COUNTY PLAN
FOR WATER AVAILABILITY
DURING EMERGENCIES

Developed in cooperation with

First Water Systems, Inc.

www.firstwaterinc.com

EXECUTIVE SUMMARY

The County has identified a need to ensure water availability to meet human needs during its anticipated emergency operations. This need has manifested itself in many counties during previous events such as tornadoes, earthquakes, hurricanes, wildfires, etc. The human need for water includes all non-suppression operations, including responding personnel and victim consumption and decontamination needs, HAZMAT cleanup, etc.

Currently, County personnel bring a limited supply of bottled water with them during deployments for their personal consumption. However, while the need for clean water is immediately after an incident, the availability of bottled water in all areas often exceeds the planned four days. After disasters, power outages and contaminated or compromised water systems further lead to months of boil-water bans, straining the supply of bottled or fresh water for victims and decontamination. In addition, the current solution to truck or fly commercially supplied bottled water is very expensive, frequently subject to federal government implementation, and will always be hindered by the many realities recently witnessed.

In addition to the above need for clean water, their also exists HAZMAT runoff incidents. In this situation, chemicals, typically diluted by suppression activities, are currently collected in holding pools and devices for shipment to authorized cleaning sites. The current process is very time consuming, expensive and disruptive to the community. There is no current method to easily treat the contaminated water at its origination point, even though it is collected and readily available.

All of the above realities lead to a need for clean water, available on-demand, in cost-effective mechanisms that can be pre-positioned in the areas of highest risk and easily transported around the County. In this way, water from local sources such as ponds, rivers, wells, low-pressure fire hydrants, tankers, flooded streets, etc. can be turned into fresh water wherever and whenever needed.

Water purification products specifically designed for these applications are a new solution to these regular and on-going needs. The desired technology is not intended to replace the bottled water delivery mechanism currently in place. Rather this new capability will augment current options and enhance the County's ability to respond to any type disaster where water quality or availability is compromised.

Hurricane Katrina was a large scale disaster that taught many lessons on the need for readily available fresh water. While surrounded by water, many people died from a lack of clean water. During this event, a new portable water purification system was tested and utilized by USAR (Urban search and Rescue), DMAT (Disaster Medical Assistance Teams), and a number of fire departments. Had an adequate number of systems been pre-positioned strategically around the affected counties, ample water to sustain victims would have been available immediately, saving many lives.

In his After-Action Briefing, General Honore, Commander of the National Guard for Hurricanes Katrina and Rita, recommended the pre-positioning of assets to enable quicker response during emergencies. This Plan actively supports this, and will meet the most basic of human need for clean water immediately after an event – and long afterward.

The County is seeking a regenerative system to provide water when it has traditionally been unavailable. The systems sought would purify ground water and locally available contaminated water into water exceeding US EPA requirements for use in its identified needs and operations. This type system is very cost effective compared with current options, and would ensure pure water under virtually any situation and be re-usable event after event for years. The County has identified such systems from *First Water Systems, Inc.* in portable, semi-portable and stationary forms for its Countywide needs. The patented technology is the only source of water purification equipment specifically designed for emergency management use, designed with input from dozens of first responder and military users.

The systems sought produce enough purified water to pay for themselves in just days. A truck load of water, approximately 3,600 gallons, costs about $4,800 without including emergency delivery realities that drove the cost for a truck load of water in Hurricane Katrina to over $10,000. Two of the portable systems sought can produce this same quantity of water in just two days for about the same cost. The larger systems available from *First Water* have an even more impressive cost recovery. Additionally, even though bottled water is consumed and then lost, these water purifiers will continue to purify water for years, and do not use any chemicals or have the environmental impact of thousands of empty plastic bottles. The return on investment is exceptional.

This Plan determines exactly the type and locations where the need exists. The result of the planning is the specific number of necessary units from each type to satisfy the anticipated needs. The Plan relies upon the flexible nature of this technology to reduce the total number of units to support its operations. Units' specific to function will be pre-positioned according to need around the County and support operations under all types of events.

The cost-effective water purification technology discussed herein is available for immediate use. The following details the type and quantities of this technology required to safeguard the County's citizens and First Responders.

