CLARIFIER

A PUBLICATION OF GULF COAST WASTE DISPOSAL AUTHORITY

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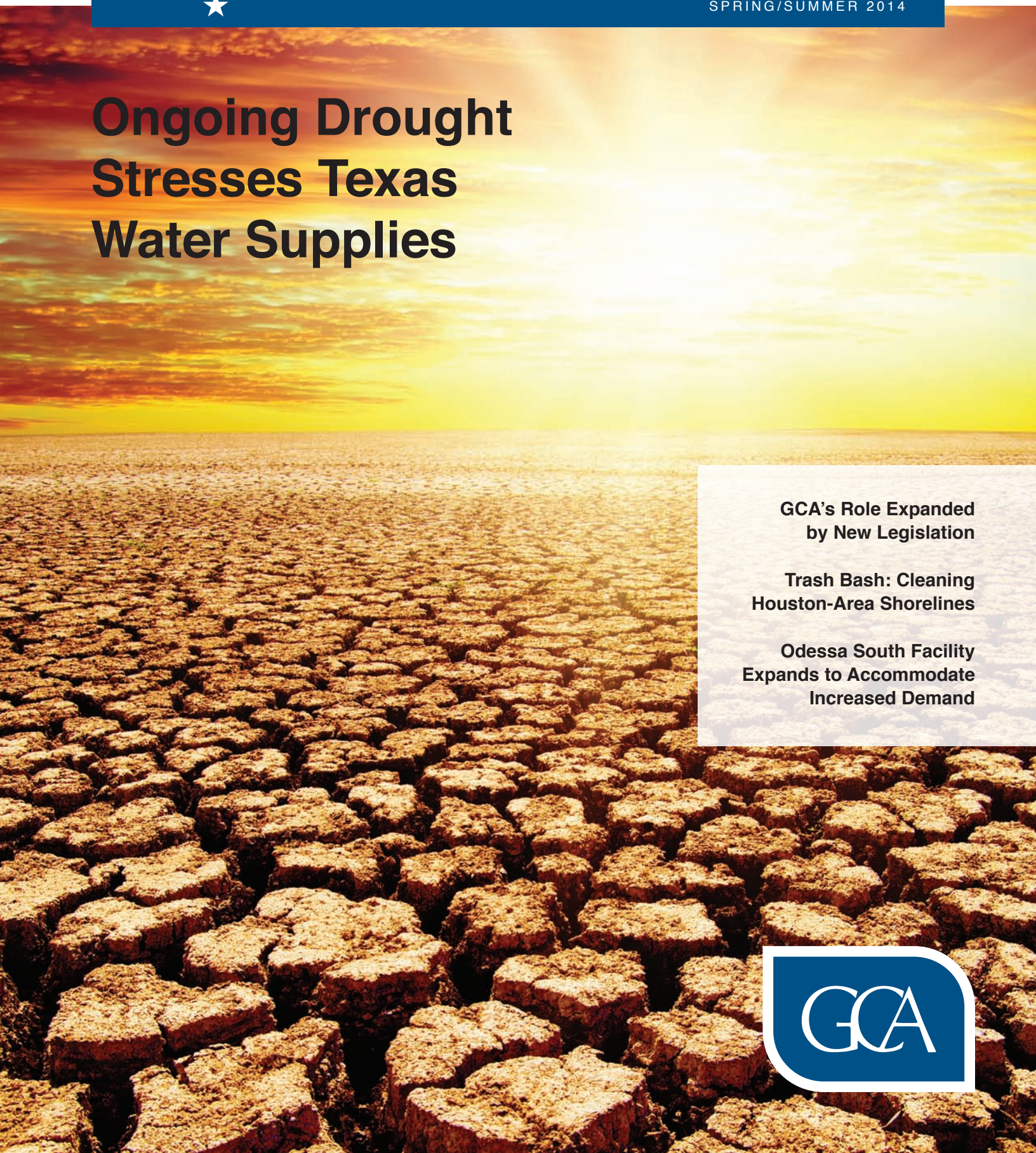
Ongoing Drought Stresses Texas Water Supplies



GCA's Role Expanded by New Legislation

Trash Bash: Cleaning Houston-Area Shorelines

Odessa South Facility Expands to Accommodate Increased Demand

FROM THE GENERAL MANAGER

The Gulf Coast Waste Disposal Authority's (GCA) importance to the state in protecting its waters was highlighted last year by passage of a new bill expanding the scope of GCA's purview to include other types of water systems. A driving force behind that legislation was recognition that the continuing drought is applying extreme pressure to Texas aquifers and other water sources. The situation is complicated by the state's rapidly increasing population and demands placed on water by hydraulic fracturing.

The bill permits GCA to build and operate a variety of water systems that promote reuse and treatment solutions for industry, while conserving potable water for human use. We are primarily looking for opportunities under the new law to provide industry with reliable water supplies from underutilized sources such as brackish groundwater and effluent reuse.

