December 2009/January 2010

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Newsletter of the Trinity River Authority of Texas

COLD WATER TREATMENT

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Construction on ROCRWS Solids Dewatering Building Gets Underway

Phase Two of Construction Project to Expand System from 3.5 MGD to 6.0 MGD is 70% Complete

The Trinity River Authority's Red Oak Creek Regional Wastewater System is undergoing expansion from a rated capacity of 3.5 million gallons per day to 6.0 MGD. As of March 2009, the interim rated capacity of 4.6 MGD was approved by the Texas Commission on Environmental Quality. This is the first expansion at ROCRWS since the system began operations in 1991.

The ROCRWS provides wastewater treatment services for the cities of Cedar Hill, DeSoto, Glenn Heights, Lancaster, Ovilla, and Red Oak, all located in northern Ellis County.

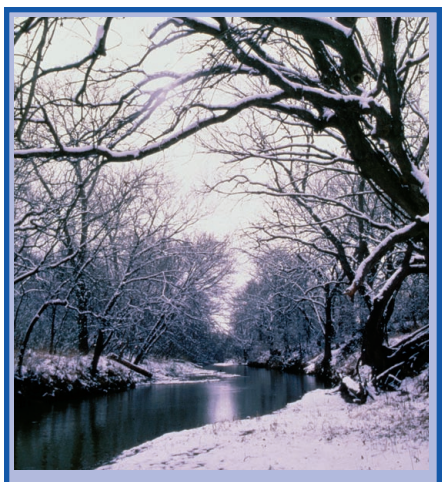
Phase I construction was limited to improvements to the system's solids dewatering and screening processes. Construction on Phase I is complete and the new facilities are in service.

Phase II construction includes improvements to pumping capacity, additional aeration basins and a complete overhaul of the dewatering, screening, grit removal and disinfection processes at the plant. A new odor control system is also included in Phase II construction. Phase II is approximately 70 percent complete.

A construction contract for the new solids dewatering building was awarded to Red River Construction Co. at the December meeting of TRA's Board of Directors. Construction is underway and is expected to be complete later this year.

Red Oak Creek Regional Wastewater System plant. This aerial photo shows ongoing construction to increase the plant capacity from 3.5 MGD to 6.0 MGD. Process upgrades include new screening facilities as well as new sludge dewatering equipment. As of March 2009, the interim rated capacity of 4.6 MGD was approved by the Texas Commission on Environmental Quality.

The new Preliminary Treatment building at ROCRWS is ready to receive equipment. Drum screens will be installed on top of the building. Grit pumps, grit screws and compactors will be housed inside.



On the cover: The unusually cold and snowy winter of 2009/2010 has posed many challenges. Treating potable water in cold weather is especially challenging. INTRA visited the four water treatment plants operated by the Trinity River Authority to see how they are coping with the cold. See story on page 2.

Inside:

Unusually Cold Winter Temperatures Strain Water Treatment Process and Distribution

Note: Most people are aware that providing potable water during the hot and dry summer months is a challenge. Demand is high as consumers use water for landscape irrigation, swimming pools and frequent showers. Pumps, pipes and other equipment are taxed to the limits. Pipeline breaks can occur as soils shrink and crack, allowing water to escape. Electrical problems can occur as electrical equipment is also taxed to the upper limit.

Less well known are the challenges water treatment operators face in freezing conditions. The treatment process is slowed substantially while the demand for water increases.

The Trinity River Authority operates four potable water treatment plants. INTRA visited each of the plants to see how they fared during this winter's unprecedented cold weather.

The winter of 2009/2010 has brought several spells of freezing weather to the Trinity River basin. In the northern reaches of the basin, the Dallas/Fort Worth metroplex, average daily temperatures for the month of January vary between lows of 35 degrees and highs of 55 degrees Fahrenheit. The southern portion of the Trinity River basin typically sees lows of 40 degrees and highs of 60 degrees F. In contrast, on January 8 and 9, temperatures dipped to 13 degrees F in the northern region of the basin and 16 degrees F in the southern region.

