Jar Testing Trailer is for the evaluation of chemical pretreatment, and coagulation and sedimentation needs. The trailer is equipped with a four-position Phipps Bird Jar tester, streaming current monitor, and all necessary field equipment to monitor and control the water or wastewater chemical treatment and coagulation system. Stock chemicals are provided by several chemical suppliers, so the evaluation of potential treatment alternatives will remain competitive. The trailer is 16'L x 8'W x 11'H and uses a single 20Amp 120V electrical supply. Continuous pilot water supply is not required.



### Ozone Generation and BAC Process

The Ozone Testing Trailer is equipped with a Pacific Ozone generator; recycle pump; injection nozzles; ozone contact tanks; ozone quench system and quenching tank, and two pilot filters. Trailer is 16'L x 8'W x 11'H and uses a single 20Amp 120V electrical supply. Pilot water supply requires 10 gpm at 45 psi.



### Emergency Chemical Feed Trailer

This Emergency Chemical Feed Trailer is capable of providing long term non-permanent chemical feed for water and wastewater treatment facilities. Although easily adapted, the trailer is traditionally used for disinfection purposes. The trailer measures 16'L x 8'W x 11'H and uses a single 50Amp 120/240V electrical supply.





## KEY PERSONNEL

### **Erik J. Grotton, P.E., President**

Erik is the Founder and President of the firm and has been piloting water treatment processes for 20 years. Erik has a broad range of experience with the water and wastewater industries, and uses the experience to find practical solutions to treatment problems. Erik has an MS degree in Civil Engineering from the University of New Hampshire and is a Registered Professional Engineer in Massachusetts, New Hampshire, Connecticut and Rhode Island. He specializes in statistical analysis for process optimization. He has experience piloting processes for the removal of iron, manganese, arsenic, organics, fluoride, ammonia and phosphorus.

### **George R. Swedberg, Project Engineer**

George has eighteen years of pilot experience with water, wastewater, and hazardous waste treatment processes. George has a BS degree in Civil Engineering from the University of New Hampshire. George specializes in bench-scale evaluation of coagulation and precipitation processes, and in statistical analysis for process optimization. He has experience piloting processes for the removal of iron, manganese, arsenic, organics, fluoride, ammonia and phosphorus.

### **Aaron R. Davis**

Aaron has 15 years of water treatment plant construction experience as a project manager and pilot engineer. Aaron has a BS degree in Civil Engineering from Worcester Polytechnical Institute. Aaron specializes in biological iron and manganese removal, complex pilot system assembly and coordination and QA/QC compliance. He has experience piloting processes for the removal of iron, manganese, arsenic, organics, and phosphorus.

### **Russell J. Hauver**

Russell has 8 years of pilot experience with submerged and pressure membrane systems. Russell has a BS degree in Chemical Engineering from the University of Massachusetts. Russell specializes in membrane treatment of surface and groundwater supplies, and bench scale evaluations.