In the first issue of Clarifier, we augment the reporting on facilities and operations with articles that put our role in perspective: What are some of the current water issues affecting our state; and how GCA and our dedicated employees are working to implement ongoing water solutions for Texas.

Ricky Clifton
General Manager

FROM THE CHAIRMAN

These are trying times for Texas water resources. We are honored that the Texas Legislature and Governor Perry have placed their trust and confidence in GCA by broadening the range of water systems we may serve. Upon the invitation of local private and public sector leaders, we're willing to go anywhere in the state to help develop regional water management solutions.

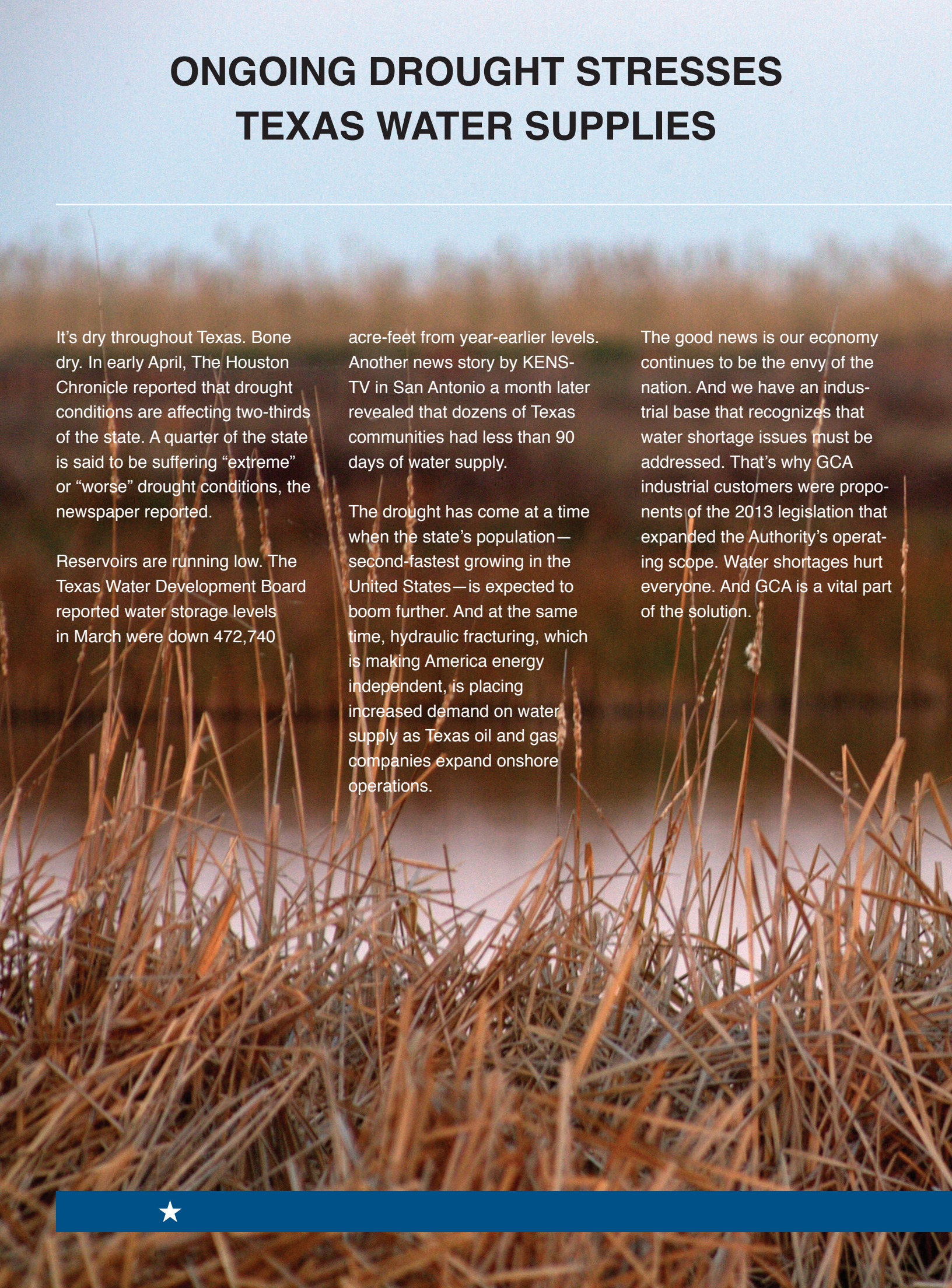
All of us on the Board of Directors are proud of the work GCA is doing every day to protect the waters of the State of Texas. We're also very proud of the industries and municipalities with which we partner; their commitment to regional water solutions is genuine and essential to the success of our mission.

We're fortunate to live in a state where government, business, industry and private citizens all work together to promote a strong, vibrant economy in concert with preserving and protecting our rich environment. This can-do, pull-together spirit is what makes Texas the envy of the nation and a magnet for people wishing to build a better life.