Producing potable water takes longer in cold weather. To understand why, let's briefly review the water treatment process. In general, raw water is pumped from a lake or river to the treatment plant. At the plant, the first step in water treatment is clarification. Water enters a clarifier, usually a large above-ground tank, where it is mixed with alum, a chemical that encourages particles to stick together. As particles clump together, they become heavy and drop to the bottom of the clarifier.

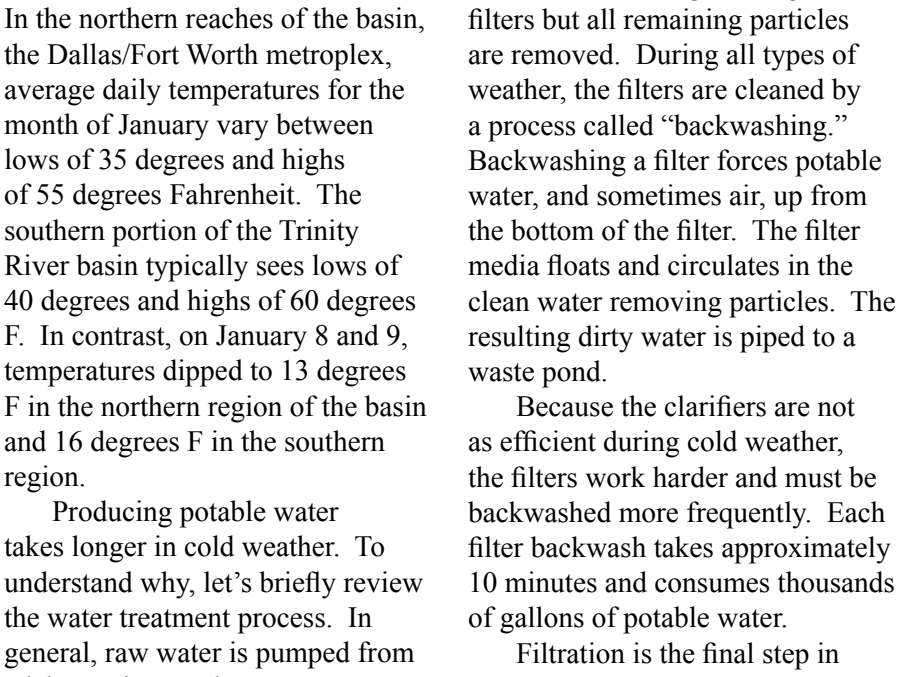
Next, the clarified water is piped to filters where it drains through several feet of sand, gravel and in some cases granular activated carbon (charcoal) to remove any remaining particles. The clarified and filtered water is disinfected, usually with chlorine. Other chemicals such as caustic soda are added to increase pH. Finally, the clean and disinfected potable water is piped to municipal tanks before final distribution to the end consumer.

Cold weather throws a wrench in the treatment process from beginning to end. As the raw water temperatures decline, the density of the water increases. Alum will not mix with cold water as readily and the particles in the water take longer to settle. As a result, the clarifiers are not as efficient at removing particles from the raw water.

The filters are taxed with cleaning the remaining particles from the water. It takes longer for the dense water to go through the filters but all remaining particles are removed. During all types of weather, the filters are cleaned by a process called "backwashing." Backwashing a filter forces potable water, and sometimes air, up from the bottom of the filter. The filter media floats and circulates in the clean water removing particles. The resulting dirty water is piped to a waste pond.

Because the clarifiers are not as efficient during cold weather, the filters work harder and must be backwashed more frequently. Each filter backwash takes approximately 10 minutes and consumes thousands of gallons of potable water.

Filtration is the final step in cleaning potable water. For this reason, the filtration process has a built-in safeguard to make sure the water is cleaned before continuing to disinfection. A turbidity meter measures the clarity of the water as it leaves each filtration unit. If the water does not meet state-mandated requirements for clarity, it goes directly to the waste pond.



John Ackerman, Operator II at HRWSS, stands on one of four clarifiers at the plant. Clarifiers do not work as well in cold weather.