COUNTYWIDE DEPLOYMENT PLAN

FOR EMERGENCY WATER AVAILABILITY

The County has identified a need to ensure water availability to meet human needs during its anticipated emergency operations. This need has manifested itself in many Counties during previous events such as tornadoes, earthquakes, hurricanes, wildfires, etc. The human need for water includes all non-suppression operations, including responding personnel and victim consumption and decontamination needs, HAZMAT cleanup, etc.

First Water Systems, Inc. (*First Water,* www.firstwaterinc.com), a Georgia small business, is grateful to assist the County with this Deployment Plan (Plan) for the distribution of water purification systems to support these County operational needs. Through this effort, the County will be able to effectively provide its first responders, emergency management personnel and citizens with fresh water in the first crucial moments and days after both natural and man-made disasters, as well as efficiently mitigate HAZMAT and sanitation incidences.

Problem Statement

The County requires clean water for several critical operational needs, as follows:

1. Fresh Water for Consumption – The current level of readiness for anticipated disasters such as hurricanes is impressive in that bottled water is typically available in most areas under most situations within four days of the event. This is not the case for unanticipated disasters such as tornadoes and terrorist attacks, where the time without water could be greater because bottled water cannot be quickly stockpiled or diverted. Also, as evidenced during a large scale disaster like Hurricane Katrina, the timeframe can extend to much longer times.

   Readily available clean water for consumption is also critical in wildfire and remote situations. Keeping firefighters and other responders hydrated is a major effort and critical to the success of the operation and firefighter safety. While there is generally surface water available from ponds, streams and rivers, as well as non-potable water available from tankers brought in, there is typically no way to utilize these available water sources.

   Currently, County personnel have a limited supply of bottled water with them during events for their personal consumption. However, while the need for clean water is immediately after an incident, the availability of bottled water in all areas can exceed the planned four days. After disasters, power outages and contaminated or compromised water systems further lead to months of boil-water bans, straining the supply of bottled or fresh water for victims

The current solution to truck or fly commercially supplied bottled water is a very expensive solution. While the lowest cost option is by truck, the Atlanta Journal-Constitution documented that the cost for a truckload of water (approximately 3600 gallons) during Hurricane Katrina routinely exceeded $10,000. The actual cost of a truckload of water, for just the water, is $4,800 (800 cases at $6.00 per case). This amount does not include the cost to deliver, which is where the $5,200 difference is realized. In addition to excessive cost, the existing sole option of bottled water will always be hindered by the following realities:

- Emergency vehicles and apparatus have precious limited space to be used as a bottled water delivery mechanism even for the personal use of responders without accounting for the water needs of victims,
- Truck delivery from outside the affected area is often impossible or severely impeded on flooded roads or roads blocked by debris and fallen trees and power lines,
- Coordination between trucks and the locations with need is difficult due to impaired communications, resulting in some areas having excessive amounts of water and some having none,
- A truck delivers its cargo at a specific location and it is then up to the responders and victims to get to the distribution site, which is many times difficult or impossible,
- The cost of delivery, including the vehicles, gasoline, driver time, damage to roads with water logged sub bases, and the cost of the water itself, is excessive and labor intensive,
- The County must depend on the federal and state systems to ensure the bottled water comes in sufficient quantities when needed,
- The amount of water required during wildfire operations to support personnel is very large because of the intense heat and nature of the operation and, because of the generally remote nature of the events, trucked in bottled water is typically difficult,
- Bottled water leaves behind tens of thousands of bottles that become an environmental issue,
- Once the bottled water is consumed, it is gone forever.

2. Clean Water for Decontamination

- During and long after disasters, ground water, well water, and water in pressurized piping systems is generally compromised and contaminated,
- The extent on the contamination is dependent on natural issues such as chemicals and impurities resident in the ground, as well as event specific pollution, such as disruption of pipelines, storage tanks, etc.,
- Responders are often in need of clean water for decontamination (Decon) of their bodies, equipment, and clothing,
- Showering and personal hygiene by responders during events is very necessary, yet difficult and wasteful of precious little clean water supplies.