At GCA, we are doing our part to fulfill the Texas dream.

J.M. "Mark" Schultz
Chairman of the Board,
Chambers County

ONGOING DROUGHT STRESSES TEXAS WATER SUPPLIES



It's dry throughout Texas. Bone dry. In early April, The Houston Chronicle reported that drought conditions are affecting two-thirds of the state. A quarter of the state is said to be suffering "extreme" or "worse" drought conditions, the newspaper reported.

Reservoirs are running low. The Texas Water Development Board reported water storage levels in March were down 472,740 acre-feet from year-earlier levels. Another news story by KENS-TV in San Antonio a month later revealed that dozens of Texas communities had less than 90 days of water supply.

The drought has come at a time when the state's population—second-fastest growing in the United States—is expected to boom further. And at the same time, hydraulic fracturing, which is making America energy independent, is placing increased demand on water supply as Texas oil and gas companies expand onshore operations.

The good news is our economy continues to be the envy of the nation. And we have an industrial base that recognizes that water shortage issues must be addressed. That's why GCA industrial customers were proponents of the 2013 legislation that expanded the Authority's operating scope. Water shortages hurt everyone. And GCA is a vital part of the solution.

GCA'S ROLE EXPANDED BY NEW LEGISLATION

June 14, 2013, marked a significant milestone for the Gulf Coast Waste Disposal Authority—and for the State of Texas. On that day, Gov. Rick Perry signed legislation that expands GCA's role beyond municipal and industrial wastewater treatment to enable the Authority to build, own and operate other types of water systems including pipelines, conduits, canals, pumping stations, force mains, plants, storage and other facilities used for the treatment, collection or distribution of water disposal systems and treatment facilities for brackish, reuse and non-potable surface or saline water.

Sen. Rodney Ellis (Houston) and Rep. Wayne Smith (Baytown) championed the legislation proposed by GCA in response to industrial customer concerns that the prolonged Texas drought might result in the curtailment of water resources for industrial use. The idea was to conserve drinking water for human use statewide by providing industries access to non-potable "reuse" water from treatment facilities. It was passed by both houses of the Texas Legislature without a dissenting vote.

"The new legislation doesn't put GCA in the position of competing with local and state water resource agencies," said GCA General Manager Ricky Clifton. "Rather, it provides us the legal authority to work with existing governmental water providers to offer regional solutions, consistent with regional needs. Our business development group is looking into areas around the state where GCA may be of service."

GCA BOARD THANKS SEN. ELLIS, REP. SMITH FOR LEGISLATIVE LEADERSHIP

GCA's Board of Directors issued proclamations in September 2013 thanking Texas State Sen. Rodney Ellis (Houston), State Rep. Wayne Smith (Baytown) and their staff for sponsoring and working diligently for the successful passage of House Bill 3871, which expanded GCA's powers and duties to include water system facilities.

"Both legislators have been long-time friends of the Gulf Coast Waste Disposal Authority. In fact, Rep. Smith is himself a former GCA board member, and we wanted to formally express our appreciation," said GCA Board Chairman Mark Schultz.

"Water resource issues are of vital concern, especially in times of drought, and we are fortunate to have such legislators who understand the role GCA plays in protecting state waters while promoting economic growth through industrial development," Schultz said.

State Rep. Wayne Smith receives the GCA Board proclamation from chairman Mark Schultz

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GCA VISITS TEXAS DELEGATION TO U.S. CONGRESS TO PROMOTE FUNDING TO FIX NATION'S AGING WATER/WASTEWATER INFRASTRUCTURE

In February 2014, GCA executives and board members participated in a "Legislative Fly-In" visit to members of the Texas delegation to the U.S. Congress in support of proposed legislation to make more funds available to improve the nation's aging water and wastewater infrastructure.

GCA General Manager Ricky Clifton and Manager of Facility Services Gordon Pederson joined board members Frank Jones and

Dr. Irvin Osborn-Lee on the trip to Washington, where they met with staff at nine Texas congressional offices, including U.S. Rep. Randy Weber of Galveston. At issue is a bill proposed by the Sustainable Water Infrastructure Coalition seeking to remove volume caps on tax exempt bonds used to finance water and wastewater projects. The goal is to help fund $635 billion in needed repairs to America's water and wastewater infrastructure.

"Drought conditions are particularly acute in Texas," said Clifton, "but the entire nation would benefit from this proposed legislation. GCA is doing its part to provide solutions to our state's water shortage."

GCA Operations

GCA's current operations include: four regional industrial wastewater treatment facilities serving over 80 industrial customers in the Houston - Gulf Coast area and in the City of Odessa; a regional municipal wastewater treatment facility serving the City of Friendswood, a small part of Houston, and two Municipal Utility Districts; the Cedar Bayou Park Utility District treatment facility; a receiving station for trucked-in wastewater; a landfill for non-hazardous industrial solid waste; and a Central Laboratory accredited by the National Environmental Laboratory Accreditation Program (NELAP) that tests incoming wastewater, treated water before discharge and samples from outside customers.