Rick Brashear, Senior Operator at LRWSS (center) supervises water line repair. Brashear is aided by Jason Smith, Operator II at LRWSS (in blue stocking cap), Robert Burchett, SR Maintenance Mechanic II (on right) and a City of Livingston employee on the left. Pipeline breaks are common in cold weather as freezing and thawing soils expand and contract causing pipes to shift and come apart.

Due to the density of cold water and the resulting clarification and filtration issues, potable water treatment in cold weather can take twice as long as it does in warm weather.

And yet the demand for water during freezing weather can be unusually high compared to normal winter demand. This increase in demand is due to two factors. First, many people open faucets to drip during freezing weather. This practice relieves pressure in the line which will lessen the chances for a pipe break if the pipe freezes. Dripping three faucets in a home or business for 24 hours uses 100 gallons of water. Multiply that by the number of homes and businesses a water system serves and the gallons add up quickly.

The second reason demand for water increases in cold weather is the occurrence of pipeline breaks. As the ground freezes and thaws, it contracts and swells. Pipelines shift and come apart allowing the water to escape. Also, as water freezes, it expands. Potable water lines are pressurized to prevent incursion of groundwater and to deliver water throughout the distribution system. The expansion caused by freezing water can also lead to broken pipes. Potable water line breaks can go undetected depending on the location.

INTRA visited TRA's four water treatment plants to see how they fared during the January cold spell.

Huntsville Regional Water Supply System

The Huntsville Regional Water Supply System provides up to 8 million gallons per day to the City of Huntsville and two Texas Department of Criminal Justice prison units. In addition, the system sends up to 6 MGD of partially treated water to Grimes County where it is used for cooling and processing at the Tenaska power generating plant. HRWSS serves a population of approximately 40,000, which includes 35,000 in the city of Huntsville and 2,500 in each of the Ellis and Estelle Texas Department of Criminal Justice prison units.

The pace of the water treatment process at HRWSS slowed to about half during the cold weather with the filters being the primary bottleneck.

"During the summer, we backwash the filters every 100 hours. During winter, we backwash about every 30 hours. During the freezing temperatures, we had to backwash every 10-12 hours," said David Odom, Chief Operator at HRWSS. The filters at HRWSS take 10 minutes to backwash and use 8,000 gallons of potable water per minute for a total of 80,000 gallons per backwash. This is water that is not going to the municipal tank.

Odom characterized the filters as "touchy" during extreme cold weather. The slightest change can cause a spike in water turbidity triggering the filters to discharge to the waste pond. This diverts even more water from the municipal tank and further delays treatment.

Meanwhile, water demand increased as residents in the City of Huntsville dripped faucets. Breaks in outdoor lines and sprinkler systems allowed water to escape the system.

In addition to the treatment and demand issues, HRWSS experienced a number of small problems at the plant and throughout the distribution

system due to freezing temperatures. Pressure sensors in storage tanks, monitored by the system's SCADA, or electronic control system, malfunctioned and sent inaccurate information to the plant.

"Two of the TDCJ tanks registered as full when they were both nearly empty," said Odom.

A water line froze and broke in the plant's administration building. There were other small breaks at the plant as well. These small problems are more of an annoyance but they do require the staff's attention and add to the stress. Plus, as we all have experienced, even small tasks are much more difficult in freezing weather. Frozen fingers don't work very well.

Livingston Regional Water Supply System

The Livingston Regional Water Supply System supplies water to the City of Livingston, the Texas Department of Criminal Justice's Polunsky Unit and a privately operated prison facility next to the Polunsky Unit. This small plant treats an average of 2 MGD.

At LRWSS, the usual cold weather treatment challenges with clarification and filtration are made worse by the plant's location on the prairie next to Lake Livingston. The clarifiers are exposed to the cold winds blowing off the lake and prairie. Winds whip up wave action on the clarifiers which causes further problems with settling.

Rick Brashear, Senior Operator at LRWSS, treated water at maximum speed for three days during the January freeze to meet the demand from the city of Livingston and TDCJ.

In addition, LRWSS experienced several small problems including a malfunctioning pressure sensor at the TDCJ tank.