3. Clean Water for Medical Needs

- Clean water is required to administer treatment to victims for topical cleaning, the cleansing of wounds, etc.,

- Clean water is required to protect responders and victims against infections and the spread of water-borne disease,
- Medical teams require clean water to ensure personal consumption requirements in remote locations for extended periods of time,
- Clean water is needed for assisting responders from distant areas with their consumption, Decon and medical needs.

In addition to the above need for clean water, their also exists HAZMAT runoff incidents. In this situation, chemicals, typically diluted by suppression activities, are currently collected in holding pools and devices for shipment to authorized cleaning sites. The current process is very time consuming, expensive, and disruptive to the community. There is no current method to easily treat the contaminated water at its origination point, even though it is collected and readily available.

The Need

All of the above realities lead to a need for clean water, available on-demand, in cost-effective mechanisms that can be pre-positioned around the County in the areas of highest risk, as well as on emergency response vehicles. In this way, water from local sources such as wells, low-pressure fire hydrants, ponds, rivers, streams, fire apparatus tankers, flooded streets, etc. can be turned into fresh water wherever and whenever needed.

Water purification products specifically designed for these applications, pre-positioned in critical areas around the County or attached to emergency vehicles, are a new solution to these regular and on-going needs. The desired technology is not intended to replace the bottled water delivery mechanism currently in place. Rather this new capability will augment current options and enhance the County's ability to respond to any type disaster where water quality or availability is compromised, and during prolonged periods of boil-water bans.

Hurricane Katrina was a large scale disaster that taught many lessons on the need for readily available fresh water. While surrounded by water, many people died from a lack of clean water. A new portable water purification system was tested and utilized by the State of Georgia, DMAT and several groups of first responders. During, and for months after their deployment, the systems were effectively utilized for consumptive and decontamination water purposes. Had the systems been strategically pre-positioned, ample water to sustain responders and victims would have been available immediately, saving many lives.

After a major event, large areas are frequently required to have boil water bans for significant lengths of time. Many shelters and critical facilities need to boil enough water to meet the consumption and cleaning requirements for hundreds of people. These types of systems will ease the burden on shelters and offer a superior option to boiling contaminated water.

For HAZMAT, the need exists to be able to clean the effluent at the point of collection, to avoid the cost and environmental impact of shipping and drying. Again, portable devices

easily transported to an incident scene that can turn the effluent into clean water for immediate local discharge is a very desirable capability.

The Requirements

The County requires a regenerative system to provide water when it is unavailable. The systems sought would purify ground water, wells, low pressure water pipes, pond or river water, etc. into water pure enough to use for its identified needs and operations. This type system would ensure clean water under virtually any situation, and be re-usable event after event for years. There are several system types required, based on portability:

Fully Portable System

1. Portability – The County has a need for portable systems that can be easily delivered by vehicle or person. The portable system requires the following:

    - ✓ An ease of use and ability to set up and tear down within 5 minutes for movement to other areas of need,
    - ✓ A wheeled lightweight package (less than 40 pounds) to enable an individual to carry the unit on a person's back if necessary,
    - ✓ A small package to allow transport in all types of typically very cramped emergency response vehicles.
    - ✓ An option to mount on a fire apparatus to draw directly from its tank.

2. Efficiency – In most circumstances, there will not be a stable power supply, and the system must function under minimal or no power supplies. In addition, the water produced from the system must be clean enough to support the three primary application areas of consumption, Decon, and medical operations.

    - ✓ A small power draw such that it can run on a vehicle battery or portable 12 volt battery for all operations, as well as a cigarette lighter adapter for powering from a vehicle battery,
    - ✓ An integrated solar capability to keep portable external batteries powered and the system producing purified water,
    - ✓ A hose and sprayer mechanism to facilitate Decon operations.

3. Power – The system must have sufficient flow and purification capabilities to support all County applications, including:

    - ✓ A 60 gallon per hour flow rate to enable quick hydration for first responders and the most victims possible,
    - ✓ Purification of water exceeding US EPA protocols and guidelines to a factor of 99.999% pure, with the effective elimination of all waterborne diseases, viruses, bacteria, heavy metals, smell, taste, etc.