Why communities and industries contract with GCA

GCA offers significant advantages for municipal and industrial customers:

Municipal

- GCA is responsible for permits and dealing with regulators;
- Favorable economies of scale save money and improve efficiency;
- Infrastructure financed by GCA preserves municipalities' capacity to issue bonds for other purposes.

Industrial

- GCA is responsible for permits and dealing with regulators;
- Favorable economies of scale save money and improve efficiency;
- Industries avoid the cost of installing and operating extensive pretreatment systems;
- GCA can provide financing for pipelines and solid waste;
- GCA staff are experts in wastewater treatment and industrial solid waste management;
- Allows industry to focus on core business.

Many of the same advantages of working with GCA to provide regional municipal and industrial wastewater treatment solutions also apply to water systems under the Authority's expanded scope granted by the Texas Legislature in 2013.

Bayport Industrial Wastewater Treatment Facility

Location: Bayport Industrial District, Pasadena, TX
Process: Activated sludge with atmospheric and pure oxygen diffusion

Bayport is GCA's largest facility, serving 65 industrial customers and two municipalities via a 2.25-mile BioSan pipeline for process wastewater and contaminated storm water runoff and a parallel "Clean Stream" concrete channel for streams that require solids treatment only, such as cooling tower blow-down water. The original plant was built by Friendswood Development Company, then owned by Exxon, as part of its Bayport Industrial Complex. GCA acquired the facility in 1974 and has expanded and improved it since.

With customers ranging from petrochemical plants, warehouses and transportation cleaning facilities to the City of LaPorte and the City of Shore Acres, Bayport treats one of the most diverse wastewater streams in the GCA system.

Blackhawk Regional Wastewater Treatment Facility

Location: Friendswood, TX
Process: Activated sludge with atmospheric aeration

While GCA's other facilities primarily treat industrial wastewater, Blackhawk is solely dedicated to regional treatment of municipal sewage, serving the City of Friendswood, Harris County Municipal Utility District (MUD) 55, Baybrook Municipal Utility District 1, and extreme southern portions of the City of Houston.

Blackhawk came on line in 1979 after the City of Friendswood invited GCA to create a regional facility to treat its and other entities' wastewater more efficiently and economically. Blackhawk's capacity was more than tripled during the 1990s to accommodate customer growth. Wastewater is transported by pipeline to the facility, where it undergoes primary, secondary and advanced treatment, including filtering through sand and charcoal, and disinfection by ultraviolet (UV) light prior to discharge into Clear Creek.

Blackhawk personnel also operate a small wastewater treatment plant near the City of Baytown for the Cedar Bayou Park Utility District.

40-Acre Industrial Wastewater Treatment Facility & Campbell Bayou Landfill

Location: Texas City, TX
Process: Oxygen-activated sludge. Non-hazardous solid waste industrial landfill

The 40-Acre Facility commenced operations in 1974 and today provides regional wastewater treatment services for two petrochemical plants and a marine terminal operation. The facility also treats storm water and carriage water from the 40-Acre landfarm, which receives sludge from the wastewater treatment facility. The storm water and non-hazardous leachate from GCA's nearby Campbell Bayou landfill are also treated at the 40-Acre Facility.

Wastewater is transported to the facility by pipeline, treated with sludge activated by pure oxygen infusion and polished in a series of retention ponds before the treated water is discharged into the Hurricane Canal, which feeds into the Texas City ship turning basin.

Personnel from 40-Acre also operate the nearby Campbell Bayou landfill for non-hazardous industrial solid waste such as construction debris from petrochemical plants operating in the Texas City Industrial Complex. Landfills are no longer permitted within 75 miles of coastal areas, so the grandfathered facility occupies a strategic position for serving this important industrial area. Space at the landfill is available by contract only.

Odessa South Industrial Wastewater Treatment Facility

Location: Odessa, TX
Process: Activated sludge with atmospheric aeration

In the late 1990s, Odessa had a problem. Economic development was constrained by the city's inability under changing environmental regulations to combine municipal wastewater with industrial streams that had not undergone pretreatment. GCA was invited to provide a regional solution—the Odessa South Industrial Wastewater Treatment Facility. GCA rebuilt and refurbished the city's old municipal plant, commencing operations in 1997.

Today, the facility provides treatment services for municipal and industrial wastewater transported by pipeline from the City of Odessa and a number of industries. Under its permit, Odessa South also receives trucked-in wastewater from municipal septic systems and portable toilets as well as non-hazardous industrial wastewater.

In 2013, the Odessa South Facility received the necessary approvals to move ahead with supplying 2 million gallons per day of effluent to a local oil and gas company for use in fracking operations. Reuse of effluent from wastewater treatment facilities will help promote conservation during the current drought and into the future.