Trinity County Regional Water Supply System

The Trinity County Regional Water Supply System provides an average of 800,000 gallons per day of potable water for Trinity, Groveton, Westwood Shores MUD, and the Glendale, Trinity Rural and Riverside Water Supply Corporations.

TCRWSS does not use alum or clarifiers in the treatment process. Instead, raw water is withdrawn from Lake Livingston through a network of shallow wells placed in natural sand and gravel deposits on the Trinity County shoreline of the lake. TCRWSS filters and disinfects the water before distribution in 42 miles of pipelines. Although the treatment process at TCRWSS did not slow due to the freezing weather, demand for water was high, eventually increasing beyond the capacity of the plant.

"As the ground began to thaw, most of the customers had breaks in their distribution lines," said Steve Lee, Senior Operator at TCRWSS.

Lee fed water to the customer's tanks all day long but it became a losing battle as water was lost through broken pipes. In one 1.5 hour period, he fed to one of his customer's tanks the maximum amount of water that could be pumped through the delivery valve, only to see it remain virtually empty.

Eventually, the system could no longer maintain pressure in the distribution lines. This made it difficult to find the line breaks. Lines under pressure will gush water when broken, making the location of the break obvious. Lee requested the system's customers temporarily shut off water to their distribution systems until the lines could be repaired and tanks could be refilled. One-by-one, he refilled each of the customer's tanks starting with the clearwell at TCRWSS. End water users were advised to temporarily boil water intended for consumption since the system had lost pressure.

Thankfully, TCRWSS did not experience many of the small problems typically caused by freezing temperatures. One pump motor in the well field froze because it was idle. The remaining pumps were operating throughout the cold spell and did not freeze.

Tarrant County Water Supply Project

The Tarrant County Water Supply Project serves as a primary water supply for Bedford, Euless, North Richland Hills, Colleyville and Grapevine. The treatment plant is capable of treating 87 MGD. During the winter months water demand can be as low as 12 or 14 MGD. This excess in capacity helps TCWSP handle cold weather spells. Even if demand doubled to 28 MGD and the treatment process was slowed by half, the plant would be able to keep up.

TCWSP does have to amend the treatment process slightly in the winter. In particular, caustic acid does not flow when temperatures dip below 50 degrees.

"We feed caustic acid at 50 percent concentration until the temperatures go below 50 degrees F," said Marion Tims, Senior Operator at TCWSP. "Below 50 degrees, we switch to 25 percent concentration," he added.

Hurricane Ike Debris Clean-up Nears Completion at Wallisville Saltwater Barrier

In September of 2008, Hurricane Ike battered the coastline of Texas with damaging winds and a 15.65 foot storm surge. The Wallisville Saltwater Barrier sustained structural damage throughout the project. The project, which contains two recreational areas, was covered in vegetative storm debris, mostly marsh grass. Man-made storm debris, including refrigerators, picnic coolers, propane tanks, lumber and other building materials, sails from boats, boat hulls, boogey boards, and toilet tank float balls was scattered throughout the project.

The Wallisville project is operated by the U.S. Army Corps of Engineers. Local sponsors for the project are the City of Houston, the Trinity River Authority and Chambers Liberty Counties Navigation District.

The project, located on the Trinity River just north of Trinity Bay, was constructed for the purpose of controlling the intrusion of saltwater from Trinity Bay upstream into the Trinity River during low river flow conditions. Saltwater is mechanically blocked by a dam. Navigational locks allow boat traffic on the river to pass.

Without the barrier, saltwater can travel upstream and cover the diversion points of major water distribution systems using Trinity River water.