Semi-Portable System

1. Portability – The need for this type of semi-portable device is for a system with easy delivery capabilities via typical emergency and command vehicles, and the ability to provide a greater amount of flow to support larger groups, such as ad-

hoc and planned shelters, critical facilities like hospitals and retirement homes, Emergency Operations Centers, etc. This type system requires the following:

- ✓ A package size that fits in a standard emergency management or command vehicle, lifted by two persons and moved by a single person
- ✓ The unit must be able to stand on its own or be mounted to a wall for an extended time of use
- ✓ The flexibility to move to a new operational area within 30 minutes and in an easy fashion.

2. Efficiency – The systems must be able to run on AC power for facilities where redundant power generation is possible. For areas where there is no stable power supply, or the power supply could be compromised during natural or manmade events, an option for the system to function under solar power is required. The requirements here are the same as for the portable system defined above.

    - ✓ An AC powered system and DC/Solar powered system for flexibility in deployments.

3. Power – The system must have sufficient flow to provide water to many hundreds of people, as well as the same purification requirements identified above for the portable system:

    - ✓ A minimum of 240 to 720 gallons per hour flow rate to enable consumption by larger groups of people up to several thousand.

Stationary System

1. Portability – These are fixed-in-place and permanently mounted units that are not intended to be moved. The application for these type units would be areas where water would be required in a planned environment, such as medical building and mobile facilities, planned shelters, large government centers, etc. As such, the units would be installed in-line with existing infrastructure, so there is no general portability requirement.

2. Efficiency – The systems must utilize the existing infrastructure, such as available plumbing and stable or redundant power supply by standard AC power or emergency generators. As such, the systems do not need a pump or power supply.

3. Power – The purification capaCounty of the units should match the need for areas of permanent installation. For example, an ice machine only requires minimal flow, but a kitchen facility would require a greater a greater flow. The systems must be able to supply the various flows while maintaining the water purity requirements listed for the Portable System:

    - ✓ A minimum of 120 to 480 gallons per hour flow rate to support several thousand persons.

The Solution

The *Responder™, Outpost™ and In-Line™* product families of water purification from *First Water* meet all of the above requirements, have been deployed both for emergency management and natural disasters around the world, and are providing purified water to tens of thousands of persons. *First Water* has deployed many water purification systems for first responders, Search and Rescue, Disaster Medical Assistance Teams, missionaries, churches, hospitals, etc.

The technology utilized by the *First Water* family of products is a patented, unique combination of the most effective purification techniques available. High strength ultraviolet (UV), which purifies without chemicals and is 30,000 times more powerful than chlorine, has been proven as the most effective way to kill biological entities (please see Attachment A for a specific list of entities killed). Activated carbon utilized in a porous block form, has been proven to be the most effective way possible to remove chemicals, taste and odor from water. All *First Water* products utilize a 0.5-micron carbon block that eliminates nearly all contaminants due in part to its incredibly small pore size. Independently, each technology is very effective. Together, they combine to be the most effective water purification process available.

In addition to the empirical evidence of hundreds of systems in place, independent laboratories have tested the technology against US EPA protocols. The level of purification achieved by the *First Water* systems far exceeds the established requirements for purity. The following table summarizes the US EPA requirements for Microbiologically Pure Water, and the level of purification achieved by the *First Water* products. Attachment A provides a listing of specific types of contaminants and chemicals destroyed or eliminated. Attachment B is an authorized letter from Truedail Independent Laboratories documenting the testing and results.

	USEPA Guide Standard Protocol for Microbiological Water Purifiers (NSF Protocol P231)		***First Water*** Standard Technology
Test/Organism	**Required Influent Concentration**	**Required Percent Reduction**	**Achieved Percent Reduction**
Bacteria	100,000 / ml	99.9999%	99.999999%
Virus	10,000 / ml	99.99%	99.999%
Protozoan Cyst	1,000 / ml	99.9%	99.999%

Portable Solution – The *Responder™*

The *Responder-S™* is a fully portable system designed with input from First Responders and the military specifically for First Responder and Emergency Management needs. It is completely stand-alone, operating on portable 12-volt batteries, vehicle batteries, or an integrated solar panel. The unit weighs only 38 pounds with the integrated solar panel, and 25 pounds without the solar panel. The briefcase size package is wheeled and can be easily carried by person, or delivered via any size emergency response vehicle. The *Responder™* also uniquely features a sprayer on the discharge hose, facilitating easy Decon operations or personal showering.