Washburn Tunnel Wastewater Treatment Facility & Vince Bayou Receiving Station

Location: Pasadena, TX, on the Houston Ship Channel
Process: Activated sludge with atmospheric and pure oxygen infusion (Washburn Tunnel)

Acquired in 1973 from Champion Paper Co. and immediately modified and improved, Washburn Tunnel was the first facility to be operated by GCA, providing an early demonstration of the effectiveness and viability of wastewater treatment on a regional scale.

Washburn Tunnel serves refineries, petrochemical plants, bulk storage facilities and other local industries located along the Houston Ship Channel. The facility also treats approximately a million gallons per day of municipal wastewater from the City of Pasadena as well as volumes from GCA's nearby Vince Bayou Receiving Station.

GCA created the Vince Bayou Receiving Station at the request of the City of Houston and the State of Texas to offload non-hazardous wastewater transported by truck for treatment at Washburn Tunnel.

Vince Bayou receives waste material from portable chemical toilets, septic tanks, equipment/parking lot wash-down streams and some industrial non-hazardous wastewater.

Central Laboratory

Location: Bayport Industrial District, Pasadena, TX
Operation: Full-service NELAP-accredited testing laboratory

GCA's individual facility laboratories were consolidated into a single Central Laboratory in 1991. While the facilities still perform some basic analysis, the heavy lifting is accomplished at the Central Laboratory, which processes 400 samples daily. Test results are normally available the same day, versus a one-week turnaround for most commercial facilities.

The Central Laboratory tests all GCA streams daily for pH balance, total organic carbons, total suspended solids, metals, chemicals and other materials to ensure that incoming wastewater may be processed effectively and is monitored for compliance reporting. The state-of-the-art facility employs spectrometry, mass spectrometry, electron capture detection, flame ionization, atomic absorption and inductively coupling plasma equipment, much of it automated, to perform its mission.

The lab employs a web-based Laboratory Information Management System that enables GCA facilities to rapidly access test status and results and performs automated quality assurance for sample analysis.

In addition to its work for GCA facilities, the Central Laboratory provides analytical services to external municipal and industrial organizations. The lab is accredited by the National Environmental Laboratory Accreditation Program (NELAP) and the Texas Commission on Environmental Quality (TCEQ).

Lori Traweek, GCA Manager of Operations, her husband Don and Liz Van Orstrand at the Armand Bayou Trash Bash Site.

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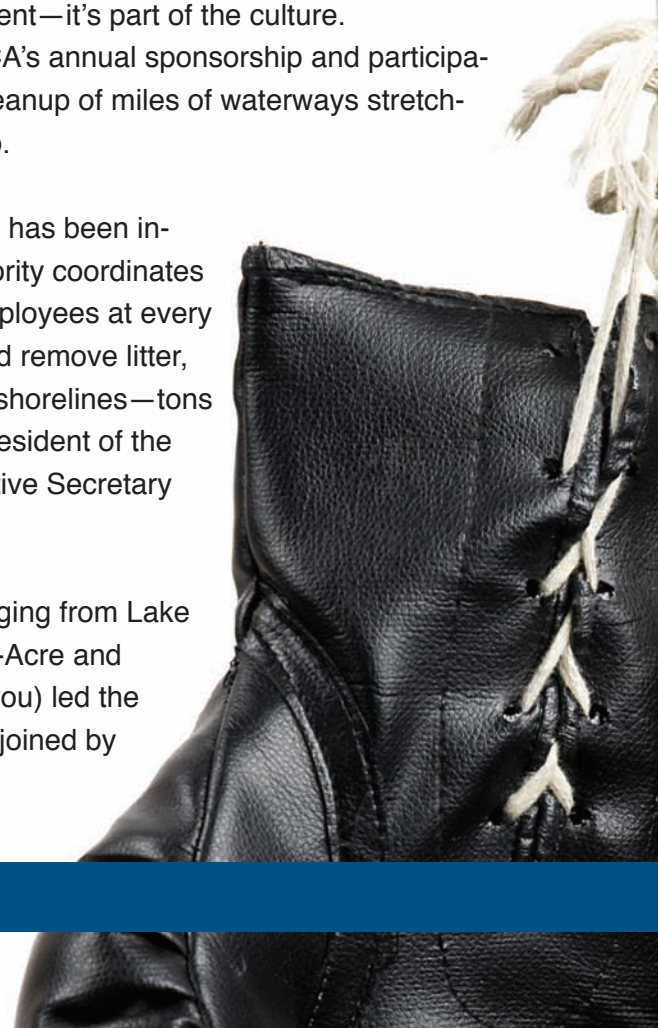
Protecting the waters of the State of Texas is GCA's job, it's true, but the commitment of the organization's employees and leadership is much broader than wastewater treatment—it's part of the culture. Perhaps the most visible example of that cultural commitment is GCA's annual sponsorship and participation in the River, Lakes, Bays 'N Bayous Trash Bash®, a massive cleanup of miles of waterways stretching from Lake Conroe all the way south almost to the Gulf of Mexico.