Name	Location	State	Date	Country	Owner	Engineer	Current Status	Water Type									Scale		Technologies																							
								Ground water	Surface Water	GWUI	Wastewater	Iron	Manganese	Arsenic	Fluoride	Organics	Turbidity	Other	Bench Scale	Pilot Scale	Full Scale	Coagulation	Oxidation	Adsorptive Media	Pressure Membrane	Submerged Membrane	Reverse Osmosis	DAF	Ballasted Flocc	Other												
Kennedy Wellfield UF Pilot Study	Acton	MA	Nov-05	USA	Acton Water District	Wright-Pierce	full-scale			X		X	X			X		X		X	X	X		X																		
Amesbury Immersed Membrane and DAF Pilot Study	Amesbury	MA	Oct-07	USA	Town of Amesbury	Metcalf & Eddy	under construction		X			X	X			X	X		X	X			X									X										
Well 6 Pilot Study	Apache Junction	AZ	May-06	USA	Apache Junction Water Company	Camp, Dresser & McKee	full-scale	X				X	X					X	X			X	X																			
Locke Lake Water System Pilot Study	Barnstead	NH	Jul-06	USA	Pennichuck Water Co.	Pennichuck Water Co.	full-scale	X				X	X	X					X	X		X	X	X																		
Newbridge #4 and Jerusalem #5 Wells Pilot Study	Bellmore	NY	Jul-05	USA	New York Water Service Corporation	New York Water Service Corp.	full-scale	X				X	X						X			X	X																			
Benkelman Pilot Study	Benkelman	NE	Feb-10	USA	Benkelman Water Department	Baseline Engineers	under review	X					X					X		X		X	X	X																	X	
Monadnock Mills Pilot Study	Bennington	NH	Jan-06	USA	Monadnock Paper Mills		none	X				X	X						X			X	X																			
Billerica WWTF Pilot Study	Billerica	MA	Aug-07	USA	Town of Billerica	Woodard & Curran	design				X								X		X		X																	X		
Mesa Verde Well #7	Blythe	AZ	Oct-09	USA	Town of Blythe	Webb Associates	Under review	X						X	X				X			X	X																	X		
Sunbelt Well 1 Pilot Study	Buckeye Center	AZ	Mar-07	USA	Town of Buckeye	RBF Consultants	full-scale	X						X					X	X		X	X	X																		
Palmer Drive Membrane Pilot Study	Canton	MA	Aug-05	USA	Town of Canton	SEA Consultants, Inc	unknown	X				X	X						X			X					X															
Well 3 Pilot Study	Cavendish	VT	Aug-04	USA	Town of Cavendish	Tighe & Bond	alternative process under constr	X				X	X						X		X		X	X																		
Charlton WWTF Pilot Study	Charlton	MA	May-07	USA	Charlton Water and Sewer Commission	Woodard & Curran	under construction				X								X			X																	X			
Smith Road Membrane Pilot Study	Chelmsford	MA	Aug-08	USA	Chelmsford Water Department	Stantec	design			X		X	X			X	X		X	X		X	X		X	X		X	X													
St. Brides Correctional Center Pilot Study	Chesapeake	VA	Jul-09	USA	Virginia Department of Corrections	Retaw Engineering	design	X				X	X							X		X	X																			
Lily Pond & MEX and Conventional Treatment	Cohasset	MA	Sep-05	USA	Cohasset Water District	Weston & Sampson	design		X							X	X		X			X																			X	
Lily Pond Ozone & Biologically Activated Carbon Pilot Study	Cohasset	MA	Mar-07	USA	Cohasset Water District	Weston & Sampson	alternative process in design		X							X	X		X	X		X																				
Middlesex School Phosphorus Removal Study	Concord	MA	Oct-08	USA	Middlesex School	Weston & Sampson	unknown				X							X	X		X																				X	
Well 1105 Pilot Study	Coolidge	AZ	Jul-05	USA	Woodruff Water Company	Tres Rios Engineers	design	X						X	X				X	X		X	X	X																X		
Mishnock Wellfield Pilot Study	Coventry	RI	Jun-06	USA	Kent County Water Authority	Stantec	design			X		X	X			X	X	X	X	X		X	X	X		X															X	
Alternative Pre-Oxidation Pilot Study	Danvers	MA	Apr-05	USA	City of Danvers	SEA Consultants, Inc	design		X							X	X		X			X	X																			X
Sand Filter Depth Pilot Study	Danvers	MA	Oct-08	USA	City of Danvers	SEA Consultants, Inc	design		X							X	X		X																							X
Ambler Park Pilot Study	Del Rey Oaks	CA	Apr-05	USA	California American Water Company	RBF Consulting	full-scale	X				X	X	X					X			X	X																			
Bouchard Well Pilot Study	Dover	NH	Dec-04	USA	City of Dover	Wright-Pierce	full-scale	X				X	X						X			X	X																			
Canal Street Pilot Study	E. Chelmsford	MA	Feb-06	USA	East Chelmsford Water District	Woodard & Curran	full-scale	X				X	X	X		X	X	X	X			X	X																			
Canal Street Plant Start-up	E. Chelmsford	MA	Mar-09	USA	East Chelmsford Water District	Woodard & Curran	completed	X				X	X							X			X	X																		
Eagle Mountain City Pilot Study	Eagle Mountain	UT	May-08	USA	Eagle Mountain Water Department		design	X						X						X			X	X																		
East Greenwich Well Pilot Study	East Greenwich	RI	Sep-09	USA	Kent County Water Authority	C&E Engineers	Under review	X					X						X			X	X																			
Gilman, Stadium and Lary Lane Well Rehabilitation Project	Exeter	NH	Jul-09	USA	Town of Exeter, NH	Weston & Sampson	Under review	X		X		X	X	X					X			X	X	X																		
Birch Road Well 3 Pilot Study	Framingham	MA	Jul-06	USA	Town of Framingham	SEA Consultants, Inc	design			X		X	X			X	X		X			X				X															X	
Acme Wells and Franklin Falls Well	Franklin	NH	May-08	USA	Town of Franklin	EarthTech	design	X				X	X						X			X	X																			
Franklin Ash Landfill Leachate Study	Franklin	NH	Nov-08	USA	Concord Regional Solid Waste Resource Recovery Cooperative	CMA Engineers	full-scale trials				X							X	X		X	X																				X
Fumasi Well #15 Pilot Study	Galt	CA	Feb-08	USA	City of Galt DPW	ECO:LOGIC Engineers	design	X				X	X						X	X			X	X																		
Industrial Well Pilot Study	Galt	CA	Apr-08	USA	City of Galt DPW	ECO:LOGIC Engineers	full-scale	X				X	X						X	X			X	X																		
Golden Heights and Monterey Bay Pilot Study	Galt	CA	Jan-10	USA	City of Galt DPW	ECO:LOGIC Engineers	full-scale	X				X	X						X	X			X	X																		
Wells 1 and 2 Pilot Study	Gilford	NH	Apr-07	USA	Winnstock Condos	Woodard & Curran	design	X				X	X						X			X			X	X	X															
Indian Head Brook Well 2 Pilot Study	Hanson	MA	May-05	USA	Ridder Farms	Weston & Sampson	none	X				X	X						X			X	X																			
Jordanelle Special Services District	Heber City	UT	May-08	USA	Jordanelle Special Services District		none	X				X	X					X			X	X																				
Aluminum Removal from Well 3 - Hightstown	Hightstown	NJ	Aug-10	USA	Town of Hightstown NJ	Roberts Engineering	Under review	X				X	X						X			X	X	X																		X
Derby Street Shoppes Wastewater Pilot Study	Hingham	NH	Nov-08	USA	Derby Street Shoppes	Martiniage Engineering	unknown				X								X	X			X																			X
Green Street Well Pilot Study	Hopedale	MA	Nov-07	USA	Town of Hopedale. MA	Tata & Howard	under construction	X				X	X						X			X	X																			
Green Street Well Pilot Study, Alternative	Hopedale	MA	Feb-10	USA	Town of Hopedale. MA	Tata & Howard	Under Construction	X				X	X					X			X			X	X	X															X	
Chain Lakes Wellfield Pilot Study	Indian Lake	NY	Jun-08	USA	Indian Lake Water District #2	Clough Harbour Assoc	design			X		X	X						X			X	X	X																		
Fifth Avenue Well Pilot Study	Isleton	CA	Sep-05	USA	California American Water Company	RBF Consulting	full-scale	X					X						X			X	X	X																		
Wescon Road Pilot Study	Johnson	VT	Oct-04	USA	Town of Johnson	Otter Creek Engineering, Inc.	full-scale	X				X	X							X			X	X																		
Notown GAC Pilot Study	Leominster	MA	Aug-08	USA	Town of Leominster	Woodard & Curran	design		X										X			X			X																	
State Road 114 Groundwater Plume Superfund Site	Levelland	TX	May-09	USA	US EPA		full-scale	X				X	X						X			X	X	X																		
Moody Road Pilot Study	Lisbon	ME	Dec-04	USA	Town of Lisbon	Wright-Pierce	full-scale	X				X	X	X					X			X	X	X																		
GWTP #1 and #2 Pilot Study	Mammoth Lakes	CA	Nov-09	USA	Mammoth Community Water District	HDR Engineers	Under review	X				X	X	X				X	X	X		X	X																			
Albertini Wells 2 & 3	Mansfield	MA	Jun-10	USA	Mansfield Water Department	Woodard & Curran	Under review	X				X	X						X			X	X																			
Rich Products Zinc and BOD Pretreatment Pilot	Marlborough	MA	Oct-01	USA	Rich Products	R.H. White Construction	none				X								X			X																		X		
Marlborough WWTF Pilot Study	Marlborough	MA	Jul-07	USA	Town of Marlborough	Camp, Dresser & McKee	under construction				X								X			X																			X	
Maynard WWTF Pilot Study	Maynard	MA	Aug-07	USA	Town of Maynard	Woodard & Curran																																				