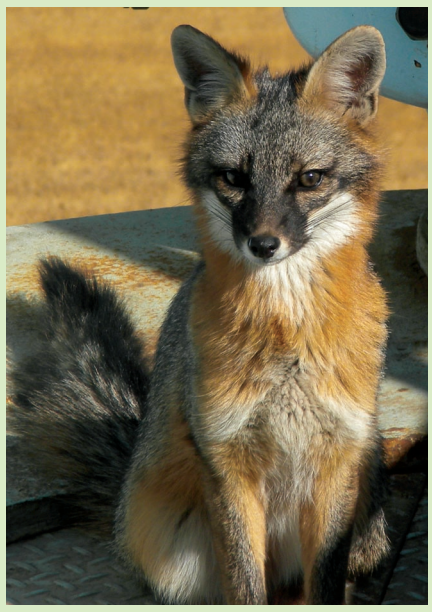
Repairs to the lock and dam were completed in 2009. Debris removal and recreational facility repair on the Wallisville Saltwater Barrier project grounds has been ongoing since the storm and is nearly complete.

Dr. Hong Wu, (left) Planning and Environmental Management Assistant at TRA, embarks on a boat tour of the Wallisville Saltwater Project. Dr. Wu was guided by Ruth Milsaps, Corps of Engineers Park Ranger, and Byron Smith, Lock Operator.

Boats like the one seen here were dispatched along the Trinity River and throughout the Wallisville project to pick up man-made storm debris.

Urban Wildlife

A gray fox was photographed in an empty sedimentation basin at Tarrant County Regional Water Supply Project.



General Manager's Message

Legacy Pollutants Remain an Issue of Concern in the Upper Trinity River

General Manager Danny Vance

A recent public meeting in Arlington sponsored by the Texas Commission on Environmental Quality resulted in a significant amount of media coverage concerning the continuing presence of Polychlorinated Biphenyls (PCBs) in portions of the upper Trinity River watershed. PCBs are a definite hazard to human health if ingested, but some of the media gave the impression that this was new "stop the presses" information.

Not only was this information not new, it was also incomplete. A series of legacy pollutants have long been known to be present in fish tissue samples taken from portions of the Clear Fork of the Trinity below Lake Benbrook and the West Fork below Lake Worth. The legacy pollutant issue continues along the West Fork of the river through Fort Worth and Dallas and extends southward along the main stem of the river to Navarro and Henderson Counties.

Legacy pollutants are chemicals whose use was banned or severely restricted in the 1970's and 1980's, but which still remain in the environment and on the shelves in many garages. Pollutants involved in the upper Trinity River include the pesticides chlordane and DDT to include DDT metabolites (chemicals derived from the breakdown of DDT) DDE and dieldrin.

PCBs, which were primarily used as a coolant in electrical transformers, are now ubiquitous in the environment as the result of inappropriate disposal and storage practices. Electrical transformers containing PCBs are still in active use and are replaced only when they fail. PCBs were also used in the production of caulk and other sealants, and carbonless copy paper.

At the time of their production and use, the greatest benefits to what are now called legacy pollutants were their stability and longevity. These same benefits are now considered some of their most negative drawbacks. Their stability prevents their decomposition to less toxic forms which result in their continued potency. Their longevity results in their long life in the environment which makes them virtually impossible to remove. How long they will remain a problem is unknown.

While the legacy pollutants are clearly undesirable, no major water supplies or locations where water is pumped from the river for water supply purposes are threatened.

Legacy pollutants are hydrophobic, meaning that they do not readily attach to water molecules and are generally not found in significant quantities in the water column. Their hydrophobic nature means that they are generally found in stream sediments. From the sediments, they are introduced into the food chain where they accumulate in the fatty tissue of fish which is the reason for the state's fish possession ban and fish consumption advisory that was issued in 2002 by the Texas Department of State Health Services.

The fish possession ban and fish consumption advisory applies to the 1,540 square miles of the upper Trinity River watershed described earlier. Other small lakes and stream segments in Tarrant and Dallas County are also listed in this directive from the State of Texas.

Almost all of the affected areas are densely populated and heavily urban in character. The remaining segments of the river listed as contaminated are immediately downstream from highly urbanized areas.

In response to these conditions, the TCEQ initiated a total maximum daily load (TMDL) project. The goal of a TMDL is to determine the amount (or load) of a pollutant that a body of water can receive and still support its designated uses, in this instance producing fish that can be safely consumed by the public. The load is then allocated among the sources of pollution within a watershed, and measures to reduce pollutant loads are developed as necessary.