GCA is a Platinum Sponsor of the yearly half-day cleanup effort and has been involved in the event every year since its inception in 1994. The Authority coordinates two cleanup sites—Sims Bayou and Virginia Point—where GCA employees at every level of the organization join scores of other volunteers to collect and remove litter, old automobile tires and other refuse from the local waterways and shorelines—tons and tons of trash. GCA Operations Manager Lori Traweek is also president of the Texas Conservation Fund, which organizes Trash Bash, and Executive Secretary Linda Norton serves as the Fund's treasurer.

Trash Bash 2014 was held on Saturday, March 29th, at 16 sites ranging from Lake Conroe to Galveston Bay. GCA facility managers Terri Strachan (40-Acre and Campbell Bayou) and Kelly Nidini (Washburn Tunnel and Vince Bayou) led the cleanup for Virginia Point and Sims Bayou, respectively. They were joined by



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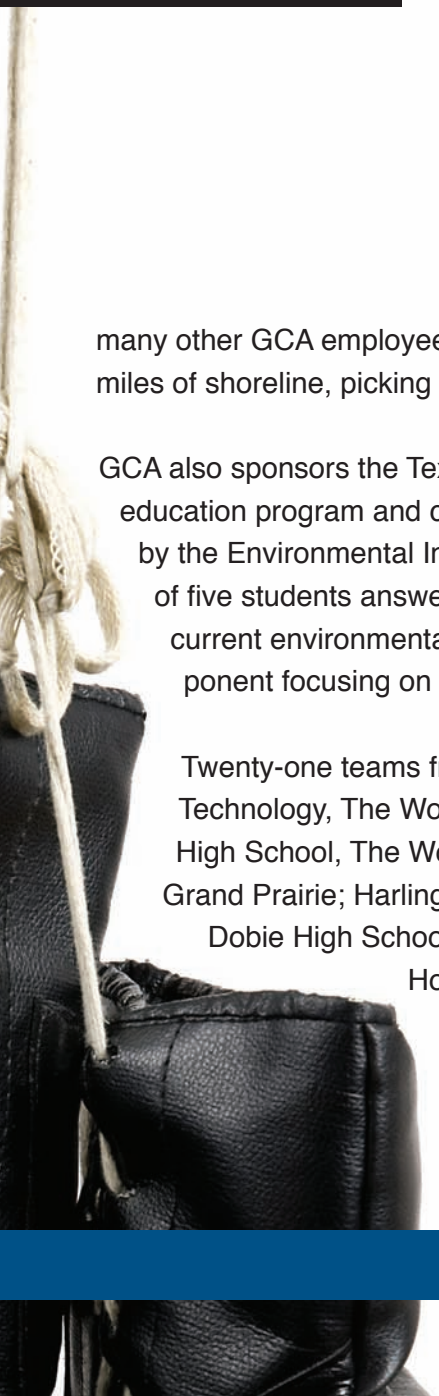
First-place Envirothon winners Team "Alligator" from the Academy of Science and Technology, The Woodlands, TX.



many other GCA employees and other volunteers. Throughout the Houston area, 4,622 volunteers policed 157 miles of shoreline, picking up and disposing of 37.6 tons of refuse, including 369 automobile tires.

GCA also sponsors the Texas Envirothon, an academic, extra-curricular environmental and natural resource education program and competition designed for high school students. The program is coordinated locally by the Environmental Institute of Houston at University of Houston – Clear Lake campus. Teams composed of five students answer questions focusing on five areas of study: aquatics, forestry, soils, wildlife, and a current environmental issue. In addition to the field experience, students also participate in an oral component focusing on a real-world environmental problem.

Twenty-one teams from 13 schools participated in the 2014 competition: The Academy of Science and Technology, The Woodlands; The John Cooper School, The Woodlands; The Woodlands College Park High School, The Woodlands; Richardson High School, Richardson; South Grand Prairie High School, Grand Prairie; Harlingen South High School, Harlingen; Carroll Senior High School, Southlake; J Frank Dobie High School, Houston; Georgetown 4-H, Georgetown; St Thomas High School, Houston; Sam Houston High School, Arlington; Science Academy of South Texas, Mercedes; and Rio Hondo High School, Rio Hondo.

The winning group in 2014 was Team "Alligator" of the Academy of Science and Technology. We congratulate them for their achievement.

GCA also is a regular sponsor of the Galveston Bay Foundation's (GBF) annual Bay Day and Marsh Mania events. Bay Day is a one-day celebration presented by GBF and its community partners. This family event is a fun way to educate participants about Galveston Bay and includes interactive exhibits, demonstrations and other activities that emphasize the beauty and value of a healthy bay. Marsh Mania is a nationally recognized,

annual wetlands restoration project that involves community volunteers. Over the past 16 years, Marsh Mania has brought together more than 7,000 volunteers who have helped restore and replant more than 200 acres of vital salt marsh habitat at 74 sites around Galveston Bay.