Blueleaf Incorporated  
[www.blueleafwater.com](http://www.blueleafwater.com)  
 508.248.7094



Name	Location	State	Date	Country	Owner	Engineer	Current Status	Ground water	Surface Water	GWUJ	Wastewater	Iron	Manganese	Arsenic	Fluoride	Organics	Turbidity	Other	Bench Scale	Pilot Scale	Full Scale	Coagulation	Oxidation	Adsorptive Media	Pressure Membrane	Submerged Membrane	Reverse Osmosis	DAF	Ballasted Flocc	Other	
								Water Type							Contaminants							Scale			Technologies						
Horn Pond Treatment Plant Pilot Study	Woburn	MA	Oct-06	USA	City of Woburn, MA	Camp, Dresser & McKee	under construction	X					X						X	X			X	X	X						
Wolfboro Sequestration Study	Wolfboro	NH	Dec-10	USA	Town of Wolfboro	Weston & Sampson	Under Review	X	X									X			X										X
Wrentham Wasterwater Phosphorus Removal	Wrentham	MA	Jul-10	USA	Town of Wrentham	Weston & Sampson	Under Review				X							X	X			X									X
East Mesa Treatment Plant Pilot Study	Yuma	AZ	May-05	USA	City of Yuma	Carollo Engineers	full-scale	X					X						X	X			X	X							