It is doubtful that eliminating any new sources of pollution will have any impact on eliminating chlordane, DDT and PCB contamination because they have not been lawfully produced or sold for well over 30-years. The TMDL program could have a positive impact by preventing any relatively new forms of pollution from being introduced into the Trinity River.

The largest source of pollution impacting the upper Trinity River today emanates from non-point sources. This includes runoff from city streets, shopping centers, dogs you walk and do not pick up after, trash that is not controlled and the extra bag of fertilizer or herbicide that you put on your lawn or spill in your drive way. Chemicals which are not absorbed into the ground, and that which is spilled or thrown onto your drive way or other paved surfaces, will runoff during rain or from irrigation system over spray.

The public at-large will have to play a direct and continuing role in solving water quality problems in the upper Trinity River. Anyone who lives in the upper Trinity River watershed can be the source of non-point pollutants. Individually, we must make the effort to reduce our impact on the environment and health of the Trinity River.

Legacy pollutants are present in fish tissues samples taken from portions of the Clear Fork of the Trinity below Lake Benbrook and the West Fork below Lake Worth continuing along the West Fork of the river through Fort Worth and Dallas and extending southward along the main stem of the river to the Cedar Creek outfall in the Navarro and Henderson Counties area. Texas Department of State Health Services issued a fish possession ban and fish consumption advisory for these portions of the Trinity River watershed.

Employee Milestones

New Hires

Jonathan O'Bryant joined DCRWS as Operator I. CSS welcomes **Belen Campos** as Clerk/Typist. **Eric Jones** joined CRWS as Field Technician I. LLP welcomes **Jeff Blankenship** as Maintenance Mechanic II.

Promotions

Eugenia Jones was promoted to Laboratory Supervisor at CRWS.

Patrick Lynn was promoted to Operator II at CRWS.

Jeff Blankenship was promoted to Maintenance Mechanic II at LLP.

Melody Cannon was promoted to Supervisor, Purchasing/Warehouse at CRWS.

Alexander Teboh was promoted to Senior Electrician at CRWS.

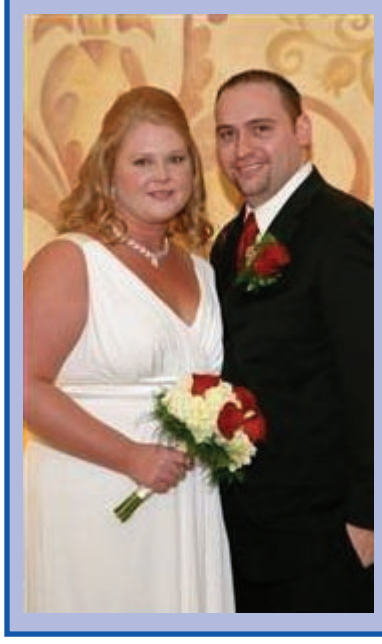
Current Events

Danny Smith, Operator I at MCRWS, earned his "D" wastewater license.

Kenny Nguyen, IT Specialist, and his wife TuyetMai, are celebrating the birth of a new baby girl. PhaLe TM Nguyen was born on Dec 27, 2009 weighing 7 pounds, 1 ounce and was 19 inches long.

Shambhawi Rai, daughter of Yesha Rai, NR Senior Secretary, became a US citizen on January 14, 2010.

Hatley's Daughter



Jonathan Hatley, son of David and Susan Hatley, married Amanda Poe on November 11, 2009. Amanda is the daughter of John and Gail Poe of Mansfield. The ceremony took place at the Stratosphere Hotel/Casino in Las Vegas, tallest building west of the Mississippi, in the Chapel in the Clouds. The ceremony was attended by 20 family members and close friends. The couple honeymooned in Las Vegas and also enjoyed a special flight over the Grand Canyon, landing in the canyon for dinner. Jon and Amanda live North of Ft. Worth. Amanda is an assistant manager of a Compass Bank and Jon is employed at Conn's in Euless. David Hatley is Lab Supervisor at CRWS.