MARSH MANIA

The Galveston Bay Foundation's (GBF) Marsh Mania is the nationally recognized, signature community-based wetlands restoration and education event of the Galveston Bay area. The goal of Marsh Mania is to involve local citizens in hands-on wetlands restoration activities while increasing their awareness and appreciation of wetland habitats and functions. The first Marsh Mania was held in 1999, that year known as "Marsh Bash." This one-day event set a national record when 1,500 volunteers planted nearly 70,000 stems of smooth cordgrass to create 14.5 acres of new habitat at eight sites around the bay. In its 16 years, Marsh Mania has involved more than 7,000 community volunteers in the restoration of over 200 acres of vital salt marsh habitat at 74 sites around Galveston Bay. GCA is a longtime sponsor of this event.

BAY DAY

Bay Day is a one-day celebration presented by the Galveston Bay Foundation and numerous community partners. It is a fun event for families and adults that allows attendees to experience and learn more about Galveston Bay, the largest bay in Texas and one of the most productive estuaries in the country. Bay Day highlights include hands-on, interactive exhibits, activities and demonstrations that emphasize the beauty and value of Galveston Bay. GCA partners with other sponsors to support GBF's efforts to share information on the value of Galveston Bay.

More than 5,000 people from all over joined GBF staff, exhibitors, and volunteers to celebrate Galveston Bay at the annual Bay Day Festival on April 26 at the Kemah Boardwalk. Attendees visited the interactive exhibits and learned about the importance of Galveston Bay and its diverse resources. A new and popular feature this year was the Water Wonders Coner, which focused on activities to teach participants about water-quality-related issues in Galveston Bay.

GCA CONTRACTS WITH OIL & GAS COMPANY TO PROVIDE WATER FOR DRILLING AND COMPLETION OPERATIONS

Ongoing drought conditions in Texas, coupled with an increase in water demand to service fracking and other oilfield drilling and completion operations, have created opportunities for GCA to help conserve drinking water by providing treated effluent to industry.

"In times of drought, scarce water supplies are allocated to people first," said GCA Manager of Facility Services Gordon Pederson. "But industry needs water, too. By providing non-potable treated water from our facilities, we can help keep the economy growing while freeing up drinking water for human use."

GCA has entered a contract to supply treated water from the Odessa South Facility to Kerr Energy for use in its Permian Basin drilling and completion operations, including hydraulic fracturing. Fracturing, or fracking, involves pumping water, chemicals and sand or other coarse

material into shale and other "tight rock" formations to crack and then prop open fissures that allow the oil and gas to flow more freely. The technique, combined with horizontal drilling, has proven to be a major boost for U.S. energy supplies and a boon to the economies of communities located near shale plays.

The agreement calls for supplying up to 2 million gallons of effluent per day from the Odessa South Facility to Kerr Energy starting in the first quarter of 2014. This marks the first time GCA has engaged in treated water reuse for industry.

RDX Technologies is in the process of acquiring Kerr Energy and plans to continue the water reuse project with GCA. RDX has a contract with COG Operating, Inc., a subsidiary of Midland's Concho Resources, to provide more than 45,000 barrels per day of treated water for a total of 13 years, divided into three terms.

The treated water will be transported by pipeline from GCA's Odessa South Facility to a field distribution center. RDX is securing pipeline right-of-ways. RDX CEO Dennis Danzik has described the project as a first-of-its-kind approach for supplying water for shale oil production.

WASHBURN TUNNEL FACILITY TO UNDERGO DISINFECTION UPGRADES

GCA is upgrading the Washburn Tunnel facility to improve the wastewater effluent disinfection process. The project will employ peracetic acid as the disinfection medium. Eliminating elevated bacterial counts in wastewater discharges to state waters helps ensure the availability of clean, sustainable water for future generations.

The scope of the project includes the design and construction of a large disinfection contact basin, underground piping modifications, instrumentation, chemical feed system controls and continuous outfall monitoring to ensure the facility sustains the highest quality wastewater discharge. Commissioning of the improvements is estimated to occur during the first quarter of 2016. Extensive technical planning and coordination with customers and the regulatory community has positioned GCA to continue to be the premier provider of industrial wastewater treatment services in Texas.

In line with GCA's Core Values and Key Business Performance Areas, this investment will pay dividends in the form of safety and environmental compliance, reliability, long-term sustainable growth and customer satisfaction.

BAYPORT FACILITY'S $27.5 MILLION IN CAPITAL PROJECTS SLATED TO MEET GROWING CUSTOMER DEMAND

The Bayport Facility has seen tremendous growth and change since its inception in 1974 and will continue to see more during the next three years. Reliability is a core value of the service that GCA provides to our customers and in order to meet these expectations Bayport has started design and construction on three major projects.