The *Responder-T™* maintains the same features as the unit above, but has been designed to mount directly on a fire apparatus or water-carrying vehicle wall to pull water directly from the storage tank. As such, it is somewhat portable in that it goes wherever the apparatus goes. It can then be available to hydrate firefighters during regular operations as needed, without having to bring bottled water to a fire scene. The purified water is also readily available for treating victims at the scene.

The *Responder™* offers exceptional efficiencies, producing up to 60 gallons per hour of purified water from any non-salinated source of water. One *Responder™* produces as much purified water as a truckload of bottled water, at approximately one third the cost, in just a few days. However, once bottled water is consumed, it is gone forever. The *Responder™* can produce clean water repeatedly for years to come. Made from military grade plastics, resins and components, it is designed to be easily cleaned (an approximately ten minute process) at the end of an event, stored for extended periods, and then brought out on a moments notice to begin immediately pumping fresh water again.

Semi-Portable Solution – The *Outpost™*

The *Outpost™* has been designed to deliver the same great quality water as the *Responder™,* but with a greater flow rate to satisfy the needs of more people and in a semi-portable package. The two models can purify up to either 240 gallons or 720 gallons per hour from virtually any source of fresh water. Emergency management planning typically accounts for one gallon of water person per day for consumption in emergency situations. Assuming a typical duty cycle of 10 hours per day, the solar powered *Outpost-4™*

will satisfy the needs of up to 2400 persons, while the AC powered *Outpost-12™* satisfies up to 7000 persons. With the anticipated interruptions in the purification process from distractions, the occasional need to clean a filter, etc., *First Water* recommends for planning purposes on the *Outpost-4™* satisfying the water needs for approximately 1400 persons, and the *Outpost-12™* satisfying approximately 4000 persons. While *First Water* recommends planning be based on a reasonable duty cycle, all systems are designed to operate 24/7 if need dictates.

The *Outpost™* is also unique in its versatility. Because it is mounted on a wheeled frame, it can easily be moved around a site or to multiple sites, enabling some portability. At approximately 150 pounds for the unit, plus another 50 pounds for the solar panel (available on the *Outpost-4™* only), one person can move it and two persons can lift it.

Fixed-In-Place Solution – The *In-Line™*

The *In-Line™* maintains the same purification capabilities as the units detailed above, but has been designed to mount directly on a building wall. It utilizes existing power sources and plumbing (it has no pump or power supply). It is perfect for facility ice machines, under sinks for general building usage, and decontamination showers. While the unit at the left is from a field hospital and uses a battery, permanent facilities would plumb the unit directly into the existing facility infrastructure.

The *In-Line-2™* offers exceptional efficiencies, producing up to 120 gallons per hour of purified water from compromised municipal water supply piping systems, and the *In-Line-8™* produces up to 480 gallons per hour.

The Plan

The table on the following page identifies areas of need, the specific type, and the locations where the need is greatest. This analysis will result in the specific number of necessary units from each type to satisfy the needs of the County. The implementation of the following will safeguard County first responders and residents with fresh water to support emergency operations and fight water-borne illness and dehydration.

Need Area and Requirement	***Responder™ Model***		***Outpost™ Model***		***In-Line™ Model***	
Vehicles:	***S*** (solar power)	***T*** (truck mount)	***4*** (solar power)	***12*** (AC power)	***2*** (facility based)	***8*** (facility based)
Fire Vehicles						
Ambulances						
Police Vehicles						
Command Vehicles						
Mobile Command Posts						
CERT Trailers						
HAZMAT Trailers						
Impaired Vehicle Response						
Public Works Vehicles						
Health Department Vehicles						
Boats						
Other						
Critical Locations:						
Fire Stations						
Police Stations						
Emergency Operations Center						
Health Department						
Planned and Ad-Hoc Shelters						
Government Continuance Facilities						
Community Services Buildings						
Medical Facilities						
Stadiums						
Retirement Facilities						
Military Facilities						
Prisons						
HAZMAT/Supply Caches						
Airport Facilities						
Port Facilities						
Park and Recreation Facilities						
Other						
Total Units:						