Log In and Learn

TRA Rolls Out Training/Learning System

by Katie Shumate, Manger, Personnel Services

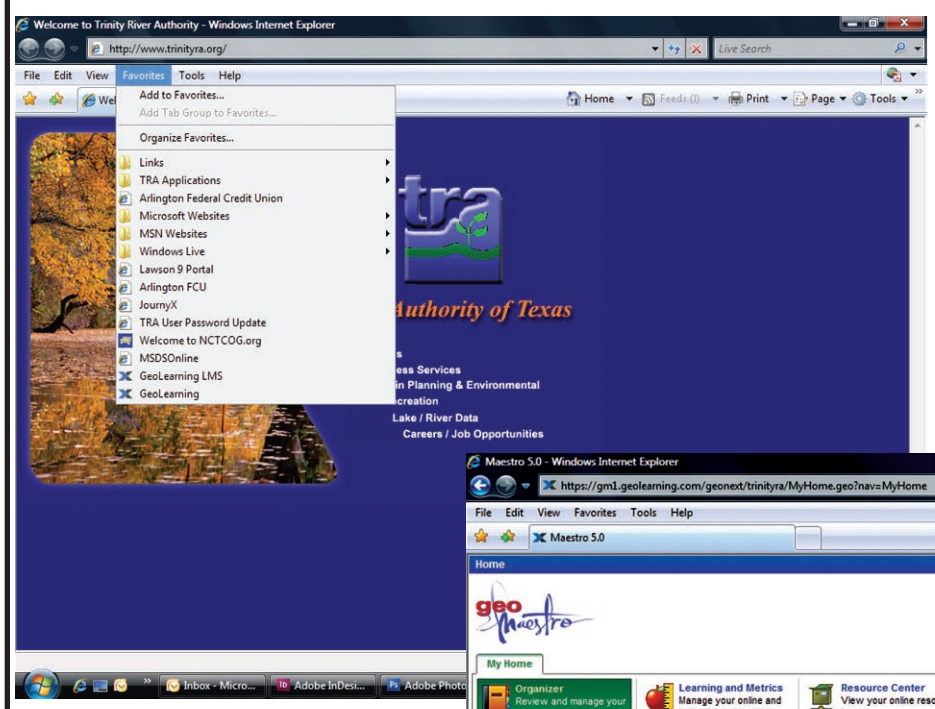
In the last year, the Trinity River Authority has purchased and tested a learning management system ("LMS") for the purpose of employee training. All projects have now had an opportunity to learn how to use the LMS. This system allows TRA to provide employees with skills, compliance, safety, licensing, and management training all in one place. Employees who would like to take a course to improve their Excel skills, for example, may do so through the LMS online at a time – or in small increments of time – of their own choosing. Also, employees who want to attend a special instructor-led offering, such as a CPR/AED course offered on-site, may register through the LMS.

In either case, the employee's successful completion of training is tracked in a transcript that is available for review by themselves or their supervisors. All requested training must be pre-approved, enabling managers to limit quantity and type of training to that which is appropriate for the needs of their staff.

The LMS is accessed from a favorites link ("GeoLearning") in TRA computers' web browser.

Benefits for TRA include lower employee training costs, since there is no per-user or per-course charge to use the training materials in this system. Also, the online courses are wonderfully flexible: you can pause your training course and continue where you left off at any time. So log in and learn!

If you'd like more information or need help using the system, you can contact Katie Shumate, Manager, Personnel Services (GS), Julie Hoppe, HR Supervisor (GS), or Tracy Owens, Training Coordinator (CRWS).