Aging infrastructure at the facility along with continued growth has driven the need for $27.5 million in capital projects. The first undertaking is to upgrade Bayport's main lift station and replace the pipeline that transports water from the main lift station to the first-step treatment tanks. The old pipeline is nearing the end of its service life and additional capacity is needed to facilitate future needs of our customers.

The second project involves relocation of Bayport's disinfection system and construction of an additional clarifier. Completion of this project will help the facility meet future permitting requirements and provide redundancy for conducting more comprehensive maintenance on Bayport's existing clarifiers.

The third and final project will replace the pipeline that conveys wastewater from the facility's first-step treatment tanks to the second-step tanks and clarifiers. The old pipeline had capacity constraints and was near the end of its service life.

During 2014 feedstock prices have remained low and the Bayport Industrial Complex is seeing tremendous growth through expansions and new facilities. This customer growth challenges the Bayport Facility to be proactive in expanding to meet increased demand. GCA recognizes the important function it serves in providing regional wastewater treatment to the Bayport Industrial Complex and continues to maintain the compliant and reliable quality of wastewater treatment service that our users expect.

GCA is charged with the task of protecting the waters of the state of Texas, and through reliability, planning, teamwork and continuous improvement, the Bayport Facility continues to meet these goals.

ODESSA SOUTH FACILITY EXPANDS TO ACCOMMODATE INCREASED DEMAND FOR TRUCKED-IN WASTEWATER DISPOSAL

The Permian Basin has seen tremendous economic growth due to the increase in oil and gas exploration activities in the area in recent years. One side effect of this growth has been increased demand for disposal options for wastewater generated by drilling and production personnel and operations. This demand comes at a time when existing Permian wastewater treatment plants were already finding their capacities under stress.

GCA's Odessa South Facility addressed this problem by tripling the number of unloading bays at its receiving station. As a result, wait times have significantly decreased for waste carriers and wastewater volumes delivered to the plant for treatment and disposal have increased. Odessa South currently receives more than 2 million gallons of trucked-in wastewater per month and that amount is on the rise. This is another good example of how GCA continues to pursue opportunities to provide solutions that support environmentally responsible economic growth in Texas.

Odessa South was established in 1997 after city officials invited GCA to offer a regional solution to wastewater management issues that were constraining economic growth in the community.

BLACKHAWK FACILITY UV DISINFECTION IMPROVED

In late 2013, GCA began work to upgrade the Blackhawk Regional Treatment Plant's disinfection system. The facility has used ultraviolet (UV) light as the primary disinfection system for more than 20 years but due to regulatory changes to treatment requirements and improvements in technology, the upgrade was determined necessary to maintain reliability.

The new system went live on April 4, 2014. It's designed to disinfect the final wastewater at the facility up to a flow rate of 27.75 million gallons per day with a light transmittance of 50 percent, which measures the ability for the UV light to travel through the treated water to disinfect any pathogens still remaining.

The system is fully automated and can turn UV lights on and off as needed as well as opening and closing the facility's weir gates to permit flow to any one of the three water channels. The system also can increase or decrease the power output of the UV lamps depending on the flow rate and quality of the effluent. This ensures high-quality, efficient disinfection.

As part of the UV system upgrade, two of Blackhawk's five dual-media sand filters also were rehabilitated. The filter media and components were removed and replaced with all new components and media.

GCA INVESTIGATES INDUSTRIAL WATER MANAGEMENT AND RECLAMATION FOR PERMIAN BASIN

The Permian Basin in West Texas is a major producing area for oil and gas, accounting for 14 percent of total annual petroleum production in the United States.

GCA is exploring the possibility of establishing regional water recycling infrastructure to provide water for industrial use—including oil and gas exploration and production—in the Permian. The conceptual approach is to build one or more facilities that would receive non-potable water from various sources, such as flowback water from fracking, produced water from waterflooding of oil wells, brackish groundwater, treated municipal wastewater and, possibly, water recovered from salt water disposal well fields. GCA would treat and blend water from these sources to provide water with a quality suitable for industrial use—including fracking and waterflooding—and then redistribute the reclaimed waters to industrial users. Transportation of water to the treatment facility and then on to the location of reuse would be by pipeline.

The potential benefits of such a system include:

- Additional water supply in a water-short area;
- Reduction of industrial demand on water suitable for potable use;
- Additional capacity for saltwater disposal; and
- Reduction in truck traffic on area roadways.

GCA is currently working with the Odessa Development Corporation and the City of Odessa to fund the study. Representatives from local energy, petrochemical, power and salt water disposal companies, in addition to municipal partners, also have been asked to participate.

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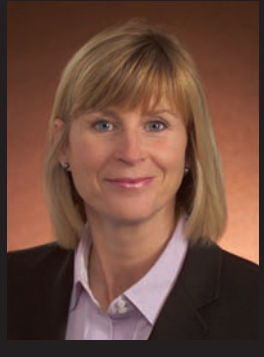

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Protecting the waters of the State of Texas
through environmentally sound and economically
feasible regional waste management practices

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