Plan Cost - Product Items	Unit Cost	Number Required	Total Amount
Responder - S™ (Portable Unit with solar)	Call for Quotation		
Responder - T™ (Truck Mounted Unit)			
Responder **Replacement Parts Kit ™** (2) Screened Pre-Filters (3) Washable/Reusable Ditch Filters (2) Sediment 5.0 Micron Filters, (2) Carbon Block 0.5 Micron Post Filter			
Responder™ Delivery to US domestic County			
Outpost-4™ (Semi-Portable Solar Unit)	Call for Quotation		
Outpost-4 **Replacement Parts Kit™** (2) Screened Pre-Filters (3) Washable/Reusable Ditch Filters (5) Sediment 5.0 Micron Filters, (5) Carbon Block 0.5 Micron Post Filter			
Outpost-12™ (Semi-Portable AC Unit)			
Outpost-12 **Replacement Parts Kit™** (2) Screened Pre-Filters (3) Washable/Reusable Ditch Filters (5) Sediment 5.0 Micron Filters, (5) Carbon Block 0.5 Micron Post Filter			
Outpost™ Delivery to US domestic County			
In-Line-2™	Call for Quotation		
In-Line-2 **Replacement Parts Kit™** (2) Sediment 5.0 Micron Filters, (1) Carbon Block 0.5 Micron Post Filter			
In-Line-8™ (Semi-Portable Non-Solar Unit)			
In-Line-8 **Replacement Parts Kit™** (2) Sediment 5.0 Micron Filters, (1) Carbon Block 0.5 Micron Post Filter			
In-Line™ Delivery to US domestic County			
PRODUCT ITEMS SUBTOTAL			

Plan Cost – Professional Services Items	Unit Cost	Number Required	Total Amount
Professional One Year Technical Support	Included	0	0
One Year Manufacturers Warranty from Aqua Sun International	Included	0	0
Optional Training One Half Day On-Site Training Class for any type of System (*Responder™ or Outpost™.*	Quote Required		
Travel to support Professional Services activities			
PROFESSIONAL SERVICES ITEMS SUBTOTAL			
PRODUCT ITEMS SUBTOTAL (from previous page)			
GRAND TOTAL			

Standard Contract Terms

Purchase Order for Grand Total, Required at Time of Order
Net 15 Days Terms after Delivery

ACCEPTANCE

For the County of _____, State of _____

Accepted By: _____

Name, Title: _____

P.O. Number: _____

Date: _____

For *First Water Systems, Inc.*

Accepted By: _____

Name, Title: _____

Date: _____

Attachment "A" - List of Effectively Killed Contaminants

Organism Type	
Bacteria	
Agrobacterium tumefaciens	Neisseria catarrhalis
Bacillus anthracis – (Anthrax)	Phytomonas tumefaciens
Bacillus anthracis spores – (Anthrax spores)	Proteus vulgaris
Bacillus magaterium sp. (veg.)	Pseudomonas aeruginosa
Bacillus paratyphusus	Pseudomonas fluorescens
Bacillus subtilis spores	Salmonella enteritidis
Bacillus subtilis	Salmonella paratyphi (Enteric fever)
Clostridium tetani	Salmonella typhosa (Typhoid fever)
Corynebacterium diphtheriae (Diptheria's)	Salmonella typhimurium
Ebertelia typhosa	Sarcina lutea
Escherichia coli (E. Coli)	Serratia marcescens
Legionella bozemanil	Shigella dyseteriae (Dysentery)
Legionella dumoffii	Shigella flexneri (Dysentery)
Legionella gormanii	Shigella paradysenteriae
Legionella micdadei	Spirillum rubrum
Legionella longbeachae	Staphylococcus albus
Legionella pneumophila (Legionnaires Dis.)	Staphylococcus aerius
Leptospiracanicola (infectious Jaundice)	Staphylococcus hemolyticus
Microccocus candidus	Staphylococcus lactis
Microccocus sphaeroides	Streptococcus viridans
Mycobacterium tuberculosis (Tuberculosis)	Vibrio comma (Cholera)
Molds	
Aspergillius glaucus	Penicillium expansum (olive)
Mucor racemosus A	Penicillium roqueforti (green)
Mucor racemosus B	Penicillium digitatum
Oospora lactis	
Protozoa	
Chlorella Vulgaris	Paramecium
Nematode Eggs	
Virus	
Bacteriopfage – E. Coli	Influenza (Influenza)
Infectious Hepatitis (Hepatitis)	Poliovirus – Poliomyelitis
Yeast	
Brewers yeast	Saccharomyces ellipsoideus
Common yeast cake	Saccharomyces spores
Saccharomyces carevisiae	