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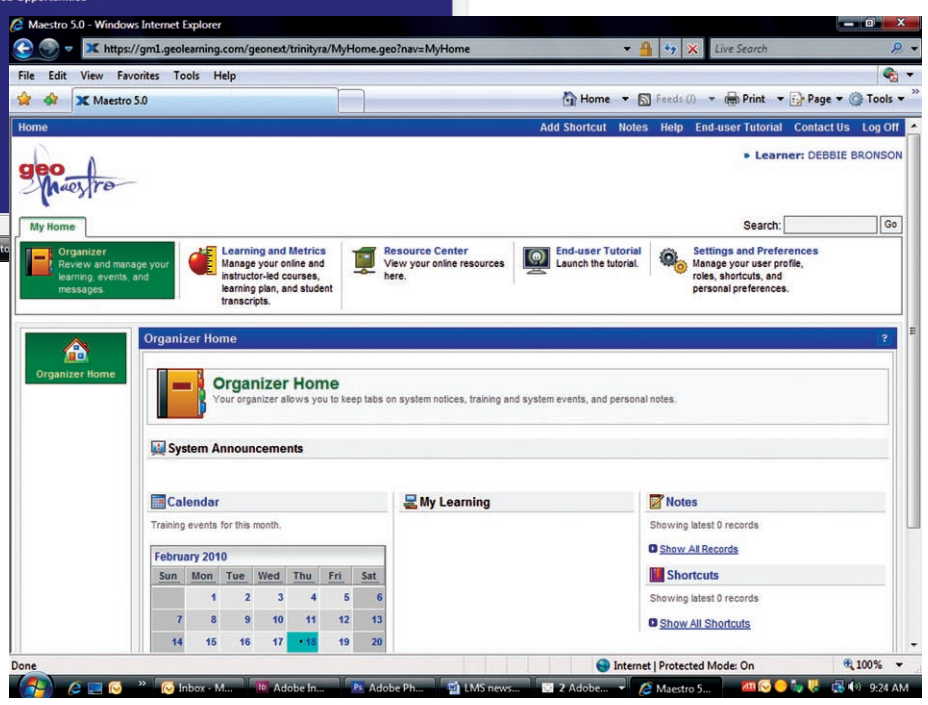

Contact Katie Shumate, Manager, Personnel Services, Julie Hoppe, HR Supervisor, or Tracy Owens, Training Coordinator at CRWS.

Anniversaries

10 Years

Steven Guerin, Senior Operator, DCRWS
Terry Kanhai, Senior Operator, TCWSP
Shalyn Shourds, Senior Biologist, CRWS
Clancy McKernan, Senior Maintenance Mechanic, CRWS
Alexander Teboh, Electrician II, CRWS

5 Years

David Johnson, CSS Construction Inspector II
Rod Shields, Operator II, CRWS
Carlos De La Cruz, Senior Maintenance Mechanic, CRWS
Heather Goins, Environmental Inspector, CRWS

3 Years

Huong Le, Information Systems Analyst, ITSS
Charles Burns, Manager, (GIS), ITSS
Cody King, Chemist, CRWS
Charles Carder, CSS Construction Inspector II
Barclay Hager, Jr., CSS Construction Inspector I
David Woodcock, Jr., CSS Construction Inspector II
Candi Nash-Trautmann, Accountant, GO
Melody Cannon, Supervisor, Purchasing/Warehouse, CRWS

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Construction Nearing Completion on TMCRWS Sludge Dewatering Facility

Substantial progress has been made on the construction of the Trinity River Authority's Ten Mile Creek Regional Wastewater System's new sludge dewatering facility. The sludge dewatering facility includes a waste activated sludge storage tank and sludge conditioning equipment, sludge blend tank, centrifuges, sludge cake conveyance equipment, odor control facilities and ancillary equipment used in the sludge dewatering process.

TMCRWS provides wastewater treatment and transportation services to the cities of Cedar Hill, DeSoto, Duncanville, Lancaster and Ferris. The plant treats an average of 16 million gallons per day and is permitted to treat 24 MGD.

Historically, TMCRWS utilized the treatment plant's sewage sludge surface disposal site for temporary biosolids disposal. In the future, biosolids produced at the plant will be dewatered via centrifuges before disposal. Construction on the new solids dewatering facility began in late August 2008.

The new sludge dewatering facility at TMCRWS includes a waste activated sludge storage tank and sludge conditioning equipment, sludge blend tank, centrifuges, sludge cake conveyance equipment, odor control facilities and ancillary equipment.