Chemical Type	
Acetadshyde	Methyl Alcohol
Acetic Acid	Mud and Sediment
Acetone	Methyl Bromide
Alchohol's	Methyl Chloride
Alkalinity	Methyl Ethyl Ketone
Amines	Naphtha
Amyl Acetate	Nitric Acid
Amyl Alcohol	Nitrobentene
Antifreeze	Nitrotuluene
Benzene	Odors, General
Bleach	Oils, Dissolved
Butyl Alcohol	Oil, Suspended
Butyl Acetate	Organic Acids
Calcium Hypachlorite	Organic Esters
Chloral	Organic Salts
Chloramine	Oxalic Acids
Chloroform	Oxygen
Chlorine	Oxone
Chtorobenzne	PCB's
Chlorophenol	Pesticides
Chlorophyll	Phenol
Citric Acid	Plastic Taste
Cresol	Plating Waste
Defoliants	Potassium Permanganate
Detergents	Precipitated Iron
Diesel Fuel and Gasoline	Precipitated Sulfur
Dyes	Proploic Acid
Emulsions	Proplonaldehyde
Ethyl Acetate	Propyl Acetate
Ethyl Acryiate	Propyl Alcohol
Ethyl Alcohol	Propyl Chloride
Ethyl Amine	Radon
Ethyl Chloride	Rubber Hose Taste
Ethel Either	Soap
Formaldehyde	Sodium Hypochlotite
Glycol's	Soluble Iron Solvents
Herbicides	Sulphonated Oils
Hydrogen Bromide	Suspended Matter
Hydrogen Iodide	Tannins
Hydrogen Peroxide	Tar Emulsion
Hydrogen Selenide	Tartaric Acid
Hydrogen Sulfide	Taste, DI Water and Organics
Hypochlorous Acid	THM's
Insecticides	Toluene
Iodine	Toludine
Isopropyl Acetate	trichloroethylene
Isopropyl Alcohol	Turpentine
Ketones	Urine and Feces
Lactic	Vinegar
Mercaptans	Xylene
Methyl Acetate	Volatile Organic Compounds (VOC's)

Attachment B

Summary Results From Independent Laboratory

REPORT

TRUESDAIL LABORATORIES, INC.

CHEMISTS · MICROBIOLOGISTS · ENGINEERS
RESEARCH · DEVELOPMENT · TESTING
ESTABLISHED 1931

14201 FRANKLIN AVENU
TUSTIN, CALIF. 92680
(714) 730-6239
FAX (714) 730-6462

Pura, Inc.
25555 West Stanford
Valencia, Calif. 91355
Attn: Ellis Anderson

DATE: July 14, 1995

RECEIVED: June 30, 1995

LABORATORY NO. 82201-1

One Model UV1 EPCB UV System

Microbiological Testing (APHA 17th Ed., 1989, 9215B)

RESULTS

Twenty Four hour cultures of E. coli were harvested off Tryptic Soy Agar slants and added to bacteria and chlorine free water and mixed. The inoculated water was pumped through the unit at 1.0 gallons per minute. Samples were taken and plate counts conducted. The results are given below:

Flow Rate: 1.0*	Bacteria Count** per milliliter	Coliform*** P/A per 100ml	Percent Reduction Over Control
Control	900,000	P	-
After 1 gallon	<1****	A	>99.999999%
After 2 gallons	<1	A	>99.999999%

* Gallons per Minute
** Colony Forming Units, Violet Red Bile Agar, 24 hours, 35°C
*** Colilert Presence/Absence
**** None Detected, less than the limit of detection

Respectfully submitted,

TRUESDAIL LABORATORIES, INC.

Karl W. Schiller, M.S.
Chief Microbiologist